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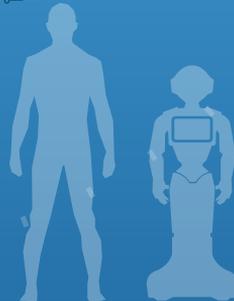
ANALYTICS

ADVANCING ASEAN IN THE DIGITAL AGE

FOURTH INDUSTRIAL
 REVOLUTION

ARTIFICIAL INTELLIGENCE

CYBER SECURITY



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ADVANCING ASEAN IN THE DIGITAL AGE

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FOREWORD

By H.E. Le Luong Minh, Secretary General of ASEAN



ASEAN, with its predominantly young and tech-savvy population, is projected to benefit immensely from the digital economy. The use of mobile devices and social media in ASEAN is among the highest in the world. Studies have shown that digital technologies in ASEAN could potentially be worth up to US\$625 billion by 2030 (representing 8 percent of ASEAN projected GDP for that year), through its impact on increasing efficiency, productivity and economic value creation. Furthermore, the ASEAN Economic Community Blueprint 2025 emphasises that digital technology is one of its most important elements due to its potential to motivate trade and investment, good governance and further the use of green technology.

The digital economy is principally a knowledge-based economy requiring specific skill sets, which currently are still much sought after in many ASEAN Member States. Yet, at the same time, all sectors of economy are steadily adopting and embedding Information and Communications Technology (ICT), bringing about surges of growth and innovation. In this regard, the ASEAN ICT Masterplan (2016-2020) is focused on facilitating these transformations to propel ASEAN towards a digitally-enabled economy, which is secure, sustainable, and transformative; and to enable

an innovative, inclusive and integrated ASEAN Community.

ASEAN Member States are also cognizant of other challenges they face in optimizing the potentials of the digital economy, including the high costs of entering the ASEAN market, limitations in infrastructure and overbearing red-tape. ASEAN is responding by investing heavily in improving infrastructure, such as introducing newer broadband technology to ensure faster and more seamless connectivity; and also undertaking efforts to eliminate the digital divide between Member States. Micro, small and medium enterprises are encouraged to participate in this economy and the generation of more ideas to lead ICT and next-generation applications. ASEAN is also working with Dialogue Partners to create a conducive ICT environment by combatting cyber-crime and enhancing human capacity.

Information digitalisation, through advances in ICT, contributes significantly to ASEAN Community building. It has the power to promote people-to-people connectivity more than any other means, which is invaluable in strengthening the ASEAN Identity. It is not only a reality of today, but is also an exciting future for tomorrow.

H.E. Le Luong Minh has been the Secretary-General of ASEAN since January 2013. Mr. Minh has had a long career in Viet Nam's diplomatic service which began in 1975. Before assuming his post as ASEAN Secretary-General, Mr. Minh was Viet Nam's Deputy Minister for Foreign Affairs.

H.E. Le Luong Minh studied Diplomacy at the University of Foreign Affairs in Hanoi, then Linguistics and English Literature at Jawaharlal Nehru University, New Delhi.

SPECIAL MESSAGE

By Dato' Sri Nazir Razak, Chairman, CIMB Group



INTRODUCTION

As we celebrate ASEAN's 50th anniversary, the Fourth Industrial Revolution (4IR) has dawned upon us, with technologies fusing the physical, digital and biological worlds, and changing everything at unprecedented speed. For ASEAN to successfully navigate the 4IR, we must understand what that means for regional integration, and the role ASEAN can and should play to help its companies and people withstand and exploit the 4IR.

CIMB is a regional banking group that has wholeheartedly embraced regionalisation since 2007, with its tagline "ASEAN For You" and expansion into all ASEAN markets. We recently reflected on the challenges of the 4IR, and have transformed our future strategies significantly. Any incumbent large bank or company that does not confront the scary and complex new realities of the 4IR risks joining the long list of corporate dinosaurs that will emerge.

ASEAN AND THE PARADIGM SHIFT

ASEAN has been a huge success. It has been the single most important reason for peace and stability in Southeast-Asia - the essential foundation for rapid economic development. ASEAN has been a stellar engine of Asia's growth, with gross domestic product (GDP) expanding exponentially from US\$23 billion in 1967 to US\$577 billion in 1999 when the current full membership of ASEAN-10 was achieved, to US\$2.55 trillion in 2016. Living standards in ASEAN have been transformed, with GDP per capita rising from US\$122 in 1967 to US\$1,135 in 1999 and US\$4,021 in 2016. The region's

poverty rate, measured by the proportion of the population living on less than US\$1.25 purchasing power parity per day, has reduced substantially, from 47 percent in 1990 to 14 percent in 2015.

At the heart of how ASEAN operates is the so-called 'ASEAN Way' of doing things, so this approach has been given much credit for the region's achievements, and deservedly so in the diplomatic and strategic domains. Although there is no official definition of the 'ASEAN Way', it would include unanimous decision-making, allowing opt out or delayed participation in any initiative, prohibiting countries from intervening in each other's affairs, minimum empowerment of supranational bodies, and denying legal enforcement powers for regional initiatives. The 'ASEAN Way' is not to force any issue on anyone.

The temptation now must be to persevere with the successful 'ASEAN Way', but we must not because what got us here will not get us there. The 'ASEAN Way' has ensured that economic integration progresses very slowly while the ASEAN Economic Community (AEC) is far from the single production base originally promised in the 2007 ASEAN Charter. The new AEC Blueprint targets a diluted version of the single production base by 2025, but without any proposed changes in approach to implementation, it is unconvincing. Furthermore, we have entered the 4IR - an era of accelerated change and one that will be unforgiving to those who cannot keep pace.

ASEAN needs to recognise the limitations of its 'ASEAN Way' to face the future. It must re-look at its priorities as well as governance

and institutional frameworks for economic integration in the context of the shortcomings of the AEC project and the 4IR.

Most critically, the regional business environment must be harmonised quickly so that ASEAN companies have the chance of taking advantage of the region's scale economies. ASEAN's platform and infrastructure businesses, such as airlines, online marketplaces, logistics providers, and even banks, must operate at regional scale. Rationalising laws and regulations among countries, opening up the markets for ASEAN businesses and encouraging cross-border labour mobility will be critical. If ASEAN does not avail regional economies of scale for its own companies, the ASEAN marketplace will be conquered by global players, and ASEAN companies will be bit players on their own turf.

To move at speed, ASEAN economic integration needs the supranational ASEAN secretariat to lead integration efforts with greater empowerment and funding. The secretariat has to spearhead a fast, nimble, inclusive and multi-stakeholder approach to making policies and implementing them, instead of relying on unwieldy inter-governmental committees.

If ASEAN does not get the 4IR right, it would be tragic as the demographics are hugely in our favour. More than half of ASEAN's population of 630 million is below the age of 30 – creative and connected digital citizens who are well-equipped to innovate. The thrilling combination of the tech-savvy and dynamic young people, the growth of the Internet economy and the transformative powers of the 4IR have the ability to transmute old-economy businesses and open up new ones, which could profoundly enrich the lives of the populations by creating jobs and wealth, and further propel progress.

BUSINESSES AND THE OPERATIONAL RE-THINK

ASEAN companies cannot wait for governments. ASEAN companies must face the 4IR by

anticipating and adapting to the challenges. Entrepreneurs and small companies can scale up at unprecedented pace, with the right ideas or products, and, of course, support. We must proliferate platforms to support our entrepreneurs with funding, mentoring and domain knowledge, as well as cross-border introductions.

Banking is one industry that is being rapidly revolutionised by technology and the 4IR as a whole. Over the next 10 years, it is not clear what will happen to incumbent banks, with large legacy infrastructures and costs, facing new competitors and alternative platforms for disintermediation. I believe that those that change and embrace technology will survive and thrive; those that do not will fade away.

CIMB has set up CIMB Fintech, a new division dedicated to ensuring that we capitalise on the opportunities of the 4IR and make the strategic adjustments to brace for expected lower margins and wider range of competitors. Being a regional bank has helped our cause tremendously as we have the economies of scale to invest in technology and innovation, diversity of clients to test our new products and ideas, geographical reach to source fintech and other partners from across ASEAN, and an aspirational brand to attract the best young talents from across the region.

Being an ASEAN universal bank has given CIMB a better chance to withstand and exploit the 4IR. ASEAN as a regional organisation must encourage and facilitate other entrepreneurs and companies to expand regionally for scale and diversity, and the best chance to navigate the 4IR. To have a realistic chance of getting this right, ASEAN needs a new 'ASEAN Way'.

ACKNOWLEDGMENT

Congratulations to CIMB ASEAN Research Institute (CARI) for the production of this timely publication and a practical reference to ASEAN's digital and 4IR challenge. I would also

like to thank all contributors – prominent leaders, business captains and policymakers – for sharing their thoughts on this critical subject.

After 15 years as Chief Executive, Dato' Sri Nazir Razak was appointed Chairman of CIMB Group in 2014. He is also a Director of Khazanah Nasional, a Member of the International Advisory Board of the University of Oxford's Blavatnik School of Government and Chairman of the World Economic Forum's ASEAN Regional Strategy Group and ASEAN Regional Business Council. In 2015, he was the recipient of Asia House's 'Asian Business Leaders Award'.

INTRODUCTION

By Tan Sri Dr. Munir Majid, Chairman, CIMB ASEAN Research Institute



“Advancing ASEAN in the Digital Age” brings to readers the future that is upon us even as the regional organization celebrates its 50th anniversary. It is a publication that focuses entirely on digitization and its impact on the ASEAN economy in so many different ways. It is the only book I know of that does this among all that have been published on ASEAN’s past 50 or next 50 years.

The CIMB Asean Research Institute (CARI) is privileged to draw on contributions from top government leaders, leading business executives, and public intellectuals, from across the region as well as beyond it. Some of the contributors are from global alpha companies at the forefront of the digital revolution.

There is undoubted optimism in ASEAN on the future driven by what is now being called the Fourth Industrial Revolution (4IR). There are however some cautionary notes pertaining to ASEAN’s preparedness in facing some of the requirements and challenges of the Digital Age.

Against the massive, phenomenal disruptions taking place across the globe, ASEAN has not been a laggard. With the world’s third largest population, 70 percent of whom are under 40 years of age, ASEAN is big and dynamic. It is one of the fastest growing Internet regions in the world, with an expected 480 million users by 2020. Tencent counts ASEAN and China as the second largest centre of innovations behind only North America.

There is no denial. Business leaders, whether directly operating in the digital space or obviously

affected by it, embrace the digital revolution. As noted by some of the contributors to this volume, the ASEAN Internet economy is expected to reach USD200 billion by 2025. A quarter of the ASEAN population are already shopping online. No doubt digital innovation will shape the next 50 years of Asean economic development.

Singapore leads the ASEAN field - by a long chalk. Indeed it is so far ahead it is attracting the world’s leading artificial intelligence (AI) talent that it could very well become a mega hub for start-ups involved in the sector. There is strong state backing for technology research. Alibaba, for instance, has decided to site one of its global AI research facilities in the island republic. A Singapore-based company has also announced it would set up an AI hub of its own which would incubate 100 start-ups every year.

The city state’s massive digital strides highlight a problem in ASEAN integration that could be caused by the digital divide in the region, extending the already existing economic divide into the Digital Age.

Singapore takes the chair of ASEAN in 2018 when it is expected to make the Digital Age the centre of the regional grouping’s attention. It would be a good time for ASEAN to take stock then not just of the vast opportunities but also some of the serious challenges of digitization to individual members state economies as well as to regional integration.

One of ASEAN’s foundational narratives is that its greater economic integration will attract foreign manufacturing investment based on low

labour cost in such destinations as Myanmar, Indonesia, the Philippines or Vietnam. However, even now, the low cost labour argument is gone. Cheaper, intelligent robotics, particularly robotic manufacturing, is readily available to displace human labour. Re-shoring is already taking place. There is the serious issue of ASEAN manufacturing employment not taking place in many of its member states.

The challenge is not limited to manufacturing employment. It cuts across all sectors, including services. A study in Malaysia puts the probability factor of computerizable jobs at 0.8 for unskilled and semi-skilled jobs. The threat to an individual ASEAN economy therefore could be higher the lower down the economic ladder it is.

It might be useful if ASEAN commissioned baseline studies of the risk to employment in individual economies from this challenge of the Digital Age.

Concomitantly, such studies should also examine the upskilling needs of the 4IR. Even the U.S. fails on this score. But, again, Singapore has an effective policy framework to achieve this which could be a model for other ASEAN member states. Schemes might have to be put in place for cross-border mentoring and retraining.

Further, as noted by some of the contributors, the ASEAN education system must be fit for purpose of the Digital Age. While new jobs may be created, the work force has to become, in the words of one of the contributors “a Think Force” that is “E-Fit.”

There is a consensus, especially among business leaders, that the current education system across much of ASEAN does not deliver the skills requirements for new jobs in the Digital Age, particularly cognitive skills. Overhaul of education systems takes time, but must begin. Investment decisions in the 4IR world are based on skilled and innovative human capital. One contributor warned ASEAN economies not to be caught in a perpetual cycle of playing catch up.

For the benefits of the Digital Age to flow across Asean, policy guidelines and regulations will have to be liberalized. Yet there will be an inclination to be protectionist from the fears aroused by the digital divide. As with protectionism in the real economy arising from the economic divide, this is short-sighted and will only result in ASEAN member states at the back being left further behind.

Yes, ASEAN must work together to address the major challenges of the Digital Age, but it has also to facilitate it by not constricting its benefits through policies that inhibit cross-border e-commerce, electronic payments, logistics and data exchange. Thus while ASEAN so readily recognizes the massive benefits of the Digital Age, it cannot afford to allow them to be minimized by the undoubted challenges the 4IR also poses. As always there has to be political leadership to negotiate this dilemma.

Tan Sri Dr. Munir is Chairman of CIMB ASEAN Research Institute, and also of Bank Muamalat Malaysia Berhad, of the Financial Services Professional Board, of ASEAN Business Advisory Council, Malaysia, as well as President of the ASEAN Business Club. He sits on the board of the Institute of Strategic and International Studies (ISIS) Malaysia and on the Financial Services Talent Council of Bank Negara Malaysia.

ASEAN AND AUSTRALIA - STRATEGIC PARTNERS IN A DYNAMIC REGION

Prime Minister of Australia, the Honourable Malcolm Turnbull MP



We live in a time when the pace and scale of change are unprecedented in human history. The last two decades have been characterised by disruption and change, much of it driven by the technology of the internet.

Nowhere in the world has this pace of change been more apparent than in Southeast Asia. In less than two decades, ASEAN's combined GDP has more than quadrupled, accompanied by rapid growth in consumer spending, urbanisation and internet penetration. Between 2012 and 2020, the ASEAN middle class will more than double, from 190 million to 400 million people. The cities of Southeast Asia are booming, with more than 90 million people expected to move to urban areas by 2030.

With 40 cities in ASEAN hosting populations of one million or more, and intra-ASEAN travelers making more than 100 million trips each year, countries in the region are more urbanised and connected to each other and the world beyond than ever before.

While the rapid integration of the region has brought about new economic growth and opportunities, it also demands greater practical cooperation on increasingly complex challenges - from the scourge of terrorism and violent extremism, to the urgent need to develop common standards to safeguard the future of digital trade.

Against this backdrop of rapid change and

complex challenges, ASEAN has been a bulwark of stability and constancy for 50 years. In 2017, ASEAN is an institution that has stood the test of time as the region's strategic convener, shaping a more prosperous and secure environment for all of us.

And in 2017, Australia's partnership with ASEAN has come of age. In 1974, when Australia became ASEAN's first dialogue partner, development assistance in the form of economic cooperation was the mainstay of our engagement. Contact between our peoples was limited. Trade was restricted by the protectionist policies and economic conditions of the day. And we did not yet have habits of cooperation on political and security issues.

How different the outlook is today. Taken as a group, ASEAN now represents

around 15 percent of Australia's total trade and is our third largest trading partner, after China and the European Union. In the last Australian census, 896,000 people claimed heritage from ASEAN nations. Behind those numbers is a story of constant and meaningful people-to-people contact. Australia welcomes more than 1.3 million visits from ASEAN countries each year, and in 2016 Australians made almost three million trips to ASEAN countries.

Incrementally over the decades, from the harrowing events of the 1970s - the Indochina refugee crisis and the Cambodian conflict -

ASEAN is an institution that has stood the test of time as the region's strategic convener, shaping a more prosperous and secure environment for all of us.

through to the end of the Cold War and beyond, we have developed a mature political dialogue. This was recognised by the elevation of our relationship to a strategic partnership in 2014, and by the agreement to hold biennial Leaders' Summits, the first of which was held in Vientiane in 2016. Today, our partnership is embedded in a strong network of regional institutions, including the East Asia Summit, ASEAN Regional Forum and ASEAN Defence Ministers Meeting Plus.

The ASEAN-Australia Special Summit in March 2018 will mark a major step forward in our partnership. It will build on our deep legacy of economic cooperation, political dialogue, and the natural interweaving of our people to establish a contemporary, outward-looking partnership for the rapidly changing world we live in.

As the first Australian Prime Minister to host all ASEAN Leaders in Australia, I see the potential of the ASEAN-Australia relationship to grow further still. The Special Summit will highlight three major opportunities: to strengthen our joint contribution to regional security and prosperity, to combat terrorism and violent extremism, and to secure greater opportunities for our people and businesses.

When Australia looks to safeguard its interests in a peaceful, secure and prosperous region, we naturally and increasingly look to ASEAN as an indispensable partner. Like ASEAN, Australia has stood for a region where might is not right and where inclusiveness is the norm. And, like ASEAN, Australia has worked to convene and strengthen organisations such as the East Asia Summit to help manage strategic risks. The Special Summit will open a new chapter in our dialogue, committing us to address challenges of common concern, like people-smuggling and human trafficking, maritime security and cyber security.

The rising threat of terrorism is a shared, transnational challenge our region must tackle head-on together. In September 2016, at the last ASEAN-Australia Summit in Vientiane, we agreed on a Joint Declaration for Cooperation to Combat

International Terrorism, to ensure that we continue to respond effectively and deepen cooperation across the region. It is essential that we sustain this.

As terrorists adapt, so must we as a region to defeat them. The scale and links between terrorist groups mean that we must work together even more closely, sharing information and lessons learned, and cooperating to keep our citizens safe.

At the ASEAN-Australia Special Summit senior officials will convene to discuss how we can work together more effectively to combat this shared and rapidly evolving threat, including through policy and law enforcement responses.

Opening new markets and opportunities for businesses in ASEAN and Australia has long been our shared ambition. The 2015 Declaration of the ASEAN Economic Community sent a decisive message to the world that ASEAN is for open markets and against protectionism. The ASEAN-Australia-New Zealand FTA, still ASEAN's most comprehensive trade agreement, was part of the inspiration for the Regional Comprehensive Economic Partnership (RCEP) – which also brings in China, Korea, Japan and India.

At the Special Summit, I want to bring business into the push for new growth in the trade and investment relationship. The objective of the CEO Forum that will precede the Special Summit is to drive better understanding of the business opportunities in our markets, and the steps we need to take collectively to secure those opportunities. I hope this will lead to more and better interaction and collaboration between our business leaders on such vital issues as digital transformation, the future of energy, and infrastructure.

Also preceding the Special Summit, a conference for Australian small and medium exporters will raise awareness of the opportunities for them within ASEAN; a reflection of my personal commitment to encouraging Australian businesses to seize the ASEAN opportunity.

I congratulate ASEAN on its 50th anniversary. Building on the enduring legacy of our partnership, Australia will continue to support ASEAN to shape a secure and prosperous region.

Malcolm Turnbull is the 29th Prime Minister of Australia.

He was born in Sydney on the 24th of October 1954 and was educated at Vaucluse Public School and Sydney Grammar School.

Following his graduation from Sydney University with a Bachelor of Arts/Laws he won a Rhodes Scholarship and completed a Bachelor of Civil Laws at Oxford.

He has worked as a journalist and a barrister before moving into investment banking and establishing Turnbull & Partners before moving to become managing director of Goldman Sachs Australia.

Elected on 9 October 2004 as the Member for Wentworth he has served as Parliamentary Secretary to the Prime Minister, Minister for the Environment and Water, Minister for Communications as well as Shadow Treasurer and Leader of the Opposition.

He was elected the leader of the Liberal Party and Prime Minister on 14 September 2015 and was re-elected as Prime Minister of Australia at the Federal Election on 2 July 2016.

Malcolm and Lucy continue to live in the eastern suburbs of Sydney, they have two children, Alex and Daisy, and three grandchildren, Jack, Isla and Alice.

ADVANCING ASEAN IN THE DIGITAL AGE

Yang Amat Berhormat Dato' Sri Mohd Najib Razak,
Prime Minister, Malaysia



The advent of mobile apps and e-commerce platforms have disrupted traditional business models and transformed consumer preferences. Modern consumers are turning more and more to online shopping over conventional retail outlets. Given that this trend coincides with a high digital penetration in Southeast Asia and the need for fast and easy transactions, it is no surprise that demand from consumers for technological services and apps is growing.

ASEAN is no exception to this trend. It is estimated that one quarter of the ASEAN population is already shopping online today. According to a report published by Google in May 2016, Southeast Asia is already the world's fastest-growing Internet region with a user base expected to grow from 260 million today to 480 million by 2020.

ASEAN's youthful population and expanding middle class are contributing to the growth of e-commerce in the region. With strong and vibrant economies, favourable demographics, ICT investments and ongoing economic integration, ASEAN has the potential to become a global leader in the digital economy with the right planning and approaches and the necessary coordination.

Increasing Internet penetration and increasingly digitally-empowered consumers - with computers, tablets and smartphones - present unprecedented opportunities for ASEAN businesses to serve customers globally, while online shopping creates new opportunities for ASEAN SMEs in cross-

border transactions.

Driven mostly by a growing base in the e-commerce market, online media and online travel, the Internet economy in ASEAN is projected to grow up to US\$200 billion by 2025. ASEAN's transformation into a digital economy powerhouse will boost economic growth and propel the region towards becoming the fourth-largest economy in the world by - according to some estimates - as early as 2030.

Currently, there are several ASEAN initiatives to promote the digital economy, such as the ASEAN Strategic Action Plan for SME Development 2016-2025; the ASEAN ICT Masterplan 2020; the 2025 Master Plan on ASEAN Connectivity; and the ASEAN Strategic Action Plan on Consumer Protection 2025. They include efforts to promote

digital trade and the use of electronic payments, to simplify customs procedures, improve Internet access, develop ICT infrastructure, enable transport connectivity, and harmonise e-commerce laws.

As e-commerce and other initiatives relating to the digital economy have been identified as a potential key priority for ASEAN next year, one outcome we can look forward to is the signing of an ASEAN Agreement which is expected to harmonise measures such as facilitating cross-border e-commerce, electronic payments, logistics and transfer of information.

This Government is very aware not just of the potential from the digital economy but of the necessity to do all we can to prepare ourselves and to be leaders, not followers, in the Fourth Industrial Revolution.

Nonetheless, the existing initiatives are not enough for ASEAN to leapfrog into the ranks of the global digital elite economies. According to a study undertaken by A.T. Kearney, there remains a significant digital divide within ASEAN, while countries in the region also face challenges in building out broadband, in regulations inhibiting innovation in mobile financial services and e-commerce, in low consumer awareness and trust, in the fact there is no single digital market, and in the limited supply of local content being produced by a weak local digital ecosystem.

It is important to note that the growth of e-Commerce is reflective of a broader trend, with new opportunities being created by the technological advances and innovation that constitute the Fourth Industrial Revolution. This will affect all aspects of the global business ecosystem, from how supply chains are managed to people-to-people interaction.

In order for Malaysia to remain relevant and competitive in this digital era, we need to make sure that our human capital is well trained and ready to embrace and adapt to new technology and employment. The Fourth Industrial Revolution should provide Malaysian manufacturing industry the opportunity to move up the value chain, from the "middle development" stage to a more productive, value-added and knowledge-intensive stage.

Malaysia established the National e-commerce Council (NeCC) in December 2015 to accelerate the growth and development of e-commerce in the country. The Council acts as the platform to guide the governance and implementation of the National eCommerce Strategic Roadmap (NeSR) involving 25 key Ministries and agencies.

Meanwhile, the implementation of the Digital Free Trade Zone (DFTZ) – the world's first - beginning in October 2017 will provide a highly conducive environment for companies anchored in the internet economy to carry out business and export their products and services. There has been very positive interest and much excitement among both local and international e-commerce players

about the opportunities the DFTZ will afford once it starts to be implemented.

To kick-start the pilot phase of DFTZ at KLIA Aeropolis, Malaysia is collaborating with e-commerce giant Alibaba. Leveraging Alibaba's Electronic World Trade Platform (eWTP) that helps SMEs overcome complex regulations, processes and barriers, DFTZ is the first regional eLogistics hub in Southeast Asia, and it is expected that by 2018 the eCommerce ecosystem will be attracting increasing numbers of local and global players who will want to be a part of DFTZ.

In other areas, the Malaysia Digital Economy Corporation (MDEC) is working on creating and supporting new digital hubs, and there are already three MSC Malaysia Cybercities that meet the standards of international hi-tech investors, including Cyberjaya, Mid Valley and Bangsar South.

To ensure our efforts to promote the digital economy are truly inclusive, the eRezeki and eUsahawan initiatives were launched in 2015. The eRezeki programme is aimed at B40 households, helping them to find new ways to earn income, while the eUsahawan programme aims to develop a generation that embraces the Digital Economy by incorporating digital entrepreneurship skills into the curriculum of Technical and Vocational Education and Training (TVET) institutions.

MDEC launched #mydigitalmaker movement, an initiative in partnership with the Ministry of Education (MoE) to aid the integration of Computational Thinking and Computer Science into the formal school curriculum; as well as facilitating industry and universities to help nurture and groom talented young digital makers through extra-curricular activities.

MDEC is also collaborating with Human Resources Development Fund (HRDF) Malaysia for the development of programmes on critical ICT skills. This is part of the Digital Talent Strategic Intervention Roadmap, which is designed to create a sustainable industry-led development model.

All of the above should help us reach the target under the 11th Malaysia Plan (2016-2020) for the digital economy to contribute 20 percent of GDP by 2020, while our E-commerce Strategic Roadmap also aims to double e-commerce growth from 10.8 percent to 20.8 percent by 2020.

This Government is very aware not just of the potential from the digital economy but of the necessity to do all we can to prepare ourselves and to be leaders, not followers, in the Fourth Industrial Revolution, which is why in late 2016 I also called for the cost of fixed broadband to be halved, the internet connection speed doubled, and for 2017 to be our “year of the internet”.

In conclusion, with more than 630 million people living in ASEAN and with more than half of the population under the age of 30, there is massive potential for ASEAN. ASEAN therefore needs to continue developing its internet infrastructure in order to enable the full participation of businesses in cross-border markets at regional and global levels. It is imperative that ASEAN reaches out to companies in the region, particularly SMEs, to stress the importance of embracing digitalisation.

ASEAN also needs to embrace and adapt to new technology and innovation under the Fourth Industrial Revolution in order to remain relevant and competitive as an attractive investment destination.

If ASEAN is to reap the full benefits of the rise of digital technology, the association must see this as an opportunity to adapt, evolve, reform and innovate. Together we can make use of digital technology to empower the ASEAN Economic Community - and for us collectively to move closer to the overarching vision of a more integrated, prosperous and competitive ASEAN by 2025, for the benefit of all.

Dato' Sri Najib Tun Razak is the Prime Minister of Malaysia.

As the son of Tun Abdul Razak Hussein, Malaysia's second Prime Minister, and nephew of Tun Hussein Onn, Malaysia's third Prime Minister, Dato' Sri Najib was born into a family of political pedigree.

Having initially pursued a career in business, he only entered public service upon his father's death. After an outpouring of public support, at the age of 22 he became the youngest MP in Malaysia's history. Despite the absence of his father to help him, by 25 he was a Deputy Cabinet Minister, by 29 the Chief Minister of a state, and by 33 a full Cabinet Minister. Having successfully led most key ministries, including Education, Defence and Finance. Aged 55 on 3 April 2009 he became Prime Minister.

ADVANCING ASEAN IN THE DIGITAL AGE

Prime Minister of Kingdom of Cambodia, H.E. Hun Sen



This year marks one of the greatest milestones in the history of the Association of Southeast Asian Nations (ASEAN) – the 50th commemorative anniversary of its establishment. For the past five decades of its existence, ASEAN has endured, strived, navigated through various turbulences, and in fact recognized as one of the world’s dynamic, successful and resilient regions, considering its robust economic growth, solid political-security stability, improved living standards, peace, and harmony. For next 50 years, we will witness the transformation of ASEAN in all areas: social, economic and political, in scope and scale that we have never experienced before, and in a new context that will be tremendously shaped by a rapid pace of technological advancement.

We all now know the world is indeed entering the new era of revolution, so-called the Fourth Industrial Revolution (Industry 4.0) that is affecting how governments run, businesses operate and people live. And we are feeling it now since technology has empowered and touched many aspects of people’s lives, societies, businesses, and governments in a way the world has never seen before, from self-driving cars and drones, to virtual travel arrangements, to 3-D printing, to Artificial Intelligence, and to other cloud-based innovations.

The rapid progress would also provide opportunities to address critical challenges in other areas as well, including but not limited to, education, public health, food security, and climate change. The FinTech can be, for example, a key to transforming the entire financial sector by reducing transaction cost and information asymmetry. On the economic front, forces of technologies in Industry 4.0 is a potential game-changer for more efficient, productive, cost-competitive and customized products and

services. Industry 4.0 and the emergence of innovative technologies offer a huge potential for ASEAN to further integrate into the global value chains (GCV) and production networks. It would help re-structure economic, trade and industry by reducing costs and boosting productivity. ASEAN could be at the forefront of change – among all means – by leapfrogging or moving ahead with the adoption of latest technologies. By 2030, ASEAN, based on research by McKinsey Global Institute, could generate huge potential economic impact from technologies, estimated to be US\$625 billion, equivalent to 4 to 12 percent of ASEAN’s GDP at that year. Recognizing its significance for the growth and development endeavors of Cambodia and the region, Cambodia is keen on one particular component of this revolution, the digital economy and its current trends.

The Internet of Things (IoT), a technological accelerator in the Industry 4.0, is set to become a megatrend. The unstoppable progress of the Internet, for instance, promises potential for online businesses and other means of e-commerce development for Micro Small Medium Enterprises (MSMEs) in ASEAN, which currently account for 99 percent of all enterprises and between 50 percent and 90 percent of employment. ASEAN’s internet penetration, based on a Temasek & Google’s recent report, was also remarkable, reaching 260 million in 2016, equivalent to over 40 percent of the total population, and is expected to be 480 million in 2020, which means 4 million new users coming online every month.

