DATA COLLECTION SURVEY ON PROMOTION OF SOLUTION BUSINESS WITH ADVANCED ICT (IN SOUTH ASIA AND CENTRAL ASIA)

FINAL REPORT FOR PAKISTAN

AUGUST 2021

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

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TABLE OF ABBREVIATED WORDS

Abbreviation	Definition
BPO	Business Process Outsourcing
CAGR	Compound Annual Growth Rate
DFR	Draft Final Report
FDI	Foreign Direct Investment
FR	Final Report
ICR	Inception Report
ITeS	IT enabled Services
ITO	Information Technology Outsourcing
JISA	Japan Information Technology Services Industry Association
KGI	Key Goal Indicator
KPI	Key Performance Indicator
METI	Ministry of Economy, Trade and Industry (of Japan)
P@SHA	Pakistan Software Houses Association for IT & ITES
PKR	Pakistan Rupee (Currency)
PoC	Proof of Concept
PSEB	Pakistan Software Export Board
PWDs	Persons with Disabilities
SDGs	Sustainable Development Goals
SMRJ	Small & Medium Enterprises and Regional Innovation, JAPAN (SME Support Japan)
VC	Venture Capital

1 Outline of the Survey

1.1 Background of the Survey

Today, we live in an era witnessing the biggest information and communication revolution in human history. Over 50% of the world's population now has access to the Internet, and new users are increasing every day. The world's data traffic is expanding year by year, and the ICT market is continuously active thanks to the rapid progress of AI/IoT in the world as well as the emergence of new markets.

Under such circumstances, the export value and human resources of the ICT industry are growing year by year in emerging countries in South Asia and Central Asia. In addition, some IT companies in emerging countries are already actively engaged in advanced technology development such as AI, Data Science, IoT, and Fintech, and are actively penetrating overseas markets mainly in Europe and America. In order to further develop the ICT industry, these countries recognize the necessity of developing and expanding new markets in addition to the current Western markets, and Japan is one of the candidates for new market development. Such needs for entry into the Japanese market have been confirmed in several countries (Sri Lanka, Armenia, Pakistan).

However, partnerships between Japanese companies and emerging countries have not been fully realized due to such factors as language barriers, differences in business practices, and lack of branding. Some efforts are already being made especially for the offshore development market through Japanese ICT solution providers, but advanced ICT companies in the target countries do not usually opt for offshore business with intermediate companies but prefer direct business matching with Japanese client companies.

For this reason, it is considered important to establish a mechanism to develop human resources that directly connects emerging countries and Japanese companies and promotes bilateral cooperation between countries. At present, however, there are many things that have not been clarified such as the degree of interest of companies in the respective countries, the number of interested companies, specific barriers for entering the Japanese market, building partnerships, and attracting investment, and the content of training to promote bilateral collaboration.

In the Survey, based on the above-mentioned current situation, the issues in promoting direct collaboration between ICT companies in emerging countries and Japanese companies who seek ICT solutions will be sorted, and an appropriate branding/marketing strategy will be created for emerging countries to enter the Japanese market, to collaborate with Japanese enterprises, and to attract investment in the target countries, all without need for intermediate companies. In addition, the purpose is to clarify the activities and human resources necessary for implementing the strategy that are lacking in the emerging countries, and to collect the information necessary to consider future support contents.

1.2 Purpose of the Survey

The purpose of the Survey is to clarify possibilities and issues involved in direct business collaboration between advanced ICT companies in each target country and potential Japanese client companies with advanced needs, and to create a branding/marketing strategy (draft) of each target country aiming at the Japanese market. The implementation body of the said branding/marketing strategy would be the government or industry associations in each target country, but we will also seek possible candidates through the Survey. In addition, necessary systems, activities, human resources, etc. for implementing the strategy that are lacking in each target country will be clarified, and information will be collected to examine the direction of future support.

1.3 Target Countries and Areas

- Armenia (Yerevan)
- Sri Lanka (Colombo)
- Pakistan (Islamabad, Karachi, Lahore)
- Japan

1.4 Implementation Strategy of the Survey

As a matter of fact, the three target countries of the Survey are not widely known in Japan for having good IT solution industries. Many emerging countries around Japan have already penetrated into the Japanese IT solution market (including China, India, Vietnam, Philippines, Indonesia, Bangladesh, and Myanmar), mostly by offshore outsourcing businesses through Japanese IT solution providers. Therefore, the offshore development market in Japan is now nearly saturated, and it is now a matter of cost competition. Some advanced IT solution providers in China, India, and Vietnam are now beginning to provide direct solution business to Japanese clients without going through intermediate Japanese IT solution providers, however, this strategy requires very good communication with Japanese clients in Japanese language (because Japan is known for very low English proficiency among non-English speaking countries[1]) as well as full understanding of Japanese business practices.

In this current situation in Japan, we must clarify differences and distinguished competitive edges from other countries that are already doing business in Japan so that we can give clear brand image of the IT solution industry in the target countries to potential Japanese clients who don't know these countries well. This current situation and our survey strategy are summarized and illustrated in the figure below.

[1] https://www.nippon.com/en/japan-data/h00594/japan%E2%80%99s-english-proficiency-drops-among-non-english-speaking-countries.html

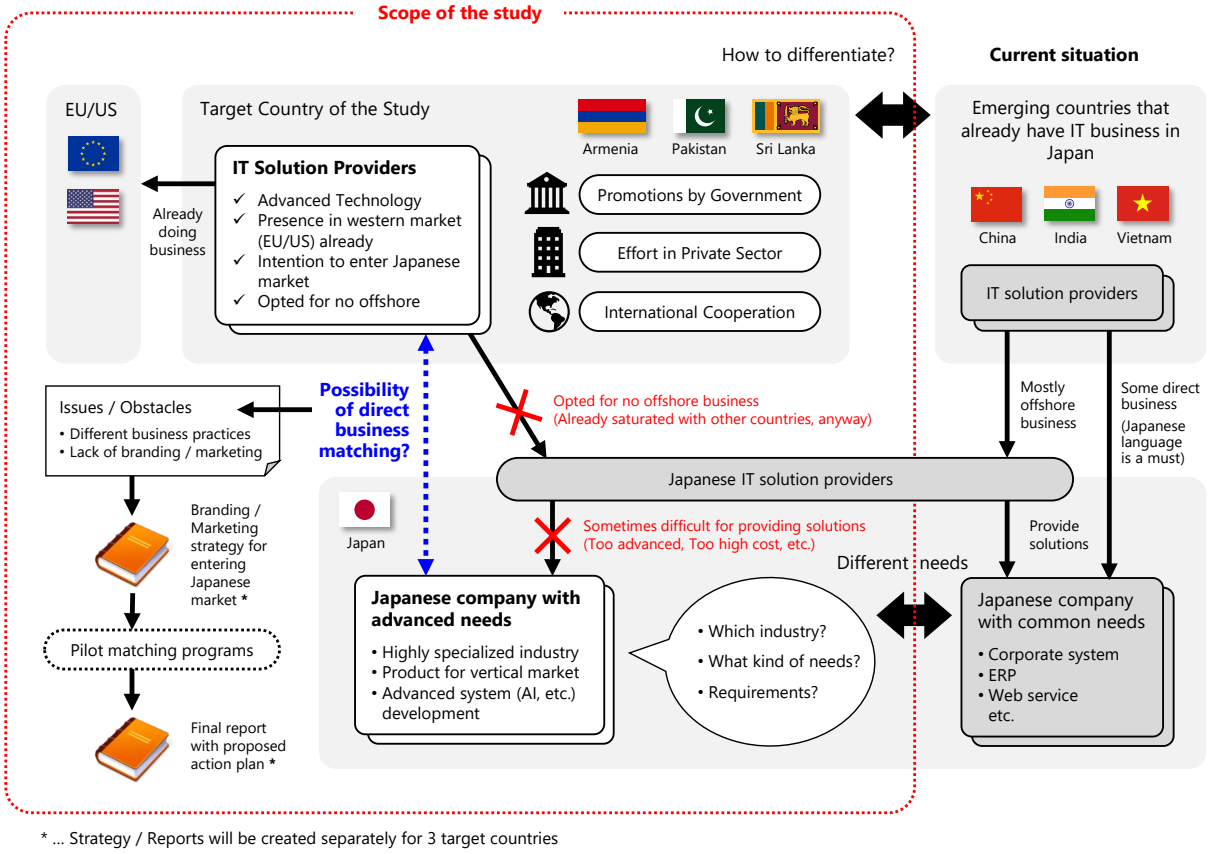


Figure-1 Overview and scope of the Survey (with current situation in Japan)

The competitive edges of target country should be clarified by the following factors, prioritized from (1) to (3).

(1) Among the numerous IT fields, identify specific IT fields in which the IT industry of each target country has clear competitive edge over other emerging countries, then formulate branding strategy that leads to business with Japanese companies that require the specific IT fields.

(2) Examine comparative advantages of each target country in the geographical aspect (such as market access to other areas of the world that Japanese companies may find attractive as a base for business expansion in those areas) or in the cultural aspect (such as in case Japanese companies plan to develop products suited for specific cultural aspect, etc.), then formulate branding strategy based on combination of technological advantages and geographical/cultural advantages.

(3) If a sufficient comparative advantage in terms of technology, geography, or culture cannot be identified, there will be no other choice but to differentiate each target country by other factors (especially by economic factors like labor cost, economic scale, etc.). Effort will be made to not simply appeal the comparative cost, but to combine the high added value of technological advantage with economic advantage of each target country.

1.5 Survey Schedule

The latest overall schedule of the Survey is shown in the figure below. The schedule has been revised three times in June 2020, September 2020, and May 2021 due to COVID-19 pandemic situation in the world and other reasons.

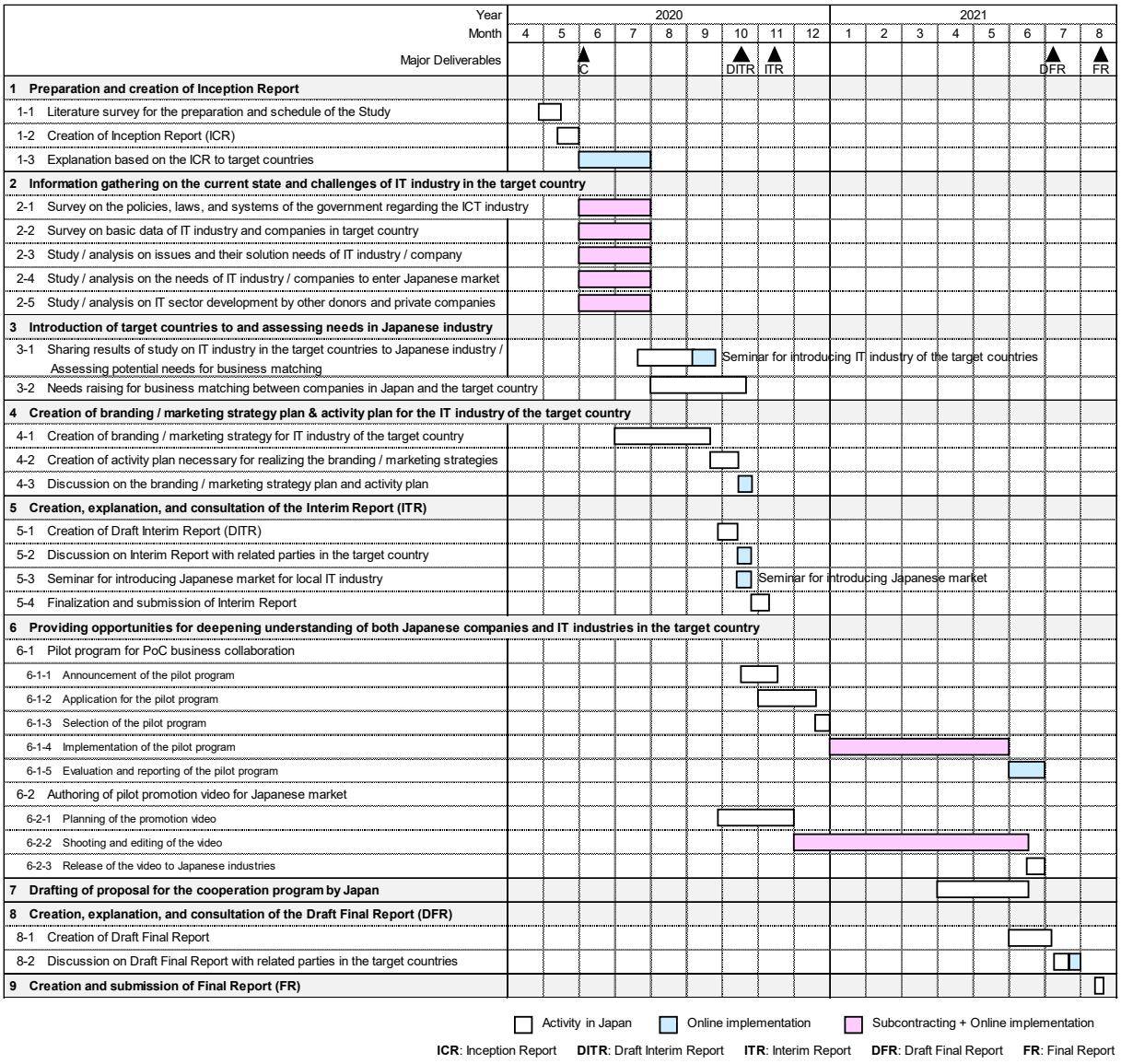


Figure-2 Overall schedule of the Survey

1.6 Survey Content

This section describes the contents of each work indicated in the schedule in Figure-2. The Survey is explained in terms of the primary category "Work" and secondary category "Processes".

Work 1 Preparation and creation of Inception Report

Process 1-1 Literature study for the preparation and schedule of the Survey

Existing information available online will be collected, examined, and analyzed for preparing detailed contents of the fieldwork in each target country.

When creating Survey items and processes, rather than creating the same content for all target countries, hypotheses will be made regarding the characteristics of each target country and the comparative advantage among the target countries and emerging countries that have already entered the Japanese market. After that, the Survey items and processes will be formulated by prioritizing the topics that can verify the hypothesis.

Process 1-2 Creation of Inception Report (ICR)

An Inception Report (draft) will be created based on the above analysis. The composition of the Inception Report will be clearly divided into content common to the three target countries and content specific to each country, and the content to be submitted to each country will be the common part plus the part specific to each country.

Before the fieldwork, a questionnaire and presentation materials will be prepared for the target country. Based on the discussion of the content with JICA, the report will be finalized.

Process 1-3 Explanation based on the ICR to target countries

The Inception Report will be provided to the target organizations/companies of the Survey along with the official letter from JICA during the first fieldwork by the local subcontractor, and the contents of ICR will be explained during the online meeting with the target organizations/ companies.

Work 2 Information gathering on the current state and challenges of IT industry in the target country

This is the first fieldwork in each target country. Due to the COVID-19 pandemic, the first fieldwork will be implemented by utilizing local subcontractors in each target country as well as by online questionnaire/interviews. The overall procedures for implementing the fieldwork are illustrated in the figure below.

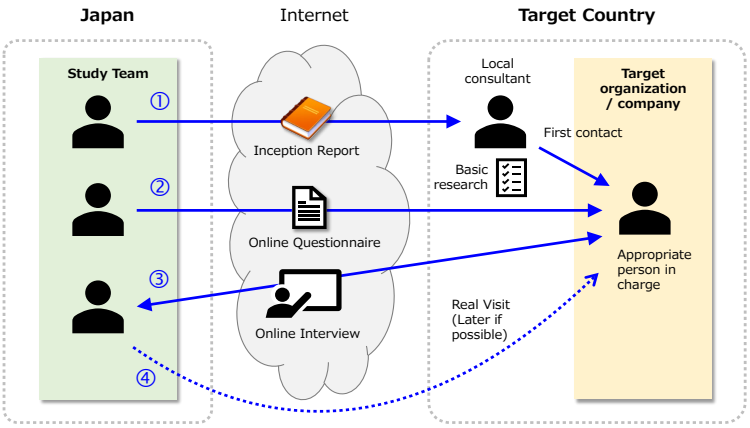


Figure-3 Implementation procedures of the fieldwork in each target country

① The Inception Report will be sent to subcontracted local consultant in each target country, and the local consultant will perform basic research on IT industry there. Then, the local consultant will make the first contact to the target organization or company for the Survey and confirm who will be the appropriate person to talk to.

② The Survey Team will send online questionnaire to the person in charge of the target organization and request response to the questionnaire.

③ Based on the result of online questionnaire, if further clarification is required the Survey Team will ask for an online interview/meeting with the person in charge of the target organization.

The list of surveyed organizations/companies is shown in Appendix 1.

Work 3 Introduction of target countries to and assessing needs in Japanese industry

Process 3-1 Sharing results of the Survey on IT industry in the target country to Japanese industry/Assessing potential needs for business matching

The results of fieldwork in the target country will be disseminated to Japanese industries/companies including the information on IT industry/companies, needs and challenges of business matching, etc. Opinions will also be heard from the Japanese side on their needs and issues regarding the possibility of business matching. For these purposes, online seminars (Webinar) have been organized, emphasizing that the content of the seminar is not just an introduction of the target countries, but will lead to the development of speedy and strategic products and services in cutting-edge technology fields that could never be achieved by typical offshore development through Japanese IT solution providers. The detail of this Webinar is described in 5.2/5.3.

Process 3-2 Needs raising for business matching between companies in Japan and the target country

For Japanese companies that expressed interest in IT companies in the target countries through the seminar, Japanese companies that were unable to attend the seminar but expressed interest, or Japanese companies that had previously approached the target countries but had not been able to collaborate with them, the Survey Team will examine the possibility of individual business matching between local IT companies and Japanese companies as revealed through the fieldwork, and conduct individual visits and interviews with those Japanese companies through online meetings, etc.

Work 4 Creation of branding/marketing strategy plan & activity plan for the IT industry of the target country

Process 4-1 Creation of branding/marketing strategy for IT industry of the target country

The branding/marketing strategy for each target country's entry into the Japanese market will be created based on the following processes, i.e., setting of priority target industry in Japan, design of the value image to be evoked, design of customer contact points, finalization of the marketing mix, design of KGI/KPI, and creation of action plan to enter the Japanese market.

Figure-4 Process for creating branding/marketing strategy and activity plan for entry to Japan

The draft branding/marketing strategy for IT industry of the target country is shown in Appendix 4.

Process 4-2 Creation of activity plan necessary for realizing the branding/marketing strategies

Based on the draft strategy developed in the previous section, the draft activity plan will be developed along a timeline that specifies the key milestones and their timing. In order to realize branding and marketing strategies based on the premise of entering the Japanese market, the draft activity plan should assign more resources to items that are particularly lacking from the current situation in each country. In addition, the proposed activities should have sufficient feasibility for entering the Japanese market by taking into account the current situation and prospects of demand in the Japanese industry for the technology area to be promoted, as well as the market environment and needs of governments and local suppliers in each country.

Process 4-3 Discussion on the branding/marketing strategy plan and activity plan

The content of the draft branding/marketing strategy and draft activity plan will be discussed with the relevant organizations in each target country through online meeting (to be held at the same time with Process 5-2).

Work 5 Creation, explanation, and consultation of the Interim Report (ITR)

Process 5-1 Creation of Draft Interim Report (DITR)

The above findings (up to Process 4-1) will be summarized in the Draft Interim Report (DITR). As in the case of the Inception Report, the structure of the DITR should be clearly divided into common content for the three target countries and country-specific content so that there will be dedicated version of the report for each of the three target countries.

Process 5-2 Discussion on Interim Report with related parties in the target country

The content of the Draft Interim Report will be discussed with the relevant organizations of each target country through online meetings.

Process 5-3 Seminar for introducing Japanese market for local IT industry

In addition to the discussion on the Draft Interim Report and proposed branding/marketing strategies and activities, an online seminar (webinar) will be held to introduce the Japanese market to the local IT industry, to introduce Japanese industries that are promising for business matching as well as necessary knowledge to enter the Japanese market. The seminar will also encourage participation in the business matching-related events described below. The result of this seminar is described in 5.3.

Process 5-4 Finalization and submission of Interim Report

The Interim Report will be finalized and submitted based on the results of discussions (Process 4-3/5-2) as well as the results of the above seminar (Process 5-3).

Work 6 Providing opportunities for deepening understanding of both Japanese companies and IT industries in the target country

Process 6-1 Pilot Program for PoC business collaboration

In order to facilitate real business matching between Japanese industries and the ICT companies in the target countries, a pilot program to support PoC business collaboration will be implemented where Japanese companies are encouraged to “try” the collaboration by raising ideas or plans to do small-scale PoC or prototype development with ICT solution companies of the target countries , and Survey Team will provide support for the implementation of those PoC/prototyping in the form of subcontracting with the target ICT companies. This activity is designed as an alternative to the

invitation program to Japan that had to be canceled due to the COVID-19 pandemic. The results of this program are described in 5.4.

Process 6-2 Authoring of pilot promotion video for Japanese market

Based on the branding/marketing strategy plan created in Process 4-1, a pilot promotion video of each target country will be created for Japanese market. Since these videos will be directly targeted at Japanese market, the content of the video will be carefully designed to match the needs of Japanese industry and to answer typical questions that Japanese companies have with the ICT industry of the target countries. The video is planned to have introduction to the ICT industry of target country as well as interviews, and discussions with ICT industry representatives of each country with Japanese subtitle and /or narration. This activity is designed as an alternative to visiting program to the target country by Japanese companies that must have been canceled due to COVID-19 pandemic.

Work 7 Drafting of proposal for the cooperation program by Japan

The possibility of cooperation by JICA in this area will be discussed, and if there is a possibility for cooperation, the cooperation scheme, activities, target counterpart organizations, companies, etc. will be examined and proposed in the final report.

Work 8 Creation, explanation, and consultation of the Draft Final Report (DFR)

Process 8-1 Creation of Draft Final Report

A draft final report (DFR) will be prepared based on the results of the research and activities. Branding and marketing strategy proposals and activity plan will also be finalized based on the results of the activities to date. In particular, the proposed activities should clearly describe the specific content and timing of the activities, as well as the Japanese counterparts involved in each activity, so that the governments and companies of the target countries can immediately participate in the activities.

Process 8-2 Discussion on Draft Final Report with related parties in the target countries

After receiving confirmation on the content of DFR from JICA, the report will be explained and reported to the relevant target country representatives via an online meeting to discuss the content of the report.

Work 9 Creation and submission of Final Report (FR)

The final report will be completed and submitted to JICA, reflecting the comments of the relevant organizations of each target country and JICA on the DFR.

2 Current Status of Advanced IT Solution Providers in Pakistan

Note: There is another JICA survey titled "Data Collection Survey on ICT Industry Development through Business Matching with Japanese ICT Companies" implemented in the same period of the Survey. In order to avoid duplicating survey, we have limited the Survey coverage.

Pakistan, with its large, young, and widely English-speaking population has seen huge growth in the IT sector, especially in outsourcing relating exports. Its IT related exports (excluding the limited figure of IT hardware exports) have increased at a CAGR of 6% from 2013 to 2018, from USD 817 million to USD 1,092 million. Given its growing population and economic development, cellular subscription has also greatly gained penetration during the past two decades, and is expected to further push the growth of the domestic IT market. The overall IT market size including both exports and domestic revenues was estimated at around USD 4 billion in 2019, and the government has ambitious plans to increase this to USD 20 billion by 2025, through the introduction of various incentives for the IT sector as well as promote the establishment of infrastructure and support facilities for startups and enterprises in the IT sector.

