NUS National University of Singapore | School of Continuing and Lifelong Education

Lee Kuan Yew School of Public Policy
National University of Singapore

DIGITAL FOR GROWTH: HARNESSING THE POWER OF DATA FOR NATIONAL RECOVERY

RECOMMENDATIONS AND INSIGHTS FROM THE INAUGURAL APAC LEADERS DIGITAL ALLIANCE

MARCH 2022

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CONTEXT

Microsoft, in partnership with the Lee Kuan Yew School of Public Policy facilitated the inaugural APAC Leaders Digital Alliance to kick off a regional series of policy dialogues to catalyse and enable agile policy making across sectors, advance socio-economic revitalisation, and ensure data-driven digital native policies are formulated to meet the demands of the digital era.

The contents of this document reflect the views and thoughts expressed in the policy dialogue. They do not necessarily represent the positions or views of Microsoft, the National University of Singapore, or the Lee Kuan Yew School of Public Policy.

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Executive Summary

The APAC Leaders Digital Alliance is a partnership between the Lee Kuan Yew School of Public Policy (LKYSPP), Microsoft, NUS School of Continuing and Lifelong Education (NUS SCALE), public sector leaders across Asia-Pacific, and industry partners. During this inaugural policy roundtable, public sector leaders from Malaysia, Indonesia, Philippines, Singapore, Thailand, Vietnam and South Korea, as well as representatives from LKYSPP, NUS SCALE, and Microsoft discussed a wide range of issues relating to data governance and the digital economy. The dialogue centered on the transformative power of data and digital infrastructure in light of challenges and opportunities exposed by the COVID-19 pandemic. A critical component of the conversations was the regulatory levers required to unlock the value of data and its benefits for people within and across national and regional boundaries.

One key theme that emerged is the need for data-driven governance powered by technology, anchored on trust: As digital adoption increases, we must remember that technologies such as Cloud, Artificial Intelligence and Quantum Computing are as much about looking forward as it is about timeless values such as privacy, security, transparency, trust, and inclusion. Data fuels and powers leading-edge technology as well as innovation. The crucial issue highlighted for data sharing and having a robust data economy is establishing trust for citizens to share their data. This can be best accomplished if data governance frameworks contain built-in guard rails and are aligned to global standards.

A second key theme is the case for cross-border data flow: The OECD has estimated that data access and sharing could generate benefits worth between 0.1% and 1.5% of GDP in the case of public-sector data, and between 1% and 2.5% of GDP when also accounting for private-sector data[1]. The discussion revolved around principles for international data sharing and mobility which ensure privacy, security, transparency, and compliance. Central to the data sharing and mobility discussion was the role and extent of trust as well as the enabling ecosystem and complementary policy with tangible incentives to accelerate innovation for better products and services.

The public sector representatives also shared their recent efforts and lessons on national data agenda and initiatives to propel the digital economy for national recovery. Finally, the participants also discussed how technology companies of all sizes play a role in helping countries and companies in the region harness data to enable further transformations and beneficial socio-economic outcomes.

[1] https://www.oecd-ilibrary.org//sites/90ebc73d-en/index.html?itemId=/content/component/90ebc73d-en#

Foreword by Jean-Philippe Courtois, Executive Vice President and President, National Transformation Partnerships, Microsoft

As we have seen over the past two years, Cloud, Data, and Artificial Intelligence (AI) have become central to inclusive economic growth and recovery.

Creating inclusive economic opportunities is essential – and the good news is that there are huge opportunities to enable underrepresented groups in today's digital economy. Microsoft partners with governments, NGOs, and social enterprises to address the skills gap through a global digital skilling initiative. Today, the initiative has provided training for over 48 million learners around the world.

We have seen positive signs coming out of COP26 including reduction in the use of coal and phasing out fossil fuel subsidies. As a company, we are honoured to play an active role in this important decision-making forum on behalf of our planet.

Data is now a strategic asset. In a crisis, data-driven decisions must be made quickly and at scale. This very specific combination of technology adoption at scale both in the public and private sectors is accelerating the transformation of economies and industries at scale, at speeds that have never been seen in our lifetimes. This has enabled positive impact for entire countries and their citizens, which means that technology as a percentage of global GDP will double from 5% today to 10% by 2030.