The importance of the Internet is in no way different for Cambodia in comparison to the other ASEAN member states since Cambodia is positioned to become a key player in production and movement of goods and services around ASEAN as well as becoming a regional hub for investors and

entrepreneurs. This could lead to a promising rich and diverse economy that provides new jobs, increases financial inclusion, as well as contributes to improving the livelihood of the people in Cambodia and the region. In this connection, Cambodians are rapidly adopting e-commerce in various forms including as consumers and merchants, fuelled by rapidly growing internet users from 1.7 million users in 2011 to 7.16 million users in 2016¹. E-Commerce and online shopping have been increasing significantly in recent years; and with 60 percent of Cambodia's population below the age of 25, it represents a huge potential not just for local but regional and international markets. Many cashless and electronic payments platforms, which are vital to the facilitation of e-commerce activities, have been introduced to the Cambodian consumers and merchants with considerable success. Moreover, the Cambodia's government is in the process of having the law on e-commerce, which covers e-commerce provisions, such as, e-signature, online consumer protection, and personal information protection, e-government, e-payment, and e-evidence. Although such development is still in progress, this will pave the way for Cambodia's economy to further integrate into the regional economy.

Taking ASEAN into consideration as a regional actor, countries will not be able to single-handedly work towards advancing their economies. This demands the need for cooperation both at the national and the regional levels. The digital economy, as well as, the Industrial 4.0 have become some of the most important topics that have been discussed among the ASEAN member states and its partners. More importantly, ASEAN has adopted ASEAN ICT Master Plan 2020 and Connectivity Master Plan 2016-2025 recognizing digital innovation as one of the five elements as well as setting it as an integral part of all three pillars (Physical, Institutional, and People-To-People Connectivity) of ASEAN Connectivity². It is starting from supporting and promoting MSMEs and other financial access through digital technologies to improving open data use and

enhancing data management among the ASEAN member states.

Yet to realize the full potential of technological advancement, ASEAN needs both hard and soft infrastructure to support the digital economy ecosystem. In addition to building hard infrastructure including broadband connections and mobile networks, aiming to expand and provide universal and low-cost internet access, ASEAN needs to further place an emphasis on soft infrastructure, which focuses on capacity building and skills development through platforms, business networking, and other ICT spaces to share international best practices, and on harmonization of regulations and rules across ASEAN member states. Any efforts by the government to manage or mitigate risks from privacy invasion and other cyber activities, however, must be done by putting the people first to maximize inclusion and digital transformation for all members of the society, including the poor, minorities, youths and women, as well as the economy as a whole.

To thrive in the dynamic social, economic and political architecture, ASEAN must constantly adapt to new conditions and retain an open and flexible attitude. This is because technological progress has come with a set of disruptions to the region, particularly as the level of readiness, application, access, and absorption of new technologies among the ASEAN member states vary considerably. The Industrial 4.0 can disrupt the labor markets in the form of worker displacement and job losses, affect current value chains with increasing volatility, shorter production life cycles and high product complexity, and expose the people to cyber risks. ASEAN, thus, must prepare their younger generations with the ICT digital literacy and skills to prepare for the future jobs that might not exist yet, to catch up fast with more developed ASEAN fellow members and encourage technological innovation through the promotion of STI-driven projects and R&D. Together, the ASEAN member states can prevent a notion of monopoly, which leads to a scenario

¹ UNTAD: Cambodia Rapid eTrade Readiness Assessment 2017

² ASEAN Master Plan on ASEAN Connectivity 2025

- winner takes all or winner takes most - in the digital economy as this could widen inequality.

Given the astonishing progress, advancing ASEAN's digital age is not an option, but a must that would require a whole-of-government as a holistic approach, matched by bold actions with the vision to change and explore new ideas. Thus, member states need to catch up fast through building a forward-looking, simplified and harmonized policies and regulations. The interface of digitalization, e-commerce, and pro-business environment requires the member states to change from working in silos to enhance synergies with other sub-regional and interregional frameworks through both existing and new initiatives to improve physical, institutional or people-to-people connectivity. With the continued national development of infrastructure to integrate into the regional digital economy, I firmly believe Cambodia and ASEAN as a whole would exploit the full benefits of the digital age as a part of our shared future.

Samdech Akka Moha Sena Padei Techo Hun Sen was in Peam Koh Sna Commune, Stoeung Trang District of Kampong Cham Province. In 1977, he led a movement that liberated Cambodia and its people in 1979 from the genocidal Pol Pot regime. His political career started in 1979 as Foreign Minister, then Deputy Prime Minister and Foreign Minister (1981-1991), and finally as Prime Minister (1985) until the present. His political career was marked by significant achievements, which laid the basis for the attainment of peace, national reconciliation, and the development of the country. He likewise proved to be an indispensable architect of the Paris Peace Agreement on Cambodia. Under his leadership, Cambodia became the 10th member of the Association of Southeast Asian Nations (ASEAN).



ASEAN IN THE DIGITAL AGE: QUO VADIS?

Technological advancement, enabled by our emerging digital behaviours and the new business models that deliver economic value, has brought us to the cusp of the digital age, impacting all aspects of human life.

Developments are accelerating in four key areas: (i) Connectivity & Computing power, (ii) Data, Analytics & Intelligence, (iii) Human-Machine Interface and (iv) Physical-Digital collision. This rapid evolution has created a significant opportunity for emerging ASEAN to jump to the forefront of the technology wave.¹

With a proper digital agenda and a strategy that harnesses

the power of both technology and people, ASEAN could see US\$1 trillion added to its GDP over the next decade, a 20-30 percent increment to its overall output by 2025.²

The Tailwinds:

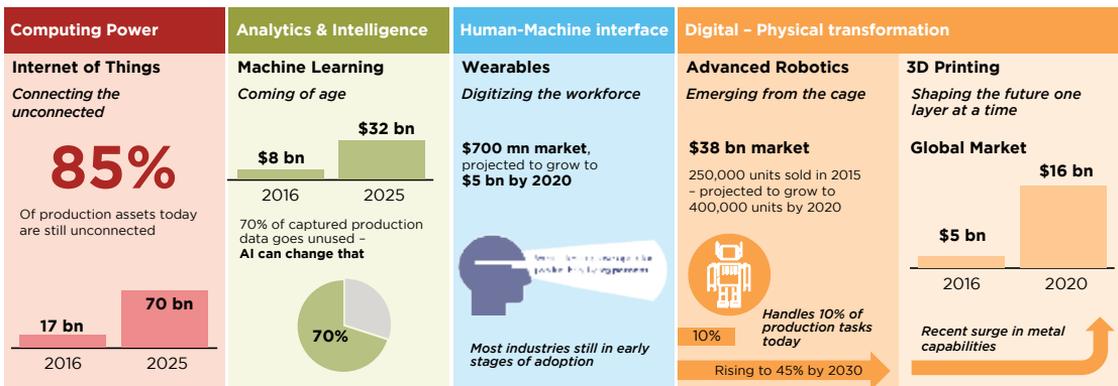
Ten-nation ASEAN has a population of more than 630 million and a robust economy, currently valued at US\$2.55 trillion with projected annual growth of more than five percent over the next decade.³ If it was a country, the bloc would be ranked #3 globally in population and #7 in GDP.⁴

Over 90 percent of ASEAN's population is literate⁵ and more than 50 percent of the

population is under 30 years of age⁶, most with internet access. This young population is likely to drive the digital push in three ways: digital innovation, growth in digital spending and the economy, and accelerating digital adoption in the workplace.

In 2015, the AEC mapped out a clear charter for the next 10 years with a clear focus on innovation and technology adoption, and the development of micro, small and medium enterprises (MSMEs)⁷. This is especially critical in ASEAN as MSMEs contribute 30-60 percent of the overall economy across markets (for example: in Malaysia it is 35 percent,

Figure 1: A cyber-physical collision is being driven by four key technology clusters



Source: A.T. Kearney

¹ Technology and Innovation for the Future of Production: Accelerating Value Creation; World Economic Forum in collaboration with A.T. Kearney;

² The ASEAN Digital Revolution; collaboration between A.T. Kearney and Axiata

³ International Monetary Fund Databases

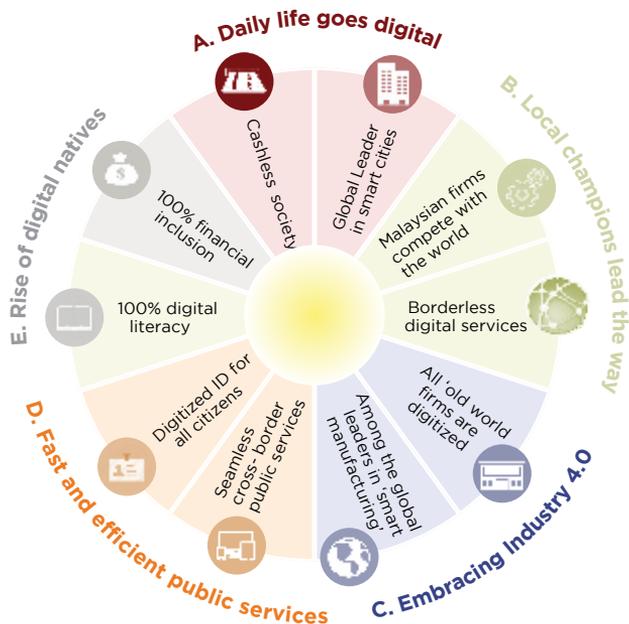
⁴ ASEAN Economic Community 2015: Progress and Key Achievements Jakarta: ASEAN Secretariat, November 2015

⁵ ASEAN Statistical Yearbook 2015

⁶ ASEAN Economic Community at a Glance 2007-2015 Jakarta: ASEAN Secretariat, August 2016

⁷ ASEAN Economic Community Blueprint 2025 Jakarta: ASEAN Secretariat, November 2015

Figure 2: A digital revolution will transform ASEAN by 2025



Source: A.T. Kearney

Indonesia 60 percent⁸), but have low ICT adoption rates (for example, only 30 percent of SMEs in Malaysia using eCommerce and epayments⁹). This twin focus on innovation and MSMEs could spur wide spread digital adoption across the region. Countries are already taking concrete steps to bring SMEs online - KOMINFO in Indonesia organized programs with employee training and provided domain IDs and free hosting services in order to bring 100,000 SMEs online and help them expand their market

reach, nationally and globally. There is also a plan to take 8 Million SMEs online through the Go Digital Vision 2020 program.

Substantial digital and physical infrastructure investments have also been underway. Over 2011-2015, almost US\$50 billion¹⁰ was invested in building communication infrastructure across ASEAN. For example, Malaysia has taken the lead by setting up the first Digital Free Trade Zone in the region to facilitate SME integration with the digital economy.

Most ASEAN countries have articulated various visions for their digital economies, such as detailed eCommerce roadmaps that integrate SME sellers into the digital economy. For example, the Malaysia Digital Economy Corporation has developed one such roadmap in partnership with A.T. Kearney, which envisions doubling the eCommerce growth rate in Malaysia.

Overall, ASEAN has a conducive demographic, macro-economic, infrastructure and strategic environment for digital adoption that will spur economic growth among the economies.

The Headwinds:

However, digital growth and its attendant benefits are not a given. There are three key challenges that need to be addressed:

1. Weak rural infrastructure development
2. Limited workforce readiness for the digital age
3. Privacy & security concerns - that need to be addressed.

Weak rural infrastructure: Rural parts of most ASEAN countries remain largely unconnected. In addition, more than half of adults in many ASEAN markets do not have a bank account.¹¹ Where banking penetration

⁸ Asian Development Bank (ADB) 2015; Asia SME Finance Monitor. Manila; Office of Small and Medium Enterprise Promotion (OSMEP). 2015. White Paper on Small and Medium Enterprises in Thailand 2015. Government of Thailand; SME Corporation Malaysia. 2015. Annual Report 2014-2015

⁹ SME Corporation Malaysia Annual Report 2015-2016

¹⁰ ASEAN Investment Report 2016 Jakarta: ASEAN Secretariat, September 2016

¹¹ World Bank Global Findex 2014

is substantial, such as in Malaysia (81 percent), cash still dominates with 7 times as many ATM withdrawals as debit card transactions.¹² While cash on delivery is being explored as a solution, digital payments will be key to creating a step jump in online transactions, which involves shifting a large proportion of unconnected and unbanked people online.

Limited work force readiness for the digital age: The digital revolution could see the end of employment as we know it. Our assessment broadly indicates three types of impact on employment across sectors: job losses, job augmentation and job enhancement.

Science, Technology, Engineering, Mathematics (STEM) graduates typically play a key role in driving digital innovation and can take up many of the ‘enhanced’ jobs. However, STEM graduates are under-represented in many

ASEAN countries - for example, Indonesia produces ~750 STEM graduates per 1 million population, far below China (~1,000), and India (~1,800).¹³ Despite this, most ASEAN countries do not have a skills roadmap for the workforce. The absence of a coherent plan will hamper workforce development for the digital age.

Privacy & Security concerns: In a recent digital transformation survey with business leaders in the region, cyber-security ranked as the top concern. Among consumers, there are increasing concerns around the security of personal data, financial and transactional data. Over the past few years many ASEAN countries have strengthened personal data and cybersecurity laws. But this will need to be continuously strengthened to enhance people’s trust.

Advancing ASEAN through four Digital Sub-revolutions:

Carpe Diem

For ASEAN to sail smoothly through the digital revolution, we will need focus in four areas:

1. Continue accelerated digital and connectivity infrastructure investments

Continued investment in digital and physical infrastructure is a must. This will range from increasing broadband internet access and digital services, to enabling the creation of smart platforms and cities.

Broadband penetration:

The focus should be on improving high-speed broadband penetration, as studies have shown that increased broadband internet access drives higher GDP growth. Ensuring healthy operator economics is critical to sustained broadband infrastructure investments. ASEAN mobile operators have high capex intensity compared

Figure 3: The collision of cyber-physical worlds has nuanced implications on the workforce



Source: A.T. Kearney

¹² Financial Stability and Payment Systems Report 2016, Bank Negara Malaysia

¹³ UNESCO Institute of Statistics 2014 or latest available

to global operators (for example, Indonesian operators invest 15-30 percent of sales on capex annually compared to developed market averages of less than 15 percent). Mobile operator economics could be improved through two sets of actions:

- Increased spectrum availability, especially of a lower band such as 700 MHz, so that operators can expand broadband coverage cost-effectively.
- Ensuring that there are no more than four mobile operators per country, so that operators can earn sufficient returns to re-invest in infrastructure.

Countries could consider the rollout of a national broadband network to increase penetration of fixed-line networks and provide enhanced mobile quality.

Payments platforms and mobile financial services:

A single framework that enables countries to harmonise regulations on payments and mobile financial services will greatly bolster digital usage. Policy makers must encourage standardised digital payments platforms – first in-country, then across ASEAN. Systems such as NETS in Singapore or mobile wallets will lower the cost of transactions and encourage daily micro-payments. Further, significant acceleration is needed towards setting up and running Internet-only and payments banks. These limited service institutions are significantly faster and cheaper than traditional brick and mortar banks, enabling deeper financial penetration and ensuring the mass of transactions are digitalized.

Physical-digital infrastructure:

Smart City programs show how you can build digital into growing infrastructure. By 2025 ASEAN is primed to have 35 cities with more than 1 million residents and generating approximately 80 percent of the Bloc’s GDP. These cities will need to be “smart” to solve the problems associated with rapid urbanisation. Policy makers should design a common strategy to nurture city standards and economies of scale as these cities develop.¹⁴

2. Foster innovation and build local champions

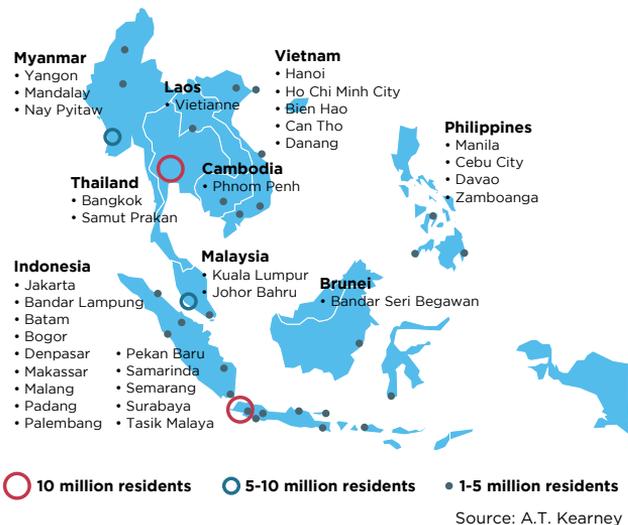
For ASEAN to fully benefit from the digital revolution, its people will need to be not just digital consumers, but also digital producers and innovators.

Local champions:

Lazada, Grab and Go-Jek are some anchors in their respective markets that have shown how

Figure 4: A Plan for ASEAN smart cities

35 smart cities across 10 countries



... deploying IoT and green technology across key dimensions

Smart energy	<ul style="list-style-type: none"> • Smart grid • Energy storage • Smart meters
Smart environment	<ul style="list-style-type: none"> • Renewable energy • Water and wastewater management • Sanitation
Smart transport	<ul style="list-style-type: none"> • Technologies to reduce traffic congestion • Green transport: electric and hybrid • Railways: metro and monorails
Smart IT	<ul style="list-style-type: none"> • Cloud computing and analytics • Security and surveillance • Disaster management
Smart buildings	<ul style="list-style-type: none"> • Intelligent building management systems to save water and electricity • Smart waste management
Smart healthcare	<ul style="list-style-type: none"> • Remote patient monitoring • E-health and m-health systems

¹⁴ The ASEAN Digital Revolution; in collaboration with A.T. Kearney and Axiata

local success stories encourage digital entrepreneurship. Observing and learning from such local success stories plays a key role in accelerating digital entrepreneurship.

Innovation ecosystem:

True innovation requires all stakeholders from policymakers to companies to schools to play a leadership role. Local incubator programs and industry-university collaborations can turbocharge innovation through creating a nurturing environment through research programs, hackathons, and internships/education credits for industry work. Silicon Valley provides a great template for creating such an environment of universities, companies, and investors and demonstrating its positive flywheel impact. Some national initiatives focused on creating a comprehensive ecosystem for innovation are already in action through the SPRINGS SEEDS Capital and Startup SG Equity programs in Singapore and MaGIC (Malaysian Global Innovation & Creativity Centre) in Malaysia. In Indonesia, the Ministry of Communication and Information Technology has set up the '1000 Startup Digital National Movement', aimed at creating 1,000 technology startups with total valuation US\$10 billion by 2020.

Establish rules that protect innovation:

Regulations and enforcement to protect developers from those who seek to produce inferior imitations, adopting the "fast

follower' strategy, are paramount to digital innovation success. Studies globally have found that strengthening intellectual property rights increases the propensity to innovate and file patents. Positive regulation to encourage innovation zones as well as 'short period moratoriums' from regulation for new technology such as M2M and IoT can encourage development of new technologies and solutions.

Encourage digitally led R&D:

ASEAN could take a similar approach to advanced R&D markets such as the US and Japan to make extensive use of R&D tax incentives to help innovative enterprises get off the ground. Such concessions must be non-discriminatory, applying to startups in all industry sectors.

3. Enhance trust and security

For digital adoption to be widespread, trust and security is paramount. Most ASEAN countries have compulsory National IDs to access certain government services, but they should now implement a national e-ID system as a first step. With national IDs in place, ASEAN can then strive toward cross-border identification, resembling the European Economic Area's adoption of national ID cards entitling people to free movement.

As everyday services move online, the risk of a breach is high. A resilient regional-wide cybersecurity regime is needed to drive public confidence in e-commerce and cross-border

data transfers. ASEAN should consider creating a world-leading agency to fight cybercrimes, like J-CAT of Europol. However, regulations need to be balanced and proportional to avoid deterring businesses from developing electronic and mobile commerce platforms.

4. Ready the workforce for the Digital Age

For ASEAN to take full advantage of the Digital Age, its workforce need to be imbued with the right skill-sets.

Upskill the workforce:

Countries should lay out a comprehensive roadmap for talent development and training. Reskilling and retraining should focus on enabling employees to use technology effectively, fostering curiosity, creativity and collaboration to prepare for a world of continuous disruption. Tighter coordination between Government, Industry and Educational institutions is necessary, with a focus on the practice aspects of digital, and the latest tools and technologies. The Thailand 4.0 model is an example of Government action in this space. The government is promoting lifelong learning through 3,600 community digital centers and is Nurturing Citizens 4.0 by setting up a Strategic Talent Center where they match specialized science and technology skills with private sector needs.

Invest in "21st-century skills" education:

ASEAN schools continue to use curriculums that are no longer future-ready. Some have added new courses such as entrepreneurship and computer studies, others have begun to incorporate technology in its curriculum, but this is not enough. According to the International Computer and Information Literacy Study (ICIL) by the International Association for the Evaluation of Educational Achievement covering 50,000 eighth-graders in more than 3,300 schools from 21 education systems, only 2 percent of students use their critical thinking and that teachers lack confidence in teaching essential computer skills. Governments need to radically transform the current education system to ensure children are prepared for the digital economy. Skills such as critical thinking, problem solving, creativity, digital literacy, and more holistic social and emotional skills will be vital for youngsters to cope

with the new technologies and rapidly evolving workplaces of tomorrow. Based on our study, we also see tremendous potential to leverage on technology (e.g. Google Apps, Skype), innovation (e.g. One Laptop per Child – a nonprofit providing low-cost computers to millions of schoolchildren), and new private-public partnerships to re-invent the way we teach the next generation.¹⁵

Overseas nationals represent an immediate opportunity to boost the existing local talent pool. Governments should be doing all they can – from financial inducements, to preferential taxes, or other incentives – to attract highly-skilled overseas workers to return home to ASEAN.

Conclusion

The digital age is coming and ASEAN urgently needs to do two things:

1. Set up an independent board – the ASEAN Digital Economy Promotion Board to provide strategic direction and guidance to the AEC and its member governments – with country representatives, industry experts and key opinion leaders.

2. Set up a Digital Index like the European Union's Digital Economy and Society Index (DESI) that collates relevant indicators on digital performance and tracks the evolution of member states' digital competitiveness.

Rome was not built in a day and neither is a digital economy. The headwinds outlined must be addressed with all stakeholders working together, pushing for an integrated roadmap that will turn the US\$1 trillion opportunity into ASEAN's reality.

A.T. Kearney is a leading global management consulting firm with offices in 40 countries. Since 1926, we have been trusted advisors to the world's foremost organizations, working with more than two-thirds of the Fortune Global 500. A.T. Kearney is a partner-owned firm, committed to helping clients achieve immediate impact and growing advantage on their most mission-critical issues.

About the authors

Soon Ghee Chua is a partner with A.T. Kearney heading the South East Asian operations. He has almost 20 years of consulting and industry experience during which he has advised Business and Government leaders across the region on digital and transformation related topics. He has also co-authored a book on 'Asian Mergers & Acquisitions'.

Hari Venkataramani is a principal with A.T. Kearney based in Singapore. He has extensive experience advising organizations across Asia-Pacific on digital and transformation related topics.

¹⁵ Rethinking K-20 Education: Transformation for a New Age; collaboration between A.T. Kearney and Ashoka

ASEAN IN THE DIGITAL ERA: OPPORTUNITIES AND CHALLENGES

H.E. Sri Mulyani Indrawati, Minister of Finance, Ministry of Finance, Indonesia



For an economist like myself, I am certain that the digital economy will contribute significantly to economic growth with increased economic efficiency and higher productivity through the greater utilization of assets, innovation, business networking, knowledge transfer and improved connectivity in value chains.

It is humbling to realize that ASEAN has just commemorated its 50th anniversary. This half-century-long journey has reflected the dynamics of the cooperation among member states and the transformation process in the region. This cooperation has made ASEAN one of the most promising players on the global stage as the region remains stable with huge growth potential.

ASEAN is now the world's sixth-largest economy with a combined GDP of US\$2.55 trillion, and is expected to continue growing at a sustained growth rate of 5 percent, the average, over the past few decades. It is not surprising to see that in five years, ASEAN will enter the exclusive group of the five largest global economies.

ASEAN will need to tirelessly

work on increasing its competitive advantages. ASEAN should capitalize on its advantage of being an attractive destination for investment and trade, to facilitate the creation and emergence of innovative businesses that incorporate digital technology.

The Benefits of the Digital Economy

As home to more than 630 million people - the world's third largest population - over 50 percent of which is under the age of 30 and is tech-savvy, ASEAN is the fastest growing internet market in the world. In fact, around 3.8 million new users come online every month in the region. In addition, ASEAN's internet economy - which includes travel, e-commerce, and the media sector¹ - is expected to reach US\$200 billion by 2025². This provides ASEAN with the

GROWTH OF INTERNET USERS IN ASEAN



ASEAN

IS THE FASTEST GROWING INTERNET MARKET IN THE WORLD

**3.8 MILLION
NEW USERS MONTHLY**

¹ E-commerce sector includes online spend on first-hand electronics, apparel/clothing, household goods, food/grocery; travel sector includes online spend on hotels, airlines, and ride hailing; while media sector includes online spend on ads and gaming.

² The study by Google and TEMASEK (2016).

potential to boost its economy beyond the traditional sectors of investments and trade towards achieving the second phase of integration for the region as outlined in the ASEAN Economic Community Blueprint 2025. This new global megatrend of the digital age is a good momentum for ASEAN to strengthen economic performance as well as people's prosperity within the region.

For an economist like myself, I am certain that the digital economy will contribute significantly to economic growth with increased economic efficiency and higher productivity through the greater utilization of assets, innovation, business networking, knowledge transfer and improved connectivity in value chains. This has also promoted an expansion of investment opportunities, created more trade, and greater access to products and services. In a more individual sphere, it also opens up opportunities for people to get involved in the economy as digital technologies allow people, especially women, to operate their businesses from home. People in ASEAN can also benefit from jobs created by young tech-savvy millennials. Regionally, it encourages economic activity to be further integrated as cross border data flows surge, connecting more countries, business and people.

The Challenges and Policy Options to Promote the Digital Economy

Nevertheless, like all countries and regions, ASEAN also faces

challenges related to the impact of the digital age - also known as the Fourth Industrial Revolution - to governments, businesses and communities. Digital innovations have revolutionized the way in which businesses and the economy operate. This has big implications for jobs as workers are finding themselves with outdated skills and struggle to match the demands of these changing business models. Low-skilled workers are being replaced by machines - often called "automisation" - leading to political pressures. The digital economy raises the risk of inequality, especially if it is not accompanied by increased digital connectivity.

In line with the new roadmap of ASEAN 2025 "Forging Ahead Together", ASEAN must be able to embrace new opportunities from digital technology but at the same time prepare measures to navigate risks it may bring with it to prevent anyone from being left behind. All Sectoral Working Groups will need to further leverage on digital trends, and integrate them into the various strategic action plans and future work programs with the aim to utilize digital technology for economic development and regional integration and cooperation.

Different stages of development among member nations including in the area of digital technologies are realities in the region. The challenge to ASEAN is to ensure that this "development gap" is

well addressed. Therefore, there is a strong need for ASEAN to encourage intensive knowledge sharing and capacity building programs among member states to deepen understanding about the digital economy, its potential role in the region, as well as to collectively formulate strategic action plans in line with the ASEAN ICT Masterplan 2020. In addition, the creation of an integrated digital economy should also include enhancement of digital connectivity. An example is the optimization of the fiscal space by enabling investment via broadband and digital devices. Consultations and targeted measures to relevant stakeholders such as businesses, including micro, small and medium enterprises, and the community would be vital to bridge the digital gap as they are often at the forefront of these trends. Examples of key measures related to these stakeholders include expansion of financial access, promotion of cost-reducing technologies, and the development of financial services and intermediary facilities such as digital payment services.

Furthermore, government investment in education has to go beyond supporting traditional education to allocating budgets that include training on specific technology-related skills. In the formal education system, governments should focus on science, technology, engineering, and math (STEM) - as acknowledged by American, Australian and European

governments – to improve compatibility of human capital with the digital era. Furthermore, research and development (R&D) is also a crucial part of technology development. ASEAN governments have to start increasing their R&D budgets to support research in their respective areas, considering the possibilities of innovation-led growth from successful R&D. While doing so, ASEAN governments need to continually conduct intensive knowledge sharing on strategies implemented to train human capital and to conduct R&D.

ASEAN governments are also expected to support a vast growing population of technopreneurs and e-commerce businesses. An example of such companies includes Indonesia's start-up Go-Jek. Founded in 2010 as digital intermediaries for the ubiquitous motorcycle taxi in Indonesian cities, Go-Jek has expanded its operation into various services such as transportation, logistics, food and beverage, delivery, cleaning, beauty, and even financial services. Currently, it operates in 50 cities in Indonesia, with around 250,000 drivers having joined the business.

While deciding to spend more

on the development of their digital economies, governments are primarily obliged to ensure fiscal prudence. The strategy then should be to optimize revenues from the digital economy. Our global taxation systems are facing challenges to address the development of the digital economy. Consultation and cooperation with the digital intermediaries is needed to strengthen government capabilities to track and record digital transactions and further formulate credible tax policies for the digital economy. Another challenge would be how to encourage and further incentivize better tax compliance for digital economy businesses and suppliers. One way is to create systems that make it difficult for people to avoid paying their taxes – known as the digitalization of tax systems – while building taxpayers' trust. This should also be supported by modernizing revenue administration and enhancing tax collectors' performance by equipping them with the best IT tools, and enhancing safeguard measures against threats of digital fraud.

Indonesia is fully supportive of the digital economy. The Government recently launched economic policy package and issuance of

E-commerce Road Map for the Year of 2017-2019. The roadmap covers the following agenda: (1) encourage the expansion of digital economic activities; (2) promote innovation; (3) provide ease of doing business in the use of e-commerce; (4) develop MSMEs and start-ups; (5) improve skills of human resources involved in e-commerce; as well as (6) build a desirable, integrated and safe digital environment.

In conclusion, I suggest ASEAN as well as individual member states to be well prepared in fulfilling the requirements needed for the digital era. These include relevant government policies in facilitating the emergence of the digital economy as one of main sources of the region's growth. In the public policy spectrum, the requirements are, inter alia, creation of an environment which puts forward the principle of fair competitive business, promotes investment in digital infrastructure and digital education, and develops a supporting regulatory framework related to digital technology developments in order to establish an innovative, inclusive, secured and integrated digitally-connected region.

Sri Mulyani Indrawati is an Indonesian economist, who is serving as the Minister of Finance of Republic of Indonesia. She returned to this position after serving as the World Bank's Managing Director and Chief Operating Officer. Sri Mulyani earned a Ph.D. and M.S. in economics from the University of Illinois, Urbana-Champaign, U.S.A.