2.1 Government Policy and Relevant Organization for ICT Sector Development

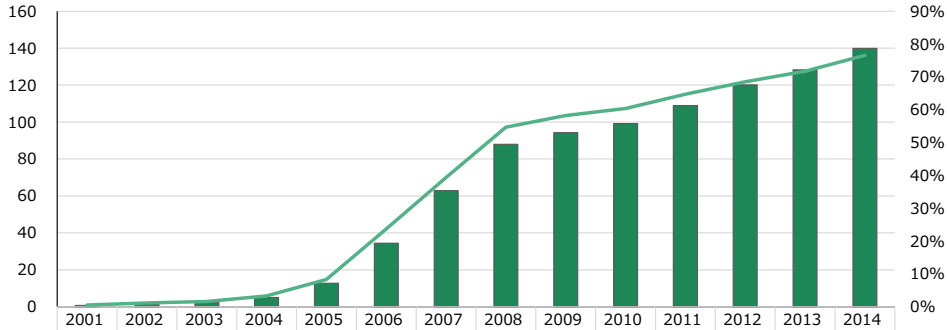
2.1.1 Overview of Government Initiatives

From an IT industry perspective, one of the early milestones was in 1985 when the government officially publicized IT imports as commercial imports and the citizens of Pakistan gained access to IT hardware for the first time. Lowered custom burdens led to a boom in the industry as well as foreign direct investments, which caused the government to realize the economic potential from the IT sector, and it established the Pakistan Software Export Board in 1995.[2] Entering the 2000s, another milestone was the separation of the Ministry of Information Technology from the Ministry of Science in Technology in 2002, allowing for further focus on the IT sector. Around this time, the national telecommunication company Pakistan Telecommunication Corporation Limited (PTCL) also launched its mobile service Ufone in 2001[3], followed by two new mobile companies being awarded licenses in 2003 and thus creating competition which increased the number of cellular subscribers rapidly from 5.0 million in FY2003-2004 to 12.7 million in FY2004-2005, and further to 34.4 million in FY2005-2006, growing from a penetration rate of 3.3% to 23.7% in only two years.[4]

[2] https://www.researchgate.net/publication/328718444_ICTs_and_Development_in_Pakistan_A_Review

[3] https://www.researchgate.net/publication/281806715_Impact_of_Information_and_Communication_Technologies_on_Pakistan%27s_Economy_and_Poverty

[4] Pakistan Telecommunication Authority Annual Reports (2004, 2005, 2008, 2014)



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Cellular subscribers (mn)	0.7	1.7	2.4	5.0	12.7	34.4	62.9	88.0	94.3	99.2	108.9	120.2	128.3	139.9
Penetration rate (%)	0.5%	1.2%	1.6%	3.3%	8.3%	23.7%	39.4%	54.7%	58.2%	60.4%	64.8%	68.5%	71.7%	76.6%

Figure-5 Number of cellular subscribers and penetration rate in Pakistan (2001-2014)[5]

By the mid-2000s Pakistan had also entered the offshore services industry with its sizable talent pool and low labor costs.It was ranked amongst the top fifty economies to outsource IT-BPO processes since 2009[6] and was identified as the most cost effective outsourcing location, above other South Asian countries such as India and Bangladesh and above all other countries in the world, by the AT Kearney Global Services Location Index in 2017.[7]

Table-1 Offshore Services Location Index Ranking 2017

(Selected countries: Major South Asian countries and top 5 countries)[8]

Country	2017 Ranking	Financial Attractiveness	People Skills and Availability	Business Environment
India	1	3.30	2.63	1.14
China	2	2.37	2.69	1.26
Malaysia	3	2.92	1.47	1.72
Indonesia	4	3.25	1.53	1.20
Brazil	5	2.65	2.02	1.27
Sri Lanka	11	3.42	1.07	1.22
Bangladesh	21	3.34	1.23	0.80
Pakistan	**30**	**3.35**	**1.30**	**0.63**

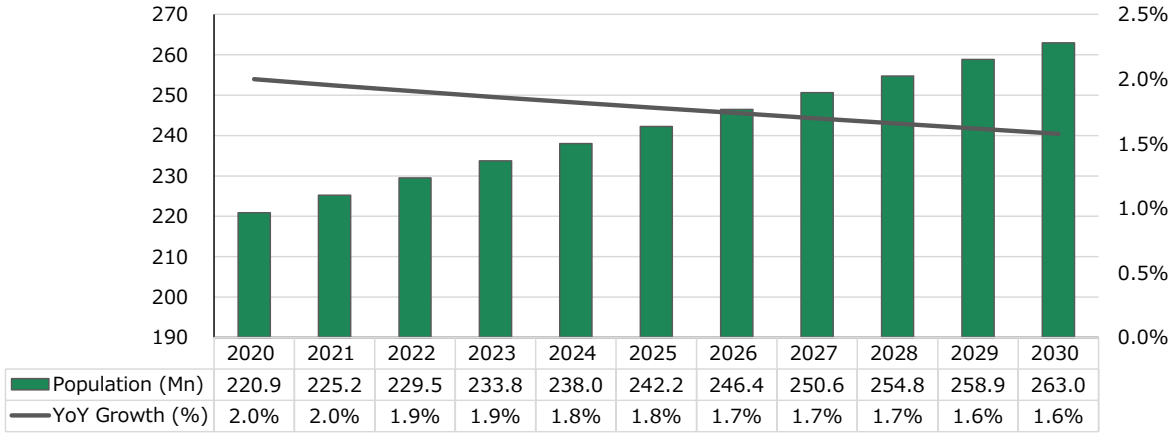
The major source of competitiveness for the Pakistan ICT industry lies in its abundant, young, low-cost, and English-speaking labor force. The Pakistani population is at more than 220 million as of 2020, and is expected to continue to grow at around 1.6-1.9% per year, surpassing 250 million by 2027 and reaching more than 260 million in 2030. As shown in Figure-7, nearly 60% of the population is under 25 in 2020, and this young age group is expected to continue to account for more than half of the population in 2030.

5 Pakistan Telecommunication Authority Annual Reports (2004, 2005, 2008, 2014) (Note: Years are fiscal years ending June of the listed year)

6 https://gvcc.duke.edu/wp-content/uploads/PakistanOffshoreServicesGVC.pdf

7 https://www.de.kearney.com/documents/20152/4977406/The+widening+Impact+of+Automation.pdf/95d8d519-e2b0-0e4f-994d-15e8716b339e?t=1505464610310

8 https://www.de.kearney.com/documents/20152/4977406/The+widening+Impact+of+Automation.pdf/95d8d519-e2b0-0e4f-994d-15e8716b339e?t=1505464610310



	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Population (Mn)	220.9	225.2	229.5	233.8	238.0	242.2	246.4	250.6	254.8	258.9	263.0
YoY Growth (%)	2.0%	2.0%	1.9%	1.9%	1.8%	1.8%	1.7%	1.7%	1.7%	1.6%	1.6%

Figure-6 Estimated population growth of Pakistan (2020-2030)[9]

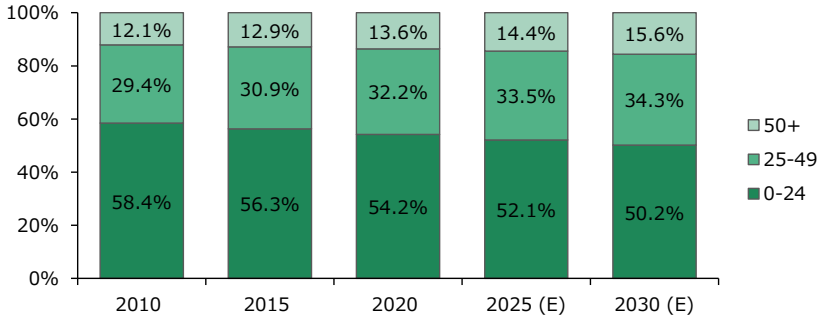


Figure-7 Population breakdown by age group (2010-2030)[10]

Being the world's third largest English-speaking country after India and the United States[11], Pakistan has more than 300,000 English-speaking IT professionals with expertise in current and emerging IT products and technologies, with more than 20,000 IT graduates and engineers newly adding to the number each year.[12]

Labor costs are also low with the average hourly rate of a software developer being around USD 25-30, which is lower than India and at par with Bangladesh and Sri Lanka. Pakistan's operational costs especially in the low value-added BPO segment is said to be 60% lower than the Philippines, the largest supplier of BPO services in the world.[13]

9 United Nations Population Division Department of Economic and Social Affairs, World Population Prospects 2019
10 United Nations Population Division Department of Economic and Social Affairs, World Population Prospects 2019
11 https://gvcc.duke.edu/wp-content/uploads/PakistanOffshoreServicesGVC.pdf
12 http://moib.gov.pk/Downloads/Policy/DIGITAL_PAKISTAN_POLICY(22-05-2018).pdf
13 https://documents.worldbank.org/en/publication/documents-reports/documentdetail/894921591073694322/digital-pakistan-economic-policy-for-export-competitiveness-a-business-and-trade-assessment

Table-2 Hourly rate of software developers (USD, 2018)[14]

Country	Hourly rate of software developer
Pakistan	25-35
India	30-40
Bangladesh	25-35
Nepal	25-30
Sri Lanka	25-35

With the rich supply of quality labor, Pakistan is home to more than 4,000 IT companies according to a World Bank report, along with more than 200 call centers being added each year. Pakistan is also said to have the third largest number of freelancers in the world, right after India and Bangladesh,[15] with its annual revenue growth from freelancing activities at 47% (2019), ranking fourth place globally, only after the United States, the United Kingdom and Brazil.[16]

The country also has numerous tax incentives and policies to promote investment in the IT sector. Tax incentives include zero income tax on IT and ITeS (IT enabled Services) exports, permitted 100% foreign ownership of IT & ITeS companies and 100% repatriation of profits to foreign IT & ITeS investors.[17] Other incentives that are currently under consideration include an extension of the income tax holiday for IT/ITes companies registered with the Pakistan Software Export Board (PSEB), 5% cash reward on export remittances by PSEB registered IT/ITes companies and call centers, reduced sales tax on domestic revenues of IT/ITes companies located in Islamabad Capital Territory, reduced long term final financing rates for IT/ITes companies, establishment of tech SEZs (Special Economic Zones) and allocation of land on a long term lease to IT/ITes companies in the form of IT Parks.[18]

Other ICT related initiatives carried out by the government include the establishment of entrepreneurship support organizations. The federal government has promoted entrepreneurship through funding National Incubation Centers (NICs) across the country in the form of public-private partnerships, with the first NIC established in Islamabad as a partnership between Teamup (Innovation hub) and Jazz (Mobile network and internet services provider) in 2016. Since 2017, NICs in a total of four cities (Islamabad, Karachi, Lahore and Peshawar) have incubated a total of 234 startups, and have generated thousands of jobs. The National ICT R&D Fund has also been revamped by rebranding itself as Ignite in 2017, and has been supporting innovation through the above mentioned NICs as well as the SEED fund (financial support for the development of innovative products and technologies), the Final

14 https://documents.worldbank.org/en/publication/documents-reports/documentdetail/894921591073694322/digital-pakistan-economic-policy-for-export-competitiveness-a-business-and-trade-assessment

15 https://documents.worldbank.org/en/publication/documents-reports/documentdetail/894921591073694322/digital-pakistan-economic-policy-for-export-competitiveness-a-business-and-trade-assessment

16 https://pubs.payoneer.com/images/q2_global_freelancing_index.pdf

17 https://invest.gov.pk/it-ites, https://www.thenews.com.pk/tns/detail/662272-economic-revival-and-the-it-sector#:~:text=Currently%20Pakistan%20has%20zero%20income,funds%20are%20available%20till%202024

18 http://moib.gov.pk/Downloads/Policy/DIGITAL_PAKISTAN_POLICY(22-05-2018).pdf

Year Project (FYP) fund (funding to undergraduate students of ICT-related disciplines for building prototypes and working models of their FYPs) and free online training programs.[19]

Long term strategies for the ICT sector has also been lay out by numerous nationwide plans. The Pakistan Vision 2025, which illustrates the country's long-term strategies and roadmap towards year 2025, touches upon the ICT sector and states initiatives in strengthening Pakistan's IT infrastructure including wider access to broader internet and computers, as well as initiatives regarding the enhancement of data protection and intellectual property rights, introduction of e-education, e-commerce, e-health and government, and improving governance.[20]

The Pakistan government also launched the Digital Pakistan Policy in 2018, with a vision to serve as "a strategic enabler for an accelerated digitization eco system to expand the knowledge-based economy and spur socio economic growth". The policy identifies the below 12 objectives as well as the key components such as infrastructure development and legislation, key socio-economic sectors to be digitized (e.g. e-Agriculture, e-Health), and the ministries and departments assigned to take lead and facilitate each policy initiative.[21]

1. **Holistic Digital Strategy:**
   Create a digital ecosystem with infrastructure and institutional frameworks for the rapid delivery of innovative digital services, applications, and content
2. **Sectorial Digitalization:**
   Promote the use of technology in education, health, agriculture, and other key socioeconomic sectors
3. **E/M-Commerce:**
   Promote e-commerce by providing and enabling an environment where Payment Service Providers (PSP) and Payment Service Operators (PSO) can operate and establish an effective e-commerce platform and take e-commerce activities in Pakistan to the next level
4. **Youth, Women and Girls empowerment using IT:**
   Initiate specific ICT for Girls' programs for imparting quality trainings in computer skills, including software coding, across the country to reduce inequalities, provide decent work and promote economic growth in line with relevant SDGs
5. **Promote Innovation, Entrepreneurship, Incubators/Startups in IT sector:**
   Generate sustainable innovation, entrepreneurship and employment opportunities for the country's rapidly growing technology savvy and entrepreneurial youth

[19] Invest2Innovate "Pakistan Startup Ecosystem Report 2019"
[20] https://www.pc.gov.pk/uploads/vision2025/Pakistan-Vision-2025.pdf
[21] http://moib.gov.pk/Downloads/Policy/DIGITAL_PAKISTAN_POLICY(22-05-2018).pdf

6. **Increase software exports, IT remittances & Domestic market**

7. **ICT Ranking of Pakistan:**
   Improve Pakistan's ICT ranking based on international indices and benchmarks measuring the business & innovation environment, infrastructure, affordability, skills readiness, and socioeconomic impact

8. **Digital Inclusion:**
   Develop IT Zones/Software Technology Parks, set up tele-centers in unserved and underserved areas of Pakistan to provide public with easy access to ICT services

9. **E-Governance:**
   Promote e-Governance to make Pakistan the front runner in good governance through IT enablement at all levels

10. **Increase foreign and domestic investment:**
    Make Pakistan an attractive destination for investment in the IT/ITeS industries to create jobs and fuel economic growth

11. **Persons with Disabilities:**
    Reduce barriers to online access for Persons with Disabilities (PWDs), include provisions of prodigious empowerment of PWDs in IT accessibility

12. **Standardization:**
    Coordinate and support standardization efforts, maximize reusability, create synergies, and deliver cost effectiveness

2.1.2 Relevant Government Organizations

(1) Punjab Board of Investment & Trade[22]

Punjab IT Policy 2018[23] - The policy envisions information technologies as a vehicle for transforming the province into a knowledge-based, economically vibrant, democratic, and inclusive society. Its vision is that Punjab becomes the top e-Governed, IT-enabled, e-Literate province in the region, regarded as a preferred destination for global IT businesses and a major supplier of skilled IT human resource.

[22] http://pbit.gop.pk/
[23] https://policy.pitb.gov.pk/system/files/Punjab_IT_Policy_2018_05062018.pdf

2.2 Efforts in Private Sector and Relevant Organizations

2.2.1 ICT Market Overview

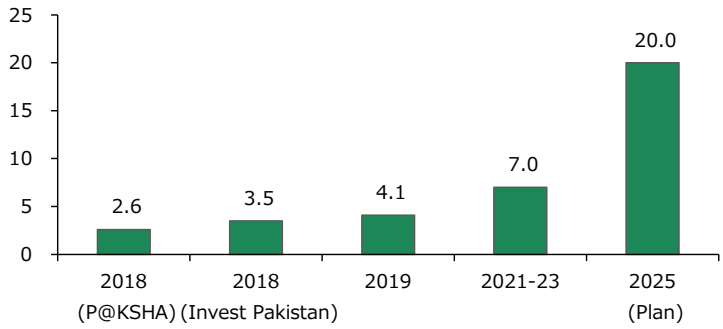


Figure-8 Pakistan IT Industry Size (USD Billion)[24]

The overall size of the IT industry in Pakistan is around USD 3.5 billion (figures vary depending on the source), accounting for approximately 1% of the country's GDP in 2018[25]. According to the Technology Times of Pakistan, this figure is expected to more than double to USD 7 billion between 2021 and 2023. Furthermore, in accordance with Pakistan Vision 2025 and the Digital Policy of Pakistan 2018, the country plans to grow this sector into a USD 20 billion industry by 2025.

The market growth will be supported both by the growth of exports as well as the domestic market, with the young population continuing to grow and fueling both domestic demand as well as respond to foreign demand for IT related outsourcing and exports.

2.2.2 ICT Market Segments

Although there is limited data on the breakdown of the overall IT market in Pakistan, P@SHA, the Pakistan Software Houses Association for IT & ITES, states that a revenue of approximately USD 1.2 billion is generated domestically as of 2018.[26] This figure, when added with the export figures from section 3.2, does not necessarily add up to the overall IT market size figures shown above in Figure-8 mainly because the official export figures, as explained in detail later, do not necessarily represent the actual size of IT goods and services exported from Pakistan. For example, they do not include revenues earned by freelancers, and tend to underreport the revenues of SMEs as well as IT related exports registered under other categories such as finance or healthcare. Although the exact share of domestic revenue remains uncertain due to the reasons mentioned above, a study conducted by Ignite, the national ICT R&D fund in 2014, revealed that 55% of the revenue generated by the studied companies were from the domestic market, while 45% were from the international market.[27]

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[24] https://www.pasha.org.pk/knowledge-center/industry-stats/, https://invest.gov.pk/sites/default/files/inline-files/IT.pdf, https://www.technologytimes.pk/2020/03/05/pakistans-fast-growing-it-sector-double-us7-billion/, https://invest.gov.pk/it-ites, https://www.pakistangulfeconomist.com/2019/10/14/booming-it-sector-can-be-the-top-export-industry-of-pakistan/amp/

[25] IMF World Economic Outlook Database (October 2019)

[26] https://www.pasha.org.pk/knowledge-center/industry-stats/

[27] https://ignite.org.pk/wp-content/uploads/2018/11/IT-ITES-Industry-Survey-reports-Dec.pdf

While the breakdown of export revenues will be covered in the following section, the following shows the breakdown of domestic revenues by segment in 2014, based on a study with 300 IT companies conducted by Ignite, the national ICT R&D fund. While unsurprisingly the IT industry is the largest source of domestic IT revenue, it is interestingly followed by education, which is consistent with the fact that 54% of the companies surveyed that are serving the domestic market answered that they cater to the education sector, though may be overrepresented to a certain extent given the limited company base (300 companies, roughly 10% or less of the overall number of IT companies) that was included in the Survey.

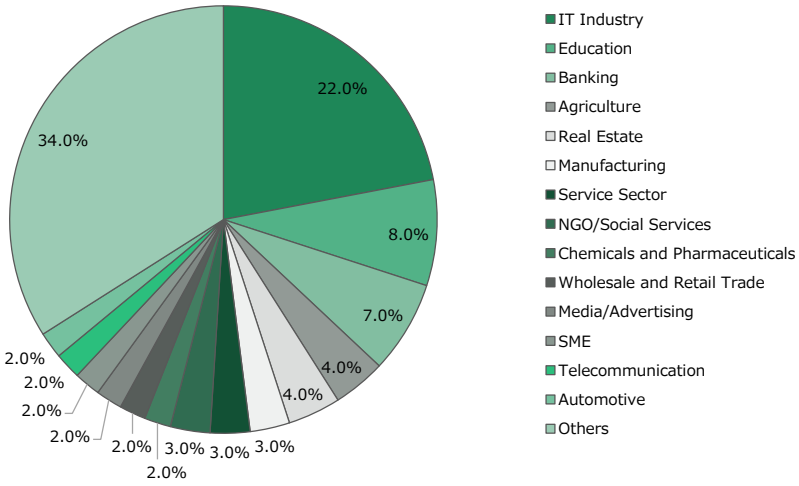


Figure-9 Breakdown of domestic IT revenue (2014)[28]

2.2.3 ICT Companies

The number of IT firms in Pakistan has more than doubled from less than 2,000 in 2007 to more than 4,000 in 2020. Apart from this figure, it is said that there are over 3,000 call centers in the country, with around 200 call centers newly registered with the PSEB annually,[29] and some sources say that there are more than 5,000 IT companies in total.[30]

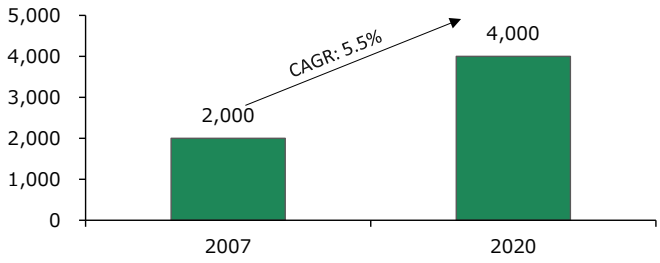


Figure-10 Number of IT firms[31]

[28] https://ignite.org.pk/wp-content/uploads/2018/11/IT-ITES-Industry-Survey-reports-Dec.pdf

[29] https://documents.worldbank.org/en/publication/documents-reports/documentdetail/894921591073694322/digital-pakistan-economic-policy-for-export-competitiveness-a-business-and-trade-assessment

[30] https://www.pakistangulfeconomist.com/2019/10/14/booming-it-sector-can-be-the-top-export-industry-of-pakistan/amp/

[31] https://documents.worldbank.org/en/publication/documents-reports/documentdetail/894921591073694322/digital-pakistan-economic-policy-for-export-competitiveness-a-business-and-trade-assessment

According to the Ignite IT company survey in 2014, 44% of the surveyed companies catered both to the domestic and international markets, while 30% focused solely on the domestic market and 25% solely to the international market.

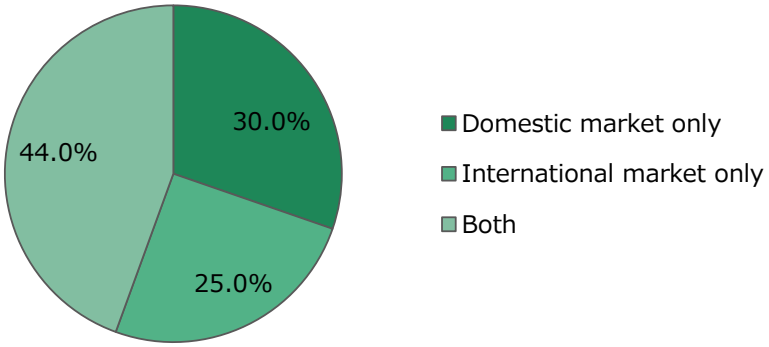


Figure-11 Breakdown of IT companies by markets of operation (2014)[32]

Employee size-wise, again according to the Ignite survey, nearly 70% of the surveyed companies had 25 employees or less, showing that the majority of Pakistani IT companies are small to medium sized.

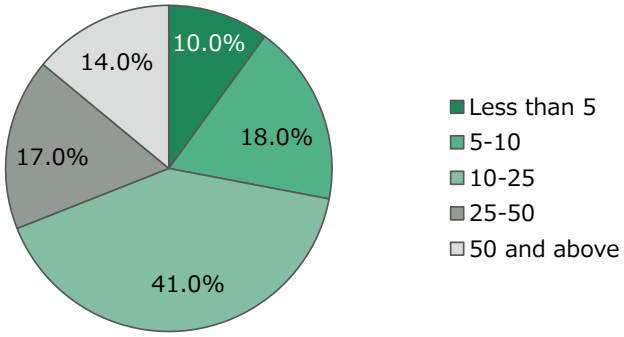


Figure-12 Breakdown of IT companies by employee size (2014)[33]

From a revenue size perspective, although data is limited to a large extent, most of the companies with revenue data fall under the USD 1-5m range, again suggesting that most of the IT companies in Pakistan can be categorized as small to medium sized.

[32] https://ignite.org.pk/wp-content/uploads/2018/11/IT-ITES-Industry-Survey-reports-Dec.pdf
[33] https://ignite.org.pk/wp-content/uploads/2018/11/IT-ITES-Industry-Survey-reports-Dec.pdf

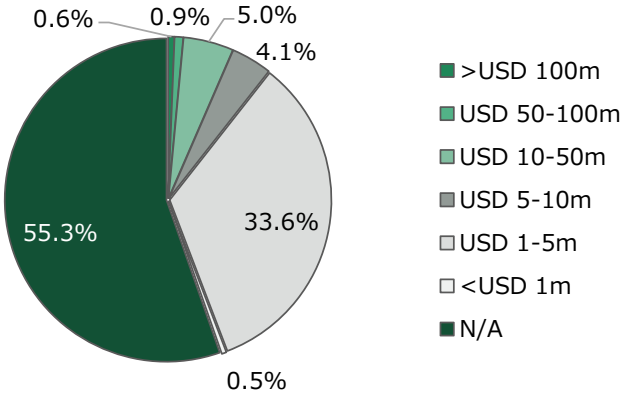


Figure-13 Breakdown of IT companies by revenue size[34]

Finally, from a business segment perspective, software accounts for more than one third of the IT companies identified in the Dow Jones Factiva database, closely followed by computer services and telecommunication services. This appears to be fairly consistent with the fact that more than 70% of the IT related exports are computer related services.

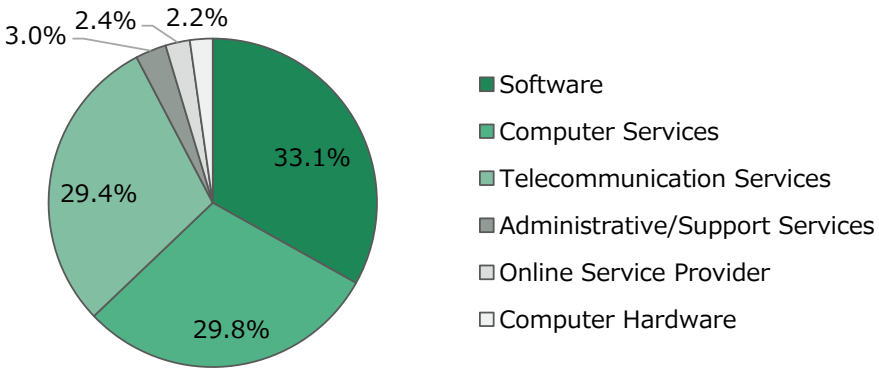


Figure-14 Breakdown of IT companies by business segment[35]

2.2.4 Startup Sector

According to the report "Starting up: Unlocking entrepreneurship in Pakistan" published by McKinsey & Company in April 2019, 720 startups have been established in Pakistan since 2010, with 67% of them still active and 100 being successful in fund raising.[36] Meanwhile there are 1,618 Pakistan based companies recorded in Crunchbase[37], hinting that there could actually be much more startups existing in the country, although this could also include non-tech startups.