As a trusted partner to governments and the business community, we take a nation-specific approach, considering the sensitivities to national and regional differences, one country at a time. With over 60 data centre regions worldwide, more than any other company, Microsoft's cloud capabilities can meet Governments' needs to drive innovation, leverage the benefits of the cloud, and better support people, business communities and public sector employees and organizations.

Over many years, Microsoft has engaged with government agencies, industry organizations and trade groups to promote ethical and responsible Cloud & AI policy and policy innovation. We know Trust is critical, which is why we have created Trusted Cloud Principles, developed with Amazon and Google. Through this industry initiative we will partner with governments around the world to resolve international conflicts of law that impede innovation, security, and privacy, and establish and ensure basic protections for organizations that store and process data in the cloud.

We look forward to working together towards a more secure and resilient digital world, and I am excited for what this alliance can achieve, today, and in the future.

Preface by Professor Danny Quah, Dean and Li Ka Shing Professor in Economics, Lee Kuan Yew School of Public Policy, National University of Singapore

On behalf of the Lee Kuan Yew School of Public Policy, National University of Singapore (LKYSPP-NUS), we are pleased to have jointly initiated this public-private partnership with Microsoft, in collaboration with the NUS School of Continuing and Lifelong Education.

The Asia-Pacific (APAC) Leaders Digital Alliance is significant in bringing together leadership from academia, public sector, and private sector, as we work through policy challenges to grow the digital economy here in the Asia Pacific. **This alliance is driven by a special focus on the power of data, articulated in the application of digital and cloud technologies for socio-economic recovery and growth.**

The digital revolution has brought about unprecedented changes across sectors and countries and will continue to make even more revolutionary impacts in the coming decades. Throughout this historical transformation, data is becoming a major resource for value-creation efforts including efficiency improvement, social inclusiveness, transparency enhancement, accountability reinforcement, resilience building, and sustainability engineering. Moreover, data can be considered a public good with uniquely valuable properties such as inexpensive collection, reusability, ease of storage, and value-enhancing through sharing.

The world today sits still in a mode of tentative contingency; societies are struggling with the global pandemic, economies are seeking to rebuild better ways forwards, and what this alliance does is it helps us advance a narrative of national recovery, organized around the transformative power of digital data. **To do this right, we need both efficiency in how we get things done and resilience in how we respond to future unknown shocks.** Trust, collaboration, the capacities we need to build to make this happen, is the work that we all must do now going forwards.

As the world increasingly faces more unknowns than knowns embracing data to build sustainable prosperity is both urgent and strategically important. Realizing this potential, however, requires not only technical efforts but also transformational endeavors as formidable and unprecedented structural challenges loom. These challenges include a legacy mindset and cybersecurity threats. As a result, good governance, effective coordination, and global collaboration play a crucial role in making data a powerful new driver of socio-economic progress in every nation.

We are delighted that Microsoft, in partnership with the Lee Kuan Yew School of Public Policy, has formed the inaugural APAC Leaders Digital Alliance to launch a regional series of policy dialogues on digital policy matters, from conceptual design to experiences from practice. We greatly hope that the APAC Leaders Digital Alliance will be a robust platform for policy makers, academics, and business leaders to strengthen their communications and collaborations, with the goal of making the formation and implementation of digital policies in the region more enlightened, productive, mutually trusted, and far-sighted.

Introduction by Andrea Della Mattea, President, Microsoft Asia-Pacific

If the pandemic has taught us anything, it's that no business is 100% resilient, but those businesses that are fortified with digital capability are more resilient than those that are not.

What we've seen is a need for more than just digital *transformation* – we're seeing an urgent and clear move to digital *acceleration*.

We've long seen the advantages digital transformation brings customers—and this data gives us concrete insights into how government agencies have handled the challenges.

More digitally prepared government agencies had an advantage in navigating the upheavals and challenges presented by the pandemic. Investing in digital transformation will ensure resiliency of government operations and agencies are prepared for any future scenario.

Perhaps the biggest contribution that government agencies can make to long-term societal improvement is developing skills and talent. Because it's people who drive digital and transformation, and skilling will be the currency for the post pandemic world.

And it's our responsibility as leaders to make it happen, by ensuring access to education, training, and technology, especially considering that by the time they join the workforce, 65% of primary school children today will perform jobs that haven't been invented yet.

We recognize the need for digital alliances for digital-first policies. We're committed to sharing our experience and expertise working with governments and industry associations around the world to help advance digital capabilities for resilience and growth.

