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Case Studies on Addressing Connectivity Challenges in APEC Economies

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EXECUTIVE SUMMARY

Since APEC Leaders announced the Connectivity Blueprint in 2013, economies have been making progress in strengthening institutional, physical and people-to-people connectivity across the region. Initiatives to implement the Blueprint have also been implemented in various APEC fora to contribute towards achieving a seamless and comprehensively connected and integrated Asia-Pacific by 2025. This study focuses on: (i) exploring the process by which certain initiatives or policies take place and the problems or issues that they are trying to resolve; (ii) the impact of the respective initiatives and efforts on efficiency and inclusiveness; and (iii) the innovative approach adopted by existing initiatives and projects that contribute towards smart problem-solving and sustainable reforms.

The six case studies

Case studies were proposed by economies covering the three different pillars of connectivity. Among the proposed case studies, two pertaining to each pillar were selected for this report. Each case study addresses different challenges of connectivity and also brings to light different policy approaches in managing such projects. The High Speed Rail (HSR) project connecting the mainland of the People's Republic of China and Hong Kong, China was announced back in 2000 after realizing the steep increase in cross-boundary annual passenger traffic of more than 18 per cent since 1996. By 2016, this demand was expected to rise three times. Better physical connectivity could also mean greener and more sustainable transport system. The HSR is expected to reduce carbon emissions: the rail system is intended to prevent the release of 13 tonnes of additional carbon dioxide on a daily basis, or a carbon footprint reduction of 4,700 tonnes per year. Additionally, it will also create 11,000 construction jobs and 10,000 new job opportunities upon commencing in services and management. This project will not only bring greater physical connectivity between the mainland of the People's Republic of China and Hong Kong, China but also improve economic prospects and sustainability.

The Russia's Information and Communications Technology (ICT) initiative highlighted the impact of better physical connectivity on economic efficiency and addressed the challenges of ensuring inclusiveness. The Russian initiative is expected to make broadband subscription more affordable and expand its reach to 95% of the population by 2020. It will also improve internet connectivity for 3,000–7,000 medical institutions and develop a unified government information system to improve interoperability of information systems in the healthcare sector. This initiative is expected to bring internet access to remote regions of Russia and provide technology-friendly solutions to the disconnected population. Additionally, the Russian ICT strategy addresses regulatory restrictions which previously hampered sharing of communication infrastructure.

Improved institutional connectivity is also enabled through cross-border paperless information exchange which allows better supply chain visibility, specifically for sea-freight logistics as shown in China's case study. Cross-border supply chain visibility addresses long lead-times, poor last-mile service quality and differing border clearance administration. Better visibility will allow supply-chain stakeholders to benefit as they can improve their inventory and quality control as well as their risk management functions.

United States' case study on data privacy issues shows how the APEC Cross-Border Privacy Rules (CBPR) supports global e-commerce through lower compliance costs while ensuring secure cross-border data flows. Additionally, participation in the CBPR can improve

consumer's trust through consistent and enforceable privacy protections as well as streamlined mechanisms for complaint-handling.

Meanwhile, OurCityLove social enterprise in Chinese Taipei shows the role of the private sector in enhancing people-to-people connectivity and addressing accessibility challenges for people with disabilities (PWDs). Elderly and disabled people experience challenging limitations to their mobility and may have issues accessing common public facilities such as stairs, gradients, light switches, or toilets. Additionally, by providing targeted, relevant, and digital platform-based accessibility information and services for the elderly and PWDs, OurCityLove has shown that accessible service and tourism not only promotes inclusiveness but could also be a profitable business model.

Japan utilises the passenger name records (PNR) to smoothen customs procedures and as a measure for terrorism prevention. PNR data supports better risk analysis to facilitate the entry of legitimate travellers through reduced processing times, reducing costs for airlines through fewer delays and shorter waiting times at the gate. Improved data gathering and analysis can facilitate easier movement of low-risk passengers while re-directing resources towards high-risk passengers.

Lessons learned

In terms of implementation process, the HSR case study highlights the participatory approach carried out to obtain support from the public at large. The consultative approach in the implementation of the co-location arrangement under the HSR project is said to have played a key role in the successful implementation of the project. The government of Hong Kong, China was closely engaged with relevant parties to address concerns during the planning of the HSR project. Communications with the Legislative Council have been maintained throughout the different stages of planning since 2000. Extensive public consultations were conducted when deciding on the detailed plans of the 26 km of the Hong Kong Section of the HSR. Individual meetings and public briefings were held within the local communities in addition to the consultations with seven District Councils and relevant Rural Committees. Indeed, a consultative approach was necessary in settling the complicated legal, operational and security issues with regard to the co-location arrangement prior to the commissioning in 2018.

The case study on sea-freight logistics shows that while advanced and intelligent physical infrastructure is needed to enable visibility across borders, the effective functioning of the system still requires the willingness of stakeholders to share information with other stakeholders. This requires a great amount of trust among the stakeholders. In turn, the issues of protection of data privacy and security need to be addressed as it is critical to provide confidence to supply chain participants to submit their information to the data exchange system or platform.

The importance of multi-stakeholders' engagement to initiate reforms was also discussed in the PNR case study. In Japan's experience, engagement with various sectors was a key element in successfully implementing PNR. Although PNR was initiated by a law enforcement agency, it consulted with legal experts and the airline sector to address any legitimate concerns.

This collaborative nature was also seen in the OurCityLove case study which showed that accessible tourism should be based on a collaborative model which brings together the government, the private sector, civil society, the elderly and PWD to arrive at holistic and

responsive solutions for accessibility. Being a social enterprise and a for-profit organisation ensures sustainability of its operations while incentivising innovation and expansion to reach marginal groups. In the first two quarters of 2018, OurCityLove served more than 3,000 family travellers, allowing it to earn up to NTD 8 million in product sales and services.

Conclusion

The case studies emphasise that the connectivity pillars are often interlinked, and as a result an initiative focused on one pillar may also have implications on other pillars. This is true for the HSR train system which not only improves physical and people-to-people connectivity between the mainland of the People's Republic of China and Hong Kong, China but also facilitates smoother institutional connectivity through its co-location agreement.

The importance of digital technology is apparent for most case studies not only in the form of ICT infrastructure development but also through the adaptation or application of technology friendly solutions; as in the case of the sea-freight visibility (APMEN), CBPR, and OurCityLove initiatives. More collaborative models of planning and projects implementation have also been encouraged throughout the case studies.

Lastly, ensuring that policy making is adaptable and forward-looking in the new digital economy has been discussed in several case studies. Russia's ICT and telecom project acknowledges the importance of being flexible in implementing the ICT infrastructure as well as preparing for the perpetually changing digital economy. As such, regulations need to be adjusted to match the new circumstances brought by the new technology landscape. The CBPR case study shows how interoperability is possible without requiring the modification of domestic laws; thus ensuring that implementation can be flexible enough to be adapted to the particular domestic legal environment of APEC Economies; while still providing certainty for system participants. Indeed, failure of policies to adapt and learn from dynamic and complex environment may lead to dire consequences.

1. INTRODUCTION

1.1 BACKGROUND

As part of APEC's effort to support stronger regional integration, connectivity has been high on its agenda. In 2013 in Bali, APEC Leaders aspired for a region that is seamlessly and comprehensively interconnected. In 2014 in Beijing, the 2015-2025 APEC Connectivity Blueprint (ACB)[1] was endorsed to advance efforts to connect the region through building on past initiatives, complementing current activities, and progressing future initiatives to allow for a seamless and interconnected Asia-Pacific.

There are various activities that are already being undertaken in different areas under the three pillars of Connectivity—i.e., Physical, Institutional and People-to-People—by APEC working groups, task forces and industry dialogues. Some of these activities may address more than one pillar. For instance, the application of big data and open data to Emergency Preparedness to support Global Supply Chain (GSC) resilience may enhance not only people-to-people connectivity but also smoothen institutional procedures. Moreover, the boost required to protect critical infrastructure will inadvertently improve physical connectivity. The 2015 Yearly Review on the Connectivity Blueprint conducted by the APEC Secretariat highlighted the following activities conducted by member economies and fora:

- • **Physical Connectivity**
  - Improvement of air connectivity through airport modernization and investment.
  - Project on Accelerating Sustainable Public-Private Investments for Infrastructure Renewal to support the flow of private capital into infrastructure development and improve the institutional, legal and regulatory framework.
  - Improvement of digital connectivity through optical cable system that could improve social development.
  - Enhancing road, rail and power interconnection.

- • **Institutional Connectivity**
  - Promotion of competitive transportation markets to identify potential reforms in transport and logistics sectors that have wide spillover effects.
  - Supporting the Harmonisation of Standards for the Movement of Data across APEC Economies.
  - Sharing of information on best practices and research in the areas of new technologies for logistics, clean transportation, movement of dangerous goods and road safety.
  - Efforts to deepen the capital market, strengthen the funds management industry and provide investors with a more diverse range of investment opportunities.
  - Implementation of the Single Window System for Tourism to facilitate administrative procedures regarding opening tourism-related businesses and investing in tourism.

- • **People-to-People Connectivity**
  - Sharing knowledge on the security of people-to-people connectivity (Passenger Name Record (PNR)).
  - Analysis of the policy approaches to improve incentives for innovation.

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[1] The APEC Connectivity Blueprint 2015-2025 can be found at https://www.apec.org/Publications/2015/01/APEC-Connectivity-Blueprint.

- The Application of Big Data and Open Data to Emergency Preparedness to support Global Supply Chain (GSC) resilience and boost cooperation on critical infrastructure protection.
- Initiative on Transport and Logistics Occupational Standards Development (warehouse operator, logistics officer, freight forwarder, logistics supervisor and supply chain manager).
- Supporting a mutual recognition arrangement within the APEC Architect Framework which establishes reciprocal fast-track cross-border registration arrangements for senior architects.
- Promoting the mobility of students, teachers and researchers as well as collaboration between universities.
- Implementing visa facilitation initiatives including introducing multiple entry visa, relaxation of visa requirements and visa waiver.

The Report to Implement Connectivity Blueprint (2014) also highlighted the importance of quality infrastructure as a cross-cutting issue across the three pillars of connectivity. In this regard, APEC has implemented several activities supporting quality infrastructure such as developing the "APEC Guidebook on Quality of Infrastructure Development and Investment" in 2014, "APEC Guideline for Quality Electric Power Infrastructure" in 2016. Since 2016, the "Peer Review and Capacity Building on APEC Infrastructure Development and Investment" initiative has been implemented with the Philippines and Viet Nam, and in 2018, Indonesia began participating in the Peer Review as the next reviewed economy. In addition, the "APEC High-Level Meeting on Quality Infrastructure" was held in 2017. Furthermore, in 2018, APEC CTI upgraded the "Guidebook on Quality of Infrastructure Development and Investment" in addition to developing a guideline for the water and sewage sectors in the "APEC Guideline for Quality of Water Infrastructure".

Leaders acknowledged that although efforts were made to progress the connectivity agenda, many challenges remain for APEC economies to fully integrate. To ensure strong progress in the ACB and to encourage innovative policy reform and problem-solving, Senior Officials (SOM) have tasked the PSU to conduct a study to identify areas where significant progress have been made under the three pillars of connectivity and where APEC economies may exchange valuable practical knowledge and policy lessons.

1.2   OBJECTIVE AND SCOPE OF THE STUDY

This study aims to identify areas where significant progress have been made under the three pillars of connectivity and where APEC economies may exchange valuable practical knowledge and policy lessons. It will apply a case study methodology. The case studies will analyse the efforts that have been made by certain economies to address connectivity challenges with a focus on the following aspects:

- The <u>process</u> by which certain initiatives or policies take place and the problems or issues that they are trying to resolve.
- The <u>impact</u> of the respective initiatives and efforts on efficiency and inclusiveness.
- The <u>innovative approach</u> adopted by existing initiatives and projects that contribute towards smart problem-solving and sustainable reforms.

The synthesis drawn from the case studies will provide recommendations on certain key areas related to connectivity. This will not only provide support to achieving the objectives of the

ACB but also enable member economies to continue building momentum in their efforts towards the full implementation of ACB. This study also adds value by looking deeper into efforts taken by economies' in implementing the ACB and distilling lessons learned that can be useful for other economies who are interested to apply the same approach.

The outline of the study is as follows. The next two chapters will discuss the case studies under physical connectivity on high-speed rail (HSR) network (submitted by Hong Kong, China) and the ICT development to achieve inclusive connectivity (Russia). Chapters 4 and 5 examine the visibility of sea freight logistics (China) and the APEC Cross-Border Privacy Rules (United States). People-to-people connectivity is covered under chapters 6 and 7 discussing about innovation for accessible tourism (Chinese Taipei) and Passengers Name Record (Japan). Chapter 8 concludes and provides the way forward.

2 PHYSICAL CONNECTIVITY: ENHANCING CONNECTIVITY TO THE ECONOMY-WIDE HIGH-SPEED RAIL NETWORK (HONG KONG, CHINA)

2.1 INTRODUCTION

The Guangzhou-Shenzhen-Hong Kong Express Rail Link project (XRL) is a high-speed passenger rail line which upon completion will expand over 142 km, connecting West Kowloon Station in Hong Kong, China to Guangzhou South Station in the People's Republic of China. The Hong Kong Section of the rail line is 26 km and runs between West Kowloon and Hong Kong, China's boundary to the mainland of the People's Republic of China. The XRL will comprise seven stations, six of which will be in the mainland of the People's Republic of China and the seventh one will be the West Kowloon Station in Hong Kong, China. The rail line will expand to connect to the People's Republic of China's growing 25,000 km high-speed rail network. The construction of the XRL began in 2005 and most of it has been in service except for the Hong Kong Section. The latter is expected to be commissioned in September 2018. In preparation for this, the Hong Kong Section of the XRL has conducted a successful trial run in April 2018.

The project was initiated as part of the "Railway Development Strategy 2000" formulated by the government of Hong Kong, China to promote the further development of railways. Specifically, the development plan of the XRL was envisioned as part of the Regional Express Line that was meant to connect urban areas with the Hong Kong, China boundary. This was announced back in 2000 as a result of the steep increase in cross-boundary annual passenger traffic of more than 18 per cent since 1996. By 2016, this demand was expected to rise three times. In order to implement this plan, a feasibility study was conducted by a Joint Expert Group comprising authorities from the People's Republic of China and the government of Hong Kong, China. The feasibility study was completed in March 2005 and found the project worth undertaking given its strategic value in improving cross-border connectivity. In addition to providing connectivity between the three cities, namely Hong Kong, China; Shenzhen; and Guangzhou, the rail line would also connect its passengers to the Beijing-Guangzhou and the Hangzhou-Fuzhou-Shenzhen passenger lines. These direct short- and long-haul connections can be seen in the rail map below (Figure 2.1).

FIGURE 2.1: DIRECT TRAINS AMONG CITIES IN THE PEOPLE'S REPUBLIC OF CHINA
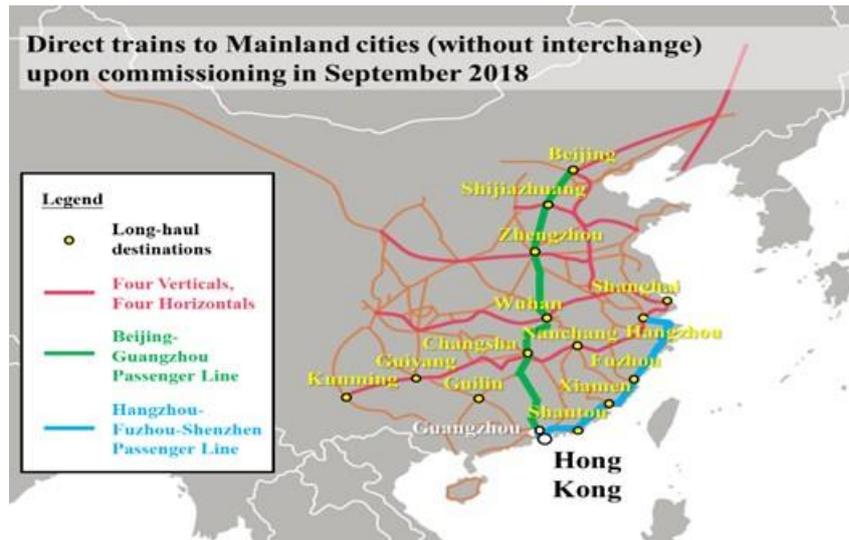
Source: Submitted by the government of Hong Kong, China.

Upon completion, the XRL project is expected to strengthen connectivity between Hong Kong, China and major cities in the mainland of the People's Republic of China. This will help facilitate commercial, cultural and educational exchanges between the two economies.

As with every major project, the government of Hong Kong, China was closely engaged with relevant parties to address their concerns during the planning of the XRL project. Communications with the Legislative Council in Hong Kong, China have been maintained through the different stages of planning since 2000. Extensive public consultations were conducted when deciding on the detailed plans of the 26 km of the Hong Kong Section of the XRL. Individual meetings and public briefings were held within the local communities in addition to the consultations with seven District Councils and relevant Rural Committees.

A total of 119 objections to the project and its amendments were received. The objections included concerns about the location of the terminus, the site for railway facilities, the planning and need for the rail line, associated housing and compensation arrangements, and related environmental impacts. Subsequent to this, the government addressed these concerns and provided further explanations leading to the withdrawal of nine objections. In easing the public's concerns, the government maintained close liaisons with the residents who would be impacted by the vacating of villages and conducted an environmental impact assessment (EIA). Mitigation measures were implemented subsequent to the assessment to minimize negative impacts on the environment. Considering the unresolved objections and the proposed amendments, the Legislative Council's Finance Committee approved the first funding application of HKD 66.8 billion in January 2010 and a further HKD 19.62 billion in March 2016. To enable further transparency and monitoring by the public, regular progress and financial reports have been submitted to the Legislative Council since the start of the construction.

2.2   CHALLENGES ADDRESSED

The XRL project aims to address two issues, namely the long travel times by rail between Hong Kong, China and the major cities in the mainland of the People's Republic of China, and the demand for environmentally friendly and sustainable transportation. Each of the issues and measures taken to address them are described below.

1. <u>Travel times between Hong Kong, China and major cities in the mainland of the People's Republic of China</u>: The XRL project was initiated to provide an alternative and faster transport solution amidst growing cross-boundary traffic. The complete journey between Hong Kong, China and Guangzhou is expected to take about an hour instead of the usual two hours. Furthermore, the travel time between Hong Kong, China and Beijing is expected to be reduced to around nine hours from the initial 24 hours[2]. The project will in general improve Hong Kong, China's reach into the mainland of the People's Republic of China and strengthen its strategic position as the southern gateway to the People's Republic of China. As a result, travellers on both sides will benefit from the increased connectivity and enhance Hong Kong, China's value as a regional transport hub.

    The increased efficiency will be derived not only from the shorter travel time between the two regions but also from the co-location arrangement at the West Kowloon Station where passengers can conveniently complete clearance procedures for both Hong Kong, China and the mainland of the People's Republic of China at one go. The co-location arrangement essentially means that parts of the West Kowloon Station in Hong Kong, China will be designated as "Mainland Port Area" and will for certain purposes be considered as lying in the mainland of the People's Republic of China by law, including customs, immigration and quarantine matters. This arrangement will allow clearance procedures of both economies to be conducted within the same building (Figure 2.2). It will also avoid the added constraint of ensuring the availability of clearance facilities at the station where one intends to disembark in the mainland of the People's Republic of China. Since providing clearance facilities at all stations connected to the high-speed rail in the mainland of the People's Republic of China would be uneconomical, the co-location arrangement provides a solution that prevents the limitation of travel choices to passengers.