Funding-wise, it is said that there was a total of 101 deals raised by 82 Pakistan-based startups between year 2015 and 2019, amounting to a total value of more than USD 165 million. As shown in Figure-15, the total investment value was significantly high in 2015, though this was because several companies

[34] Dow Jones Factiva
[35] Dow Jones Factiva
[36] McKinsey & Company "Starting up: Unlocking entrepreneurship in Pakistan"
[37] Crunchbase Company Database

raised large amounts in this year including USD 33 million by Daraz.pk (Ecommerce platform), USD 9 million by Zameen (Online real estate portal) and USD 6.5 million by Rozee.pk (Online job portal).[38]

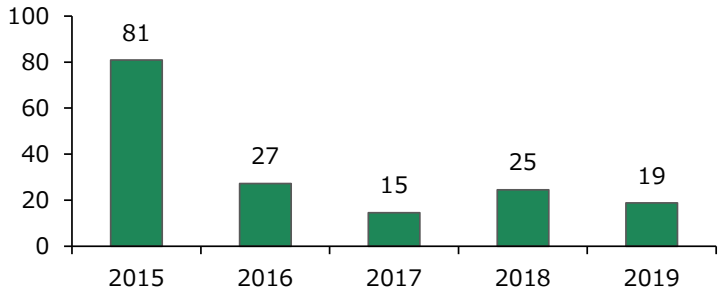


Figure-15 Investment raised per year through early stage deals in Pakistan (USD million)[39]

According to the ranking on venture capital deals provided by the Global Innovation Index, Pakistan still lags its South Asian neighbors in terms of venture capital deals, ranking 72 below India at 30 and Sri Lanka at 45, and only higher than Bangladesh ranking at 73.[40] Zubair Naeem Paracha, the founder of MENAbytes, the online media publication covering technology and startups from the Middle East and Africa, points out that Pakistan is "a few years behind the Middle East and North Africa when it comes to its start-up landscape. You could count the start-ups that have been able to raise Series A [funding] on your fingers".[41]

Some of the challenges and gaps of the Pakistani ecosystem include the lack of sufficient support organizations and programs to promote the growth of startups compared to other emerging economies such as India, the gap in capital requirements and supply especially in early stage startups, and unfavorable policies and regulatory environments, especially for investors.[42]

However, at the same time the startup ecosystem in Pakistan is said to be slowly maturing, with support and growth factors increasingly seen in the four areas shown below – namely the government, talent, funding and incubators. The government has been active in implementing policies to support the startup scene such as approving licenses for Pakistan's first PE and VC funds in 2017, and setting up government-led incubators supporting early stage startups. From the academia some private sector universities including LUMS, NUST, IBA AND FAST have launched entrepreneurship courses, while the presence and investment of both international and local investors in Pakistan has also seen a significant increase in the past few years.[43]

38 Invest2Innovate "Pakistan Startup Ecosystem Report 2019"
39 Invest2Innovate "Pakistan Startup Ecosystem Report 2019"
40 https://www.globalinnovationindex.org/analysis-indicator
41 https://gulfnews.com/world/asia/pakistan/pakistan-surveying-the-start-up-scene-1.1585042364687
42 Invest2Innovate "Pakistan Startup Ecosystem Report 2019"
43 https://www.mckinsey.com/~/media/mckinsey/featured%20insights/middle%20east%20and%20africa/pakistans%20start%20up%20landscape%20three%20ways%20to%20energize%20entrepreneurship/starting-up-unlocking-entrepreneurship-in-pakistan.ashx

As shown below in Figure-16, according to Crunchbase, some major industrial sectors in which the Pakistani startups are active in include software, information technology, internet services, sales and marketing, and commerce and shopping.

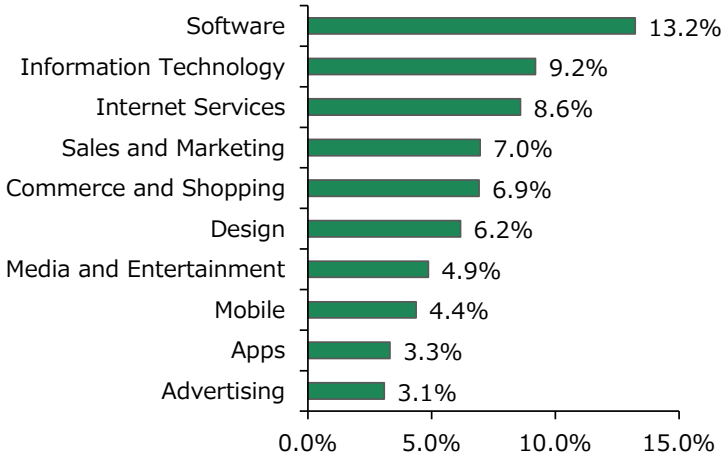


Figure-16 Top industries which startups are active in
(Percentage of companies tagged with mentioned industry within Crunchbase)

The below shows sector-wise breakdown of the total of 82 startups that raised funding between 2015 and 2019. Although this is not a funding value based breakdown, it shows the high interest and expectations for the e-commerce sector, which is aligned with the strong growth seen in the Pakistani e-commerce market size which has grown from PKR 51.8 billion (USD 310 million) in FY16-17 to PKR 99.3 billion (USD 590 million) in FY 17-18, at a remarkable YoY growth rate of 92%.[44]

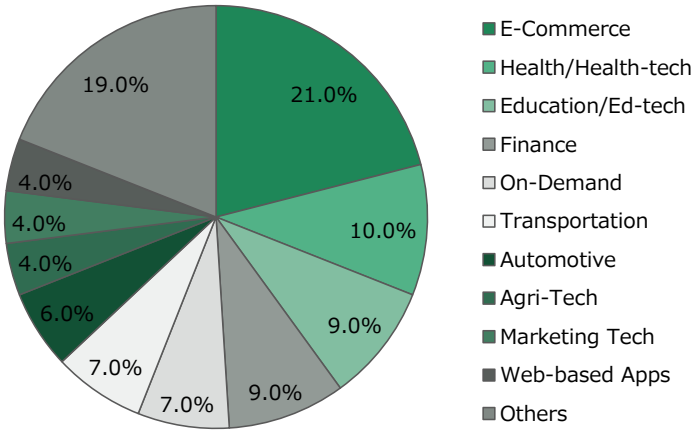


Figure-17 Sector-wise breakdown of startups that raised funding between 2015-2019[45]

[44] http://www.kcci.com.pk/research/wp-content/uploads/2019/09/E-commerce-A-Solution-to-Pakistans-Economic-Woes.pdf (Note: Exchange rate used for calculation is 1PKR=0.0060USD)

[45] Invest2Innovate "Pakistan Startup Ecosystem Report 2019"

From an investment stage perspective, as shown below in Figure-18, seed-stage investments account for the largest portion of the deals that occurred between 2015 and 2019. Other major stages include pre-seed and series A, reflecting the current nascency of the startup ecosystem in Pakistan and the number of startups seeking early stage capital.

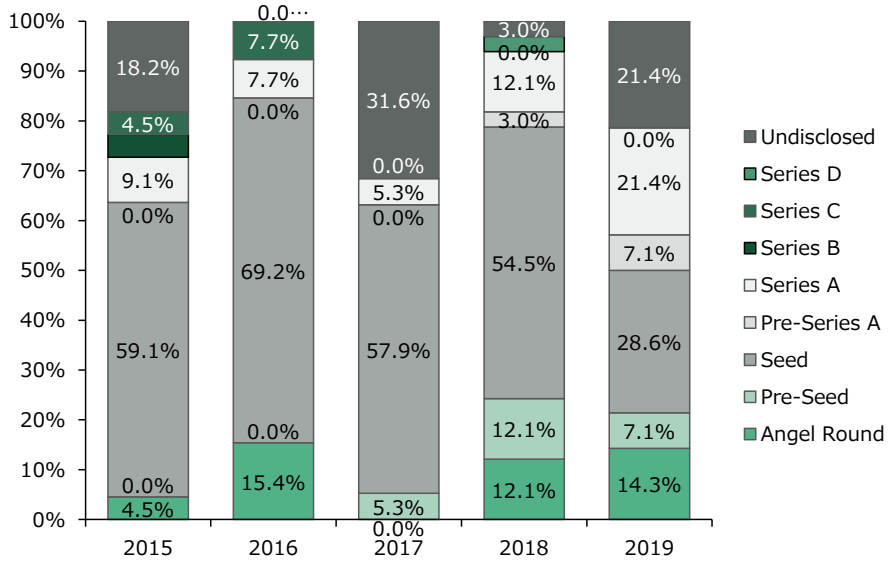


Figure-18 Stage-wise breakdown of funding/investment deals (2015-2019)[46]

Investor-wise, local investors including local angel investors, syndicates, family office and local VC funds together account for more than 60% of the total funding raised by startups in 2018 and 2019. International investors including angel investors, VC and others collectively only account for a little over 25%.

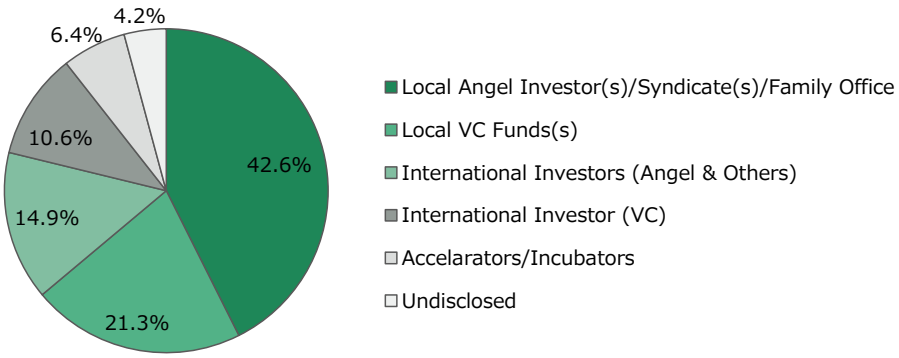


Figure-19 Types of funding raised by startups in 2018 and 2019[47]

[46] Invest2Innovate "Pakistan Startup Ecosystem Report 2019"
[47] Invest2Innovate "Pakistan Startup Ecosystem Report 2019"

2.2.5 International Cooperation in ICT Sector

Pakistan has established numerous bilateral partnerships with foreign countries in the ICT sector, and has especially been active in collaborating with China during the past few years. In December 2014, an IT delegation comprising delegates from the Pakistan Software Export Board (PSEB) , CEOs of IT companies and the COMSATS Institute of Information Technology (CIIT) visited China to promote bilateral cooperation and trade between the IT sectors of the two countries, which led to the signing of 15 MOUs between Pakistani and Chinese IT companies, serving as a foundation for increased exports of Pakistan's IT products and services to China.[48] This was followed by a major partnership between the Trade Development of Authority of Pakistan with the Chinese e-commerce giant Alibaba and its affiliate Ant Financial in 2017, aiming to foster growth of exports from Pakistan's small and medium-sized enterprises, while providing training to Pakistani SMEs to use Alibaba's platforms and e-commerce better.[49] Another example of a major partnership with Chinese companies in the ICT sector is the MOU signed with Huawei, in which Huawei promised a massive investment and the establishment of a cloud data center in the country.[50] Most recently in April 2020, it was announced that the Pakistani Ministry of Information Technology and Telecommunication (MoIT) will sign a memorandum of understanding with China for cooperation in ICT infrastructure development, application innovation, human resource development, cybersecurity, radio spectrum regulation, and technology business forums.[51]

Other major bilateral partnerships in the ICT sector include the MOU signed with Malaysia for the telecom sector in 2019[52] and the string of MOUs signed with Turkey in February 2020 including collaborations in the e-commerce sector[53]. The United States' Agency for International Development (USAID) also supports Pakistani SMEs especially in the ICT sector by providing grand support for the creation and diffusion of innovation solutions to the challenges facing Pakistani SMEs, through the Challenge Fund it operates by its arm SMEA (Small and Medium Enterprise Activity).[54]

Regarding relationships with Japan, Pakistan has signed a MOC (Memorandum of Cooperation) for the export of "specified skilled workers" in December 2019, which among the 14 specified fields include electronics and information industries. This MOC is similar to those Japan has signed with countries like Bangladesh, Sri Lanka, Nepal, the Philippines, Thailand, Indonesia, Cambodia, and Vietnam, and paves way for skilled Pakistani workers including those in the ICT sector to obtain employment opportunities in Japan.[55] The Pakistani president has also emphasized the strengthening of Pakistan-Japan cooperation in the field of AI (Artificial Intelligence) and invited Japanese software companies to

48 https://propakistani.pk/2014/12/20/pakistani-delegation-signs-mous-chinese-companies/
49 https://www.alizila.com/pakistan-partners-alibaba-e-commerce-growth/
50 https://www.datacenterdynamics.com/en/news/huawei-signs-mou-pakistan-cloud-data-center/
51 https://profit.pakistantoday.com.pk/2020/04/04/moit-to-sign-mou-with-china-for-cooperation-in-ict-field/
52 https://www.opengovasia.com/malaysia-and-pakistan-sign-telecom-mou/
53 https://www.aa.com.tr/en/turkey/turkey-pakistan-sign-a-string-of-mous/1734323
54 https://pk.usembassy.gov/u-s-governments-initiatives-to-augment-pakistans-ict-sector-highlighted-at-momentum-conference-2019/
55 https://www.pk.emb-japan.go.jp/itpr_ja/00_000505.html

invest in Pakistan during his visit to Japan to attend the enthronement ceremony of Emperor Naruhito earlier in October 2019.[56]

2.2.6 Relevant Non-government Organizations

There are the following relevant non-government organizations for the promotion of advanced ICT sector.

(1) Pakistan Software Houses Association for IT and ITeS (P@SHA)[57]

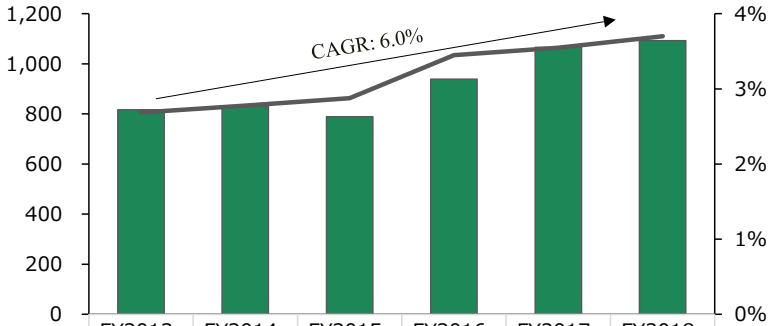
Founded in 1992 by a number of software houses, P@SHA is the largest functional trade association for the IT industry in Pakistan. It has more than 350 member companies, and its primary activity is to promote and develop the software and services industry in Pakistan and to protect the rights of its members. It lobbied with the government to initiate policies and create an environment that would attract more firms to join the industry.

In terms of promoting advanced ICT industry, it conducts P@SHA Awards every year to give awards to outstanding startup companies that employ the most advanced and important ICT to date.

2.3 Export Status of ICT Sector

2.3.1 Achievements

Pakistan is the second largest exporter of ICT services in South Asia, only behind India, with more than USD 1 billion worth of exports.[58] As shown below in Figure-20, IT related exports have been growing at a CAGR of 6.0% between 2013 and 2018, outperforming the growth of total exports and hence growing in share among the export of all goods and services.



	FY2013-14	FY2014-15	FY2015-16	FY2016-17	FY2017-18	FY2018-19
Total IT-related exports	817	830	789	939	1,066	1,092
% of total X	2.7%	2.8%	2.9%	3.4%	3.5%	3.7%

Figure-20 Total IT-related exports in Pakistan (USD million) and share among total exports[59]

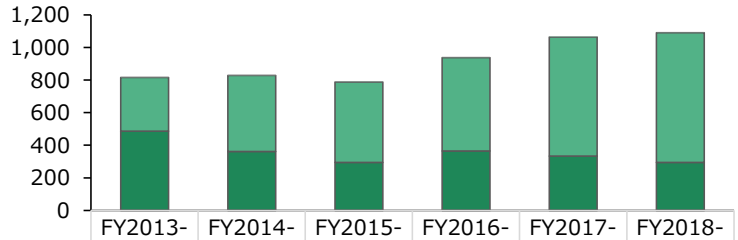
[56] https://www.app.com.pk/national/national/president-stresses-upon-pak-japan-cooperation-in-artificial-intelligence-field/
[57] https://www.pasha.org.pk/
[58] https://documents.worldbank.org/en/publication/documents-reports/documentdetail/894921591073694322/digital-pakistan-economic-policy-for-export-competitiveness-a-business-and-trade-assessment
[59] State Bank of Pakistan (Note: Years are fiscal years, starting July that year and ending June of the following year)

It is said that the actual value of IT sectors could be as three times more than the above figures reported by the central bank, due to the fact that export income could be reflected in other various sectors such as finance, automobile, and health. Another factor that must be considered is the existence of freelancers that earn significant amounts of overseas remittances that are not integrated into the export figures.[60] Pakistan was ranked as the fourth most popular country for freelancing in the world after India, Bangladesh and the United States by the 2017 Online Labor Index[61], also has been ranked fourth after the US, UK and Brazil in terms of annual freelancing revenue growth in the Global Freelancing Index of Q2 2019.[62] Industry experts believe that the total is around USD 1.5 billion worth of exports that are not captured in official statistics, USD 1 billion by SMEs and USD 0.5 million by freelancers.[63] If these estimates prove to be true, the share of IT related exports among total exports could potentially be as high as 8-9%.

Another figure that is not included here is the exports of IT goods, which remains limited in both size and growth – sized at USD 45 million in 2017, only growing at a CAGR of 0.8% from 2010.[64]

2.3.2 Breakdown by Segments

Focusing on the exports of IT services, sector-wise, information services have gained share among Pakistan's ICT exports within the past five years, replacing computer services as the top segment and now accounting for more than 70% of the total ICT related exports.



	FY2013-14	FY2014-15	FY2015-16	FY2016-17	FY2017-18	FY2018-19
Information Services	0.9	1.3	1.5	1.6	2.1	2.4
Computer Services	330.0	467.2	492.8	572.4	729.9	794.7
Telecommunications Services	485.7	361.2	294.3	364.7	334.0	295.0

Figure-21 Breakdown of ICT Exports by Segment (million)[65]

[60] https://propakistani.pk/2018/08/06/pakistans-it-exports-make-history-by-crossing-1-billion-mark/
[61] https://gvcc.duke.edu/wp-content/uploads/PakistanOffshoreServicesGVC.pdf
[62] https://pubs.payoneer.com/images/q2_global_freelancing_index.pdf
[63] https://documents.worldbank.org/en/publication/documents-reports/documentdetail/894921591073694322/digital-pakistan-economic-policy-for-export-competitiveness-a-business-and-trade-assessment
[64] World Development Indicators
[65] State Bank of Pakistan (Note: Years are fiscal years, starting July that year and ending June of the following year. Excludes the export of IT goods)

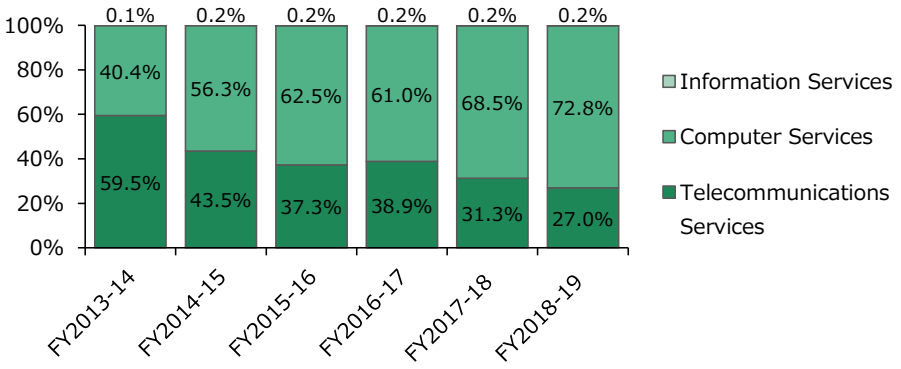


Figure-22 Breakdown of ICT Exports by Segment (%)

Destination-wise, more than half of Pakistan's ICT exports are to the United States, followed by 8.6% to the UAE and 7.5% to Great Britain. The entire IT-BPO industry is said to be built on top of strong business ties with clients in the United States, represented in US based large enterprises such as Bentley, IBM, Mentor Graphics, S&P Global Market, Symantec, Teradata and VMware establishing consulting service centers, R&D facilities and BPO support services in Pakistan.[66]

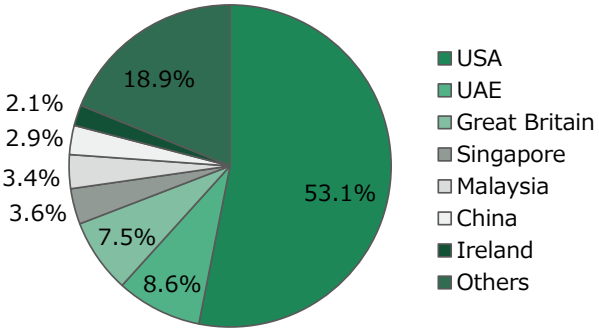


Figure-23 Breakdown of ICT Exports by Destination (FY2018-19)

2.3.3 Core Competence of ICT Sector

Based on criteria including market size, number of startups and dedicated policies and/or education programs, we have identified the following four areas where Pakistan's ICT sector has strengths in, and moreover, would potentially be attractive areas for Japanese companies to partner or collaborate with. The first two areas (AI and BPO) are more on the strength side, while the remaining two areas (insurance and logistics/supply chain) are more about underserved sectors with startups and companies trying to tackle the challenges using digital technologies, which could be interesting approaches for Japanese companies working on digitalization in those respective sectors.

[66] https://www.phclondon.org/Tourism/Diplomat_mag_report_on_pakistan_april_2020.pdf

(1) AI (Artificial Intelligence)

Pakistan has identified AI as one of its focus areas in its Digital Pakistan Policy, and has launched multiple initiatives to promote R&D in the AI domain, represented by the establishment of the National Centre of Artificial Intelligence in March 2018. Further in April 2018, the Pakistani government announced its plan to invest PKR 1.1 billion (approximately USD 6.6 million) to start a three-year project on artificial intelligence. Under this project, the Higher Education Commission (HEC) has orchestrated the establishment of nine AI focused labs across the country – two labs at NUST (National University of Sciences and Technology) for intelligent robotics and deep learning, two at NED UET (Nadirshaw Eduljee Dinshaw University of Engineering and Technology) Karachi on smart city and neuro-computation, one at CIIT (COMSATS Institute of Information Technology) to work on medical imaging and diagnostics, one at UET (University of Engineering and Technology) Lahore on intelligent criminology, and one at the Punjab University for computational modeling. The president of Pakistan has also launched an initiative called the President's Initiative on Artificial Intelligence and Computing (PIAIC) in November 2018, offering opportunities to learn and develop businesses in block chain, cloud native and artificial intelligence.[67]

AI is also an area where Pakistan has shown its strong interest and willingness to partner with Japan, where the Pakistani president Dr. Arif Alvi, during his visit to Japan in October 2019, emphasized the strengthening of Pakistan-Japan cooperation in the field of AI. The president stated that the AI training system initiative that has just been launched is targeted to produce about 100,000 AI experts within two years, and invited Japanese software companies to invest in Pakistan.[68]

(2) ITO (Information Technology Outsourcing) and BPO (Business Process Outsourcing)

Given its abundant, young, and widely English-speaking labor supply as well as strong business linkages with Pakistani American in the US, Pakistan has been active in the business outsourcing domain for decades. In 2017, offshore service exports from Pakistan totaled USD 655 million, with the majority (87%, USD 572 million) being from ITO segment and the BPO segment accounting for 13% (USD 83 million). Offshore service exports, as a total, accounted for 0.2% of the country's GDP and 2.4% of the country's total exports in that year.[69]

Among the exports in the ITO segment, about 90% is said to be derived from software services (enterprise resource planning, applications development, applications integration, desktop management, etc.) while within the BPO segment, 90% of the revenue is said to derive from the

[67] https://nation.com.pk/31-Mar-2020/pakistan-needs-artificial-intelligence-to-beat-covid-19

[68] https://www.brecorder.com/2019/10/21/533275/president-stresses-upon-pak-japan-cooperation-in-artificial-intelligence-field/

[69] https://gvcc.duke.edu/wp-content/uploads/PakistanOffshoreServicesGVC.pdf

contact/call center sector. Although most of the revenue is focused on services fairly low-end, there are high value-added services exported from Pakistan as well, mainly by the large companies with over 10 years of experience in the market and strong business ties with the US. These high-end exports include complex IT-BPO and KPO (Knowledge Process Outsourcing) solutions to knowledge-intensive sectors in developed economies, varying from asset finance and leasing software for the BFSI (Banking, Financial Services and Insurance) industry to medical transcription and artificial intelligence platforms for the healthcare industry, and geoscience management solutions for the exploration and extraction of petroleum.[70]

(3) Insurance

Pakistan is said to have the lowest penetration rate of insurance (percentage of premium volume collected by the companies among the country's GDP) in the region, at just about 1%, lower than countries such as India, Iran, UAE, and Saudi Arabia. While personal insurance products represent almost 40-45% of non-life premium, the share in Pakistan is only 10-12%, pointing to the huge potential for growth especially in personal motor, personal health, personal accident, home, and travel insurance products.[71]

With this huge potential for growth, leading insurance companies in Pakistan have started to offer digital products and solutions, helping users to increase their understanding of insurance products, and enabling insurance companies to offer seamless customer experiences as opposed to the traditional ways of selling insurance. Companies have been especially innovative in their approaches given the current low penetration rate of insurance and immature understanding of the concept of insurance itself, well-illustrated by a comment made by the deputy CEO of BIMA, a microinsurance provider operating in Pakistan: "75% of our subscribers have never had insurance before. We need to educate people about what it is, and also why you need it."[72]

While detailed examples will be covered later on under section 5.3, some innovative and customer friendly solutions developed by Pakistani companies include online/digital personal insurance products in the Takaful (type of Islamic insurance allowing individuals to pool their money together to insure against losses or damages) domain, and mobile apps allowing an end-to-end personal insurance solution.

(4) Logistics/Supply Chain

Logistics is another area where Pakistan faces many challenges, and again where many companies and startups are emerging with innovative approaches to tackle them. It is estimated that 40% of

[70] https://gvcc.duke.edu/wp-content/uploads/PakistanOffshoreServicesGVC.pdf

[71] https://www.pakistangulfeconomist.com/2019/12/16/ongoing-trends-and-review-of-insurance-sector-and-future-recommendations/amp/

[72] https://www.pakistangulfeconomist.com/2019/04/15/insurtech-in-pakistan-trends-products-and-significance-to-penetrating-a-developing-market/amp/

the package deliveries in Pakistan fail to reach their end destinations, with one of the most common reasons being customers not aware of the delivery and hence not being at home and/or available to pay for and receive the package. These failed deliveries come to a high cost for e-commerce retailers and delivery companies.[73] The government recognizes these issues and have made clear its willingness to digitalize the sector, a seen in the e-Commerce Policy of Pakistan, which was released in October 2019, which states the following three areas as policy outcomes:[74]

1. Automation in logistics will be adopted by e-Commerce platforms. This will entail 3PL (third-party logistics) businesses to install systems to offer plug-in to online retailers and marketplaces.
2. Identification of logistics infrastructure will be done to complement e-businesses.
3. Ministry of Communications is working on National Logistics Policy, it will include a Chapter on facilitating e-Commerce, including timely payment to sellers by the Logistics companies.