These are some of reasons we are so proud to be partnering with the Lee Kuan Yew School of Public Policy at the National University of Singapore for the launch of the APAC Leaders Digital Alliance.

We're at that stage where the choices we make are grounded in the fact that technology development doesn't just happen - it happens because us humans make design choices. Those design choices need to be grounded in principles and ethics - and that's the best way to ensure the future we all want.

As Asia moves out of the pandemic, cloud is not only a critical foundation for business resilience but will also be a key driver of the region's next wave of economic growth.

We hope that the discussions from this event will help to provide a direction on policy recommendations for a holistic approach to digital governance.

At Microsoft, we have a fundamental responsibility to help others succeed, because our success is built on the success of our customers and partners.

Our goal is to help nations build strong, inclusive digital economies where everyone could experience the benefits of technology and can participate in the creation of the new digital economy.

Digital: An Engine for Growth, Fuelled by Data

As more organisations move online, and data has become the lifeblood of the 21st century, no single organisation, whether private sector or public sector, has the resources for the immense amounts of data and processing power required to reap the benefits of the digital economy.

With data and technology fuelling the transformation of governance, education, healthcare, and financial services, the dialogue comprised insights from leaders across APAC, and learnings gained in their efforts to unlock the value of data for socio-economic revitalisation and national recovery.

One key area of opportunity is the potential for **greater regulatory clarity which will enable the sharing of data**. Breakthroughs in technology have not only been driven by the democratization of digital technologies, but also the availability of data for training powerful algorithms. IDC predicts the exponential growth of data to be from 18 zettabytes in 2018 to 175 zettabytes by 2025 (one zettabyte is equal to a trillion gigabytes).

However, the value of data can only be extracted if this is made available to the innovation ecosystem, and a key factor here is enabling access to important data locked in the silos of government systems. It is for this reason that there must be pragmatic policies that enable data sharing for public good while balancing privacy and security concerns. This will be instrumental in achieving purpose-driven and sustainable national open data initiatives which would eliminate data silos, enable a single view of the citizen, and allow access to data for research and innovation.

With the proliferation of data and devices, governments across the world preside over sprawling data estates. A data estate refers to the system which stores, prepares, models, serves, and visualizes data to identify insights, trends, and unforeseen relations between variables which can support, accelerate, and transform operations for governments and businesses.

In reaping the benefits of their data estates, data governance, classification, and management are critical for the public sector due to the ever-increasing amounts of data and various national objectives.

One question raised by public sector leaders present was whether there is correlation between location of the data at rest and its ownership. Attendees highlighted the differences in culture and governance structures across countries, and raised the need to consider the type of the data, whether it is housing data, healthcare data, critical infrastructure data, or data that is used to run cities, e.g., energy, transport, public safety, or economic and financial information and how this data is shared across agencies and businesses, both locally and abroad. In essence, there are multiple layers which must be considered in data management and governance.

As Governments explore the possible uses of data for the country's benefit, in alignment with national goals and priorities, we continue to observe tensions between the free flow of data for innovation and economic growth, and the protection of personal data that in most instances leads to data localisation.

Data localisation refers to measures restricting data flows and can take several forms. From least restrictive to most restrictive, these measures include[2]:

- Prior consent before data is transferred outside national borders.
- One copy of data must reside within national borders, and copies can be transferred abroad.
- Data must be stored in servers located within a country's borders and cannot be transferred outside national borders.

Data localisation is a costly response to what is perceived to be loss of digital sovereignty. Data localisation requirements are a setback for the digital economy, as start-ups and scale-ups will have to pay for the prohibitive cost of compliance, and will not be able to utilise regional or global services which may have servers abroad.

The European Center for International Political Economy found that enacted or proposed data localisation policies in China, for instance, would cost 1.1% of its GDP[3]: reducing domestic investment by 1.8%, exports by 1.7%, and welfare by the equivalent of 13% of each citizen's salary. Empirical evidence shows that data localisation and other barriers to data flows impose significant costs, reducing India's GDP, for example, by 0.1-0.7 percent.[4] In the European Union, data localisation costs would add up to 0.4% of its GDP, reduce investment by 3.9%, and result in welfare costs up to $193 billion.