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[2]   Xiahua   News.   (2018,   April   2).   Retrieved   from: http://www.xinhuanet.com/gangao/2018-04/02/c_129842361.htm

FIGURE 2.2: PASSENGER FLOW AT THE WEST KOWLOON STATION
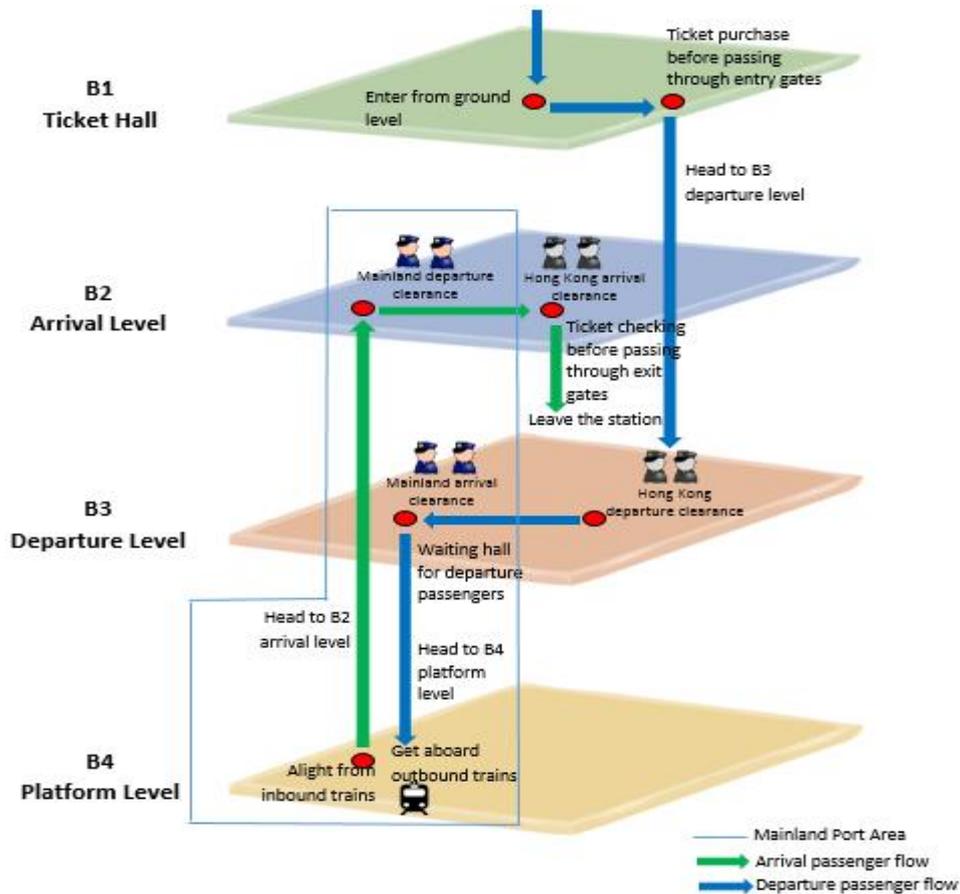
Source: Legislative Council of Hong Kong, China. Retrieved from: https://www.legco.gov.hk/yr16-17/english/hc/papers/hccb2-1966-1-e.pdf

The terminus of the Hong Kong Section of the XRL will be located at West Kowloon, which is in the heart of Hong Kong, China's business and tourist districts. Convenient interchanges to the domestic railway network via the Tung Chung Line and the West Rail Line will be available in the vicinity of the West Kowloon Station. A connection to the Airport Express will also allow passengers to easily commute to the Hong Kong International Airport.

2. Demand for environmentally friendly and sustainable transportation: MTR Corporation Limited, the operator company in charge of the XRL project, had conducted an Environment Impact Assessment (EIA) based on the EIA Ordinance in 2009. The assessment found the XRL project to be more environmentally friendly than other transport options like airplanes and road vehicles because pollutants emitted from airplanes and road vehicles are directly released into the atmosphere but emissions from the electrically powered XRL would come from the power plants and can hence be controlled and mitigated. According to the assessment conducted in 2009, if all XRL passengers, which was expected to be around 99,000 daily, were to use the cross-boundary coach, an estimated 13 tonnes of additional carbon dioxide would be emitted on a daily basis, amounting to 4,700 tonnes of additional carbon dioxide per annum[3].

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[3] MTR Corporation. Retrieved from: http://www.expressraillink.hk/en/project-details/environment-and-sustainability.html

2.3   IMPLEMENTATION CHALLENGES

The co-location arrangement was a critical challenge in realizing the XRL project. In implementing the arrangement, the government of Hong Kong, China and authorities of the People's Republic of China conducted studies over several years to better understand and analyse the different alternatives and the relevant legal issues.

The detailed studies resulted in the development of a three-step process for the implementation of the co-location arrangement. The process entailed the following steps:

- Step 1: The first step was for the authorities of the People's Republic of China and the government of Hong Kong, China to reach a co-operation arrangement. This step was completed on 18 November 2017 when the Co-operation Arrangement between the Mainland and the Hong Kong Special Administrative Region on the Establishment of the Port at the West Kowloon Station of the Guangzhou-Shenzhen-Hong Kong Express Rail Link for Implementing Co-location Arrangement (Co-operation Arrangement) was signed by the two economies.

- Step 2: The second step entailed the approval and endorsement of the Co-operation Arrangement by the Standing Committee of the National People's Congress (NPCSC) of the People's Republic of China which was obtained on 27 December 2017. NPCSC's approval confirmed that the Co-operation Arrangement was consistent with the Constitution of the People's Republic of China and the Basic Law of the Hong Kong Special Administrative Region.

- Step 3: The last step was for both sides to implement the arrangement in accordance to their own law. For Hong Kong, China this meant the enactment of a local bill to implement the co-location arrangement. The government of Hong Kong, China gazetted the Guangzhou-Shenzhen-Hong Kong Express Rail Link (Co-location) Bill on 26 January 2018. It was drafted with reference to the legal legislation adopted at the co-location arrangement of the Shenzhen Bay Port. The Bill was passed by the Legislative Council in Hong Kong, China after months of scrutiny on 14 June 2018. The passing of the Bill has provided a sound legal basis for the implementation of the co-location arrangement.

From the beginning, public engagement played an important role in tackling the co-location arrangement. Despite the Legislative Council being in summer recess on the day the co-location arrangement was proposed, the government of Hong Kong, China took the initiative to explain the proposal to legislators. A special House Committee meeting was conducted by the Legislative Council, followed by a joint meeting with the Panel on Security, the Panel on Transport and the Panel on Administration of Justice and Legal Services in August 2017. The Secretary for Justice, the Secretary for Security and the Secretary for Transport and Housing attended multiple public events and gave interviews to explain the co-location arrangement and understand community views.

To reach out to the public and clearly explain the clearance procedures and the co-location arrangement, the government distributed promotional booklets, displayed posters, broadcasted audio- and video-clips through various sources and also shared information via online social media networks. Lastly, two deputation sessions were conducted by the Legislative Council in March and April 2018. Of the 218 deputations and individuals who attended the sessions, 190 expressed support for the co-location arrangement. MTR Corporation Limited, the project

manager of the Hong Kong Section of the XRL, also played its part in sharing information on the XRL project by producing television infomercials and conducting roving exhibitions and promotional activities. Moreover, various stakeholders were invited to visit the railway facilities in the Hong Kong Section of the XRL between July and October 2017. The relevant stakeholders included representatives from the legal sector, the tourism industry, chamber of commerce, professional bodies and think tanks.

A second challenge for this project was the funding approach necessary to ensure its sustainability. In doing so, the government of Hong Kong, China adopted a concession approach as its financial model. Based on this approach, the government would provide funding to construct the Hong Kong Section of the XRL through the Public Works Programme. Upon its completion, the government intends to entrust the Hong Kong Section of the XRL to the government-owned Kowloon-Canton Railway Corporation (KCRC), which would then incorporate it into its Service Concession Agreement with MTR Corporation Limited, a public listed company that the government is a major shareholder of. As a result, the government would continue to benefit indirectly through the service concession payments received by MTR Corporation Limited that are used to pay future dividends.

The financial viability of this project would depend on several factors like the fare charged and its adjustment arrangement, and the revenue split arrangement. These factors would be subject to the availability of train paths, cross-boundary station facilities and discussions with operators of the Mainland Section of the XRL. According to the concession approach, the government of Hong Kong, China will be able to share revenue arising from the XRL and can decide to take back operation of the XRL when it is fully operational or upon termination of the service concession.

With regard to sustainably managing the operations of the XRL, the government of Hong Kong, China will coordinate and resolve interface issues between the Hong Kong Section and the Mainland Section of the XRL with the authorities of the People's Republic of China. The interface issues can include the location of train paths, the adoption of standards to enable inter-operability of the two systems, and the necessary arrangements for emergency evacuations amongst others.

2.4   IMPACT

Upon completion of the XRL, the travel times by rail between Hong Kong, China and various cities in the mainland of the People's Republic of China will be greatly shortened. As mentioned earlier, a complete journey from West Kowloon Station to Guangzhou South Station will take about an hour instead of the initial two hours. Similarly, the United States High Speed Rail Association (USHSR) asserts that high speed rail trips are 70 per cent shorter than taking conventional rails. Based on a previous assessment, the Hong Kong Section of the XRL is expected to save passengers around 39 million hours of travel time per year, which amounts to a monetary equivalent of HKD 90 billion (discounted to 2015 prices at a rate of 4 per cent) during the 50 years of XRL's operation starting from 2018. The XRL will enable the creation of a "24-hour living circle" within which residents along the railway alignment would be able to travel to and from different cities within a day, hence creating a new mode of living.

However, media reports stated that recent trials of the XRL showed that the journey might actually take about an hour and 18 minutes. MTR Corporation Limited's Operations Chief later explained that the longer time was due to the stopping of the train at each station along the

journey in contrast to the 48 minutes that would apply to direct trains from West Kowloon Station to Guangzhou South Station[4]. According to Yau (2018), MTR was still in discussions with the authorities of the People's Republic of China on detailed timetables and arrangement of services. The fare price has also been noted to be higher than the original estimations. The fare for the full journey was estimated at HKD 180 in 2009, then HKD 210 in 2016 and it was finally set at HKD 260 in 2018. Similarly, the fare from West Kowloon Station to Futian Station in Shenzhen was estimated to be HKD 45 in 2009 and has since almost doubled to HKD 80. Ticket fares to most other destinations have risen as well since the 2009 estimations[5].

TABLE 2.1: PAST ANALYSIS ON THE EXPECTED BENEFITS OF XRL

Factor	Benefits of commissioning XRL
Time and money	Save passengers 39 million hours per year, equivalent to HKD 90billion for the 50 years of operation
Employment	Provide 11,000 construction job opportunities at peak and 10,000 new job opportunities upon commencing in services and management
Rate of return	Economic internal rate of return of 6 per cent expected in base case
Environment	4,700 tonnes less of carbon dioxide generated as compared to cross boundary coach

Despite the fare increases, the XRL project is expected to create many job opportunities. The government's estimate expects an average of 5,500 new jobs in the construction of the Hong Kong Section of the XRL within a short term and 11,000 new jobs at its peak. Upon commencing operations, 10,000 new employment opportunities are expected. These can include railway operation, station management, boundary control, and catering and retail services. In assessing the economic returns of the XRL, it was estimated that an Economic Internal Rate of Return (EIRR) would range between 5 per cent and 7 per cent based on a set of assumptions. The assumptions were based on three different scenarios (low, base, and high cases) depending on factors like population and GDP growth rates. For example, in the base case, an EIRR of 6 per cent was expected at the end of the 50 years of operations. There are however certain things to be aware of when depending on the EIRR for an accurate measure of returns on a project. The EIRR measures the net rate of return on a project by subtracting the construction and operation costs from the economic benefits but does not take into account any indirect economic and social benefits that are hard to quantify. Thus, it may not give a full picture of the overall impact.

Furthermore, the XRL is expected to strengthen cooperation between the economies of Hong Kong, China and the People's Republic of China and provide development opportunities to many sectors such as trade, finance and professional services. These opportunities will improve Hong Kong, China's position as an international city in the Pearl River Delta region and enhance its competitiveness as an international hub. The XRL will also open up new tourism markets through the improved connectivity between the two economies and the increased availability of transport options for foreign tourists who wish to visit the mainland of the People's Republic of China via Hong Kong, China. The closeness of the terminus to the West Kowloon Cultural District is expected to attract visitors interested in international art,

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[4] Yau, C. (2018). Retrieved from South China Morning Post: https://www.scmp.com/news/hong-kong/hong-kong-economy/article/2146092/hong-kong-rail-chiefs-admit-high-speed-rail-link
[5] Siu, P., & Yeung, R. (2018). Retrieved from South China Morning Post: https://www.scmp.com/news/hong-kong/economy/article/2128314/express-rail-fares-will-cost-hk260-hong-kong-guangdong

exhibitions and cultural performances. The XRL service will have a comparative advantage over alternative modes of transportation. Its competitive advantage to the aviation service will be most obvious within a 1,000 km radius or areas within a four-hour journey. However, the aviation industry would also be able to use the XRL to their advantage by developing air-railway intermodal services. This will be particularly beneficial given the proximity of the West Kowloon Station to the Airport Express which links passengers to the Hong Kong International Airport. Airlines could also instead launch more long-haul flights which have higher profitability, hence strengthening Hong Kong, China's position as an international transport hub.

As previously addressed, the XRL is more environmentally friendly compared to other modes of transportation. This is true of most electric high-speed rails whose emissions are limited to those from the power plants. Emissions from the power plants are expected to be more manageable than emissions from airplanes and road vehicles. The impact on the environment is also expected to be minimal because the Hong Kong Section of the XRL will run within tunnels. The additional 4,700 tonnes of carbon dioxide generated per year when using the cross-boundary coach proves the XRL's role in supporting sustainable development.

2.5 LESSONS LEARNED

The XRL project addresses two pillars of the APEC Connectivity Blueprint 2015-2025. The physical connectivity pillar commits to the development, maintenance and renewal of quality infrastructure which includes transport infrastructure. The XRL project will contribute towards this goal by further developing the APEC transport network with quality and sustainable infrastructure. As the high-speed rail is a passenger service, it will also facilitate people to people connectivity pillar of the blueprint as well. The shorter travel time between the two economies will promote several goals under the people to people connectivity pillar. It will foster the growth of tourism through improved ease of travel, promote cultural exchanges, and facilitate labour and skill mobility allowing for greater flow of technology, innovation and ideas between the economies.

Lessons can be drawn from the XRL project on enhancing cross-border connectivity among other APEC economies. These are listed below:

1. Planning and prioritisation: Experience shows that high-speed rail projects can take up to a decade or longer, from the formulation of ideas, planning and consultation with stakeholders to the eventual construction and completion of the project. There are also huge capital investments involved. Hence, it is essential to make timely plans and adjustments throughout the process, and maintain close relationships with relevant stakeholders. In addition, the decades-long impact of the XRL on people's livelihood and society's development makes wider socio-economic benefits a priority among other important factors such as transport demand and cost-effectiveness.

2. Co-location arrangement: Despite not being a novel idea, the co-location arrangement does require the settlement of complicated legal, operational and security issues. Similar arrangements exist in other economies as described in Box 2.1 Hong Kong, China's experience has faced its fair share of challenges. Questions from both constitutional and operational perspectives were raised towards the government of Hong Kong, China by legislators. These questions included not only the respective authorities of the immigration, customs, and quarantine officers from both economies but also the division of labour in

times of emergency and security measures necessary to avoid illegal crossing. Facing these challenges has made Hong Kong, China appreciate the development of the co-location arrangement proposal at an early stage to allow for adequate time to gain public support and settle implementation details in time for the commissioning of the XRL.

BOX 2.1: CO-LOCATION ARRANGEMENTS IN OTHER ECONOMIES

West Kowloon is not the first co-location arrangement between the economies of Hong Kong, China and the People's Republic of China. The Hong Kong Port Area in Shenzhen Bay Port, established in 2007, also adopts a co-location arrangement model but with Hong Kong, China having jurisdiction over an area in the mainland of the People's Republic of China. As such Hong Kong, China's laws apply within the designated areas; the courts of Hong Kong, China have jurisdiction; and the land is regarded as Hong Kong, China's government land[6].

United States has co-location arrangements with Canada, Ireland, the UAE, and several Caribbean economies. The US refers to its co-location arrangements as 'preclearance' operations. The preclearance arrangements with Canada allow for US immigration officials to be stationed in designated preclearance areas in Canadian airports. Travellers to the US can then be cleared before boarding a flight. As such, flights from Canada to the US can be treated as domestic US flights for the purposes of customs and immigration and can land at any airport in the US, even those that do not have customs and immigration facilities[7].

The UK, France and Belgium also have co-location arrangements, which they refer to as 'juxtaposed controls'. The arrangement between the UK and France allows for control zones to be designated at ports, such as train and ferry stations. The control zones remain under the jurisdiction of the UK, but French officers are granted special powers. In particular, French officers may carry out customs and immigration procedures on passengers traveling to France from the UK. They can also detain travellers for a period of up to 24 hours, or more in exceptional circumstances. French officers can then request the UK police to take the detained persons into custody[8].

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[6] Hong Kong e-Legislation. Cap. 591 Shenzhen Bay Port Hong Kong Port Area Ordinance. Retrieved from: https://www.elegislation.gov.hk/hk/cap591!en-zh-Hant-HK?INDEX_CS=N
[7] Parliament of Canada. Statutes of Canada 2017: An Act respecting the preclearance of persons and goods in Canada and the United States. Retrieved from: http://www.parl.ca/DocumentViewer/en/42-1/bill/C-23/royal-assent
[8] UK Legislation. Nationality, Immigration and Asylum Act 2002 (Juxtaposed Controls) Order 2003. Retrieved from: https://www.legislation.gov.uk/ukdsi/2003/0110465709

3 PHYSICAL CONNECTIVITY: ICT AND TELECOM: ACHIEVING INCLUSIVE CONNECTIVITY (RUSSIA)

3.1 INTRODUCTION

Russia is the economy with the largest geographical land area in the world, with a sprawling land area of over 16 million square kilometers. According to the World Bank, only 1.1 per cent of Russian land area qualified as "urban" in 2010, yet 74 per cent of the population lived in this small urban part of the economy. Population densities in Russia's rural areas can be as low as 3 inhabitants per square kilometer which renders providing services challenging both economically as well as physically. However, the advent of information and communications technology (ICT) has opened up new opportunities for improving connectivity, and Russia with its unique geography and demographics may profit greatly from these new developments.

Efforts to address the connectivity issue in Russia began two decades ago. During this time (see Graph 3.1), the number of internet users grew steeply at an average of 38 per cent per year while 73 per cent of the Russian population accessed the internet in 2016. Similarly, the fixed broadband subscription rose from 2 to 19 units per 100 people in the 10 years 2006-2016 (see Graph 3.2). Rossotto et al. (2015)[9] also found Russia's internet speed comparable to EU economies in 2015 and noted a steady rise which was expected to reach 44 Mbps by 2018. In addition, Russian broadband was considered affordable with 90 per cent of the population being able to afford it. According to the World Economic Forum[10], Russia ranked 10th in the world in terms of affordability under the Networked Readiness Index. This statistic was however not representative of all the remote regions of Russia. In 2015, the ratio of people with fixed broadband access between Moscow and the least connected regions was projected at 285 to 50. Accordingly, Rossotto et al. (2015) noted the challenge of ensuring the same affordability throughout the economy. Hence, the ultimate goal of the developments in the ICT sector is to ensure accessibility and affordability of broadband services, specifically ensuring provision of services with a speed of 10 Mbps to 97 per cent of the households and 100 Mbps to all public entities like hospitals and schools by 2024.

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[9] Rossotto, C. M., Gelvanovska, N., Hohlov, D. Y., Mačiulė, D. V., & Shaposhnik, S. (2015). A Sector Assessment: Broadband in Russia. World Bank. Retrieved from http://documents.worldbank.org/curated/en/93444146298761104/pdf/949410WP0BROAD00Box385445B00PUBLIC0.pdf

[10] See World Economic Forum. Retrieved from: http://reports.weforum.org/global-information-technology-report-2016/networked-readiness-index/

FIGURE 3.1: INTERNET USERS
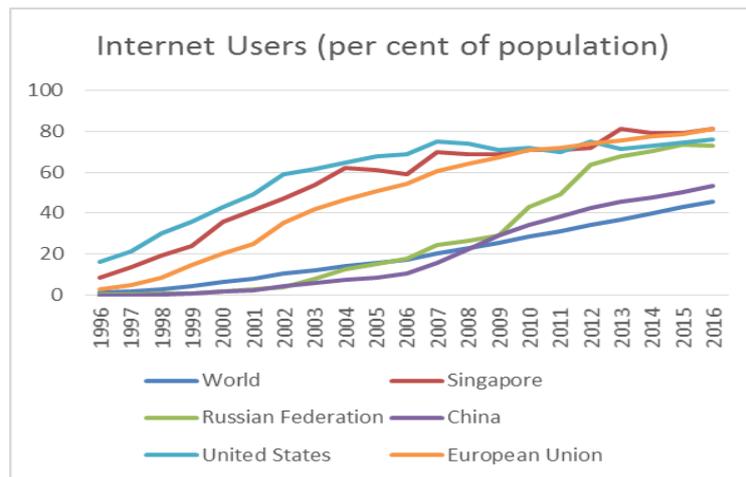
Source: World Bank

FIGURE 3.2: FIXED BROADBAND SUBSCRIPTIONS
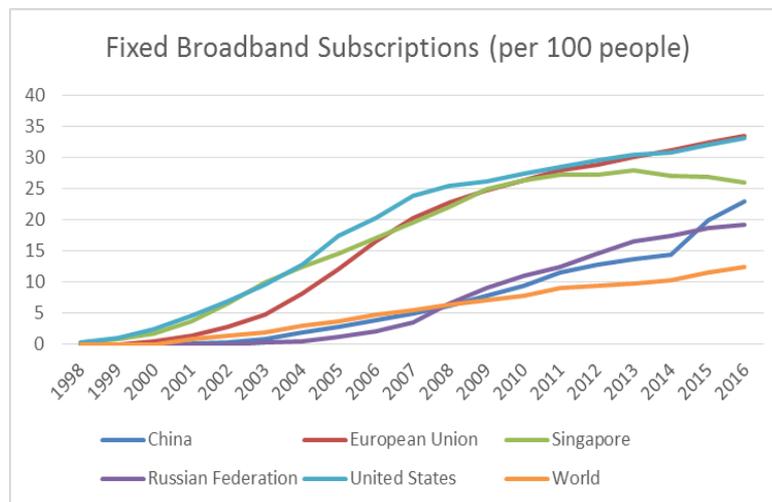
Source: World Bank

Recognising the challenge of bringing connectivity to the remote regions, Russia has developed its internet connectivity strategy. This has encompassed a range of initiatives targeting broadband access and telecommunication networks over the last few years. The past decade's progress in telecommunications and internet services can be divided into three phases.