Apart from multiple dedicated startups and companies have been approaching these challenges in the logistics and supply chain domains which will be discussed later in detail, major logistics companies are also working on these issues, including TPL Logistics, claiming itself as the first digital end to end logistics provider.[75]

2.4 Export Status to Japan

2.4.1 Achievements

Export status of Pakistan to Japan has steady amount in total, but the portion for IT export is still very small (There is no concrete statistics for IT sector export value to Japan). Figure below shows total export value to Japan for reference purpose.

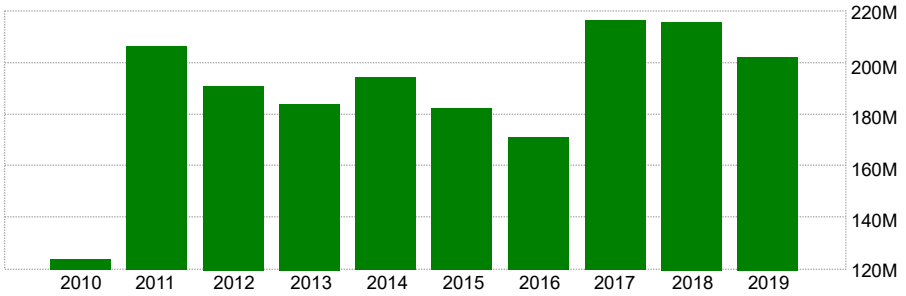


Figure-24 Total export from Pakistan to Japan (USD)[76]

[73] https://pakobserver.net/tpl-logistics-launches-pakistans-first-live-order-tracking/
[74] http://www.commerce.gov.pk/wp-content/uploads/2019/11/e-Commerce_Policy_of_Pakistan_Print.pdf
[75] https://pakobserver.net/tpl-logistics-launches-pakistans-first-live-order-tracking/
[76] https://www.tradeeconomics.com/trade-insights/trade-performance-dashboards/

2.4.2 Issues on Export Promotion

According to the World Bank's Doing Business Report of 2019, Pakistan ranked 136 among the 190 countries included in the study. It especially showed weaknesses in starting a business, dealing with construction permits, getting electricity, paying taxes, trading across borders, and enforcing contracts, ranking behind more than a hundred countries for each of the areas.

PAKISTAN		South Asia		GNI per capita (US$)	
Ease of doing business rank (1–190)	136	Ease of doing business score (0–100)	55.31	Population	197,015,955
✔ **Starting a business** (rank)	130	**Getting credit** (rank)	112	**Trading across borders** (rank)	142
Score for starting a business (0–100)	81.89	Score for getting credit (0–100)	45.00	Score for trading across borders (0–100)	60.12
Procedures (number)	10	Strength of legal rights index (0–12)	2	*Time to export*	
Time (days)	16.5	Depth of credit information index (0–8)	7	Documentary compliance (hours)	55
Cost (% of income per capita)	6.8	Credit bureau coverage (% of adults)	7.2	Border compliance (hours)	75
Minimum capital (% of income per capita)	0.0	Credit registry coverage (% of adults)	10.7	*Cost to export*	
				Documentary compliance (US$)	118
Dealing with construction permits (rank)	166	**Protecting minority investors** (rank)	26	Border compliance (US$)	356
Score for dealing with construction permits (0–100)	53.59	Score for protecting minority investors (0–100)	71.67	*Time to import*	
Procedures (number)	18.7	Extent of disclosure index (0–10)	6	Documentary compliance (hours)	143
Time (days)	262.8	Extent of director liability index (0–10)	7	Border compliance (hours)	120
Cost (% of warehouse value)	9.0	Ease of shareholder suits index (0–10)	6	*Cost to import*	
Building quality control index (0–15)	12.3	Extent of shareholder rights index (0–10)	8	Documentary compliance (US$)	250
		Extent of ownership and control index (0–10)	9	Border compliance (US$)	475.7
Getting electricity (rank)	167	Extent of corporate transparency index (0–10)	7		
Score for getting electricity (0–100)	44.75			**Enforcing contracts** (rank)	156
Procedures (number)	5.4	**Paying taxes** (rank)	173	Score for enforcing contracts (0–100)	43.49
Time (days)	161.2	Score for paying taxes (0–100)	47.05	Time (days)	1,071.2
Cost (% of income per capita)	1,585.3	Payments (number per year)	47	Cost (% of claim value)	20.5
Reliability of supply and transparency of tariffs index (0–8)	0	Time (hours per year)	293.5	Quality of judicial processes index (0–18)	5.7
		Total tax and contribution rate (% of profit)	34.1		
✔ **Registering property** (rank)	161	Postfiling index (0–100)	10.49	✔ **Resolving insolvency** (rank)	53
Score for registering property (0–100)	45.63			Score for resolving insolvency (0–100)	59.86
Procedures (number)	7.3			Time (years)	2.6
Time (days)	144.1			Cost (% of estate)	4.0
Cost (% of property value)	4.2			Recovery rate (cents on the dollar)	44.5
Quality of land administration index (0–30)	9.5			Strength of insolvency framework index (0–16)	11.5

Figure-25 Ease of Doing Business – Pakistan (2019)[77]

Issues in taxation has specifically been an issue noted by the IT sector, with the lack of tax harmonization for service industries across various provinces posing a huge burden in terms of duties and compliance. According to a study by the World Bank, dealing with tax authorities has been identified as one of the most challenging areas among the private sector, being a costly task both in terms of time and financial resources.[78]

Security is another topic often raised especially by foreign investors. In 2018, with terrorism as the main reason, the US Department of State ranked Pakistan with the Advisory Level 3 "reconsider travelling". This has led many US firms, which are the largest IT services importers for Pakistan, to perceive the Pakistan as a high-risk nation, and industry stakeholders say that potential buyers or investors in the US often decline to travel to Pakistan, hindering potential business and partnerships with local companies. The World Bank, in its Political Stability and Absence of Violence/Terrorism Index, has also ranked Pakistan as 125th place among a total of 126 countries.[79]

Amidst multiple barriers and issues mentioned above, the Pakistani government has introduced various initiatives to improve its business environment. For example, the online one-stop registration, launched

77 https://www.doingbusiness.org/content/dam/doingBusiness/media/Annual-Reports/English/DB2019-report_web-version.pdf

78 http://documents.worldbank.org/curated/en/894921591073694322/Digital-Pakistan-Economic-Policy-for-Export-Competitiveness-A-Business-and-Trade-Assessment

79 https://gvcc.duke.edu/wp-content/uploads/PakistanOffshoreServicesGVC.pdf

in Karachi and Lahore, has replaced the several forms for incorporation with a simple application, enabled the sharing of information between the registry and made the establishment of businesses easier. Other changes include streamlined and automated administrative procedures for property registration in Lahore, and introduction of reorganization procedures and improvements in the continuation of the debtor's business during insolvency proceedings in Karachi and Lahore.[80]

2.4.3 Issues for Japanese Companies

Although many of the issues stated above are common for Japanese companies as well, according to a study conducted in August 2018 with the participation of 50 Japanese companies, the largest perceived obstacles regarding investment in Pakistan was security, accompanied by political instability (ranked 2nd) and political inconsistencies (ranked 5th). Some of the comments made by the respondents included challenges in making business trips due to the Ministry of Foreign Affairs' travel restrictions, as well as prevailing prejudice against Pakistan as a "dangerous" nation despite the significant improvement in security over the past few years.

Other major concerns include poor infrastructure and taxation. Some of the tax-related challenges specifically pointed out were issues like sudden raises in import duties, unpaid tax refunds, and high import tariffs.

The top 5 topics on the investment decisive factors based on the questionnaire survey are as follows
(1：The lowest～5：The highest. Showing the average value of each item)

1.	Market Size & Growth Potential	3.9
2.	Wage level	3.2
3.	Foreign Exchange Regulation	2.8
4.	Trade Clearance System	2.5
5.	Procedure for Investment	2.5

Conversely, the worst 5 of impediment factors is as follows

1.	Security	1.6
2.	Political Stability	1.9
3.	Infrastructure	2.0
4.	Taxation System	2.1
5.	Political Consistency	2.3

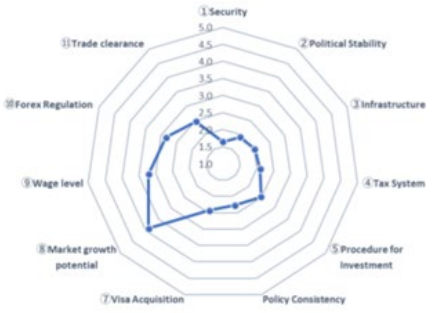


Figure-26 Investment Decisive Factors
(Based on August 2018 Survey with 50 Japanese Companies)[81]

[80] https://www.doingbusiness.org/content/dam/doingBusiness/media/Annual-Reports/English/DB2019-report_web-version.pdf
[81] https://www.meti.go.jp/meti_lib/report/H30FY/000013.pdf

3 Needs for Advanced IT Solution Services in Japanese Industries

3.1 Needs in Major Japanese Industries

It is expected that there are many Japanese industries that have the needs for advanced ICT solutions. In order to grab those potential needs, Survey Team has picked up 91 industry associations in 20 industries/sectors in Japan (see Appendix 2 for the list) that may have the potential for business matching with the advanced ICT solution company of the target countries. Then Survey Team made contacts with all these associations by providing information on the Survey as well as the strength and characteristics of ICT industry in the target countries, and ask them to distribute the information to member companies of the association and to participate in the Webinar for introducing ICT companies of the target countries (See 5.3 for the detail of the Webinar).

There are, however, very few meaningful responses from these industry associations so far. Among 91 industry associations, 30 of them have responded that they acknowledged our contact, but only two of them had actually responded that they have circulated the information to member companies. There is no concrete progress for the business matching with these industry associations and their members up to now. However, some companies have come to attend our Webinar for introducing target country's ICT companies (see 5.3 for detail) as well as to join our Pilot Program for trial business collaboration (see 5.5 for detail).

3.2 Current Status/Issues/Needs in Collaboration with Overseas IT Companies

Based on these circumstances, the Survey Team have picked up the most probable industries that should have needs for advanced ICT solutions, i.e., Medical equipment, Smart Agriculture, and Manufacturing industry, and tried to contact individual companies in those industries directly in order to get information on current status, issues, and needs in collaboration with overseas IT companies.

3.2.1 Medical Equipment

In the implementation plan document of the Survey, we proposed 1) "Medical Equipment", 2) "Biochemical Analysis", and 3) "Pharmaceutical Development" as the priority fields in the health and medical-related industries in Japan, which have the possibility of collaboration with ICT industry in the three target countries. In addition, 4) "Health-Tech" utilizing big data has been greatly developed in recent years in the health and medical sector, and 5) advanced "Medical ICT System" including telemedicine, which has become increasingly significant amidst the pandemic of COVID-19, are also regarded as growing industries. So, we added those two fields to the above-mentioned three fields.

Of the five fields mentioned above, we conducted interview sessions with the following Japanese enterprises who responded to our contact: one enterprise in "Medical Equipment"; one enterprise in "Biochemical Analysis"; one enterprise in "Health Tech"; and two enterprises in "Medical ICT System".

Concerning “Pharmaceutical Development”, in particular, it is “drug discovery” that requires sophisticated ICT technology. Since “drug discovery” is the most important technology field for pharmaceutical manufacturers, in most cases, those related technologies such as advanced pharmacological substance screening, chemical modification, various simulation techniques, etc., are regarded as protected technologies by pharmaceutical manufacturers. Having said that, as pharmaceutical manufacturers sometimes incorporate enterprises with special technologies related to drug discovery through acquisition, etc., we only approached pharmaceutical manufacturers through industry groups.

The table below provides a summary of the contents of the interviews for the five Japanese enterprises with which we actually conducted the interview survey. Note that the company names are not shown for their privacy.

Table-3 List of interviewed companies in medical sector

Company	Industry/Sector	Needs for advanced ICT solution
A	Medical equipment	The company itself does not require advanced technology development at this time (assuming the level that can be developed in-house). However, they did not eliminate the possibility of collaboration with overseas enterprises with high ICT technology in future, and they indicated their intention to participate in the event.
B	Biochemical Analysis	They have been taking approaches mainly based on the Health-Tech data business using biochemical analyzers developed by them, but it has stopped due to the effects of COVID-19 pandemic. Currently, they have developed and published a number of SARS-Cov-2 antibody-detecting and antigen-detecting methods using ELISA and immuno-chromatography, by utilizing their special expertise. They restructured their organization in the situation described above, they also mentioned the possibility of outsourcing the system development and so on.
C	Health tech	At present, the CIO does not indicate any needs for product development through collaboration with overseas enterprises. On the other hand, he also set up an enterprise that specifically matches with American Silicon Valley-based enterprises and is working as a mentor to Japanese start-up enterprises, recognized as an influencer in the entrepreneurial community.
D	Medical ICT system	The president of the company demonstrated that the possibility of collaboration with overseas companies can be considered given that they are ICT enterprises with high technologies. As they have some ideas, they would like to consult with the Survey Team once they could make it a practical plan for product development.
E	Medical ICT system	The company participates in joint research on AI-based detection of oral cancer biomarkers with a certain hospital to develop detection devices after biomarkers have been identified, but there is currently no urgent need for direct collaboration with overseas enterprises.

All interviewed companies were those who have responded to the contact from the Survey Team, but none were originally supposed to cooperate with overseas enterprises. Naturally, only one out of five enterprises showed the possibility of future collaboration with ICT enterprises in the three target countries at this moment. Other enterprises said they had no knowledge about the existence of companies with high ICT technology in the three target countries; in particular, two companies asked us to distribute

related information through social media, etc. Through such collaboration, it is believed that a certain level of positive impact could be made to improving awareness of Japanese companies of the target three countries, which is one of the objectives of the Survey.

Apart from individual contacts described above, we found eight health and medical related enterprises in the list of 193 Japanese enterprises participated in the Morning Pitch seminar featuring Armenian/Pakistani/Sri Lankan ICT enterprises held on the 8th and 23rd of September 2020 (see 5.3 for the detail). Breaking this down, two were enterprises that Survey Team offered consultation through individual interviews (one is Medical Equipment/Medical ICT and the other is Medical ICT), two were pharmaceutical manufacturers, one was a pharmaceutical and medical device trading company that also conducts in-house development, and one was a medical management consulting and pharmacy management company. These companies were continuously invited to seminars and other events, and follow-up activities (e.g., request for interviews) have been conducted to achieve matching with ICT enterprises in the three target countries.

3.2.2 Smart Agriculture

For the technical field of smart agriculture, we contacted five agricultural machinery manufactures (three agro-machinery companies and two post-harvest machinery companies), nine agriculture-related companies (food companies, horticultural company, software companies, etc.), and five agriculture-related organizations (including Japan Agricultural Cooperatives). Also, we contacted drone-related companies as a link to smart agriculture (see 3.2.4 for the detail).

Table-4 List of interviewed companies in smart agriculture sector

Company	Industry/Sector	Needs for advanced ICT solution
F	Agricultural machinery	Currently, several agricultural machinery development projects are underway. Current issues include cost reduction in the development of harvesting robots and rice sowing machinery and insufficient budget. They are planning to apply for a smart agricultural subsidy from the Ministry of Agriculture, Forestry and Fisheries Japan, and if they get it, they would like to cooperate with overseas companies for the purpose of cost reduction. There is also a desire to expand overseas through drone surveying and pesticide spraying, so they seem to be interested in the PoC scheme of the Survey.
G	Smart Agriculture	Currently, we are training IT human resources in Nepal and Myanmar in Japan (in collaboration with Ritsumeikan Asia Pacific University). They visited Latvia last year and think that there is a possibility of developing technologies that are not yet available in Japan, such as forestry IT solutions that are being advanced locally.

As a result, one large agro-machinery manufacturer and one agriculture-related organization participated in the pitch event held in September 2020. Also, one Japanese leading automotive supplier and one Japanese automotive finance company participated in this event.

3.2.3 Manufacturing

We contacted total of 7 automotive manufacturers and automotive suppliers for potential business collaboration in the field of sensing, autonomous driving, etc. However, they told us that these advanced ICT fields are mostly developed inhouse or through collaboration with high-tech ICT companies in Japan and US, thus there is no immediate needs for the business collaboration with ICT companies of the three target countries. We also contacted several other manufacturing companies and had interviewed two of them so far as listed in the table below. Of these, the Survey Team tried to match Company I, which develops biometric devices, with several companies in the target countries, but could not find any company in the target countries that were interested in collaboration because the content of the match was joint development and sales of a system incorporating Company I's products.

Table-5 List of interviewed companies in manufacturing sector

Company	Industry/Sector	Needs for advanced ICT solution
H	Tea manufacturing machinery	The company develops and sells machinery for tea manufacturing, and is considering whether to upgrade their machinery by advanced ICT such as AI image recognition or not. But there is no immediate needs yet. Communication in English would be the biggest problem.
I	Biometrics device	The company develops and sells vein based biometrics devices, and is seeking the partner in other countries to jointly develop security system that utilizes their biometrics device.

Our initial assumption was that SMEs in manufacturing industry might also have needs for advanced ICT solutions for digitalizing manufacturing processes and KAIZEN activities according to the global trend of Industry 4.0 movement. Through several interviews with manufacturing SME representatives and SME consultants, however, most of SME manufacturers are still in the early stage of DX that their current typical needs are for general office digitalization, not the needs for advanced ICT solutions. Another serious obstacle for SMEs is the language barrier because typical SMEs have very limited human resources who are fluent in English.

Still, there should be some leading SMEs who are more determined to implement advanced digitalization as well as more active for collaborating with overseas companies. In order to find such SMEs, the Survey Team contacted southern branch of Tokyo Small and Medium Enterprise management Consultant Association where there are many manufacturing SMEs. The association explained that their client SMEs also include many ICT solution providers that would compete with those from the target countries, so it is not possible to introduce manufacturing SMEs to the Survey Team. But the association allowed the Survey Team to have a seminar for members of the association to introduce the ICT industry of target countries.

The Survey Team also contacted SME Support Japan (SMRJ)[82] who runs Web business matching portal called J-GoodTech[83] for Japanese SMEs who wish to collaborate with overseas industries and export their products. SMRJ explained that there are several possibilities to find good SMEs for collaborating with ICT solution providers of the target countries. The first one is to use J-GoodTech matching portal by ICT solution providers, though it requires to get recommendation letter form the government of the target countries. The second possibility is to ask some experts in SMRJ for overseas business matching since they know companies who want to have relationship with foreign partners (but they are not limited to IT companies). The third possibility is to ask experts of domestic IT support in SMRJ who know companies who want to develop information systems, but because of their limited resources it was not possible. Based on further discussions with SMRJ experts, however, we came to know that it might be difficult to find Japanese SMEs who are willing to cooperate with foreign ICT companies due to their lack of English proficiency.

3.2.4 Drone

During the course of contacting agriculture and manufacturing industry, we have found that Drone industry also has specific needs for advanced ICT solutions especially for semiconductor design of FPGA or ASIC, so we have done further survey on this industry. We have contacted 23 drone-related companies. Six of them are companies that have drone-related business, 11 of them are companies that provide customized drone hardware to specific industries such as agriculture, and six of them are startups that design and develop drone hardware/software.

Among 23 companies, seven showed interest in the Survey and two of them accepted interview by the Survey Team as summarized in the table below.

Table-6 List of interviewed companies in drone sector

Company	Industry/Sector	Needs for advanced ICT solution
J	Drone software	Mainly engaging in the development of spatial recognition, AI, etc. using drones. Proposing the use of drones to local governments such as Osaka Prefecture and Kobe City. In specific, now considering demonstration the use of drones to manage the condition of landfills in Kobe City using temperature sensors and are interested in developing new software. Although there is no immediate idea of collaboration, the drone industry is looking for collaboration with the third countries as China plus one.
K	Agriculture/civil engineering using drones	Working on the development of agricultural drones (surveying, civil engineering, 3D). They are interested in visualizing semiconductor design data and are looking for a collaborator, hoping that there is something that can be made 3D in real time. When they heard of the Survey, they wanted to know companies who make good use of the technology of the other party in Japan through licensing and loyalty business, rather than collaborating on consignment. There is also a Fintech department, so if there is useful information, he wants to share it internally. I'm also interested in PoC, but it's usually tens of millions of yen, so is it too small?

[82] https://www.smrj.go.jp/english/index.html

[83] https://jgoodtech.jp/pub/en/

4 Potential of Business Matching between Advanced IT Solution Companies in Pakistan and Japanese Industry

4.1 Analysis of Matching Possibility

Based on the core competence of Pakistani ICT industry described in 2.3.3, result of needs in Japanese industries so far described in Chapter 3, and the past effort for approaching to Japanese ICT market described in 2.4, we analyzed and summarized the matching possibility into the matrix shown in the table below.

Table-7 Matching possibility matrix

(Core competence of Pakistani ICT industry vs. Japanese industry in needs)

Core Cp. / J. Ind.	AI	ITO/BPO*	Insurance	Logistics/ Supply Chain
Finance	⊙	○		
Securities	○	○	○	
Insurance	○	⊙	◎	
Medical	⊙	○	○	
Healthcare	⊙	⊙	○	○
Machine tools	○	○		
Automobile	⊙	⊙		○
Manufacturing	⊙	◎		
Distribution	◎	◎		◎
Aerospace	○	○		
Material science	○			
Biochemical analysis	○			
Drug discovery/ pharmaceutical				
Resource exploration	⊙			
Plant control	◎	○		
Information security/ Physical security	◎	⊙		
Agriculture	◎	◎	○	⊙
Tourism	○	⊙	○	
Education/Training	⊙	○	○	
Research				
Clothing/Fashion				
Environment	⊙	○		
Others				

* ITO/BPO is not considered as advanced ICT and are rather for offshore development, so they are out of the scope of the Survey unless combined with advanced ICT topics such as AI, IoT, Block chain, etc.

◎: High possibility of matching with clear technological advantage from other emerging countries in the world.

⊙: Rather high possibility of matching with on a par technological advantage with other emerging countries in the world.

○: Has possibility of matching in a certain condition such as needs for geographical position of Pakistan

4.2 Hypothesis on Promoting Business Collaboration

There are the following hypotheses for promoting business collaboration between advanced Pakistani ICT industry and Japanese industry with advanced ICT needs.

4.2.1 A “Technology” Oriented Business Matching System/Platform

It is observed that for most Japanese companies, Pakistan is still only an option for outsourcing destination, and those Japanese companies who have clear needs for specific advanced ICT solutions cannot think of Pakistan as the “only” option for the collaboration because there are many other countries to consider for advanced ICT such as China, India, Israel, etc. However, there may be cases where only a specific Pakistani company could provide solutions to specific technological needs of Japanese companies.

In order to provide matching opportunities for such specific individual technology needs, it would be helpful to establish a kind of “official” business matching system/platform by a Japanese public organization (or by private company who is delegated the management of such system from the government of Japan) so that Japanese companies can post specific technology needs onto the system without having to specify the company or country of origin for the solution. ICT solution providers from Pakistan (as well as from any other country) can also register to the system, then can browse the needs posted by Japanese companies. If a Pakistani solution provider finds a need that the company can provide solutions for, then the company can start contacting the Japanese company who posted the needs. It is also possible that the system and /or assigned advisors to the system can help in choosing the matching ICT companies. This kind of system is also effective where Japanese companies are not good at directly communicating in English.

The system/platform should be established in Japan rather than in the target country because it is not convenient for Japanese companies to visit individual business matching system in each country. Japan already has a similar system, J-GoodTech, as mentioned in 3.2.3, but since its main purpose is to introduce Japanese companies' technologies overseas, it cannot be used for the purpose described here. In addition, JETRO has a platform called J-BRIDGE, which supports collaboration and cooperation between overseas start-ups and Japanese companies. But this platform also supports “Japanese companies aiming to develop products and services overseas to collaborate with local start-ups”. In addition, the current focus countries are Singapore, Indonesia, Vietnam, India, Israel, Australia, and the United States (Australia and the United States are only in the environmental field). Pakistan is not included in the list.

The figure below shows a concept of proposed system/platform in the Survey.

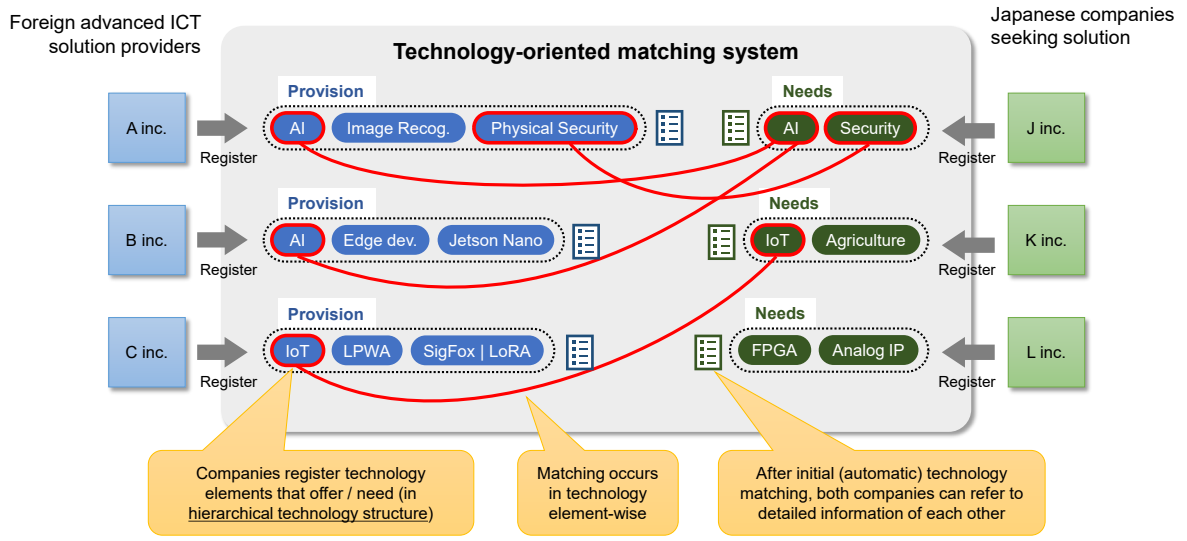


Figure-27 A concept of technology-oriented matching system/platform

4.2.2 International Support for Startup

Pakistan already has good supporting environment for startups (such as competition events by NIC, P@SHA, etc.), but it is not well known to Japan. For Japanese companies who seek potential advanced ICT startups to collaborate, it is important to know that Pakistan (among all other countries in the world) has such a rich ecosystem of startups. It is therefore beneficial for both Japanese companies and Pakistani startups to have better scheme to enable international support for Pakistani startups as well as better information dissemination of Pakistani startups in Japan[84]. Possible actions include collaborating with Japanese industry associations for startup information exchange, to invite Japanese incubators to startup competition, to collaborate with cities in Japan that try to attract good foreign startup companies, etc.