ADVANCING ASEAN IN THE DIGITAL AGE

Yang Berhormat Dato' Sri Mustapa bin Mohamed, Minister of International Trade and Industry, Ministry of International Trade and Industry, Malaysia



Within ASEAN, Malaysia is set to be at the forefront of the digital economy and disruptive technologies with our effort to establish the Digital Free Trade Zone (DFTZ) – the first of its kind to promote cross border ecommerce.

ASEAN turns fifty this year. This is something all Southeast Asians can be proud of. Besides the peace and stability the regional grouping has provided, the progress we have made through economic integration as well as political, security and socio-cultural cooperation is considerable.

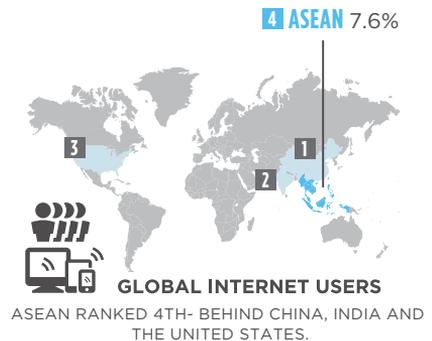
Today, half a century on, ASEAN is the 6th largest economy in the world with a combined GDP of US\$2.55 trillion. Since 1993, our average growth rate has been 4.7 percent with some ASEAN countries posting rates exceeding 6 percent. With a population of over 630 million people (65 percent of whom are below the age of 35), ASEAN is projected to rank as the fourth-largest economy in the world by the year 2050.

It has created a strong, growing

middle-class currently at around 100 million, making ASEAN a very lucrative consumer market. Our total trade posted nearly a six-fold rise since the beginning of the ASEAN Free Trade Agreement - from US\$430 billion in 1993 to US\$2.55 trillion in 2016. Intra-ASEAN trade also surged by more than six-fold in the same period from US\$82 billion to US\$521.7 billion.

While these achievements are commendable, we must not lose sight of the challenges ahead - including coping with the digital age. This agenda cannot simply be at the periphery of the ASEAN Economic Community (AEC) framework, as it would leave potential unfulfilled. The digital economy could contribute towards making the regional economic integration, bigger, better and closer.

INTERNET USERS AND MOBILE SUBSCRIBERS IN ASEAN



ASEAN has a strong potential to successfully embrace the digital age and ride on the wave of technology. As a grouping, ASEAN is ranked 3rd and has 10.2 percent global mobile subscribers, behind China and India. Meanwhile, 7.6 percent of global internet users are also from ASEAN, behind China, India and the United States.

The fact is clear - Southeast Asia is the world's fastest growing internet region. According to Google, four million new users are expected to come online every month over the next three years, which could result in a user base of 480 million by 2020. It is not only large and growing, but it is also predominantly young (70 percent are below the age of 40) and increasing middle class.

This speaks volumes about the potential of internet consumers market, which could also contribute to boosting trade within the region.

Such potential can only be unlocked if we have necessary instruments in place, including the online transaction mechanism. We cannot turn a blind eye to the low penetration of payment mechanism - about 150 million adults under the age of 25 in ASEAN still do not have a bank account.

E-commerce must be the way forward and it is set to be among the key drivers that will reshape the landscape of global

trade. It can only continue to thrive if there is seamless data flows. Currently, there is a trust deficit due to concerns surrounding data privacy and security, not only in ASEAN but also elsewhere.

A regional solution therefore is required to deal with this problem, as barriers to such data flows, be they within or between countries, will only hinder the adoption of the digital economy in ASEAN. An effective cooperation framework on this matter will certainly help boost the use of online payments options and drive the growth of online sales. The growing consumer base in ASEAN will definitely provide numerous opportunities for Small and Medium Enterprises (SMEs) in the areas of digital economy. It is not rocket science that digitalisation will bring far-reaching impact on SMEs - it will allow them to access global markets for both customers and suppliers.

We want to ensure the benefits of regional economic integration will be inclusive, and thus SMEs will play an important role in ensuring that these benefits will trickle down to many.

As such, it is imperative for SMEs to continue developing their capabilities in transitioning themselves into the digital age. This will require an increased level of efficiency in their operations - cross-border trade

must be quicker, easier and cheaper. Automation is definitely a must.

It is important therefore for policy makers to come up with regulations and incentives that would encourage SMEs to be part of this new reality. Disruptive technologies will pose a challenge to SMEs primarily since they will alter the way of doing business. However, if they are being managed properly, disruptive technologies could significantly lower costs for SMEs, which in turn will increase their profit levels.

Within ASEAN, Malaysia is set to be at the forefront of the digital economy and disruptive technologies with our effort to establish the Digital Free Trade Zone (DFTZ) - the first of its kind to promote cross border ecommerce.

A total of 1,500 local SMEs will be identified to be trained including through the Alibaba platform as we prepare them for this game-changer initiative. The establishment of DFTZ is testament of Malaysia's commitment to embrace the digital economy. By 2025, we foresee US\$65 billion worth of goods will be moved through DFTZ. It will double the growth rate of exports among SMEs and create 60,000 jobs by the same year.

As we focus on the potential of digital economy consumers

within the region, we must not lose sight on the need to create digital economy producers as well.

Our workforce needs to be ready to adapt to this changing landscape. They must be equipped with necessary skills not only to survive, but thrive in the digital age.

There is a consensus that coding will be the language of the future. ASEAN countries therefore need to ensure that these skills are being taught from the early age. We must prepare them for the jobs of the future, some of which may not even exist yet at this stage!

For Malaysia, we take cognisance of this new reality and therefore we will be introducing coding to the syllabuses of national schools. The preparation for this is currently underway and

this is in line with the Malaysia Education Blueprint which calls for the encouraging of cognitive and higher order thinking, as well as embedding IT as a teaching and learning tool.

Indeed, the road ahead for ASEAN, including its embrace of the digital economy, will be long and arduous. Reforms—whether economic or administrative—are never easy. Moreover, we are faced with the challenge of evening out development, reducing inequality and forging consensus on difficult issues across our diverse region. And we need to continue pushing our envelope as we forge ahead into the era of digital age.

But I am confident that with closer cooperation, as well as mutual trust and respect, all challenges can be met even as global geopolitical and

economic gravity shifts towards our side of the world.

ASEAN is now a reality, having evolved from a loose organisation to a permanent and stronger regional grouping. It has and will continue to deliver peace, stability and progress, as well as inclusive growth for everyone in the region.

Dato' Sri Mustapa Mohamed is the Minister of International Trade and Industry. He was the first Malaysian to hold two Ministerial portfolios at the same time, in Entrepreneur Development and Finance. He has also served as the Minister of Higher Education and Agriculture and Agro-Based Industry.

DIGITAL REVOLUTION: A MOMENTUM FOR ASEAN ECONOMIC COOPERATION AND INTERNATIONAL INTEGRATION IN THE FORTHCOMING YEARS

H.E. Minister Tran Tuan Anh, Minister of Industry and Trade, Ministry of Industry and Trade, Viet Nam



...it is high time ASEAN Governments embark on re-education and capacity-building policies for the workforce to acquire the knowledge and skills needed in a digital age.

ASEAN has achieved remarkable success in economic cooperation and international integration since the 1990s. In fact, ASEAN has become an important part of the world with its own global competitiveness. The fast integration and economic cooperation of ASEAN nowadays calls for a digital revolution, though the region is still facing several challenges in terms of infrastructure, human resource and technology.

Achievements in economic cooperation and international integration

Consisting of 10 member states, with 50 years of development, ASEAN is now the 6th largest economy in the world with a combined GDP of more than US\$ 2.55 trillion in 2016. With steady growth momentum, ASEAN is expected to become the 4th largest economy in the world by 2050. The establishment of ASEAN Economic Community (AEC) in 2015 has proven the synergy and the strong determination to foster regional economic integration of the member states.

Concerning regional integration, efforts have been made to promote liberalization of trade in goods, on the basis

of the ASEAN Trade in Goods Agreement (ATIGA). As a result, by the end of 2016, ASEAN eliminated import duties for 96.01 percent of total tariff lines. Regarding the liberalization of trade in services, within the ASEAN Framework Agreement on Services (AFAS), ASEAN has been working on the signing, ratifying and implementing 10 commitment packages on trade in services, 8 commitment packages on financial services, and 10 commitment packages on air transport services under AFAS.

As regards international integration, ASEAN signed Free Trade Agreements (FTA) with 6 partners, namely China, Japan, the Republic of Korea, India, Australia and New Zealand. In addition, ASEAN has recently concluded the negotiations for the ASEAN-Hong Kong, China FTA (AHKFTA) and is now in the process of negotiating Regional Comprehensive Economic Partnership Agreement (RCEP).

Active integration into the international economy has opened up great opportunities for business communities to access and expand their markets, improve domestic productivity and increase the competitiveness of goods and services.

With deepening economic cooperation and integration, it is believed that the implementation of a comprehensive digital agenda could possibly add US\$1 trillion to the region's GDP over the next 10 years. Digital revolution will also help build a stronger, faster and more integrated economy.

ASEAN into digital age

ASEAN has its own strengths and opportunities to move forward to the digital age. ASEAN is the 3rd most populous economy in the world with a population of 630 million people, and more than half of them are Internet users. There is no doubt that the digital sector is drumming up a lot of interest across the region.

The advantages of ASEAN lie not only in population but also in its several well-developed IT clusters being in place across the region. Attracting innovation and investment in new technology, the clusters have leveled up worker productivity and brought in new digital industries.

Moreover, in the next few years, the region is expected to have embraced "Industry 4.0", which will help enhance efficiency, level up flexibility and actualize great customization in production.

Nevertheless, there remains a number of challenges for ASEAN member states. By and large, ASEAN is still at lower levels of technology, capital and high-quality workforce in

comparison with other peers in the world. Entering the digital age, the region will have to face threats from cyber-attacks and have to ensure data security, especially when data becomes common data, and the broadband network coverage is much wider.

Moreover, the Industry 4.0 is about a revolution in substance or depth, not about an expansion of scale or volume. Key to open the 4th generation door are technologies and innovations, the factors that are not part of current ASEAN's advantages. Mostly they must be imported from the west. This dependency leads to a requirement, and also a vast difficulty, in a timely manner, for the region to adjust its living practice and consuming custom of the people, especially in countryside areas. On the demand side, the ability to adapt with and to afford new highly technological facilities and utilities will determine the actual need for 4.0 industry modernization. On the supply side, if a worker wants to join the 4th generation, he needs to upgrade his skills, so as to meet the new standards of the wave. This is never an easy task for any individual, not to mention a nation as a member of a group. There is hardly any shortcut for an economy to move fast on this front.

A call for action

For the region to be propelled into the digital age, taking

into consideration all these aforementioned challenges, we need to work towards several solutions.

Firstly, it is high time ASEAN Governments embark on re-education and capacity-building policies for the workforce to acquire the knowledge and skills needed in a digital age.

Secondly, ASEAN needs to strengthen local and regional digital economy as there are now only a few countries in the region that have developed digital economy. In order to be successful in building digital economy, we need to develop collaborative innovations so as to meet the expectations of digitally empowered customers.

Thirdly, in order to truly step into a digital revolution, ASEAN should foster e-commerce as well as financial services. We should invest more in ICT infrastructure to make these services more appealing to ASEAN citizens. Only then could we increase the usage of those services in both public and private sectors.

Finally, we need to ensure data security and cyber security, not only on national scale but also across the region through introducing privacy laws in some member states and setting up a regional organization that fights against cybercrimes.

Actions of Viet Nam

In preparation for the digital

age, Viet Nam has started to embrace “Industry 4.0”. In May 2017, Vietnamese Prime Minister Nguyen Xuan Phuc issued Order No 16/CT-TTg on strengthening access to the 4th Industrial Revolution. Thereby he directed the nation to concentrate on ICT infrastructure development and encouraged start-ups with innovative technology.

Viet Nam has also been developing “smart cities” across the country. In particular, many large cities and provinces are moving forward with plans to build smart cities, such as Ha Noi, Can Tho, Da Nang and Binh Duong. In May 2017, Viet Nam installed its first smart city communication platform in Ho Chi Minh City. The city is expected to become the “Silicon Valley of the Pacific”.

There is still a long journey ahead for ASEAN to actually prove its important role in the digital age. In order to successfully acquire the digital advantages, the region should build a comprehensive agenda and officially start the digital revolution. The outcomes of digital revolution will propel the region’s economic cooperation and international integration to a higher level of development. This can only be done by concerted ASEAN’s efforts and synergy building, like what the region has been doing for 50 years now.

H.E. Mr. Tran Tuan Anh was born in 1964 in Quang Ngai, Viet Nam. He holds a Ph.D in Economics. He is now Minister of Industry and Trade of Viet Nam, Member of the Central Committee of the Communist Party (12th tenure) and Deputy to the National Assembly (14th tenure).

OPPORTUNITIES ARISING FROM THE FOURTH INDUSTRIAL REVOLUTION

The Honourable Pehin Dato Lim Jock Seng, Second Minister of Foreign Affairs and Trade, Ministry of Foreign Affairs and Trade, Brunei



ASEAN should also continue to actively engage its partners, and strengthen cooperation in the development of innovation and technology. In this respect, the support from its Dialogue Partners who are steps ahead in digital-readiness, is very much valued.

Following the establishment of the ASEAN Economic Community at the end of 2015, ASEAN is now embarking on a new 10-year Vision under the ASEAN Economic Community (AEC) Blueprint 2025, where the emphasis is very much on making our economies more innovative, dynamic and competitive, in order to move higher up the global value chain. With the world economy now undergoing a transformational phase brought about by rapid technological and scientific advancements, this new AEC 2025 Vision could not have come at a more crucial time. The rise of megatrends and new technologies, in the era of the Fourth Industrial Revolution (4IR), necessitates a regional and collective response.

With over 50 percent of its population under the age of 30 years old, ASEAN has the potential to leap frog into the digital age, but it needs to focus its strategies towards increasing the region's connectivity, competitiveness and productivity. Here, addressing the skills needs of the digital economy for ASEAN is first and foremost, one of the fundamental requirements towards ensuring that our region is digital-ready. Emphasis

on STEM disciplines (Science, Technology, Engineering and Mathematics) should be placed within school curriculums. In addition, investment in human capital development and reskilling, to ensure digital-literacy and technology competency, is also important for the region to continuously be able to adapt.

Aside from addressing skill sets of our labour market, ASEAN's success in the digital age will also depend on the ability of its entrepreneurs, particularly the Micro, Small and Medium Enterprises (MSMEs), in reaping the opportunities from 4IR. As such, strategies must be in place to ensure an environment conducive for the growth of MSMEs, such as by promoting competition, flexible labour policies, support for upskilling and access to affordable and quality infrastructure.

ASEAN has already laid the foundations in preparing for the necessary environment that supports technological progress including the 4IR. This is illustrated in the AEC Blueprint 2025 and its strategic measures, where in the context of creating a connected, competitive, innovative and dynamic ASEAN, among others, by:

- **Ensuring Productivity-Driven Growth, innovation, research and development, and technology commercialization:**

through promotion of strategic partnerships among the academia, research institutions and the private sector towards developing capabilities and creating an effective channel for technology transfer and commercialisation; strengthening the competitiveness of Micro, Small and Medium Enterprises (MSMEs) through the application of Science and Technology tools, and placing greater emphasis on entrepreneurship and development of incubator programmes;

- **Strengthening Intellectual Property (IP) Rights Cooperation:**

through strengthened IP offices and enhancement of regional mechanisms to promote asset creation and commercialisation, including the development of supporting schemes for MSMEs and creative industry sectors;

- **Developing Information and Communication Technology (ICT):**

through further utilisation and coordination of ICT for economic development and promoting digital trade in ASEAN, and support for ICT innovations and entrepreneurship as well as new technological developments such as Smart City, and Big Data and Analytics;

- **E-Commerce:**

through intensified cooperation on E-Commerce, building on the e-ASEAN Framework Agreement adopted by ASEAN

Leaders in November 2000, with a view to develop an ASEAN Agreement on E-Commerce to facilitate cross-border E-Commerce transactions in ASEAN.

As ASEAN pursues its economic integration agenda, it is crucial that we continue to deepen our understanding of the challenges and implications arising from these transformative and potentially disruptive technologies, so that we can fully harness the opportunities of the digital economy.

In this respect, at the 30th ASEAN Summit that was held this year on 29 April 2017 in Manila, ASEAN Leaders recognized the need for ASEAN to be well prepared and able to maximize the opportunities from 4IR, so as to foster the region's economic growth, and promote inclusive and equitable economic development. At the 49th ASEAN Economic Ministers Meeting that was held on 7th September 2017, Ministers agreed to task the ASEAN Secretariat to conduct this study to assess ASEAN's preparedness.

At the same time, ASEAN should also continue to actively engage its partners, and strengthen cooperation in the development of innovation and technology. In this respect, the support from its Dialogue Partners who are steps ahead in digital-readiness, is very much valued. At the same time, it is also worth noting

that other regional groupings whose members include ASEAN Member States, have also put this at the forefront of their agenda.

For example, the Asia Pacific Economic Cooperation (APEC) is developing a Roadmap on the Internet and the Digital Economy that is targeted for completion in November 2017. This Roadmap is expected to be a work program that brings together the different cross-cutting APEC initiatives which promote economic growth through the Internet and Digital Economy. This Roadmap is also expected to encourage cooperation across APEC fora and sub-fora, and will build an open and cooperative environment.

Similarly, in the Asia-Europe Meeting (ASEM), the 7th Economic Ministers Meeting that was held on 21st - 22nd September 2017, agreed to the "Seoul Initiative on the Fourth Industrial Revolution", which essentially recognizes the importance of ASEM-wide cooperation in order to fully understand the implications of the 4IR, and to realize maximum mutual benefits and to achieve sustainable and inclusive prosperity. An ASEM Conference to discuss the economic impact of 4IR to ASEM Economies will thus be held in Seoul in 2018.

As such, these efforts will also complement the work being pursued in ASEAN, and

hopefully contribute towards greater consensus-building on policy responses from each ASEAN Member State, that are necessary towards the creation of an environment in the ASEAN Economic Community which will be conducive for the development of the digital economy.

The Honourable Pehin Dato Lim Jock Seng was appointed as the Second Minister of Foreign Affairs and Trade in May 2005. Since 2015, he is also a Minister at the Prime Minister's Office. He studied Sociology/Social Anthropology at the University of Swansea and has a Master of Philosophy in Social Anthropology from the London School of Economics.

TOWARDS A DIGITALLY-ENABLED, INNOVATIVE, INCLUSIVE AND INTEGRATED ASEAN COMMUNITY

H.E. Dr. Lim Hong Hin, Deputy Secretary-General of ASEAN



The right policy mix would lead to an open, secure, and enabling digital environment, which would meet the fast changing need of the community and keep in step with international developments.

The ASEAN Community has come to face with the reality of the digital age. Business models and ways of lives the world over are being altered by the transformative and expansive power of digital technologies. The widening reach of digital technologies has overcome the constraints of physical distance, opening markets for businesses as well as expanding the choices of product and services for consumers.

To stay ahead of the game, ASEAN must embrace the digital age and the era of technologies. To an extent, such recognition has been reflected in the AEC Blueprint 2025. As ASEAN strives to transcend from a production-driven economy to a productivity-driven economy, dedicated forward-looking elements on electronic commerce and technology commercialisation can be found side by side in the Blueprint with the softer infrastructures for development, from good regulatory practice to sustainable economic development and global megatrends.

The impact of digitisation will go beyond economics, affecting different aspects of our lives from government to governance, from how education and

healthcare are delivered to how workers learn and get affected by new production processes. ASEAN's resilience depends on its agility in dealing with such changes. Critical to this is the awareness of leaders, including policymakers and thought leaders, of how the digital age is changing the way we live, shaping our future.

Electroniccommerce(e-Commerce) is often the first thing that springs to mind when we discuss the digital age. Conversations often quickly go into how to ensure market actors, big and small, benefit from this new commercial platform, at the same time ensuring that the interests of buyers, sellers and regulators are safeguarded. Digitisation itself goes beyond e-Commerce, as it enables new approaches to deliver non-commercial services and organise production activities that would ultimately determine a country's competitiveness in the global economy.

In practice, similar to previous industrial revolutions, the digital age brings about both positive economic transformation as well as polarising effects. Slower technological catch-up by the less developed economies will result in the digital divide

among economies, further exacerbating the income and development gap. This is where the even-hand of informed and responsive policymaking finds its relevance. The digital transformation will leave few policy areas untouched and a holistic approach is needed to anticipate the effects of one policy area (or its lack of) on another, whether or not intended.

ASEAN, with a combined GDP of US\$2.55 trillion and a total population of 630 million in 2016, is a fertile ground for a digital coming of age, albeit unevenly across membership. Nestled in the Asia-Pacific region – the world’s largest retail e-commerce market— ASEAN is well-positioned to cultivate the opportunities presented by the digital economy. It is forecasted that by 2030 digital technologies could potentially boost the region’s economy by US\$220 billion to US\$625 billion annually. The question is how to realise this potential as we work towards a digitally-ready ASEAN.

The recent establishment of the ASEAN Coordinating Committee on Electronic Commerce will help promote, coordinate and enhance efforts by various ASEAN sectoral bodies to promote the growth e-Commerce in ASEAN. It will also give impetus to the implementation of the ASEAN Work Programme on Electronic Commerce 2017-

2025, which was adopted by the ASEAN Economic Ministers in September 2017. The Work Programme recognises the need for a holistic approach to e-Commerce in the region and covers multi-sectoral initiatives in the areas of infrastructure, education and technology competency, consumer protection, modernisation of the legal framework, security of electronic transactions, payment systems, trade facilitation, competition, logistics, and e-commerce framework.

Beyond the specific ASEAN work on e-Commerce, other relevant work is also being undertaken in parallel. For example, digital innovation is included as one of the strategies under Master Plan on Connectivity 2025, which covers key initiatives from enhancing the micro, small, and medium enterprises (MSMEs) technology platform to establishing an ASEAN open data network. Similarly, in the area of competition, work has been undertaken to build awareness and foster greater understanding of the competition and regulatory challenges arising from e-Commerce.

To address the key challenge of digital divide in the region, a series of strategic measures has been incorporated in the ASEAN ICT Masterplan 2020, including enhancing internet broadband penetration and affordability in ASEAN, raising awareness and the uptake of digital trade

and use of electronic facilities such as e-payment among businesses including MSMEs, as well as educational and training strategies on ‘smart use’ of technology for consumers. ASEAN recognises that beyond delivering efficiency gains, the digital economy should be harnessed to promote inclusive growth towards a people-centered and people-oriented ASEAN. To this end, the region would benefit from appropriate policy support.

Achieving digital-ready policies requires closing the gap between “Industry 4.0” or the 4th industrial revolution, which combines the physical, digital, and biological worlds through technologies, and traditional policy making. The ‘right’ policy mix should aim at creating an enabling environment for innovators, start-ups, researchers, and businesses to incubate, develop, and commercialise their products and services in the digital age as well as manage a new dimension of digital risks. The scale of transformation can be tremendous given the differing and interrelated policy areas affected by digital transformation, from intellectual property rights, cross-border data transfer, consumer protection, customs regulations, to taxation.

The right policy mix would lead to an open, secure, and enabling digital environment, which would meet the fast changing

need of the community and keep in step with international developments. In the process, collaboration and coordination between relevant agencies and stakeholders are key. Given the fast changing nature of the digital environment, policymakers need to engage with those at the fore of the phenomenon including the private sector, industry experts and consumer or user communities. Regional platform should also be utilised for greater exchange of ideas, best practices and experiences, and be leveraged on to further deepen cooperation including through appropriate regulatory cooperation.

The digital transformation is here to stay. While the region will not transform itself over night, gradual steps to embrace the digital era need to be put in motion. A digital-ready ASEAN would therefore need to stay agile and be forward looking with its policies and processes to maintain an even

footing as it rides the currents of the digital age well into its future as a deeply integrated economic region. Ultimately it is in ASEAN's interest to embrace digital economy for the well-being of its people as well as the resilience and continued relevance of the region.

Lim Hong Hin is currently serving his second term as the Deputy Secretary-General of ASEAN for ASEAN Economic Community to support ASEAN Member States' effort to create a deeply integrated and highly cohesive ASEAN economy which will engender a more sustainable and inclusive economic growth for its people.



DRIVING ASEAN'S TALENT TRANSFORMATION THROUGH TECHNOLOGY

The digital revolution has touched every part of our lives - economic, personal as well as social. But while exponential technologies can create unprecedented economic opportunities, it is people, skilled and capable of participating in this revolution, who will convert these opportunities into economic reality.

How will ASEAN businesses and policy makers position the regional workforce to harness the power of advanced technologies in the long term?

The prospects of ASEAN's workforce - and by extension, economic growth in the region - are under threat. Even as new technologies, notably automation and Artificial Intelligence (AI), propel innovation in businesses and the broader economy, they are increasingly replacing low and middle-skilled jobs in the region's traditional industries. For the existing - and future - workforce, the question of

skills relevance looms large. According to the International Labour Organisation¹ (ILO), in Cambodia, where garment production dominates the manufacturing sector, half a million sewing machine operators are at risk of having their jobs automated. A million shop sales assistants in Thailand, 1.7 million office clerks in Indonesia and a million call-centre operators in the Philippines are also at risk of being replaced by machines².

The ILO estimates that 56 percent of all employment in Cambodia, Indonesia, Thailand, Vietnam and the Philippines is at risk of displacement due to technology over the next decade or two. These countries account for 80 percent of the region's workforce and having more than half at risk of job displacement would be a significant blow to economic growth.

The challenges of job losses and shifts are evident not only in the employment market in

the region, but also businesses themselves - a growing number of new jobs created by the same technological revolution in industries such as healthcare, banking, finance, and insurance, remain unfilled for the lack of skills needed. While this is not a problem unique to ASEAN - the World Economic Forum reports that more than 40 percent of employers globally report talent shortages³ - it is one that businesses and policy makers need to address urgently.

The new match: Human and machine

The great technological breakthroughs of the past - electricity, railways and IT - boosted productivity significantly, but did not create entirely new workforces. By contrast, advanced technologies such as AI are redefining the relationship between humans and machines - and it is one that can lead to net employment gain and meaningful, more productive jobs. AI has the power to transform the workforce of

¹ Jae-Hee Chang and Phu Huynh, Asean in Transformation, The future of jobs at risk of automation, International Labour Organisation, July 2016, http://www.ilo.org/public/english/dialogue/actemp/downloads/publications/2016/asean_in_transf_2016_r2_future.pdf

² The end of the line, The Economist, Feb 2016, <https://www.economist.com/news/international/21690041-call-centres-have-created-millions-good-jobs-emerging-world-technology-threatens>

³ Unlocking US\$100 Trillion for Business and Society from Digital Transformation, World Economic Forum, Jan 2017: https://www.accenture.com/t20170411T120304Z__w_/us-en/_acnmedia/Accenture/Conversion-Assets/WEF/PDF/Accenture-DTI-executive-summary.pdf

the future, not simply replace today's jobs. Accenture's research reveals that AI could increase Singapore's labour productivity by 41 percent by 2035, the highest among developed economies, and nearly double its annual economic growth rate over the same period, underlining the combined strength of human and machine⁴.

Across ASEAN, companies are already taking advantage of new technologies to complement and enhance the skills and ability of existing workforces. In Malaysia, for example, Sime Darby Plantation supports field employees with the Sime Darby Digital Supervision (SDDS) system⁵, which makes use of GPS-enabled handheld devices to allow real time, online reporting from the field. This technology improves the transparency of field harvesting activities and removes barriers to communication between estate managers, assistants and supervisors, helping them make better and faster decisions.

In Indonesia⁶, meanwhile, drones at a paper and pulp plantation record information on the ground, previously painstakingly collected by human workers. Part of a connected forestry

and agriculture precision system, the drones transmit this data to mobile devices, where it is analysed by intelligent decision support systems so interventions by workers are faster and more precise.

Jobs freed up by automation are not lost. Employees shift to fill new roles created by technology. At Accenture, employees freed-up by the automation of 17,000 back office jobs were reskilled and now fill much-needed higher-value roles within data and analytics⁷. They also supervise machines that perform simpler tasks. AI helped us streamline processes while offering our employees the opportunity to take up more complex, satisfying work.

The reality is that businesses need to invest not only in new technologies but also in helping workers transition successfully to new jobs by equipping them with new, relevant skills. Notably, today's business leaders must be mindful of the need to reskill at the top of their organisations as well. Several companies in Malaysia are experimenting with 'reverse mentoring', roping in younger employees to mentor senior leadership, including CEOs, on digital trends⁸. At the same time,

these senior employees pass on valuable institutional knowledge to new talent rising through the ranks.

However, Accenture's Digital Performance Index analysis in Malaysia found that just 30 percent of companies have made the effort to improve their employees' digital skills through formal training⁹. This lack of action is preventing companies from unlocking the economic potential that can be brought about by new technologies.

Agile workforce champions

According to the World Economic Forum (WEF), four in five executives agree that the future workforce will be structured in project groups rather than by job function. This calls for a different kind of employee - one that is adaptable, tech-savvy, functions effectively in teams, and learns on the go. Innovative companies that become agile workforce champions will be better positioned to unlock greater economic potential in the future.

Eighty percent of 3,100 IT and business executives we surveyed globally believe that these flexible and fluid workers will be their most valuable employees in the

⁴ http://www.nationmultimedia.com/detail/Startup_and_IT/30321389

⁵ Innovating for the future, Sime Darby Annual Report 2016, P27 and 78, http://www.simedarby.com/clients/simedarby_group/assets/contentMS/img/template/editor/Sime%20Darby%20Annual%20Report%202016.pdf

⁶ Joy Tang, "RGE April Group benefits from connected forestry and agriculture system," TechTrade Asia, April 2016, <http://www.techtradeasia.info/2016/04/rge-april-group-benefits-from-connected.html>

⁷ Nicky Cappella, "Accenture automates 17,000 jobs without layoffs," The Stack, January 2017, <https://thestack.com/big-data/2017/01/19/accenture-automates-17000-jobs-without-layoffs/>

⁸ "Learning from young mentors," New Straits Times, October 2015, <https://www.nst.com.my/news/2015/10/learning-young-mentors>

⁹ Lim Yin Sern et al., "Malaysia's Digital Performance Index: Faster Than Ever" <https://www.accenture.com/MalaysiaDPI>

digital age. Leading employers today are prioritising breadth of skills and ability to ‘quickly learn’ and ‘shift gears’ over ‘deep expertise for the specialised task at hand’¹⁰.

Given the rapid pace of innovation, the skills needed by such a workforce are a moving target. The key to turning your workforce into an agile one is continuous upskilling. One study showed that companies that invest US\$1,500 annually in each employee would see profit margins that are 24 percent higher on average than those that don’t. What can companies do to become agile workforce champions?