The first entails the time period before 2005 during which any municipal level locality was mandated to have at least one multi-purpose payphone at a distance requiring less than one hour of walking. In the second phase, which ranged from 2005 to 2014, universal services provision was included such that any locality with a population of more than 500 people would have to have a community access point. In 2014, universal broadband access was added into the set of universal services. It was supported by the Russian Federal Law No. 126-FZ of 7 July 2003 "On communications", which required the installation of broadband access points with a minimum speed of 10 Mbps in all localities with 250-500 inhabitants. As a result, about 46,000 km of optical fibre cables have been laid down to connect 5,656 localities, which include 34 localities in the Arctic zone. The aim is to connect more access points in areas with harsh climate and lay down a total of 200,000 km fibre optic communications lines (FOCL).

Russia also made the move to a single universal service provider model selecting PJSC Rostelecom, a state-owned enterprise (SOE), given its significant presence in the market of majority of the regions of Russia. Despite being an SOE, the World Bank acknowledges the dominant but competitive role that Rostelecom plays in improving connectivity. The company has been a driver for much of Russia's investment in backbone infrastructure for internet connectivity and accordingly has experienced an increasing market share in almost all market segments. The increased ICT investments have raised the 4G base stations in the economy from 2,000 to 160,000 between 2012 and 2018. Rostelecom is also trying to connect settlements with 500 to 10,000 people or higher as part of its special investment program. 26 million people in 16,000 settlements (500-10,000 people) accounting for 87% of the population have been connected as a result of the program by 2016. Additionally, a pilot for the 5G network has been launched with the plan to have all cities with a population of over 1 million covered by the network by 2024. These past initiatives and policies have led to substantial improvements in connectivity in the recent years.

3.2 INITIATIVES

The work on enhancing connectivity in Russia particularly in remote regions has continued through efforts targeted at eliminating the disparity between regions. In doing so, the main goals of the Russian government are to 1) provide broadband access to inhabitants, public authorities and principal institutions like educational and medical amongst others; 2) ensure communication network coverage of all federal highways; 3) introduce 5G mobile and fixed line technologies to cities inhabiting more than a million people; and 4) construct a federal narrow-band low-power wide-area network (LPWAN).

Five key principles have been highlighted in pursuing these goals: free access to information at all stages of development and implementation to public authorities, local governments, organisations and citizens; prevention of malicious use of information infrastructure; expansion of the e-government infrastructure system; ensure integrity of the telecommunication networks; and ensure reliability and availability of telecommunications and ICT services in rural and remote areas.

The first step to improve remote connectivity adopted by Russia was to develop FOCL infrastructure. According to the World Bank report, the Universal Service Obligation contract requires Rostelecom to provide connection access points with a speed of at least 10 Mbps to 13,600 localities inhabited by 250 to 500 people before 2019 (Rossotto et al., 2015). As initially mentioned, 46,000 km of the intended 200,000 km of FOCL have been developed and Rostelecom continues to work towards realizing the ambitious aim of one of the largest FOCL deployment projects in the world. By 2018, 90 per cent of the households are expected to have broadband connectivity.

To improve broadband coverage, Russia plans to deploy satellite and mobile technologies financed through a special universal services fund. These technologies are particularly useful in regions where it is hard and expensive to construct FOCL. Despite focusing on using FOCL, regulators have identified the challenges in doing so in remote regions and have permitted the use of other technologies. According to Rossotto et al. (2015), satellite broadband access will be provided for private use as part of the universal service of connecting localities with 250-500 people or through various government-subsidised programs. To provide coverage with mobile technologies, the State Commission for Radio Frequencies has established conditions for radio frequencies based on the population of localities, specifically, frequency range of up

to 1 GHz for a population of over 1,000 people, 1 to 2.2 GHz for over 2,000 people settlements and 2.2 to 3 GHz in places with more than 10,000 inhabitants. This coverage will be realized by 2020 and will ensure mobile broadband connectivity to 90 per cent of the Russian population. In addition, telephone communication services like payphones and information kiosks are to be provided at walking distances in almost all localities.

The Russian government adopted its Digital Economy of the Russian Federation economy-wide program with the aim to improve quality of life and business environment through the use of ICT. The program focusses on creating a digital economy ecosystem with necessary and sufficient institutional and infrastructural conditions, eliminating restrictions to creating and/or developing high-tech businesses and avoiding new obstacles both in traditional and new industries and high-tech markets, and increasing global competitiveness for individual industries and the whole economy. Five relevant sub-programs were developed, along with relevant roadmaps in order to ensure comprehensive, effective and timely implementation. Initially, the program allocated USD 53.14 million[11] to finance the activities of all subprograms (Dokuchaev, 2018)[12], but the actual spending may be revised to cater to changing circumstances. Each of the subprograms and their objectives to be achieved by 2024 are discussed below:

1. **Information infrastructure**. The subprogram aims to develop communication networks, data centre systems and digital data platforms to facilitate the work of businesses, government and citizens. The objectives are to ensure broadband access to 97 per cent of households, a sustainable economy-wide coverage at the rate of 100 Mbps and 5G network coverage in cities with population of more than a million people.

2. **Human resources and education**. This subprogram is intended to train personnel in the necessary skills and transform the labour market based on the digital economy requirements. In order to prepare the labour market for this change, the program plans to produce 120,000 higher education graduates and 800,000 higher and secondary vocational education graduates in the field of ICT and/or telecommunications per year. As a result, it is expected that 40 per cent of the population will be equipped with the necessary digital skills.

3. **Normative-legal regulation**. The aim of the normative-legal regulation subprogram is to organise a new regulatory environment that is more welcoming and supportive of the development of modern technologies and the relevant economic activities necessary for their use. A comprehensive legal regulation program is expected to be completed by 2019 and will entail about 50 bills on ten key areas in the two years of 2018 and 2019 (Analytical Center for the Government of the Russian Government, 2018)[13].

4. **Information security**. This subprogram aims to protect relevant parties from internal and external information threats by ensuring the implementation of constitutional rights, decent standards of living, and sustainable economic and social development of

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[11] See Russia Briefing. (2018, April 2). Russia Moves to Fund Digital Economy in Five Sectors. Retrieved from: https://www.russia-briefing.com/news/russia-moves-fund-digital-economy-five-sectors.html/. [last accessed 19 July 2018]

[12] Dokuchaev, P. V. (2018). State Program: Digital Economy. The Main Trends of ICT/Telecommunications in the Russian Federation (2018 - 2024). ITU-D, GCBI Meeting. February 27-28. Geneva: ITU Academy. Retrieved from https://academy.itu.int/download.php?filename=VladimirDokuchaev.pdf

[13] Analytical Center for the Government of the Russian Government. (2018, February 21). *The Government is to Make Decisions about the Digital Economy Regulation in 2018.* Retrieved from Analytical Center for the Government of the Russian Government: http://ac.gov.ru/en/events/016008.html

the economy. In line with this aim, the program intends to raise the proportion of the population using information protection tools to 97 per cent within a year; and increase literacy in the use of internet services and related fields to 50 per cent; and use of standards of secure information for interactions between the government and public institutions to 75 per cent.

5. **Development of research competencies and technological reserves**. The last subprogram aims to create a support system for applied research in the field of digital economy. To do so, 30 digital economy related projects of at least 100 million rubles each are to be implemented by 2024. In addition, 10 companies are to be involved in major projects in priority areas of the digital economy like scientific and technical cooperation valued at least at 190 million rubles each.

In addition to these subprograms, the government is considering the introduction of new subprograms to improve the realisation of the Digital Economy program. These subprograms await further analysis prior to approval and include the following topics: digital transport and logistics; smart city; digital agriculture; digital construction; and digital healthcare (Dokuchaev, 2018). Besides these, there are other existing programmes like the Information Society (2011-2020), Economic Development and Innovative Economy, Development of the Transport System, and Development of the Electronic and Radioelectronic Industry in 2013-2025.

3.3   IMPLEMENTATION CHALLENGES

There have unconditionally been challenges in implementing the above initiatives. These include construction of costly infrastructure in difficult-to-reach regions, lack of skilled labour, and lack of market competition. Firstly, the deployment of infrastructure in difficult-to-reach areas has been a particular concern as most of Russia is remote. The aim to target and improve remote connectivity has hence been a timely one for the economy. Opportunities for remote area development have been provided through the adoption of alternative mechanisms like satellite and mobile technologies, where FOCL cannot be constructed. In addition, the Digital Economy program and its proposed new subprograms like digital transportation and construction provide valuable opportunities to reduce the physical barriers of a remote locality. To ensure the financial sustainability of the initiatives, Rossotto et al. (2015) suggest the development of standard procedures and rules to enable optimal allocation of support from federal and regional budgets. Additionally, since the implementation of the project and the infusion of the funds will prompt market development, an efficient, open-access model that will enable maximized usage of current and developing infrastructure will be beneficial.

A further challenge is the lack of competent and skilled labour resources. The adoption and development of digital technology and its embedded activities are not sustainable without training the labour force in their usage. This is recognised in the Digital Economy program in which the human resources and education subprogram aims to promote the field of ICT and telecommunications among higher and secondary vocational centres and higher educational institutions. The objective is to equip 40 per cent of the population with the required digital knowledge and skills. In addition, the Ministry of Digital Development, Communications and Mass Media and the Ministry of Education and Science are jointly working on increasing the number of IT specialists. This can be seen from the rise in state-funded scholarships in the relevant fields from 25,000 to 47,000 since 2014. Moreover, the two ministries developed the Hour to Code program in 2014 to teach school students the basic concepts of programming. In its first year, the program saw the participation of 6 million students, and this number rose to

over 10 million by 2017. This program takes place in almost every school in the economy. It provides an online environment for individual training and is divided into 3 levels based on the age of the students to provide targeted skills development opportunities. The project site also provides updated methodological materials for teachers to better prepare their lessons. Other ICT-targeted educational initiatives include the Quantorium which focusses on providing children with research space and technology parks or incubators[14]. At the university level, there is the Digital University[15] initiative that provides opportunity for e-leaning. These initiatives are going a long way in ensuring that graduating students are ready for the digital future.

A third and last challenge relates to the lack of competition owing to Russia's move to a single provider model with Rostelecom, a company with a two-third market share. The high market share is also due to Rostelecom's significant investments in backbone infrastructure. In 2013, Rostelecom was one of four major players in the broadband market, namely MTS, Vimpelcom (the subsidiary of VEON Corporation), and Megafon. Rostelecom held only 1.5 per cent of the market share in mobile broadband while MTS and Vimpelcom had market shares of over 30 per cent each. It was however dominant in the fixed line telephony and fixed broadband markets in which it held 70 per cent and 44.6 per cent of the market shares respectively. These figures show that Rostelecom was developing to become a significant player in the fixed broadband market despite the intense competition from the other operators. According to Rossotto et al. (2015) the trend was expected to lead to at least 60 per cent of the company's investments in improving broadband services in the four years following 2013. The company did eventually grow in the market and was awarded sole provision of universal services in 2014. This combined with the fact that Rostelecom is government owned presents possible conflict of interest. The absence of sector-specific regulators also introduce concerns over the government ownership of the company and the opportunities available for healthy competition.

However, in recent development, several economy-wide plans and new decisions to improve competition in the market and prevent discriminatory access to infrastructure have been initiated (Rossotto et al., 2015). Many regulatory restrictions which hampered the sharing of communication infrastructure were removed between 2012 and 2014 and new regulations to govern the use of passive and active communication equipment have been introduced with particular emphasis on sharing of base stations. Enabling sharing and joint use of communications infrastructure will reduce the costs of developing the infrastructure and hence make it more profitable to cover remote regions.

Additionally, a non-discriminatory law with regards to access to infrastructure was adopted by the Russian government in late 2014. Furthermore, in 2013, the principle of technical neutrality was established and mobile number portability was employed. As a result of the latter, 8.4 million users switched their operator. In the following years, several improvements were made such as the requirement to pay for the number of base stations was replaced with the requirement to pay for the radio-frequency volume (2014), the shared use of frequencies (2015) and infrastructure (2016) was allowed, the access of operators to apartment houses was simplified (2017), and most recently the intra-network roaming fee was abrogated (2018). Overall, measures are being taken to overcome most of the implementation issues in order to strengthen the impacts of the initiatives.

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[14] See the official website of the "Quantorium" project (in Russian) http://m.roskvantorium.ru/
[15]   See   Digital   University   platform   (in   Russian).
https://edstudy.ru/?_target_path=https%3A%2F%2Fedstudy.ru%2Fabout%3F_hash%3DGy%252FUp0x%252B
m1EFn8xaoSfcPKSqQzZ1rWVoUpxc9PC1bxA%253D&login_required=1

3.4 IMPACT

TABLE 3.1: BENEFITS OF ICT INITIATIVES

Factor	Benefits

Physical infrastructure	• 200,000km of FOCL to be laid.
	• 147,675 new payphones.
	• 13,600 access points to be deployed.
	• Targets:
	   o Broadband access to 97 per cent of households;
	   o Sustainable economy-wide coverage at a rate of 100 Mbps;
	   o 5G network coverage in cities with a population of more than 1 million people.

Affordability	• One of the lowest prices for internet access and mobile services in the world. Fraction of the population who can afford a fixed broadband subscription has increased to 80 per cent. Expecting to reach 95 per cent by 2020.
Connectivity	• Improved internet connectivity for 3,000 medical institutions. Planning to connect 7,000 more. • Developing a unified government information system to improve interoperability of information systems in the healthcare sector, as well as other electronic systems for the provision of public services.

Education	• More than 10 million students participated in Coding program in 2017
	• Developing online learning courses which will engage 11 million people before 2026.
	• Targets:
	   o 120 000 ICT-specialists graduating a year;
	   o 800 000 students with sufficient digital skills at the world-average level a year;
	   o At least a 40 per cent digitally literate population.

Trade	• The production of digital content products increased to 70 billion rubles. • Online purchases amounted to 800 billion rubles in 2016, after a 23 per cent growth since 2015[16]. • e-commerce share of retail sales expects a gradual increase of 0.2 per cent per year. • Online retail grew by 32 per cent to amount to 145 billion rubles in 2016. • Value of cross-border online purchases have grown by around 10 per cent between 2013 and 2016.

The results of these ambitious initiatives have undoubtedly improved remote area connectivity. Around 46,000 km of the 200,000 km FOCL have been laid, 147,675 payphones constructed, and 6,723 access points of the planned 13,600 have been deployed. Once the project is

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[16] See Online trade market in Russia in 2017 (in Russian): http://datainsight.ru/sites/default/files/ecommerce2017.pdf

completed, over 13,000 access points are expected to cover 96 localities in the Arctic region. In addition, the improved accessibility has made digital and telecommunication services more affordable in the remote areas of the economy. For example, the monthly access prices dropped by 76.5 per cent in the Far Eastern and 83.6 per cent in the Southern district between 2012 and 2014 (Rossotto et al., 2015). Furthermore, the Russian Association for Electronic Communications (RAEC) found the price of a fixed broadband sub-basket with at least 1 GB data to be significantly cheaper in Russia compared to other economies. Specifically, it costs 51 per cent of the equivalent in South Africa, 40 percent of the American, 30 per cent of the Filipino, 28 per cent of the French, and 17 per cent of the German in 2015 (RAEC, 2017)[17]. In line with these trends, the overall fraction of the population who can afford a fixed broadband subscription has risen to 80 per cent recently, short of 15 per cent to reach the 2020 goal.

Positive impacts of the initiatives can be seen in various industries. In the health sector, the Ministry of Health's federal law to promote remote retail medicine trade sought to connect 10,000 medical institutions to the internet by 2018. By 2017, more than 3,000 medical institutions had successfully reported internet connectivity. Improvements in the health sector also followed with the commission of the emergency response domestic system called "ERA-GLONASS", which has been ordered into regular use since 2015. Prior to the newly suggested digital healthcare subprogram under the Digital Economy program, the government has adopted a law concerning the application of information technology in healthcare. The law intends to introduce the concept of telemedicine technologies to improve remote communication between patients and healthcare providers, and better regulate the application of information technologies in the healthcare field. Also, the government is developing a unified information system for the healthcare sector to provide interoperability among information systems and to ensure protection of personal data.

In the education sector, as initially noted, the Hour to Code program has seen significant participation in the four years of its operation. More than 10 million students participated in 2017 and the distribution of the participants was regarded to be almost equal amongst boys and girls in most districts[18]. In addition to the education subprogram of the Digital Economy program, the National Online Library is currently developing the Russian Unified Digital Knowledge Space to provide a reliable source of knowledge to remote regions over the internet. To further encourage e-learning, the number of online courses have increased and is expected to have engaged 11 million people before 2026 (Nikanorov & Shvindt, 2017)[19].

The Russian Post also plays an important role in e-commerce and connectivity in Russia. The structural reforms it underwent since 2012 have resulted in 284 million international parcels being delivered in 2017. Additionally, the introduction of the Post Office Bank of Russia has improved access to financial and banking services to customers especially in remote areas through the wide network of 13,000 cooperative offices. There are plans to develop 5,000 more by the end of the year.

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[17] RAEC. (2017). Mobile Internet Economy in Russia 2017. Russian Association for Electronic Communications. Retrieved from http://mobile2017.raec.ru/assets/mobile-internet-economy-in-russia-eng.pdf [last accessed 2 October 2018]

[18] See: http://coderussia.ru/. [last accessed 20 July 2018]

[19] Nikanorov, I., & Shvindt, A. (2017). Approaches to formation of the digital learning estimation system in the Russian Federation. *MATEC Web of Conferences, 141*. Retrieved from https://www.matec-conferences.org/articles/matecconf/pdf/2017/55/matecconf_smartgrids2017_01054.pdf [last accessed 2 October 2018]

The digitisation of the economy has inevitably influenced the products produced and traded. The production of digital content products like videos, music and games have gone up to 70 billion rubles. Trade has been affected by the opportunity for e-commerce. According to Abraham et al. (2017)[20], the e-commerce share of retail sales was forecasted to be about 3 per cent by 2018, a gradual increase of 0.2 per cent per year. The business-to-consumer e-commerce rate rose by 20 per cent in Russia in 2016, a rate much higher than Europe, and the e-commerce market in general was expected to be worth 1.15 trillion rubles in 2017. The most popular online platforms for retail are Wildberries, Ulmart, Citilink, MVideo, Eldorado, Lamoda and Ozon. An increasing portion of this e-commerce trade is also cross-border. The value of cross-border online purchases have grown by about 10 per cent between 2013 and 2016. It was further noted that China's AliExpress was the most visited e-commerce website in Russia in 2017 (Abraham et al., 2017)[21]. The increasing convenience and availability of internet services and related protectionary regulations have increased Russia's domestic and cross border e-commerce trade.

