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Resiliency in a Post-Pandemic APEC: Approaches to Driving Growth in Digital Services

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KEY MESSAGES

- Services is arguably the hardest-hit sector during the COVID-19 pandemic. This is particularly true for services that traditionally have required in-person contact. Changing consumer preferences and government containment measures made operations challenging for such businesses. The difficulties prompted people and businesses to turn to digital services.

- One way of estimating digital services is by categorising certain existing services categories (e.g., telecommunications, financial, professional and management consulting services) as digitally deliverable services (DDS). Collectively, APEC contributes more than one-third of global DDS exports in 2020.

- Services trade data show that digitalisation has been one of the ways used to strengthen resiliency during the pandemic. Pre-pandemic, growth in DDS trade had already outpaced non-DDS trade. The pandemic accelerated this trend. DDS trade in the APEC region grew by 1.2 percent between 2019 and 2020, while non-DDS trade contracted sharply, by 43.6 percent, over the same period.

- There are at least three ways for digitalisation to improve services trade resilience amid the pandemic: (1) minimising reliance on physical proximity; (2) improving efficiency and productivity; and (3) reimagining services delivery to create new opportunities.

- The transition to providing services digitally, however, is not an easy one to make. Many factors have to come together. The ability to access and make use of relevant technologies is critical to participate in and benefit from the digital economy. A supportive regulatory environment is also important in accelerating the move toward the digital economy.

- Appropriate policies have a strong role to play in growing digital services. Policymakers could consider enhancing digital literacy and digital skills, and adopting innovative approaches to overcome digital access issues. Employing a holistic approach to domestic regulation, tackling regulatory heterogeneity, leveraging regional cooperation and improving the availability of reliable statistics are also critical.

The COVID-19 pandemic has had a devastating impact on global trade; and services is arguably the hardest-hit sector. This is particularly true for services that traditionally have required in-person contact (e.g., professional and tourism services) since changing consumer preferences and government containment measures had made operations challenging during the pandemic. These difficulties prompted people and businesses to adopt new solutions at an unprecedented speed, including digitalising services delivery.

This policy brief explores the convergence between digitalisation and services, and how that intersection can make an economy more resilient to shocks. It analyses some of the available services statistics, highlights the role of digitalisation in services access and provision, and offers policymakers a set of recommendations to drive growth in digital services.

What Happened to APEC's Services Sector during the Pandemic?

The services sector is critical to many economies. In addition to being a sector in its own right, services act as a glue to ensure the proper functioning of global value chains (GVCs) as well as other parts of the economy. In a majority of APEC economies, services make up more than half of their GDP and total employment.[1]

Commercial services exports originating from APEC economies have generally increased over the last decade, thereby providing opportunities for economic growth. These gains, however, were reversed when the COVID-19 pandemic struck in 2020, causing services trade to plummet by 22.3 percent – representing more than double the decline following the 2008 financial crisis. [2] In comparison, the value of merchandise trade fell by around 4.7 percent (exports) and 6.3 percent (imports) in 2020.[3]

These contractions have important implications for APEC's mission toward building inclusive growth. After all, micro, small and medium enterprises (MSMEs) comprise over 98 percent of businesses in most APEC economies, and most of these MSMEs are engaged in services, such as wholesale and retail trade, business services, maintenance, logistics, construction, and information and communications technology-related activities.[4] MSMEs also account for over 60 percent of total employment in the majority of APEC economies, and above 80 percent in several of those economies.[5] From the gender perspective, two-thirds of women are engaged in services activities, significantly higher than in the agriculture and manufacturing sectors.[6]

As businesses (including MSMEs) scrambled to adapt their business models to ones that could circumvent (or at least reduce) the need for physical interactions, one solution has been to shift activity online (e.g., offering services digitally).

Understanding the Proliferation of Digital Services in APEC

Measuring digital services from the lens of digitally deliverable services

Understanding the role and importance of digital services requires having sufficient information and statistics about it. However, there is currently no agreed global definition of what constitutes a digital service. One way of estimating digital services is by categorising certain existing services categories as digitally deliverable services (DDS)[7] and analysing

[1] APEC economies where services made up more than half of GDP from 2016 onwards are: Australia; Canada; Chile; China; Hong Kong, China; Japan; Korea; Malaysia; Mexico; New Zealand; Peru; the Philippines; Russia; Singapore; Chinese Taipei; Thailand; and the United States. APEC economies where services made up more than half of total employment from 2016 onwards are: Australia; Brunei Darussalam; Canada; Chile; Hong Kong, China; Japan; Korea; Malaysia; Mexico; New Zealand; Peru; the Philippines; Russia; Singapore; Chinese Taipei; and the United States. APEC, 'StatsAPEC', accessed 8 July 2022, http://statistics.apec.org/

[2] APEC Policy Support Unit (PSU) calculations based on the United Nations Conference on Trade and Development (UNCTAD), UNCTADStat data.

[3] APEC, 'APEC Regional Trends Analysis: Bolstering Supply Chains, Rebuilding Global Trade; Making Recovery Inclusive' (Singapore: APEC, May 2021), https://www.apec.org/docs/default-source/publications/2021/5/apec-regional-trends-analysis---may-2021/221_psu_arta_may_2021_final.pdf?sfvrsn=2d914ef5_1

[4] APEC, 'APEC Economic Policy Report 2016' (Singapore: APEC, 2016), http://www.apec.org/publications/2016/11/2016-apec-economic-policy-report

[5] APEC, 'Overview of the SME Sector in the APEC Region: Key Issues on Market Access and Internationalization' (Singapore: APEC, 2020), https://www.apec.org/docs/default-source/publications/2020/4/overview-of-the-sme-sector-in-the-apec-region---key-issues-on-market-access-and-internationalization/220_psu_sme-market-access-and-internalization.pdf?sfvrsn=2758bd1_1

[6] APEC, 'APEC Economic Policy Report 2016'.