Provide opportunities for continuous learning: Connected learning provides employers with readily available, relatively inexpensive, up-to-date tools, and provides employees with anytime, anywhere learning. A wide range of digital tools from MOOCs (massive open online courses) to wearable technologies can be paired to suit different preferences and learning styles. Companies in the region are already experimenting with this. During a four-month trial, ten Singapore Power¹¹ engineers conducted video conferences with their supervisors via wearables that allowed supervisors to see

exactly what the engineers were seeing, and to guide them through the job.

Accenture Connected Learning¹² combines classroom training with a digital learning environment that connects a company’s employees with relevant professional content and experts from both inside and outside Accenture. Companies can develop highly specialised skills at scale and respond to changing business requirements almost as quickly as they occur. Employees enrich their professional capabilities, develop the critical skills needed to stay relevant, and enhance their own career opportunities.

Adopt a broader definition of workforce: The definition of workforce must be broadened to include a combination of internal and external talent – full-timers, freelancers and contractors – assembled into project teams and disbanded as needed. For businesses, a more flexible workforce model means being able to match demand and supply of skills to meet needs as they arise, plug gaps, and speed products to market.

Companies also need to rethink how they access talent in the digital economy. Millennials, a

generation of tech-savvy talent, prizes flexibility, eschew hierarchy, and are keen to shape their own career paths. They plug into technology platforms to secure short-term gigs on a part-time, freelance or ad hoc basis. Our research¹³ shows that this freelance trend is strongest in emerging markets where 86 percent said they were interested in freelancing compared to 59 percent in developed countries. On-demand labour platforms are where gig workers meet businesses. Flexing It links over 1,600 organizations in ASEAN and India, and has curated over 50,000 professionals for its corporate clients. Thai platform Fastwork¹⁴, meanwhile, matches 4,000 freelancers from 50 different specialisations to their clients.

Shape the talent pipeline at its source: To secure tomorrow’s talent, business and policy leaders must reach back to the source of the talent pipeline: the primary and secondary schools, specialised vocational institutions, and universities that are incubating the next generation of employees. National curricula should produce students with skills relevant to the digital age, but who are also capable of critical thinking, problem solving and creativity – the ‘human skills’ that cannot

¹⁰ Adrian Lim, Allan Oung, Kwan Chee Kin and Fong Siew Keng, “People First: the Primacy of People in a Digital Age, Malaysian Perspective,” Accenture, p. 30, 2016, https://www.accenture.com/t20161123T040806Z__w__/sg-en/_acn-media/PDF-37/Accenture-TechVision-2016-Malaysian-Perspective.pdf

¹¹ <http://www.straitstimes.com/singapore/singapore-power-turns-to-wearable-technology-to-boost-productivity>

¹² Stacey Jones and Sam Hyland, “Accenture Invests More than US\$840 Million in Employee Learning and Professional Development,” Business Wire, January 2016, <http://www.businesswire.com/news/home/20160113005143/en/Accenture-Invests-US840-Million-Employee-Learning-Professional>

¹³ Elyn Shook and Mark Knickrehm, “Harnessing Revolution: Creating the Future Workforce,” Accenture, 2017, <https://www.accenture.com/us-en/insight-future-workforce-today>

¹⁴ Christina Morales, “How This Freelancing Platform is Changing the Way Thai People Work,” Inc. Southeast Asia, May 2017, <http://inc-asean.com/editor-picks/freelancing-platform-changing-way-thai-people-work/>

be automated or codified. By 2020, WEF anticipates a growing demand for cognitive abilities (52 percent), systems skills (42 percent) and complex problem-solving skills (40 percent) as part of core skill sets of jobs¹⁵.

In summary, agile workforce champions are those companies that focus on creating a new, modern workforce — specialized, flexible, augmented and adaptive, the kind of workforce required to gain a competitive advantage in existing and new markets¹⁶.

Put people first

There is little doubt that digital technology has the potential to improve productivity, and unlock new and immense value for the region's businesses and economies. But it is people who will be key to harnessing this potential. Businesses and policy

makers need to put their people first, at the centre of change, and ensure that they are relevant, adaptable and able to rise to the challenge of the digital revolution.

To do this, business will need to become digital on the inside, and they will need to do this rapidly as human and machine interaction dramatically alters so many aspects of work. This will mean upskilling internal employees and creating opportunities for greater collaboration. It will mean combining internal employees with external talent to form highly targeted and effective project teams. And it will mean taking an active hand in developing tomorrow's talent.

Taking these steps is critical to developing an organisation that is agile, able to change course, and that will thrive amid

constant disruption. And they must accelerate action, while opportunities of the digital age remain within reach, or risk rendering workers - and their businesses - redundant.

ASEAN is in the enviable position of building on a large and young workforce that is already highly engaged with digital technologies. What is needed is for the region's business leaders and policy makers to move together, with renewed purpose and focus, and quickly and decisively equip workplaces and workforces for the digital age. If they are successful, the region will have a valuable pool of talent that will not only flourish in a future augmented by new technologies, but do so in a way that drives economic prosperity for the region as a whole.

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¹⁵ Ellyn Shook and Mark Knickrehm, "Harnessing Revolution: Creating the Future Workforce," Accenture, 2017, <https://www.accenture.com/us-en/insight-future-workforce-today>

¹⁶ https://www.accenture.com/t20170928T072130Z_w_/us-en/_acnmedia/PDF-62/Accenture-Leading-in-the-New-POV.pdf#zoom=50

HARNESSING ASEAN'S POTENTIAL IN DIGITAL REVOLUTION

H.E. Ong Keng Yong, Advisor, CIMB ASEAN Research Institute and Executive Deputy Chairman, S. Rajaratnam School of International Studies



Government support is also important for digital content firms to thrive. This could be in the form of providing tax breaks and subsidies for start-ups that are engaged in the digital content industry.

The ASEAN Economic Community (AEC) envisioned a deeply integrated and highly cohesive regional economy, which involves strengthening the overall competitiveness of ASEAN by means of fostering regional inclusive growth and development. Part of the integration process is to recognise Information and Communication Technology (ICT) as a key driver of ASEAN's economic and social transformation.

To survive the global competition, ASEAN needs to promote digital economy in the region. This goal is supported by the current ASEAN ICT Masterplan (AIM) 2020, which focuses on the adoption of sustainable and environmentally friendly ICT. However, promoting digital innovation in ASEAN requires policy approaches that are designed to reap the benefits and address the challenges of digital economy in the region.

Currently, the ASEAN digital economy generates approximately US\$150 billion in revenues per year. According to an American global consulting firm, connectivity and online services account for around 40 percent of overall revenues in ASEAN digital economy. What is even

more important is that ASEAN is predicted to have the potential to become one of the top five digital economies in the world by 2025.

ASEAN's strong and vibrant economy is one of the fundamentals that puts the region in the trajectory to become a global digital leader. It is projected that ASEAN economy will grow six percent annually over the next decade which is an indicator of rising income level and more disposable cash. This economic trend will open avenues for a strong consumption of digital services by a large and youthful population in the region. Favourable demographics is also ASEAN's sweet spot for the growth of its digital economy. It is estimated that 94 percent of its population are literate and over 50 percent are under the age of 30 years old. This group of people are technologically savvy who participate actively for the growth of digital economy by means of using the Internet.

ASEAN ICT investment amounted to US\$100 billion in 2014, which is presently growing at more than 15 percent annually. The growth of ICT investment could be attributed

to the continuous efforts of governments across the region to build ICT infrastructure. Furthermore, the ongoing implementation of AEC could further boost the growth of digital economy in the region, especially when its policy goals are centred towards becoming a single market with free flow of goods, services, labour, and capital, in which digital technology has an important role to play.

However, ASEAN's path to being an inclusive digital economy is not without its challenges. Limited broadband access in rural areas is a major challenge. A large segment of the population, especially in countries like Indonesia, Thailand, the Philippines and Viet Nam, live in rural areas where Internet connectivity remains relatively poor.

A large number of consumers in the region still lack access to proper banking facilities, limiting their ability to make payments online and hinders the growth of the sector. According to the World Bank's 2014 Global Findex database, only 36 percent of adults in Indonesia have bank accounts. Even among those who have access to banking services such as credit and debit cards, there is a reluctance to conduct transactions and share their financial details online. Except for Singaporeans, ASEAN citizens are 10-30 percent more reluctant to share their financial information for an

online purchase compared to the global average.

Appropriate policy measures should be implemented to harness the full benefits of the digital economy in ASEAN. These policies must be geared towards assisting ASEAN member countries to collectively benefit from the movement of this technology wave. One of the policy measures that should be implemented is to promote digital literacy that could be done through improving the educational curriculum. This should provide the students with working knowledge of computers that equip them with the right tools to perform the functions of Internet. There should also be ICT training to help increase the productivity of the workforce.

It is also necessary to support digital innovation that will help to move up the economic value chain of ASEAN. For example, integrating technology sensors and devices into equipment and machinery will ramp up the productivity of the manufacturing sector by the increase of value-added activities in the production process. Government support is also important for digital content firms to thrive. This could be in the form of providing tax breaks and subsidies for start-ups that are engaged in the digital content industry. Some experts have mooted the idea of a Digital Economy Promotion Board in ASEAN, which is tasked

to conduct market analysis and monitor the progress of digital innovation in the region.

E-commerce plays a key role in facilitating both cross-border trade and foreign investment. ASEAN countries are gearing up to this trend, as seen by the rise of regional e-commerce platforms such as Lazada and Alibaba's trade platform across Malaysia, Thailand and Indonesia. Such facilities can enable ASEAN to deliver on the potential of global e-commerce.

In terms of legal protection of intellectual property, ASEAN still has a long way to go. According to the 2015 International Intellectual Property or IP Index, Singapore is ranked at 25.38 out of 30, due to the strict IP laws it has in place as well as effective enforcement of IP rights, including action against online piracy and prevention of copyright infringement.

Malaysia scored an average 14.62 in the IP Index. While Malaysia has increased its enforcement activities to curb online piracy and amended its copyright law to include penalties for unlawful Web hosting, streaming and linking, incidence of piracy is high.

Indonesia scored 8.61 on the IP Index, mainly due to software piracy levels and lack of stiff penalties for infringement. Thailand and Viet Nam were placed below Indonesia because of various reasons, principally weak protection of IPs.

Until policy makers in ASEAN come together and put out a comprehensive plan to tap into the digital economy, the various challenges are likely to go unaddressed. ASEAN has a winning ticket in digital development and member states should rally to cash the benefits. An updated ASEAN legal framework is the first step.

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MUDDLING THROUGH IS NOT MUDDLE-HEADED: ASEAN'S MARCH INTO THE DIGITAL ECONOMY

Tan Sri Andrew Sheng, Honorary Advisor, CIMB ASEAN Research Institute and Distinguished Fellow of Asia Global Institute, The University of Hong Kong



Digital transformation will not only change our consumption patterns, but also our production through the Internet of Things (IoT), and even governance models.

Those of us who witnessed the founding of the Association of South East Asian Nations (ASEAN) in August 1967 could not have imagined how much was achieved in the last 50 years. ASEAN was born literally out of the ashes of colonialism and the Viet Nam War. It started as a security pact, but gradually evolved into an economic and financial community that is not yet a cultural common, mainly because of its celebrated diversity.

Today, ASEAN comprises 10 countries, covering a land area of 4.4 million square kilometres, 3 percent of global total, with over 630 million population or just under 9 percent of the world population. Its combined nominal GDP is already over US\$2.55 trillion and if counted as a single entity, it would rank 6th in the world, behind the USA, China, Japan, India and Germany.

The region is geographically blessed, located within the fastest growth zone in the world, with natural maritime access to India (growing over 7 percent), China (6.5 percent) and global markets as a hub of the global supply chain. Within ASEAN,

the younger countries (Cambodia, Myanmar, Laos) are growing over 7 percent per annum, whereas the members with over 100 million population (Indonesia, Philippines and Viet Nam) are all growing 5-6 percent.

The ASEAN+3 (China plus Hong Kong, Japan and South Korea) grouping is expected to grow around 5 percent per annum in 2017-8, buoyed by domestic consumption, despite some protectionist headwinds. This is almost double that of the advanced countries and emerging markets in Latin America, Africa and Middle East. Despite regional tensions and rivalries, ASEAN remains the pivot to maintain balance, cool heads and a zone of peace and stability.

Today, ASEAN plus China's share of global trade already exceeds that of the United States, as more and more ASEAN members accelerate their trade linkages. ASEAN+3's participation rate in the global supply chain is over half of exports, higher than the US (40 percent) and Euro-area (just over half)¹.

¹ ASEAN+3 Regional Economic Outlook 2017, Figure 2.7, pg. 51, ASEAN+3 Macroeconomic Research Office, March 2017.

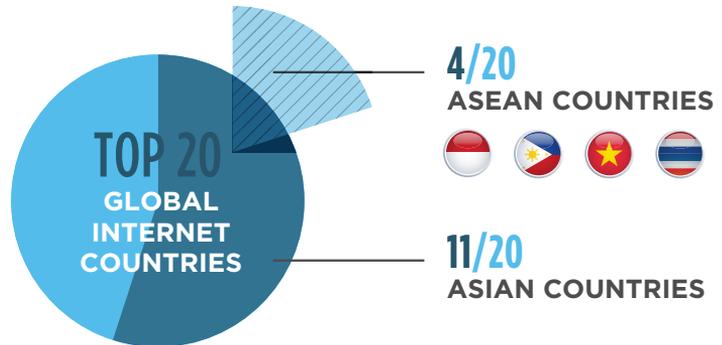
The region is home to some of the world's oldest and richest biodiverse resources, including tropical forests, maritime reefs and nearly 13 million square kilometres of sea.

What is holding back the region's growth rate is the lack of infrastructure development. The Asian Development Bank has estimated that ASEAN countries need to invest over US\$60 billion a year in infrastructure until 2020 to maintain their growth, but current infrastructure spending is around 3-4 percent of GDP compared with the desired rate of 5-8 percent of GDP².

The infrastructure is needed not only to improve domestic and regional connectivity, but also to deal with basic needs such as water, electricity, health and climate change amelioration investments. Most studies show that there is no shortage of long-term savings to fund infrastructure investments, but there are still serious gaps and barriers to match the demand and supply for funds.

The game changer may arrive in the area of technology and innovation. A 2016 study by Temasek and Google suggested that just six ASEAN economies (Indonesia, Malaysia, Philippines, Singapore, Thailand and Viet Nam) will become the fastest growing internet region in the world, with

TOP ASEAN INTERNET COUNTRIES



over 480 million users by 2020. This group's Internet economy (mostly e-commerce) will grow by roughly 14 percent compound annual growth rate (CAGR) to US\$200 billion by 2025.

The reasons for the fast growth are because the region has a burgeoning young population with 70 percent under the age of 40, with rapidly growing spending power. ASEAN e-commerce adoption also occurs faster because the region lacks advanced country retail distribution systems and is ripe for technological disruption.

My own gut feel is that ASEAN's digital transformation will be faster than just e-commerce adoption. The reason is that digital transformation will not only change our consumption patterns, but also our production through the Internet of Things (IoT), and even governance models. A 2015 Frost and Sullivan report

for SGX estimated that by 2020, the IoT market (interconnected devices) will have a market size of US\$79.3 billion by 2020, growing at a 26.8 percent CAGR.

ASEAN is well positioned to advance IoT, because its middle income market has both IT skills due to good basic education and innate adaptability to new technology. Out of the top 20 global Internet countries, 11 are in Asia, of which 4 (Indonesia, Philippines, Viet Nam and Thailand) are in ASEAN. Outside the US and India, Facebook's user base is huge in Southeast Asia, of which 126 million are in Indonesia. Malaysians have 50 percent more chance of using Facebook for business reasons than the world average.

For example, Philippines earned US\$25 billion in revenue from business process outsourcing (BPO) in 2016, providing over 1.3 million jobs. The World Bank has estimated that BPO revenues

² ASEAN Lifting the Barriers Report: Infrastructure, CARI (CIMB Asean Research Institute), 2015

could soar to over US\$50 billion and creating another 1.3 million jobs by 2020. Thailand, already a major auto-components manufacturer and processed food producer, is aiming for Thailand 4.0 to upgrade her digital capacity in manufacturing and services, much in line with China's Internet+ and Made in China 2025 strategy and Europe's Industry 4.0. A Malaysian startup called Grab is already successfully challenging Uber within ASEAN in vehicle hailing platforms.

In addition to e-Commerce and IoT, the next wave of productivity will come from innovations in social technology. McKinsey Global Institute has estimated that improvements in digital social technology can increase the productivity of workers by 20 to 25 percent (McKinsey 2012). The young in ASEAN are discovering that social media technology can help mobilize social action fast, with the result that coordinating large scale and complex projects through the use of smart technology and artificial intelligence is only just beginning.

ASEAN countries can therefore utilize digitization and internet technology to improve on energy and resource usage, reduce pollution and increase their overall productive capacity. Nowhere is this more important than in upgrading the quality of our food and agriculture production, as well as increasing the productivity of our congested cities. For example, Go-Jek, a mobile phone app, has more than 250,000 drivers in Indonesia, helping to reduce traffic congestion, delivery times and convenience to traffic-clogged cities like Jakarta.

The ability of social media to improve coordination within bureaucracies, facilitate Big Data analysis and artificial intelligence in making smarter decisions, is only beginning and ASEAN is leading the world in piloting many experimentations in this field, mainly because of its diversity in culture and stages of development, that provides a natural competitive gene pool of innovation.

Critics of ASEAN have complained that ASEAN

succeeded by muddling through. Muddling through is not muddle-headed. It is a practical, perhaps somewhat messy way forward, preferring pragmatism and reality over theoretical elegance. It is precisely because ASEAN evolves through consensus and cultural mixing that slowly but surely forms its own adaptive model of survival with resilience.

Onward, ASEAN for the next 50 years!

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AS SECTOR PARTITIONS CRUMBLE, ASEAN COMPANIES MUST CROSS BORDERS

Markets and industries have always evolved as businesses strived to create new conveniences and value for their customers while at the same time capturing increased revenues and profits. Historically for many industries, this has meant that quaint specialty shops have been slowly displaced larger and larger stores that offer greater variety and one-stop convenience and have come to define complete sectors. In a similar vein, today's familiar sectors are being usurped by online ecosystems, digital consumer marketplaces that defy traditional sector boundaries.

Banking and telecommunications, for example, have experienced a portentous evolution. The products and services of individual traders or subsectors, like foreign exchange and lending, were absorbed into bigger entities, forming today's modern topography of industrial sectors. And now, with the rise of digital technology, the partitions between these modern sectors are crumbling. Borders are becoming less relevant, and one day economists might be looking back at "quaint" sectors such as banking, telecommunications, and utilities.

ASEAN challenge urgent,

valuable

Companies around the world are facing these challenges to traditional configurations, and in ASEAN, where so many have only recently awakened to the idea of transnational markets, understanding this evolution is both urgent and valuable. As a trade bloc, ASEAN makes up the world's fifth largest economy, trailing only the United States, the European Union (EU), China, and Japan. In 2016, its economic output totaled about US\$2.6 trillion, a production level that is expected to more than double by 2030.

This dynamic region is being pushed by a many strong factors. Internally, the consuming class within the bloc is not only getting bigger, but also getting richer. In 2013, ASEAN held about 83 million consuming households - those with enough income to make significant discretionary purchases - and by 2030 their number is expected to increase to more than 160 million. And the share of those households making more than US\$20,000 annually is expected to double over the period.

Just as importantly, this growing community of consumers is embracing the digital economy with gusto. By one estimate, about 3.8 million new users are

coming online every month in ASEAN, making the bloc the world's fastest growing Internet market. Between 2015 and 2025, e-commerce receipts in ASEAN are predicted to grow from about US\$5.5 billion to almost US\$100 billion, a 17-fold increase.

Beyond the impetus offered by an expanding consumer class, ASEAN also has the economic muscle to propel accelerated growth. Just a few figures illustrate the region's potential. For example, between 2012 and 2016, foreign direct investment totaled US\$90 billion, and in 2015 trade flows with markets outside the bloc came to US\$1.7 trillion. Also underscoring the region's potential, manufacturing labor productivity rose on average by 7 percent a year between 2007 and 2012.

Borders between sectors vanishing

Yet even with these strong fundamentals companies in ASEAN and indeed the trade bloc itself will find it difficult to reach their growth potential without a clear understanding of how new technologies are tearing down borders, real ones that once stood between markets and metaphorical ones between industries.

The disappearance of barriers between national markets is perhaps the easier to grasp. ASEAN has a long history of working to reduce trade barriers among member countries, and global references such as the EU and multinational trade pacts serve as useful examples. In essence, in Southeast Asia the distinction between a “local” company and a global one is fading. Banking and telecommunications companies were the first to recognize the change and have worked hard to innovate around broader consumer needs. But critical industries, including real estate, retail, and consumer products, are finding it harder to let go of their local orientation and

release the innovative energy needed to match the change in market realities.

The challenge is only exacerbated when the collapse of borders between sectors are considered. In Japan, for example, Rakuten Ichiba spans a range of offerings – retail, banking, travel, investment, communications, and others – that, as a whole, defy industry classification. Amazon in the United States and Tencent in China have also blurred industry lines, providing customers with a sultry mix of products and services.

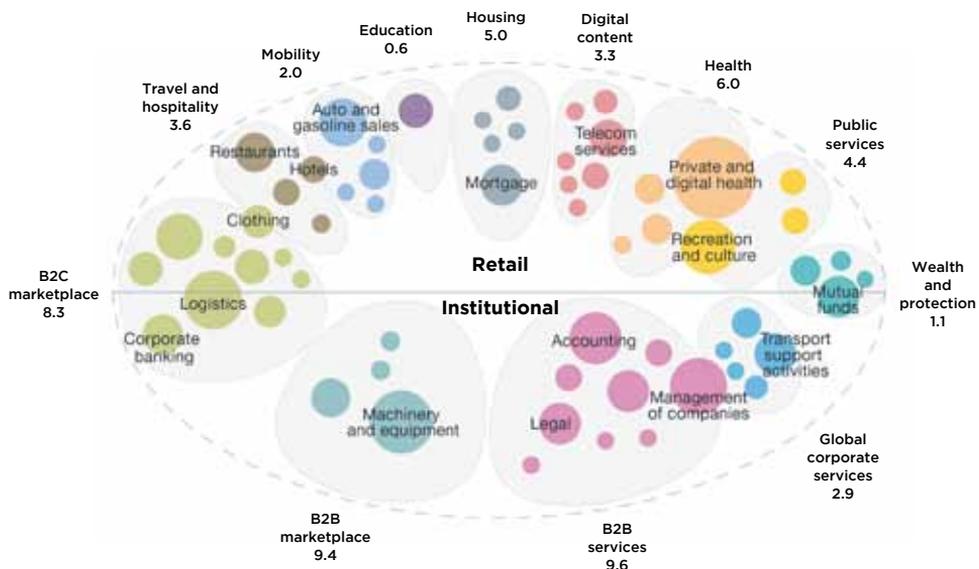
These and other digital natives, companies with no legacy business models predating the

Internet era, reach for profits wherever the opportunity arises. The speeds at which the walls between sectors are crumbling vary, and some sectors – heavy industry, for example – may be immune, at least for the moment. But digital technologies have greatly reduced the costs of attacking the walls that separate many sectors.

Advances of big data analytics, mobile interfaces, and artificial intelligence or machine learning, in particular, have prompted companies everywhere that are not digital natives to try to understand the benefits and risks presented by these changes. A recent McKinsey study showed that among 300

New ecosystems are likely to emerge in place of many traditional industries by 2025

Ecosystem illustration, estimated total sales in 2025,¹ US\$trillion



Source: IHS World Industry Service; Panorama by McKinsey; McKinsey analysis

¹ Circle sizes show approximate revenue pool sizes. Additional ecosystems are expected to emerge in addition to the those depicted; not all industries or subcategories are show.

CEOs interviewed globally across 37 sectors about a third was focused on cross-sector opportunities and threats. Many were especially concerned about whether new tech-savvy competitors understood their customers' needs better than they did.

Banking is a well-known example of how this evolution has proceeded, as digital companies from outside the traditional sector have rushed to provide financial services ranging from ride sharing players providing payments services to telecommunications companies offering insurance. Perhaps more surprising are the blurred boundaries surrounding the utilities industry. Tesla, an electric car maker, also offers energy solutions; Google offers smart thermostats and other connected home appliances; and US start-up Innovari provides integrated demand management services based on advanced analytics, to cite just a few encroachers.

Understanding ecosystems to meet challenge

At the nexus of these changes in sector topography is the digital ecosystem. Companies that want to thrive in the new environment must understand these systems, which orbit around the singular idea of customer needs. These ecosystems coalesce around consumer market places that provide customers with a familiar environment across a range of products and services

Different sectors come into play at every stage of the mobility ecosystem



Source: Panorama by McKinsey

that they can access from whichever device they chose.

To succeed in these ecosystems, companies must adopt a mindset that reaches beyond their traditional sectors and explores opportunities wherever

they might emerge. They must also build capabilities in big data analytics to develop insights into customer needs and behavior that stretch beyond a company's current portfolio of products and services. In addition, they must redefine their approach to

partnerships to form the wide range of alliances needed to deliver value in these complex systems.

And finally – the very essence of these market changes – companies must develop close, emotional relations with their customers or risk being relegated to low-value suppliers to those that do. This requires a sharp understanding of elevated customer expectations. In products, for instance, customers want greater choice, control, reliability, and convenience, and in services they are

looking for immediate access across channels and clear customization. The want brands that are socially responsible and prices that are affordable and predictable.

To meet these demands, ASEAN companies will have to innovate constantly around product design and delivery. While there is no playbook that prescribes a guaranteed regimen leading to such innovation, the critical starting point must be customer insights. For talent, this means hiring and promoting people who are ready and able to create

new value for customers, and for product development, eagerly embracing relevant opportunities as they are identified.

The continued integration of ASEAN member-state economies offers a bountiful landscape for companies willing to reach for profits and growth across crumbling sector and geographic boundaries and to create modern businesses focused on consumer needs. But those that rigidly cling to traditional industry definitions will be blind to this rich potential.

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Diaan-Yi is the Managing partner of McKinsey & Company in Singapore and a leader in our Public Sector, Private Equity, and Capital Projects & Infrastructure Practices in Asia. She also helps direct work with sovereign wealth funds in the region and has worked extensively with government entities and government-linked companies in Asia, particularly on the design and implementation of large-scale programs to drive performance transformation and economic development.

Ferry Grijpink is a Senior Partner in McKinsey & Company Singapore office and leads the Telecommunications, Media and Entertainment, and High Tech Practices in Southeast Asia. He focuses on advising telecommunication companies on strategy, marketing, and operations, including mobile operators that are launching adjacent businesses in areas such as mobile health and money services. He also co-leads McKinsey's research on deploying and commercializing next-generation infrastructures such as fiber and mobile broadband.

THE FUTURE OF ASEAN IS DIGITAL

Tan Sri Tony Fernandes, CEO, AirAsia Group



Governments hold the key to ensuring Asean maintains its trajectory and develops a robust digital economy.

The future is digital. Nowhere is this more obvious than Asia, a region that has wholeheartedly embraced the Fourth Industrial Revolution, allowing entire countries to leapfrog redundant technologies right into the digital era.

Pensioners in China pay for vegetables at the wet market with QR codes, unbanked Indian workers receive wages on their mobile phones, Filipinos with no credit cards purchase flights via text message. What's most impressive is the speed at which these changes are taking place. It took Sweden decades to transition to a practically cashless society¹. We now see the same thing happening in China's big cities in the span of about 10 years.

Everywhere in Asia, people are rapidly adopting digital technologies and adapting them to the local context. This is particularly true for ASEAN, which is an exciting piece of Asia's digital landscape puzzle. Cheap mobile devices and affordable data plans mean more people connect to the internet using their phones. ASEAN's mobile penetration rates are

some of the highest in the world. A young population that came of age during the digital revolution means a tech-savvy generation that is comfortable with interacting and transacting via mobile apps.

This is important for ASEAN - a diverse region of more than 630 million people and countries at every stage of economic development - because digital technology is the great equaliser that lowers barriers of entry to take part in the digital economy. Many small e-commerce retailers are nothing more than a mobile phone, maybe a desk and a computer. Starting your own business now just takes a few swipes and clicks, and minimal capital.

Because of this rapid growth in e-commerce, the number of online consumers in ASEAN has surged 50 percent over the last year to 200 million and the region's digital economy has grown to more than US\$50 billion² - about the size of Cambodia's GDP.

ASEAN also is home to some of the world's fastest-growing economies. Of the top 10 fastest-

¹ Cash transactions made up less than 2 percent of the value of all payments made in Sweden, according to central bank Riksbank.

² Digital Acceleration in Southeast Asia: Navigating Tectonic Shifts, Bain & Company (2017)

ASEAN'S DIGITAL ECONOMY AND ONLINE CONSUMERS



growing economies in 2017 as forecasted by World Bank, four are in ASEAN - Laos, Cambodia, Myanmar and the Philippines³.

ASEAN's affinity for digitalisation, coupled with its rapid growth, means the region is home to some of the most competitive digital economies. Singapore leads the pack, followed closely by Malaysia, Indonesia, the Philippines and Vietnam. In fact, Malaysia is seen as an exemplar of how Asia is "the most exciting region in the world" when it comes to the digital revolution, right alongside the powerhouse that is China⁴.

The biggest drivers for future growth in the digital space will be travel and e-commerce. Travel accounts for 44 percent of the ASEAN digital economy (US\$22 billion), followed by e-commerce (US\$15 billion)⁵.

Recognising this, Singapore has declared the digital economy a key focus area when it takes over the ASEAN chair next

year, with a focus on promoting innovation, digital connectivity and e-commerce flows that will benefit businesses, especially small-to-medium enterprises (SMEs). Singapore also intends to expedite customs clearance via a regional electronic platform that will help ASEAN businesses lower the administrative costs of trade.

It's not just SMEs that stand to benefit. Going digital also has the potential to supercharge large businesses, including AirAsia. That's why we are investing in heavily in data and digitalisation as we move towards becoming a truly digital airline.

AirAsia has always been ahead of the curve. We debuted SMS bookings in 2003 before apps were a thing, we put our lowest fares on airasia.com back when airlines still sold seats through travel agents, we introduced our AskAirAsia page with search box to answer frequently asked questions and, of course, we rolled out our ubiquitous airport

kiosks so guests can check in or print their boarding passes with ease.

More recently, we have pursued even greater automation at the airport counter, from home bag tags to self bag drop. Eventually, AirAsia guests will be able to go through the entire check-in process from start to finish at their own convenience. We are working with technology partners, airports and regulators to develop the airport of the future offering a seamless experience based on facial recognition.