5 Pilot Activities to Promote Business Matching

5.1 Initial Plan and the Changes due to COVID-19 Pandemic

At the beginning of the Survey, the following activities were planned for the pilot promotion of business matching (as described earlier in our Inception Report in May 2020).

- Individual visits to selected local ICT companies in the target country
- Invitation program to Japan for government officials of the target country
- Business matching seminar for ICT companies in the target countries and Japanese companies
- Visiting program to the target country by Japanese companies

Due to COVID-19 pandemic, however, all these activities that require visiting to/from the target countries must be canceled, and following activities are added instead of the canceled activities.

[84] https://www.jetro.go.jp/en/jgc/reports/2020/6790871cde54c518.html

- All individual surveys and interviews to the government, organizations, and ICT companies of the target countries are done through online methods.
- Implement a competition for PoC (Proof of Concept) of business collaboration between ICT solution companies in the target countries and Japanese industry.
- Create a promotion video of the ICT industry of each target country specifically targeting the Japanese potential market based on the proposal of branding and marketing strategy that is being created in the Survey.

5.2 Website and SNS for Information Dissemination

The Survey Team created a Web site[85] to disseminate information on activities of the Survey as well as to introduce selected ICT companies of the target countries to potential Japanese industries. The Survey Team also used SNS (Facebook[86] and Twitter[87]) to disseminate information on each selected ICT company and launched SNS advertisements to reach potential Japanese companies to participate in the trial business collaboration program (described in 5.5), etc.

The result of using SNS advertising was considered effective as many Japanese companies showed their interest in the trial business collaboration program, and some of them actually applied to the program. Below is the overview of SNS advertisements the Survey Team launched.

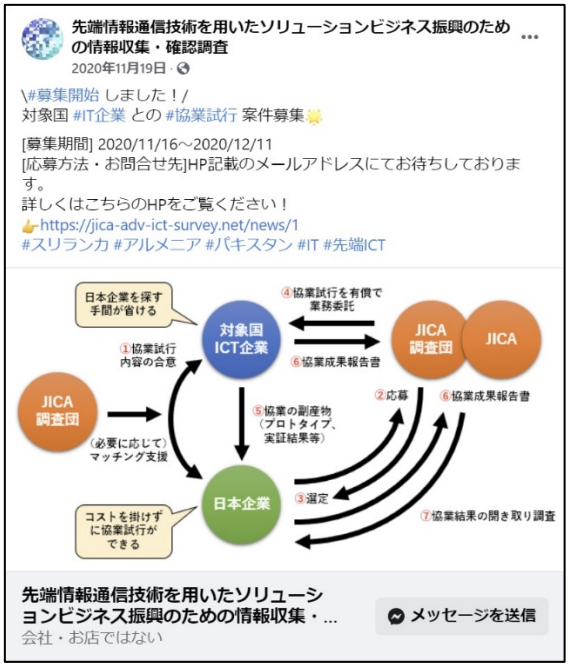
Table-8 Overview of launched SNS advertisement

Ad 1	• Ad for 5.4 “Seminar on Introducing Japanese Market to Local IT Companies” • Ad article (Facebook)  • Target audience: CEO, Programmers, Solution architect of target countries • Target Age: 18 and above • Cost: 1,000 JPY for 2 days (Ad cost only. Article was created by Survey Team with no cost) • Result: Reached (Ad shown to) 9,272 people in 2 days. Among them, 192 responded “Interested”. • Location: Pakistan: around 8,000, Sri Lanka: around 800, Armenia: around 200

85 https://jica-adv-ict-survey.net/

86 https://www.facebook.com/先端情報通信技術を用いたソリューションビジネス振興のための情報収集確認調査-103439194853226

87 https://twitter.com/ICT53038019

Ad 2	• Ad for 5.5 “Pilot Program for Trial Business Collaboration with Japanese Companies” • Ad article (Facebook)  • Target Industries: Administrative Services, IT and Technical Services, Education and Libraries, Business and Finance, Management, Architecture and Engineering, Food and Restaurants, Construction and Extraction, Production, Healthcare and Medical Services, Installation and Repair Services, Life, Physical and Social Sciences, Protective Services, Farming, Fishing and Forestry, Cleaning and Maintenance Services or Transportation and Moving • Target Age: 20 and above • Cost: 4,000 JPY for 1 week (Ad cost only. Article was created by Survey Team with no cost) • Result: Reached (Ad shown to) 489 people in 1 week. Among them, 15 responded (clicked the link, etc.) • Japanese company applied for the trial business collaboration by seeing the ad: 2

5.3 Seminar on Introducing Advanced Pakistani IT Companies to Japan

Two IT industry introduction seminars were held to provide Japanese companies with information on the strengths and characteristics of IT industries in the target countries, and to grasp the needs of Japanese companies concerning the possibility of cooperation with IT companies in the target countries. The objective of the Survey is not just to enhance mere collaboration as offshore development, but aims to promote matching in advanced IT areas that are difficult for Japanese IT solutions companies to provide. Therefore, the event was held as a part of Morning Pitch, an open innovation platform by Deloitte Tohmatsu Venture Support, which has more than 14,000 registered members mainly consisting of new business development managers from large companies searching for advanced technologies and new business creation partners. The event was cohosted by JICA with cooperation from JETRO for leaching potential participants. Due to COVID -19, the seminar was held as a webinar on Zoom.

5.3.1 Summary of the Event

Table-9 Outline of the seminar on introducing advanced Pakistani IT companies to Japan

Seminar Title	Morning Pitch Global: Next Frontier of Innovation - IT Sector in Sri Lanka and Pakistan -
Date/Time	September 23rd (Wed), 2020 19:00 – 21:00 (Japan Standard Time)
Format	Online (Zoom Webinar)
Purpose	• Promote Japanese companies' understanding of the strengths of Sri Lankan and Pakistani IT companies and draw attention to IT enterprises in the target countries • Identify the interests and needs of Japanese companies
Target	Japanese companies that are highly interested in open innovation, Japanese companies that are interested in collaborating with overseas IT companies, and Japanese companies that wish to develop overseas markets through partnerships with South Asian companies
Summary	Pakistan has 300,000 IT engineers currently and produces more than 20,000 IT human resources in the labor market every year, and the IT industry is achieving continuous growth. Pakistan has gained experinec and know-how and IT BPO sector owing to global network of Pakistan nationals living in overseas and low labor costs in the country. Since 2018, the Pakistani government has been focusing on investing in AI secotor due to high potential of young and large pool of IT talent in the country. As a result the number of IT startups is increasing, especially in the AI, IoT, and AR/VR sectors. Neighboring country Sri Lanka is a maritime island located as a hub of West Asia and Southeast Asia. With the goal of creating 1,000 tech startups by 2022, the government is focusing on strengthening the tech ecosystem by introducing a 0% corporate tax rate for tech startups, managing government funds to fund startups, and establishing a regulatory sandbox. Their efforts have gradually blossomed, and in recent years, the potential of IT companies in the country has been drawing attention, as shown in the Global Startup Ecosystem Report 2020 of Startup Genome as an active ecosystem. Sri Lanka's IT industry is characterized by a large pool of IT talent, high technology capacity and low development costs. In Sri Lanka, more than 7,000 people with degrees in IT engineering are added to the workforce each year, and Moratwa University, one of the top universities in engineering, has a rich pool of highly skilled talent, with the highest number of students selected by the Google Summer Code (Open Source Software Contest) among participating universities for the 9th consecutive year from 2005. Also, as exemplified by the use of the electronic trading platform developed by Millennium Information Technologies in stock exchanges in London, Italy, Oslo, and Johannesburg, Sri Lankan IT companies have long been providing world-class enterprise solutions to leading companies around the world, and have accumulated know-how. For many years, the country has been positioned as a leading outsourcing country due to its low labor costs and business environment. However, in recent years, due to the government's support measures and deregulation that promotes innovation, many promising IT companies in fields such as FinTech, Blockchain, IoT, and AI have emerged. In this program, we introduce software development companies with high expertise and development technologies, and startups that develop leading-edge IT technologies, so that participants can get a glimpse of the IT industry in Sri Lanka and Pakistan.
Program	19:00-19:20 Overview of the IT Ecosystem in Sri Lanka and Pakistan 19:20-20:55 Company Pitch (Introduction of each company (moderator) 1 minute + pitch 4minutes + Q & A 8 minutes x 7 companies) <u>List of companies</u> **Effective Solutions** (Sri Lanka): Providing non-invasive technology “JENDO” for early detection of cardiovascular disease by data analysis **Senzmate** (Sri Lanka): Tailor-made precision agricultural technology (soil and microclimate sensors, crop hardness) for agricultural companies and researchers algorithms) **BooleanLabs** (Sri Lanka): Providing intelligent banking solutions using AI and IoT for smart cities **Tracified** (Sri Lanka): Supply chain tracking platform leveraging blockchain

	ConscientAI (Sri Lanka): Bespoke AI solutions for multiple industried to predict fashion trends **Wonder Tree** (Pakistan): Development of a physical therapy and cognitive therapy game using AR **LFD** (Pakistan): AI, Data science related consulting and solution development 20:55-21:00 Closing

Note: Information on the participating Pakistani companies is provided in Appendix 1.

5.3.2 Results of the Event

(1) Participants

153 people registered for the event and 78 people participated on the day. The breakdown of the participants was as follows: 69% were from business companies, 7% from financial institutions (banks & VCs), 3% from media companies, 7% from public agencies, and 14% from others.

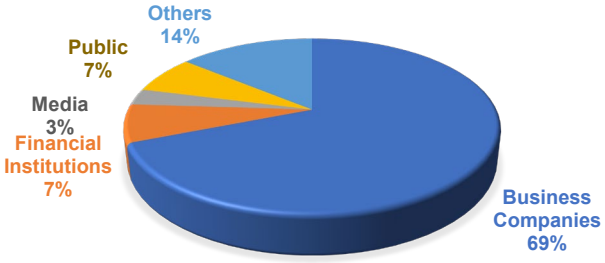


Figure-28 Breakdown of participants
(Seminar on introducing advanced Sri Lankan and Pakistani IT companies)

(2) Results of the questionnaire

The questionnaire function of the webinar was utilized on the day, and the following questionnaire was carried out.

Table-10 Question items in the seminar

#	Question item	Timing of the questionnaire
1	What is your current impression of Sri Lankan and Pakistani IT companies?	Ecosystem overview
2	What are your company's ICT needs and challenges?	Ecosystem overview
3	Are you interested in (company name) company?	After each company's pitch
4	Which company would you like to talk to among the companies that pitched today?	Before event ends

The results of the questionnaire are as follows.

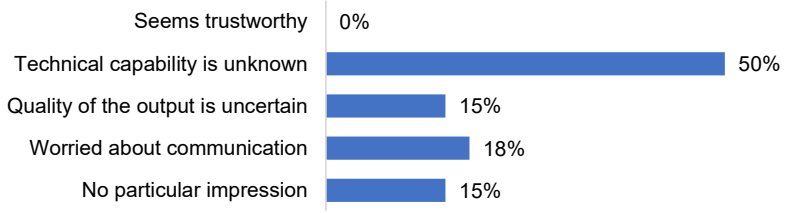


Figure-29 First impression of Sri Lankan IT Companies

Regarding the impressions of Pakistani IT companies, 50% of the respondents answered that "Technical capabilities are unknown" which was the highest among three target countries of the Survey. No respondents answered that "Seems trustworthy", indicating that the IT industry in Pakistan is still not fully recognized.

The participants' ICT related needs and perceptions were the same as previous seminar for introducing Armenian ICT companies, indicating that there are many companies with a sense of challenges related to the lack of human resources capable of handling leading-edge technologies, and that they are searching for ways to tackle DX.

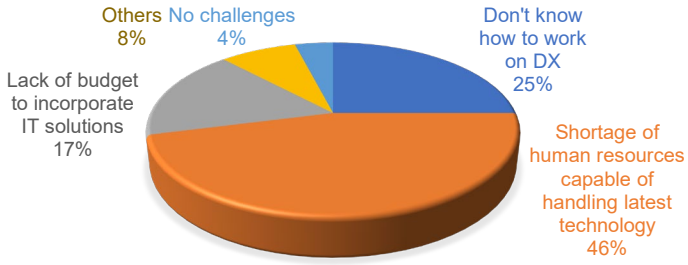


Figure-30 Participants' perception of their ICT related issues

The number of participants showing interest in the companies on stage was as follows, and a certain level of interest was confirmed for all companies.

Figure-31 Participants interested in Armanian companies

Table-11 Industries of participants that showed interest in companies presented in the seminar.

Company	Industries of interested participants
SenzMate	Chemical products, telecommunications, scientific products, electrical equipment, manufacturing, agriculture, open innovation
Effective Solutions	Medical equipment, open innovation, electrical equipment, research institutes
LFD	Advertising agency, telecommunications, media, finance
Conscient AI	Automotive, telecommunications, media, open innovation
WonderTree	Medical devices, electronic products, information and communications, research institutes
BooleanLabs	Information and communications, electronic products, open innovation
Tracified	Information and communications, manufacturing, open innovation

(3) Results of Q&A sessions

Q&A sessions were held for about eight minutes after each company pitch. Questions were accepted through the webinar's Q&A function. The main questions from the audience were as follows. (Answers to these questions are omitted.)

Table-12 Main Q&As (Seminar on introducing advanced Sri Lankan and Pakistani IT companies)

Company	Questions
Senzmate	• Can I ask what kind of indices your sensor can capture? • At SenzMate, do you also design hardware or sensors that you use in your solutions • Please explain your business model for SenzAgro services
Effective Solutions	• Are there any other Japanese companies you work with besides Niigata? • What would be your edge vis-a-vis big guys such as as definitive dow jone & Acuris etc. • In you presentation you mentioned that JENDO started clinical tests in Sri Lankan hospital in 2019. What kind of results have you received? What is the next step of this project?
LFD	• How do you get learning data to improve the accuracy of machine learning? • How do you comply with privacy laws and regulations in each country? • Is EAGLE a cloud based solution or is it a on premise solution. Please explain how you ensure the privacy and security of the information transactions in the system.
Conscient AI	• What would be your winning strategy over the big guys? What would be their problems? And what solutions could you provide? • What are the strengths of your company compared to other AI startups?
WonderTree	• Have you applied your solution for dementia? • I would like to know the development schedule for senior products. • Can you please explain how the progress of learning is measured in the therapy games? • What is the business model for AR games?
BooleanLabs	• Can you please explain how your solution is better than what is currently existing in the market • Who are your existing customers? Please explain why they selected your product
Tracified	• Who are your existing customers? Please explain why they selected your product • Are you using open/closed or hybrid blockchain technology in your solution? Please explain the benefits of using that technology?

(4) Business Matching Support after the Event

For Japanese companies who answered in the questionnaire that they are interested in participating companies, follow-ups were provided via e-mail regarding their needs for cooperation and interest in trial projects. If they show their interest or specific technology needs to be solved, the Survey team supported discussions through online meetings, etc.

5.4 Seminar on Introducing Japanese Market to Local IT Companies

A seminar was held to introduce the characteristics of the Japanese market and its potential needs to the IT industry in the target countries. The seminar was originally planned to be held locally when the Survey Team visited the target countries, but since the field visit was cancelled, the seminar was held online with all the target countries invited. Invitations to seminar participants were sent by e-mail to all government agencies, companies, and industry organizations that were contacted in the course of the Survey, and the recipients were asked to freely share the information with their related parties.

5.4.1 Summary of the Event

Table-13 Outline of seminar on introducing Japanese market to local IT companies

Seminar Title	Introduction to entering advanced ICT solution market in Japan
Date/Time	Wednesday, 21 October, 2020, 18:00~19:30 Japan Standard Time (13:00~14:30 Armenia, 14:00~15:30 Pakistan, 14:30~16:00 Sri Lanka)
Format	Online (Zoom Webinar)
Purpose	• Introduce situation of advanced ICT solution needs in Japan • Introduce characteristics and differences of the Japanese market compared to the Western market • Provide information on branding and marketing to appeal the Japanese market • Encourage participation to pilot business matching activity planned by JICA
Target	• Advanced ICT solution companies in the target countries (Armenia, Pakistan, Sri Lanka) • ICT industry associations and incubators in the target countries • Relevant government agencies and international organizations in the target countries
Program (Armenia Time)	13:00-13:05 Opening remarks and introduction of the project 13:05-13:10 Opening speech Mr. SAITO Mikiya (Senior Deputy Director General, Senior Director, Office of Science, Technology and Innovation, and Digital Transformation, Governance and Peacebuilding Department, JICA) 13:10-13:30 "Situation and needs of advanced ICT solution market in Japan" Prof. John Kojiro MORIWAKA (CEO of Silicon Valley Ventures, Executive Vice President of Moriwaka Medical) 13:30-13:50 "Practices and Uniqueness of the Japanese Business" Mr. Toshihiro MOMATA (Marketing Consultant) 13:50-14:10 "How to brand your company to appeal the Japanese advanced ICT solution market" Yoichi KOGURE (Senior Consultant of Japan Development Service Co., Ltd.) 14:10-14:20 Information for entering Japanese market 14:20-14:25 Invitation to JICA Pilot Program for business matching 14:25-14:30 Closing remarks

5.4.2 Results of the Event

(1) Participants

A total of 149 people registered to participate, and 97 people attended in the seminar. The breakdown of participants is as shown in the figure below. 16 participants from Armenia, 43 from Pakistan, 30 from Sri Lanka, etc. By organization, the overwhelming majority were from the private sector. It should be noted that many of the participants from Armenia were government officials (all from MHTI).

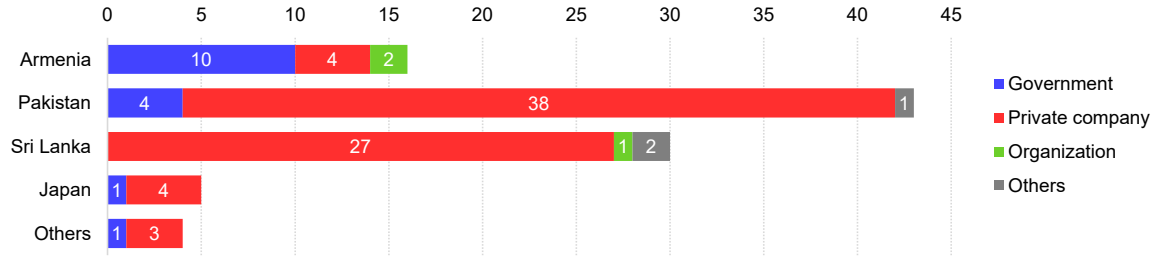


Figure-32 Breakdown of participants (Seminar on introducing Japanese market)

(2) Results of Q&A sessions

During the seminar, Q&A sessions were held using the Q&A function. In total, there were 75 active questions, all of which were answered on the spot by the presenters or the Survey Team members. Typical questions and answers are shown in the table below.

Table-14 Main Q&As (Seminar on introducing Japanese market)

Question	Answer
Can you tell us how we can approach Japanese companies for offering them IT solutions?	I think you need to physically present in one of trade shows (such as Japan IT Week). Or you can find some Japanese friends to connect in the target industry
Are there any opportunities in offshoring IT services?	Yes, but with tough competition.
What is the level of blockchain adoption in Japan?	For crypt currency market, many. For financial sectors, not so much.
How can we connect with SMEs? Are there any forums?	Try J-GoodTech
How long does it take to build trust and lock a deal in Japan on average?	It depends. Sometimes, it will be longer than you think. But, be patient. Show whoever you are trying to gain trust you are serious.
Is Japanese society hierarchical?	I would say, yes. Seniority is valued as well. President is stronger than vice president, and VP is stronger than manager, oftentimes.
In Trust building mechanisms how can we get the referral based company or person?	Start with nearby connections such as your bank, friends, anyone you see anywhere in Japan. Use every possible way of making connections. Even at restaurants, you may be able to get some connections.
What do Japan based companies think about companies based in Armenia, Pakistan and Sri Lanka? and their way of working?	Many Japanese companies unfortunately don't have a lot of knowledge about those three countries.
Is it necessary to learn Japanese to "melt hearts"?	Some Japanese words might help melting hearts. My suggestion for you is to learn culture behind the language.
How can we reach out to the local Japanese market?	There are a couple of government services for foreign companies when they open business in Japan. One example is JETRO. Please look at their web site.

5.5 Pilot Program for Trial Business Collaboration with Japanese Companies

5.5.1 Overview of the Pilot Program

As a part of the Survey, a pilot program was conducted to solicit business matching, in which ICT solution companies in the target countries were paired with Japanese companies to conduct some kind of collaboration or trial in the field of advanced ICT (PoC, development of prototypes, research for product development, etc.). From the applications received, a maximum of six projects were selected after a prescribed screening process, and JICA covered the costs (up to US$10,000 each) for the ICT companies in the target countries to implement the projects. As shown in the figure below, this pilot program was implemented in the form of subcontracting work from the Survey Team entrusted by JICA to the ICT companies in the target countries.

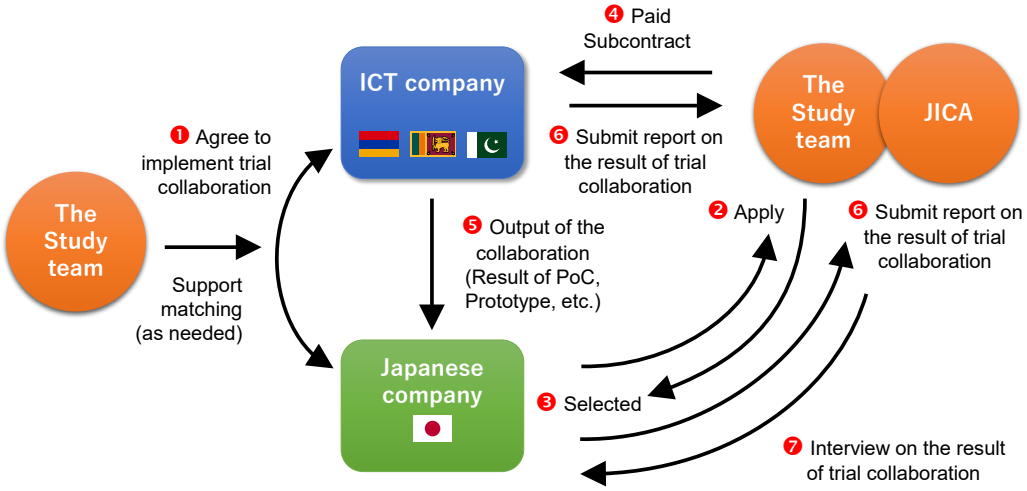


Figure-33 Overview of the Pilot Program for trial business collaboration with Japanese companies

Requirements for applying to the Pilot Program

- The content of the collaboration should be compatible with the purpose of the Survey. Specifically, the collaboration should be related to some advanced ICT field (AI, IoT, Block Chain, etc.). Specific examples are as follows.
  - ➢ Creation of AI models for evaluation by using data provided by Japanese companies
  - ➢ FPGA prototyping according to the specifications provided by the Japanese company (until the demonstration)
  - ➢ PoC supply chain experiment to track producers, etc. using Block Chain
  - ➢ Survey on the current needs for the development of smart medical systems
- The Japanese company should provide the technical specifications and data necessary for the development by the company of the target countries. In principle, technical communication during the development should be conducted directly between the companies.
- As a general rule, the copyright of specific software developed through this project will be held by the IT company (since existing code held by the IT company is often used for prototype development, for example), but detailed terms and conditions should be determined by agreement between the Japanese company and the partner IT company.
- Other conditions for participation and application shall be in accordance with the prescribed agreement, and submission of the agreement shall be a condition for application.

5.5.2 Call for Pilot Projects and Results of Selection

The call for the Pilot Program was done from November 16th to December 11th, 2020, and all Japanese companies and companies in the target countries that had been contacted in the Survey were invited to apply directly. The invitation was also made through our website of the Survey mentioned above, the e-mail newsletter of related industry associations, and the advertising function of Facebook, etc.

As a result of the recruitment, there were finally applications from 10 corporate pairs. The application documents were reviewed on December 15, 2020 in the form of an online conference. In addition to the Survey Team, JICA's person in charge of this case and international cooperation specialists participated in the review meeting. In examining the application documents, the evaluation criteria were prepared in advance as shown in the table below, and the total evaluation points were set to 100 points.

As a result of the call for applications, we finally received applications from 10 company pairs. The screening of the applications was conducted on December 15, 2020 in the form of an online conference by the Survey Team, the JICA staff in charge of the Survey, and JICA's international cooperation experts. In reviewing the applications, the evaluation criteria were prepared in advance as shown in the table below, and the full score of the evaluation was set at 100 points.