[7] These services categories include those that are inherently digital services (e.g., telecommunications) and services whose ability to be traded internationally would be enhanced by digital tools (e.g., business services and financial services). This methodology has its limitations. For example, it may overestimate the role of digitalisation in the delivery of such services because although all DDS can be digitally delivered, not all of them are digitally delivered in practice. It also does not consider the role of digitalisation in services categorised as non-DDS.

how trade in these DDS has changed over time.[8] Table 1 shows DDS categories based on the approach adopted by the Asian Development Bank (ADB), which had itself built on a framework by the Organisation for Economic Co-operation and Development (OECD), World Trade Organization (WTO) and International Monetary Fund (IMF).[9]

Table 1. Overview of DDS and non-DDS categories

EBOPS 2010 Code and Service Description[a]		DDS
SA	Manufacturing services on physical inputs owned by others	
SB	Maintenance and repair services, n.i.e.	
SC	Transport	
SD	Travel	
SE	Construction	
SF	Insurance and pension services	Yes
SG	Financial services	Yes
SH	Charges for the use of intellectual property, n.i.e.	Yes
SI1	Telecommunications services	Yes
SI2	Computer services	Yes
SI3	Information services	Yes
SJ1	Research and development services	Yes
SJ2	Professional and management consulting services	Yes
SJ3[b]	Technical, trade-related and other business services	Yes
SK1	Audio-visual and related services	Yes
SK2[b]	Other personal, cultural, and recreational services	Yes
SL	Government goods and services, n.i.e.	

DDS=digitally deliverable services; EBOPS=Extended Balance of Payments Services classification; n.i.e.=not identified elsewhere

Note:

a. Values in this policy brief are taken at the parent category level due to data coverage issues at more detailed categories (i.e., numbered codes). Parent categories for these numbered codes are telecommunications, computer, and information services (SI); other business services (SJ); and personal, cultural and recreational services (SK).

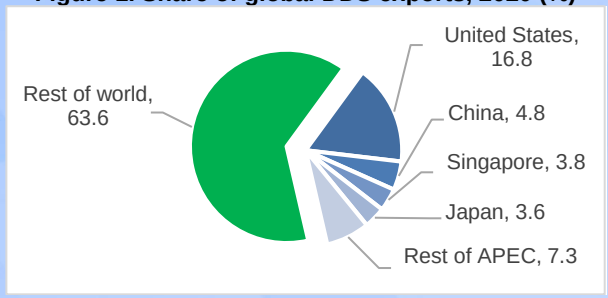
b. For SJ3, sub-categories such as waste treatment and de-pollution, agricultural and mining services (SJ32), operating leasing services (SJ33) and trade-related services (SJ34) are not considered as DDS. For SK2, sub-categories such as other personal services (SK24) are not considered as DDS. Although measuring services at the SJ and SK level in this policy brief means that these sub-categories are included, their traded values are negligible and should not affect the DDS trends.

Source: Adapted from Asian Development Bank (ADB), 'Asian Economic Integration Report 2022' (Manila: ADB, 2022), Table 7.1, https://www.adb.org/sites/default/files/publication/770436/asian-economic-integration-report-2022.pdf

APEC trade in digitally deliverable services

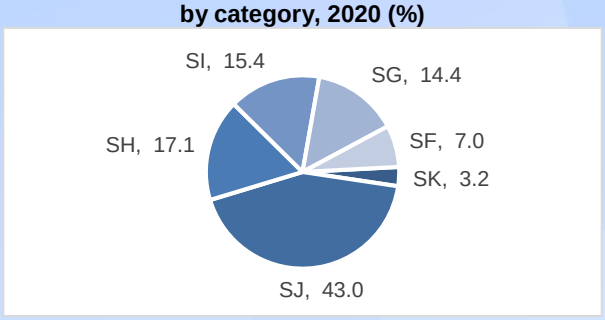
In sum, APEC economies contribute significantly to the global export of DDS in 2020 (Figure 1). Leading the APEC region is the United States, which accounts for approximately 16.8 percent of global export of DDS. This is followed by China (4.8 percent); Singapore (3.8 percent); and Japan (3.6 percent). The rest of the APEC economies collectively contribute about 7.3 percent.

Figure 1. Share of global DDS exports, 2020 (%)



DDS=digitally deliverable services
Note: APEC data do not include Brunei Darussalam; Hong Kong, China; Peru; and Viet Nam due to incomplete coverage.
Source: APEC Policy Support Unit (PSU) calculations based on UNCTADStat data.

Figure 2. Share of DDS trade in APEC by category, 2020 (%)



DDS=digitally deliverable services
Categories shown are:
SF=insurance and pensions services; SG=financial services; SI=telecommunications, computer and information services; SH=charges for the use of intellectual property, not identified elsewhere; SJ=other business services; SK=personal, cultural and recreational services.
Note: Data for Brunei Darussalam; Hong Kong, China; Peru; and Viet Nam are not included due to incomplete coverage. Calculated using total trade (exports and imports).
Source: APEC PSU calculations based on UNCTADStat data.

[8] The Organisation for Economic Co-operation and Development (OECD) defines DDS as 'international transactions that are delivered remotely in an electronic format, using computer networks specifically designed for the purpose'. DDS can be distinguished from digitally ordered trade, which refers to 'the international sale or purchase of a good or service, conducted over computer networks by methods specifically designed for the purpose of receiving or placing orders'. In practice, these two can have a significant overlap (i.e., DDS are often digitally ordered). See: OECD, World Trade Organization (WTO) and International Monetary Fund (IMF), 'Handbook on Measuring Digital Trade, Version 1' (OECD, 2020), https://www.oecd.org/sdd/its/Handbook-on-Measuring-Digital-Trade.htm

[9] Asian Development Bank (ADB), 'Asian Economic Integration Report 2022' (Manila: ADB, 2022), https://www.adb.org/sites/default/files/publication/770436/asian-economic-integration-report-2022.pdf; OECD, WTO and IMF, 'Handbook on Measuring Digital Trade'.

Disaggregating APEC trade in DDS by services categories, other business services took the lion's share in 2020 (43.0 percent), as shown in Figure 2. This is followed by: charges for the use of intellectual property, not identified elsewhere (17.1 percent); telecommunications, computer and information services (15.4 percent); and financial services (14.4 percent). Meanwhile, insurance and pension services comprise 7.0 percent while personal, cultural and recreational services account for 3.2 percent.

Digitally deliverable vis-à-vis non-digitally deliverable services

Comparative data for the APEC region show that DDS trade in the APEC region grew by 1.2 percent between 2019 and 2020, while non-DDS trade contracted sharply, by 43.6 percent, over the same period. Table 2 shows in more detail the growth of DDS and non-DDS trade in APEC. All non-DDS services categories showed negative growth between 2019 and 2020. Travel services was the hardest-hit category, declining by 63.8 percent. This is followed by maintenance and repair services, not identified elsewhere (−46.3 percent); manufacturing services on physical inputs owned by others (−37.8 percent); and transport services (−20.5 percent).