3.5 LESSONS LEARNED

Russia's ICT and telecom project plays a key role in addressing disparity with respect to access to and quality of ICT infrastructure in the APEC region. It tackles the physical connectivity pillar of the APEC Connectivity Blueprint 2015-2025. The pillar commits to developing, maintaining and renewing quality infrastructure which includes ICT infrastructure. This project contributes by enabling faster and reliable connectivity within the region through provision of greater broadband internet access. Better connectivity will in turn reduce the digital divide, enhance inclusiveness, and improve facilitation of trade and economic growth.

There are several key lessons to be noted from Russia's early success and continued work in realising its ambitious ICT plan. Other APEC economies that intend to improve their connectivity and in particular bridge the gap between their big cities and remote regions can refer to them as below:

1. **Political support**: A large portion of the ICT project has been funded and managed by the government. In addition to the indispensable financial support from the government, Russia asserts the presence of strong political will as a key ingredient. Political will has enabled the adoption of high-level strategic documents like the Strategy for the Development of Information Society in the Russian Federation in 2017-2030 and the Digital Economy of the Russian Federation program. These complementary programs and policies play a significant role in achieving the ICT goals.
2. **Clarity**: Appropriate and plausible time frames should be spelt out in the documents to facilitate coordination among the various actors. In addition, relevant indicators should be measured before and after the initiatives' implementation to allow clear measurement of the impacts. Indicators will allow monitoring of the policies and help develop adjustments if needed.
3. **Flexibility**: Russia recognises the importance of being flexible in achieving the objectives of the different programs. For instance, the On Communications law provided support for the construction of FOCL to install broadband access points, but construction of FOCL

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[20] Abraham, J., Lone, S., & Couenberg, J. (2017). Ecommerce Report Russia 2017. Ecommerce Foundation. Retrieved from https://www.arvato.com/content/dam/arvato/documents/reports/russia-reports/Russian_Country%20Report_2017_%20Ecommerce%20Foundation_Arvato_Rus.pdf [last accessed 2 October 2018]

[21] Ibid.

may not be sustainable in some regions due to geographical constraints. In such instances, the government has adapted the procedure to use satellite or mobile technologies on a case-by-case basis. In this regard, it might be beneficial to set a quality of service approach, for example specifying the provision of a no less than 10 Mbps speed, instead of prescribing the type of access technology to be used.

4. **Development of regulatory framework**: The digitisation of the economy requires appropriate laws to be developed that will facilitate the switch to and growth of the new type of economy.

5. **Development of complementary initiatives**: Complementary resources like education and skills have to be developed to digitise the economy. Designing online education programs for people in remote regions and reforming school syllabus to include IT training are necessary to ensure increased participation. It is also easier to realise the benefits of the initiatives when the labour force and the population at large is prepared for it. In addition, it is necessary to be aware of the different types of stakeholders, like small and medium enterprises and scientific institutions, to best develop inclusive policies and activities.

6. **Improvement of existing infrastructure**: Russia suggested a more careful approach in eliminating old infrastructures like payphones. It was realised that despite being an old technology, payphones are still used especially for emergency services calls. Since this technology would play an important role in disaster management, the government has decided to maintain the existing payphones and construct new ones. However, the new installations have been updated with advanced functions like payment for government services as well as audio and video consultations.

7. **Conducting structural reforms**: Russia has been actively applying the programme approach to its structural reforms. Through the development of target-oriented programs with desired indicators, it has become easier to coordinate and estimate the progress made. Moreover, the programs are being implemented through the creation of dedicated working groups which help in bringing all the relevant stakeholders together to conduct dialogues and ensure that a holistic and inclusive approach to the regulation is taken.

4 INSTITUTIONAL CONNECTIVITY: PROMOTE THE VISIBILITY OF SEA FREIGHT LOGISTICS (CHINA)

4.1 INTRODUCTION

The Asia Pacific Model E-Port Network (APMEN) is a network between ports within APEC economies to promote development of trade facilitation and supply chain interoperability in the Asia-Pacific region, specifically on the scope related to E-Port platform. With the proliferation of internet and information technologies, E-Port platform development is directed to provide the 'data-tized' paperless trade schemes, integrated trade facilitation measures, and institutional credibility through Public Private Partnership (PPP) for intra-agency, inter-agency, and inter-economy coordination.

The 2014 Meeting of APEC Ministers Responsible for Trade (MRT) noted that APMEN will aim to establish an active cooperation and knowledge sharing network on information and communications technology (ICT) infrastructure and services among APEC economies. Eventually, APMEN can help to boost cooperation among e-ports that "will reinforce trade data connectivity, improve the implementation of paperless trade, and effectively reduce trade cost and lead time". Additionally, Ministers also noted that successful E-port framework could be one of the effective underlying solutions for helping APEC economies implement their Single Window programs[22].

The background for this initiative is the fact that the information exchange between two or more authorities and enterprises from different economies remains to be in paper format, if not none at all. This is despite most APMEN member economies having accepted digital documents and implemented ICT infrastructure for port operations. Thus, there is a necessity to construct active cooperation and knowledge sharing network on ICT infrastructure and services among different model E-Ports in order to catalyze advancement of APEC's related agendas such as trade facilitation, regional economic integration and supply chain connectivity.

As of 2018, APMEN includes 19 ports from 11 APEC economies. These E-Ports are the primary stakeholders, as they are the ones who are establishing networks between each other under the APMEN framework. Below are the full list of participating E-Ports:

TABLE 4.1: APMEN MEMBERS

No.	Economy	Port	Date of Accession
1	Australia	NSW Ports (Ports of Botany and Kembla)	November 2014
2	Canada	Port of Vancouver	November 2014
3	Chile	Lirquen Port	February 2017
4		Coronel Port	February 2017
5	China	Shanghai	November 2014
6		Xiamen	September 2017
7	Hong Kong, China	TradePort	November 2014
8		OnePort	November 2014
9		GLSHK	November 2014
10	Malaysia	Port of Klang	August 2015

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22 APEC. (2014). 2014 Meeting of APEC Ministers Responsible for Trade. Retrieved from https://www.apec.org/Meeting-Papers/Sectoral-Ministerial-Meetings/Trade/2014_trade

11		DNeX	April 2018
12	Mexico	Port of Manzanillo	November 2014
13		Port of Lázaro Cárdenas	November 2014
14	Peru	Callao Port	November 2014
15	Philippines	Cebu Port	February 2018
16		Intercommerce	July 2018
17	Chinese Taipei	Kaohsiung	November 2014
18	Viet Nam	Ho Chi Minh	November 2014
19		Hai Phone	November 2014

Under the framework of APMEN, member ports can collaborate on data exchange and stepwise realization of end-to-end data visibility for sea freight. The APMEN pilot project on visibility of sea-freight logistics starts with the port-to-port information sharing which comprises information such as product location/situation, including arrival, discharge, inspection, clearance and departure. Having the capability to undertake real-time tracking and tracing services can improve transparency and visibility of logistics supply chains; and contribute towards seamless integration and collaboration across different stakeholders.

4.2   VISIBILITY IN THE SUPPLY CHAIN

The traditional paper-based information exchange is expensive, slow and inefficient thereby creating unnecessary burdens to importers, exporters, traders and agents that are involved in the supply chain. In the process of supplying information and documents to the relevant authority and the often occurring procedural delays, businesses suffer and may incur significant costs as well as lose business opportunities due to the lack of predictability in their operations. According to OECD (2005)[23], these costs may range from 2% to 15% of the value of traded goods.

When customers place orders for their product, they are given a certain date for delivery. This date will kick-start the execution of planning and supply chain activities: from looking at inventory, securing raw and input materials, arranging transportation and warehousing, submission of trade documentation, and payment of invoices. The production process is normally smooth as companies usually have a complete control over the process of production. However, problems usually begin when tackling transportation and connecting supply chains as they involve different actors and systems across different platforms – particularly in a cross-border setting. Shipping and delivery are often said to be the weak link in supply chain connectivity. Additionally, this unreliability is not only due to physical transport or warehousing infrastructure, but also because of the underlying information and data infrastructure supporting the physical logistics. In logistics, the movement of data is as important as the movement of goods itself.

Electronic platforms such as electronic data interchange (EDI), in principle can process and manage trade documents (or messages) such as packing list, delivery note, invoice, certificates and customs declaration for different and across entities[24]. Unfortunately, in this regards, EDI

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[23] OECD (2015). Policy Brief: The Costs and Benefits of Trade Facilitation. Available at http://www.oecd.org/trade/facilitation/35459690.pdf [last accessed 2 October 2018]

[24] UNECE and World Economic Forum (2017). Paperless Trading: How Does It Impact the Trade System? Available   at http://www3.weforum.org/docs/WEF_36073_Paperless_Trading_How_Does_It_Impact_the_Trade_System.pdf [last accessed: 2 October 2018]

data from the shipping line is often poor. More often, businesses only identify problems after they have occurred thereby leaving limited room for a solution or alternative arrangements. It is said that to make efficient decisions on the supply chain, a visibility of at least 95% is required.

NSW Ports, a member of APMEN, highlights the current issues within Australia's supply chain logistics in trying to complete cross-border trade transaction[25]:

- Multiple screens and platforms: this fragmentation could lead to loss of information, lack of comprehensive view and difficulty in combining information.
- Multiple number of communication channels: creating connection complexity among stakeholders and unavoidable manual transactions.
- 'Problem Discovery': difficulty of problem identification in a timely manner; often have to rely on manual processes to resolve the problem which is further complicated with uncertainty regarding who has what information.
- No IT systems are in place: resulting in manual handling and the need for interacting parties to still add manual steps to their automated systems.
- Manual transactions: wasted resources for completing repeated administration procedures; incorrect information due to re-keying errors; lost or incomplete information during transmission; conflicts and disputes due to outdated or late notification; and difficulty in combining information and optimizing resources.
- Unnecessary and wasted truck movements: empty truck movements create excessive cost for transport operators, non-optimal use of container terminal infrastructure (due to uncoordinated bookings or mismatch in operating hours), congestion and decrease of port capacity[26].

Better supply chain visibility could address the above issues by providing for more efficient data-exchange and data-sharing between multiple stakeholders using an online digital or IT platform. One definition of supply chain visibility (SCV) is the capability of sharing on-time and accurate data on customer demand, amount and location of inventory, cost of transportation and other logistics dimensions throughout an entire supply chain[27]. More practically, SCV could be seen to include four steps: (i) data collection (making sure data is available and of good quality); (ii) data sharing and integration; (iii) intelligence creation (to understand what the data means at the precise moment in time); (iv) decision impact (to take corresponding action to initiate positive business outcomes). Ideally, SCV requires the real-time, seamless and on-line data-exchange across supply chain stakeholders. This level of visibility will require a paperless and digital platform where data can flow and be exchanged simultaneously across borders. Supporting cross-border information sharing in digital form will also enhance the efficiency of logistics services and customs clearance.

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[25] NSW Ports presentation by Adem Long (2017). The 3rd Public-Private Dialogue on Advancing Trade Facilitation and Supply Chain Connectivity Through Asia-Pacific Model E-port Network, Ha Noi, Viet Nam, 19 May 2017.

[26] Fremantle Ports (2014). Truck Productivity Study. Available at: http://www.fremantleports.com.au/SiteCollectionDocuments/Fremantle%20Ports%20Truck%20Productivity%20Study.pdf [last accessed: 4 October 2018]

[27] Jaume Ribera and Cristina Castillo (2015). Cross-border end to end supply chain visibility. Presentation at the APEC PPD on Advancing Trade Facilitation & Supply Chain Connectivity through APMEN.

Additionally, end-to-end supply chain visibility through paperless trading will support a higher-level form of trade facilitation. Paperless or digitized exchange of data could happen in several ways (UNECE and WEF, 2017). The simplest would be using email to send the scanned copy of certain documents. Data can also be exchanged electronically through a web-portal where users can input individual data elements, also known as the data-trader interface (DTI). A more advanced form of paperless data exchange is the electronic data interchange (EDI) using standardized data formats such UN/EDIFACT and XML. Single Window systems normally would require some sort of EDI platform in their operation.

UNECE and World Economic Forum (2017) highlighted the following TFA articles related to paperless trading in table 4.2. These articles highlighted the following principles of paperless trade facilitation such as: lodging and acceptance of documents in electronic format; electronic payment for duties, taxes and charges; application of relevant international standards for trade formalities and procedures; and establishment or maintenance of single window for traders.

TABLE 4.2: TFA ARTICLES RELATED TO PAPERLESS TRADING

Article 7.1	"Each Member shall, as appropriate, provide for advance lodging of documents in electronic format for pre-arrival processing of such documents."
Article 7.2	"Each Member shall, to the extent practicable, adopt or maintain procedures allowing the option of electronic payment for duties, taxes, fees, and charges collected by customs incurred upon importation and exportation."
Article 10.2	"Each Member shall, where appropriate, endeavour to accept paper or electronic copies of supporting documents required for import, export, or transit."
Article 10.3	Encourages Members to "use relevant international standards or parts thereof as a basis for their import, export, or transit formalities and procedures" which in theory would apply to standards relevant for e-commerce as well.
Article 10.4	"Members shall endeavor to establish or maintain a single window, enabling traders to submit documentation and/ or data requirements for importation, exportation, or transit of goods through a single-entry point to the participating authorities or agencies." The article further stipulates that "Members shall, to the extent possible and practicable, use information technology to support the single window."

Source: UNECE and World Economic Forum (2017)

Cross-border and cross-port information sharing in digital form to support the operations of logistics services and customs clearance is indispensable. The visibility of sea-freight logistics project will help promote visibility of the whole supply chain and also facilitate efficient border management and high level trade facilitation.

4.3   CHALLENGES ADDRESSED

With e-commerce flourishing, businesses require greater efficiency in cross-border flows of trade to meet the demand of customers. For instance, the B2C market, in particular, is very fragmented making it difficult to track the movement of the goods during delivery – particularly once it goes through customs[28]. In general, the private sector experiences four key challenges when engaging in cross-border ecommerce[29]:

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[28] Ivy Kuo, Associate Director Customer and Digital Consulting (PWC), speech delivered during APMEN PPD (2015).

[29] Malaysia Digital Economy Corporation (2017). The Malaysian Experience in Facilitating Trade.

- Long lead-time and poor last-mile service quality: (i) long delivery lead-time for non-express services; (ii) gaps in track and trace capability across providers.
- Differing border clearance administration: (i) variation in custom requirements; (ii) lack of clear KPI in clearance time, resulting in buffers inefficiencies.
- Lack of information transparency & choice: (i) no information on differences in services and standards across economies; (ii) lack of transparency in pricing – particularly for total landing costs.
- Difficulties with returns: reverse logistics is particularly problematic for large volumes and with postal services.

Better visibility requires efficient cross-border data exchange among stakeholders of the supply chain; improved visibility will benefit everyone, including customs as they can improve their inspection and risk management functions.

Traders have increasingly high requirements and expectations for the timeliness, controllability and security of the goods moving across borders. In this regard, the traditional paper-based information exchange is considered to be expensive, burdensome and inefficient, hindering the efficient supply chain operations. The realization of cross-border information sharing in digital form under a maritime or port platform will facilitate the visibility of the whole supply chain.

Lack of visibility of supply chain can create serious business consequences:
1. High inventory that unnecessarily ties up expensive capital.
2. The necessity to maintain a high raw material stock for precautionary purposes.
3. Revenue delays because of missed sale windows.
4. Unreliable logistics supply chain operations.

As such supply chain visibility makes a good investment and can be a strategic tool to improve services and strengthen the business competitiveness of firms.

4.4   VISIBILITY OF SEA FREIGHT LOGISTICS IN PRACTICE

In delivering the goods, both exporters and importers have to go through a web of inter-related agencies and stakeholders such as customs brokers, shipping lines and freight forwarders across different IT platforms and electronic interactions (see Figure 4.1 for the example in Australia). It may take up to 120 transactions and processes to complete a cross-border shipping of a single container. The information being exchanged in the trade processes is highly repetitive: involves 30 documents and 750 data items of which 50% are unique[30]. One possible solution to escape the maze and complications, as suggested by NSW port is to have better collaboration and data-sharing across supply chain participants by improving the Port Community System (PCS). The System could provide a neutral and open economic platform to improve speed and accuracy of transmission, reduce unnecessary duplication (submit once but use many times) and to broaden reach and availability of Supply Chain information including performance data and "where is my container?"[31].

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[30] Logistics and trade reforms across APEC Economies. Presentation by Adem Long (NSW Port). Available at: http://www.ftalliance.com.au/data/news_attachments/11.%20adem%20long.pdf [last accessed: 4 October 2018].
[31] NSW Port presentation by Adem Long (2017). The 3rd Public-Private Dialogue on Advancing Trade Facilitation and Supply Chain Connectivity Through Asia-Pacific Model E-port Network, Ha Noi, Viet Nam, 19 May 2017.

FIGURE 4.1: TRADERS HAVE TO GO THROUGH A WEB OF INTER-RELATED AGENCIES AND STAKEHOLDERS
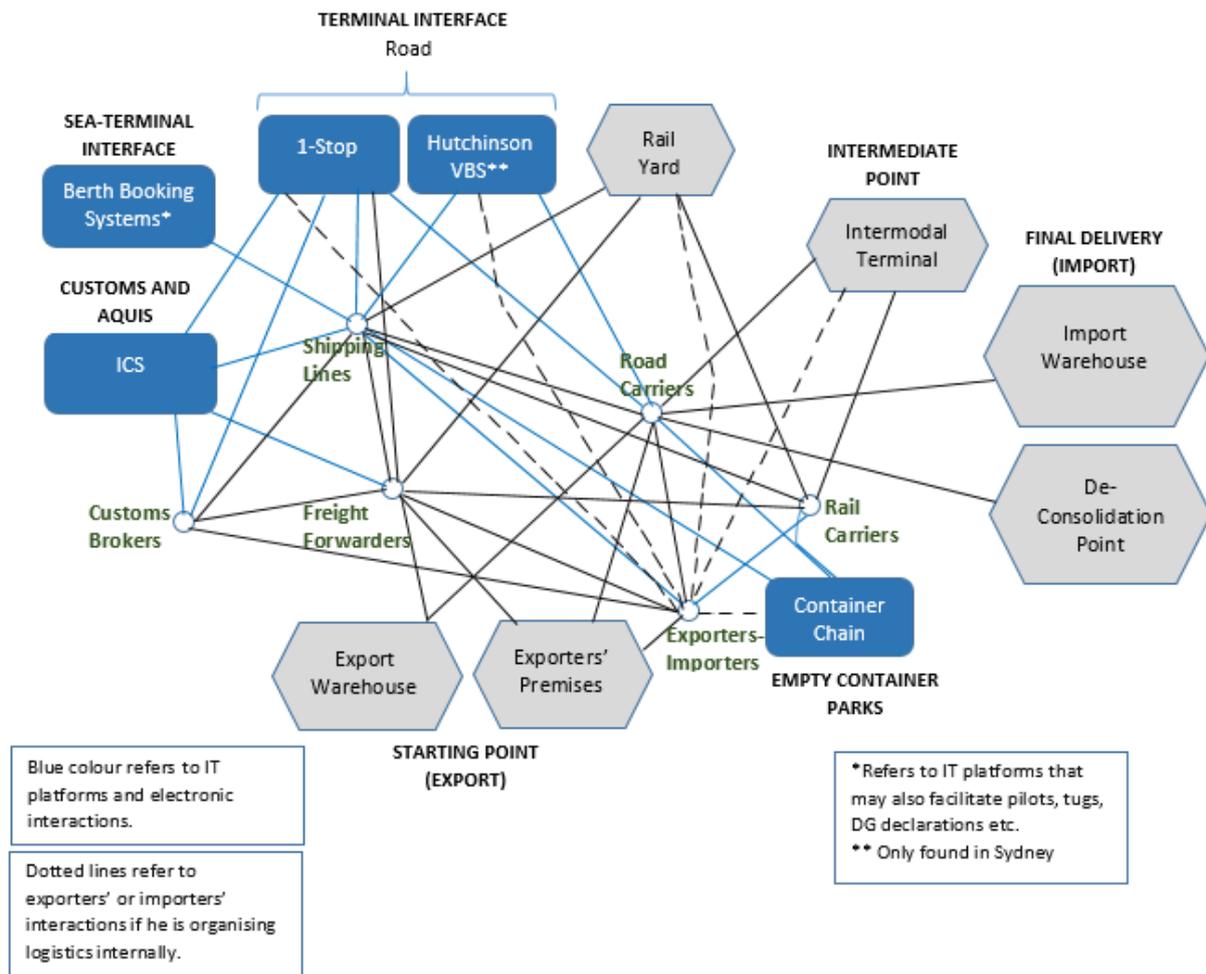
Source: Developing a Port Community System, NICTA (www.nicta.com.au)

OnePort from Hong Kong, China has a system called the Common Barge Platform to address problems of terminals facing barge traffic congestions due to a double-digit annual growth of barge volume. This PCS solution greatly enhances feeder operation efficiency in receiving berth request approval and substantially reducing information delay errors including reworks caused by manual paper processes. The system fully automates and streamlines work flow of barge berthing requests and container declarations among terminals, liners, and barge operators on a unified platform[32]. The following specific improvements were recorded from the application of the PCS platform[33]:

- Higher visibility of incoming traffic allows more accurate forecast of volume
- Better utilization of yard space
- Higher productivity in loads and discharges
- Cargo information available for Customs Pre-clearance
- Eliminate unnecessary delay of discharge due to Customs-hold
- Feeder stowage planning becomes more accurate and reliable

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[32] Hong Kong Port (2017). River Trade Facilitation through Direct Data Connectivity with Feeder Ports in Pearl River Delta.
[33] Ibid.