Existing businesses aside, ASEAN has also emerged as an excellent breeding ground for new startups. The region benefits from a highly educated workforce, entrepreneurial spirit and gaps in service that attract innovative solutions. Grab, Go-Jek and Garena are some of the examples of local unicorns that not only add convenience and improve quality of life, but also create jobs and attract

³ Global Economic Prospects, World Bank (2017)

⁴ Digital Evolution Index 2017, Harvard Business Review (2017)

⁵ Digital Acceleration in Southeast Asia: Navigating Tectonic Shifts, Bain & Company (2017)

significant foreign investment.

Governments hold the key to ensuring ASEAN maintains its trajectory and develops a robust digital economy. Investments in infrastructure and education, harmonising standards, facilitating investments by improving access to funding, providing technological and business mentorship and responding quickly to change by crafting laws and regulations that support disruptive but beneficial businesses can mean all the difference.

Crucially, the digital economy has potential to catalyse infrastructure developments over the long term. Digital integration allows businesses to move to the front of the pack and connect ASEAN member nations with regional supply chains in production and distribution. This in turn stimulates physical infrastructure development, fostering more inclusive growth, setting in motion a virtuous cycle of development.

With big neighbours like China and India who have invested heavily in the digital infrastructure and technologies, who possess access to deep capital markets and boast huge populations, the onus is on ASEAN to do all it can to ensure sustainable development of an indigenous digital economy that can compete on equal footing.

Tan Sri Tony Fernandes is the co-founder of AirAsia, Asia's largest low-cost carrier by passengers. He studied at the London School of Economics and is a qualified chartered accountant. Fernandes has received numerous honours, including the Honour of the Commander of the Order of the British Empire and Commander of the Legion d'Honneur for his contributions to aviation.

FINANCIAL INCLUSION FOR ASEAN'S EMERGING CONSUMERS

George Sartorel, Regional CEO, Asia Pacific Allianz



As we enter a fourth industrial revolution in Southeast Asia, technology provides the means of alleviating this inequity, and unlocking the potential to provide financial awareness and access to the region's masses.

Over the last 50 years ASEAN has made huge strides in economic and social progress. Today ASEAN is an economic force to be reckoned with, boasting a GDP of US\$2.55 trillion. The 630 million citizens of ASEAN are a young and growing population by global standards. Its labour force is the third largest in the world. As the working population continues to grow, it promises to boost GDP and individual wealth.

However, not everyone is feeling the benefit of this economic momentum. Despite the economic success of the past half-century, there are still an estimated 264 million adults in Southeast Asia who are unbanked, ie, lacking access to basic financial services like a deposit account. For this population outside of the reach of financial access, savings tend to be kept at bedside and borrowings come from shadow sources at high costs. The social and economic toll of this inequity is significant.

As we enter a fourth industrial revolution in Southeast Asia, technology provides the means of alleviating this inequity, and unlocking the potential to provide financial awareness and access to the region's masses.

Accelerated data speeds on mobile networks and the proliferation of devices at historically affordable prices is driving a paradigm shift in the dissemination and consumption of information and services. Technology has emerged as a means to accelerating financial inclusion, increasing commerce and bringing about a digital dividend that could drive the next 50 years of ASEAN's growth.

Nearly half of Asia's population reside in rural areas lacking the services infrastructure common in urban centres. Reaching and serving these emerging customers require enterprises to revisit the way they operate, distribute and localize.

In June 2016, Allianz partnered with Indonesia's largest ride-hailing company Go-Jek to offer health insurance to its 250,000 drivers and their families. With Go-Jek drivers typically taking home about a third of Jakarta's average income per capita, Allianz designed an affordable health solution offering medical, hospitalization and inpatient benefits, with premiums deducted digitally from the drivers' e-wallets, eliminating the need for cash transactions. Backed by a synergistic

understanding and partnership with Go-Jek, this customer-centric and digital approach has meant Allianz is able to reach, and cater to these new 250,000 families in Indonesia, going some way towards close the protection gap in ASEAN's emerging consumer class.

Investing in ASEAN's Future Growth

Small businesses and micro-entrepreneurs are the backbone of many ASEAN economies, contributing substantially to income, output and employment, and playing an under-recognized role in lifting rural communities out of poverty. Yet, their potential and prospects are often hampered by the lack of access to financial capital for take-off and expansion.

To overcome this challenge, Allianz in 2016 pioneered the Trust Network Finance ("TNF") programme, an open-source micro-equity project to reach the unbanked communities in Indonesia.

Agung Nugrohob is one of them. An owner of a chicken stall in Bogor, Agung is tired of renting

and dreams of having his own equipment in order to expand his inventory. Under TNF, Agung receives cashless loans from Allianz via digital transfers, with repayments suspended for an agreed period until his business takes off. In addition, the shariah-compliant programme also provides micro-entrepreneurs like Agung with value-adding financial education and business mentoring. By bringing new solutions to old development issues, Allianz has been able to play a bigger role in driving sustainable micro-enterprise growth and job creation to support ASEAN's emerging communities.

The next 50 years

With ASEAN poised to welcome millions of people into the middle class within the next decade, it rests on enterprises and policymakers to ensure last-mile financial access is within reach of this new segment of emerging consumers.

The road to financial inclusion is neither short nor easy. But it is an important one. As we mark 50 years of ASEAN and look ahead to the next half-century,

our expectation is there will be more opportunities for private enterprises, digital players and policymakers to work together in closing the region's protection gap, and to prioritize financial inclusion in ASEAN's economic agenda.

As Regional CEO of Allianz in Asia Pacific, George is responsible for the core growth region of Allianz Group. Under his leadership, Allianz has accelerated its growth strategy in Asia Pacific, while also leading the industry in embracing digital innovations to drive stronger engagement with its 18 million customers in the region.

DIGITAL ASIA HAS THE POWER TO TRANSFORM LIVES

Steve Turner, Digital Cities Lead and LiYu Tseng, Senior Consultant, Arup



One thing we have learnt is that if cities are to harness the full benefits of the opportunities available, then they need to develop a far more integrated and holistic approach to the digital world.

Around the globe, digital advances are permeating almost every aspect of our lives. Digitalisation is influencing all areas of society, but the trend is particularly prevalent in urban environments as towns and cities in Asia and elsewhere begin to see the transformative power of digital technology in action.

The rise of digitalisation is influencing everything from how we plan our cities and the way we shop to shifting the way we travel around, communicate and organise our leisure time.

Transformation at this pace and scale fundamentally challenges how we think about the future. If harnessed effectively, the digital transformation has the potential to make cities more liveable and competitive. For example, technology is already improving outcomes for citizens and businesses, delivering services at lower cost; increasing productivity and boosting jobs and growth; and connecting citizens in new ways that allow communities a far greater voice in shaping their environment.

On the flip side, the digital revolution has also brought with it a host of new challenges in terms of how we deal with

issues such as cyber security, privacy, the effective utilisation of vast new stores of data and even how we think about tax collection.

One thing we have learnt is that if cities are to harness the full benefits of the opportunities available, then they need to develop a far more integrated and holistic approach to the digital world. In practice, this means investing time and resources in soft infrastructure such as land use planning, skills, training and developing coherent business and procurement policies, as well as tackling the hard issues of connectivity, embedding data hubs, cables and digital tools.

Today, cities around the globe are making decisions that will influence their development for decades to come. For example, many authorities have embraced the large city operating model to address systems at scale such as transport and water. Others have focussed more on innovation, for example, investing in engagement tools that place the citizen at the heart of the urban design process. And more recently, we have seen the emergence of new business models such as Uber and Airbnb, which are using the

city as a 'platform'.

In reality, of course, there is no perfect answer and a 'one size fits all' approach does not work. To make a success of this exciting new phase of innovation, Asian cities must have a strong digital vision for the future that is intrinsically tied to the overarching aims of the city as a whole. This strategic vision must then be tied to robust governance and leadership aligned to a clear strategy for delivery and implementation.

There are a number of emerging examples and case studies of where the ASEAN region is making particularly rapid progress in this agenda. Arguably, this has been most prevalent in the masterplanning of large redevelopment schemes. Singapore, in particular, has been at the vanguard of this work in Asia, just as Amsterdam and Barcelona were at the forefront of similar activity in Europe.

In 2014, the Singapore government launched its Smart Nation Programme, which set out a vision for the government to better harness the capabilities of digital technology to improve the lives of Singaporeans. Since then, different government agencies have been developing

their own smart plans to deliver the national programme.

With over 80 percent of Singaporeans living in Housing Development Board (HDB) homes, representing approximately 3.5 million people, a new masterplan was devised as a unique opportunity for digital technology to transform the living environment of many Singaporeans. Arup worked with the Singapore HDB to define a Smart Urban Habitat Masterplan in the first phase of the project.

As with experience from across Europe and North America, the team sought to establish a coherent vision and a set of goals that could be used to guide HDB's use of digital technology. The next stage of this work will be to implement a selection of initiatives in two carefully selected HDB towns. The lessons and insights gained from this implementation will be fed back into HDB's masterplan to shape future developments.

At the same time, one of Singapore's leading developers and industrial estate managers, is also driving progress in this field. The Jurong Town Corporation (JTC) identified the need to develop a digital masterplan for the 110+ Ha Woodlands development in Northern Singapore. The scheme

required a multi-disciplinary approach with expertise around a whole series of infrastructure assets, including Transport, Sustainability, Lighting, Security, Civil Engineering and Smart City consulting.

The Woodlands vision describes the development as 'the gateway to Singapore' due to the major transport hub that connects the site to Malaysia. The masterplan for the project focuses on key digital initiatives for the site, which will attract innovative businesses, shape user experience, and improve the operation of the development. The masterplan also details the core ICT infrastructure requirements for the site to demonstrate the future of estate operations, as well as the options for delivering the shortlisted digital initiatives.

As a global multi-disciplinary practice Arup has been shaping and supporting both national governments and city authorities on their digital agendas for a number of years. We value our independence highly, which has enabled us to differentiate ourselves in the marketplace, and with offices spread across the ASEAN region we are well placed to support ASEAN clients around strategy, design, operations and insight.

Steve Turner leads Arup's consulting work on smart cities. His clients include city and national governments, industry and urban developments. Recent work includes strategy and policy work

for UK cities and national governments including, London and Manchester as well as urbanisation policy across China.

LiYu Tseng is a Senior Consultant in Arup Digital, where she focuses on digital strategy. She is passionate about how technologies can change the way businesses and people behave. Her recent projects include the development of a smart city and digital strategy for national governments and property developers in the Middle East and Asia.

NEW ZEALAND'S OPPORTUNITY WITH ASEAN IN TODAY'S DIGITALLY CONNECTED WORLD

Peter Vile and Mitchell Pham, Directors, Augen Software Group and Kiwi Connection Tech Hub



New Zealand is well advanced in knowledge and development across many industry sectors. The expertise and know-how that we have developed can be leveraged as IP to help lifting ASEAN industries to international levels in order to compete and thrive.

New Zealand needs partners in Southeast Asia to grow in today's digitally connected world. Our high-tech nation can also contribute significantly to the regional ASEAN Community for economic development as well as political, security, social and cultural advancements.

New Zealand is a country geographically about the same size as Japan, United Kingdom and Vietnam, but on a global population scale is one of the smallest in the world. In comparison the ASEAN region is one of the top seven economies, globally. The region has an abundance of tech talent, investment capital and large markets for products and services. Singapore and New Zealand are both ranked No.1 in the world for ease of doing business. Kiwi businesses today can easily engage with member countries of ASEAN - the New Zealand Government has a strong presence in the region through the Ministry of Foreign Affairs and Trade and New Zealand Trade and Enterprise.

Why New Zealand is relevant to ASEAN

The ASEAN Economic Community is equivalent to one single economy. This economy has progressively become

more integrated since the establishment of ASEAN. Trade agreements have also opened up markets in ASEAN to both domestic and international competition.

New Zealand is well advanced in knowledge and development across many industry sectors. The expertise and know-how that we have developed can be leveraged as IP to help lifting ASEAN industries to international levels in order to compete and thrive. This is where New Zealand has the opportunity to make a difference with our tech and business sectors.

ASEAN has plenty of tech talent, investment capital, large populations and exponentially-growing digital technology uptake across the region. All of this represent massive opportunities for its businesses to innovate locally. However, many member countries are new to the development of know-how, scientific R&D, harnessing of intellectual property and innovating with many types of technology. Also, developing nations tend to start from a smaller foundation of IP.

For the region, there is an opportunity to work with

external partners who bring a wealth of both expertise and IP. New Zealand is a well-developed digital nation, with nearly 29,000 technology firms from a population of just 4.5 million. Again, this is where New Zealand has the opportunity to make a difference to ASEAN with our tech and business sectors.

Why ASEAN is relevant to New Zealand

Technology innovation in New Zealand continues to grow rapidly and is a key enabler and accelerator on all fronts for the rest of the economy. However, so far, we have only seen the tip of the iceberg. There is still room for Kiwis to achieve much more with our tech businesses and also to effect more significant impact in regions such as ASEAN.

Being a small economy, we do not have large customer markets for our businesses. Consequently, many of our companies innovate for the global market by default. This makes the large and rapidly growing markets and digital economies in the ASEAN region important to our growth.

At the same time, while aspiring to capture global demand for our innovation, we do not have enough tech talent to provide the capacity needed to speed up our development for speed-to-market. We also have a limited pool of investment capital as well as risk appetite for

technology innovation. These again make the ASEAN region important to fuel our growth.

On top of this, technology has been lacking as part of the New Zealand story that we have been projecting to the world, especially in regions such as ASEAN. This must change, if we are going to gain more traction in doing business with ASEAN markets.

An example of New Zealand engagement in ASEAN

In recent years, there has been an increasing number of New Zealand businesses and tech firms establishing their presence and engaging in the ASEAN region. One example is the Kiwi Connection Tech Hub located in Vietnam, managed by the Augen Software Group.

Augen started to help Kiwi businesses tap into the large growing pool of tech talent in ASEAN by establishing its offshore base in Ho Chi Minh City, Vietnam in 2005. Since then, the company has been assisting dozens of NZ businesses across numerous industry sectors with innovation projects, in ways that accelerate development and speed-to-market with increased capacity, scalability and cost efficiency while reducing risk, complexity as well as cultural barriers.

In 2016, in collaboration with business, industry and government partners, Augen launched the Kiwi Connection

Tech Hub. The group's business model expanded to include assisting Kiwi companies to physically deliver technology offerings into Vietnam and the ASEAN region as well as provide more extensive support to international customers across more time zones and doing so more cost effectively.

Collaborators and supporters so far include the ASEAN-New Zealand Business Council, Export New Zealand, New Zealand Trade & Enterprise, Ministry of Foreign Affairs & Trade, Asia New Zealand Foundation, KEA, New Zealand Technology Industry Association, New Zealand Software Association, Canterbury Technology Cluster, Auckland Tourism, Events & Economic Development, Wellington Regional Economic Development Agency, Christchurch New Zealand, Auckland University of Technology, University of Auckland, University of Canterbury, among others.

Augen's plan is to continue expanding Kiwi Connection Tech Hub through partnering to include supporting Kiwi businesses to access investment capital and distribution networks to large customer markets in the ASEAN region.

Some tips for Kiwi tech businesses wanting to engage in ASEAN

Technology is playing an increasingly important role in New Zealand and ASEAN trade growth stories. The ASEAN

tech market is expected to be a major regional performer over the coming years due to strong growth dynamics, while New Zealand's technology sector grew to more than US\$6.5 billion dollars in 2016.

As far as the tech sector goes, we are not an island. It would be smart and important to engage ASEAN markets alongside other Kiwi industry sectors which have been doing business development in the region for much longer and therefore are bigger, stronger, better known, more visible, more active and more connected in the region.

It is also vital that Kiwi businesses do their market research and engage in rigorous on-the-ground validation of their target customers in the region, then follow-through after their visits to progress relationships into business. We have to prove to the markets in the region that we understand their needs and are capable of engaging and

delivering with the scale that is needed to meet demands.

Summary

New Zealand and the ASEAN Community are highly relevant to each other.

As ASEAN continues to become more integrated as well as internationalised, its industry sectors need to rapidly lift their standards and grow capabilities to compete, and so stand to benefit from New Zealand's expertise and know-how in the form of IP that we can share with the region. At the same time, New Zealand can also share the strengths of a digital nation and our large and constantly advancing tech sector.

Conversely, New Zealand is a small population, and as such we have limited capacity in terms of tech talent, investment capital, large customer markets and fast-growing digital economies. Our businesses

need to connect and engage with the ASEAN region as part of our global growth strategy. Our companies, industries and government also need to more strongly and pervasively assert the New Zealand technology story to the ASEAN region as well as the world.

Peter Vile is co-founder and director of Augen Software Group and Kiwi Connection Tech Hub, executive of ASEAN-New Zealand Business Council (ANZBC).

Mitchell Pham is co-founder and director of Augen Software Group and Kiwi Connection Tech Hub, chairman of the New Zealand Technology Industry Association (NZTech) and the New Zealand Financial Innovation and Technology Association (FinTechNZ).

ADVANCING ASEAN IN THE DIGITAL AGE

Jaime Augusto Zobel de Ayala, Chairman and CEO, Ayala Corporation



Much more needs to be done in capturing the opportunities and navigating the challenges that digital transformation brings.

At a time of enormous volatility in various parts of the world, ASEAN has shown consistent growth and has become such a dynamic region. Even with global headwinds, I believe that the outlook for Southeast Asia remains bright, maintaining a relatively positive growth trajectory and remaining an attractive destination for investments.

What makes this development more impressive is the interplay of key trends that have contributed to ASEAN's potential for sustained growth. Southeast Asia is undergoing a demographic dividend, with over 50 percent of the population below the age of 30. Higher-skilled workers are also on the younger end of the workforce, with a median age in the mid-20s, suggesting an increasingly well-educated population that bodes well for ASEAN's future productivity. This is particularly valuable when it comes to disruptions in employment that require more education, greater skill, and higher adaptability.

The growing economies of ASEAN member-nations drove increasing affluence. By 2030, the number of households with greater discretionary purchasing power is poised to

nearly double, from 81 million households in 2013 to 163 million in 2030.

ASEAN is also experiencing rapid urbanization. Populations in major cities all over the region have grown by as much as 50 percent over the last decade. ASEAN's cities account for over 65 percent of regional gross domestic product. This is likely to grow, with more than 90 million people expected to move to urban centers by 2030, driven by the prospect of higher wages.

Finally, ASEAN's commitment to an open trade environment, as seen in the ASEAN Economic Community and in its participation in other free trade agreements and economic initiatives, provide a boost to the region's potential.

The confluence of these factors drove the rapid transformation of many industries across the region. The digital revolution, in particular, is changing how consumers find and buy products and services, how businesses interact with customers and their supply chains, how governments engage citizens, and even how ASEAN works with the rest of the world. We have observed six

key technology trends that are fueling this digital revolution.

First is mobile technology. Today's mobile devices are equipped with enormous computing power, ever larger screens, pervasive high speed networks, and made even more accessible to individuals. Second is social media that has changed the way people and societies interact with one another and the rest of the world. Third is the shift in the way individuals now interact with their surroundings. From face-to-face and personal engagements, interactions are now done through a screen - from mobile phones to tablets to laptops and PCs, and even digital billboards. Fourth, the cloud has allowed individuals and enterprises the flexibility to store data, keep memories, and manage IT infrastructure.

Fifth is the accelerating adoption of the Internet of Things, which allows offloading mundane interactions between humans and machines into

machine to machine, presents greater efficiencies in the way we do things. Finally, advanced analytics are helping solve various challenges in sectors such as healthcare and education to national security.

Overall, these six technology trends present tremendous potential and opportunities for enterprises, societies, and governments. However, the challenge lies in how we can properly harness the benefits they bring and on the flipside, manage their potential misuse.

With how the mobile and Internet economy is changing our lifestyle, it is imperative that ASEAN enterprises be able to adapt quickly by integrating digitization into their business strategies and operations. We have seen how start-up companies are flourishing in this environment where the nature of employment and entrepreneurship are shifting. Similarly, governments must adapt to the digital

transformation to cater to the needs and preferences of the modern citizen.

In closing, much more needs to be done in capturing the opportunities and navigating the challenges that digital transformation brings. This entails collaborative efforts among governments, the private sector, the academe, and research institutions, particularly in support for harnessing intellectual knowledge, innovation, and enabling frictionless flow of data and information. More than ever, close cooperation among ASEAN member nations is crucial in this journey towards digital revolution.

Jaime Augusto Zobel de Ayala is the Chairman and CEO of Ayala Corporation, one of the largest business groups in the Philippines, with interests in real estate, banking, telecommunications, water, power, industrial technologies, infrastructure, healthcare, and education. Outside the Ayala group, he is a member of various business and socio-civic organizations in the Philippines and abroad, including the JP Morgan International Council, Mitsubishi Corporation International Advisory Council, and the Council of Foreign Relations.

THE TRANSFORMATION OF ASEAN'S FINANCIAL SECTOR

Chartsiri Sophonpanich, President, Bangkok Bank



Technology can also help SMEs gain much-needed access to credit as potential lenders can more accurately assess business potential and pinpoint risks through the aggregation of digital and alternative data, and advanced analytics.

The financial services industry globally is facing one of its greatest-ever challenges with increasing competition from FinTechs and the growing use of technologies such as blockchain, the “cloud” and Artificial Intelligence (AI). In its Global FinTechs Report 2017, PwC predicts that FinTechs’ growing influence will make the industry unrecognizable within five years.

Fortunately, ASEAN has many advantages which will help us make this great leap into the future. For one, we are already well along the path to transformation, spurred by the formation of the ASEAN Economic Community (AEC) and its commitment to economic and financial integration. Moreover, our fast-growing economies, youthful population (over 50 percent of people are under 30 years of age), and the rapid adoption of technology (including smartphones) will all support the region’s transition to a digital future.

A recent report by A.T. Kearney, a management consultancy, suggests that although the AEC lags behind other economic blocs in its embrace of the digital economy, it has the potential

to enter the top-five digital economies by 2025 thanks to rapid developments in areas such as cashless payments, smart cities, mobile financial services and new-generation manufacturing.

The same report estimates that transforming the AEC into a leading global digital economy would potentially generate an additional US\$1 trillion in GDP over 10 years. As the transaction provider for goods and services, the enabler for wealth management and source of finance for business development, the financial sector will clearly play an essential role in this transformation. Given that new entrants are challenging traditional providers in all these areas, we must lead the way with better facilitation of goods and services settlement, and provide highly secure and affordable electronic payment systems that are widely accepted across all channels and even across national borders.

Digital financial solutions will also help with the provision of banking services to people who are currently unbanked by providing customer and verification processes which are fast, convenient and low-

cost, and which use mobile applications such as e-wallets. Technology can also help SMEs gain much-needed access to credit as potential lenders can more accurately assess business potential and pinpoint risks through the aggregation of digital and alternative data, and advanced analytics.

The first step towards the digital economy is electronic connectivity. However, AEC countries are at very different stages of development in this area. At one end of the spectrum, Singapore is an advanced high-income country which already ranks in the top 10 of the United Nations ICT (Information, Communications and Technology) Index, while others such as Myanmar and Laos are emerging economies still lacking vital infrastructure. This gap is reflected in internet connectivity – Singapore, Brunei, Thailand and Malaysia have internet penetration rates of around 80 percent, while Laos, Cambodia and Myanmar have rates of less than 30 percent. However, once infrastructure is available these emerging economies can catch up very

rapidly – for example, the number of internet users in Laos grew by 83 percent in 2016!

Most AEC countries are leapfrogging straight to the mobile internet, rather than connecting via PC, which is an advantage as the mobile platform is one of the most dynamic areas for the development of new FinTechs services. As we have seen in China, where people are abandoning cash for mobile payments, once people are connected to the internet via their mobile devices, their behavior changes very quickly and this opens many opportunities for different kinds of commerce and new forms of payment. Thanks to the AEC’s youthful population we can expect very fast adoption here also.

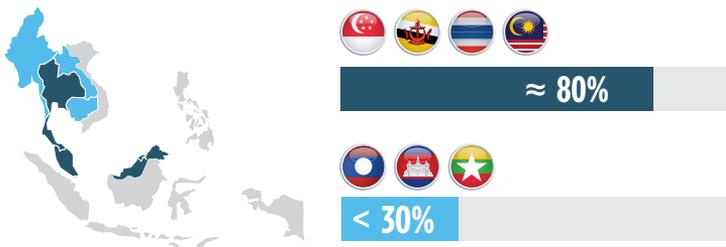
As mobile devices become the dominant channel for accessing banking services, this is stimulating demand for biometric systems of customer identification and authorization coupled with e-KYC (electronic Know Your Customer).

Aside from the requirement

to provide universal internet access, another important step in the AEC’s transition to a digital economy is the establishment of comprehensive payments platforms that are fast, secure and can be easily used by everyone. Thailand is well advanced in this endeavor, with the government, the central bank (Bank of Thailand) and commercial banks working together to establish a secure and standardized e-payment platform linked to the national ID system.

The centerpiece is a system called “PromptPay” that links bank accounts to mobile phone numbers and/or Citizen ID cards to provide highly secure and extremely low-cost electronic transfers. The Bank of Thailand is also encouraging all businesses, no matter how small, to accept electronic payments as part of its mission to make Thailand a cashless society. The latest innovation is a QR Code system which is standardized across all banks, and which is now being rolled out to market vendors and marketed by banks as the most convenient, secure and easy way to receive payments using mobile devices. The Thai government is also linking the PromptPay system with electronic delivery of tax returns and welfare payments – another important step towards a digital economy.

Moves to encourage a cashless society are also taking place in other parts of the AEC, such



ASEAN INTERNET PENETRATION RATE

as Indonesia, Malaysia and Singapore. The experience of these countries in providing national digital payment systems will provide useful models for others in the region and potentially a base for providing cross-border payments using technologies such as blockchain. The close cooperation between governments, central banks, regulators and private institutions within the AEC should help facilitate this. These institutions also need to work collaboratively on cyber security as the shift to digital financial services is greatly increasing the risk of cybercrime

Another major trend shaping the direction of our region's financial services is the emergence of FinTechs startups and their innovative new services. At Bangkok Bank, we have first-hand experience of the vitality of this sector through our global FinTechs accelerator program, Bangkok Bank InnoHub. Members of the initial program come from five countries, and their services include technology solutions for wealth management, mobile security,

blockchain-based transfers, SME lending, and P2P invoice trading – all of which point the way to the kinds of innovations we can expect to see in the future.

Meanwhile, commercial banks are adopting new business models. Rather than attempting to provide a full range of services as in the old “financial supermarket” model, they are forming partnerships with FinTechs companies and providing services to their customers through Application Programming Interfaces (APIs) whereby the bank connects the customer with a service through an application such as micro-finance for small businesses and robo-advisory.

This trend was reflected in the Global FinTechs survey which found 82 percent of financial providers planning to increase partnerships with FinTechs providers in the next five years. Meanwhile 77 percent expected to adopt blockchain for part of their processes by 2020, and 30 percent are investing in AI.

By forming partnerships with FinTechs, financial services

providers can bring innovative products and services to the market more quickly. With Big Data and AI they can mine their customer data (richer than ever before thanks to mobile banking) to target and tailor services to individual clients, while blockchain will enable them to speed up delivery of transactions, reduce costs and better manage identity verification processes.

Here in ASEAN we could lead the way in the transformation of the financial sector but it will require close cooperation between all parties – governments, central banks, regulators, telecoms, financial institutions and FinTechs start-ups. Let's hope we rise to the challenge!

Mr. Chartsiri Sophonpanich is President of Bangkok Bank, a leading Thai bank with a long-standing presence across Southeast Asia as well as greater China, Japan, New York and London. Its international network, including wholly-owned subsidiaries Bangkok Bank (China) and Bangkok Bank Berhad in Malaysia, spans 32 locations in 15 economies.

DIGITAL REVOLUTION IN ASEAN: THE IMPACT TODAY AND DRIVERS OF TOMORROW

Paul de Courtois, Managing Director of BMW Group Asia, BMW



Specifically looking at the automotive and transport industries, regional tech companies, global car manufacturers and even local governments are also leveraging digital innovations in order to connect with consumers within ASEAN.

How will the digital revolution impact economic prosperity in ASEAN? What will be the driving factors?

No matter what industry you are in, “digital” is a familiar term that comes up in nearly every conversation today, especially if you are in ASEAN. Whether it’s DBS Bank, Axiata Group, Carousell, or RedMart, each of these companies is actively embracing the digital revolution and are making strides to engage with today’s tech savvy consumers.

Specifically looking at the automotive and transport industries, regional tech companies, global car manufacturers and even local governments are also leveraging digital innovations in order to connect with consumers within ASEAN.

A New Digital Experience

Grab, the region’s leading mobile taxi booking service network, is in 55 cities across Southeast Asia and the Grab app has been downloaded onto over 45 million devices¹. Since its launch, the company has continuously

rolled out new features to enhance user experience. In August 2017, Grab launched its new peer-to-peer fund transfer feature, to enable consumers to transfer GrabPay Credits to one another².

BMW is also riding the digital wave globally and in the region from manufacturing plants to showrooms. For example, in 2016 Performance Motors (PML), the authorised dealer for BMW cars and motorcycles in Singapore, launched their newly renovated showroom under the “Future Retail” concept. As part of the launch, a new key offering in the form of the Virtual Product Presentation (VPP) device was introduced to enable the display of car configurations on a high-definition 3D displays in a highly realistic and detailed representation. Customers no longer have to rely on their imagination, or need to see in person, the colors, options, and packages they have chosen for their new BMW.

In order to bring the showroom to the customer, this year ASUS Global introduced the availability of the BMW i Augmented Reality

¹ <https://www.grab.com/sg/press/business/grab-celebrates-fifth-anniversary-significant-user-milestones/>

² <https://www.grab.com/sg/press/tech-product/grab-launches-peer-to-peer-fund-transfer-in-grabpay-mobile-wallet-in-singapore/>

(AR) Visualiser to customers in Singapore. Compatible with the new ASUS ZenFone AR smartphone and powered by Tango, Google's smartphone augmented reality technology, customers can explore and pre-configure their ideal BMW i3 or BMW i8 wherever and whenever they chose to.

In the public transport sector, Singapore announced in 2017 that users with NFC-enabled mobile phones can simply tap in and out of the MRT, LRT and public buses using their phones. The country is also exploring the use of health and fitness wearable devices as payment modes for public transport rides. Thanks to digital innovations, Singapore is well on its way to a "hands free" fare system for public transport.

The Road Ahead in ASEAN

It's clear the digital revolution is alive and kicking throughout certain markets in ASEAN. However, the question remains as to how ALL markets in ASEAN across all industries can embrace digital innovations in order to grow not only their individual economies, but the region as a whole. As the world's 3rd largest economy with more than 630 million people, 70 percent under the age of 40, across 10 countries, ASEAN has a tough road ahead, but not an impossible one. In order to prosper in the next 50 years, a few key factors need to be considered.