Table 2. Growth of DDS and non-DDS trade in APEC (%)[a]

Services categories	2010–2019[b]	2019–2020
All DDS	**6.6**	**1.2**
SF: Insurance and pension services	0.5	7.2
SG: Financial services	6.5	5.2
SH: Charges for the use of intellectual property, n.i.e.	4.1	0.4
SI: Telecommunications, computer and information services	10.9	5.3
SJ: Other business services	7.9	(1.7)
SK: Personal, cultural and recreational services	7.4	(0.6)
All non-DDS	**4.3**	**(43.6)**
SA: Manufacturing services on physical inputs owned by others	0.9	(37.8)
SB: Maintenance and repair services, n.i.e.	10.4	(46.3)
SC: Transport	2.1	(20.5)
SD: Travel	6.6	(63.8)
SE: Construction	2.2	(15.4)
SL: Government gods and services, n.i.e.	0.3	(3.0)

DDS=digitally deliverable services; n.i.e. = not identified elsewhere.
Note:
a. Negative values are in parentheses. Growth rates were calculated using total trade (exports and imports). APEC data do not include Brunei Darussalam; Hong Kong, China; Peru; and Viet Nam due to incomplete coverage.
b. Based on compound annual growth rate.
Source: APEC PSU calculations based on UNCTADStat data.

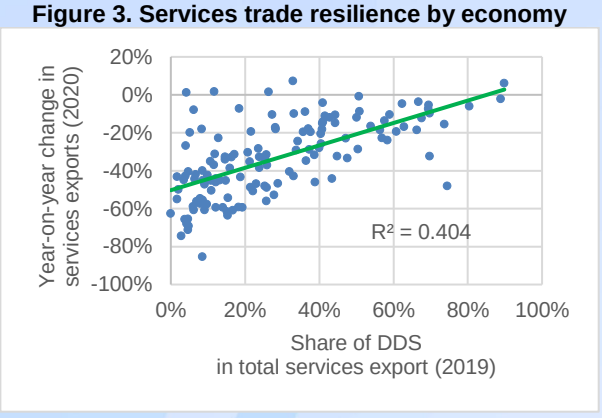
In comparison, only two DDS services categories registered (minimal) drops of 0.6 percent (personal, cultural and recreational services) and 1.7 percent (other business services). Moreover, the rest reported positive growth rates, namely: insurance and pension services (7.2 percent); telecommunications, computer and information services (5.3 percent); financial services (5.2 percent); and charges for the use of intellectual property, not identified elsewhere (0.4 percent).

With economies reopening and reconnecting with each other, the preference to do things on-site may return. The increase in the trade of DDS may have been a one-off event driven by COVID-19, and would plateau or even fall as economies reopen. However, there are grounds for observing that digitalisation is fast spreading and is here to stay. For example, the convenience of telehealth services, of joining meetings via Zoom or Microsoft Teams, and of accessing financial services online, including making e-payments, suggests that such services would be unlikely to fade as economies reopen. In fact, trade in DDS had gained traction even before the pandemic. Table 2 shows that DDS trade had grown at a compound annual rate of 6.6 percent between 2010 and 2019. In contrast, non-DDS trade registered a comparatively lower growth rate of 4.3 percent over the same period.

Services Trade Resilience amid the COVID-19 Pandemic

The disruptions caused by the pandemic has put resilience in the front and centre of many economies' strategies. In the context of services, digitalisation has proven to be a significant way of strengthening resiliency.

Figure 3. Services trade resilience by economy



DDS=digitally deliverable services
Source: APEC PSU calculations based on UNCTADStat data for 134 economies (including 18 APEC economies).

Indeed, a simple correlation analysis between the share of DDS in economies' total services export pre-pandemic (i.e., 2019) and the year-on-year change in services exports during the pandemic (i.e., between 2019 and 2020) shows a positive relationship between the two measures (Figure 3).

How does digitalisation improve the resiliency of services trade in response to COVID-19? There are at least three ways, namely: (1) minimising reliance on physical proximity; (2) improving efficiency and productivity; and (3) reimagining services delivery to create new opportunities.

Minimising reliance on physical proximity

Containment measures and health safety protocols implemented during the COVID-19 pandemic had severely limited in-person services delivery, such as in the case of professional and tourism services.[10] Digital services, however, were more resilient since they could be accessed and provided without (or with less) physical proximity. In fact, a survey in the Middle East and Central Asia region revealed that digitally enabled firms experienced a relatively lower decline[11] in sales compared to digitally constrained firms during the pandemic.[12]

The Islamic Food and Nutrition Council of America,[13] for instance, demonstrated its resilience by implementing virtual halal audits, particularly for firms where all aspects of the process (i.e., ingredients to packaging) are already halal-certified.[14] Another example would be firms that began offering virtual tours, hence enabling customers to remotely visit museums, tourist sites and other locations using videoconferencing software.[15]

Researchers in various fields (e.g., automotive, biomedical, energy storage) also benefited from services that were provided remotely. For instance, Exponent offered remote, real-time laboratory testing and inspection services by utilising video cameras, videoconferencing software and secure streaming capabilities.[16]

Moreover, digital services, including those that were already in use pre-pandemic, proliferated as businesses and consumers adapted to highly restricted in-person operations. Mobile wallets and contactless payment options are some examples of services that gained more traction. In fact, mobile-first economies in Southeast Asia enjoyed more financial connectivity as 'super apps' (e.g., GCash, Momo and GrabPay) increasingly offered different financial products such as 'buy now, pay later' schemes and real-time cross-border payments.[17]

Improving efficiency and productivity

Utilising digital technologies to better manage services delivery can help improve efficiency and generate higher productivity. One example is how Bouygues Construction utilised a digital project management platform to improve its efficiency in providing engineering and construction services.[18] The platform enabled company employees and supply chain partners to utilise real-time project data throughout the lifecycle of a building or structure. In a similar vein, the tools and solutions developed by PwC Singapore, as part of its digital transformation across functions and practices, have enabled the firm to clock more than 47,000 hours of time savings in two years and helped its

[10] Note that tourism can be categorised either as a 'travel service' or as a 'personal, cultural and recreational service'. The difference lies in whether the consumer is a resident or a non-resident as well as whether the consumer enjoys the service on-site or remotely from the service provider. 'Travel services' are those activities that non-residents enjoy on-site from the service provider. See: Australian Bureau of Statistics, 'Categories of International Trade in Services Statistics (Reference Period: Deember 2021)', 9 December 2021, accessed 23 July 2022, https://www.abs.gov.au/statistics/detailed-methodology-information/concepts-sources-methods/international-trade-services-concepts-sources-and-methods/dec-2021/categories-international-trade-services-statistics

[11] About four percentage points lower compared to digitally constrained firms.