Under the visualization of sea-freight logistics, the Shanghai E-port and Xiamen E-port of China together with the NSW Ports of Australia have jointly discussed and explored solutions for interconnection and data exchange across E-port systems. The pilot project will be implemented in three stages:

- Stage 1: Establish a common data set based on a commonly agreed event list
- Stage 2: Validate the performance of the data sharing framework and value of the track-and-trace service proposed to maritime transport stakeholders.
- Stage 3: Extend the pilot project, possibly engaging more APMEN member ports, adding more documents/data sets, or developing other value-added services.

4.5   IMPLEMENTATION CHALLENGES

Several key common challenges faced during the implementation of the E-Port cooperation framework are:

- The willingness of stakeholders to share their information with other stakeholders: Support and trust from stakeholders are important to realise data-exchange cooperation. This involves collaboration from a variety of stakeholders from the public and private sectors involved in sea freight logistics, including sellers, carriers, forwarders, border agencies, distributors and buyers. A word of caution, not every stakeholder will have the same motivation to have better transparency and visibility as they may make some profit off the opaqueness of the supply chain.
- Protection of data privacy and security: As the data exchange may involve various kinds of business and regulatory information, it is important to get assurance of the data privacy and security. This will also provide confidence for supply chain participants to submit their information to the data exchange system.
- Reliability and accessibility of the data exchange system: The data exchange platform will need to ensure reliability and easy access to ensure a comprehensive supply chain visibility.
- ICT costs: Tracking systems are not cheap. For example, to have an on-line and live data sharing system, the installation of a GPS on a container will require cellular signal. While RFID tags are affordable, the reader is quite expensive. The issue of who should pay these costs will need to be considered and compared with the potential benefits from SCV. Other important cost areas are related to data cleansing and data harmonisation. In summary, without a clear view of the commercial benefits of having more visibility, industry players would be reluctant to bear the high ICT costs.
- Comprehensive logistics management: Lastly, it must be understood that better visibility will not automatically solve every problem. Perfect visibility will not matter much if trucks keep breaking down, traffic is jammed, and ships turn up late. In order to bring tangible benefits, businesses need to be able to take concrete actions on the intelligence provided by their visibility platforms.

4.6   EXPECTED IMPACT

There are important benefits that could be expected from having paperless supply chain visibility across borders:

- *For enterprises*: they can be kept updated on the location and status of their cargo and make more efficient supply chain management decisions in terms of inventory, quality control and border clearance. SCV will also support SMEs that use e-commerce platforms as these firms normally sell in small consignments or individual (low-value) parcels and have limited resources to handle any additional trade procedures and documentation. One example where if EDI files were not accepted, traders may need to declare individual parcels; which is very cumbersome.[34]
- *For carriers and forwarders*: they can provide faster and more reliable logistics services and improve their customers' shopping experiences. By avoiding delivery delays, consumer's trust could be maintained and traders' reputation could be further improved.
- *For regulators*: they can exert closer supervision on the cargo and have more effective tools for law enforcement. This could result in a more targeted supply chain risk inspection and control.

The trade facilitation cloud service has the potential to achieve a significant effect. For example, it has reduced the declaration error rate from 0.8% to 0.01% and cost from several hundred Yuan per consignment to 20 Yuan. Processing time for each consignment is also reduced from 2 days to 1 hour[35].

4.7   LESSONS LEARNED

Improving cross-border paperless sea-freight visibility, or in general, supply chain visibility is important to provide a more efficient digital trade platform for businesses and governments; including port and logistics operators.

APEC has been leading many work projects concerning trade facilitation and supply chain connectivity. Initial work on SCV was noted in the "APEC Implementation for Cargo Status Information Network for enhancing Supply Chain Visibility" report (2012) that highlighted the Japan-China Container RFID Tracking System pilot between Nippon Express Group and Shanghai International Port Group (SIPG). The main features of the SCV project is to use RFID deployment to provide real-time container status information read at reading points; and allow customs declarations to be made at the same time as unloading at Hakata (the port of import in Japan) is detected by the RFID system, enabling immediate customs clearance upon arrival and faster customs release[36]. APEC CTI also has implemented five Global Data Standards (GDS) pilots that highlighted the potential impact of SCV to a more connected and reliable global supply chains.

Promoting the visibility of sea-freight will require a more connected E-port network that is able to process digital trade information for both businesses and regulatory purposes. Ports in APEC economies need to modernise their systems to keep pace with the developments in ICT, cloud computing and e-commerce.

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[34] National Board of Trade (2012). E-commerce: New Opportunities, New Barriers.
[35] The 2nd APEC Public-Private Dialogue on Advancing Trade Facilitation and Supply Chain Connectivity through APMEN. Presentation by AEOtrade.com.
[36] APEC Implementation for Cargo Status Information Network for enhancing Supply Chain Visibility (2012).

An Accenture report[37] asserts that digital technologies will be an important driver in the upgrading and transformation of ports to improve existing supply chains. Several examples of new technology applications in the port industry are provided below.

TABLE 4.3: NEW TECHNOLOGY APPLICATIONS IN THE PORT INDUSTRY

Technology	Application and value	Examples
Internet of Thing	Monitor physical logistics flows, collect and monitor data, enable intelligent decision making, optimize processes.	The Port of Hamburg uses intranets, cloud computing, mobile terminal equipment, the Internet of Things and big data technologies to manage the port area, parking lots, terminal and roads. Intelligent ships reduce oil consumption and monitor shipping.
Drones Driverless trucks Crewless ships	Eliminate or minimize manned operations, improve efficiency and shipping security.	Ports use drones to monitor discharges; ships use drones to deliver paper documents. Starship Technologies is testing its revolutionary self-driving delivery robots in London.
Robots	Undertake standardized, process-based operations to improve efficiency	Amazon uses robots at its warehouses to manage and deliver goods.
3D printing technologies	Turn mass production into customized and distributed production	The Port of Rotterdam uses 3D printing technologies to support the maintenance and repair of parts and accessories.
Big data	Provide data analysis and insights, identify opportunity and risk, and maximize efficiency	The Maritime and Port Authority of Singapore integrates real-time data through a unified platform, using aggregation analysis, anomaly analysis and data mining to develop transportation monitoring tools, and monitor and detect vessel anomalies to improve port security. Through its dynamic process management program Damco Dynamic Flow Control, Damco analyzes and optimizes supply chain data, reduces logistics time and costs, and simplifies processes.
Cloud computing	Build port communities, facilitate the deal process	Trucker Path and Cargomatic have launched apps to facilitate deal making, reduce idle transportation and improve the efficiency of trucking.

Source: Accenture & SIPG (2016).

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[37] Accenture & SIPG (2016). Connected Ports Driving Future Trade. Available at https://www.accenture.com/t20161012T003018Z__w__/us-en/_acnmedia/PDF-29/accenture-connected-ports-driving-future-trade.pdf [last accessed 2 October 2018]

Moving forward, by combining SCV with big data analytics, ports could become more intelligent and able to provide new logistics services to their business clients. Globally connected ports will enable higher efficiency of the entire shipping logistics value chain. However, this will require stronger collaboration and cooperation among ports, and greater willingness and trust to share good quality data using a secure and reliable data-sharing platform.

5   INSTITUTIONAL CONNECTIVITY: APEC CROSS BORDER PRIVACY RULES (CBPR) SYSTEM (UNITED STATES)

5.1   INTRODUCTION

The Cross Border Privacy Rules (CBPR) System[38] facilitates cross-border data transfers while protecting privacy rights. The CBPR implements the APEC Privacy Framework (Framework), which contains principles based upon the OECD Guidelines Governing the Protection of Privacy and Transborder Flows of Personal Data. Out of the 21 APEC member economies, currently six APEC economies are part of the CBPR System, and three other APEC Economies are in the process of joining. APEC CBPR certifications are conducted by APEC CBPR System Accountability Agents (AAs), which review, certify, and ensure organizations comply with CBPR Program Requirements.

CBPR is also mentioned under the APEC Trade Facilitation Action Plan implementation in 2007-2010, together with the Data Privacy Pathfinder Initiative. Also closely related with the CBPR is the APEC Cross-Border Privacy Enforcement Arrangement (CPEA). Commenced in July 2010, the CPEA creates a framework for regional cooperation among privacy enforcement authorities in the region. The CPEA provides its 27 member authorities with mechanisms and procedures for sharing information and cooperating on privacy enforcement related activities. CPEA member authorities also act as backstop enforcement authorities for the CBPR System.[39] The CPEA signifies the ongoing commitment within APEC to increase the protection of cross-border flows of personal information and is a significant step in the effective implementation of the APEC Privacy Framework. Authorities from the Philippines and Chinese Taipei have recently joined the CPEA.

5.1.1   THE OBJECTIVES OF CBPR

The goals of the CBPR are to reduce barriers to information flows, enhance consumer privacy, and promote interoperability across regional data privacy regimes. CBPR 'Policies, Rules and Guidelines' document stated the following success criteria for the CBPR system:

- Effective protection of consumer personal information privacy in a system trusted by consumers;

- Flexible implementation enough to be adapted to the particular domestic legal environment of APEC Economies, while providing certainty for system participants; and

- Minimised regulatory burden while allowing business to develop and comply with effective and coherent rules for cross-border flows of personal information.

The goals and objectives of the CBPR reflect the overall goal of the APEC Privacy Framework, which is to "facilitate the flow of information between the 21 APEC economies by promoting a common set of privacy principles that will enhance electronic commerce, facilitate trade and economic growth, and strengthen consumer privacy protections".

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[38] APEC Cross-Border Privacy Rules (CBPR) System, [Online] Available at <http://www.cbprs.org/> [accessed: 15 July 2018].

[39] "PH Strengthens Extraterritorial Reach through the APEC Cross Border Privacy Enforcement Arrangement", National Privacy Commission, (December 2017), [Online] Available at <https://privacy.gov.ph/ph-strengthens-extraterritorial-reach-apec-cross-border-privacy-enforcement-arrangement/> [accessed: 15 July 2018].

Furthermore, CBPR objectives are of high relevance for policy makers today. According to Bughin and Lund, global flows of goods, services, finance, people, and data have raised world GDP by at least 10% in the past decade. They also noted that the value of data flows is very significant to the value of global trade in physical goods: by 2014 cross-border data flows accounted for $2.3 trillion, or roughly 3.5% of total world GDP.[40]

On a broader level, CBPR aligns well with other global initiatives. For instance, in Hamburg in 2017, G20 leaders reiterated that cross-border data flows are an important policy issue. Furthermore, the G20 Taskforce on Digitalization has identified cross-border data flows as one of its key policy areas.[41] At the level of the G7, there is an increased call for enabling cross-border data flows, which reflects concerns over localization requirements.[42] At the level of the World Trade Organization, similar concerns for localization requirements were raised during the last few years at informal discussions (such as during the World Trade Public Forums) and during the ministerial conference in Buenos Aires in 2018. These concerns have put on the highlight the necessity for building interoperable frameworks for cross-border data flows. In a report from 2018, the OECD notes that lack of standards could create data silos and standards were needed to enable interoperability that would help to encourage competition by lowering barriers to switching service providers[43]. Given its flexibility, the CBPR System offers a solution for interoperability that does not require domestic approaches to be the same while facilitating data flows across APEC member economies.

5.1.2 CURRENT CBPR ECOSYSTEM

Since the CBPR was endorsed by APEC leaders in 2011,[44] public and government attention to privacy and personal data have increased.

Furthermore, there is a current emergence and re-examination of data protection laws around the world. In the APEC region some examples include: Australia, which issued the Privacy Amendment (Notifiable Data Breaches) Act in 2017; Japan, which passed substantive reforms to the Act on the Protection of Personal Information in 2015, and its guidelines for offshore data transfer recognize APEC's CBPR as a transfer mechanism[45]; and China, whose 2016 Cybersecurity Law contains principles for data processing and cross border transfers.[46] In other

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[40] Bughin, Jacques and Susan Lund. "The ascendancy of international data flows", VOX CEPR Policy Portal, (January 2017), [Online] Available at <https://voxeu.org/article/ascendancy-international-data-flows> [accessed: 17 July 2018].

[41] Bendiek, Sabine. "The new global economy runs on free flow of data and trust", G20 Germany 2017, (February 2017), [Online] Available at <https://www.b20germany.org/priorities/digitalization/digitalization-dossier/digitalization-article/news/the-new-global-economy-runs-on-free-flow-of-data-and-trust/> [accessed: 19 July 2018].

[42] Ermert, Monika. "G7 ICT Ministers: Free Data Flows, More Access to Data, But IP Protection Nevertheless", Intellectual Property Watch, (September, 2017), [Online] Available at <http://www.ip-watch.org/2017/09/26/g7-ict-ministers-free-data-flows-access-data-ip-protection-nonetheless/> [accessed: 19 July 2018].

[43] OECD, "OECD Expert Workshop on Enhanced Access to Data: Reconciling Risks and Benefits of Data Re-Use," April 19, 2018, http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DSTI/CDEP/SPDE(2018)4&docLanguage=En.

[44] 2011 APEC Leaders' Declaration, Honolulu: Hawaii, United States, (12 November 2011).

[45] "Update on amendments to Japan's privacy law", DLA Piper Data Protection Alert (January 2017), [Online] Available at <https://www.dlapiper.com/ja/japan/insights/publications/2017/01/update-on-amendments-to-japans-privacy-law/> [accessed: 17 July 2018].

[46] Ministry of Industry and Information Technology of the People's Republic of China, "Cyber Security Law of the People's Republic of China," November 7, 2016, http://www.miit.gov.cn/n1146295/n1146557/n1146614/c5345009/content.html.

regions significant changes have also occurred. For example, the European Union (EU) has enacted the General Data Protection Regulation (GDPR) (in force since May 2018) and India recently issued a draft of the Personal Data Protection Bill. In some cases, the update of these new laws impose restrictions on offshore transfers of data. The reach of those restrictions varies in intensity but can be broadly classified in three scenarios: (i) data cannot be transferred outside economy borders; (ii) data can be transferred outside economy borders, but a copy must be maintained domestically; or (iii) prior consent is required before global transfers are allowed.[47]

At the same time, those restrictions may be aimed at achieving various objectives, being the most frequently cited: the protection of citizens' personal privacy, rapid access to data by law enforcement, domestic security, prevention of computer related crime, improving economic growth and competitiveness, among others.[48] Yet, the economic impact of data localization measures is negative as it leads to increased costs for firms.[49] Furthermore, according to Bauer et al., increasing restrictions in personal data transfers could result in lower levels of GDP.[50]

Finally, the CBPR (as it only applies to data controllers) is complemented by the Privacy Recognition for Processors (PRP) System, endorsed by APEC economies in 2015. The PRP works as a certification mechanism for data processors, so they can demonstrate their ability to provide effective implementation of a personal information controller's privacy obligations related to the processing of personal information. The PRP also helps controllers identify qualified and accountable processors.[51]

5.1.3   KEY STAKEHOLDERS AND THEIR INTERESTS

The key stakeholders in the CBPR system are:

- *Consumers:* CBPR certified organizations adhere to international standards for privacy protection that can be above domestic privacy laws. Likewise, those organizations offer various redress mechanisms, varying from arbitration, internal redress, actions in front of Privacy Enforcement Authorities (PEAs) and Accountability Agents (AAs), that exceed the venues for redress that are typically available at the domestic level. In this sense, consumers benefit from the CBPR system, as they gain from accessible redress mechanisms and high-levels of privacy protections.

- *Governments of the APEC member economies*: Currently, the US (since 2012), Mexico (since 2013), Japan (since 2014), Canada (since 2015) and Korea (since 2017) and Singapore (since March 2018) are the six APEC member economies part of the CBPR system. On 23 November 2017, the Attorney General's Department

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[47] Meltzer, Joshua P. and Peter Lovelock, Regulating for a Digital Economy: Understanding the Importance of Cross-Border Data Flows in Asia, Brookings Institution. (March 2018): p:V.

[48] Ibid.

[49] Cory, Nigel. "Post-Hearing Written Submission before the United States International Trade Commission, Investigation No. 332-561: Global Digital Trade I: Market Opportunities and Key Foreign Trade Restrictions", Information Technology and Innovation Foundation, (21 April 2017).

[50] See: Matthias Bauer et al., "The Cost of Data Localization: Friendly Fire on Economic Recovery," ECIPE Occasional Paper, no. 3 (2014): 19. Also, Robert Pepper, John Garrity, and Connie LaSalle, "Cross-Border Data Flows, Digital Innovation, and Economic Growth," in The Global Information Technology Report 2016: Innovating in the Digital Economy, ed. Silja Baller, Soumitra Dutta, and Bruno Lanvin (Geneva, Switzerland: World Economic Forum and INSEAD, 2016), 43.

[51] APEC, "APEC Privacy Recognition for Processors ("PRP") Purpose and Background," 2015.

announced that Australia would participate in the APEC CBPR.[52] The Philippines and Chinese Taipei are at different stages of consideration to participate in the CBPR. So far, only Malaysia and Chile had no intention of joining the international data transfer system[53].

- *Accountability Agents (AAs):* AAs are third-party agents that conduct verification services to organizations seeking CBPR certification. AAs receive their designation if they meet certain the criteria. Currently, the CBPR only counts with two AAs: JIPDEC and TRUSTe.

- *Organizations (Companies):* So far, mainly large organizations based in the US have employed the CBPR (23 out of 25 certified organizations). Only two organizations are Japanese (IntaSect Communications and GMO GlobalSign). It should be in the interest of smaller organizations to take part on the CBPR system, as it would help to alleviate the compliance costs (currently, two SMEs are certified under CBPR).

5.2   CHALLENGES ADDRESSED

At present, APEC economies each have their own privacy laws and regulations, which lead to significant privacy compliance costs for firms with cross border operations. The CBPR provides a degree of certainty that reduces compliance costs facilitating cross-border connectivity and interoperability. It is an urgent issue to be addressed given increasing restrictions to cross-border data flows due to emerging data privacy regulations, particularly as the companies most impacted are SMEs.[54]

5.3   IMPLEMENTATION OF CBPR

The implementation of the CBPR can be analysed in function of its stakeholder. The following sections identify the main aspects the stakeholder participation in the CBPR system.

5.3.1   STAKEHOLDERS AND PARTICIPATION IN CBPR SYSTEM

Table 5.1 explains the functions and obligations of the different stakeholders under the CBPR mechanism.

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[52] "APEC Cross Border Privacy Rules public consultation – Australia's participation", Australian Government, Attorney's General Department, (July 2017), [Online] Available at <https://www.ag.gov.au/Consultations/Pages/APEC-cross-border-privacy-rules-public-consultation.aspx/> [accessed: 19 July 2018].

[53] Lee, Danbee and Mike Swift. " South Korea poised to join APEC cross-border privacy system", MLex Market Insights, (December, 2016), [Online] Available at <https://mlexmarketinsight.com/insights-center/editors-picks/Technology-Media-and-Telecoms/cross-jurisdiction/south-korea-poised-to-join-apec-cross-border-privacy-system> [accessed: 12 July 2018].

[54] Cory, N. "Cross-Border Data Flows: Where Are the Barriers, and What Do They Cost?" Information Technology & Information Foundation, (May, 2017), [Online] Available at <Available at https://itif.org/publications/2017/05/01/cross-border-data-flows-where-are-barriers-and-what-do-they-cost> [accessed: 12 July 2018].