Restrictions on the free movement of data tend to arise from concerns over privacy, security, and lack of control. Governments implement data localisation with the justification of protecting citizens, preserving national security, allowing law enforcement to have rapid access to data, and improving economic growth or competitiveness, while also achieving the underlying objective of prioritising local firms while excluding foreign competitors. However, data protectionism has proved to be counterproductive in today's digital economy, causing lower domestic economic growth and reduced exports.[5]

Security is often the main concern when discussing cross-border data flow and the use of cloud computing systems which store and process data outside national borders. While there is a widely held perception that servers under one's roof are safer than servers stored abroad, there is little evidence to support the contention that data is safer when stored domestically. Data localisation requirements do not enhance security, they merely enhance the perception of control.

[2] https://www.brookings.edu/wp-content/uploads/2018/03/digital-economy_meltzer_lovelock_web.pdf
[3] http://www.ecipe.org/app/uploads/2014/12/OCC32014__1.pdf
[4] https://www.brookings.edu/wp-content/uploads/2018/03/digital-economy_meltzer_lovelock_web.pdf
[5] https://www.brookings.edu/wp-content/uploads/2018/03/digital-economy_meltzer_lovelock_web.pdf

Control over data is not lost when storing data in the cloud. Cloud technology providers are held to global privacy and security standards and compliance requirements, with some cloud providers extending the protection afforded by the European Union's General Data Protection Regulation to technology users around the world.

The OECD has estimated that data access and sharing could generate benefits worth between 0.1% and 1.5% of GDP in the case of public-sector data, and between 1% and 2.5% of GDP when also accounting for private-sector data[6]. National policies should encourage data sharing while paying attention to data privacy and security. Cloud systems and their intelligence capabilities, such as artificial intelligence and machine learning, are critical in this respect. The cloud system should be fit for purpose for businesses, and it should be capable of being used nationally and internationally.

A perspective from Singapore:
Sovereignty over personal data and how Singapore manages it, from *personal vs statistical* perspectives

Data is a public good, and there are specific concerns about its sharing and usage. People in Singapore are aware of their data's value and contributions, and concerns are minimal when the data is anonymised. However, concerns increase in instances where personal data is collected and not anonymised, because of the need to identify certain information or trends. Such concerns were heightened during the pandemic, and there were also challenges relating to contact tracing data - not only in Singapore, but in many countries around the world. This demonstrated the need to involve citizens' perspectives in decision-making. For example, in data governance, in the context of health data, there is a need to engage the community to understand what amounts to trustworthy data governance, what they feel is acceptable, and how to make citizens owners in the process.

Regarding data privacy, the starting point is often that people are uncomfortable with sharing their data, and this can result in *harmful distrust* – therefore, it is necessary to not only educate members of society, but also enable them to play a role in crafting policies and frameworks related to data governance, data collection, data storage and data usage. Overall, there is a need to increase citizen engagement, and there is great potential for governments in the region to leverage this.

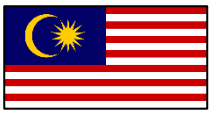
We have learnt that participatory democracy results in a high level of trust in governments' use of data. People understand what their data is being used for, and thus are more likely to share their data. The emphasis here is on transparency of how data is used, and openness will help win people over.

[6] https://www.oecd-ilibrary.org//sites/90ebc73d-en/index.html?itemId=/content/component/90ebc73d-en#

ASEAN Perspectives on Cross Border Data Sharing

ASEAN digital ministers acknowledged the criticality of data at the January 2022 Digital Ministers' meeting. They talked about the best practices and models for cross-border data flows, particularly the importance of data management and cross border data flows to boost our ability to seize opportunities in the digital economy. In that respect, there is a need to think about facilitating data sharing in a trusted manner and articulating principles in a way that converges policy, technology, and the sometimes diverging opinions of business groups and national governments.

From the cybersecurity perspective, there is a need to keep national security interests in mind. This is particularly important as there can be no national security without cybersecurity. ASEAN economies are growing, and countries share a wide variety of interests as connectivity increases. The countries are more closely linked than before, and there is great benefit in understanding shared issues, interests, and potential uses of data for the region's advantage.



Malaysia

Across ASEAN, healthcare is heavily regulated, and transborder data sharing has continued to be a challenge. Malaysia has recently created a digital health subgroup within ASEAN with the aim to develop principles and guidelines on data sharing and data governance.