[12] N. Abidi, M.E. Herradi and S. Sakha, 'Digitalization and Resilience: Firm-Level Evidence during the COVID-19 Pandemic', IMF Working Papers, IMF, 18 February 2022, https://www.imf.org/en/Publications/WP/Issues/2022/02/18/Digitalization-and-Resilience-Firm-level-Evidence-During-the-COVID-19-Pandemic-513169

[13] They have operations in about 70 economies.

[14] 'Virtual Halal Audits during COVID-19 on "Case-by-case" Basis', says IFANCA', Salaam Gateway, 8 June 2020, https://www.salaamgateway.com/story/virtual-halal-audits-during-covid-19-on-case-by-case-basis-says-ifanca

[15] L.B. Bloom, 'Ranked: The World's 15 Best Virtual Tours to Take during Coronavirus', *Forbes*, 27 April 2020, https://www.forbes.com/sites/laurabegleybloom/2020/04/27/ranked-worlds-15-best-virtual-tours-coronavirus/?sh=44b966d66709

[16] Exponent, 'Remote Laboratory Testing and Inspections', accessed 23 July 2022, https://www.exponent.com/services/practices/engineering/thermal-sciences/capabilities/additional-services/remote-laboratory-testing-and-inspections/?serviceId=04fc2d78-b3ef-446a-8374-6c1695846f00&loadAllByPageSize=true&knowledgePageSize=7&knowledgePageNum=0&newseventPageSize=7&newseventPageNum=0&professionalsPageNum=1

[17] McKinsey & Company, 'Mobile Wallets: Southeast Asia's New Digital Life Hack', 25 May 2022, https://www.mckinsey.com/industries/financial-services/our-insights/mobile-wallets-southeast-asias-new-digital-life-hack

[18] Deloitte, 'Winning with Connected Construction: Digital Opportunities in Engineering and Construction' (Deloitte, 2019), https://www2.deloitte.com/content/dam/Deloitte/us/Documents/manufacturing/digital-opportunities-in-engineering-and-construction.pdf

clients in many different ways such as better risk management and operations optimisation.[19]

Another way for firms to improve efficiency is by utilising digital technology to bundle products and services that complement each other.[20] IKEA, for instance, enhanced their customer experience by partnering with TaskRabbit to provide its customers with access to a network of freelancers who could help them assemble their IKEA products.[21] By doing so, IKEA was able to bundle a product (disassembled furniture) and a service (product assembly), potentially resulting in happier customers who are then more willing to spend.

Besides providing better services, incorporating DDS into existing operations can also help firms to reach a wider market. For instance, aside from providing investors with automated investment management options and quicker access to financial information, financial firms that offer robo-advisors on top of human financial advisors can potentially attract a wider range of investors.[22] In particular, robo-advisors could appeal more to passive and/or young investors compared to human financial advisors.[23] One evidence of the efficiency and convenience brought by robo-advisors could perhaps be seen in the increase of account holders during the pandemic.[24] Other examples of DDS include how artificial intelligence-powered chatbots helped save JP Morgan 360,000 hours annually and boosted Emirates Vacations' engagement rates by 87 percent.[25]

Elsewhere, studies have shown that firms in the hotel, restaurant, taxi and retail trade sector based in economies where online platform development is more advanced experienced a differentiated increase in total factor productivity.[26]

Reimagining services delivery to create new opportunities

Digital technologies have been changing some of the underlying characteristics of services (e.g., simultaneity of consumption and production and innovative services delivery), which leads to increased tradability and reduced trade costs. By reimagining how services are delivered, businesses are able to not only help people access essential services, such as health and education, but also to create new opportunities.

With many schools physically closed during the pandemic, students had to attend classes remotely – an abrupt shift that made it necessary for schools to reimagine how education is delivered. In China, students continued their studies through digital platforms such as Tencent K-12 Online School.[27] Education providers eventually offered a hybrid classroom setup that enabled education providers to comply with in-person restrictions during the pandemic as well as provide geographically distant students (e.g., international students) with the opportunity to take courses that would have been inaccessible with a traditional classroom model.[28]

During the pandemic, health services were made more accessible through telehealth services.[29] This service often took the form of virtual appointments that allowed doctors to virtually diagnose patients,[30] provide consultations (e.g., suggest home care strategies or recommend additional medical care for ongoing treatments) and prescribe medications via emails or text messages.

[19] PwC, 'Upskilling for a Digital World', accessed 5 July 2022, https://www.pwc.com/sg/en/case-study/upskilling-for-a-digital-world.html

[20] M. Opaso-Basaez, F. Vendrell-Herrero and O.F. Bustinza, 'Digital Service Innovation: A Paradigm Shift in Technological Innovation', *Journal of Service Management* 22, no. 1 (2022): 97–120, https://doi.org/10.1108/JOSM-11-2020-0427

[21] Whatfix, 'What is Digital Innovation? +Corporate Benefits & Examples', 15 September 2021, https://whatfix.com/blog/digital-innovation/

[22] T. Loudenback and R. Houston, 'The 5 Best Online Financial Advisors', *Business Insider*, 7 July 2022, https://www.businessinsider.com/personal-finance/best-online-financial-advisors

[23] J. Royal, 'Robo Advisors vs. Financial Advisors: How to Decide Which is Best for You', Bankrate, 4 May 2022, https://www.bankrate.com/investing/robo-advisors-vs-human-financial-advisors/

[24] 'Young Investors Drove Use of Robo-advisors during Pandemic', *Insider Intelligence*, 30 June 2021, https://www.emarketer.com/content/young-investors-drove-robo-advisor-use

[25] J. Maly, 'Chatbots Are Becoming More Efficient, the Results Couldn't Be Better', Digital Signage Today, 21 January 2022, https://www.digitalsignagetoday.com/blogs/chatbots-are-becoming-more-efficient-the-results-couldnt-be-better/

[26] A.B. Rivares et al., 'Like It or Not? The Impact of Online Platforms on the Productivity of Incumbent Service Providers', OECD Economics Department Working Papers 1548, OECD, 2019, https://dx.doi.org/10.1787/080a17ce-en

[27] C. Li and F. Lalani, 'The COVID-19 Pandemic Has Changed Education Forever. This Is How', World Economic Forum, 29 April 2020, https://www.weforum.org/agenda/2020/04/coronavirus-education-global-covid19-online-digital-learning/

[28] B. Schiano, 'Making the Most of the Hybrid Classroom', Harvard Business Publishing, 20 April 2021, https://hbsp.harvard.edu/inspiring-minds/making-the-most-of-the-hybrid-classroom

[29] Mayo Clinic, 'Telehealth: Technology Meets Health Care', 18 June 2022, https://www.mayoclinic.org/healthy-lifestyle/consumer-health/in-depth/telehealth/art-20044878

[30] There were challenges to these virtual diagnoses though. For instance, having good video quality and internet connection could be important for doctors to reach a correct diagnosis.