TABLE 5.1: FUNCTIONS AND OBLIGATIONS OF THE STAKEHOLDERS UNDER THE CBPR MECHANISM

Stakeholder	Participation in overall structure
APEC member economies	Formally, in order to be part of the CBPR system, an APEC Member economy must: • File formal notice to participate in and adhere to the CBPR system; • Designate at least one domestic PEA that participates in APEC's CPEA and is capable of enforcing CBPR requirements pursuant to domestic law; • Receive approval to join the CBPR from the Joint Oversight Panel (consisting of three APEC Economies) Once the member economy has formally joined the CBPR, it should appoint at least one AA.
Accountability Agents	In order to become APEC recognized AA, they must: 1. Meet recognition criteria, which includes: availability of a dispute resolution system, policies and procedures to avoid conflict of interest, ongoing monitoring and compliance reviews. 2. Consent to relevant government requests. After the AA is certified, it is allowed to: 1. Review an organization's application and certify that it meets CBPR intake criteria and hence its eligibility to participate in the CBPR. 2. Monitor the organization throughout the certification period. 3. Receive and investigate complaints about the organization, and resolve disputes between complainants and the organization. 4. Enforce the CBPR program requirements against the organization, either through contract or by law.
Organizations (Companies)	Organizations applying for CBPR certification must: 1. Develop internal rules and procedures for protection of personal data and cross-border data transfers that meet baseline standards set out in the CBPR framework.[55] 2. Self-assess and attest to its compliance with CBPR using an intake questionnaire developed by the domestic AA, which evaluates its personal information policies and compliance with the APEC Privacy principles.[56]
Consumers	• Have access to international redress through the cooperative enforcement agreement of the CPEA.

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[55] The company must be certified to at least a set of 50 baseline program requirements agreed to in the CBPR System. However, both Accountability Agents and participating economies can require additional provisions or requirements and companies must ensure compliance with domestic laws in whatever jurisdiction they are utilizing their CBPR certification.

[56] APEC Privacy Principles includes: (i) Preventing harm; (ii) Notice; (iii) Collection limitation; (iv) Use of personal information; (v) Choice; (vi) Integrity of personal information; (vii) Security safeguards; (viii) Access and correction; (ix) Accountability.

In summary, to participate in the CBPR system, economies need to have at least one Privacy Enforcement Authority (PEA) that is able to enforce the CBPR against participating businesses and at least one AA that will review and certify organizations under the CBPR before participation. Once formally joined the CBPR system, organizations within that economy may seek CBPR certification from the AA. After receiving CBPR certification, organizations have to comply with specific privacy and information security program requirements of the CBPR.

5.3.2   THE IMPORTANCE AND THE NEED FOR MORE ACCOUNTABILITY AGENTS

As the previous table showcases, accountability and credibility in the CBPR system depend heavily on the role and effectiveness of AA. The existence of PEAs and the evaluation for member economy participation by the Joint Oversight Panel add further credibility to the system.

In the implementation of CBPR, AA is in charge of enforcement actions. The PEA acts as the backstop. The procedure is the following[57]:

1. The AA notices that a CBPR certified organization is not complying with the CBPR program requirements. This may occur through either: (a) a regular monitoring processes, (b) a direct complaint from an individual;

2. The AA notifies the organization, outlining the actions that must be taken to address the non-compliance within a reasonable period of time;

3. Failure to comply will lead to enforcement action by the AA that is proportional to the harm or potential harm of the violation, including: (a) removing the organization from the CBPR System; (b) temporarily suspending the organization's right to display the AA seal; (b) naming the organization and publicising the non-compliance; (d) other penalties, including monetary penalties, compensation or other actions to make good the harm suffered by individuals;

4. Where the AA is unable to resolve the problem and the failure is a violation of applicable privacy law, the AA may refer the matter to the relevant PEA for review and possible law enforcement action;

5. The PEA may contact another CPEA participant for assistance.[58] The liability for violation of the CBPR program requirement(s) rests with the CBPR-certified organization.

At the moment only two AAs, one in Japan and one in the US, are approved to provide CBPR certification. It is expected that the market for privacy seals providers will increase in the upcoming years, as companies and organizations need to appeal to privacy conscious consumers and transfer data offshore. In economies with no trustmark providers, the increasing awareness of the role of the AA in the market for privacy certifications will lead to the emergence or expansion (at the domestic level) of the number of trustmark providers and AAs. Furthermore, possible solutions for the scarcity of AAs, could include allowing PEAs to act as

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[57] "Towards a Truly Global Framework for Personal Information Transfers Comparison and Assessment of EU BCR and APEC CBPR Systems". Information Integrity Solutions (September 2013): p.10.
[58] The CPEA facilitates information sharing among member PEAs in APEC economies, provide mechanisms to promote effective cross-border cooperation between authorities in the enforcement of privacy law; and encourages information sharing and cooperation on privacy investigation and enforcement.

AAs, or exploring whether AAs could offer CBPR certification on cross-border basis. This last alternative is still unclear as there are legal issues to evaluate.

5.3.3   THE KEY DRIVING FACTORS TO JOIN CBPR: ORGANIZATIONS AND MEMBER ECONOMIES PERSPECTIVES

One of the key driving factors for organizations applying for CBPR certification is the facilitation of cross-border data flows, within the APEC region but also across other regions of the world. For example, within the APEC region, CBPR certification allows transfers of data to other economies that are part of the CBPR system, and allows an organization to take full advantage of domestic laws that recognize the CBPR as mechanism for transfer. This is the case of the Japanese personal information protection law, which requires companies to obtain consent before transferring data to another economy, but allows an exception for organizations that are CBPR-certified.[59] Beyond the APEC region, CBPR certification can also bring concrete benefits as a basis for other certifications. For instance, the CBPR can be used as a basis for organizations applying for European Union (EU) Binding Corporate Rules (BCRs),[60] which allows transfers of personal data out of the EU.[61] This latter case is, in particular, a great example of how two different privacy frameworks operating in two different regions can be interoperable for the benefit of consumers and organizations.

BOX 5.1: THE CASE OF MERCK: ACHIEVING CBPR AND BCR CERTIFICATION

Merck & Co., Inc. was the first organization to adopt both BCRs and CBPR certification as a way to achieve streamlined data flows. In March 2016 Merck obtained the approval for its BCR application, which was largely facilitated by the privacy practices, policies and procedures already put in place for its CBPR certification. The process to make the CBPR system interoperable with the EU BCRs was facilitated by the common referential developed by Article 29 Working Party and APEC that serves as an "informal pragmatic checklist for organizations applying for authorization of BCR and/or certification of CBPR".[62] This example highlights an organization's concrete benefit of getting CBPR certified and the potential of the CBPR itself as an instrument to advance global trade through a more trusted environment. CBPR is a scalable set of standards that can potentially also alleviate localisation pressures.[63]

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[59] "Japan's Amended Privacy Law to Go into Effect May 30, 2017 – CBPRs Recognized as an Approved Transfer Mechanism", TrustArc Blog, (May 2017), [Online] Available at <https://www.trustarc.com/blog/2017/05/22/japans-amended-privacy-law-go-effect-may-30-2017-cbprs-recognized-approved-transfer-mechanism/> [accessed: 15 July 2018].

[60] EU's BCRs allow organizations with a presence in the EU/European Economic Area to transfer personal information about European citizens within the same corporate group to members of the same corporate group, located in other parts of the world.

[61] Lynch, George. "Pacific Privacy Rules to Ease Trade Are Set to Take Off", Bloomberg Law: Privacy & Data Security, (March 2017), [Online] Available at <https://www.bna.com/pacific-privacy-rules-n57982084970/> [accessed: 18 July 2018].

[62] "Opinion 02/2014 on a referential for requirements for Binding Corporate Rules submitted to national Data Protection Authorities in the EU and Cross Border Privacy Rules submitted to APEC CBPR Accountability Agents (WP 212)", Article 29 Data Protection Working Party, (2014).

[63] Moens, A. "Report explores CBPR benefits", IAPP, (February 2016), [Online] Available at <https://iapp.org/news/a/report-explores-cbpr-benefits/> [accessed: 19 July 2018].

In the case of APEC member economies, being part of the CBPR system will bring domestic benefits as industry associations across the different APEC member economies have showed strong support for the adoption of the CBPR.[64] However, readiness to be part of the CBPR framework might vary across the region. There are several reasons that could deter remaining APEC member economies to join CBPR:

1. Lack of data privacy laws: According to the "Survey on the Readiness for Joining Cross Border Privacy Rules System", Brunei Darussalam; China; Indonesia; Papua New Guinea; Thailand declared that they are unable to join CBPRs due to the lack of data privacy laws.[65] The survey also provided the following findings: 14 APEC economies have at least one enforcement authority on Privacy (PEA); 9 APEC economies have participated in the CPEA; and 10 APEC member economies have at least one domestic trust-mark provider.

2. Lack of awareness and multiplicity of privacy certifications: organizations may have less motivation to join CBPR if they don't see the benefits and potential of CBPR in improving their business competitiveness and value. Additionally, with many existing privacy regimes, organizations (particularly SMEs) that abide by these regulations have to face the challenge in designing applicable privacy programs that fit their respective budget.

5.4   IMPACT

At the general macroeconomic level, some evidence pointed to the benefit of more data to productivity and employment. Mandel (2017) noted that, in the US, the digital sector has recorded 2.7 percent productivity growth since 2000, while the physical sector has averaged only 0.8 percent annual productivity growth. Additionally, he also highlighted that in retailing, the shift to data-rich e-commerce since 2007 has created 397,000 jobs in electronic shopping and fulfilment centres in the US, while only costing 76,000 jobs in brick-and-mortar retailing.[66]

APEC ECSG Report (2016) noted that the value of the CBPR system would depend on the individual economy's domestic law as well as the current and future trading partners and their requirements[67]. Additionally, the domestic economy's characteristics will also determine the value of data and data privacy. Mexico[68] and the Philippines[69] have a significant size of firms providing data services while Singapore and Hong Kong, China are known as a major hub for

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[64] "Global industry calls for timely and ambitious expansion of participation in the APEC cross border privacy rules system", Information Technology Industry Council, [Online] Available at <https://www.itic.org/dotAsset/55b60045-5ac2-4fed-8b2b-8e0ba0f2bbe9.pdf> [accessed: 15 July 2018].

[65] Bui, H, "Survey on the Readiness for Joining Cross Border Privacy Rules System – CBPRs Final Report", APEC, (2017).

[66] Mandel, Michael. "The Economic Impact of Data: Why Data Is Not Like Oil", Progressive Policy Institute, (November 2017), [Online] Available at <http://www.progressivepolicy.org/publications/economic-impact-data-data-not-like-oil/> [accessed: 19 July 2018].

[67] APEC ECSG (2016). Enabling Legal Compliance & Cross-Border Data Transfers with the APEC Cross- Border Privacy Rules (CBPR).

[68] Brazil and Mexico were seen as leading the LATAM region in data center growth - accounting for 47.6 and 25.8 percent of revenues respectively.

[69] IDC study commissioned by Microsoft predicts that approximately 40% of the Philippines' GDP will be derived from digital products or services by 2021.

data processing and analytics.[70] As such, it is important having data transfer mechanisms in place.

The following are the specific (potential) benefits of CBPR to member economies and organizations (including SMEs):

- *For member economies*: Promotes regulatory interoperability. CBPR also promotes harmonisation at the level of basic principles. However, as the CBPR does not mandate the modification of domestic law, it promotes interoperability rather than legal harmonization.

- *For organizations*: The CBPR facilitates and streamlines legal compliance, and enables cross-border data flows. In addition, the CBPR may help advance a global privacy compliance program. One company reported that the CBPR process helped considerably in its application for EU BCRs, shortening the time of completion to nine months and reducing costs by nearly 10 percent.[71] There is also jurisdiction-specific transfer benefits: in Japan, organizations with CBPR certification do not have to obtain consent to transfer data to another economy[72].

- *For consumers*: participation in the CBPR can improve consumer trust through consistent and more easily enforceable privacy protections and streamlined mechanism for complaint-handling.[73]

Albeit the benefits mentioned above, participation in the CBPR remains low. However, as more APEC member economies will join the system, the value of the CBPR system will only increase. As the Australia intention to join confirms, the APEC region enjoys momentum for expanding the CBPR system.

Furthermore, as the cost for compliance with other privacy regulations will increase, the necessity for counting with CBPR certification will only become more evident. Borrowing the GDPR as an example, a study by Christensen et al (2013) noted that the GDPR reform could increase European small and medium-sized enterprises' annual IT costs by between approximately € 3,000 and € 7,200 depending on the industry the particular SME is operating in. This is because Article 20 of the GDPR requires an online service to write specialized code (export-import module, EIM) that will export data from that service and import it to another service[74].

Additionally, the value of the CBPR will depend on how much customers and business value privacy. The International Association of Privacy Professionals (IAPP) provides a rough estimate of the market size for privacy technology of about half a billion dollars; based on an average expenditure of $206,000 a year among the roughly 2,200 global companies whose

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[70] UK-based Global Switch unveiled Hong Kong's largest data centre in Tseung Kwan O Industrial Estate built at a cost of HKD5 billion (US$640 million).

[71] Pfeifle, Sam. "APEC examines CBPR program, Japan now fully on board", IAPP, (February, 2016), [Online] Available at <https://iapp.org/news/a/apec-examines-cbpr-program-japan-now-fully-on-board/> [accessed: 19 July 2018].

[72] "5 Benefits of APEC CBPR Certification You Should Know About", 13 March 2017, https://www.trustarc.com/blog/2017/03/13/5-benefits-of-apec-cbpr/ [accessed: 24 September 2018].

[73] Heyder, Markus. "The APEC Cross-Border Privacy Rules—Now That We've Built It, Will They Come?" IAPP, (September 2014), [Online] Available at <https://iapp.org/news/a/the-apec-cross-border-privacy-rules-now-that-weve-built-it-will-they-come/> [accessed: 19 July 2018].

[74] Diker Vanberg, Aysemand Mehmet Bilal Ünver. "The right to data portability in the GDPR and EU competition law: odd couple or dynamic duo?" European Journal of Law and Technology, 8 (1). (2017).

revenue is $1 billion or more[75]. Further, IAPP and EY concluded that Fortune's Global 500 companies could spend as much as $7.8 billion over a multi-year period to achieve compliance with GDPR.[76] The most recent IAPP-EY Privacy Governance Report found the average company, globally, spends $1.7 million on privacy — or roughly $354 per employee.

Leonard (2018) noted that a number of economies have already adopted trustmark schemes, including privacy trustmark schemes, which varied in nature and structure. Different economies have different experience with trustmark and certification schemes[77]:

- *Australia*: Certification mechanisms, privacy seals and trustmarks delivered in a third economy could be considered as a valid means for a data exporter to demonstrate compliance with Australian Privacy Principle 8.1. In 2008, the Australian Law Reform Commission noted that one feature of the APEC Privacy Framework that may have application in the Australian context was as trustmark scheme.

- *Korea*: Under Korean law, certification mechanisms, privacy seals and trustmarks delivered in third economies are not considered as valid means for a data exporter to demonstrate compliance with local cross-border data controls.

- *New Zealand*: Counts with uniform privacy laws and does not rely on certification, trustmarks or privacy seals.

- *The Philippines*: Currently does not provide for certification to demonstrate compliance similar to that contemplated under Article 42 of the GDPR; however, there is no prohibition from adopting a similar mechanism.

- *Singapore*: The National Trust Council's trustmark "TrustSg" is publicly supported by Singapore's Infocomm Media Development Authority. In July 2017, Singapore announced plans to introduce a Data Protection Trustmark certification scheme by end 2018.

- *United States*: Trustmark bodies are private sector organisations.

- *Viet Nam*: Certification, trustmarks and privacy seals are currently not compulsory under Vietnamese law.

5.5   LESSONS LEARNED

As the digital economy progresses, there will be a need to ensure that frameworks are interoperable and enable cross-border data transfers. Those frameworks must strike the right balance between privacy protection and free flow of data. In this context, APEC is the ideal forum to discuss and develop CBPR. As a forum of regional cooperation, APEC promotes policy discussions to enhance and facilitate trade and investment across the region. APEC decisions are endorsed by APEC member economies but are not binding (in contrast to other schemes, such as the World Trade Organization). In this line, the CBPR reflects those institutional characteristics. That is, the CBPR is a voluntary system, and does not overrule

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[75] Tansey, Bernadette. "Europe's New Data Privacy Rules Nourish U.S. Privacy Tech Sector", xconomy, (February 2018), [Online] Available at <https://www.xconomy.com/san-francisco/2018/02/16/europes-new-data-privacy-rules-nourish-u-s-privacy-tech-sector/> [accessed: 15 July 2018].

[76] Castro, Daniel and Michael McLaughlin. "Why the GDPR Will Make Your Online Experience Worse" Fortune Commentary, (May 2018), [Online] Available at <http://fortune.com/go/commentary/gdpr-compliant-privacy-facebook-google-analytics-policy-deadline/> [accessed: 11 July 2018].

[77] Girot, Clarisse, Abu Bakar Munir, Ken Chia, and Asian Business Law Institute (Singapore). "Regulation of Cross-Border Transfers of Personal Data in Asia", (2018). Singapore: Asian Business Law Institute.

domestic law. This leaves enough policy space for APEC member economies to implement and modify their data privacy domestic laws according their own policy considerations without subjecting them to an international obligation. Furthermore, APEC includes member economies that are also part of other forums (e.g. CPTPP). In this sense, APEC policies can influence international norm making. Lastly, the APEC market is diverse, reason why this is an important forum to promote interoperability of regulations.

As regards to the CBPR system itself, and its internal functioning, the following are the current good practices that could be identified:

- High standards for designation of AAs: JIPDEC[78] and TRUSTe[79] are well-known brand names in the privacy certification market, with significant consumers' trust. Inadequate AAs would be detrimental to the system. Nevertheless, maintaining high expectations of AAs needs to be balanced by the costs organizations are willing to pay for certification (APEC ECSG, 2016). In particular, AAs take some of the burden off from governments by certifying applicant organizations and handling disputes that may arise between certified organizations and data subjects[80].

- Interoperability without requiring the modification of domestic laws: The CBPR works at the level of basic standards that can be increased at the domestic level. Therefore, it does not interfere with an economy ability to modify its domestic law.

- Interoperability across different privacy frameworks (e.g. EU BCRs): As the Merck & Co., Inc example (Box 5.1) highlights, the CBPR could help to achieve interoperability across different privacy frameworks. Therefore, the referential of the common elements between the EU BCRs and the CBPR, developed in 2014, is an example of a good practice.[81] Moreover, APEC's Electronic Commerce Steering Group and EU officials held explorative talks to recognize the CBPR as a certification mechanism under the GDPR in 2017.[82]

Finally, a number of key issues that need to be explored by APEC in the near term include:

- The rules around selecting the relevant jurisdiction for certification for organizations (and their subsidiaries) that are active in numerous APEC member economies and/or that are headquartered outside of APEC but with significant business operations in APEC, and the precise scope of a CBPR certification in these cases[83];

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[78] JIPDEC, affiliated with METI, introduced the Privacy Mark (P-mark) system in 1998.
[79] "Which Site Seal do People Trust the Most? (2013/2016 Survey Results)", Baymard Institute, [Online] Available at <https://baymard.com/blog/site-seal-trust> [accessed: 11 July 2018].
[80] Jones, C Bryan. "How Asia–Pacific minds your business across borders", The Journal, [Online] Available at <https://journal.accj.or.jp/data-defense/> [accessed: 19 July 2018].
[81] APEC, "APEC/EU Common Referential for the Structure of the EU Binding Corporate Rules and the APEC Cross Border Privacy Rules System (CBPR), comparing the compliance and certification requirements of both systems," 2014.
[82] APEC, "Data Privacy Subgroup Meeting with European Union," https://www.apec.org/Groups/Committee-on-Trade-and-Investment/Electronic-Commerce-Steering-Group/Data-Privacy-Subgroup-Meeting-with-European-Union
[83] Workshop: Enabling Legal Compliance & Cross-Border Data Transfers with the APEC Cross-Border Privacy Rules (CBPR), 18 July 2016, Singapore.

- Mechanisms for identifying and taking action against false claims relating to CBPR certification in various APEC member economies[84];

- Better mechanism to which external parties can provide inputs or feedback to the CBPR certification process and result;

- How economies could facilitate efforts to introduce a harmonisation of terminology and definitions in their domestic laws and regulations to reduce the level of confusion and uncertainty over those terms[85];

- How to develop a good pubic private partnership with trustmark providers. The 2017 APEC survey highlighted the following challenges being identified by trust-mark providers: better engagement with PEAs; lack of capacity and social awareness.