Table-15 Evaluation criteria for applications of trial business collaboration

Evaluation items	Perspective of the evaluation	Score
Relevance to the Survey	Is the pair a combination of an ICT company of a target country that provides solutions in the field of advanced ICT and a Japanese company that is a user of the solutions suitable for the purpose of the Survey? Is it a case that "the solution has already been widely adopted in Japan, and there is no need to use a company from the target country in terms of cost" or not?	20
Advanced technology	Does the content apply technologies from advanced ICT fields (AI, IoT, blockchain, robotics, etc.)?	20
Feasibility	Can the project be implemented within a limited period of three months? Is it likely that clear and objective results will be obtained?	20
Implementation system	Are there any problems with the implementation system on the part of the Japanese company and on the part of the company of the target countries? Has the commitment of the Japanese company been obtained?	20
Sustainability	Although it is up to the Japanese company to decide whether or not to continue the collaboration after the PoC is implemented, does the PoC have a certain level of sustainability from an objective standpoint? Would it be a case study that can be expected to have a ripple effect on other Japanese companies?	10
Price point	Is the composition of the rough estimate reasonable and within the predefined limit price?	10
	Total	100

After reviewing the 10 applications submitted in accordance with the above-mentioned criteria, the evaluation results were as shown in the table below, and the top six projects with the highest total score were selected. By country, there were three Sri Lankan companies, two Armenian companies, and one Pakistani company.

Table-16 Selection result of trial business collaboration applications

	Selected pairs						Pairs that were not selected			
Evaluation items	A	B	C	D	E	F	G	H	I	J
Relevance to the Survey	20	20	20	20	20	20	10	5	10	10
Advanced technology	20	20	20	15	15	15	18	10	10	10
Feasibility	18	20	20	20	20	20	20	10	5	15
Implementation system	20	20	20	20	20	20	20	5	5	15
Sustainability	10	8	8	10	10	8	4	0	5	8
Price point	10	10	10	10	10	10	10	10	10	10
Total score	**98**	**98**	**98**	**95**	**95**	**93**	**82**	**40**	**45**	**68**

5.5.3 Implementation Results of the Pilot Projects

The selected company pairs started business collaboration in the latter half of December 2020 immediately after the notification of the selection result. Of the six corporate pairs, one of them subsequently declined the Pilot Program in the process of discussing specific details of the collaboration, but the remaining five company pairs all completed the collaboration by May 2021. Appendix 3 shows the results of the trial collaboration for the six corporate pairs, including the pair that declined. The table below shows the summary of results that were judged to be useful from the work completion reports submitted by each corporate pair. Similar opinions are combined into one and its number of opinions is appended. Opinions specific to each country (Armenia, Pakistan, and Sri Lanka) are marked with the country flag.

Table-17 Summary of implementation results of pilot collaboration projects

Question		Answers from Japanese company	Answers from IT company of the partner country
Issues and problems encountered during trial business collaboration	Communication, business practices, culture, etc.	• Language barrier: 3 companies • Time difference	• Language barrier: 2 companies • End users do not understand English • Understanding Japanese industry knowledge and terms
	Technical problems	• Low expertise in fields other than IT (customer industry)	
How the above problems were solved (or not solved)		• Regular meetings • Flexible response to scope changes, etc. • Support from person with high English proficiency • Support from the Survey Team members who are strong in IT	• Regular meetings • Support from the Survey Team members who are strong in English
Possibility to collaborate with companies in the partner country	Future possibilities	• Yes (positive): 5 companies	• Yes (positive): 5 companies
	Attractiveness of partner country companies	• High cost performance: 4 companies • High level of advanced technology: 2 companies • Fast development speed: 2 companies • Global standard development approach	• Japanese are professionals: 2 companies • Japanese labor culture, polite business etiquette, time and resource accuracy • Japan's agricultural market is very attractive

Question		Answers from Japanese company	Answers from IT company of the partner country
	Challenges of the partner country industry	• Support and troubleshooting that require on-site work cannot be expected	• Japanese language is a barrier: 3 companies • Lack of information about the Japanese market
What to do to promote business collaboration	By companies and industry associations of your country	• Make efforts to include target country in the options of the contractor as industry association • Collect more information on IT companies in the target countries, discover good companies, and actively interact with them.	• Providing Japanese language education for developers and incentives for Japanese language ability: 2 companies • Trade and exchange program implementation: 2 companies • Promotion of understanding of Japanese culture, work ethics, etc. • Cooperation with companies in specific industries: 2 companies
	By JICA , Government of Japan	• Continuous implementation of trial business collaboration: 2 companies • Collect and share information regarding IT industry of target countries: 3 companies	• Promotion of entry of IT companies in target countries in the projects of JICA and Japanese companies: 3 companies • Network building between the industry of two countries (Web portal, annual conferences, use case accumulation, etc.): 3 companies
	By Government of target country	• Collect and share information on local IT companies • Support for Japanese language (brochure, etc.)	• Network building between the industry of two countries (Web portal, public relations with Japanese market): 5 companies • Add Japanese to elective courses at IT universities • IT -related joint research with Japanese universities and the support for start-ups starting from there
Other comments and suggestions to promote collaboration between the two countries			• Expansion of international students to Japanese universities • Cooperation program by universities in both countries (joint research, start-up support by both countries, etc.)

5.5.4 Analysis of the Results of the Pilot Project

In the implementation results shown above, all pairs that collaborated were mostly satisfied with the content of the collaboration and responded positively to the idea of further collaboration with the target country companies. For the IT companies in the target countries, the attitude of the Japanese companies and the Japanese business culture seemed to be favorable, and the Japanese companies were satisfied with the cost performance and technology level of the target companies.

In almost all of the trial projects, the language barrier was cited as an issue. Even if the Japanese side has a person in charge who is fluent in English, if the final beneficiaries (end users) do not have good

English skills, there were many issues such as the inability to have direct discussions between users and developers. Another issue is that even if the Japanese company is a specialist in a particular industry, if they are not familiar with the IT field, there were several cases where the members of the Survey Team had to participate in every meeting because the Japanese side could not understand the IT-related content explained by the target company. In order to deal with these issues in future collaborations, English coordinators with knowledge of the target industry will be needed for the former, and (English) coordinators with knowledge of the ICT field will be needed for the latter.

Another area on the Japanese side that deserves special mention is smart agriculture. The Japanese agricultural market is highly premium and crops are sold at a high price point compared to other countries. Farmers are also highly literate in IT and technology, which makes it easy for them to adopt IT and command a price premium to cover the cost.

5.6 Production of a Promotional Video for the Pakistani ICT Industry in the Japanese Market

5.6.1 Production Overview

In line with the content of the branding and marketing strategy, 10-15 minute ICT industry promotional video for the Japanese market was produced for each target country. This activity was conducted as an alternative measure to help Japanese companies deepen their understanding of the characteristics and strengths of the ICT ecosystem in each country, since the program for Japanese companies to visit the target countries was cancelled due to COVID-19.

5.6.2 Structure and Content of the Video

In order to introduce the Pakistani government's efforts to promote the ICT industry, the characteristics of ICT education, the history of the development of the ICT industry, and the strengths of local ICT companies, we conducted interviews with the following stakeholders in Pakistan.

Table-18 Target of interview recording in Pakistan

Classification	Organization	Position	Name
Government's initiatives on ICT sector	Pakistan Software Export Board (PSEB)	Managing Director	Mr. Osman Nasir
Government's initiatives on AI sector	National Centre of AI (NCAI)	Central Project Director/ Chairman	Dr. Yasar Ayaz
Government's initiatives on startup support	IGNITE	CEO	Mr. Asim Shahryar Husain
ICT companies (startup)	BaseH Technologies	CEO & Co-Founder	Mr. Anis Shiekh
ICT companies	10 Pearls	Co-founder & Managing Director	Mr. Zeeshan Aftab
Collaboration with Japanese corporates	UBP Investments	Fund Manager/Analyst	Mr. Shota Komatsu

The following is a synopsis of the promotional video that was produced.

Table-19 Synopsis of the promotional video produced

Part	Contents
1. Quick overview of Pakistan	• Geographical location • Population of 210 million • Growing presence as a new AI technology hub with increased investments from the government.
2. ICT industry of Pakistan	• Owing to historic relations with the UK, Pakistan has been proving IT outsourcing services to Europe and USA for many years. • IT industry is one of the largest foreign currency earners in Pakistan. • Pakistan has the fastest growing IT industry in South Asia, with 600% growth in the past 10 years.
3. Pakistan as an AI hub	• Pakistan focuses on developing its IT industry as an AI hub and established the National Center for AI (NCAI) in 2018. NCAI develops new AI technologies by collaborating with top AI engineers in Pakistan at nine different R&D labs established across the country. • At the same time, Pakistan government initiated IGNITE, a startup incubation center to support startups at national level, focusing on AI and emerging technologies. 272 startups successfully graduated in last 4 years.
4. AI companies in Pakistan	• Many Pakistani AI companies are working in global level projects, with companies from the USA, Europe and Middle East. • BaseH Technologies developed world's first AI journalist 'Dante' for financial sector. • 10 Peals has offices all over the world with 600 employees in Pakistan, developing various innovative solutions with emerging technologies including AI for global companies.
5. Core values	• Strength of Pakistan's IT industry lies in highly skilled IT labor force, that have experience in developing AI and data analytics related solutions at an affordable cost
6. Collaboration between Pakistan and Japanese companies	• There are many collaboration cases between Pakistani companies and US/European companies, however, the collaboration is still very limited with Japanese companies. • UBP Investment, an asset management company is currently collaborating with a Pakistan IT company to develop a pilot project on data analytics application. • It is expected that Pakistani ICT companies gain more recognition in the Japanese market for enhanced collaborations.

This video will be uploaded to JICA's YouTube channel and will also be shared with Japanese companies, industry associations, Japanese embassies, JETRO, etc.

6 Proposed Branding/Marketing Strategy for IT Companies to Japan

In the Survey, we developed a draft strategy for branding and marketing of the Pakistani ICT industry to the Japanese market, as well as proposed activities based on the draft strategy. These documents are prepared in PowerPoint format with a lot of infographics in accordance with marketing methodology and will be submitted to the Pakistani government as a separate document from this report. Here, we will only discuss the outline of the draft strategy and its activities and attach thumbnail images of the draft in Appendix 4.

6.1 Overview of the Proposed Branding/Marketing Strategy

Sri Lanka's branding/marketing strategy was developed according to the following steps, as shown in Process 4-1 of Work 4 in Chapter 1.6

(1) Set priority target industry in Japan

As shown in Table-7, the following industries have been identified as priority target industries.

AI, ITO/BPO, Insurance, Logistics/Supply Chain

(2) Value image to be evoked

First, the target persona for marketing was assumed to be an engineering professional in a Japanese business company, where Xtech/DX is a management issue, but the ideas and solutions are still unclear. The value image of Pakistan that we wanted to evoke in this persona is “When it comes to AI, it is Pakistan”.

(3) Customer contact points

The story that appeals to customers starts with Pakistan's national background, followed by its human resource development, advanced ICT companies, additional business values such as geographic conditions and economic advantages, and the current status of its entry into the Japanese market, before concluding that it would be beneficial for Japanese companies to cooperate with Pakistani companies. The promotional video in the previous Chapter was produced in line with this story.

(4) KGI/KPI

As for KGI/KPI to quantitatively measure the results of branding/marketing implementation, it is desirable to use the followings from the perspective of measuring how well the target audience was reached.

- KGI: Market share of Pakistani advanced ICT technology companies in the Japanese market
- KPI: Recall rate of Pakistan as an image of an advanced ICT country: 10%; Matching/business meeting support rate: 50%.

6.2 Outline of the Proposed Action Plan

In addition to the above proposed branding/marketing strategy, we have also prepared a separate document on the proposed activities to be undertaken by the Pakistani side in the future. The following is a summary of this document. (See Appendix 4 for details.)

- PSEB will take the lead in promotion in Japan.

- For Pakistani advanced ICT companies, it is desirable to secure more resources to enhance the programs and contents related to the entry into the Japanese market.
- As a PR approach to Japanese companies, Pakistan will actively participate in exhibitions, business matching and pitching events in line with the behavioral process of Japanese companies in selecting vendors. It would also be effective to set up a base in Japan to be in charge of matching the Pakistani ICT industry with Japanese companies.
- Assume one year for research and planning, and about 1.5 years for the launch of the Japan branch.

7 Recommendations on Japan's Support for Promotion of the ICT Industry

In this Chapter, based on the results of the Survey described so far and the results of the various events described in Chapter 6, we will clarify what Japan should support in order to promote business matching between the Pakistani ICT industry and Japanese user companies. First, a SWOT analysis was conducted on the advantages of Pakistan's ICT industry compared to the ICT industries of other emerging countries (China, India, Vietnam, Bangladesh, etc.) that are already doing business in Japan. The results are shown in the figure below.

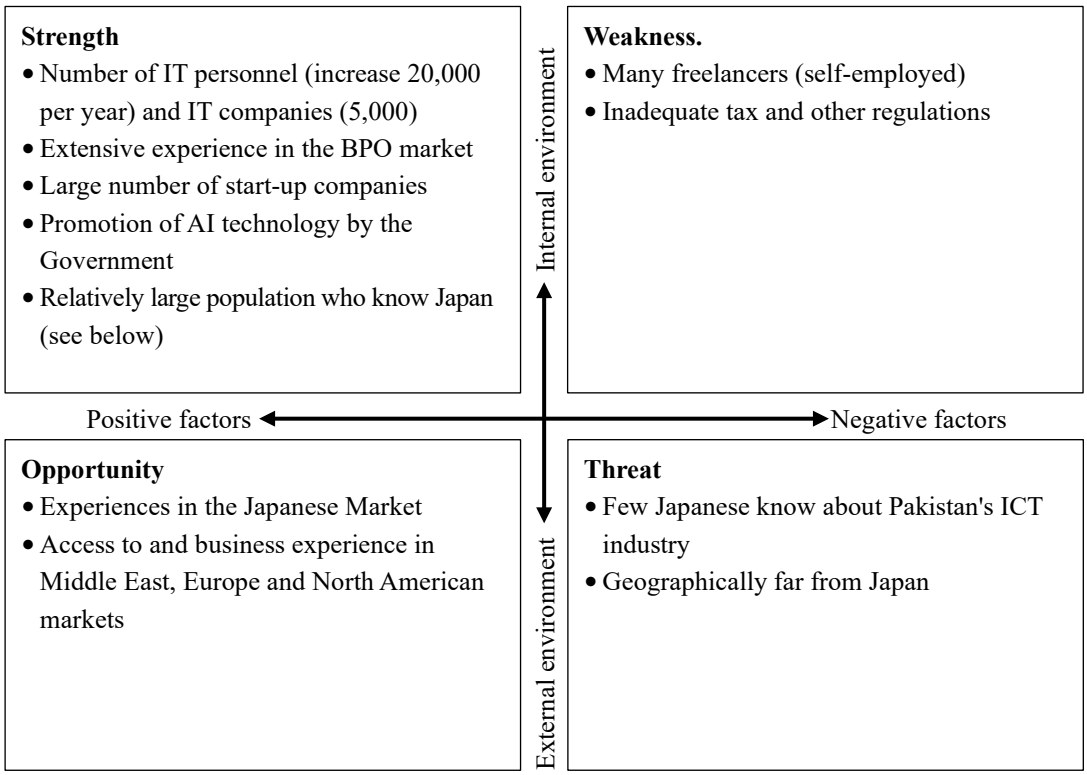
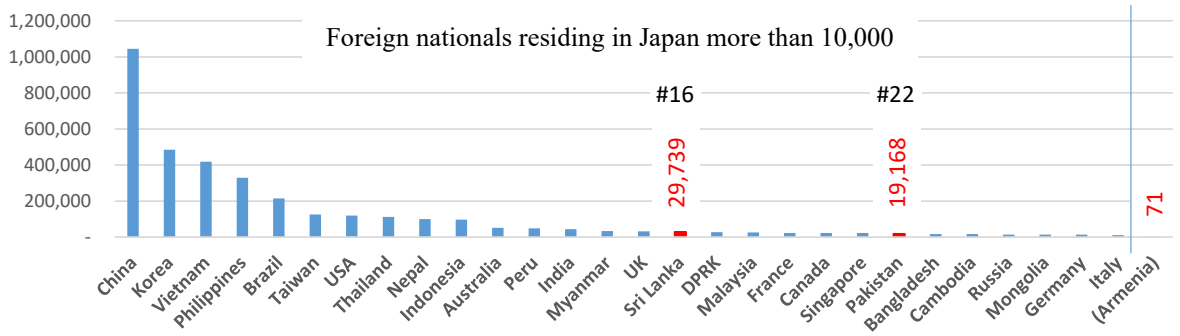


Figure-34 SWOT Analysis of Pakistani ICT industry compared to existing countries with business in Japan

Among these, “Relatively large population who know Japan “means that the number of Pakistani residents in Japan is relatively large, and as shown in the figure below, its number is nearly 20,000. This means that there are many Pakistanis who are well versed in the Japanese culture and business environment. Such human resources should be utilized in business matching between Japanese user companies and the Pakistani ICT industry.



Source: Immigration Services Agency of Japan, Statistics of Foreign Residents as of December 31, 2019

Figure-35 Number of foreign residents in Japan by country

Based on the results of the SWOT analysis, the table below categorizes the contents that Japan should support in terms of the target group and the SWOT approach. In the table, those indicated by notation like [PRG1] are the numbers of support measures and actions. Details of each program are described in the next section. In addition, there is already a plan to dispatch a JICA to the Ministry of Information Technology & Communication in Pakistan during FY2021, proposals for duplicative support is not included here.

Table-20 Proposed support measures and actions by Japan for the promotion of business collaboration with ICT industry in Pakistan

Strategy / Target group	Enhance the Strengths	Overcome the Weaknesses	Take advantage of Opportunities	Ward off Threats
Government body (Agency)				
Educational Institutions		**[PRG2]** Internship program at Japanese companies		
IT industry	**[PRG1]** Business matching event with Japanese companies focusing on specific technological fields in which Pakistani companies have strengths	**[PRG3]** Entering the ICT market for freelancers in Japan	**[PRG4]** Accumulate and publicize cases of business collaboration with Japanese companies **[PRG5]** Promotion of business matching with Pakistani companies headquartered in the U.S. and Europe	**[PRG6]** Building a technology-oriented business matching system/platform

7.1 Project Possibilities

There are the following project proposals related to advanced ICT for governmental and educational institutions in Pakistan.

[PRG1] Internship program at Japanese companies

Type of cooperation	Collaboration between universities and the private sector
Necessity of cooperation	Pakistan produces 20,000 graduates in the ICT field annually, but not all of them may find jobs in the country. Japan, on the other hand, is experiencing a serious shortage of IT engineers.
Purpose of cooperation	Provide opportunities for Pakistani advanced ICT human resources to work in the Japanese market, and at the same time, establish a system that can contribute to the development of the ICT industry in their home country. By accepting excellent students as interns in Japanese companies, it will be beneficial to the Japanese side that is suffering from the shortage of ICT engineers, and the goal is that after the interns return to their home countries, they will be able to find jobs that will lead to business matching with the Japanese market rather than Europe and the United States.
Target institution	Universities and higher education institutions
Cooperating organization in Japan	Japanese user companies (small and medium-sized distributors, manufacturers, etc.) that lack advanced ICT human resources, Center for International Cooperation in Computerization (CICC), JICA, METI's "Internship Program to Promote Internationalization[88], etc.
Contents of cooperation	• Through the Japanese partner organization, recruit companies that want to accept ICT students from Pakistan as interns in advanced ICT fields such as Data scientist, AI and Block chain. • On the Pakistani side, recruit students who wish to participate in internship program at Japanese companies. • Students who wish to participate will be matched with companies through online interviews. • Training on Japanese culture and simple Japanese language will be provided prior to the trip to Japan. • Conduct an internship at a Japanese company. The duration of the program would be about 3 to 6 months. • The host company will bear the cost of travel to and stay in Japan. • CICC has successfully implemented a similar project in Myanmar[89] so it is advisable to refer to that project.
Time frame	As soon as the Japanese side is ready to cooperate.

7.2 Possibility of Private Sector Collaboration

Potential private sector partnerships with Pakistan's ICT industry include the following.

[PRG2] Business matching event with Japanese companies focusing on specific technological fields in which Pakistani companies have strength

Type of cooperation	Event implementation
Necessity of cooperation	Based on the result of the Survey, it is clear that there are needs in the Japanese market in the field of AI, which the Pakistani side is also focusing on in particular. However, there are currently few opportunities for matching with Japanese companies that have needs, so it is necessary to plan and implement events with a clearly defined purpose.

[88] https://internshipprogram.go.jp/

[89] http://www.cicc.or.jp/japanese/news/pdf_ppt/201106MyanmarInternship2020.pdf

Purpose of cooperation	Business matching between the two countries in the field of AI
Target institution	Pakistani companies that can provide solutions in the field of AI. In particular, the following areas are considered to be in need on the Japanese side. • Small-scale, inexpensive AI solutions for small and medium-sized companies • Edge AI (IoT sensor + AI solution running on a single board computer) for product inspection and other applications at manufacturing lines
Cooperating organization in Japan	Chambers of Commerce and Industry of each prefecture and municipality, Embassy of Pakistan in Japan, METI, JETRO, JICA, etc.
Contents of cooperation	• National-level organizations such as JICA and JETRO will organize matching events on small-scale AI solutions through local government chambers of commerce and industry associations. • Select participating companies on the Pakistani side that have already done business with Japanese companies or that can secure Japanese interpreters only (matching in English will be difficult if the Japanese side is a small to medium-sized company). • The Japanese side will make a list of companies that have needs for small-scale AI solutions through the Chamber of Commerce and Industry. • The Pakistani side will compile information on the types of solutions and case studies provided by Pakistani companies in advance and present it to the Japanese side. The Japanese company will browse through the information and pick up companies that match the needs of their own company with priority. • The Japanese side will also summarize the needs of each company and present them to the Pakistani side as much as possible. The Pakistani side also picks up companies that are likely to match their company's solutions with priority. • At the event, hold multiple online business sessions starting from company pairs that have the highest combined priorities. Interpreters for the session will basically be provided by the Pakistani side.
Time frame	Implement one event, and if there are enough number of successful matchings, continue to hold the event on a regular basis.

[PRG3] Entering the ICT market for freelancers in Japan

Type of cooperation	Information sharing and support to ICT industry associations in Pakistan
Necessity of cooperation	One of the characteristics of the ICT industry in Pakistan is that there are many small-scale or individual freelance engineers. Although it is difficult for such self-employed companies to do business with major Japanese companies in terms of reliability, matching services between freelance developers and small-scale needs are becoming popular in Japan, and we could encourage them to participate in such services.
Purpose of cooperation	To further revitalize the freelance ICT industry by giving Japanese users the opportunity to have their solutions provided by overseas freelancers.
Target institution	Freelance or very small-scale Pakistani ICT engineers and companies
Cooperating organization in Japan	Freelance matching services, etc.
Contents of cooperation	• Provide information on Japanese freelance matching services to Pakistani ICT freelance industry organizations, etc., and approach them for participation. However, at present such services (lancers.jp for example) are only available in Japanese language, so initially only those who can work in Japanese will be targeted. • Encourage the freelance matching services in Japan to allow registration in English. • Alternatively, we will direct Pakistani and Japanese companies to existing English-language matching services (such as upwork.com).
Time frame	Immediate

[PRG4] Accumulate and publicize cases of business collaboration with Japanese companies

Type of cooperation	Information sharing
Necessity of cooperation	One of the characteristics of the business mindset in Japanese industry is the tendency to place emphasis on word of mouth and real cases. No matter how good the ICT companies are in Pakistan, Japanese companies often fail to take concrete actions if there are no real cases of collaboration between those companies and Japanese companies.
Purpose of cooperation	Provide Japanese companies with an opportunity to generate interest in matching with Pakistani companies and to take concrete actions.
Target institution	Pakistani advanced technology companies that have experience working with Japanese companies (not limited to ICT field)
Cooperating organization in Japan	Japanese companies with experience in collaborating with Pakistani advanced technology companies, Pakistan Embassy in Tokyo, JETRO, etc.
Contents of cooperation	• Collect case studies in both countries of collaboration between advanced Pakistani and Japanese companies. • Interviews will be conducted with companies in both countries that have collaborated with each other to gather information on the challenges of collaboration and the strengths of the other country's companies. • The collected information will be accumulated and (with the consent of the interviewee company) posted on websites that support collaboration with overseas companies. • Ideally, it would be desirable to collect similar cases not only from Pakistan but also from Armenia, Sri Lanka, and all other countries where promoting cooperation with Japan in the future would be beneficial to both countries, and publish them on the business matching system described below.
Time frame	As soon as we find an existing matching site that can help us accumulate and publish examples of collaboration

[PRG5] Promotion of business matching with Pakistani companies headquartered in the U.S. and Europe

Type of cooperation	Diverting the business matching scheme with European and American companies
Necessity of cooperation	Based on the results of the trial business matching events conducted in the Survey, Japanese companies that don't know Pakistan well tend to have insufficient confidence in Pakistan. However, in fact, many Pakistani companies are headquartered in Europe or the U.S. and are recognized as European or U.S. companies in terms of registration, so we will take this fact and use Japanese companies' sense of security in "European or U.S. companies" and the existing matching scheme for European or U.S. companies to conduct matching.
Purpose of cooperation	Business matching between international Pakistani companies based in the U.S. and Europe and Japanese companies
Target institution	International Pakistani companies with offices in Europe and the United States
Cooperating organization in Japan	Organizations and companies that support matching with Western companies, such as Japanese companies that have a need for the solutions offered by Pakistani companies mentioned above, or Japanese companies that wish to form a JV with such companies.
Contents of cooperation	• List the ICT companies (or advanced technology companies in general) in Pakistan that are based in Europe or the United States. In addition to Pakistan, similar companies in Armenia and Sri Lanka can also be listed. • Identify Japanese industries that may have a need for the solutions provided by the listed companies and solicit interested Japanese companies through industry associations. In doing so, it is not necessary to specify that the listed companies are originally from Pakistan, Armenia or Sri Lanka (as they are registered as European/US companies). • The business matching between these companies and Japanese companies will be conducted using the existing business matching scheme and platform with European/US companies. In other words, formally, it is no different from matching with European/US companies.