Beyond telehealth, recent advancements in robotics, computer technology and telecommunications have strengthened the possibilities of telesurgery, essentially conducting surgery remotely. [31] For instance, the world's first remote brain surgery was made possible by 5G network technologies and the Internet of Things overcoming video lags and remote-control delays.[32] In fact, the power of 5G[33] could inspire a reimagination of how healthcare providers deliver much-needed services to patients (e.g., delivery of drugs via unmanned aerial vehicles and novel apps powered by cloud-based softwarised network functions), especially those who are geographically constrained or residing in areas where certain medical expertise is unavailable.

One area, albeit arguably still in the early stage, that could potentially unleash new opportunities over the next decade or so is the metaverse, which refers to a digital universe powered by virtual reality (VR), augmented reality (AR) and video technology, among others. [34] Interest in the metaverse is expected to grow as VR and AR technologies advance. Meta (formerly Facebook), for instance, has already made a stake in the metaverse, with the company expecting to spend at least USD 10 billion in 2022 alone.[35] How video games are played, how education is received and how people interact with each other are just some of the activities that could be reimagined by the advent of the metaverse.

Drivers and Challenges of Digital Services

The transition to providing services digitally, however, is not an easy one to make. Many factors have to come together to bolster the transition. In the context of the digital economy, the ability to access and make use of relevant technologies is critical to participate in and benefit from it.[36] Having a supportive regulatory environment, including regulations pertaining to data governance, is also important in accelerating the move toward the digital economy.

Digital skills

To benefit from digitalisation, economies need to have a population equipped with the right digital skills and a sufficient level of digital literacy. Education has an important role as it is among the key drivers to developing digital skills and improving productivity.[37] A study of 129 NUTS 2 regions[38] in Europe (with a population between 800,000 and 3 million each) shows that local technological capacity is significantly dependent on the degree of formal education received by the region's inhabitants.[39]

One measure of the quality of education in the APEC region, and possibly the ability of their students to thrive in the digital economy, is the OECD Programme for International Student Assessment (PISA) in key subject areas (i.e., reading, mathematics and science). The assessment focuses on the ability of 15-year-old students to use their knowledge and skills to meet real-life challenges, including potentially succeeding in a digital world (e.g., validating information or navigating in a multiple-source environment). [40] Figure 4 shows that APEC economies vary on these measures. For example, the mean scores for reading range between 340

[31] H. Aliouche, 'What is Remote Surgery/Telesurgery?', News Medical, 11 November 2021, https://www.news-medical.net/health/What-is-Remote-SurgeryTelesurgery.aspx

[32] J. Loeffler, 'China's First-Ever 5G Remote Brain Surgery', Interesting Engineering, 9 June 2021, https://interestingengineering.com/china-performs-countrys-first-ever-5g-remote-brain-surgery

[33] Y. Siriwardhana et al., 'The Role of 5G for Digital Healthcare against COVID-19 Pandemic: Opportunities and Challenges', *ICT Express* 7, no. 2 (2021): 244–52, https://doi.org/10.1016/j.icte.2020.10.002

[34] M. Snider and B. Molina, 'Everyone Wants to Own the Metaverse including Facebook and Microsoft. But What Exactly Is It?' *USA Today*, 10 November 2021, https://www.usatoday.com/story/tech/2021/11/10/metaverse-what-is-it-explained-facebook-microsoft-meta-vr/6337635001/

[35] K. Leswing, 'Mark Zuckerberg Showed These Prototype Headsets to Build Support for His $10 Billion Metaverse Bet', *CNBC*, 21 June 2022, https://www.cnbc.com/2022/06/21/mark-zuckerberg-shows-early-metaverse-headsets-mirror-lake-holocake.html

[36] United Nations Conference on Trade and Development (UNCTAD), 'Digital Economy Report 2021' (New York: UN, 2021), https://unctad.org/system/files/official-document/der2021_en.pdf

[37] A. Dieppe et al., 'What Explains Productivity Growth', in A. Dieppe, ed., *Global Productivity: Trends Drivers and Policies* (Washington, DC: World Bank, 2021), Ch. 2, https://thedocs.worldbank.org/en/doc/687781593465323067-0050022020/original/GlobalProductivityChapter2.pdf; N. Berger and P. Fisher, 'A Well-Educated Workforce Is Key to State Prosperity', Economic Analysis and Research Network, Washington, DC, 22 August 2013, https://files.epi.org/2013/A%20well-educated%20workforce%20is%20key%20to%20state%20prosperity.pdf

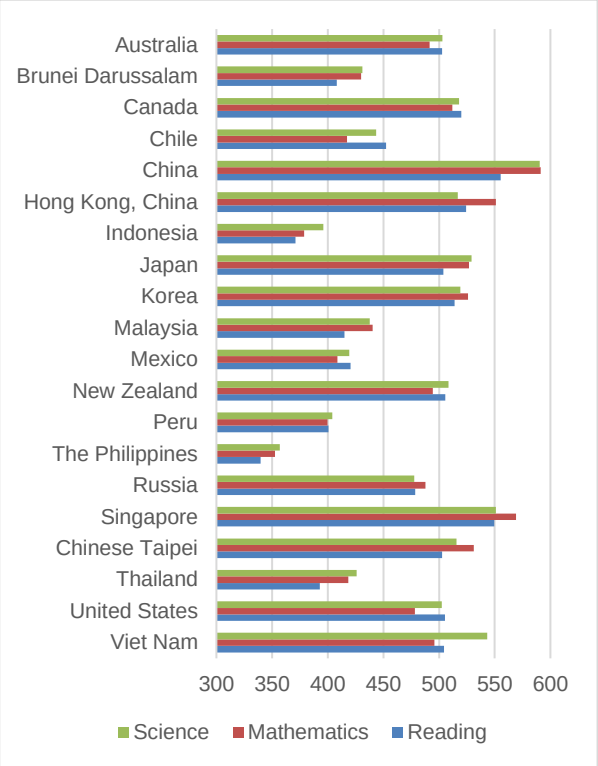
[38] The European Union follows the Nomenclature of Territorial Units for Statistics (NUTS) to divide economic territories into regions, thereby facilitating better framing of data. The NUTS 2 socioeconomic category divides the region into basic areas for the application of regional policies. See: European Commission, 'Eurostat: NUTS – Nomenclature of Territorial Units for Statistics: Background', accessed 10 June 2022, https://ec.europa.eu/eurostat/web/nuts/background

[39] D.N. Pena, V.R.L. Ruiz and J.L.A. Navarro, 'An Analysis of the Key Role of Human and Technological Development in the Smart Specialization of Smart European Regions', *Information Technology for Development* 26, no. 4 (2020): 728–41, https://doi.org/10.1080/02681102.2019.1704675

[40] OECD, '21st Century Readers: Developing Literacy Skills in a Digital World' (Paris: OECD, 2021), https://www.oecd.org/pisa/publications/21st-century-readers-a83d84cb-en.htm

and 555 while the mean scores for mathematics range between 353 and 591.