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[84] US Federal Trade Commission, "Three Companies Settle FTC Charges that They Deceived Consumers About Participation in International Privacy Program," https://www.ftc.gov/news-events/press-releases/2017/02/three-companies-settle-ftc-charges-they-deceived-consumers-about

[85] The Asia Pacific Carriers' Coalition (APCC) and The Asia Cloud Computing Association (ACCA), "Report on Cloud Data Regulations: A contribution on how to reduce the compliancy costs of Cross-Border Data Transfers". (2014).

6 PEOPLE-TO-PEOPLE CONNECTIVITY: INNOVATING FOR ACCESSIBLE TOURISM (CHINESE TAIPEI)

6.1 BACKGROUND

According to the Ministry of Health and Welfare (MOHW),[86] 12.5% of the economy's population is above 65 years old—i.e., 2.9 million people as of 2015 (Figure 6.1). MOHW also estimates that there are 1.2 million people with disabilities (PWD) in the economy, of which 32% are physically disabled, 11% have hearing disabilities, and 5% are visually impaired. Moreover, the proportion of elderly and PWD population is growing. The elderly composed 10% of the population in 2005 and grew to 12.5% in 2015; this proportion is expected to increase to 24% in 2030 and 36% in 2050. Likewise, composed 4.9% of the population in 2015, up from 4.1% in 2005—an increase of about 220,000 PWD in 10 years, growing at around 2% per year during the period.

FIGURE 6.1: ELDERLY POPULATION OF CHINESE TAIPEI
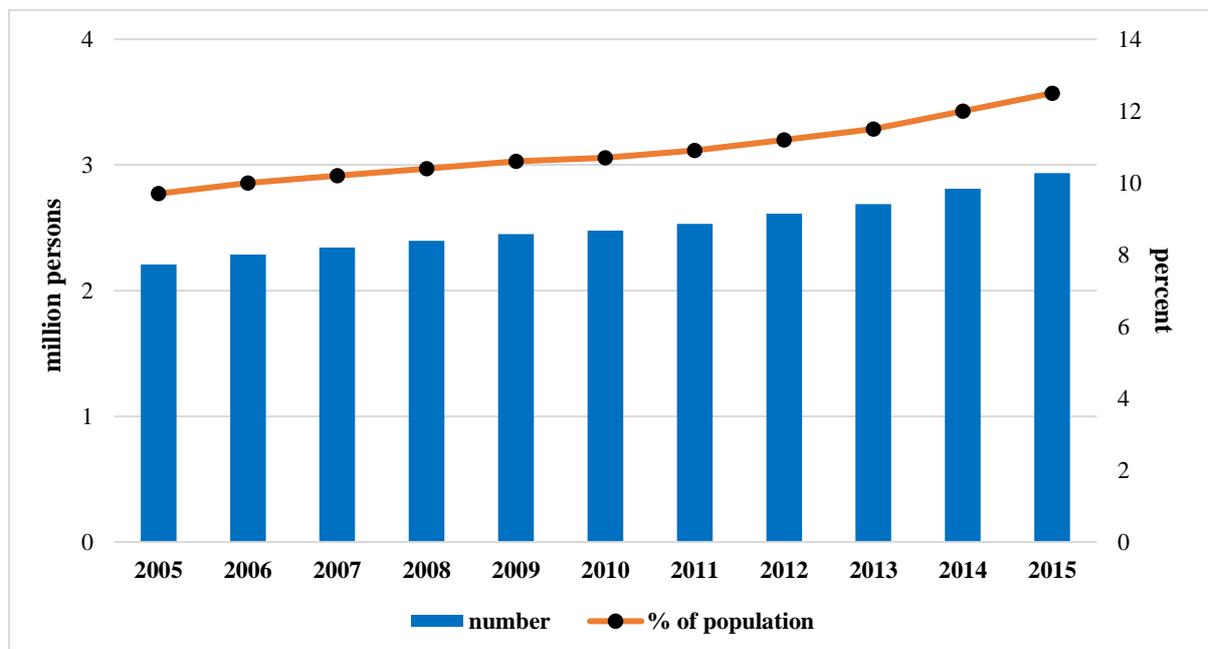
Note: Elderly population are persons 65 years old or older.
Source: Ministry of Health and Welfare.

Elderly and disabled people experience significant constraints to their mobility and may have access issues that able-bodied individuals do not think about (e.g., see Figure 6.2). Common features like stairs, gradients, light switches, or toilets could become difficult challenges for people with limited mobility and other disabilities. Among other everyday problems, this lack of accessibility could discourage the elderly and PWD from accessing services such as restaurants, hotels, or tourist sites.

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[86] Ministry of Health and Welfare. (n.d.). The Statistics and Trends in Health and Welfare 2015. Retrieved from https://www.mohw.gov.tw/lp-3570-2.html

FIGURE 6.2: ACCESS CONSTRAINTS FOR PEOPLE WITH DISABILITIES

Source: OurCityLove Social Enterprise.

A common frustration among the elderly and PWD—as well as their families who care for them—is travelling far for tourism only to find out that options are severely limited on where they can go, what they can do, and what they will experience. It could be a costly and discouraging experience to plan and spend a holiday just to find out that some members of the family or group are not able to access certain areas or needed services are not provided.

Firms such as restaurants, hotels, or resorts also face frustrations from lack of utilisation of their PWD-friendly facilities. Firms can run costs up to millions of dollars to make sure that they are compliant with accessibility regulations and to attain relevant PWD-friendly certifications. This is especially difficult for hotels where in addition to installing modifications such as ramps and lifts, they may need to allocate a few rooms to have PWD-friendly features— such as wheelchair-friendly toilets, wide automatic doors, and accessible switches and outlets—that make them undesirable for able-bodied customers. While firms may be willing to invest in accessible facilities, they need these facilities need to be utilised in order to make a return on their investment.

6.2   OURCITYLOVE: INNOVATING TO PROMOTE ACCESSIBILITY

In 2014, the founder of OurCityLove realised that there is a gap between those who need practical and reliable information on accessibility and those who have invested in making their sites and services accessible to all. Hence, he founded OurCityLove Social Enterprise (众社會企業) which aims to utilise technology to gather and disseminate accessibility information about restaurants, hotels, transportation services, and tourist attractions (Figure 6.3). In doing so, elderly and PWD are given a voice to air their concerns while firms who have invested in accessible infrastructure are able to increase utilisation of their investments.

FIGURE 6.3: OURCITYLOVE'S ROLE IN ACCESSIBLE TOURISM AND INCLUSIVE ECONOMY

Elderly and PWDs

- need information on accessible locations and services

- need a voice to air their concerns and needs

- could help to veriify and improve the accessibility of facilities and services

OurCityLove

- provides practical and reliable information on accessibility

- brings together elderly and PWD with firms and service providers

- OurCityLove smartphone apps and website: http://9453.OurCityLove.com

Firms and Service Providers

- need PWDs' advice to improve services

- need to increase utilisation of investments on accessibility

- aim to be more responsive to the needs of elderly and PWD customers and clients

OurCityLove is a social enterprise registered with the Ministry of Economic Affairs. As a social enterprise, it has a dual nature of being a for-profit corporation while having a social objective of improving accessibility for the elderly and PWD. Hence, OurCityLove has a policy in its company charter of donating half of its profits to youth and PWD cause-oriented groups and the other half is reinvested into the company as capital. One reason for organising OurCityLove as a for-profit organisation is to ensure sustainability of its operations while incentivising innovation and expansion. Starting with three members of staff and NTD 6 million in capital, OurCityLove has expanded to 22 full-time staff and 430 part-time PWD investigators and NTD 50 million in capital after four years of operation. It works together with various ministries—i.e., Ministry of Economic Affairs (for registration and permits), Ministry of Labour Affairs (on issues relating to employment of elderly and PWD), Ministry of Interior Affairs (on issues relating to accessibility regulation and certifications), and Ministry of Transportation (on accessible transportation and tourism issues)—as well as private sector firms in the tourism, transportation and public service fields.

OurCityLove delivers its services through a website—http://9453.OurCityLove.com—and various smartphone apps that can be used on Android or iPhone devices. Both platforms provide updated and relevant information on accessibility and certifies sites that conform to accessibility regulations. In addition, it provides information on what mobility-challenged individuals can do in various tourist sites. For example, information on a theme park will not only indicate the presence of access ramps and disable-friendly toilets, but will also indicate which of the rides are accessible for wheelchair users and what theme park activities are amenable to the needs of elderly or PWD customers. In addition, the smartphone apps for High Speed Rail and Subway has location awareness that can allow visually impaired users to tell family or friends where they are without needing visual cues. The apps also allow users who have speaking and hearing difficulties to send an SMS with their location information.

While other websites gather accessibility information through crowdsourcing—i.e., relying on unverified reports to determine whether a hotel has accessible rooms or if a tourist site has

ramps—OurCityLove verifies information by working with on-site investigators who are themselves elderly or PWD. Not only does this provide employment opportunities for these sectors, but it also empowers them by using their voice in determining whether a place is indeed accessible or not. As can be seen in Figure 6.4, investigators visit hotels, restaurants, and other sites before they are certified by the company as being accessible and advertised on the platform as such. Hence, elderly and PWD are not only the customers and users of OurCityLove, but they are also active partners and stakeholders in the enterprise.

FIGURE 6.4: ENSURING RELEVANT AND RELIABLE INFORMATION ON ACCESSIBILITY

Fullon Hotel LihPao Land

No. 88, Furong Road, Houli District, Taichung City
Nearby Attractions : LihPao Outlet Mall, LihPao Land, LihPao Ferris Wheel, Yuemei Tourism Sugar Factory, Chang Lien-cheng Saxophone Museum

📞 04-2559-2888
📠 04-2556-1388
🔗 http://www.fullon-hotels.com.tw/ym/
✉ pr_ho@fullon-hotels.com.tw
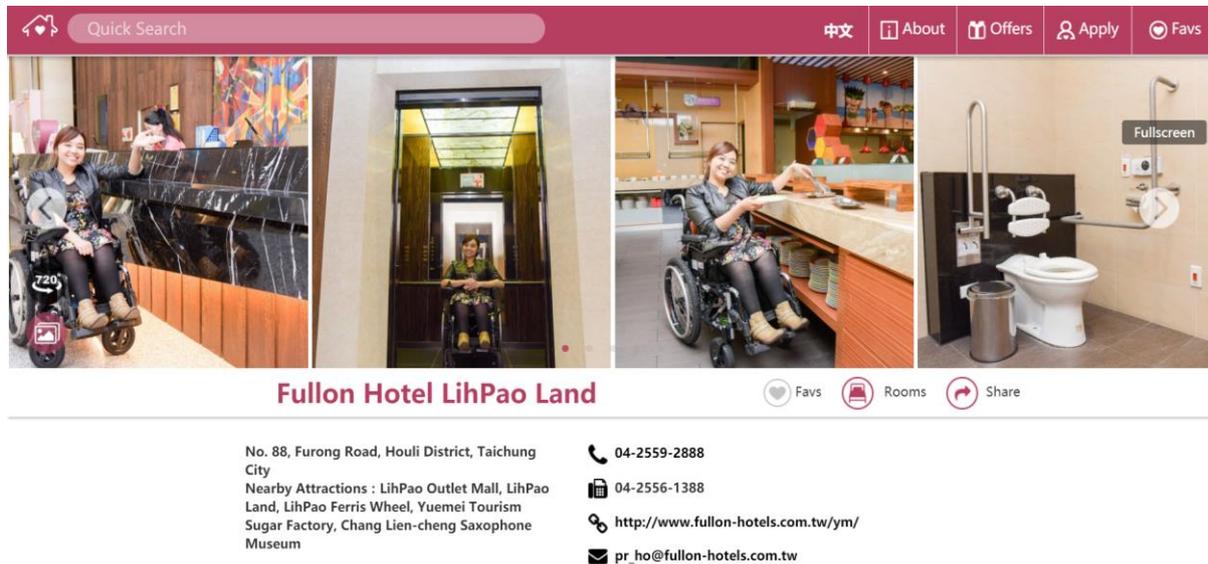
Source: OurCityLove Social Enterprise.

OurCityLove's business model covers a wide range of business and customer relationships. It provides a Business-to-Consumer (B2C) service by providing accessible travel information through website and apps. It functions as a Business-to-Business-to-Consumer (B2B2C) service by enabling purchases of travel packages along with accommodation and transportation requirements. It also functions as a Business-to-Business (B2B) service by bringing together travel agencies and operators specialising in accessible tourism. Finally, it innovates B2C products such as assistive devices or technologies for PWD, the elderly, and care givers.

There are about half a million OurCityLove app users and about five million website views of its accessible tourism online service in the first six months of 2018. OurCityLove currently provides accessible information in 14 cities: Taipei, New Taipei, Keelung, Hsinchu, Taichung, Tainan, Kaohsiung, Pindong, Hualien, Yunlin, Chiayi, and Taoyuan. It also has a presence in other APEC economies such as Hong Kong, China and Malaysia (Kuala Lumpur) and has plans to expand its operations to Singapore and other APEC economies.

Information on accessibility and integrated travel services also increase market demand for accessible dinning, accommodation, and transportation. It can also spur demand in related businesses, such as rental services for assistive devices and equipment and the sale of accessible vehicles. In the first two quarters 2018, OurCityLove has served more than 3,000 family travelers, allowing it to earn up to NTD 8 million in product sales and service.

BOX 6.1: MR HSU AND "MY FRIENDLY COUNTRY ROAD"

OurCityLove's detailed accessibility information and integrated transportation services not only contribute to inclusive tourism, but can also enable PWD to be more productive members of society. This has been the experience of Mr Hsu Chi-Feng and Ms Huang Shin-Yi.

Mr Hsu and Ms Huang are spinal cord injury patients. Mr Hsu, who is 62 years old, has been sitting in wheelchair for more than 38 years. "I always remembered the green meadow, river side, the beetles and the tree leaf toys I played while I was a kid living with my parents in the rural villages," said Mr Hsu. "I want so badly to touch the river water again with my own fingers to recall those sweetest memories of my childhood." However, travel to the rural areas is not always friendly for wheelchair-bound patients like Mr Hsu.

Mr Hsu thus invited Ms Huang (36 years old) and 12 other PWDs to join a project called "My Friendly Country Road," which was initiated in 2014 by the Soil and Water Conservation Bureau (SWCB) of Chinese Taipei and OurCityLove to encourage rural communities to develop facilities and services that promote accessible tourism.[87]

Working with accessibility professionals and architects, Mr Hsu's team helped 37 rural communities to better understand the experiences and needs of disabled and elderly people, redesign the construction of facilities, develop assistive services, and disseminate success stories so that the other rural villages could be inspired as well. Through knowledge dissemination and product design, OurCityLove creates a collaborative model of public-private partnership (PPP) for cross-sectoral collaboration on improving accessibility and increasing awareness on accessibility issues.

FIGURE 6.5: OURCITYLOVE'S CROSS-SECTORAL PPP MODEL FOR ACCESSIBILITY

L to R: Lin Chang-Li, Deputy Director General, SWCB; Liu Chu-Ying, Rural Community Leader/Wei-Wei-Jia Persimmon Cake Farm; Huang Shin-Yi, Friendly Investigator and Accessible Tour Guide; Prof. Dr Lin Chong-Wey, Founder, OurCityLove; Chung-Yung Tsao, Vice-President Luxgen Motor; and Jung-Xian Chen, Director, Red Taxi Service.
Source: OurCityLove Social Enterprise.

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[87] For more information see http://ruralcurator.swcb.gov.tw/FriendlyEn/Home/About/5462

Mr Hsu and his PWD colleagues also initiated the design of accessible transportation in cooperation with OurCityLove. In 2017, they successfully worked with the Tourism Bureau in Ministry of Transportation, SME Administration in Ministry of Economic Affairs and the local transportation industries—such as car manufacturer YuLong Group and Luxgen Motor—to design an accessible family vehicle.

The design of the vehicle not only considers the needs of elderly and PWD passengers, but also those of their family members and companions. The vehicle has attracted the attention of automobile rental and taxi services seeking to serve people and families with special accessibility requirements.

In the interview, Mr Hsu shared his sense of accomplishment of connecting various stakeholders and achieving tangible outcome. Beyond economic returns, he describes the psychic income of being a productive member of society despite being an elderly and disabled person. "I can do something good for society with my disability, no, with my different ability!," says Mr Hsu.

"But most important of all, when I took the accessible vehicle with my wife to the countryside, we whistled the tree leaf and my wife turned around, cleaned my face and gave me the smile that I know she feels really relaxed from taking care of me, and the smile I remembered when I could still walk with her hand in hand. At that moment, I feel my whole life's happiness is now coming back into my own hands."

FIGURE 6.6: MR AND MRS HSU

Source: OurCityLove Social Enterprise.

OurCityLove's "My Friendly Country Road" is not merely a project that helps the disabled and the elderly access tourism sites. It is also highly valued by rural communities because, by developing an accessible environment for tourism, it helps the communities create better and safer living spaces for their elderly members while stimulating the development of accessible dining and accommodation services and increasing local tourism revenues

6.3   LESSONS LEARNED

OurCityLove's achievements in promoting accessible tourism has been recognised through the many awards it has received. In its four years of existence, OurCityLove has received 109 awards and accolades from various organisations in Canada; China; Hong Kong, China; Korea; Malaysia; the Philippines; Singapore; and Chinese Taipei as well as France and Spain.

The success of the social enterprise stems from seeing beyond "disabled" and instead seeing "differently abled." Ensuring inclusive economies and spaces for the elderly and PWD is not only about making regulations about anti-discrimination or accessible infrastructure. Rather, making economies inclusive means giving the elderly and PWD the opportunities to share their experience and expertise and turning this into a viable business model. While OurCityLove is a social enterprise with an identified social cause, its successful operation shows that working with marginalised sectors of society need not be a charity but can be a profitable venture.

FIGURE 6.7: OURCITYLOVE AT A SOCIAL INNOVATION EVENT

Note: Photo shows OurCityLove working with PWD and universities.
Source: OurCityLove Social Enterprise.

Another key lesson for APEC economies is that accessible tourism should be a collaborative model. It needs to bring together government, the private sector, civil society, the elderly and PWD to arrive at holistic and responsive solutions for accessibility. Each stakeholder has a role to play in ensuring inclusive and accessible economies, and each can provide inputs to each other to develop responsive and constructive policies and solutions.

Many APEC economies are facing the challenges of an ageing population. As can be seen in Figure 6.8, the number of elderly workers is increasing in the region, and more of them are staying in the labour force beyond the age of 65. This has implications not only on the sustainability of services and social protection for the elderly, but also on their increasing buying power as they stay economically productive.

FIGURE 6.8: ELDERLY POPULATION IN THE LABOUR FORCE IN APEC, 2000-2016
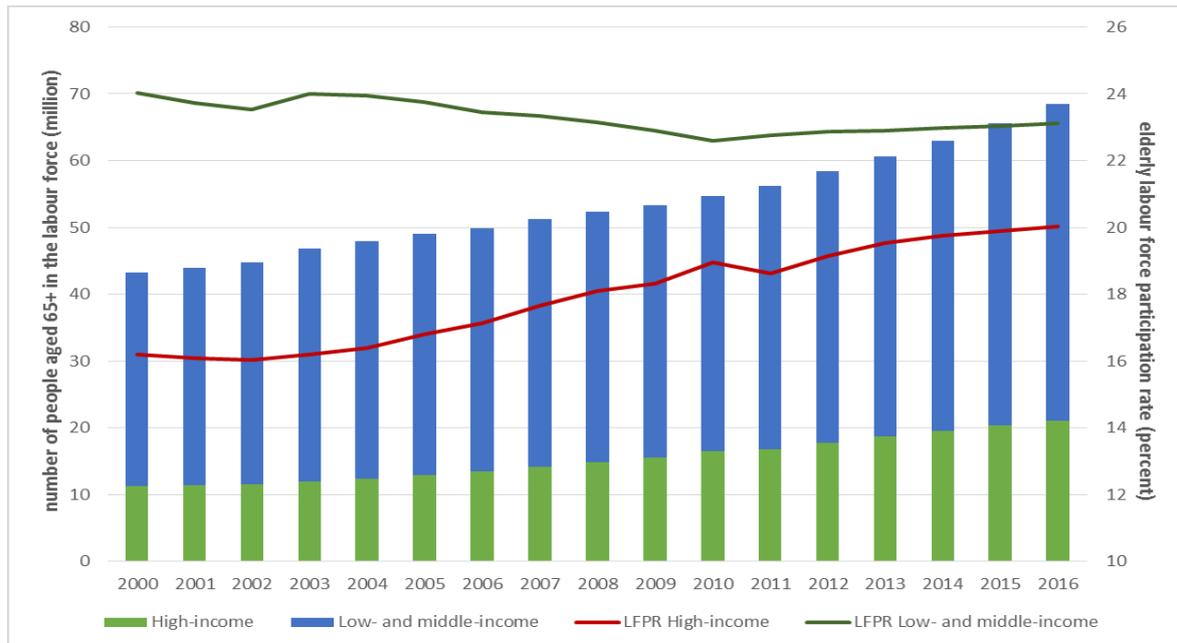
Note: Based on IMF classification, high-income APEC economies are Australia; Brunei Darussalam; Canada; Hong Kong, China; Japan; Korea; New Zealand; Singapore; Chinese Taipei; and the United States. Low- and middle-income economies are other APEC economies not classified as high-income.
Source: APEC Economic Policy Report 2017: Structural Reform and Human Capital Development.