When Malaysia was deliberating on its digital framework for the next ten years, there was a need to anchor it on basic principles related to **data governance and data stewardship**, which did not need to be considered five years earlier. A consultative approach involving citizens will be employed as Malaysia moves forward, particularly in **developing trust and striving to provide privacy, security, and confidentiality**. This will be implemented in the development of a blueprint for Malaysia Healthcare System Reform – to be introduced as part of the 12th Malaysia Plan, towards advancing transformation and resilience, charting the way forward for national healthcare system transformation.

Indonesia

President Joko Widodo shared that during the pandemic, **digital technology was one of the clear winners which enabled continued innovation and solutions to meet societal needs**. The Government's leadership in digitalising micro enterprises and *warungs* was one example of a truly transformative effort to increase economic resilience and convert digital divides into digital dividends. This has been a continuing effort through various initiatives including Microsoft's partnership with *Bukalapak*, a home-grown Indonesian technology company which enables more than 12 million micro, small and medium enterprises, and 100 million customers.

Singapore

The critical consideration is the value governments bring to citizens and businesses. From the government's point of view, people want more personalized services, and the government would need data to enable this. From ASEAN's perspective, there are immense opportunities for innovation within the region. For example, for seamless regional trade, Trade-tech could help verify digital identity, enable e-invoicing, and close the loop with payments. It will benefit incumbent firms and lower the barriers for smaller firms to participate in regional trade.

There are two crucial components to accomplish regional data sharing - **Governance and infrastructure.** As governments digitally transform and increase investments in digital infrastructure, there is a parallel need for **investment in regulatory modernisation and skilling** – this will advance the development of resilient societal, digital, and institutional infrastructure.

Philippines

The Philippines has been working with other governments and regulatory bodies in ASEAN, to craft new domestic policy and regulatory frameworks that facilitates data sharing, and some sectors have already started this journey – towards a **data-driven, data informed, and agile public service**. Part of the continued push for universal healthcare is the government's thrust for a National Health Data Repository, and among the enablers for financial inclusion in the country is the adoption of the Open Finance Framework[7] of the Central Bank, Bangko Sentral ng Pilipinas'. It espouses **consent-driven data portability, interoperability, and collaborative partnerships** among financial institutions and third-party providers. The National Strategy for Financial Inclusion (NSFI)[8] seeks to develop a framework for collecting and sharing agriculture and MSME data for credit evaluation to enhance the financing ecosystem.

Vietnam

Digital infrastructure plays a key role in the digital economy. **In Vietnam, the government prioritizes digital infrastructure on the investment agenda to support the digital economy, which will reach 20 per cent of Vietnam's GDP by 2025.** The Ministry of Information and Communication prioritises investment in high-quality mobile broadband infrastructure and deploying 5G network nationwide. The government has already issued pilot 5G licenses in eight provinces and is expected to start commercial deployment in 2022. In 2023, the goal is for each citizen to have a smartphone, and for each household to have access to 5G broadband internet access.

[7] https://www.bsp.gov.ph/Regulations/Issuances/2021/1122.pdf
[8] https://www.bsp.gov.ph/Pages/InclusiveFinance/NSFI-2022-2028.pdf

Vietnam has managed to turn the global health and economic crisis into an opportunity for digital development: in 2020, the e-commerce market grew by 16 per cent and reached a scale of over USD 14 billion. The average growth rate in 2020-2025 is predicted to be 29 per cent and reach the scale of USD 52 billion. Many SMEs are moving business online, and there is a rise of domestic e-commerce platforms, like Postmart and Voso that support farmers; these platforms enabled farmers to share 1000 tons of agricultural products.

A trusted, responsible, and inclusive digital strategy will form the foundation necessary to meaningfully unlock potential, build resilience, and develop the digital economy. There is much to be done at local, national, and regional levels, and the journey is just beginning, as we strive to amplify human ingenuity and create economic opportunities in the new normal.

As countries in the Asia-Pacific continue to work towards the development of digital-first policies to unlock the value of data, below are key lessons and takeaways from the policy dialogue:

- There is growing, widespread recognition that data access and sharing can generate benefits to society, governance, and the economy, resulting in increased GDP growth, innovation, and trust.

- Governments play a critical role in leading by example in how they share their own data sets and demonstrate benefits of data sharing.

- Data agreements and technical standards drive collaboration, interoperability, and usability.