Figure 4. PISA mean scores by APEC economy



PISA=Programme for International Student Assessment
Note: PISA 2018 mean scores are shown. Data for Papua New Guinea are unavailable.
Source: APEC PSU calculations based on OECD PISA data, accessed 15 July 2022, https://statlinks.oecdcode.org/EDU-2019-4228-EN-T014.XLSX

Having digital skills is important in engaging with the digital economy. Equally important are the skills, both digital and non-digital, used to provide cross-border digital services. A key issue here is ensuring that the skills and qualifications attained in one economy are recognised in another. Those providing professional services underline why this is necessary. Without recognition of their qualifications and skills, they are unable to practise their profession and offer their services.

To address this, APEC member economies have made significant efforts to recognise qualifications from abroad, according to a 2020 APEC report. [41] However, the recognitions had tended to be narrow in scope: 80 percent of all mutual recognition agreements entered into by economies cover just five occupations, namely, engineers, accountants, surveyors, actuaries and architects. Moreover, partial recognition is more common than automatic recognition, which means that professionals require additional testing, training or supervised work experience before they can be considered as licensed professionals in the host economy.

Digital connectivity

Access to the internet is a prerequisite for participating in the digital economy, including digital services delivery. A 2018 OECD paper suggests that digital connectivity has a trade-enhancing role for DDS, with the highest impacts being observed in telecommunications, computer services and other business services.[42]

Broadband subscriptions (both fixed and mobile) have improved tremendously in APEC. The number of fixed broadband subscriptions has more than doubled from around 12 subscriptions per 100 inhabitants in 2010 to nearly 27 subscriptions per 100 inhabitants in 2019. The growth rate is even higher for mobile broadband subscriptions, increasing from approximately 20 per 100 inhabitants to 104 per 100 inhabitants over the same period. Amid the pandemic in 2020, fixed and mobile broadband subscriptions per 100 inhabitants grew by a further 6.7 and 2.0 percent, respectively.[43]

Despite this growth, it is important to note the huge variation in the number of fixed and mobile broadband subscriptions across APEC. Fixed broadband subscriptions in 2020 range from 0.2 to 43.5 per 100 inhabitants, while mobile broadband subscriptions range from 12.3 to 202.3 per 100 inhabitants. Access may also vary within a single economy, in particular between those residing in rural and urban areas or between different segments of the society (e.g., young and old or male and female).[44]

[41] APEC, 'Mutual Recognition of Professional Qualifications in the Asia Pacific: Lessons from the Inventory of Mutual Recognition Agreements in APEC' (Singapore: APEC, 2021), https://www.apec.org/docs/default-source/publications/2021/11/mutual-recognition-of-professional-qualifications-in-the-asia-pacific/221_gos_mutual-recognition-of-professional-qualifications-in-the-asia-pacific.pdf?sfvrsn=cc9b8931_2#:~:text=The%20APEC%20Inventory%20of%20Mutual%20Recognition%20Agreements%20for%20Professional%20Qualifications,the%20United%20States%20and%20Peru

[42] J. Lopez Gonzalez and J. Ferencz, 'Digital Trade and Market Openness', OECD Trade Policy Papers 217, OECD, Paris, 2018, http://dx.doi.org/10.1787/1bd89c9a-en

[43] APEC PSU calculations using data from the International Telecommunication Union (ITU). APEC aggregate is a weighted average based on total population data from the World Bank.

[44] F.M.A. Quimba, M.A.D. Rosellon and S.C. Calizo Jr, 'Digital Divide and the Platform Economy: Looking for the Connection from the Asian Experience', Philippine Institute of Development Studies, Quezon City, December 2020, https://pidswebs.pids.gov.ph/CDN/PUBLICATIONS/pidsdps2030.pdf

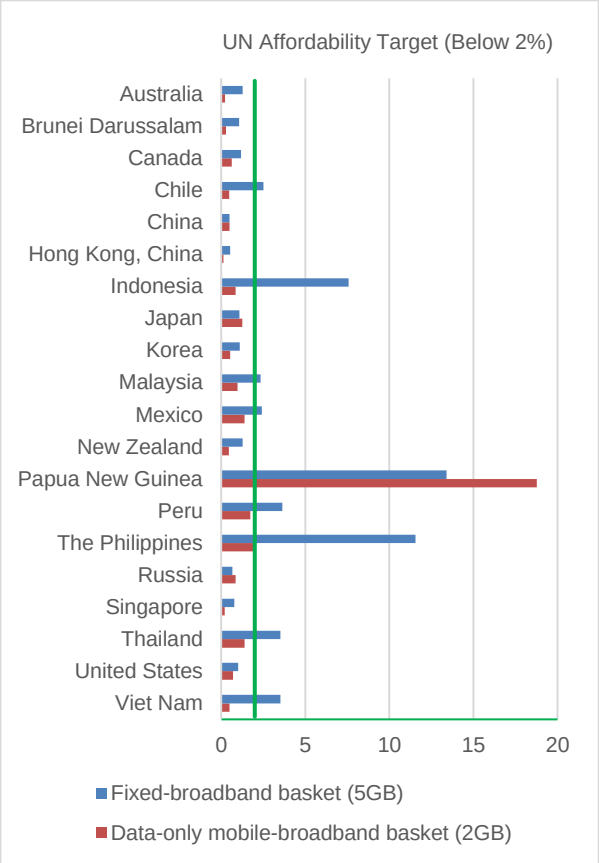
In terms of coverage, 4G mobile networks in most APEC economies already cover at least 95 percent of their population in 2020. However, the coverage is lower in several APEC economies.[45] The more advanced 5G mobile network has relatively less coverage. Globally, only 17 percent of the population are covered as of 2020.[46]

There are also noticeable variations in both fixed and mobile broadband prices among the APEC economies, when measured in current international dollars. Fixed broadband can range from USD 1.4 to USD 16.7 per gigabyte (GB), whereas mobile broadband can be from USD 1.5 to USD 24.9 per GB. Interestingly, while the common perception is for fixed broadband prices to be lower than mobile broadband prices, some economies offer considerably more price-competitive (at least 50 percent more affordable) mobile broadband services relative to fixed broadband services.