Human Capital

According to "Digital in Southeast Asia in 2017", a special report by We Are Social and Hootsuite, 53 percent of the combined population in the region is online today, 47 percent are active social media users, 133 percent have mobile subscriptions and 42 percent are active mobile social users. In order to tap this customer base and stay ahead of the game throughout the digital revolution, organisations need a different type of "human capital" than what was needed in the past.

In the past, we looked for employees with technical skills who could build innovative digital technologies. While they are still important today, organisations across the region need to search for employees who live and breathe the digital world. This new type of "human capital" is understanding what a customer wants and needs from a digital world and what experience they are looking for.

Regulations

With 10 different countries within ASEAN, there are 10 different sets of regulations for every sector. The good news is, as a region, we are making progress in this area. For instance, Singapore, Malaysia, Thailand and the Philippines recently signed a memorandum of understanding (MoU) to establish the ASEAN Federation of Electric and Hybrid Vehicles Association (AFEHVA). The

exchange of best practices, policies, information and technology will benefit all parties by creating a more favourable environment for the sector to develop and flourish in the long run.

Public and Private Cooperation

According to Jack Ma, founder and executive chairman of the Alibaba Group, "There are big problems that change the world. If we are working together, that will make us understand each other, appreciate each other, help each other." When it comes to the digital revolution, private companies can only do so much. Without support and cooperation with the public sector, whether it be academic institutions or government bodies, there is a ceiling to what can be achieved.

For example, in order for electric vehicle adoption to be a success, car manufacturers can develop the vehicles, technology companies can develop the applications, and service providers can assist in the installation of charging infrastructure. However, without support from academic institutions for R&D or government organisations to incentivise consumers to adopt the new technology, success will be hindered.

New Opportunities, New Expectations

The proliferation of digitalisation has opened new doors to how we live, work and play and

the demand for hassle-free experiences wherever we go has resulted in the development of new and innovative solutions. ASEAN is unmistakably at the forefront the digital revolution and, based on current and future developments, the region has a strong chance of maintaining this position globally.

Mr. Paul de Courtois began his career at the BMW Group in 1997 in the Sales department of BMW Group France. He then worked at BMW Group headquarters in Munich, BMW Group Hungary and BMW Group Poland before taking on his current position as Managing Director for BMW Group Asia in Singapore.

ASEAN'S PATH INTO THE DIGITAL AGE

Martin Hayes, President, Bosch Southeast Asia



Adaptive leadership is needed to overcome challenges within an uncertain environment. Both business and political leaders should possess the knowledge and capability to be agile, adaptable and resilient.

The world is becoming interconnected at a phenomenal rate. Today, the world's population stands at around 7.6 billion people and is reaching 9.8 billion by 2050, as estimated by the UN. According to Gartner, there will be approximately 20.8 billion devices worldwide connected to the internet by 2020. These are not only the mobile devices and wearables that we have today, but also include sensors such as in cars or machines. What's more, the cost of connecting a product will decrease drastically from US\$4 to US\$2.50 in 2015 to US\$2 to US\$1 in 2020, thereby fuelling the growth of connected devices.

ASEAN is in a prime position to leverage on such technological connectivity and harness its economic benefits. With a GDP of US\$2.55 trillion for the full year of 2016, ASEAN is expected

to hit US\$2.6 trillion by end 2017 with an economic growth rate of 4.6 percent. This places ASEAN as one of the world's biggest and most dynamic economic regions. If counted as a single entity, it would rank sixth only behind the United States, China, Japan, India and Germany. In addition, ASEAN is one of the fastest-growing internet regions in the world with over 480 million users by 2020.

Most recently, the economy of ASEAN picked up the pace with a growth of five percent annually in Q2 of this year, according to an estimate of regional GDP compiled by FocusEconomics. This is ASEAN's best performance since Q3 2013. Such a momentum is expected to continue in the coming years, as the largest economies in the region have pledged to increase infrastructure investment with over US\$60 billion a year until 2020.

While infrastructure investment would lead to improvement in domestic and regional connectivity, it is the rapid adoption of new technology by ASEAN member countries that would be the biggest driver of economic growth and integration for decades to come.

However, digital transformation is not without its challenges, and

ASEAN INTERNET USERS BY 2020



these are the areas that require attention from ASEAN to reach its potential of fully leveraging such technology and advance in the digital age.

Complexity

In a Volatile, Uncertain, Complex and Ambiguous (VUCA) world today, disruptive technologies are redefining business models and ruffling the feathers of existing players in the industry. Policymakers have to take on the challenge to keep track on the latest technology developments and consider legislative adjustments, facilitate the adoption of innovative solutions while mitigating the risks they potentially entail.

We are seeing rising customer expectations and requirements such as product customization, the availability of 24/7 service and shortened delivery times. New social behaviours are also emerging and becoming prevalent, such as online shopping, while new ecosystems are appearing and merging with existing ones. Take a car for example. Bosch first started making a car smart by installing automotive assistance systems that detect imminent collisions and help drivers brake ahead of time; or notify drivers if they veer away from their lanes and even steer the car back on track. Next, we add connectivity to the car – by today’s standards, this would be by way of the in-car navigation system, for example eCall – an emergency response system that helps saves lives

by detecting that an accident has occurred, and dispatching emergency medical services automatically to the accident site. In the near future, the car as a product will be a part of a connected system where they will be able to communicate with one another via the internet to warn of hazards and obstacles on the road, as well as to detect vacant parking lots as they drive pass. And the next evolution would be that this system of cars is part of a larger system that comprises other sub-systems such as traffic information, environmental situations and GPS navigation - and this would be when autonomous driving will truly be available for everyone.

Adaptive leadership is needed to overcome challenges within an uncertain environment. Both business and political leaders should possess the knowledge and capability to be agile, adaptable and resilient. The looming question is that while the private sector is embracing or spearheading new technologies, methods and business models, how are the local governments supporting business and economic growth, but yet ensuring fairness and a level-playing field in the industries?

Growing Competition

Traditional markets are facing increasing competition from new entrants not only through vertical and horizontal integration, but also by means of disruptive technologies and services. To

ensure that fair competition is upheld, governments must not foster any protectionist measures that purely serve the interests of specific sectors or companies. In ASEAN, an effective competition policy should entail enforceable rules that proscribe anti-competitive activities, so as to facilitate liberalization, as well as a unified market and production base within the region. Harmonized competition laws based on international best practices also need to be implemented in all ASEAN member states at the national level. At present, merger control will almost certainly form part of nine of the ten ASEAN competition law regimes. However, our suggestion is for all member states to have mandatory notification requirements – something that is not present at this point.

Data Security

A digital economy transcends physical boundaries and borders. The responsible use and treatment of data forms the very basis of consumer trust that can also become a competitive advantage. Clear and precise regulations and legislation on how to treat data are required to ensure transparency and avoid ambiguity. For privacy reasons, certain national governments legislated that local data must also be hosted locally, with a tendency to build up even stricter data laws that may potentially restrict growth and progression for cloud platforms and other services. For non-

personal data, or “inactive data”, clear rules are required to avoid legal uncertainty.

Cyber-attacks and cybercrimes are top concerns for companies and governments alike. No single IT system is 100 percent invulnerable. However, does that mean that we cut off access altogether, or embrace reality and invest in cybersecurity? With a rapidly evolving business landscape, companies will have to choose the latter path and with it, its ever-changing risks. ASEAN governments need to strengthen cooperation within the region in combatting cybercrimes as part of the 2025 blueprint for political security that will foster greater confidence by companies and consumers alike. For instance, ASEAN countries should adopt internationally-accepted encryption standards.

Fast Fish or Slow Fish?

As respectable Professor Klaus Schwab, Founder and Executive Chairman of the World Economic Forum said in October last year, “In the future, it will not be the big fish that eat the small fish; it will be the

fast fish that eat the slow fish.” I believe that the future that he’s referring to is already upon us.

It is true that ASEAN has the makings of a fast fish. However, even the fastest of fish slow down in the face of obstacles. The question is: do we allow such challenges to slow us down, or do we work together to overcome them? The potential is there, so let us come together and remain fast in the digital age.

Martin Hayes has helmed the business operations of Bosch in Southeast Asia as President and in Singapore as Managing Director since 2011. A founding member of the EU-ASEAN Business Council, Mr. Hayes is passionate about promoting shared business interests in ASEAN, especially in the areas of technology and innovation.

TRANSFORMATIONAL TECHNOLOGIES ARE TAKING OFF: CAN ASEAN BENEFIT?

Manu Bhaskaran, Advisor, CIMB ASEAN Research Institute and Partner, Centennial Group



We could be in an era similar to the early 20th century when the confluence of electricity, the internal combustion engine and new manufacturing processes unleashed many decades of economic growth.

The world is seeing an unusual confluence of multiple technologies reaching take off points almost simultaneously. Clichés such as “game changing” and “disruption” do not do full justice to the dramatic effects that these technologies will have on virtually every aspect of our lives. In this article, we will focus on what these changes mean for ASEAN’s economies and how well ASEAN is likely to cope with such monumental challenges as well as opportunities.

An array of new technologies emerging

There are several major technology trends which are important. There are technologies that will affect our physical world including nanotechnology, advanced materials, renewable energy such as solar and wind, 3D printing and automation. Then there are biological technologies with genome mapping and tissue engineering being the most prominent. Then there are digital technologies such as fintech (including blockchain) as well as social-mobility-analytics-cloud computing – and, of course, the internet of things (IOT).

These technologies are diverse but share a few features. First, the rate of technological change

and adoption is rapid. All three – physical, biological and digital – are deeply interrelated: that means that the various technologies benefit from each other, feeding off and reinforcing each other to produce an unprecedented rate of change that looks like changing the landscape so thoroughly that some observers have taken to labelling them collectively as the fourth industrial revolution. Second, the economic potential is sizeable. Third, there is also a high risk of economic disruption or dislocation.

The economic gains could be massive

We could be in an era similar to the early 20th century when the confluence of electricity, the internal combustion engine and new manufacturing processes unleashed many decades of economic growth. Here are some likely broad economic implications:

First, we should see higher economic growth as a result of two forces:

- **A pickup in investment:** The high returns promised by these new technologies will spur a new wave of investment. So transformational are these emerging technologies that much of the existing capital

stock will become obsolete and will need to be replaced. This higher investment will add to demand and raise economic growth.

- **Accelerating productivity growth will also improve economic growth:** Automation and robotics will result in greater efficiency as more output is generated with the same amounts of inputs. The IOT will also spur productivity gains as interconnected smart devices lead to time savings for the users. E-commerce and fintech platforms will also allow consumers to purchase goods and services without being physically present and would likely cut out the middlemen. Once artificial intelligence (AI) is integrated with the other technologies, smart factories, warehouses and even devices will learn from their surroundings and become more efficient the more they are used. And this is only the beginning!

Second, the structure of competitiveness could change:

- **We could see more re-shoring,** or the return of manufacturing back to developed countries: Automation and the use of AI could well raise productivity in developed economies so high that their unit labour costs fall sufficiently to make domestic manufacturing more viable compared to relocating manufacturing to economies with low labour costs.

- **There could be a greater**

premium on scale favouring countries with large populations:

It cannot be a coincidence that the biggest winners from recent technological advances have been the likes of Apple, Facebook, Google and Amazon from the United States as well as Alibaba, Tencent and Baidu from China. The ability to reach massive scale quickly by having easy access to a huge market seems to be becoming more important.

- **Capacity to leapfrog could help less developed economies:**

The new technologies offer the laggards in economic development the scope to leapfrog ahead of others. In India and Africa, for example, mobile technology has helped spawn advances in finance which are promoting financial inclusion and new payments platforms.

Third, employment patterns will also evolve in different directions:

There is much talk about the destruction of jobs as a result of these technological changes given the automation potential and the possibility that robots, for instance, could perform better at many occupations than human beings.

It is indeed true that automation, robotics and AI could displace a large number of jobs, not limited to blue-collar factory jobs but even white-collar professional jobs such as accounting and the back offices of financial services. Furthermore, rising industries

such as e-commerce, fintech and SMAC are proving to be less labour-intensive than traditional manufacturing sector. Even the manufacturing jobs of the future will likely require less menial workers to put parts together and more knowledge workers to operate and troubleshoot automated assembly lines. The labour market will likely see significant disruptions as these emerging technological trends take root.

Still, this is not the entire story. There are several reasons why the impact on employment may not be as malign as some of the alarmist reports claim:

Technology comes with overhead costs which create new kinds of jobs: For example, how many analysts forecast the massive expansion of the cyber security industry when the internet emerged? The fact is that all new technologies come with side effects and spillovers that need to be managed. Recall how the advent of the motor car resulted in the growth suburbs, a whole new industry of support services such as traffic lights and traffic management and promoted industries such as local tourism. Indeed, by raising economic growth and expanding the scope of business opportunities in so many unpredictable ways, the demand for employment as a whole will rise. More efficient ways of doing things in areas as diverse as manufacturing and legal services, opens the way for

higher salaries for the specialists and so higher demand as they spend more. With less of their time taken up by mundane tasks, they will be able to be more creative as well.

What will determine who the winners and losers are?

One thing is clear – we are entering a period tumultuous change which will bring opportunities as well as dislocation. It strikes us that two factors will determine which countries will do better out of this period than others.

The first determinant is resilience to shocks. In a period of dislocation, economies will have to deal with greater volatility and more frequent stresses or even outright shocks. Countries need to be able to absorb these shocks and bounce back. For that they need to be diverse, have a strong capacity for policy responses and ensure that their fundamentals especially financial structures are strong.

The second determinant is the flexibility to adjust to competitiveness challenges and the dislocations that will be

caused at the industry level. How strong is the bottom up capacity to adjust to these changes and will the top down policy and regulatory structures impede or facilitate such adjustments?

This analysis suggests that the benefits of economic change might be uneven across ASEAN. Most ASEAN economies have actually improved their economic resilience since the Asian crisis of the late 1990s. The divergent performances could come from differing levels of flexibility:

- Thailand and Malaysia, for instance, have shown a capacity for bottom up entrepreneurial ingenuity in adjusting to challenges and exploiting new opportunities, despite some challenges.
- Singapore has demonstrated a tremendous capacity for top down mobilisation of resources for development but may not be as strong in terms of the entrepreneurial flair that is so critical in determining successful adaptation to this new world.
- Indonesia offers tremendous scale economies which will

attract many of the global giants that are emerging from the fourth industrial revolution. Its business eco-system may, however, not be as friendly as it needs to be for companies to innovate and compete. The good news is that President Joko Widodo’s administration appears to understand this and is reforming regulations steadily.

- Viet Nam and the Philippines are similar in some respects to Indonesia – their large populations offer scaling opportunities but their business environments need to see more regulatory reforms.

Overall, we think that the ASEAN region can address impediments to successful adaptation to the new economy and has the potential to emerge as a great node of growth and dynamism in the world economy.

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ADVANCING ASEAN IN THE DIGITAL AGE

Tunku Zain Al-Abidin ibni Tuanku Muhriz, Senior Fellows, CIMB ASEAN Research Institute



Across the world we see examples of greater distrust, societal division and security challenges to nation states catalysed by the very same technology.

Identifying the beginning of the “digital age” depends on which definition and criteria adopted, but certainly there was a time when the rapid acquisition of digital technology by middle class populations - represented by the personal computer, internet connectivity and mobile phones - was supposed to herald an era where greater communication, knowledge exchange and virtual interaction was supposed to have eliminated barriers across communities and nation states, promoting peace, mutual respect and the advancement of democratic values.

That promise has not been universally fulfilled. Across the world we see examples of greater distrust, societal division and security challenges to nation states catalysed by the very same technology. The propensity of authoritarian states in controlling the media continually catches up with technological advancements, and in some cases the state has successfully pressured so-called champions of free speech to modify their principles in return for market access. But even in democracies, public confidence in traditional institutions has been dented, accompanied by polarising ideologies and radical politics. The proliferation of fake news

and its dissemination on social media platforms further fuels a confrontational and sceptical mindset amongst citizens.

The two now classic examples that relate to this phenomenon are the election of Donald Trump as President of the United States and the United Kingdom’s vote to leave the European Union. The response to these events in turn has also triggered reactions ranging from those advocating for a return to constitutional principles on the one hand, to those who feel that only radical change can result in sustained peace and prosperity once again.

In ASEAN too, we see evidence that similar narratives may be unfolding. Despite the existence of the ASEAN Charter and regular public commitments to the development of the ASEAN Community, across the region we see how divisions among ethnic, cultural, religious, linguistic, geographical or class lines persist, or in some cases are being widened, often in pursuit of political objectives. In other words, deliberately sowing division can lead to electoral rewards or the consolidation of power.

The most graphic and egregious example is the tragedy affecting

the Rohingya in Myanmar that is increasingly being described as “ethnic cleansing”. But all across the region political actors can be seen to be making appeals to narrowly-defined constituencies to strengthen their position, stultifying democratic progress.

Despite this, it must be recognised that many advances in the ASEAN agenda have been made by these leaders or their predecessors. Commemorations of the 50th anniversary of ASEAN have pointed out of course that the bloc’s *raison d’être* has changed over the five decades, but even to maintain peace between countries of such diverse cultural and religious populations and forms of government is a feat in itself, when some other regions of the world have fared far worse.

Explicit ASEAN agendas that comprise dialogues and conventions towards freer trade, greater connectivity and cooperation on problems such as human trafficking or transboundary pollution have indeed helped to raise living standards for potentially millions of people across the ten countries. These in turn encourage the private sector and civil society to push for more,

and indeed it is often noted that the greatest contributions to intra-ASEAN interaction and connectivity have been enabled by businesses.

These are important drivers in a world where economic nationalism coupled with political authoritarianism are (once again) becoming a new normal, championed as they are by the world’s traditional and emerging superpowers. Yet, a key question will be how successful non-political agents can be in such an environment.

The answer will come from within the cohort of young middle class ASEAN citizens who have fully embraced the digital age. It is they who will be assessing how well the promises of ASEAN - apart from their own national institutions - are serving them. If participation with the regional agenda remains too aloof and remote, they may conclude that ASEAN is irrelevant to them.

It has long been a staple of conferences on ASEAN to cite the lessons we are able to learn from the European Union: don’t transfer too much (any?) sovereignty, be careful about establishing a common parliament or adopting an

overarching legal system, and don’t create a common currency without an understanding of the economic consequences. As I write, another lesson will no doubt be drawn from the EU’s response (or lack thereof) to demands for independence (and the legal status of referenda on that question) in Catalonia.

Advancing ASEAN in the digital age will no doubt require its chief proponents to understand these lessons, but before that, an important prerequisite is working towards a common understanding of the ASEAN Charter and the pillars of the ASEAN Community at the very least - if not the introduction of ASEAN-related history and geography components in schools across the region. That is a crucial link in the necessary step of transferring participation in, and ownership of, ASEAN from the political and diplomatic elites to a wider base of citizens.

Without these ingredients, ASEAN’s peoples may turn towards greater polarisation and division, with the advent of the digital age serving destructive, rather than cooperative, interests.

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GETTING E-FIT: FROM WORKFORCE TO THINKFORCE

Donald Kanak, Chairman, EU-ASEAN Business Council



ASEAN only received 1.5 percent of the global total [new venture funding], less than the amount received by Israel, which has just 1 percent of ASEAN's population and just one-eighth of ASEAN's GDP.

ASEAN has much to celebrate on its 50th birthday – it is the fifth largest economy worldwide¹; and it has raised its citizens' standards of living steadily in a largely peaceful environment. ASEAN's success has been built on strong fundamentals. With the world's third largest work force, and globally competitive wages, ASEAN has benefited greatly from the diffusion of technology and the migration of work to the most efficient locations. However, fundamental changes in the paradigm of global competitiveness are afoot. The advantage of low labor costs is being eroded by technological advances such as natural language processing, machine learning, big data analytics, and connectivity between humans and machines. In order to make the next 50 years just as celebration-worthy, ASEAN will need to rely on more diverse pillars of growth capitalising on technology.

In fact, the future is here already. There are Chinese clothing manufacturers opening factories manned by robots (and some human supervisors) in Arkansas, USA – much closer to US markets than competitors in ASEAN.

Automation is not limited to manufacturing – Amazon and Alibaba have launched cashier-free stores. About four of every five Wall Street firms have already implemented, or plan to use, some form of AI², and some law firms are automating client name checking and document drafting.

Looking ahead, the changes in the nature of work require ASEAN to transform its workforce into the world's third largest "think force". To do this, ASEAN needs to get "E-FIT", improving its education, finance, infrastructure and technology.

Education

The transformation from workforce to thinkforce starts with education.

ASEAN needs to continue to improve its compulsory education (i.e., up to 15 years old). In OECD's PISA, Singapore was #1 across science, reading and mathematics, and encouragingly, Vietnam was #8 in science, and average on reading and mathematics. Thailand and Indonesia were below the OECD average in all 3 areas, and other ASEAN

¹ "GDP (current US\$)", World Bank (as of 12 Oct 2017). ASEAN #5 after US, EU, China and Japan

² Greenwich Associates

countries were not covered.

The future challenges extend to higher education. In terms of researchers per million of population³, Singapore ranks #6 worldwide, Malaysia #37, while Indonesia, the Philippines, Thailand and Vietnam rank below #50. Ranking in research foretells levels of innovation. For example, Singapore leads ASEAN ranking at #13 in patent applications per million of population⁴, Malaysia next at #36, while Indonesia, the Philippines, Thailand and Vietnam rank below #70.

Even if students do not work in laboratories upon graduation, education in science and mathematics is important as they build skills that allow humans to interface with and improve the functions of machines. These skills include problem solving, critical thinking, interpretation and openness towards new ideas, and the willingness to challenge old ideas. Education that strengthens communication and develops relationship skills will also be needed.

Improving on all those fronts will require greater investments in education - private and public, for-profit and charitable - and in every stage of a child's life, from early childhood development, through to compulsory education and higher education. It also requires opening up the

playing field for different parties to participate and new modes of individualized learning taking advantage of mobile technology.

Finance

The financial industry is not only one of the largest employers of skilled workers; its development also attracts capital and funds long-term investments.

While ASEAN's savings rates are generally high, most savings are in cash, bank deposits or property. Capital markets (stocks, bonds and money markets) are critical to channel the savings into long-term productive investments. These include physical infrastructure (such as transport and communications), social infrastructure (such as schools and hospitals), and funds to grow business and industry, including new ventures.

ASEAN's capital markets are less mature relative to developed economies. The ratio of floated book value of equity and bonds outstanding to GDP - a measure of capital markets maturity - was only 34 percent in Indonesia, 36 percent in Vietnam and 65 percent in the Philippines in 2016. The same ratio was 262 percent in the US and UK, 282 percent in Japan and 191 percent in South Korea⁵.

Long-term planning from the government and concerted,

multi-year effort from both private and public stakeholders are required to speed-up capital markets development, from establishing benchmark assets, promoting a deep and broad investor base, encouraging issuance, to setting transparent rules and friendly taxation policies. This will allow ASEAN to attract capital, support development and enable all aspects of the economy to flourish.

Interconnectivity for Competitiveness

Strengthening intra-region infrastructure and interconnectivity will lower production costs, create a larger market, and encourage inward investments in supply chains. Closing the infrastructure gap through public and private efforts will be critical in information connectivity. This includes not only ports, rail, roads and power but also telecommunications and data. In 2016, only 40 percent of ASEAN's population had internet access⁶.

Strengthening interconnectivity in ASEAN is not just about infrastructure. It also requires increasing commitment to remove trade barriers and frictions. Doing so is estimated to increase GDP by 9.3 percent⁷. This will boost ASEAN's share of global trade - critical as both total merchandise export

³ Global Innovation Index 2017

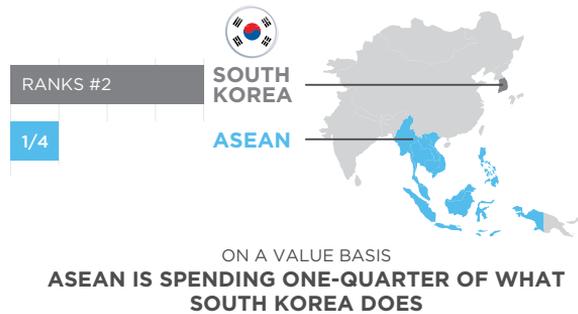
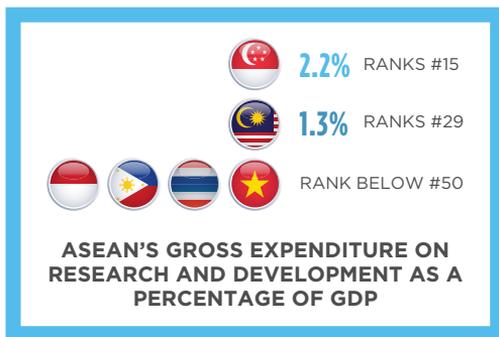
⁴ The World Economic Forum Global Competitiveness Index 2016

⁵ Floated book value from Bloomberg; Bonds outstanding from Asia Bonds Monitor

⁶ ITU 2016 statistics "Percentage of Individuals using the Internet"

⁷ "Enabling Trade Valuing Growth Opportunities", World Economic Forum, 2013

ASEAN'S R&D SPENDING IS LAGGING BEHIND WORLD LEADERS



and inflow of foreign direct investment peaked in 2014⁸. Although work is underway to address issues such as non-tariff barriers, customs procedures and trade facilitation, standards harmonization and intellectual property rights protection, speedier integration across the region are needed to stay competitive.

Technology

Innovation and the digital economy are driven by research and technological breakthroughs. However, ASEAN's gross expenditure on research and development (R&D) as a percentage of GDP is low⁹. While Singapore ranks #15 with 2.2 percent and Malaysia #29 with 1.3 percent, Indonesia, the Philippines, Thailand and Vietnam rank below #50. On a value basis, these six ASEAN countries are spending just one-quarter of what South Korea (ranked #2)

does and roughly the same as Israel (ranked #1).

Another measure to consider is new venture funding (including angel, venture capital and corporate venture capital funding). While venture funding for Asia increased dramatically from US\$9.5B or 6 percent of the global total in 2012 to US\$98B or 28 percent in 2016¹⁰, this was dominated by China. ASEAN only received 1.5 percent of the global total, less than the amount received by Israel, which has just 1 percent of ASEAN's population and just one-eighth of ASEAN's GDP. Today, Israel has the third most companies listed on the tech-focused NASDAQ stock exchange after the US and China¹¹.

Both increasing the level of R&D investments and coordinating and concentrating the spending is key to innovation of new technology. This means ASEAN

should work on policies to encourage investment, whether domestically or by foreign companies, and also develop an overarching strategy to create the interrelationships among global technology companies, local education and research institutions, and government resources and incentives.

Conclusion

ASEAN has made exceptional progress in its first 50 years, but it must become an innovation center and equip its people to compete effectively in the digital economy. With continued focus on becoming E-FIT - improving education, developing financial markets to mobilise long-term capital, building inter-connectivity and investing in technology and research -- ASEAN can fulfill its potential and become a leading source of global growth in the next decade.

Don Kanak is the Chairman of the EU-ASEAN Business Council, the primary voice for European businesses in ASEAN.

⁸ ASEANStats as of 30 June 2017

⁹ Global Innovation Index 2017

¹⁰ CB Insights. Only has data for 8 ASEAN countries: Cambodia, Indonesia, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam

¹¹ "Israel is a tech titan. These 5 charts explain its startup success", The World Economic Forum. 19 May 2017

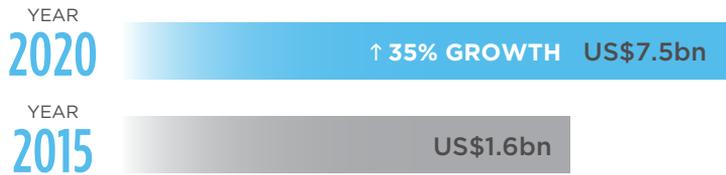
WHY ASEAN NEEDS POLICY GUIDELINES TO POWER AND PROTECT ITS EMERGING DIGITAL INDUSTRIAL ECONOMIES

Wouter Van Wersch, President & CEO, GE ASEAN & ANZ



As the digital industrial playing field is vast, wide, and borderless, drawing in players from all parts of the economy, developing fundamental 'rules of the game' to support sector development is a pressing need across ASEAN.

IoT SPENDING ACROSS ASEAN



ASEAN's industrial roots are deep, diverse, and developing constantly to embrace new opportunities and technologies.

As reported in the "Fifty Years On, Southeast Asia Emerges as Global Growth Leader" story published by Bloomberg, factors such as growing domestic demand, infrastructure improvements, and lower labor costs have helped ASEAN emerge as strong manufacturing alternative to neighboring China.

In addition, according to findings from the 2016 Deloitte Global Manufacturing Competitiveness Index (DGMCI), Malaysia, Indonesia, Viet Nam, and Thailand are anticipated to be among the 15-most competitive manufacturing nations in the world by 2020.¹

Like Singapore (number 10 in the DGMCI rankings), Malaysia, Indonesia, Thailand, and Viet Nam have invested in programs designed to enhance their Industrial Internet of Things (IIoT), or Industry 4.0 readiness. Malaysia is following a National IoT Strategic Roadmap while Thailand, Indonesia, and Viet Nam, have similar campaigns in play. Across ASEAN in fact, IoT spending is expected to grow in value by 35 percent from an estimated US\$1.6bn in 2015 to reach US\$7.5bn by 2020².

50 billion connected devices by 2020

These plans underline the importance that governments across ASEAN have placed in maximizing the potential of IIoT to transform their economies.

¹ <https://www.nst.com.my/news/2016/05/144515/mighty-five-nations-be-asian-powerhouses>

² <https://www.dealstreetasia.com/stories/iot-developments-in-asean-highlight-economic-potential-in-the-region-64946/>

Cisco IBSG predicts that 50 billion devices will be connected to the Internet by 2020³, while market research company, MarketsandMarkets estimates the IIoT will be worth US\$195 billion by 2022⁴.

For GE, the Industrial Internet refers to the integration of physical machines with networked sensors and software. Industrial Internet technologies gather data from machines and analyzes it, and the combination of technology, the curation of vast quantities of data, and predictive analytics can have a profound impact on not only industrial processes, but also health, energy efficiency and the lifespan of industrial assets, as well as the safety of industrial workers.

While the Industrial Internet is relatively young, it is progressing quickly driven by strong private-public sector innovation aimed at promoting interoperability for industrial customers. GE began its Industrial Internet push as an internal project in 2011 to understand how to use data from GE machines to gain more efficiency from our assets. GE then saw the opportunity to do the same thing for its customers, creating GE Digital in 2015 as the business unit to take this forward. This business delivers applications in Asset Performance Management (APM) and Field Service Management (ServiceMax) to drive value for

customers, powered by Predix - GE's platform for the Industrial Internet.