Given the special mobility needs of the elderly, accessible tourism will become a growing and increasingly important market in the future. OurCityLove's innovative approach to improve accessibility innovations through a sound business model—and making a healthy profit—shows that an inclusive model of tourism can work for all stakeholders.

7   PEOPLE-TO-PEOPLE CONNECTIVITY: UTILISING PASSENGER NAME RECORDS TO FACILITATE TRAVEL (JAPAN)

7.1   BACKGROUND

Passenger Name Record (PNR) is a list of passengers' identification data sent by transportation service providers to pertinent authorities. Some form of PNR has been used for more than 60 years by the aviation sector and immigration and customs authorities around the world.

Other related terms are used interchangeably with PNR—i.e., Advanced Passenger Information (API) and Advanced Passenger Processing (APP)—but they are not the same. API, which is based on travel documents, are data that identify passengers and is used to conduct APP. APP, in turn, is the processing of API data to determine whether a passenger is cleared to board the aircraft (Statewatch 2007) [88]. PNR, on the other hand, contains more information than API and includes information on flight reservations, frequent flyer memberships, billing and payments, and all other information provided by the passenger at the time of booking (see Table 7.1 for a list of API and PNR data). While API is needed for immigration and customs processing and is collected from departure control systems, the broader information provided by PNR from airlines is useful for risk assessment and law enforcement.

TABLE 7.1: LIST OF API AND PNR DATA ELEMENTS

Advance Passenger Information (API)	
Flight data	**Passenger-specific data**
Flight identification	Surname/given name(s)
Scheduled departure date and time	Nationality
Scheduled arrival date and time	Date of birth
Last place/port of call of aircraft	Sex
Place/port of aircraft initial arrival	Official travel document number
Subsequent place/port of call	Issuer of official travel document
Number of passengers	Travel document type
	Expiration date of travel document
Passenger Name Record (PNR)	
PNR record locator	Split/divided (if one passenger from group)
Date of reservation/ticket issue	General remarks (e.g., assistance, requests, meals)
Date(s) of intended travel	Ticketing information (e.g., number, issue date, class)
Name(s)	Seat number and seat requests
Address and contact information	Codeshare information
Payment and billing information	Baggage information (e.g., pieces, weight, claim tags)
Complete travel itinerary	Number and other names of travellers on PNR
Frequent flyer information	Any API collected data
Travel agency/agent	All historical changes to PNR
Travel status (e.g., waitlist, confirmed, checked-in)	

Source: API data from IATA: https://www.iata.org/iata/passenger-data-toolkit/presentation.html; PNR data from Hungary Passenger Information Unit: http://tibek.gov.hu/download/7/a8/02000/PNR_guideline_2018.pdf

PNR was originally developed by the airline industry to facilitate sharing of information in cases where passengers take multiple airlines in one itinerary. With the increasing volume of international travelers, governments started requesting PNR data to aid in law enforcement and

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[88] Statewatch. (2007, July 15). EU: European Commission to propose EU PNR travel surveillance system. Retrieved from Statewatch: http://www.statewatch.org/news/2007/jul/03eu-pnr.htm

prevention of terrorism (Statewatch 2007; European Commission 2011[89]). Eventually, law enforcement agencies that utilise PNR started sharing information with other governments to help mitigate cross-border risks.[90]

7.2   IMPLEMENTATION OF PNR IN JAPAN

In March 2011, the Japanese Diet revised the Customs Law to authorise the Customs and Tariffs Bureau (i.e., Japan Customs) under the Ministry of Finance to request airlines for PNR data on inbound passengers; implementation began in October 2011.[91] In 2015, Japan amended the PNR regulation to allow airlines to electronically submit the PNR data to Japan Customs. In 2016, the inbound flights started sending PNR data twice: 72 hours before the flight and directly after the take-off (Tanaka 2015)[92]. In June 2017, the Customs Law was further revised, mandating airlines to provide PNR data to Japan Customs upon request as well as authorising the bureau to request PNR data on outbound passengers.[93]

Prior to implementing PNR data gathering, Japan Customs engaged in consultations with various stakeholders such as lawyers groups and airlines. Beyond issues of technicality and data compatibility, Japan takes consideration of the importance of PNR data protection as personal information is included in the data. There are only several Customs officials that can access the data. The data can only be exclusively utilised as per listed in the Customs Law, and there is limited replication and external transmission that is authorised (Tanaka 2015).

The primary reason for implementing PNR data collection in Japan is for law enforcement and prevention of terrorism. Travel facilitation is not the main consideration for this policy, but it is thought that through proper vetting and risk analysis of airline passengers, entry for legitimate and low-risk travelers could be facilitated and time and resources could be focused instead on passengers deemed to be high-risk.

Japan Customs requests the following data from airlines: (35 items are stipulated in our Customs law such as PNR name details, Address details, Contact telephone number, Any collected API data, Frequent flyer information, PNR locator code, Number of passengers on PMNR, Passenger travel status, All date information, Split/divided PNR information, All ticket field information, All travel itinerary for PNR, Form of payment information, All check-in information, All seat information, All baggage information, Travel agent information, Received-from information, Go-show information, No-show information, General remarks and history). This data is analysed by Japan Customs to construct a risk profile for airline passengers.

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[89] European Commission. (2011, February 2). EU Passenger Name Record (PNR) - Frequently Asked Questions. Retrieved from European Commission: http://europa.eu/rapid/press-release_MEMO-11-60_en.htm
[90] European Commission. (n.d.). Transfer of air passenger name record data and terrorist finance tracking programme. Retrieved from https://ec.europa.eu/info/law/law-topic/data-protection/data-transfers-outside-eu/transfer-air-passenger-name-record-data-and-terrorist-finance-tracking-programme_en
[91] Japan Customs and Tariff Bureau. (n.d.). Summary of Passenger Name Record (PNR). Retrieved from http://www.customs.go.jp/english/procedures/advance4_e/index_e.htm
[92] Tanaka, H. (2015). Japan's new approach to Passenger Name Records. In W. C. Organization, WCO news: API/PNR - What lays behind these two key words on the global security agenda (pp. 26-27). World Customs Organization. Retrieved from http://www.wcoomd.org/en/media/wco-news-magazine/~/media/8C15C4D2F4784FF9A09FA65E62B83599.ashx%23page=40
[93] European airlines do not provide PNR data to Japan due to EU privacy legislation.

7.3   CHALLENGES AND BENEFITS OF PNR

In introducing the PNR system, there are concerns about data privacy and protection. Given that some PNR data are personal in nature—such as personal identification, travel plans, and billing/payment information—there are concerns about who has access to the data, how they are used, and with whom they are shared.

To ensure the appropriate and effective use of PNR data, some economies including Japan have introduced dedicated unit called the Passenger Information Unit (PIU). PIU is a centralised unit that solely utilises PNR data for analysing and assessment of passengers. Having a PIU can respond to concerns of data privacy as it ensures that data access is limited. Japan introduced PIU so as to further secure data privacy and protection while making risk assessments based on PNR more effective and efficient. To limit the access to PNR data, the data is used in a closed system (i.e., not connected online) and access to the PIU's facility and office is strictly limited. The scope of usage and sharing of PNR data is also strictly limited by the Act on the Protection of Personal Information held by Administrative Organs in Japan (Act No. 58 of 2003).[94] Passengers can be confident that, although general concerns on data security are lingering, there are technical and legal ways to guarantee the protection of data obtained by economies in APEC.

Impacts of PNR use are mixed on the cost side. On one hand, setting up PNR systems and ensuring data compatibility and safeguards can be a significant burden on economies and airlines, particularly in cases where there are legacy systems that are incompatible with the requirements of the new systems. There are also considerable costs in implementing the system, from manpower costs of data entry to encoding and transmission (Geluykens 2010)[95]. IATA estimates that it costs USD 14 per flight to transmit API data—with only 15 data elements—to authorities, totalling more than USD 100 million per year for the industry (Mironenko 2010)[96]. PNR data, on the other hand, can contain up to 76 data elements and could mean even greater implementation and transmission costs. Costs could especially be burdensome for economies that do not yet issue machine-readable passports as data entry will need to be done manually at check-in, further increasing costs in terms of time and money.

One possible solution could be for economies to obtain PNR data in any format. Paper-based data gathering could be considered as an initial step in some cases, though its feasibility depends on various factors such as how many airplanes take off and land on a daily basis, etc. Another way is to use open-source software to reduce the costs of setting up data collection and analysis systems. For example, the United States Customs and Border Protection has developed an application called the Global Travel Assessment System (GTAS) for the World Customs Organization (WCO) in a bid to help optimise traveller screening. GTAS is an open-source web application for improving global security by using industry-standard Advance Passenger Information (API) to screen commercial air travellers. One of its notable characteristics is that GTAS requires no cost to use and is free to modify to fit economies' needs. The examples mentioned could be effective as an initial step for collecting PNR data while helping economies alleviate costs.

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[94] Government of Japan. (n.d.). Act on the Protection of Personal Information Held by Administrative Organs (Act No. 58 of 2003). Retrieved from http://www.cas.go.jp/jp/seisaku/hourei/data/APPIHAO.pdf

[95] Geluykens, W. (2010). The Effectiveness of the Exchange of Passenger Name Records (PNR) in Europe. Retrieved from https://lib.ugent.be/fulltxt/RUG01/001/458/490/RUG01-001458490_2011_0001_AC.pdf

[96] Mironenko, Olga (2010). Air Passenger Lists in Civil Aviation. In: Overvåking i en rettsstatt (Surveillance and Rule of Law), Schartum, Dag Wiese (ed.) Fagbokforlaget 2010, pp. 217-242.

On the other hand, PNR can offer significant cost reductions for governments, airlines, and legitimate travellers in the longer run (see Box 7.1 for IATA's list of benefits). For passengers, PNR can reduce processing time at immigration and customs since authorities already have their data and initial screening has been done prior to arrival. For airlines, after the initial costs of setting up and adjusting to new systems and requirements, substantial savings could be obtained from efficient electronic communications and data compatibility. Airlines also benefit from reducing passenger clearing times, reducing costly delays and waiting time at the gate. This, of course, requires relevant authorities to have systems in place to process API and PNR data that can contribute to reduced delays (Geluykens 2010; Mironenko 2010).

BOX 7.1: BENEFITS OF PASSENGER DATA EXCHANGE

Faster implementation
- Airline systems to comply with global standards already exist
- Typically airlines can transmit standard API within 3 months upon release of the detailed technical specifications
- Less testing is required for both airline and government

Better compliance
- Airline staff more easily understand standard requirements data elements and format are already known
- Harmonized systems will require fewer modifications that may impact compliance abilities

Cost control
- Airline systems already exist
- Requirements outside of standard result in additional reprogramming with significant associated costs.
- Reinventing the wheel is an expensive proposition

Reliable data
- Harmonized systems involve predictable and common data elements
- API data should be limited to that which is shown in the MRZ of the passport
- Data requiring interrogation and manual capture is subject to errors
- Only that data in official documents can be verified

Minimum impact on airport infrastructure
- Ability to capture data via automation speeds up the process
- Common data requirements reduces confusion and speeds check-in time
- Data re-entry due to input errors is greatly reduced

Source: IATA Passenger Data Toolkit: https://www.iata.org/iata/passenger-data-toolkit/presentation.html

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However, the main benefits are for governments and law enforcement authorities as it allows for risk assessment and pre-screening of passengers. Figure 7.1 shows the process flow utilised by Indonesia Customs showing how data is utilised for risk assessment and law enforcement.

FIGURE 7.1: INDONESIA'S API AND PNR DATA UTILISATION PROCESS
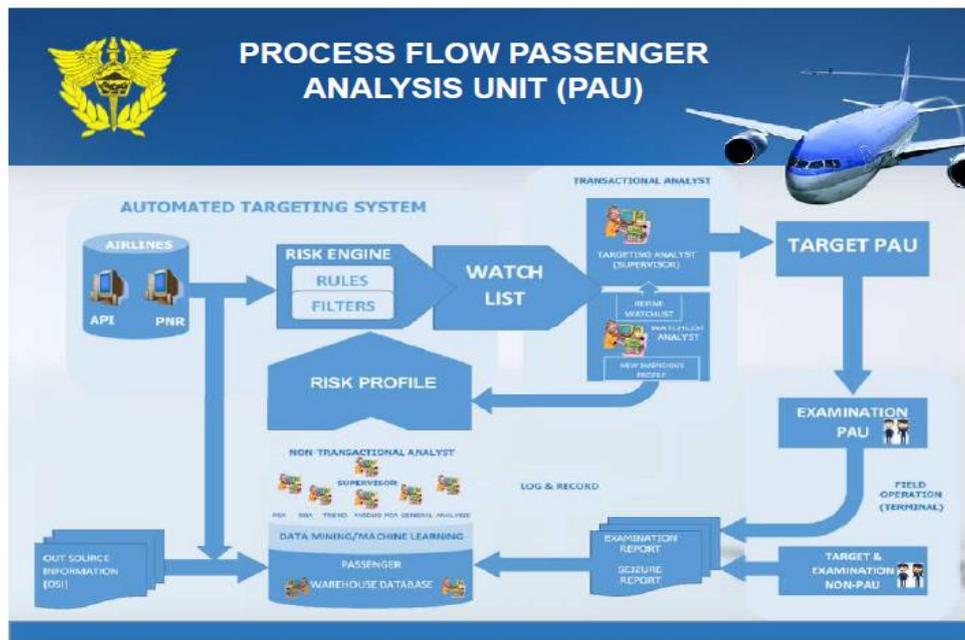
Source: Krisdiyanto (2015).

According to Krisdiyanto (2015)[97], analysis of API and PNR data contributed to around 60% of arrests of high-risk passengers and was key to a major drug bust in August 2015 where 94 kilogrammes of methamphetamine and 112,189 ecstasy pills were confiscated.

7.4 LESSONS FOR APEC ECONOMIES

PNR for security and travel facilitation is already being utilised by many economies around the world—practically everyone who has taken an international flight would have provided PNR data during booking or check-in. IATA, ICAO, and WCO are in the forefront of expanding the use of PNR around the world. Discussions on PNR utilisation are also relevant in various APEC fora such as BMG, CTWG, SCCP, and TWG.

In Japan's experience, a key element in implementing PNR is stakeholder engagement. Although PNR was initiated by a law enforcement agency, i.e., Japan Customs, it consulted with legal experts and the airline sector to address any concerns. Hence, opposition to implementing PNR was minimised and buy-in from various sectors was ensured.

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[97] Krisdiyanto, A. (2015). "API-PNRGOV for Securing Cross-Border Travel Facilitation." Presentation given at World Customs Technology & Innovation Forum. Rotterdam, The Netherlands, 26-29 October 2015: https://www.eiseverywhere.com/file_uploads/1f3789a18c15da6852e32369a4098fde_AgundKrisdiyanto_session 3.pdf

8 CONCLUSION

Connectivity in the APEC region stands on three broad pillars: physical, institutional, and people-to-people. The physical connectivity pillar aims to develop necessary physical infrastructure to improve transportation, logistics, and communication in the region. Measures to advance this pillar include improving infrastructure financing, creating a better investment climate, and encouraging application of good practices in delivering infrastructure projects. Institutional connectivity seeks to reform the "software" of connectivity; i.e., the institutional procedures that facilitate trade and investment across borders. Modernising customs, encouraging cross-agency coordination, and ensuring harmonisation of standards are some measures relevant to this pillar. The third pillar on people-to-people connectivity strives to facilitate the movement of people and skills across borders, be it for cross-border education, business travel, or tourism. Some of the measures under this pillar include expanding the APEC Business Travel Card scheme, reducing barriers to tourism, and improving cooperation for cross-border education.

The three connectivity pillars are often interlinked, and oftentimes an initiative focused on one pillar may also have implications on the other pillars. For instance, the XRL train system connecting the mainland of the People's Republic of China and Hong Kong, China will not only improve physical and people-to-people connectivity between the two economies but, through its co-location agreement, will also facilitate better institutional connectivity. Similarly, the use of passenger name records (PNR) has enhanced people-to-people and institutional connectivity in Japan by improving border screening efficiency while facilitating the entry of low-risk travellers. Hence, the three pillars should not be viewed in silos but rather as interlinked aspects of connectivity.

The importance of digital technology is heavily communicated in most of the case studies. While the ICT and telecom case study in Russia directly addresses the benefits of improving ICT infrastructure in connecting remote regions of the economy, the APMEN, CBPR, and OurCityLove case studies encourage adaptation while acknowledging the growing digital economy. For instance, APMEN promotes the development of internet platforms to facilitate customs clearing procedures. It exploits the opportunity for greater visibility across the supply chain through the use of internet. Similarly, OurCityLove uses available digital platforms to disseminate relevant and accurate information on the accessibility of hotels, restaurants, and tourist sites. As for CBPR, it acknowledges the regulatory adaptation required as economies digitise and data being increasingly flows across borders. It specifically aims to develop an interoperable framework for data flows while protecting privacy rights. The use of digital technology to improve safety and enforce laws has also been demonstrated in the use of PNR data for passenger processing, allowing authorities to focus on high-risk travellers while facilitating the travel of known and low-risk passengers.

Another commonly addressed issue within the case studies is inclusion. In the ICT and telecom case study, Russia aims to reach out to the 26% of its population living in remote regions through better ICT infrastructure. The development of ICT infrastructure in these regions will not only improve their connectivity but also provide access to more basic services like health care and education. Similarly, the HSR project improves connectivity among the more inland regions of the mainland of the People's Republic of China by now providing a convenient connection to Hong Kong, China. Additionally, OurCityLove aims to improve inclusion among the elderly and people living with disabilities (PWD) by enabling them to make informed decisions on travel, tourism, and procurement of goods and services.

Utilising a more collaborative model in planning and executing projects is another reoccurring suggestion throughout the case studies. The HSR project's planning involves substantial public engagement to not only ensure that relevant stakeholders are informed about the developments of the co-location arrangement but to also address their concerns. The OurCityLove project also illustrates the need to engage stakeholders including the elderly and PWD to arrive at more holistic and constructive policies. Using PWDs as investigators enables them to verify information and be active participants of the enterprise. In the case of CBPR, collaboration among many public and private stakeholders is pertinent to ensure sharing of information within the system. Likewise, the success of Japan's implementation of PNR data gathering and utilisation is attributed to strong engagement and consultation with stakeholders such as security agencies, airlines, lawyers' groups, and privacy advocates.

The case studies also showed the importance of **Public Private Partnerships**. The XRL adopted a concession approach, whereby, upon its completion, the Hong Kong Section of the XRL would be incorporated in a Service Concession Agreement with MTR Corporation Limited, a public listed company that the government is a major shareholder of. In order for the CBPR system to work efficiently, it needs to develop a good pubic private partnership with trust-mark providers. OurCityLove works together with private sector firms in the tourism, transportation and public service fields. The E-Port cooperation framework will need support from the private sectors involved in the sea freight logistics (sellers, carriers, forwarders, distributors and buyers) so that they are willing to share their information to realise the data-exchange cooperation.

Lastly, ensuring **adaptability of policies**, particularly in the new digital economy**,** has been discussed in several case studies. Russia's ICT and telecom project acknowledges the importance of being flexible in not only implementing the ICT infrastructure but also in preparing for the perpetually changing digital economy. As such, regulations need to be adjusted to match the new circumstances brought by the new landscape. The CBPR case study shows how interoperability is possible without requiring the modification of domestic laws. CBPR is a voluntary system, and does not overrule domestic law which leaves enough policy space for APEC member economies to implement and modify their data privacy domestic laws according their own policy considerations without subjecting them to an international obligation. This flexibility reflects the need for governments to constantly rethink policies in empowering the digital economy.

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