One important benchmark for affordability, which was set by the UN Broadband Commission for Sustainable Development, is a target of below 2 percent of monthly gross national income (GNI) per capita for cost of entry-level broadband services. As of 2021, almost all APEC members have met this target for mobile broadband although only half of them have successfully done so for fixed broadband (Figure 5).

While having access to the internet is imperative, quality of connection is also critical. In APEC, although internet speed and latency [47] are improving in general, a wide variation among individual economies continue to be observed. For example, May 2022 data show that the median download speed for mobile broadband ranges between 16.42 and 106.82 megabits per second (Mbps) while the median latency for mobile broadband ranges between 16 and 37 milliseconds (ms).[48]

Figure 5. Broadband prices in APEC, 2021 (% of monthly GNI per capita)



GNI=gross national income
Note: Data for Chinese Taipei is unavailable.
Source: APEC PSU calculations based on the International Telecommunication Union (ITU) ICT Price Baskets, historical data series, March 2022 release, https://www.itu.int/en/ITU-D/Statistics/Documents/publications/prices2021/ITU_ICTPriceBaskets_2008-2021.xlsx

Regulatory environment

The regulatory environment for services trade is relatively more challenging compared to goods trade since services trade typically has more behind-the-border measures or domestic regulations (e.g., requirements for commercial presence). [49] In fact, these regulations account for more than 40 percent of the cost of services trade, which is already twice as high compared to goods trade.[50] Fortunately, 2021 policy trends based on the OECD Services Trade Restrictiveness Index (STRI) reveal that liberalisation has already outpaced the entry of new services trade

[45] ITU, 'DDD Data Set January 2022', accessed 27 June 2022, https://www.itu.int/en/ITU-D/Statistics/Documents/DDD/ddd_dataset.xlsx
[46] S. O'Dea, 'Global 5G Population Coverage Worldwide by Region 2020', Statista, 28 October 2021, https://www.statista.com/statistics/1272525/5g-population-coverage-worldwide-by-region/
[47] Latency (sometimes called ping) measures how quickly a device gets a response after sending out a request. Low latency means the server is responding quickly to the request whereas high latency means a slow response.
[48] Speedtest, 'Speedtest Global Index: Global Median Speeds May 2022', June 2022, https://www.speedtest.net/global-index
[49] APEC, 'APEC Economic Policy Report 2016'.
[50] OECD and WTO, 'Services Domestic Regulation in the WTO: Cutting Red Tape, Slashing Trade Costs, and Facilitating Services Trade', OECD–WTO Trade Policy Brief, November 2021, https://www.wto.org/english/tratop_e/serv_e/oecd_wto_trade_policy_2021.pdf

regulations. Such trends are likely to be supported further by the WTO Reference Paper on Services Domestic Regulation, possibly resulting in annual trade cost savings of about USD 150 billion.[51]

Moreover, the nature of digital services trade adds another layer of complexity to the regulatory landscape. A 2020 APEC Policy Support Unit (PSU) study, which mapped laws and regulations across different digital policy issues for the APEC region, shows regulatory heterogeneity across economies in the region.[52] For instance, while many APEC economies have e-payment laws and regulations, there is often no single law that regulates it and the interpretation of e-payments varies across the region. And, although most APEC economies have introduced laws on data privacy and protection, they differ in terms of what is defined as personal information. APEC economies also have different approaches toward cross-border data flows and network management practices, among others.

One indicator of these variations is the OECD Digital STRI, which aims to quantify regulatory impediments affecting trade in digital services, with scores between 0 (completely open) to 1 (completely closed).[53] Scores for APEC economies covered by the database range between 0 and 0.488 in 2020. In many cases, the main contributors to the scores are measures affecting infrastructure and connectivity (e.g., regulations on interconnection and cross-border data flows) and measures categorised under other barriers (e.g., requirements for commercial and/or local presence to provide cross-border services).[54]

Certainly, the rapid evolution of digital technologies has made it more challenging to regulate. Indeed, this has been cited as the primary reason for recently concluded dedicated digital trade agreements such as the Digital Economy Partnership Agreement putting emphasis on establishing a platform for collaboration rather than binding hard law.[55]

On the positive side, this has also made policymakers more open to innovative policy approaches. For example, regulatory sandboxes can help foster the adoption of and the innovation of digital services, and this is not limited to just the financial sector but also to other types of services (e.g., health, transport and energy).[56] At the same time, such innovative approaches can also fall prey to its own set of challenges (e.g., unpredictable results, difficulties in scaling up or becoming resource-heavy for regulators).[57]

Policy Approaches to Growing Digital Services

Digital services could strengthen resiliency in the services trade, particularly in the context of the COVID-19 pandemic where in-person contact has been challenging. In the broader context, digital services could improve efficiency and productivity either by complementing existing services or by reimagining their delivery. Digital services could also lead to new business opportunities by offering an entirely new range of services.

Benefitting from digital services, however, is not a given. As discussed earlier, many factors have to come together for these services to be delivered seamlessly. At the same time, it is important to recognise that any policy should take into consideration an economy's intrinsic characteristics. Some policy recommendations that policymakers can consider are discussed below.

Enhance digital literacy and digital skills

Holistic policy approaches to human capital development are critical to ensuring that the population has the relevant skills to use digital tools and to employ them to their benefit. For a start, economies need to ensure that their education

[51] OECD, 'Services Trade Liberalised in 2021, Showing Significant Decrease in Volume and Effects of New Measures, OECD Says', 1 February 2021, https://www.oecd.org/newsroom/services-trade-liberalised-in-2021-showing-significant-decrease-in-volume-and-effects-of-new-measures.htm#:~:text=OECD%20Services%20Trade%20Restrictiveness%20Index,almost%20all%20major%20sectors%20covered

[52] APEC, 'Assessment of Capacity Building Needs to Support WTO Negotiation on Trade Related Aspects of E-Commerce' (Singapore: APEC, 2020), https://www.apec.org/Publications/2020/12/Assessment-of-Capacity-Building-Needs-to-Support-WTO-Negotiation

[53] J. Ferencz, 'The OECD Digital Services Trade Restrictiveness Index', OECD Trade Policy Papers 221, OECD, Paris, 2019, http://dx.doi.org/10.1787/16ed2d78-en

[54] OECD, 'Digital Services Trade Restrictiveness Index', accessed 5 July 2022, https://stats.oecd.org/Index.aspx?DataSetCode=STRI_DIGITAL#

[55] S. Honey, 'Enabling Trust, Trade Flows, and Innovation: The DEPA at Work', Hinrich Foundation, 21 July 2021, https://www.hinrichfoundation.com/research/article/digital/enabling-trust-trade-flows-and-innovation-depa-at-work/

[56] United Nations Department of Economic and Social Affairs (UN DESA), 'Sandboxing and Experimenting Digital Technologies for Sustainable Development', UN DESA Policy Brief 123, United Nations, 3 December 2021, https://www.un.org/development/desa/dpad/publication/un-desa-policy-brief-123-sandboxing-and-experimenting-digital-technologies-for-sustainable-development/

[57] M. Lesher, 'Bringing New Digitally Enabled Products and Services to Market: Sandboxes and the Role of Policy Experimentation', VoxEU.org, 13 October 2020, https://voxeu.org/article/sandboxes-and-role-policy-experimentation

curriculum evolves with the requirements of the digital economy, with particular attention being placed on early childhood education as some skills may be best acquired in the early years.