We work with industrial customers around the world to advance their Industrial IoT ambitions. Through these collaborations with customers - whose industrial assets cross many borders - we have identified a need for regulation/policies to expedite the development of this space.

Policy guidelines

Industrial Internet regulation today is in a premature state. As the sector develops however, policymakers will better understand the space and appropriate regulations. We believe a multi-pronged approach is the best way to harness its full potential and key policy areas include

Data Sovereignty -

Large aggregated data sets yield the greatest insights, to the benefit of Industrial Internet users and society. Given this, governments should not adopt laws or policies (without sound public policy justification) that require data to be located in a particular jurisdiction, or restrict transfer of data across borders. Laws that restrict aggregating data across borders deny the countries that enact such laws the full benefit of the Industrial Internet.

Privacy -

Governments should not adopt privacy regulation designed for the consumer internet and apply those same policies for the Industrial Internet. Data generated by industrial equipment (unless healthcare related) rarely includes anything that could be construed as personal data. Most of the data collected from locomotives, turbines, airplane engines, and oil wells concern the function of the machine itself.

Freedom of Contract -

Industrial Internet services are B2B, or B2G, with legally sophisticated parties on both sides. Given this, contracts are proving to be an effective means to address a range of issues with potential public policy ramifications such as liability, data rights, customer entitlement to software updates, and intellectual property. Contracts also offer more flexibility than legislation as Industrial Internet innovation continues. Government policy should respect the enforceability of contracts and promote freedom of contract.

Data Access and Use -

Rights to industrial Internet data are best handled through contractual arrangements, and not by government imposed rights. Many Industrial Internet companies determine issues of data ownership through

³ https://www.cisco.com/c/dam/en_us/about/ac79/docs/innov/IoT_IBSG_0411FINAL.pdf

⁴ <http://www.marketsandmarkets.com/PressReleases/industrial-internet-of-things.asp>

contracts with customers, suppliers, researchers, and other parties – the contracts are negotiated by organizations with a deep understanding of the context in which the data will be developed, shared, and used. The sheer variety of scenarios involving technical data in B2B and B2G dealings are best handled by bespoke contractual arrangements not one-size-fits-all ownership rights, or access rules imposed by governments.

Cybersecurity –

Cybersecurity regulation should be technology neutral with respect to where data is processed and stored, and not discriminate against the Cloud. As in other areas of IT, the nature of cybersecurity threats targeting the Industrial internet is constantly changing, and the response from vendors must similarly evolve.

We believe voluntary, private-sector led, performance and risk based cybersecurity standards, such as the U.S. National Institute of Science Technology (NIST) framework is the most effective approach to promoting cybersecurity. While cybersecurity is a shared responsibility, government has a unique role to play in protecting private-sector critical infrastructure from nation-state attacks and cyberterrorism.

Standards –

Given we are in the early adoption phase for the Industrial Internet, its global nature, and pace of innovation, open

and private-sector led groups are the most effective means to maximize innovation and interoperability. Governments that adopt country-specific Industrial Internet standards risk fragmenting the Industrial Internet, and cutting their countries off from the benefits of insights based on global data sets.

Intellectual Property –

Governments should not discriminate, based on field of technology, about the issuance of patents. Given the prominent role that software is playing in the functioning of the Industrial Internet, it is vital that software innovation is protected under robust patent and IP laws. In software, like other technology fields, robust IP protections incentive R&D investments that drive progress.

Workforce Development –

The Industrial Internet represents a significant opportunity for faster productivity growth, but with accompanying potential disruption to job markets. Governments should adopt a comprehensive approach to leverage digital industrial innovations for faster job creation with measures to support digital training and retraining programs, labor market reforms, redesigned social safety nets, and measures to promote digital innovation, and facilitate the adoption of skills-augmenting technologies.

Direct Government

Engagement –

Governments have clear interests around promoting the Industrial Internet and digitization of businesses. They should consider using tools such as research funding, international cooperation agreements, and infrastructure spending to promote new technologies. In addition, government policies should encompass not only manufacturing, but a broad range of business sectors and applications – investments in digital infrastructure should be considered as important and beneficial as physical infrastructure projects.

As the digital industrial playing field is vast, wide, and borderless, drawing in players from all parts of the economy, developing fundamental ‘rules of the game’ to support sector development is a pressing need across ASEAN.

While Singapore, Malaysia, Thailand, Indonesia, Viet Nam, and other nations, deserve plaudits for their Industrial IoT foresight, it is imperative they ensure sector policymaking receives as much attention, priority, and action, as high-profile initiatives such as infrastructure development, technology implementation, education, and smart city plans.

A “working in tandem” plan is highly recommended, and given the pace of change, it may be the difference between a well-paced, step-by-step digital

industrial transformation, or being caught in a perpetual cycle of playing 'catch up.'

Wouter's career in management, sales, and marketing, began with Vivendi Universal, and includes senior positions with Airbus, and Alcatel in China and Indonesia. He joined Alstom in 2006 as VP Sales Europe and promoted to SVP Asia Pacific in 2011. He was appointed Growth Leader in the GE-Alstom integration in 2014 before taking his current role in 2015.

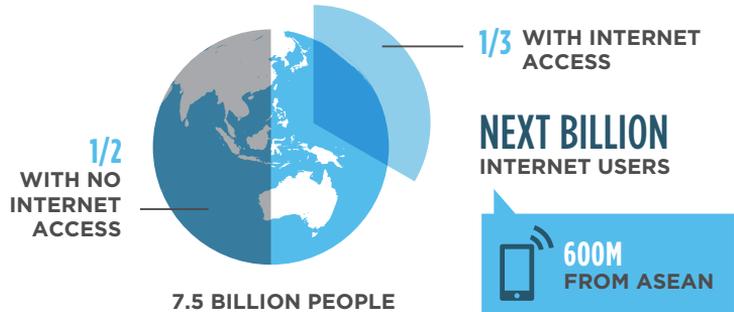
BUILDING FOR BILLIONS: CORE LESSONS FROM GOOGLE

Sajith Sivanandan, Managing Director, Google Malaysia, Viet Nam, Philippines and New Emerging Markets



The people coming online through smartphones are using the Internet in radically new ways, and there is a massive potential for creativity and innovation in trying to help them solve their problems.

ASEAN'S FUTURE INTERNET USERS



Would it surprise you to know that out of the 7.5 billion people in the world, more than half still do not have access to Internet - something one-third of the world takes for granted. Out of the next billion users of the Internet that are coming from this group of as-yet unconnected citizens of the world, 600 million are from the ASEAN region, and virtually all of them will become familiar with the Internet only via a smartphone. A device that didn't exist just a decade ago!

At Google, we've been mindful of these 'mobile first' user behaviors for a while now as a company - the majority of whom reside in the Asia Pacific region. They, and the incoming billions of new users across Southeast Asia, South Asia, Latin America and Africa are part of a trend that is about to redefine the Internet: "building

for billions."

Building for billions means designing new technology for everyone from the very start of the design process. The people coming online through smartphones are using the Internet in radically new ways, and there is a massive potential for creativity and innovation in trying to help them solve their problems with the technology they have in their hands. The future of the Internet will be written by these people and more than ever, tech companies like Google that grew up during the Personal Computing boom need to focus on reshaping our apps, services, and platforms to work for the majority of the mobile first planet.

A decade ago the One Laptop Per Child initiative planned to build a US\$100 laptop for every

child on the planet. In recent years, smartphones look to be partially fulfilling that goal of making technology more accessible. Google's Android mobile operating system alone powers two billion active devices. Smartphones, which now come cheaper than US\$100, have more power than a laptop from ten years ago and millions of apps available for download.

We should not become complacent, however, that the spread of smartphones completely bridges the digital divide. The push for more affordable smartphones is far from over. There is a lot of potential to create cheaper phones that don't sacrifice much quality. But when thinking about building for the billions who will use those phones, we need a second revolution to solve the next three major gaps: reliability of connection, data costs and relevant content.

At Google, we have a team called Next Billion Users who travel the world to hear about people's Internet pain points and think up new solutions. Their experiences led them to build programs like Google Station, a model for improved connectivity that is already bringing millions of people high-quality Internet access at more than 100 Indian Railways stations. We have meanwhile adapted our Search, Chrome, YouTube, and Maps apps to work for users with unreliable or intermittent connectivity, through reducing

data consumption or allowing content to be taken offline for later use. We invest into making more languages work on smartphones through open-source fonts, flexible keyboards, handwriting and voice inputs, so that people don't have to learn English — or learn to type — just to use the Internet. And we are piloting new apps that serve new Internet users' specific needs, including YouTube Go, an offline-first video app that works during low or no connectivity.

But the work of one company isn't enough. The biggest change we can make is by empowering other developers and companies to solve these issues. There are three core lessons that Google's learned over the last few years building for billions, and in sharing them we hope other app developers and startup entrepreneurs can more quickly reach the newest billion Internet users:

Reduce data required to use your apps. A third of global smartphones have less than 1 GB of storage, so apps need to be small. India's Ola Cabs fixed the problem of heavy native apps by creating a Progressive Web App (PWA) — a lightweight mobile website that feels like an app. Their PWA is only 0.5MB and takes up just 50KB of data on its first payload and then 10 KB on subsequent loads. This greatly opens up the number of people in India who can call up an Ola cab.

Optimize for speed. For users on 2G, it can take 25 seconds to load a webpage and use 1MB of (very expensive) data. So in 2015 we started optimizing webpages for users on slow connections in Indonesia, India, and Brazil which load four times faster and use 80 percent fewer bytes. This did not just improve users' experiences but publishers are getting 50 percent more traffic from these lighter web pages.

Speak multiple languages. In India, we found that people would switch between Hindi and English to figure out which language provided the best information. In response, we set up what we call "tabbed search," which lets you quickly flip between the search results in each language. Given this option, users are searching 50 percent more.

While these concepts might seem simple, they've proven remarkably powerful as core design principles. And if you want to know more, we have more tips for designing for the new reality of the world's Internet at developers.google.com/billions.

Today, there are 2.8 billion smartphone users globally, and there will be hundreds of millions more by the end of the year. The Internet is becoming truly global, and we believe that this will give developers from Southeast Asia, Africa and Latin America an unprecedented new canvas for their talent

and entrepreneurialism. And as people come online for the first time, we must train more developers in those countries, since they are the closest to local users' needs and can build apps that work best for them. And this is great for the globe. Building within the kinds of constraints the next billion users face gives developers a head start in the new rush to the wider trend of building for billions. Catering to the Internet's next billion users is not just about expanding familiar tech to new places, but developing completely new things for the future.

Sajith Sivanandan is the Managing Director of Google Malaysia, Viet Nam, Philippines and New Emerging Markets where he oversees sales and business development operations as well as developing strategic plans in these countries. He was previously Head of Travel for Google Southeast Asia.

ASEAN PRIMED FOR A DIGITAL FUTURE

Kevin Martin, Regional Head of Retail Banking and Wealth Management for Asia Pacific, HSBC



ASEAN is on the cusp of an all-encompassing digital transformation, with technology promising to offer a new way of life and better experiences for consumers in this dynamic region.

Half a century into the ASEAN story, the growing importance of digital innovation will shape the next wave of economic development.

As the Association of Southeast Asian Nations (ASEAN) turns 50 this year, the economic strides that have made the regional bloc the world's seventh-largest economy will set it up for sustained growth, increased prosperity and exciting prospects for the next half century.

Technology, and how it will continue to change the way people live, work, shop, dine, travel and save, is perhaps one of the most fascinating advances in recent times, and one that presents vast opportunities ahead.

China gives us a glimpse of the transformative power of online and mobile innovation in a young, increasingly affluent, and tech-savvy population. From a standing start in 2003, the country has become the largest e-commerce market in the world. Likewise, Tencent's Wechat app, which launched as recently as 2011 and can now do

everything from messaging to payments, now has 963 million regular users¹.

True, neighbouring ASEAN, with its 10 member countries, is not China. The region spans a huge array of cultures, languages, and political systems. Levels of affluence, economic and infrastructure development, and internet and mobile penetration vary widely.

Still, the region holds some of the same potential that can already be witnessed in China.

Take a look at the sheer numbers. At 630 million or so, ASEAN's population is less than that of Wechat's user base. But 15 years from now, the region will have added another 120 million inhabitants² - the equivalent of one-and-a-half Germany's³.

ASEAN's population is also one of the world's youngest. For example, half of the population of the Philippines, and over 40 percent of Indonesians are under 25 years old⁴.

Meanwhile, disposable incomes are gradually rising in much of the region. ASEAN as a whole,

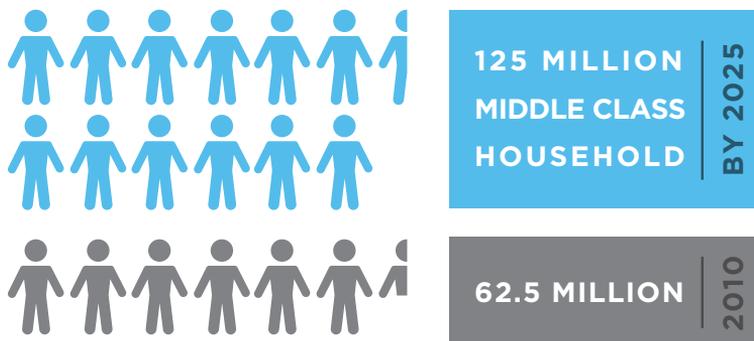
¹ Tencent q2 earnings: Tencent Announces 2017 Second Quarter and Interim Results

² HSBC Global Research: ASEAN Economic Community, 19 November 2015; World Bank: Population

³ World Bank: Population

⁴ Index Mundi

NUMBER OF MIDDLE CLASS HOUSEHOLDS IN ASEAN



Source: McKinsey: Understanding ASEAN, Seven Things You Need to Know

will have some 125 million middle class households by 2025 – roughly double the number in 2010⁵.

All this means is that for businesses, bankers and investors, ASEAN offers a large, dynamic and eager consumer base – and one they can tap and service increasingly easily via digital tools and mobile handsets.

Take internet penetration. Last year, only about 260 million ASEAN inhabitants were internet users – but that number is expected to soar to 480 million by 2020⁶.

Similarly, in much of the region, cash-on-delivery, rather than digital payments, still dominates when it comes to paying for online purchases: an estimated

three-quarters of transactions are still paid by cash⁷. And while Asia-Pacific, as a whole, accounted for 40 percent of global e-commerce sales in the first quarter of 2017, the vast majority of those sales went to China, Japan, Korea, Australia, and India rather than Southeast Asia⁸. But that leaves plenty of room for growth, and positions the region as the next frontier for e-commerce and digital payments.

Meanwhile, it is easy to see that ASEAN's young consumers, just like their “millennial” counterparts in China, the U.S. or Europe, are highly likely to want to incorporate online and mobile innovation into multiple aspects of their lives.

As internet and mobile penetration pick up, they too

will come to take for granted a world in which they can chat with friends online 24/7, and shop and access banking services (from remittances and payments, to foreign exchange and stocks, credit cards and personal loans) via their phones easily and securely around the clock.

It's already clear that people in the region are receptive to digital tools. A recent HSBC survey found that four in five home buyers in Malaysia, for example, used online channels to research their recent property purchase, and over three-quarters went online for financing options⁹.

Amid all this change and potential, it is no wonder that ASEAN has begun to spawn a number of fintech companies. In Indonesia, for example, the

⁵ McKinsey: Understanding ASEAN, Seven Things You Need to Know

⁶ Google and Temasek Presentation; Bloomberg “Google. Temasek See S.E. Asia Web Economy Reaching US\$200 Billion

⁷ eCommercelQ: Why Everyone is Wrong About Southeast Asia's True Ecommerce Potential World Bank: Population

⁸ Business Insider: Southeast Asia Set for Explosive E-commerce Growth

⁹ HSBC Beyond the Bricks – The future of home buying report

highly popular Go-Jek platform has started to add digital payment functionality to its core transportation services. In Thailand, there is Omise – a payments platform that has already raised US\$50 million in funding¹⁰.

Traditional banks are starting to invest significantly in their digital capabilities to offer a simpler, better, faster and more secure banking and payments experience. This includes working more and more with nimble fintech start-ups to ensure that their services meet the demands of a young, tech-savvy consumer base.

Meanwhile, some ASEAN governments are working to enable innovation. Singapore, for example, is leveraging its status as an established financial centre to take a leading role in fintech development, with support from the Monetary Authority of Singapore¹¹.

ASEAN is on the cusp of an all-encompassing digital transformation, with technology promising to offer a new way of life and better experiences for consumers in this dynamic region.

The opportunities are numerous and ripe for the taking; the challenge is to be quick, bold and flexible to change.

Kevin Martin is Group General Manager and Regional Head of Retail Banking and Wealth Management, Asia-Pacific at HSBC. Based in Hong Kong, he is responsible for delivering the global RBWM strategy in Asia to continue to grow a sustainable business across the region.

¹⁰ Omise: About

¹¹ Monetary Authority of Singapore: Singapore's FinTech Journey - Where We Are, What is Next

ASEAN'S DIGITAL ECONOMY: AN ATTRACTIVE INVESTMENT

Henry Nguyen, Managing General Partner, IDG Ventures Vietnam



In the last few years, quite a few VC firms have added eCommerce as a strategic pillar of investment... However, a key shortfall in the ASEAN ecosystem at this time are exit considerations for ventures... the region will need to show that it can provide more potential exits in a way that brings meaningful returns to entrepreneurs and investors.

ASEAN is viewed to be amongst the most exciting places to invest over the next decade. The region is on track to reach a historic number of venture capital deals in 2017, with 244 deals accounting for nearly US\$5 billion in total funding through 31st July. The wave of Venture Capital (VC) firms has already begun coming into the region for a few years, giving a lot of encouragement for the local ecosystem. This essay will look at how this wave is evolving across the countries in ASEAN and how much VC firms can bring to the table other than the capital.

Much of the ASEAN's growth is rooted in macroeconomic trends that are seeing the expansion of the digital economies and middle classes. Deep-diving into the opportunity, the report commissioned jointly by Google and Singapore's sovereign wealth fund, Temasek identified three main drivers for this optimism in the ASEAN region that will drive this explosive growth: a fast-growing young population of 70 percent being under 40, a growing middle class of consumers that will contribute significantly to GDP growth, and the lack of major retail establishments as compared to the rest of the world. Investments in ASEAN are growing in both

frequency and size, particularly with regards to growth-stage financing. According to a CB Insights report, Southeast Asia has already seen more venture capital than any prior year with nearly US\$5 billion in total funding. Relative to investment destinations like Malaysia and Indonesia, Singapore appears to be a crucial connector to other Asia Pacific and international markets. In case of the most successful regional companies, they have been actively cooperating in Singapore to obtain final-stage financing and most global VC firms expand into Singapore when they decide to invest in the region. Since 2012, Singapore has seen over 700 disclosed deals with an aggregate value of US\$7.3 billion, the most of any country in the region, followed by Indonesia, Malaysia, and Vietnam.

There is an active interest in the region from technology investors as there has been an increased focus on B2B, robotics, and automation. Meanwhile, fintech-focused start-ups are expected to continue to garner significant investment in Asia. Apart from technology, the Google-Temasek also report showed that ASEAN's internet economy was expected to be valued at more than US\$200 billion

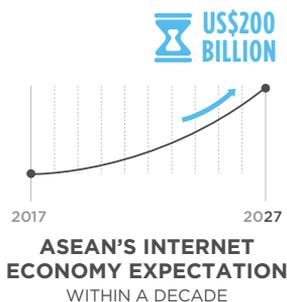
within a decade. With around 260 million users in the region, ASEAN has become the 4th largest eCommerce market in the world. However, this market still remains underdeveloped, accounting for less than 1 percent of total retail sales, compared to rates of an average of 7 percent in Europe, China, and the United States. As early as 2025 the size of the eCommerce market is foreseen to grow into a US\$88 billion market, led by Malaysia, Thailand, and Singapore. While online shopping experiences remained constrained five years ago, in 2016 some internet retailers reported that mobile already surpassed 50 percent of online sales across Southeast Asia. For example, the online sales of The Gioi Di Dong (MWG), Vietnam's leading enterprise in the digital device distribution sector, grew 94 percent in 2016, far outpacing its competitors in Vietnam. Additionally, MWG is also one of a few Vietnamese businesses that have US\$1 billion or more in capitalisation value.

In the last few years, quite a few VC firms have added eCommerce as a strategic pillar of investment. To illustrate, VC firms are prone to companies in the branded consumer space that showcase a strong desire to achieve profitability and have strong balance sheets. However, a key shortfall in the ASEAN ecosystem at this time are exit considerations for ventures. Within the next two to three years, the region will need to show that it can provide more potential exits in a way that brings meaningful returns to entrepreneurs and investors.

According to Temasek's report, there are currently around 7,000 start-ups in Southeast Asia, with 80 percent of them based in Singapore, Indonesia, and Vietnam. In 2016 leading VC firms such as Alibaba, Tencent Holdings, SoftBank, 500 Startups, and Golden Gate Ventures invested US\$1.1 billion in Southeast Asia's start-ups, spreading over 355 deals. With 88 percent of the cash going

into Singapore and Indonesia and 65 percent of the sum going into five giant start-ups – Grab, PropertyGuru, Trikonsel, Qoo10, and iCarsClub. In Southeast Asia's ride-hailing market, Grab has successfully raised US\$2 billion from SoftBank and Didi Chuxing in July 2017. This investment is expected to create a more powerful rival to Uber, which has already struggled to build a base in the region. Similarly, Go-Jek, a bike and car on-demand platform in Indonesia that is seen widely as the market leader in the country, is competing with Grab by securing a new round of US\$1.2 billion led by Tencent Holdings in May 2017. Understanding that the business environment in ASEAN is highly fragmented, Grab has established a clear leadership in the region based on its market position, superior technology, and truly local insight. In the digital economy, the transformation requires businesses like Grab and Go-Jek to fully understand multiple cultures and languages, localise their products, connect with local business contacts, and recruit a talented local team.

THE POTENTIAL OF ASEAN'S E-ECONOMY



Funds like 500 Startups has been targeting the Vietnam-connected start-ups since 2016. As a part of the ASEAN community, Vietnam is a rapidly growing country with talented entrepreneurs and engineers. It is one of the world's fastest growing economies since 1990 and has been Apple's fastest growing market in the world. This is further strengthened by

other developments, like the agreement on the Trans-Pacific Partnership (now in abeyance), inexpensive labor costs, and growing consumer spending. Notably, IDG Ventures, a USA early-stage Venture Capital firm, has been active in Vietnam since 2004. With US\$100 million under management, the firm has invested in a diverse portfolio of 40 start-ups in areas like technology, media, and consumer services and products. One of the first investments of IDG Ventures Vietnam was VNG,

raising a series A investment in 2005. From there, this company has built a platform stretching from music downloads to mobile games to its flagship chat app, Zalo which was valued at US\$1 billion and secured US\$100 million in revenue in 2016. Hence, VNG is an example of how the company specifically targets Vietnamese consumers and is touching on a large enough market to make it worthwhile for investors like IDG Ventures.

Overall, it is probably due

to the sheer complexity and heterogeneity of Southeast Asia that Western companies would look to establish their foothold here. Start-ups in the region have offered VC firms their fundamental and strategic values in the markets they operate in so it is widely believed that by investing in talent and in business, both entrepreneurs and investors can yield successful cases in the ASEAN region.

Henry Nguyen serves as the Managing General Partner of IDG Ventures Vietnam, a private equity firm focused on technology, media, and telecom investments in Vietnam. He is the Master Franchisee for McDonald's restaurants and the Chairman for Forbes Magazine in Vietnam. He is also the President of the Vietnam Basketball Federation (VBF) as well as the Vice Chairman and Owner of the Los Angeles Football Club (LAFC), the newest club in Major League Soccer (MLS).

LOGISTICS AND THE DIGITAL AGE IN ASEAN

James Evans, Director of Legal and External Affairs, Asia, Linfox International Group



Many of the world's top technology companies are looking at improving energy efficiency. Whether this is through fuel technology or electrical battery power, these advances will also bring efficiencies for the logistics sector.

We are now moving into the fourth industrial revolution of significant relevance to the logistics industry - the first being steam and water power; the second being electricity; and the third being automation and IT. This time it is internet of things, ecommerce, big data, 3D printing, artificial intelligence such as autonomous vehicles and energy storage such as electric vehicles.

eCommerce

ASEAN is one of the largest and fastest growing eCommerce markets in the world, with Vietnamese programmers at the forefront of development, Indonesia offering creative and complex distribution options to the end consumer and Thailand, Malaysia and Singapore having well established eCommerce infrastructure already.

The supply chain industry has been using eCommerce tools such as electronic data to communicate with its customers for over 20 years. Supply chain partners use the data to exchange order information between their distribution centres and sales and customer service teams to ensure deliveries occur on time and accurately. The explosion of eCommerce in

Asia uses the same concept to communicate directly to offer a more customised and targeted channel of supply.

To remain competitive, logistics companies must respond to customer needs: eCommerce is increasingly becoming a tool for large retailers to connect with their individual outlets to provide services such as automated inventory management and reordering services using point-of-sale data. This is particularly relevant in the supermarket industry, where, across ASEAN, competition is already at advanced stages between major retailers for online purchase and delivery services.

In ASEAN countries, traffic congestion will continue to be a barrier to the efficient delivery of goods. The industry must not be held back by this and the adage "you are not stuck in traffic, you are traffic" illustrates that until public transport infrastructure improves and attitudes towards private car use changes, we must get around the problem. Put simplistically, the issue of efficient road transport and infrastructure is a similar innovation tale - design around the problem and improve.

The low traffic speeds in

Bangkok and Jakarta for example, are directly influencing the rise of eCommerce with residents finding it increasingly difficult to access shopping malls and supermarkets. The consumer stands to benefit from efficient software, planned delivery schedules and motorbike transport.

These new networks need intelligent systems to provide accessibility and visibility of transactions for distributors and consumers. Until recently, the high cost of driver devices was a considerable barrier to completing the visibility loop in the supply chain. But increasing wage rates and low cost smart phones is now solving this problem.

As a result, new apps are appearing in the market, replacing the old and expensive enterprise track and trace solutions with agile and intelligent proof of delivery (ePOD) solutions. These apps allow customers to see where their goods are in real time, and allow sellers and retailers to receive instant confirmation of orders reaching their destination.

This development significantly speeds up the order to cash cycle for many businesses from the manufacturer through to the delivery driver. It also maximises the flexibility of delivery options by using GPS apps to adjust deliveries en route based on traffic conditions or changes to customers' requirements.

Supply chain providers like Linfox are now successfully filling this gap with a fulfilment solution that plugs into our customers' online presence, providing a fully integrated service and direct access to the end-customer. It offers comprehensive services for customers' B2B and e-commerce offerings - ranging from basic 'pick and pack' and dispatch services to reverse logistics, repairs and track and trace.

Logistics is a key part of the process and Linfox is working closely with our customers to provide solutions such as greater network visibility, shorter delivery timeframes, and innovations in warehouse operations to meet higher volume small order requirements.

Looking ahead

The fourth industrial revolution - the internet of things, eCommerce, big data, 3D printing, artificial intelligence such as autonomous vehicles and energy storage such as electric vehicles - is well on its way.

As the use and understanding of big data and analytics deepens through the expansion of the Internet of Things, the range of options for end consumers will be boundless. 3D printing will provide flexibility on the supply side and hence allow the consumer to tailor elements of the product to meet specific requirements. It will affect certain industries quicker than

others, particularly those that require bespoke parts that may not be mass-market products. However, if the consumer demands it, the level to which it may disrupt the logistics market may increase.

Autonomous vehicles appear to be a fair way off the market, but its impact on road transport delivery will be huge. Long distance driving will no longer be impacted by fatigue laws, programmers will argue that autonomous systems are more efficient than human drivers and eventually, cheaper. In the warehouse, automation is already well underway, and for ASEAN, as soon as the cost of implementing and running automated warehouse systems makes economic sense, it will eventually replace workers.

Many of the world's top technology companies are looking at improving energy efficiency. Whether this is through fuel technology or electrical battery power, these advances will also bring efficiencies for the logistics sector. Fuel economy is one of the greatest challenges the transport industry will face as valuable resources become more scarce and more expensive. To avoid increasing the price per kilometre, the road industry and supply chain will need to rely more on electricity, battery power and other innovations. Tesla is due to unveil its new Tesla Semi Truck in October this year, with a reported range of

320-480 km on a single charge, which shows recognition of the importance of this technology to the logistics industry. With niche engine makers such as Cummins, high technology companies such as Dyson and motor giants such as Toyota also ramping up activity and we can expect imminent advances in this market.

Improvements in the supply chain should be embraced, as they bring significant benefits to consumer, in the form of choice and price and to the transporter and owner of the product as well as the environment. This must not be at the expense of safety, which should always be of paramount importance and policy makers will need to get ahead of the curve to ensure they don't lag behind technological advances and changing customer demands.

As Director of Legal and External Affairs for the Linfox International Group, James oversees all legal, regulatory, compliance, external and government relations matters in Asia. James has worked in Asia for over 13 years across a wide variety of legal matters and jurisdictions. His background is in intellectual property, technology and innovation.

HOW ASEAN CAN REALIZE ITS DIGITAL DREAM

Dr. James Riady, Chief Executive Officer, The Lippo Group of Companies



For ASEAN itself, the best is yet to be. In the years ahead, as the cyber-driven fourth industrial revolution unfurls, ASEAN has a tremendous chance to build on its strong fundamentals and to redeem itself from its limitations.

I look at ASEAN at 50, at its current stage of its development and its likely future after five decades of existence. I look at it with the eyes of a businessman and a stakeholder. I like what I see.

ASEAN is by no means perfect. It is true that it makes progress incrementally. But the fact remains that for half a century it has been a decisive force for peace and prosperity not only in Southeast Asia but also in the greater Asia-Pacific region. Warts and all, ASEAN remains the best thing that has ever happened to Southeast Asia.

For ASEAN itself, the best is yet to be. In the years ahead, as the cyber-driven fourth industrial revolution unfurls, ASEAN has a tremendous chance to build on its strong fundamentals and to redeem itself from its limitations. It helps that ASEAN has integrated itself into an Economic Community that is committed to function as a single economic unit where goods, services, skilled labor and capital investment flow freely. As such, it is the sixth largest economy in the world today, with a GDP of US\$2.55 trillion and an average GDP growth of five to six percent annually.

It has a vast population—one of

every nine human beings today is a citizen of ASEAN. Over 50 percent of that population is under 30, almost all of whom are literate. Most are “digitally engaged,” with a rapidly growing spending power.