	• The fact that the nationality of the company to be matched is Pakistani (or Armenian or Sri Lankan) will naturally become apparent during the matching process. However, if the matching is done from the perspective of technology and business, these facts will not be a problem.
Time frame	At any time

[PRG6] Building a technology-oriented business matching system/platform

Type of cooperation	Building an online platform
Necessity of cooperation	As mentioned in Section 4.2.1 of the main text, existing business matching sites only provide information on companies, and users can only find companies by searching through a vast amount of information. However, companies that are actually looking for collaboration partners need a function that can automatically present matching candidates based on specific technical keywords.
Purpose of cooperation	Create a new international business matching system/platform that is easy to use and highly efficient for both Japanese and foreign companies looking for business partners.
Target institution	Overseas companies wishing to collaborate with Japanese companies (not limited to countries covered by the Survey)
Cooperating organization in Japan	Japanese companies wishing to collaborate with overseas companies, JETRO, JICA, etc.
Contents of cooperation	• Establish an online system that allows overseas and domestic companies to register their information for the purpose of finding collaborators. • Be sure to conduct screening (manual or automatic) to eliminate false information when registering company information. • In addition to automatic matching based on technical keywords entered by the company, AI will pick up companies with a high expected success rate for matching based on machine learning from the overall information entered by the company, without placing a large burden on the system operator. • In order to alleviate the language barrier, which is the biggest obstacle for Japanese companies to collaborate with overseas, the information entered by overseas companies can be searched and viewed in Japanese by linking with an external automatic translation function, etc. The system will also have a registration function for interpreters. This will allow the same site to be used for securing and booking interpreters in the other party's language when conducting specific business negotiations online. Interpreter personnel can also register on this site to ensure stable and continuous work. • It is desirable that the system be operated by a public organization such as JETRO, as it will ultimately benefit Japanese companies by enabling them to find high-quality, low-cost solutions.
Time frame	As soon as the governing body of the system is determined and the budget is available

(End)

Appendix 1: List of Organizations/IT Companies Surveyed in Pakistan

Note: There is another JICA survey titled "Data Collection Survey on ICT Industry Development through Business Matching with Japanese ICT Companies" implemented in the same period as the Survey. In order to avoid duplicating the Survey, we did not cover target organizations/ companies that are covered by another survey (indicated by the mark * in the following lists).

Government organizations

Name	URL	Overview
Ministry of Information Technology & Communication*	https://moitt.gov.pk/	A cabinet-level ministry concerned with information technology and telecommunications.
Ministry of Commerce*	http://www.commerce.gov.pk/	A cabinet-level ministry concerned with economic growth and commerce development and promotion.
Pakistan Software Export Board*	https://www.pseb.org.pk	An apex government body mandated to promote IT Industry in local and international markets.
Engineering Development Board*	http://www.engineeringpakistan.com/	An apex government body mandated to strengthen engineering base in Pakistan
Board of Investment (BOI)*	https://invest.gov.pk/	Investment application and licensing agency. Also makes policy such as incentives.
Trade Development Authority of Pakistan (TDAP)*	https://www.tdap.gov.pk/	As an organization that promotes trade under the MoC, holds exhibitions overseas and in Pakistan, conducts overseas market analysis, formulates trade policies, etc.
Ministry of National Food Security & Research	http://www.mnfsr.gov.pk/	Has plan to collaborate with MoTT in e-Agriculture field
Ministry of National Health Services, Regulation and Coordination	http://www.nhsrc.gov.pk/	Has plan to collaborate with MoTT in e-Health field
Punjab Board of Investment & Trade (PBIT)	http://www.pbit.gop.pk/	a provincial investment and trade promotion agency established by the Government of Punjab. organized 'National Champions Pitch Competition' in collaboration with Annual Investment Meeting (AIM) under Ministry of Economy UAE and NSpire-NETSOL where Start-ups from all over Pakistan participated.
Punjab Information Technology Board (PITB)	https://www.pitb.gov.pk/	an autonomous body set by Government of the Punjab, provides the foundation for Punjab's innovation economy. The Board aims at not only modernizing the governance techniques through transparency induced methods but also at increasing the digital literacy of the citizens - among many other services.
Khyber Pakhtunkhwa Information Technology Board (KPITB)	https://www.kpitb.gov.pk/	a public sector autonomous organization for the promotion of IT launched "Durhsal" providing a vital link between the local governments, tech industry, IT entrepreneurs and investors to anchor KP's digital transformation.
Ministry of Information Technology & Communication*	https://moitt.gov.pk/	A cabinet-level ministry concerned with information technology and telecommunications.

IT industry associations, organizations, incubation centers, and venture capitals

Name	URL	Overview
Invest2Innovate (i2i)	https://invest2innovate.com/	It is an accelerator designed to grow businesses and position them for the investment. i2i finds, vets and selects young entrepreneurs for a four-month long program that provides business support, mentorship and access to their angel investor community. They also support entrepreneurs, engage mentors & investors, partner with local stakeholders, and conduct comprehensive research to build a better environment to encourage investment & entrepreneurship in the country. (Islamabad)
Plan9	https://plan9.pitb.gov.pk/	It is an incubator for technological ventures in Pakistan established by the Punjab Information Technology Board. Plan9 has graduated 130+ startups with a gross value of $70 million so far.
The Nest I/O	https://thenestio.com/	It is a technology incubator and community hub launched by P@ SHA with global partners Google for Entrepreneurs and Samsung and through a supporting grant from the US State Department. It provides budding entrepreneurs with space, infrastructure and facilities as well as access to a network of mentors and potential investors. The Nest i/o also holds regular events and competitions, and hosts 021 Disrupts, the annual technology conference in Karachi.
Telenor Velocity	https://telenorvelocity.com.pk/	It is a corporate startup accelerator in Islamabad which focuses on helping startups go to market, over a period of 4 months, by accessing Telenor Pakistan's scale and assets. It overall tries to create an impact on various societies and communities. The program has had a recent focus on agriculture innovation.
Jazz xlr8	https://jazzxlr8.com.pk/	Based in Islamabad, it is laying the foundation for a sustainable technology ecosystem, and provide resources and expertise to help young entrepreneurs fulfill their potential, and grow their communities. Jazz xLr8 is a corporate accelerator associated with Jazz, a telecommunications company.
Fintech Factory	https://fintechfactory.pk/	It is an immersive accelerator in Karachi with an aim to empower and accelerate technological innovation within financial services in partnership with investors.
Ignite (National Technology Fund)*	https://ignite.org.pk/	It is an organization under the Ministry of Information Technology and Telecommunication, Government of Pakistan created to develop Pakistan's economy by supporting sustainable and effective ICT ventures with a focus on fourth industrial wave technology. Their Seed Fund provides funding to startups for innovative product development and also to Universities for research & development. Ignite has also established Pakistan largest network of NICs all across Pakistan.
Innovation District 92	https://id92.pk/	It is a startup incubation space for enterprises that require guidance in converting their business ideas into profitable businesses. Innovation District 92 provides selected startups with free office space for 6 months, where they can network with a large network of mentors, investors and facilitators, who in turn provide them with support in growing, branding and marketing their businesses. (Lahore)
10Xc	10xC - Seed Fund | LinkedIn	It is a tech startup seed fund that provides seed funding to entrepreneurs working on ideas or concepts towards validation of product/market fit. 10xC is a part of the PlanetN Group of Companies and makes tech investments regardless of industry or vertical. Nadeem Hussain and Saif Akhtar are the co-founders of 10XC and are acting as Chairman and CEO respectively (Karachchi).

Name	URL	Overview
PlanX	https://planx.pitb.gov.pk/	It is an accelerator being supported by the Punjab Information Technology Board which seeks to promote the sustainability of technology startups in Pakistan. PlanX was founded in 2014, aims to empower commercially viable mid-stage technology startups by providing access to multiple funding channels, specialized network of mentors and global exposure to establish high impact businesses. (Lahore)
Pakistan Software Houses Association for IT and ITES (P@SHA)*	https://www.pasha.org.pk/	The largest ICT industry association in Pakistan with 800+ startup members.
National Science & Technology Park (NSTP)	https://nstp.pk/	The first fully integrated science and technology park (STP) and the first university hosted STP of the country; the initiative is meticulously aimed at kindling the knowledge economy of Pakistan by stimulating and nurturing innovation-led germination and growth of hi-tech entities. With over PKR 8 Billion being invested into the master plan, NSTP will emerge as an innovation powerhouse for businesses.
Urban Unit	https://www.urbanunit.gov.pk/UU/Home	A knowledge based organization striving to inculcate the sense of proportions among key stakeholders to manage rapid urbanization and improve the standard of living of the people of Pakistan
National Incubation Center (NIC)*	https://nicpakistan.pk/	Pakistan's largest technology incubation center. Support programs and activities Target startup stage, technology focus, etc. Prospective ICT companies for business matching with Japanese industry
NIC Lahore*	https://niclahore.lums.edu.pk/	Lahore branch of NIC
NIC Karachi*	https://www.nickarachi.com/	Karachi branch of NIC
JumpStart Pakistan	http://www.jumpstartpakistan.com/	An entrepreneurial movement whose ultimate vision is to create a national robust sustainable eco system of enterprise by leveraging the nation's resources and uniting to be stronger together in building a great nation.
Pakistan Information Technology Association (PITA)*	https://pita.org.pk/	PITA members are connected to a network of experienced IT Professionals and include leading Information Technology academics, researchers and practitioners from every industry.

IT companies

Company name	URL	Overview
Absoluit	https://absoluit.com/	It is an online Taxi solution provider as a team of designers, developers, writers, marketers, and analysts working under an umbrella of digital age.
Addo AI	https://addo.ai/	Headquartered in Singapore, it is an Enterprise AI solutions firm that powers your vision with artificial intelligence and machine learning. It is selected by Forbes magazine as one of four AI companies in Asia that will transform the world.
ANZEN	https://anzen.pk/	Provides an intelligent surveillance solution on a subscription model
datumBrain	https://datumbrain.com/	Data science, analysis, Big data, machine learning
eKhata	http://ekhata.com/	Provides personal digital financing diary.
E-Khata	www.ekhataerp.com	It is a complete and highly customizable accounting & inventory solution that is aims to automate at least 5M SMEs in Pakistan & across the globe. They help businesses streamline themselves, reduce costs and increase efficiency.
Focustech	https://www.focusteck.com/	It is a user-focused digital agency providing research, design and development of apps, brands, digital products and campaigns. We specialize in helping companies launch or improve their digital products, focusing on localizing the user experience and executing the full digital production cycle to the highest standard.

Company name	URL	Overview
Fotisto	https://www.fotisto.pk/	Management Systems, Artificial Intelligence, Content and Publishing, Marketing, Photo, Other Media and Entertainment, Science and Engineering, E-Commerce, Commerce and Shopping, Sales and Marketing Software
GeniTeam	https://www.geniteam.com/	Game, 3D, VR/AR, Gamification
Grandeur Technologies	https://grandeur.tech/	It is helping manufacturers and startups to build smart (IoT) products with its comprehensive cloud computing platform. With their cloud platform you can do this all in weeks without any upfront cost. This saves months of work, manpower and cost. They take care of the complex parts like networking, storage and scaling, while you just use their SDK and focus on your hardware.
IOTA PAKISTAN	https://www.iotapakistan.com/	Internet of Things and Automation (IoTA) Pakistan Pvt. Ltd is a unique business venture aiming to bring digital revolution in customers' lives. Commercialize Internet of Things (IoT) oriented products and solutions that have the capacity and power to revolutionize your “way-of-life”. Support businesses in bringing automation to their core services to help them generate greater revenues and cut operational costs.
LFD	http://www.lovefordata.com/	Finalist of national pitch competition 2020. Love For Data is an emerging predictive analytics company that works with businesses by utilizing publicly available data and incorporating it with organizational data to come up with actionable insights. Its cost effective platform aggregates, organizes and analyzes millions of data points across multiple data sources and provides access to these insights through dashboards, reports, visualization and Application Program Interfaces (APIs).
LMKT	https://www.lmkt.com/	A full-service technology company based out of Pakistan offering scalable IT solutions. The company specializes in smart cities, smart buildings, e-governance, clean technology and agri-tech solutions in its pursuit to supporting the country’s fast growing economy and rapid urbanization.
Metis	https://www.metispvt.com/	Metis is the local market leader in Big Data and IoT, one of the fastest growing Big Data and IoT Team in the country. Join our team of fun and hard-working people who enjoy coming to work every day. You’ll be trusted with solving significant challenges in the Analytics, AI, Machine Learning domain, which will be recognized and rewarded.
Repair Desk	www.repairdesk.co	Repair Desk is a web-based application for mobile repair shop owners. They help users keep track of the mobile repairs, manage their inventory and keep staff and customer comments among other things.
Screen IT	https://goscreenit.com/	A location based Dynamic Digital Out of Home (DD-OOH) Advertising platform.
Sehat Kahani	https://sehatkahani.com/	All female health provider network that provides quality healthcare to those in need, using telemedicine.
Socialbu	www.socialbu.com	SocialBu is a social media management and automation tool. It allows you to manage your social media efficiently and save time. You can schedule and publish content to multiple social media accounts across different social media networks, engage and interact with your fans and followers, and create automation rules to automate repetitive actions on your social media.
Socialchamp	socialchamp.io	Social media management and automation tool
Techlogix	https://www.techlogix.com/	Main services - innovation and software product engineering, digital transformation, financial industry solutions
teradata	https://www.teradata.pk/	Teradata delivers real-time, intelligent answers, leveraging 100% of the relevant data, regardless of scale or volume of query. And we do it on-premises, in the cloud, and anywhere in between. It’s called Pervasive Data Intelligence. And only Teradata has the industry-leading products, expertise, and services to deliver it today.

Company name	URL	Overview
Unique Software Development	https://www.uniquesoftwaredev.com/	It designs and develops intelligent apps that transform the world. While directly driving over $2 billion in revenues through our application and learning builds.
Walee	https://walee.pk/	Finalist of national pitch competition 2020. Software solution for influencer match-making. The software will enable influencer matchmaking in Pakistan at a much lower cost with a greater focus, which will result in a much higher impact for SMEs.
WonderTree	wondertree.co	Gamify learning for special school for disabled people by using AI
Xgrid	https://xgrid.co/	Established in 2012, Xgrid is a pioneer in the virtual networking domain, committed to deliver a wide range of intelligent and secure cloud infrastructure solutions. The core values that define Xgrid.
Xord	https://xord.one/	It develops decentralized applications to help empower this world with advancements of blockchain technology.

International donors/foreign companies that are engaged in IT sector development

Name	URL	Overview
FAO Pakistan	http://www.fao.org/pakistan/en/	Start policy support for e-Agriculture in collaboration with International Telecommunication Union (ITU)
UNDP Pakistan	https://www.pk.undp.org/content/pakistan/en/home/accelerator-labs.html	UNDP Innovation in Pakistan is growing its support not only to its projects but also to its partners as it launches UNDP Innovation AccLab-Pakistan.
Karandaaz, DFID	https://karandaaz.com.pk/	Karandaaz Digital aims to catalyze the financial services industry towards greater financial inclusion by employing cutting-edge innovations and digital solutions for social impact, also manages the Innovation Challenge Fund
USAID Pakistan	https://www.usaid.gov/pakistan	USAID Funding enables Pakistani Entrepreneurs to innovative and grow
World Bank Pakistan *	https://projects.worldbank.org/en/projects-operations/project-detail/P167230	pipeline project: Digital transformation in KP http://documents.worldbank.org/curated/en/610291538487714485/pdf/Concept-Project-Information-Document-Integrated-Safeguards-Data-Sheet-Khyber-Pakhtunkhwa-Cities-and-Digital-Transformation-Project-P167230.pdf#search='Khyber+Pakhtunkhwa+IT+world+bank'

Appendix 2: List of Contacted Japanese Industry Associations with Potential Needs for Advanced ICT Solutions

Industry Sector	Potential Technology to Apply	Industry Association and Major Company	URL
Finance/Securities	AI, Blockchain, Big Data processing, Privileged Access Management Service, Smartphone app, Startup service, etc.	Japanese Bankers Association	https://www.zenginkyo.or.jp/en/
		Japan Securities Dealers Association (JSDA)	https://www.jsda.or.jp/en/
		Japan Consumer Credit Association (JCA)	https://www.j-credit.or.jp/en/
		Fintech Association of Japan	https://www.fintechjapan.org/
		Institute for Monetary and Economics Studies, Bank of Japan (IMES)	https://www.imes.boj.or.jp/en/
		Center for Financial Industry Information Systems (FISC)	https://www.fisc.or.jp/english/
		Chigin Network Service Co., Ltd. (CNS)	https://www.chigin-cns.co.jp/
		Blockchain Collaborative Consortium	https://bccc.global/
		Japan Blockchain Association (JBA)	https://jba-web.jp/
Insurance	AI, Blockchain, Big Data processing, Smartphone app, Image processing recognition and data analysis, Privileged access management service, etc.	General Insurance Association of Japan (GiAJ)	https://www.sonpo.or.jp/en/
		All Japan Independent Adjusters Association (JAA)	http://zengikyo.gr.jp
		National Agricultural Insurance Association	http://nosai.or.jp/
Medical system/ Health care	AI, Big Data processing, Computer vision, Image processing recognition and data analysis, Deep learning, Privileged Access Management Service, Image annotation technology for AI, Smartphone app, etc.	Japan Federation of Medical Devices Associations (JFMDA)	http://www.jfmda.gr.jp/e/
		Japan Association of Medical Devices Industries (JAMDI)	http://www.jamdi.org/about/index_en.html
		Medical Technology Association of Japan (MTJAPAN)	http://www.mtjapan.or.jp/jp/mtj/en/
		Japan Analytical Instruments Manufacturers' Association (JAIMA)	https://www.jaima.or.jp/en/
		Tokyo Metropolitan Institute of Medicine and Engineering HUB Organization	https://ikou-hub.tokyo/
		IoMT (Internet of Medical Things) Society	https://iomt.or.jp/
		Association of Medical Databases in Japan (AMDJ)	http://www.amdj.org/
		Health Data Scientist Association	http://japan-hds.org/
		Japan Medical Venture Association (JMVA)	https://jmva.or.jp/
		Japan Bioindustry Association (JBA)	https://www.jba.or.jp/en/
Machine Tools	AI, FPGA, SoC design, Image processing recognition and data analysis, Computer vision, Deep learning, etc.	Japan Electrical Manufacturers' Association (JEMA)	https://www.jema-net.or.jp/English/
		Japan Auto-Body Industries Association inc. (JABIA)	https://www.jabia.or.jp/en/
		Japan Die & Mold Industry Association (JaDMA)	https://www.jdmia.or.jp/english/
		Japan Machine Tool Builders' Association (JMTBA)	https://www.jmtba.or.jp/english/
		Japan Machine Tool Distributors Association (JMTDA)	http://www.nikkohan.or.jp/english/
Automobile (autonomous driving, etc.)	Autonomous driving, sensing, electrification, etc.	Japan Automobile Manufacturers Association (JAMA)	http://www.jama-english.jp/
		Japan Auto Parts Industries Association (JAPIA)	https://www.japia.or.jp/en/
		Japan Electronics and Information Technology Industries Association (JEITA)	https://www.jeita.or.jp/english/
		Japan Automotive Service Equipment Association (JASEA)	https://www.jasea.org/en.html
		Internet ITS Consortium (IIC)	http://www.internetits.org/

Industry Sector	Potential Technology to Apply	Industry Association and Major Company	URL
Distribution	AI, Blockchain, FPGA, SoC design, Big Data processing, Deep learning, Image annotation technology for AI, Smartphone app, etc.	Japan Retailers Association	https://japan-retail.or.jp/english/
		Japan Institute of Logistic Systems (JILS)	https://www1.logistics.or.jp/
		Japan Information Technology Service Industry Association (JISA)	https://www.jisa.or.jp/e/
		Japan Institute of Material Handling (JIMH)	https://www.jimh.or.jp/en/
Aerospace	AI, Big Data processing, FPGA, SoC design, Image processing recognition and data analysis, Computer vision, Deep learning, etc.	Society of Japanese Aerospace Companies (SJAC)	https://www.sjac.or.jp/en_index.html
		Nationwide Network of Aircraft Manufacturing Clusters (NAMAC)	https://namac.jp/en/
Materials science	AI, Big Data processing, Computer vision, FPGA, SoC design, Image processing recognition and data analysis, etc.	Japan Petrochemical Industry Association (JPCA)	https://www.jpca.or.jp/english/
		Sokeizai Center	https://www.sokeizai.or.jp/english/
		Japan Association for Chemical Innovation (JACI)	http://www.jaci.or.jp/english/
		Japan Chemical Industry Association (JCIA)	https://www.nikkakyo.org/
		West Japan Plastic Products Industrial Association	https://www.nishipla.or.jp/
		Smart IoT Acceleration Forum	https://smartiot-forum.jp/
Biochemical analysis	AI, Computer vision, Image processing recognition and data analysis, etc.	Japanese Association of Clinical Laboratory Systems (JACLaS)	https://jaclas.or.jp/en/
Drug discovery/ pharmaceutical	AI, Big Data processing, FPGA, SoC design, Image processing recognition and data analysis, Computer vision, etc.	Japan Pharmaceutical Manufacturers Association (JPMA)	http://www.jpma.or.jp/english/
		Japan Generic Medicines Association (JGA)	https://backup.jga.gr.jp/english.html
Resource exploration	AI, Big Data processing, FPGA, SoC Design, Image processing recognition and data analysis, Deep learning, etc.	Japan Marine Surveys Association (JAMSA)	https://www.jamsa.or.jp/
		Japan Oil, Gas and Metals National Corporation (JOGMEC)	http://www.jogmec.go.jp/english/
		Remote Sensing Technology Center of Japan (RESTEC)	https://www.restec.or.jp/en/
Plant control	AI, Big Data processing, FPGA, SoC design, Image processing recognition and data analysis, Deep learning, etc.	Japan Institute of Plant Maintenance (JIPM)	https://jipmglobal.com/
		Instrumentation & Process Control Engineers' Association (IPC)	https://www.ipc.gr.jp/
Information security/ Physical security	AI Big Data processing, FPGA, SoC design, Image processing recognition and data analysis, Background noise reduction, Deep learning, Privileged access management service, etc.	Japan Information Security Audit Association (JASA)	https://www.jasa.jp/en/
		Information-technology Promotion Agency, Japan (IPA)	https://www.ipa.go.jp/index-e.html
		Local IoT Acceleration Lab	https://local-iot-lab.ipa.go.jp/
		National Institute of Information and Communications Technology (NICT)	https://www.nict.go.jp/en/index.html
		Japan Institute for Promotion of Digital Economy and Community (JIPDEC)	https://english.jipdec.or.jp/
		Japan Network Security Association (JNSA)	https://www.jnsa.org/en/aboutus/
Agriculture	AI, IoT, Agricultural support technology using aerial imaging system, Image processing recognition and data analysis, FPGA, SoC design, Deep learning, etc.	Japan Agricultural Mechanization Association (JAMA)	https://nitinoki.or.jp/
		Forestry and Fisheries Aviation Association	http://www.j3a.or.jp/
		Japan Agricultural Drone Association	https://www.nougyoudrone.com/
		Japan Association for Techno-innovation in Agriculture, Forestry and Fisheries (Jataff)	https://www.jataff.jp/index.html
		Agricultural and Livestock Industries Corporation (alic)	https://www.alic.go.jp/english/index.html
		Japan Fisheries Information Service Center (JAFIC)	https://www.jafic.or.jp/

Industry Sector	Potential Technology to Apply	Industry Association and Major Company	URL
		Japan Drone Association (JDA)	https://alldrones.org/
		Japan Agricultural Drone Association	https://www.alpsdrone.co.jp/
		International Drone Association (IDA)	https://ida-drone.com/
		Hokkaido Agricultural Machinery Manufactures Association	http://hokunoko.jp/
		Japan Management Association (JMA)	https://www.jma.or.jp/en/index.html
		ZEN-NOH(JA)	https://www.zennoh.or.jp/english/index.html
		Central Union of Agricultural Co-operatives (JA-ZENCHU)	https://www.zenchu-ja.or.jp/eng/
		AgVenture Lab	https://agventurelab.or.jp/
		National Agricultural Insurance Association (NOSAI)	http://nosai.or.jp/index.php
		Hokuren	https://www.hokuren.or.jp/
Tourism	Guide AR, Online VR, Smartphone app, etc.	Virtual Reality Innovation Organization (VRIO)	https://vrio.or.jp/
		Japan Travel and Tourism Association	https://www.nihon-kankou.or.jp/home/
Education/ Training	Programming self-study service, Smartphone app, etc.	LOT	https://lot.or.jp/
		Virtual Reality Innovation Organization (VRIO)	https://vrio.or.jp/
Research	Consumer trend survey system, etc.	Japan Marketing Research Association (JMRA)	https://www.jmra-net.or.jp/Portals/0/aboutus/en/index.html
		Japan Marketing Association (JMA)	https://www.jma2-jp.org/index.php
		Computer Software Association of Japan (CSAJ)	https://www.csaj.jp/english/index.html
Clothing/ Fashion	Trend analysis, customer behavior analysis, SNS social listening, Deep learning, etc.	Japan Direct Marketing Association (JDMA)	https://www.jadma.or.jp/
		Japan Apparel Fashion Industry Council (JAFIC)	http://www.jafic.org/
		Japan Fashion Industry Council (JFIC)	http://www.jfic.jp/
Environment	Environment	National Institute for Environmental Studies (NIES)	https://www.nies.go.jp/index-e.html
		Japan Agency for Marine-Earth Science and Technology (JAMSTEC)	https://www.jamstec.go.jp/e/
		New Energy and Industrial Technology Development Organization (NEDO)	https://www.nedo.go.jp/english/index.html
		National Institute of Advanced Industrial Science and Technology (AIST)	https://www.aist.go.jp/index_en.html
Startup	Startup support	Japan Startup Support Association (JSSA)	https://www.yumeplanning.jp/
Others		Smart Japan Alliance	https://smt-jpn.org/

Appendix 3: Results of the Pilot Program for Trial Business Collaboration with Japanese Companies

Table-21 Summary of trial business collaboration results of company pair A

Japanese company	Investment information provider	
ICT company	Mid-sized ICT solution provider in Pakistan	
Content of collaboration	Construction of algorithm for collection and automatic evaluation of corporate governance information by machine learning	
Category of collaboration	PoC	
Result status	Completed	
Questions	Answers from Japanese company	Answers from Pakistani company
Issues and problems caused by communication with the other party, business practices, culture, etc.	N/A	N/A
Technical problems	N/A	(Omitted for technical details)
Other issues and problems	N/A	(Omitted for technical details)
How the above problems were solved (or not solved)	During the regular weekly meetings, the issues faced by the outsourced engineers were shared and discussed. We also shared the output data for each development process and provided feedback on whether there were any major omissions, issues to be resolved, or exceptions to be dealt with.	Frequent meetings were held with customers to discuss and understand the problems they were facing.
Possibility to collaborate with companies in the partner country (not limited to this company) in the future	Positive consideration. Would like to consider assessing corporate governance information with various advanced technologies, as it seems that the company has many elemental technologies, not limited to machine learning in this case.	We can provide services and this project showed us that remote work is possible and there were no significant issues. However, marketing and identifying businesses in need of these services would be a challenge.
Attractiveness of companies of partner country felt through this trial business collaboration	• Response to requests and corrections were quick, and weekly reports were easy to understand, making communication easy. • Rarely felt the time difference, and information exchange was smooth. • The quality of performance is high in relation to the cost, and they have a deep knowledge of advanced technology.	• Very professional business encounter • Hours of operations suitable for remote work
Obstacles of the partner country industry felt through this trial business collaboration	No particular issues	• All of our engineers understand English, but data and documents written in Japanese need to be translated and sometimes the context is not understood. • Language can be a barrier as analysts need to interact with customers. • Social media marketing is very important for off-site companies like ours, but currently, access to social media in Japan is limited.
What companies and industry of your country should do to promote collaboration	To include the target countries in the choice of outsourcing partners/To make these efforts by Japanese industry organizations.	Provide trainings on Japanese language and business culture of Japanese industry.
What JICA and the Government of Japan should do to promote collaboration	Continue trial business collaboration projects like this. The lack of familiarity with the target country may be the first barrier, so it is necessary to expand awareness as the number of PoC cases increases, and to have enough information and deep understanding to be able to introduce IT companies in the target country.	Facilitate additional Japanese subsidiary companies in Pakistan and require IT and software services for them be provided by local Pakistan companies.