Economies should also look at having strong worker retraining programmes, preferably as part of a broader set of active labour market policies (ALMPs) to ensure that the unemployed have the necessary digital skills to find jobs more quickly. Often, such policies would need to be complemented with social safety nets capable of supporting workers during the transition (e.g., unemployment benefits and cash transfers). Additionally, economies would need to provide avenues for lifelong learning to ensure that workers, including those who are currently employed, could acquire new skills and remain relevant.

Overcome digital access issues

Ensuring universal and affordable access to hardware and to the internet is fundamental to participating in the digital economy. Besides allowing for digital services to be delivered, they enable participation in online digital literacy training. Economies need to work with telecommunications providers to widen their network coverage and to ensure affordability of subscriptions while, at the same time, making sure that services quality is not compromised. For instance, policies that encourage competition and investment in high-speed networks can be critical to realise the full potential of the digital transformation.[58]

Also, economies could consider focusing on developing the mobile broadband market since this can be more affordable compared to fixed broadband services, not to mention that mobile networks can better reach those residing in underserved areas.[59] Other innovative approaches worth exploring include the use of TV white spaces – geographically unused radio spectrum in the TV broadcast bands – to provide coverage in remote locations. Economies should also look into how grants, subsidies and other incentives could be provided to support purchase of devices and to upgrade legacy systems, among others.

Employ a holistic approach to domestic regulation

Resilience is a function of flexibility. In the context of services, economies would need to facilitate provision of services across multiple modes (including digitally) to ensure that events such as a pandemic would not affect access significantly. Doing so requires economies to acknowledge that services policy does not work in silos and a holistic approach to services regulation is imperative to ensure seamless provision across modes of supply.

Economies would have to build on existing mechanisms as well as explore new ones to better coordinate policies between ministries and agencies, including those responsible for the digital space (e.g., trade, sectoral regulators, and privacy enforcement authorities). Recognising that the private sector is the beneficiary, provider and user of services, economies should enhance engagement with them (e.g., through stronger industry–government–academia linkages) and consider how their perspectives could be incorporated into the policymaking process. The development of Industry Transformation Maps and the accompanying Skills Frameworks, which are co-created by both the public and private sector, is an example of such engagement.[60]

Economies could also consider implementing regulatory sandboxes to allow for trials of new technology and offerings, particularly in highly regulated sectors where compliance with existing regulatory approaches might be challenging.

Tackle regulatory heterogeneity and leverage regional cooperation

Economies are driven by different values, and this has implications on the regulations that they enact, including those affecting digital services and the broader digital economy. Regulatory heterogeneity among economies increases trade cost and could potentially limit access and provision of services. To overcome this, economies could work together to identify and agree on some common principles behind regulations affecting services. The APEC Non-Binding Principles of Domestic Regulation of the Services Sector, the recently concluded WTO Joint Initiative on Services Domestic Regulation and the ongoing WTO Joint Initiative on E-commerce are just some examples.

[58] J. Ferencz and F. Gonzales, 'Barriers to Trade in Digitally Enabled Services in the G20', OECD Trade Policy Papers 232, OECD, Paris, 2019, http://dx.doi.org/10.1787/264c4c02-en

[59] T-Mobile for Business, 'How 5G Will Bring High-Speed Internet to Underserved Communities', *Forbes*, 9 April 2021, https://www.forbes.com/sites/tmobile/2021/04/09/how-5g-will-bring-high-speed-internet-to-underserved-communities/?sh=4e27e5521ac7

[60] SkillsFuture Singapore, 'Skills Framework', accessed 23 July 2022, https://www.skillsfuture.gov.sg/skills-framework; Ministry of Trade and Industry, Singapore, 'ITMs: Overview', accessed 23 July 2022, https://www.mti.gov.sg/ITMs/Overview

Economies could also strengthen cooperation on various aspects of the digital economy by mutually recognising professional qualifications, exploring interoperability between regulations and initiatives, carving in frameworks supportive of the digital economy in existing agreements, and negotiating new agreements specific to the digital economy.

As a regional forum, APEC has many ongoing initiatives related to services and the digital economy, including the APEC Services Competitiveness Roadmap (ASCR), the APEC Internet and Digital Economy Roadmap (AIDER) and the Enhanced APEC Agenda for Structural Reform (EAASR). Economies could leverage the capacity-building activities organised under the ambit of these initiatives to learn best practices and to improve their regulations. Given that these cross-cutting initiatives have common elements, ensuring better synergy between them and strengthening cross-fora collaboration would enable economies to deliver a greater impact, one that is over and beyond the individual objectives of each initiative.

Improve availability of reliable statistics

Data and indicators serve a range of useful purposes. They can stimulate discussions both within and between economies, in particular among agencies with varied policy objectives. They also allow economies to undertake reforms and make informed policy adjustments. Moreover, they enable economies to determine if a situation has improved, remained the same, or backtracked over time, which allows policymakers and regulators to respond accordingly.

Nevertheless, existing indicators are not without gaps and challenges. It is important to expand their coverage to more economies, to ensure their comparability across economies and (where relevant) to disaggregate statistics by gender and geographical location for more targeted policy interventions.

Indicators may also need to be refined to ensure their continued relevance in the digital economy. One example would be supplementing data on the share of population using the internet with how it is being used. Likewise, indicators on skills and competencies should endeavour to identify the share of population (or segments of the population) with specific digital skills.

Finally, recognising that there is a limit to improving existing indicators, economies should complement them with new indicators, including reaching consensus on definitions as their absence presents serious challenges to measuring progress, which affects especially analyses across multiple economies.

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The APEC Policy Support Unit (PSU) is the policy research and analysis arm for APEC. It supports APEC members and fora in improving the quality of their deliberations and decisions and promoting policies that support the achievement of APEC's goals by providing objective and high quality research, analytical capacity and policy support capability.
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