- Policies developed in the analogue era must be modernized to avoid force-fitting into scenarios not envisioned at the time of drafting.

- The impact of data sharing can be far greater once data is able to be accessed and shared across borders.

- Increased cooperation and policy interoperability will enable greater shared benefits of digital trade across the region.

  Today's trade routes are digital, and digital infrastructure forms the highways and railway tracks of the 21st century. The digital economy is equivalent to 15.5% of global GDP, growing two and a half times faster than global GDP over the past 15 years.

  Consequently, there is a need to develop future-proof policies and sustain enabling environments to advance the nation and region's economic competitiveness as governments unlock the potential of data estates and national digital infrastructure in building social and economic resilience.

Policy Recommendations

During the discussion, participants shared policy recommendations on data governance in the digital economy. As Chatham House Rules applied during the APAC Leaders Digital Alliance, participants are not named in this paper, and recommendations are not attributed to individuals.

1. Data Governance: Management and Classification vary based on how governments define data and set boundaries to data collection, handling, and disposal. The participants highlighted two guiding principles: *First*, **data is an asset** and value can be extracted for the improved wellbeing of residents, citizens, and corporations. On the other hand, **data is a liability** in terms of safekeeping – the more data is collected, the higher the responsibility for handling data in terms of increased cybersecurity in data governance, maintenance, and disposal. *Second*, data can be open or managed **to enable innovation, particularly in civil society and academia**; but guardrails should be implemented. For instance, risk-based data classification would allow governments to categorise their data and ensure appropriate mechanisms are put in place to keep data secure.

   Proper, risk-based data classification of government data ensures that data is handled based on the potential impact to national security in the event that data is compromised or lost. Unfortunately, it is observed that many government agencies default to classifying all or most of their data as State Secrets. Overclassifying and overprotecting data has serious implications for cost and overall efficiency. In addition to the impact to innovation and data-driven decisionmaking, each increased level of classification results in increased infrastructure costs, security costs, and information management overheads.

2. Policy Imperatives for Digital Economy. The participants highlighted five considerations as governments develop digital-native policies for national recovery:

   a) **Specificity**. As digital maturity and development needs vary among organisations – from micro-enterprises to large corporations – it is crucial to define the scope and applicability of the policy. This considers the need for more nuanced policies to address the differing needs of organisations.

   b) **Sector-based maturity**. For example, digitalisation in the social services sector lags behind compared to finance or healthcare industries.

   c) **Cross-sector synergy**. The consideration of broader interconnectedness is important: for example, social services are connected to the healthcare sector in terms of complete end-to-end services that can be provided. This requires government systems and policies to be connected and interoperable, moving away from legacy systems which are often siloed.

d) **Cross-border connectedness** – bringing the national digital economy beyond geographical boundaries. However, the participants voiced a note of caution on this point, stemming from the review of multiple regional and national digital roadmaps.

   In the absence of cross-border policy interoperability and digital connectivity, digital transformation initiatives are often short-lived, resulting in digital optimization rather than digital transformation. Digital transformation aims at capturing new growth opportunities, while optimization aims at increasing the efficiency of existing opportunities. Increased cross-border connectedness will allow for greater economic growth and shared digital dividends.

e) **Digital Skills**: **Skills are the building blocks of the post-COVID economy, and partnerships will be critical in this regard.** In Indonesia, the Government partnered Microsoft to provide digital skills certifications for 615 000 individuals as of December 2021. Democratising digital skills will have transformational effects on the lives of local communities and individuals, particularly those among us who are yet to be active participants in today's digital economy.

3. On a more granular level of policy implementation, the participants emphasized the importance of **including measurable outcomes and key performance indicators (KPIs) in tender specifications** for digital projects. Currently, 80 to 90 per cent of digital technology tenders released by governments in the past two years, focus on technical specifications, not outcomes; 50 to 70 per cent of projects do not include measurements or metrics to assess project success.

4. Tender specifications should also reflect the increased adoption of cloud computing and the roles of privacy and security as we move towards increasingly digital governments.

5. Anchored on People: People have built-in resilience mechanisms, and this was observed in pandemic responses across the region. Based on a recent report, between March 2020 and September 2021, a net of 30,000 new firms were created in Singapore, predominantly in professional services, wholesale trade and retail, as opposed to industries based on conventional earned income. This shift in sector composition suggests that people are adjusting to the pandemic-induced crisis and their digital needs change. Therefore, the policy imperative is to help these new enterprises take shape and grow.