Longstanding programs

Several ASEAN countries have been implementing longstanding programs to build digital infrastructures and employ cutting edge cyber technology in a bid to become globally competitive. Two remarkable examples are Singapore and Indonesia.

With more than 80 percent of its population already benefiting from access to the Internet, Singapore is now focused on innovation and harnessing new technologies such as artificial intelligence and data science, cyber security, virtual and augmented reality technologies, and the Internet of things (IoT). Indonesia, on the other hand, is gearing its Palapa Ring fiber-optic network to provide the whole country with Internet access by 2019. This year alone the government will spend US\$1.5 billion to deliver connectivity to areas not yet served by broadband. The government has a standing Indonesia Broadband Plan (IBP)

that mandates it to stimulate and shape markets.

In Malaysia the economy enjoys a precocious 67 percent broadband penetration. Six of ASEAN's eight largest publicly traded Internet companies are based in Malaysia, the other two being in Singapore.

The Philippines and are also rated as potential leaders in the digital economy, considering their current pace of enhancing their cyber capabilities. The Philippines is the world leader in business process outsourcing. In recent months Viet Nam experienced a surge in the number of fiber-based broadband subscribers.

Last year Thailand established a Ministry of Digital Economy and Society to guide the transformation of the country's transformation into a more cyber oriented one. In Cambodia, as e-commerce expands into a multi-billion dollar industry, the government is crafting the necessary regulatory framework to ensure the security of this important sector.

In Myanmar, the government is intensively promoting the use of digital technology in all sectors to bring about the emergence of a digital economy. In Laos, the government is partnering with Microsoft to advance the country's cyber technology for sustained economic development. And in Brunei Darussalam, the government

has adopted a set of long-term goals called Wawasan 2035, which will all be achieved through information technology.

The world's fastest

Last year a study by Temasek and Google predicted that just six ASEAN countries would become the world's fastest growing Internet region. The six: Indonesia, Malaysia, Philippines, Singapore, Thailand and Viet Nam, will have over 480 million Internet users in 2020 and an Internet economy of US\$200 billion by 2025. However the fact that the four other ASEAN members were not mentioned in the study could mean that the Association is not yet moving forward on a sufficiently broad front in its Digital Revolution.

Nevertheless ASEAN has an ICT Master Plan designed to reduce gaps and enhance interoperability among members. What is needed now is for ASEAN to agree on regional goals in terms of broadband coverage, speed, reliability and security. The challenge is for all Member States to deal in concert with the technical and administrative complexity of running a region-wide digital ecosystem where no one is left behind.

And beyond the building of the infrastructure for speedy Internets, they must think in terms of people. Whether they are students, blue-collar workers, white-collar workers, homemakers, or senior citizens—

people must gain high computer literacy to leverage the Internet. Content is also important: messages and applications that are socially and economically useful, and those that promote good governance, have to be crafted and disseminated. So there must be people who have or will acquire the skills to craft meaningful broadband content.

This calls for a massive effort at education and training. All over the ASEAN region, educational institutions, the relevant civil society organizations and government extension workers are called upon to organize and work together to see to it that the great mass of the population of the region receives the knowledge and the skills to become native to the digital economy.

That is a tall order—putting up broadband infrastructure and building a regional ecosystem while edifying all the people on how to make the Internet meaningful. It demands a huge investment of money and effort. But it will be worth it.

Leap-frogging development

If the ASEAN Internet Master Plan is enhanced and becomes the blueprint of a Digital Revolution, it is projected that the region will be among the world's top five digital economies by 2025. This means that through digital integration, ASEAN countries will have leap-frogged over the normal stages of development. They will have become pioneers

in the generation of new digital services, including e-commerce and mobile financial services, and in the application of the Internet of things (IoT) so that the production of goods in the region is customized according to the precise needs and desires of consumers.

ASEAN economies will be firmly linked with supply chains. Job opportunities will abound. Access to public services will be so efficient that it can create a new wave of political enlightenment. Urban sprawls will tend to morph into smart cities, where information technology is the main infrastructure and all economic activities are sustainable.

The Internet will empower very senior citizens to become more independent and take better care of their health. The young will grow in creativity as they gain free and wide access to the wisdom stored in the great universities of the

world. Inclusive growth will bring about near universal participation in new ways of producing wealth and new ways of using that wealth. In absolute terms, according to the World Economic Forum, the Digital Revolution will add US\$1 trillion to ASEAN's GDP in ten years.

That may sound like a dream. But it is actually the way to go. It is the future economy. The ASEAN countries need only to fine-tune the ASEAN Internet Master Plan, meet its investment requirements, implement it robustly and empower their peoples through cyber literacy—and they will reap the immense rewards of the Digital Revolution.

Dr. James Riady is the Chief Executive Officer of Lippo Group, a Pan-Asian group based in Jakarta. The group has interests in property, department stores, food retailing, malls, IT services, hotels and other businesses. He is also the Founder and Chairman of Pelita Harapan Educational Foundation, or the Educational Foundation of Hope and Light, a group of co-educational K1-Year 12 private, international Christian schools in Indonesia.

DIGITALIZATION AND GLOBALIZATION: THE PILLARS OF GROWTH

Naotoshi Okada, President and CEO, Nikkei Inc.



This huge and rapidly growing market, driven by a young workforce, is adapting digital technologies at a faster pace than many developed countries.

Whenever I visit Singapore, Bangkok and other major cities in the Association of Southeast Asian Nations bloc, I am always struck by their youthful populations and economic vitality.

There is plenty of data to back up these observations: The median age in ASEAN states is 29.1, compared with Japan's 46.9. ASEAN's real economic growth rate in 2016 was 5.8 percent, while Japan's was 0.6 percent. ASEAN's total population is more than 630 million, nearly six times that of Japan. This huge and rapidly growing market, driven by a young workforce, is adapting digital technologies at a faster pace than many developed countries.

The explosive growth of internet use in Southeast Asia should not be overlooked. In the past, connections were predominantly wired, and building the necessary infrastructure was both costly and time consuming. But the mushrooming of cheaper cellular base stations paved the way for smartphones to replace PCs as the main communication tools - putting the internet within reach of far more people.

This, in turn, is giving rise to

innovative new businesses that are disrupting old models. Grab, a Singapore-based ride-hailing app provider founded by Malaysian entrepreneur Anthony Tan in 2011, now has a presence in 87 cities in seven countries and competes with the industry's biggest player, Uber Technologies of the U.S. In 2014, Japan's SoftBank Group Corp. invested 30 billion yen in Grab and became its largest shareholder. This year, Toyota Motor Co. teamed up with Grab to handle maintenance and inspections of cars managed by the startup.

At Nikkei, we are keeping a close eye on pioneers like Tan. In a front page feature series of The Nikkei newspaper, titled "Asia's future builders," we focused on several young Southeast Asian innovators. One was Tan Min-Liang, from Singapore, whose company develops peripheral devices for games and has drawn worldwide attention. The series also featured Philippine singer Charice Pempengco, who is known as the "net-born diva" after cracking the top 10 charts in the U.S. Their impressive accomplishments suggest a future in which digitalization propels Southeast Asian countries to the global center stage.

Southeast Asian governments, too, are actively working to keep pace with the digital age. “The Eleventh Malaysia Plan” announced by the nation’s government in 2015 includes policies to expand e-commerce and improve communications links to outlying regions. That same year, the Thai government set a new nation-building goal called “Thailand 4.0.” The idea is to jump from the “third stage” of economic development, led by heavy industry and exports, to the “fourth stage,” driven by the latest digital technologies.

With the support of such policies, the digital waves that have mainly benefited urban areas will spread to the countryside and help reduce regional disparities. These policies will also contribute to the expansion of the middle class – the driving force of consumption.

We recognize the importance of accurately conveying this remarkable Asian growth story to readers around the world. To this end, we have made numerous investments over the last few years under our slogan “G & G,” which stands for “global expansion and growth.”

The readership of the Nikkei Asian Review, the English-language news service we established in 2013, continues to increase. Online and in print, it delivers the region’s economic news to a global audience – all with a uniquely Asian perspective.

In 2014, we set up Nikkei’s Editorial Headquarters for Asia in Bangkok and doubled the number of reporters spread across the region. Our goal is to be the media leader in Asia, in part through on-the-ground reporting of untold growth stories.

Alongside the Nikkei Asian Review, our strategy for regional expansion has another pillar: the Asia300. This is Nikkei’s exclusive list of 300 influential companies from 11 economies across the region, including 130 from ASEAN states.

Since the launch of the Asia300 in 2014, our reporters have been dedicating much of their time to these companies. As the next step, we launched the Nikkei Asia300 Index in December 2016 to provide a new gauge of Asian stocks. We believe these endeavors are a clear indication of Nikkei’s focus on the region, and ASEAN countries in particular.

Dovetailing with our global strategy is our commitment to digital-driven journalism. We are investing to realize a new type of journalism that will stay relevant in this fast-changing, digital world. The Nikkei Online Edition – launched in 2010, ahead of similar websites by other Japanese newspaper publishers – has grown into one of the world’s most successful news sites with a paywall, with more than 550,000 paid subscribers.

“Be an innovator, not a follower.” That is our motto. We resolved to make 2017 our “leap year” toward becoming a truly digital news organization. We have revamped the Nikkei Asian Review’s editing procedures to focus on web-oriented publishing. We have also formed an Innovation Laboratory in Tokyo, with new trends like artificial intelligence, fifth-generation mobile networks and other new technologies in mind. The objective is to start integrating the tech that will shape the way news is reported long into the future.

Nikkei’s new partner, Britain’s Financial Times, joined us in 2015. As a truly global media group, the Nikkei-FT alliance delivers unparalleled coverage of Asia to readers worldwide. Not only is the FT a trusted global brand, it is also a pioneer in the shift from print to digital media. We will continue to pool our strengths and digital experience to provide the finest reader experience.

Our emphasis on ASEAN countries, meanwhile, is not limited to news coverage. Nikkei in 2014 started working with N2N Connect, Malaysia’s largest stock trading platform provider, to distribute corporate analysis tools and Nikkei Asian Review content. We formed a capital and business alliance with StoxPlus, a leading financial information service provider in Viet Nam, the same year. Nikkei

also organizes international conferences in major cities throughout Asia, inviting top executives to share their unique insights with audiences.

ASEAN and Nikkei can be considered partners in digitalization. Nikkei is ideally positioned not only to track the pulse of this vibrant, dynamic region, but also to support and accelerate its development. I am certain that this mutually beneficial relationship will last for decades to come.

Naotoshi Okada is the president and CEO of Nikkei Inc. He joined Nikkei Inc. in 1976 and was a correspondent in Paris and New York, before becoming Editor-in-Chief. In 2013, he launched the Nikkei Asian Review. After being appointed president in 2015, he initiated the "Global Expansion and Growth" strategy and acquired the Financial Times the same year.

DIGITALIZATION TO ENHANCE ASEAN ECONOMIC GROWTH

Prof. Dr. Od Phongsavanh, President, Phongsavanh Group



This digital trend of cashless systems may remove the currency boundary among countries, bringing all nations, particularly ASEAN countries, into a united region using one single digital currency.

Today technology plays a crucial role in advancing countries around the globe as they digitalize their industries to support their economic growth. There are a number of advantages with digitalization particularly in the financial and banking sectors. If we think about the financial sector in the digital age, we may think about cashless systems. Developing cashless systems may bring a lot of benefits for people and it may change the way people shop as they only have to use their mobile phone or any digital devices to make payments for their desired products and services. To this matter, various business sectors will transition to cashless systems for payment, for the comfort and convenience of both customers and business owners. People are also likely to save more time as, nowadays, most banks tend to have payment services for public utility bills in order to attract more customers. Also bank services such as loans and deposits transactions can be made through mobile or internet banking. In the near future, I foresee that people will use their mobile phone or digital devices to do everything - shopping, making tax, rental and loan payments, borrowing, making deposits, and many others.

These will totally change our regional payment systems.

In the banking sector, digitalization requires huge investments and high security so it may also affect employment in the sector. The more digitalized systems we invest in, the lower the number of bank or financial services staff are needed and at the same time banking service units or financial institutions may also decline since people will change their payment behaviors. We can see around the globe, particularly in USA when a few years ago many big banks halved their bank service units and bank branches as well as the number of bank staff. This potentially affects employment rate, affecting not only the banking sector but also other sectors as well.

Digitalization may bring both advantages and disadvantages to our growing economy, however, moving forward into the digital age may bring a lot of advantages rather than disadvantages and if we don't follow the movement of this trend, our businesses may fail in number of ways. The important thing that we should consider during this transition into digitalization is how we can adapt our business operations.

It is very important for every government in ASEAN to supervise and manage properly potential issues such as the unemployment rate and internet security that may occur during the transition to the digital era. With close and proper supervision and management from ASEAN governments, these issues may be mitigated but if we don't follow this digital trend, we may face a lot of obstacles in our business operations.

In the banking and financial sectors, meetings between bank clients or bank staff have been made much more convenient in the digital era. Clients can enjoy a variety of benefits from the improved technology such as being able to meet bank staff directly via video or conference calls and benefiting from deposit and loan payments through the Internet in real time. Financial transactions through mobile banking and internet banking are more likely to enhance effective and efficient business operations for users. Personally, I would love to bring cashless systems into our ASEAN community or use the same digital currency for financial transactions in

ASEAN or develop a global digital currency for conducting any transaction around the world. This digital trend of cashless systems may remove the currency boundary among countries, bringing all nations, particularly ASEAN countries, into a united region using one single digital currency.

In addition, this digital enhancement in business operations will definitely lead to better customer experiences, better brand reputation, streamlined operations that save time and money, increased sales, a larger customer base, increased organizational reach, improved management decisions through technology platforms, rapid development of new products and services, and a larger degree of creativity and innovation. These are some benefits we have gained or will have gained as long as we move towards fully digitalizing operations in this new era.

These days information technology has become a part of people's lives and it will include almost everything. Now is a good time for ASEAN nations to move forward together in

digitalizing our industries to support regional economic growth. In Laos, our business as Phongsavanh Group which has at least 15 companies under it is moving forward slowly and digitalizing each business step by step. It may affect employment in some sectors but we may transfer those from the affected sectors into other sectors since we have very complex business operations throughout the country. Five years from now, I believe that digitalization will play a very crucial part in everyone's life as everything will be transacted through digital devices. Cash is more unlikely to be used for any transaction with cashless systems completely replacing the need for notes and coins. I foresee that every industrial sector will move to the digital world soon in order to improve productivity. There might be various opportunities during this digital transition and we will stand to gain the most benefit from it and do believe that digitalization will enhance our regional economic growth in ASEAN.

Prof. Dr. Od Phongsavanh is the President of Phongsavanh Group which has had an integrated business to serve society in the Laos and the region since 1977. Over past thirty-five years Dr. Od has established 10 subsidiaries under Phongsavanh Group. In addition to his success in business operations, he contributes to socio-economic development in the country and is currently a top member of the Lao Front for National Construction, a government organization.

THE TSUNAMI OF DIGITAL INNOVATION AT THE DOORSTEP OF ASEAN: ASEAN BUSINESSES MUST INITIATE DISRUPTION THEMSELVES

Teresita Sy-Coson, Vice-Chairperson, SM Investments Corporation



What is different in this digital age is that physical borders are becoming less and less significant.

In many ways, digital innovation is already upon us in ASEAN but so far, except for a few areas affected by headline grabbing services like Facebook, AirBnb, Netflix and Uber, our businesses (Singapore excluded) have been largely spared from the huge disruptions across many sectors experienced by developed economies. While we have seen the proliferation and some significant successes of tech start-ups in ASEAN (e.g., Lazada, Grab and Zalora), their overall impact remains minor at present.

However, this may be about to change. The virtual earthquake has occurred offshore and the digital tsunami is on its way to disrupt our businesses. We must look into innovating and disrupting our own businesses to compete in this new digital world of doing business. Amazon and Alibaba are halfway inside the front door already and there are hundreds if not thousands more behind them spanning all types of businesses.

Some may reason out that ASEAN has time to change to adapt to the digital tsunami. There are conditions here that hamper such from taking full effect including low broadband accessibility, low credit card

penetration, inefficient logistics, and the lack of credit facilities. On the other hand, Alibaba has successfully demonstrated in China how it resolved all of these problems within a short period of time.

What is different in this digital age is that physical borders are becoming less and less significant. For example, services are being provided to local consumers and businesses by offshore companies that most haven't even heard about. Competition in many sectors is becoming increasingly global. Who would have thought that "taxi" services or retail services would be provided by global companies in our domestic markets?

The pace of innovation and disruption is not abating but instead it is speeding up. Over the next decade with the advances in artificial intelligence, blockchain, cloud services, image recognition, battery technologies, driverless vehicles, and additive manufacturing, expect to see major disruptions in the retail, banking, energy, manufacturing, transportation, and healthcare sectors among others.

What can companies do?

First, we must embrace digital innovation and live and breathe it ourselves. We need to understand and learn very quickly what this digital world is all about. We need to upgrade our people and their skills. We need to recreate our organizations to be more flexible and agile so that changes can happen in months instead of years. We must digitize data to the fullest extent to support an agile organization.

Governments have key roles to play as well. National laws have to be upgraded to enable local businesses to compete and thrive in an increasingly digital economy. There are many examples such as taxation matters of local companies hampered by laws that do not apply to foreign-based players. In crafting new laws, such as those on data privacy, local legislators

must take extreme care that the new laws and regulations do not unduly burden the local companies from competing with their foreign counterparts in the domestic and international markets.

And this is where ASEAN plays a significant role. A coordinated policy and legal environment (e.g. tax fairness between local and offshore entities, easier cross border movement of goods and services within ASEAN, common data privacy and data security rules) across all ASEAN states will have a huge positive impact on helping ASEAN businesses achieve a successful transition to a digital economy. It is timely that Singapore - the digital technology leader in our region - will be the ASEAN Chair in 2018. As Chair, Singapore is expected to push for the digital economy agenda as one of the pillars of its chairmanship.

Teresita Sy-Coson is the vice chairperson of SM Investments Corporation (SMIC), a Philippine company with interests in retail, banking and property development. She is the chairperson of BDO Unibank (BDO), the Philippines' leading bank, to date. Her expertise has helped transform the Group's retail business. She is also an advisor to the board of SM Prime Holdings, one of the largest integrated property developers in the Philippines that is into mall, residential and commercial, and leisure and tourism development. She serves as the vice chairperson of SM Foundation, Inc. (SMFI), which takes the lead in effecting a community impact template that improves the quality of life of its host communities and promotes initiatives to enhance the sustainability of the environment. She is currently the Philippine representative to the ASEAN Business Advisory Council.

ADVANCING ASEAN IN THE DIGITAL AGE: A CAMBODIAN PERSPECTIVE

H.E. Dr. Sok Siphana, Managing Partner, SokSiphana&associates and Advisor, Royal Government of Cambodia



As a latecomer to the digital economy, Cambodia faces strong competition from far superior rivals as close as neighboring Thailand and Viet Nam. Cambodia's e-commerce and fintech scene is more nascent and lags behind most other markets in Southeast Asia, but this is changing fast. The momentum for catch up is felt rapidly in the sector.

When Cambodia joined the Association of Southeast Asian Nations (ASEAN) in 1999, the Royal Government of Cambodia (Government) faced seemingly insurmountable obstacles of social, institutional, economic, and political nature. From the economic point of view, the country is confronted with fundamental deficits. Cambodia is a small country with a relatively small but fast growing population, a large proportion of which is impoverished. Economic reintegration has been an important objective of the government in term of its growth vision for the country. For both political and economic reasons, Cambodia joining the World Trade Organization (WTO) in 2004 was a defining moment. With its ASEAN and WTO membership secured, Cambodia could finally claim its rightful place in the worldwide family of trading nations.

From the outset, Cambodia has made its position clear that it looked to the ASEAN Economic Community (AEC) as a positive externality to stimulate and make irreversible substantial economic liberalization and more comprehensive and broadly based reforms. This clear policy direction was translated into visible political

commitment and has enabled Cambodia to move rapidly in its institutional reform and economic development process. Successful reforms have led to significant improvements in the services markets themselves in terms of prices, quality, product variety, and the availability of new products. More efficient provision of telecommunications, banking, and other ICT related services have also advanced the digital integration of the economy with that of ASEAN.

As a regional grouping, ASEAN is perceived as a wellspring of opportunity for high tech companies because of growth in the region's digital economy coupled with a growing middle-class base and its young and tech-savvy population. To ASEAN policy makers, technology is a great leveler and the digital economy plays a strategic role as a critical enabler for deepening regional integration and as well as helping drive next-generation domestic demand led growth for startups and SME's. The launch of 'ASEAN ICT Masterplan 2015' is a reflection of such belief that ICT is a key enabler for ASEAN's social and economic integration.

Cambodia, which was once a country synonymous with

conflict and poverty, now boasts more than two decades of impressive growth. In 2015, the country attained lower-middle- income status. With this comes a growing middle class whose spending power and consumer behaviors give rise to a need for new solutions in payments, credit, and mobile technology. As a latecomer to the digital economy, Cambodia faces strong competition from far superior rivals as close as neighboring Thailand and Viet Nam. Cambodia’s e-commerce and fintech scene is more nascent and lags behind most other markets in Southeast Asia, but this is changing.

Policy wise, in its National Strategic Development Plan (NSDP) 2014-2018, the Government set out a clear economic diversification policy agenda focused on developing the backbone information and telecommunication technology sector. Sharing the vision of the ASEAN Masterplan, the Government adopted its Cambodian ICT Masterplan 2020 driven by four strategic thrusts to harness the benefits of the so-called Fourth Industrial Revolution: (i) Empowering people by way of human resource development and e-Awareness; (ii) Ensuring Connectivity encompassing national ICT infrastructure, legal framework and cyber security; (iii) Enhancing capabilities in the ICT industry, ICT standards, and research and development; and (iv) Enriching e-Services

covering e-Government services, e-Public services, e-Economy services and e-Education services.

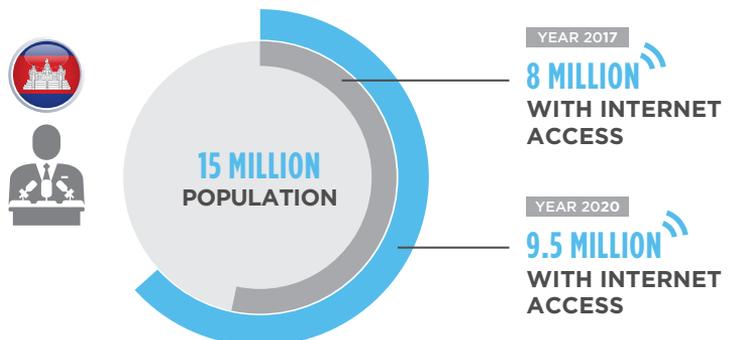
In term of infrastructure to support its digital economy, Cambodia has witnessed a swift transformation driven by the injection of new technological advancement, similar to other advanced ASEAN countries. Rapid improvements in Internet accessibility and affordability, expansion of wireless networks and widespread usage of smart phones, absorption of advance technology among youths are all determining factors explaining Cambodia’s fast catching up in the regional digital economy.

According to the Ministry of Posts and Telecommunications, approximately 8 million out of the country’s 15 million people have now access to the Internet and it expects that number to reach 9.5 million by 2020, out of which 100 percent of the urban dwellers and 80 percent of the rural dwellers would have access to the Internet. In term of mobile telephony, 4G coverage across

the country is impressive and provides opportunities for new industries like mobile commerce, on-demand services and fintech to thrive. The rate of mobile penetration is extremely high – estimated at between 90 to 130 percent, with notably, some 50 percent of phone users using smartphones. According to a recent survey, 48 percent of the respondents stated they have used Facebook while 37 percent of Cambodians indicated that they used Facebook on their own phone. Facebook is now the number one news source in Cambodia, having surpassed television and printed media.

This year, the Malaysia-Cambodia- Thailand (MCT) Submarine Cable System and Landing Station was launched in Cambodia and Telecom Cambodia inaugurated its Greater Mekong Telecom Backbone Network project, which included the installation of a 467km fibre-optic cable connection between Sihanoukville and Kampong Cham. Cambodia’s mobile telecommunications company

CAMBODIANS WITH INTERNET ACCESS



Smart Axiata, in partnership with global ICT solutions provider Huawei, also launched the 4.5G network in Cambodia, marking the beginning of a new era of improved and secured internet connection capable of providing an Internet speed 8 times higher than that of 4G. This latest evolution of mobile technology will enable subscribers to enjoy better and faster mobile internet, which is indeed an important tool in developing a digital economy. Industry experts expect the first commercial launch of full-fledged 5G to happen in 2020. Moreover, Axiata has recently partnered with Mitsui to offer enhanced digital services and Internet-of-things that would leapfrog Cambodia's digital economy.

Conclusion:

Cambodia, no different than other ASEAN nations, is embracing the Digital Economy to advance its development agenda. Last May 2017, speaking at the opening ceremony of the World Economic Forum on ASEAN, Cambodian Prime Minister Samdech Akka Moha

Sena Padei Techo Hun Sen emphasized the need for ASEAN to ensure that its growth vision and agenda be responsive to the new context of a rapidly changing world, especially the strong momentum generated by the so-called Fourth Industrial Revolution, which creates a new growth dynamism characterised by dependence on advanced technology and markets. Already, Cambodia has made the necessary shift towards innovation and solution development in its efforts to contribute to the highly competitive digital economy of ASEAN in the decades to come.

Dr. Sok is a practicing attorney and the Managing Partner at SokSiphana&associates/a Member of Zicolaw. He was appointed as Advisor of the Royal Government of Cambodia with rank of Minister in 2009. Since 2011, he has also served as the Chairman of the Board of Cambodia Development Resource Institute (CDRI).

THE OPPORTUNITY FOR ASEAN IN THE NEXT 50 YEARS: BUILDING A COMMUNITY OF DIGITAL INNOVATIONS

MA Huateng (Pony Ma), Chairman of the Board and Chief Executive Officer, Tencent



The increasing prosperity of ASEAN's growing middle-class demographic is driving higher-value consumption, and rising consumer demand is a catalyst for digital transformation of industries.

The 50th anniversary of the founding of ASEAN is a globally-significant milestone that deserves congratulations from government and business leaders around the world. Binding together 10 Southeast Asian countries with diverse populations, languages and cultures, ASEAN is an economic community that celebrates open collaboration, showcasing a development model with remarkable symmetries to today's global digital economy.

Established two years before the birth of the Internet, ASEAN's development coincided with the third industrial revolution powered by computing, Internet and ICT technologies. ASEAN has become a critical player in the global economy – collectively, ASEAN and China now account for a higher percentage of global trade than the United States. Grouping together ASEAN and neighboring countries such as China and India, the super-region is now the world's most economically-dynamic growth engine, constantly adding new impetus to the global economy, and more important, is a bulwark of peace and stability.

Today, the fourth industrial revolution based on mobile Internet, big data, cloud

computing, artificial intelligence and intelligent manufacturing is in motion. To drive ASEAN's sustainable growth in the next 50 years, digital innovations are key for member countries to make the quantum leap and seize the opportunities generated by the new industrial revolution, accelerating economic and societal development. Personally, there are three underlying drivers that make me very positive about ASEAN's future.

First of all, ASEAN's strong economic growth has created the foundation for digital innovations to thrive. In recent years, the average annual economic growth rate of ASEAN member countries has hit 5 percent, and growth rates in some emerging countries such as Cambodia, Myanmar and Laos exceed 7 percent. The increasing prosperity of ASEAN's growing middle-class demographic is driving higher-value consumption, and rising consumer demand is a catalyst for digital transformation of industries. The confluence of demand- and supply-side synergies is creating a virtuous cycle to propel economic development in the region. Across ASEAN, we are seeing tremendous opportunities for new digital innovations and business models including O2O

(Online to Offline) and the sharing economy, similar to what we observed in China. For example, Go-Jek, an Indonesian company that received an investment from Tencent, now has more than 250,000 drivers in its network, helping to reduce traffic congestion and shorten delivery times, bringing convenience to consumers in metropolitan centers including Jakarta.

Secondly, the relatively young demographic and the strong need for infrastructure upgrades in ASEAN countries mean there is large scope for digital innovations to flourish and deliver outsized economic benefits. Almost 70 percent of ASEAN's population of 630 million are under the age of 40, and this not only creates an enormous market for consumption of goods and services today, but also provides a deep talent pool that will drive digital innovations for tomorrow. ASEAN lacks well-developed transportation, communications and retail infrastructure compared to developed countries. However,

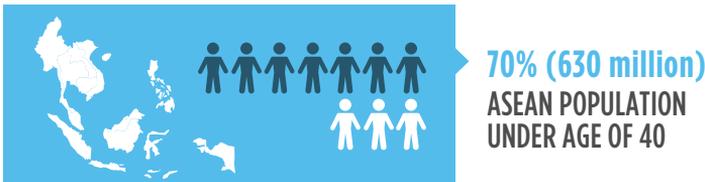
youths across the region have an inherent passion to embrace new technologies, driving digital innovations that expedite the development of future-ready, next-generation infrastructure. Indeed, China has similar experiences: in the past, personal computers had a lower rate of adoption in China, compared to developed countries. Far from being detrimental to China, this was a factor that drove the country to lead the rest of the world in migrating quickly to mobile Internet. China's relatively low financial and credit card penetration rate has also, to a certain extent, driven world-leading innovations in mobile payments.

The Southeast Asian region, including ASEAN and China, has become the world's second largest center of innovations behind only North America. This extended digital innovation community in the East is delivering technologies that seamlessly integrate hardware, software and services, not only

enabling ASEAN and China to grasp the opportunities brought about by the new industrial revolution, but also helping to enhance the quality of life of billions of consumers globally. China's experience in "Internet Plus" and digital economy will help ASEAN countries move into the digital innovation fast-lane in a smoother and easier way. Cloud, mobile payments and other new infrastructure will also help stimulate entrepreneurship and innovation in ASEAN countries. As China is a neighbor to many ASEAN countries, our affinity in lifestyles and culture is a great advantage for us to work together to create digital services such as games, animation, online literature and music. For example, Tencent's online music application JOOX is now very popular in Southeast Asia.

Looking forward, we hope that ASEAN countries will further deepen their collaboration with China's technology centers such as the Guangdong-Hong Kong-Macao Greater Bay Area, taking advantage of policies such as the "Belt and Road Initiative" to create new catalysts that help accelerate the growth of our shared community of digital innovations. We are fully confident about the continuing success of ASEAN in the next 50 years.

ASEAN'S POPULATION UNDER 40



Pony Ma is one of Tencent's Co-Founders and currently serves as Chairman of the Board and Chief Executive Officer. Pony oversees strategic development, overall direction and management of Tencent. Pony has more than 20 years of experience in telecommunications and internet industries. Pony received his Bachelor of Science degree in Computer Science from Shenzhen University in 1993.

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