6. Cross-sector Collaborations. The academic sector plays an important role in economic development by creating and testing new technologies. Many **educational institutions are testbeds for pilot technological projects,** and can be part of government tenders to spur innovation, for citizen-centric use cases, to fail fast, and innovate even faster – such as Thammasat University and Chulalongkorn University in Thailand, Nanyang Technological University, National University of Singapore, and Singapore University of Technology and Design, and Indonesia's Institut Teknologi Bandung, Universitas Katolik Atmajaya, and Universitas Indonesia.

Moreover, collaboration between the private sector and academia may bring in new **upskilling opportunities for students** by offering industry-driven technology platforms to practice and get familiarised with industry standards. **Governments can provide real-world use cases and support the initiatives of local communities** to provide access to digital resources and services, e.g., apps to fact-check and debunk false information, and developing solutions to translate healthcare information for migrant workers.

7. Addressing the Digital Divide. It is crucial to consider the existing digital divide in terms of access to hardware and software, as well as digital skills and adoption. **Different policies may be needed depending on the socio-economic status of the targeted households**.

   For instance, according to a 2021 World Economic Forum report, only 30 per cent of the population of lower-income economies had basic digital literacy skills, compared to 60 per cent in higher-income economies. Population from lower socioeconomic households are more likely to believe in fake news. Moreover, children in lower-income families were reported to use digital more for content consumption, whereas their peers from high-income families engaged in more content creation using the technology.

   Furthermore, **certain groups of workers may be marginalized when it comes to digital upskilling**. For example, national and global conversations on developing digital skills and competencies pay disproportionally little attention to gig workers. To tackle this gap, the Lee Kuan Yew School of Public Policy at NUS, together with SkillsFuture, are looking at how to build digital competency among workers with flexible working arrangements.

Global Trends in Digital Development

Zooming out of the specificities of policy recommendations, it is also important to consider the emerging macro trends shaping digital economy development, and how they may influence national and regional policy processes. The International Data Corporation (IDC) highlights the following trends:

1. *Digital Government*. There is a growing trend of **automation** across public sector agencies, especially in creating digital services with personal applicable focus, such as automated filling up of tax and healthcare forms. Next, by 2024, 30 per cent of governments will double investments into data protection, governance and sharing capabilities to create a **digital government-industry ecosystem.** Further, governments are stepping up national security by expanding **zero-trust architecture** by 50 per cent. Finally, by 2025, 70 per cent of government agencies will support a hybrid workforce at scale.

2. *Smart Cities and Local Governments.* Due to the increasing prevalence of hybrid work, there is a need to **reimagine the spaces for work, life, and play** to balance health, energy use and service delivery in a sustainable way. This is particularly evident in the development of smart cities and smart economic hubs, i.e., the digital transformation and economic transformation of peri-urban or rural areas.

3. *Health Industry.* By 2027, 60 per cent of healthcare professionals and 20 per cent of households will **be able to access healthcare services from home**, powered by intelligent speech recognition, sensors, and/or gesture-based controls. Meanwhile, by 2023, governments will **develop regulations for health data sharing.**

4. *Education.* Prolonged remote learning has prompted 60 per cent of leading institutions to develop **new digital content and pedagogy** for both online and hybrid learning. Further, 70 per cent of education institutions will access partnerships with technology companies for connectivity, devices, and skills training to **close the digital divide**.

5. *Life Science.* Enabled by the expanded healthcare ecosystem, care and medical research will move beyond clinical endpoints; the number of **integrated research organisations** will double by 2027. By 2023, 75 per cent of life science manufacturers will invest in **intelligent supply chain solutions** to enhance supply chain resilience.

6. **To ensure the "stickiness" of the digital progress** of the past two years, all sectors will tackle three cross-cutting considerations: digital, social, and personal **security**, **supply chain** to manage resourcing for digital transformation, and **sustainability** in services financing and procurement.

Closing thoughts

While the pandemic has been both a great divider and a great equalizer, offering us an opportunity to reset and rebuild with greater inclusion and resilience, today's conversation has provided a clear reminder of the possibilities that can be realized when we come together to enable a more inclusive and resilient digital future.

In our conversations with governments across the world, skills, cybersecurity, digital policies, and data have been at the centre of transformation journeys, as innovation continues to occur at an incredibly rapid pace. This has resulted in the evolution of systems and concepts which have existed for decades, if not centuries. Throughout this evolution, people have been the common denominator, and in this instance, it is *people* who will drive secure and resilient digital transformation.

Which is why our mission is deeply inclusive: to empower every person and organization on the planet to achieve more.

Beyond economic growth, the greatest value of digital is its ability to improve resilience, social equality, and stronger footholds in the global economy – and it is for this reason that we believe digital *is* economy.

As the fuel that drives the digital economy, the pandemic has highlighted the powerful role that data can play. Every aspect of this pandemic has required a new level of data capability, by governments, by businesses, and by countries everywhere across the world, and this shows us the way forward. It doesn't matter what the problem is – there is a good chance that the better use of data will be part of the solution.

We must bear in mind that increased technology adoption does not automatically result in a dystopian or utopian world, and both our participation and resulting benefits from the digital economy depend on the combined robustness of our digital policies, talent, and infrastructure.

We want to be part of *not just* the conversation, *but of this cause*, using data, technology, and skills to democratize economic resilience and opportunity for all of us in the region, and across the world.

Conclusion

In the context of the global pandemic crisis, growing inequality, skills mismatch, and climate change, the adoption of cloud and AI-based technology is a crucial component of economic recovery and development. This technology is versatile: it can enhance growth in high-income countries, and facilitate growth and enable us to meet the SDGs, which lower- and middle-income countries acutely need.

The APAC Leaders Digital Alliance gathered policymakers, practitioners, and academics for an inaugural discussion on harnessing the power of data for national recovery. Representatives from Microsoft, World Bank, and IDC shared their expertise on technological aspects of digital growth and trends affecting numerous industries touching almost every aspect of human life. The government representatives shared their plans and experience on data management and facilitation of digital economy growth and development in countries across ASEAN.

The participants first discussed data management and addressed several critical questions. *Who owns the data: the individual, the company, or the state? How much data should be shared without jeopardizing the individual privacy and security? How much data should be shared to extract meaningful insights to use for improving citizen's wellbeing?* The participants discussed data as both an asset and a liability, and shared best practices relating to cybersecurity. The discussion extended to the cross-border sharing of data, as well as accompanying opportunities and challenges.

Next, the participants shared about the regulatory frameworks for digital economy development in Malaysia, Indonesia, Vietnam, Singapore, and institutional and regulatory support provided to business entities. Much attention was paid to bridging the digital divide, especially in digital skills development. The discussants shared ideas on cross-sector collaborations, such as public-private partnerships for building digital infrastructure, and academic and business cooperation for digital-native policies and continuous education.

It was a rich discussion on pressing topics with the aim to continue the conversation on APAC digital development through this ongoing series of policy dialogues. Multiple topics, such as COVID-19 exit strategies, SMEs were not covered in depth due to time limitation; however, while this inaugural summit only scratched the surface of the digital economy, participants were in agreement that the conversation must continue, as we work to maximise the potential of digital technology to transform lives and catapult nations into a digital post-COVID era.

As we journey on, let us use this as an opportunity to commit ourselves to put technology to work, in addressing both the opportunities and challenges presented by the digital age.

We look forward to collaborating, learning, and iterating together, towards a sustainable, resilient, and inclusive digital future.

Appendix – List of Presenters (in order of presentation)

1. *Professor Danny Quah*, Dean and Li Ka Shing Professor in Economics, Lee Kuan Yew School of Public Policy, National University of Singapore

2. *Andrea Della Mattea*, President, Microsoft Asia-Pacific

3. *Jean-Philippe Courtois*, Executive Vice President and President, National Transformation Partnerships, Microsoft

4. *Dr. Julia Glidden*, CVP Public Sector Microsoft

5. *Professor Tan Chuan Hoo*, Associate Professor and Deputy Head (Administration and Research), NUS School of Computing

6. *Gerald Wang*, Director, Asia Pacific Public Sector, IDC Government Insights and IDC Health Insights, IDC Asia Pacific

7. *Natasha Beschorner*, Senior Digital Development Specialist, World Bank

8. *Dr. Carol Soon Wan Ting*, Principal Investigator at the NUS Centre for Trusted Internet and Community and Senior Research Fellow, Institute of Policy Studies, National University of Singapore