What the government of Pakistan should do to promote collaboration	N/A	Allow simpler and fast establishment of Japanese companies in Pakistan and provide tax and other incentives if these companies use Pakistan IT and software services.
Other comments and suggestions to promote collaboration between the two countries	N/A	Scholarships to Pakistani computer science and engineering students for studies in Japanese colleges. This will allow them to learn the language and culture as well as evaluate software needs. These students can then return to Pakistan and become key segment of providing such services to Japanese industry.

Table-22 Summary of trial business collaboration results of company pair B

Japanese company	Semiconductor design solution development company
ICT company	Semiconductor design solution development company in Armenia
Content of collaboration	Performance Improvement of Display Device Electrical Characteristics Analysis Tool
Category of collaboration	Technical study
Result status	The Japanese companies declined the collaboration. The reasons for declining are as follows. • Could not get the specifics of the software implementation in the final proposal submitted by the Armenian company. • The software production capacity seemed to be high, and there were suggestions for means and strategies for long-term implementation methods, but the time, cost, and feasibility of reaching the goal were unclear. Note by the Survey Team: It seems that the Japanese company was expecting not only a trial collaboration but also a full-scale collaboration afterwards, but they were unable to reach an agreement on the part of the collaboration that went beyond the trial.

Table-23 Summary of trial business collaboration results of company pair C

Japanese company	Steel pipe manufacturing company	
ICT company	AI solution provider in Armenia	
Content of collaboration	Project to automate the quality check process using image recognition of produced steel pipes	
Category of collaboration	PoC, Prototype development	
Result status	Completed	
Questions	Answers from Japanese company	Answers from Armenian company
Issues and problems caused by communication with the other party, business practices, culture, etc.	• Language barrier • 5 hour time difference between Japan and Armenia	N/A
Technical problems	• Little expertise in camera selection, photography methods, etc.	• The placement of the camera and lighting to create a good quality AI model was more difficult than expected, and was not completed in time.
Other issues and problems	N/A	• Insufficient high quality data with label to achieve high accuracy of detection was the biggest challenge.
How the above problems were solved (or not solved)	• Members with good English conversation skills participated. • Use of meeting tool such as Zoom	• Changed the implementation method of the AI model.
Possibility to collaborate with companies in the partner country (not limited to this company) in the future	Plans to consider future collaboration in a positive manner.	Ready to provide consulting services to any Japanese company in any industry on how they can benefit from the use of AI in their daily operations.
Attractiveness of companies of partner country felt through this trial business collaboration	• High level of expertise in image analysis • Low cost compared to companies in Japan	• Japan's production monitoring and quality assurance market is attractive • Possible to collaborate on quality control solutions with large Japanese manufacturing companies

		• Japanese work culture, respectful business etiquette, and precision for time & resource estimations are important
Obstacles of the partner country industry felt through this trial business collaboration	• Support and troubleshooting that requires on-site work cannot be expected. • Performance evaluation of analysis speed, etc. is not possible because there is no comparison.	• The language barrier can certainly be an issue. Luckily, we have not had such issues.
What companies and industry of your country should do to promote collaboration	• Communication tools should be adapted to the company in the other country. • Do not ask for excessive (too detailed) specifications, quality, or verification as domestic companies do.	• Have more various collaborations with companies of different industries
What JICA and the Government of Japan should do to promote collaboration	• Compliance with corporate security policies	• Promoting data collection and education on data quality.
What the government of Armenia should do to promote collaboration	N/A	• Creating more opportunities for partnership between Japanese and Armenian companies.
Other comments and suggestions to promote collaboration between the two countries	N/A	N/A

Table-24 Summary of trial business collaboration results of company pair D

Japanese company	Medical device startup company	
ICT company	IoT solution development company in Sri Lanka	
Content of collaboration	Application development for IoT medical device prototype using new medical sensors	
Category of collaboration	PoC, Prototype development, Research	
Result status	Completed	
Questions	Answers from Japanese company	Answers from Sri Lankan company
Issues and problems caused by communication with the other party, business practices, culture, etc.	• Japanese companies should learn to recognize technical terms in English common to the ICT industry.	• During initial discussions, we got the help of Sri Lankan friend located in Japan for translation.
Technical problems	• The software used to share the deliverables and progress was not very common in Japan. It would be good to have an opportunity to discuss in advance what software will be used.	(Omitted for technical details.)
Other issues and problems	None	(Omitted for technical details.)
How the above problems were solved (or not solved)	• Supported by the Survey Team members. (for technical discussions, etc.)	To verify how the actual system works, we had a real device sent to us by courier.
Possibility to collaborate with companies in the partner country (not limited to this company) in the future	• Opportunities for online collaboration should continue to increase. For Japanese companies looking to expand their business globally, collaboration with overseas companies is inevitable. • We are very satisfied and would like to continue to collaborate with them.	• We see a great potential in business collaborations in the IoT domain. We are confident of gaining a foothold in the Japanese market using technology in this field.
Attractiveness of companies of partner country felt through this trial business collaboration	• A global standard development approach • Fast development speed • Might also be cost effective	• Common Asian Culture that binds the two countries • Increased use of IoT applications in day-to-day life • High growth potential for foreign software firms

Obstacles of the partner country industry felt through this trial business collaboration	• Need for frequent and smooth communication since the common language is English • Need to agree on the software to be used • Adjusting the time zone (inevitable for foreign country)	• Lack of information about use of advanced ICT technologies used in the Japanese market • Unavailability of any guideline/tax structure/ employee restrictions for foreign companies who wish to operate in Japan. • Lack of information about salary structure/remuneration schemes for software developers in Japan
What companies and industry of your country should do to promote collaboration	• We need to develop our own services and products, always with the perspective of developing global services. • Make necessary contacts to ensure that specifications and communication in English are available.	• Train developers in the Japanese language and provide incentives for competency in Japanese • Establish professional developer exchange programs with Japanese counterparts • Work with the Sri Lankan embassy in Japan to organize referral programs showcasing Sri Lankan ICT companies
What JICA and the Government of Japan should do to promote collaboration	To create business and collaboration opportunities for both the partner country and the Japanese side, and to provide financial support and subsidies.	• Establish a web-based portal highlighting opportunities available in the Japanese market. • Register ICT companies in Sri Lanka for possible matching with startups/ businesses in Japan • Initiate a referral program where JICA will act as a referrer of ICT companies in Sri Lanka for Japanese businesses • Enable and open opportunities for Sri Lankan ICT companies to develop software for JICA funded projects in other countries.
What the government of Sri Lanka should do to promote collaboration	Maintaining development environment when local development is required. Provide measures for people from Japanese companies to travel and stay in the country safely, including convenience in obtaining visas. In addition, should actively disseminate information on the development environment, business customs and culture of the country and maintain close communication with each other.	• Include Japanese language as an optional course unit in Universities for ICT degree programs • Promote the online portal[90] through social media and the Japanese consulate. • Establish a Japanese business linkage cell to coordinate ICT business collaborations between Japan and Sri Lanka • Provide incentives to university academics to carry out research collaborations with Japanese universities relevant to the ICT industry and setup startup companies based on research outputs
Other comments and suggestions to promote collaboration between the two countries	Would like to see more announcements of this kind of collaborative trial projects in the future.	• Organize annual conference where startups from both countries can showcase their products • JICA to support establishment of joint ventures/partnerships between ICT companies in the two countries • JICA to offer support to obtain ISO certification for ICT startups • Initiate a global referral program where Japanese and Sri Lankan companies jointly develop software for major Japanese companies who serve other continents (e.g. automakers, heavy machinery, electronics, etc.)

[90] https://www.srilankabusiness.com/

		• Establish a program where University academics from both countries can start a business serving a common goal (e.g. University academic in Japan establishes a startup company to manufacture an IoT device and partner faculty from Sri Lankan university setup a startup company to develop required application software for the IoT device).

Table-25 Summary of trial business collaboration results of company pair E

Japanese company	Smart agriculture system development company	
ICT company	Smart agriculture solution provider in Sri Lanka	
Content of collaboration	Smart agriculture solutions for monitoring crops, conserving resources, preventing risks, and maximizing production using AI and IoT	
Category of collaboration	PoC, Prototype development, Research	
Result status	Completed	
Questions	Answers from Japanese company	Answers from Sri Lankan company
Issues and problems caused by communication with the other party, business practices, culture, etc.	Got support from the Survey Team members, but it was a little difficult to get the Sri Lankan engineers to understand the meaning of Kanji characters in technical terms.	• Language was a barrier to communicate with Japanese farmers. • The end client is a farmer, so we need to communicate through our business partner
Technical problems	Technically, there is no problem.	The solution was designed for 2G networks, but since there is no 2G in Japan, it had to be changed to support 3G and Wi-Fi.
Other issues and problems	(Omitted for technical details.)	Due to sudden climate changes this year, crop rotation is delayed by one month, so the completion of the project was extended to the end of May 2021.
How the above problems were solved (or not solved)	(Omitted for technical details.)	• Had a mediator to translate between English and Japanese. And we got support from Survey Team. • Got assistance from Japanese local Wi-Fi providers as well. • Instructed the deployment guidelines, shared instruction manuals/videos, and provided virtual training as well.
Possibility to collaborate with companies in the partner country (not limited to this company) in the future	In the future, we can further standardize data, provide data to new farmers, and collaborate in consultations.	Japanese agricultural market is highly premium, and crops are sold at high price points. Also, the technological literacy of farmers is one of the highest in the world. Therefore, agri-tech companies have the potential to expand in the Japanese market.
Attractiveness of companies of partner country felt through this trial business collaboration	• It is possible to build a cloud system for cultivation at a relatively low cost. • We felt that there is a lot of potential for the use of AI and big data in the future. • Companies that can also develop IoT units	• The demand for IoT intelligence in the agricultural sector is growing across the globe. • The IT literacy of Japanese farmers is surprisingly attractive. • Even small improvements through technology can bring high value and return on investment in Japan's premium agricultural market.
Obstacles of the partner country industry felt through this trial business collaboration	N/A	• There is a lot of customization required to localize a technology platform into Japanese. • Japan is very competitive in the technology sector compared to other consumer markets in the world.

What companies and industry of your country should do to promote collaboration	Gather more information on IT companies in the target countries, discover unknown good companies, and actively interact with them.	• Further strengthen cooperative relationships with public institutions such as JICA. • Frequent trade programs and conferences. • Selection of technology companies in specific fields to participate in projects in Japan.
What JICA and the Government of Japan should do to promote collaboration	Would also like to receive support for the phase after the PoC where the results are put into products.	• Give these opportunities to young start-ups to experiment with new market development. • JICA can share more use cases in an open forum through Sri Lankan ICT agencies to bid for them.
What the government of Sri Lanka should do to promote collaboration	It would be good to have a system to collect detailed information on local companies and introduce some of the most suitable companies in response to inquiries from Japan. It would also be helpful if they can coordinate a visit to the country.	To support local start-up companies to enter the Japanese market by conducting technological exchanges within the government.
Other comments and suggestions to promote collaboration between the two countries	Sri Lanka, as a subcontractor of the world's IT companies, has a concentration of world standard technologies. If we can match them well, I think we can build a better relationship for both countries.	The two governments should sign a long-term agreement to share technical expertise and exchange technology.

Table-26 Summary of trial business collaboration results of company pair F

Japanese company	Agricultural IoT solutions company	
ICT company	AI Solution Provider in Sri Lanka	
Content of collaboration	Video analysis of agricultural workers and Japanese voice command recognition	
Category of collaboration	PoC, Prototype development	
Result status	Completed	
Questions	Answers from Japanese company	Answers from Sri Lankan company
Issues and problems caused by communication with the other party, business practices, culture, etc.	• It was difficult for the Sri Lankan engineers to judge whether the recognized Japanese from the voice was correct. Knowledge of Japanese language, Japanese customs, and the agricultural field are necessary, and it is difficult to learn in a short period of time, so an advisor to support them is essential. • It was difficult to respond due to lack of English conversation skills. There were many points that we did not understand about Sri Lankan culture.	• Language barrier since our team does not speak or read Japanese language. • The timeline and the budget were somewhat limited for the initial scope of the project.
Technical problems	Since their technical capabilities and development environment are unknown, it would be difficult to improve the accuracy rate of the important Japanese conversion of voice commands.	• Relatively low maturity of AI speech to text technology for Japanese language compared to English. • Developer testing voice input flows of the solution was somewhat challenging
Other issues and problems	As for the development, we have been holding development progress meetings every two weeks, but due to the limited development time, the program verification time becomes short.	N/A
How the above problems were solved (or not solved)	In order to support development in a short period of time, we provided specific voice examples in advance with their Japanese text for voice commands, and provided data to verify whether the developed application can convert the voice correctly when playing the voice in-house.	• With the support of a Survey Team member, we could overcome the language barrier. The product owner of Japanese company also speaks English, so communication was not a problem. • Timeline and budgetary limitations were overcome by discussing with the client and agreeing to a manageable yet usable scope. The client understood the limitations and was flexible to reduce the scope.

Possibility to collaborate with companies in the partner country (not limited to this company) in the future	Companies in each country have established Japanese subsidiaries to collaborate with Japanese companies. There is a possibility of collaboration for new projects in the future, if necessary.	We believe that there is great potential in the Japanese market because we can provide services in specialized fields without compromising on quality or competence. We find Japanese people and the culture to be welcoming and professional which makes it quite easier to work with.
Attractiveness of companies of partner country felt through this trial business collaboration	• Speeding up development by working with companies that have excellent human resources in the target countries • Reduction of development costs	• Developed, stable economy • Mature tech industry • High demand for tech talent • Professionalism and the work-oriented culture
Obstacles of the partner country industry felt through this trial business collaboration	• Lack of understanding of Japanese • Lack of English skills on the Japanese side	• language barrier • Potential competition with existing suppliers • Physical distance and time difference
What companies and industry of your country should do to promote collaboration	• Company: English Skill Up • Industry associations: Research strengths and weaknesses of overseas IT companies. Create a map of recommended skills.	• Actively pursue opportunities and deliver the best quality outcomes • Overcome the language barrier by acquiring or developing staff who can communicate and work in Japanese • Understand the Japanese culture, work ethics etc. and adapt to those • Organize as a community and promote the services/talent as a country
What JICA and the Government of Japan should do to promote collaboration	• Organize past achievements and recommendations. • Organize the history, characteristics, and contributions of the target company. • Disclose the characteristics of the target country's IT companies, the target country's policies and promotion subsidies, etc.	• Promote Sri Lankan companies to the Japanese market and encourage collaboration • Open channels and facilitate networking between the industries from two countries • Become early facilitators of any limitations such as language and market access
What the government of Sri Lanka should do to promote collaboration	• Brochures in Japanese language • Strengthening of Japanese language support system	• Encourage local industry to pursue opportunities in Japan • Facilitate collaboration between the industries form two countries and eliminate any barrier • Actively promote the local talent and the capabilities in the Japanese market
Other comments and suggestions to promote collaboration between the two countries	• It should have been a great challenge for the Sri Lankan company to participate without knowing Japanese. • It was very important that we got support from a Survey Team member who understand both Japanese and Sri Lankan culture so that we could select company and follow-up development in a short time period.	Short-term, PoC projects like this give a very good opportunity for service providers to prove their capabilities to prospective clients. And for prospective clients, it is a good opportunity to evaluate new suppliers without taking too much business risk.

Appendix 4: Branding/Marketing Strategy and Action Plan for Pakistan to Enter Japanese Market (Thumbnail only)

Pakistan

1

The target persona :

Not Sler or investors but industrial companies. Also, not sales or generalist positions but engineers. "Xtech" or "DX" is the keyword.

Industrial companies

Sler

Investors

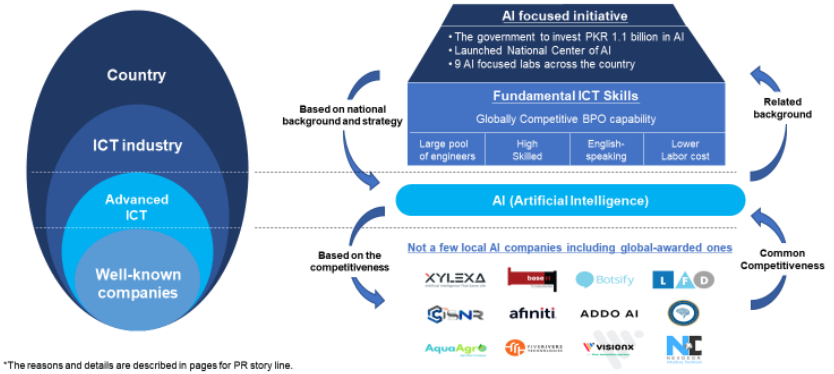
Job title	Engineers	Management issues	• Creating a disruptive business model with DX in our industry is the 1st priority in our management issues.
Position	Upper Management	Engineers issues	• We, as engineers, need to achieve DX from a technical perspective by utilizing the most advanced technology.
Decision-making	Yes		
Interested theme	Xtech /DX	Status (domestic)	• We have no ideas nor solutions now. • We haven't found appropriate external partners yet. • Existing vendors are unable to meet our requirements.
Global business	Yes		
Info sources	• Nikkei • Nikkei Xtech • WIRED • Google Alert • Trade paper • Online search (Google)	Status (overseas)	• It doesn't matter if the company is domestic or foreign, so long as it can solve our problems. • We haven't actively investigated foreign companies yet from the standpoint of communication, after-sales support and information security. • Pakistan is more like an "offshore" image for us. We assume western developed companies could meet our expectations. • However, if Pakistani companies could solve our problems, we would be interested in them, because it would seem to be promising in terms of cost.

2

Value images to create :

"When it comes to AI, it is Pakistan."

Structure of the value image



*The reasons and details are described in pages for PR story line.

3

Summary of Story-line :

Appealing AI as Pakistan ICT competitiveness, and linking it to Japanese companies' needs

Summary of Story-line

National Background policy	1. Pakistan has been gaining competitive ICT fundamental skills through BPO business. 2. On top of the fundamental ICT skills, the government has been focusing on AI in recent years.
HRD	1. The 14 software IT Parks have been contributing to produce promising ICT companies. 2. For advanced ICT startups, the growing Pakistani startup ecosystem contributes to increasing the number of advanced ICT companies continuously including in AI field. 3. In AI field, NCAI (National Center of Artificial Intelligence) plays a key role in producing AI talented engineers in Pakistan. 4. Furthermore, the government announced its plan to invest PKR 1.1 billion to start a 3-year project on AI, establishing nine AI focused labs across the country through this project.
Technology companies	1. As a result, Pakistan has both of various multinational giant ICT companies in mainly BPO field, and proven AI start-ups in AI field. 2. The Pakistani AI companies in the field are various and active worldwide.
Additional values	1. **Geographical Advantages:** Accessing to South, Central and West Asia makes Japanese companies extend their business globally. 2. **Historical Advantages:** Accessing to UK and US economies makes Japanese companies extend their business globally. 3. **Cultural Advantages:** Accessing to Islamic economies makes Japanese companies extend their business globally. 4. **Economic(cost) Advantages:** Unit costs for IT engineers are also lower and cost effective than North America and Europe.
Japan specific	1. Pakistan has been gaining expertise for having business with Japanese companies through collaborations with Japanese organizations / companies in both of public and private sector.
Conclusion	1. We believe it is beneficial for Japanese companies to have a business with Pakistani ICT companies. And that would contribute to the development of both countries.

4

Storyline

5

1. Pakistan's ICT background

Pakistan has been gaining competitive ICT fundamental skills through BPO business.

Outline - BPO industry in Pakistan

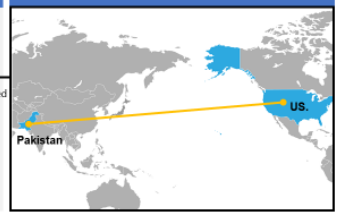
Globally Competitive BPO Country

Large number of talented ICT engineers

Approx.
300,000

- High-skilled engineers — Gained
- English-speaking engineers — The world's third largest English-speaking country
- Young engineers — Nearly 60% of the population is under 25 in 2020
- Lower labor cost engineers — Labor costs USD 25-30/h

Tight business linkage with Pakistani Americans in US.



6

2. Government policy

On top of the fundamental ICT skills, the government has been focusing on AI in recent years.

AI related initiatives

2018

- The government has launched the Digital Pakistan Policy
- The government established the **National Centre of Artificial Intelligence**
- The government announced its plan to invest **PKR 1.1 billion** (approximately USD 6.6 million) to start a 3-year project on Artificial Intelligence.
- Under this project, the Higher Education Commission (HEC) has orchestrated the **establishment of nine AI focused labs across the country**
- The president of Pakistan has also launched an initiative called the **President's Initiative on Artificial Intelligence and Computing (PIAIC)**

2019

- Pakistani president Dr Arif Alvi, during his visit to Japan in October 2019, emphasized the strengthening of Pakistan-Japan cooperation in the field of AI.
- The president stated that the AI training system initiative that has just been launched is targeted to produce **about 100,000 AI experts within two years** and invited Japanese software companies to invest in Pakistan.
- Released e-Commerce Policy of Pakistan.

7

2. HRD 1/4 – ICT

14 software IT Parks have been contributing to produce promising ICT companies.

Outline

Lahore

- Aiwan e Iqbal Software Technology Park
- Shaheen Complex Software Technology Park
- Anjuman Himayat e Islam Software Technology Park
- Netsol IT Village
- JGC Descon Software Technology Park
- Imran House Software Technology Park
- TRG Complex Software Technology Park
- Systems Software Technology Park

Islamabad/Rawalpindi

- Awami Markaz Software Technology Park
- Evacee Trust Complex Software Technology Park
- KSL Software Technology Park
- Rose Center Software Technology Park
- Meridian Software Technology Park

Karachi

- Tariq Center

Source: PSEB website

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2. HRD 2/4 – ICT startup

For advanced ICT startups, the growing Pakistani startup ecosystem contributes to increase the number of advanced ICT companies continuously including in AI field.

The Pakistani startup ecosystem

Government
- Government, at both the provincial and federal level, is carrying out initiatives to promote startup culture
- SECP recently approved the license for Pakistan's first PE & VC funds in 2017 (Ijara Capital and Lakson Investments)

Talent
- Universities and academia promote entrepreneurship, particularly by providing space for students to test and incubate potential businesses and learn entrepreneurial skills

Funding
- Corporations, foundations and government provide funding for early stage startups to accelerate their growth
- Planet N has invested in 14 startups across e-commerce, fintech, edu-tech and renewable sectors

Incubators
- Incubators provide management services and secondary support services to help new startups setup on ground
- Government has funded incubation centers in all 4 provinces

Source: McKinsey & Company "Starting up: Unlocking entrepreneurship in Pakistan"

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2. HRD 3/4 – AI

In the AI field, the NCAI (National Center of Artificial Intelligence) plays a key role in producing AI talented engineers in Pakistan.

Outline

"The center is designed to become the leading hub of innovation, scientific research, knowledge transfer to the local economy, and training in the area of Artificial Intelligence (AI) and its closely affiliated fields.

The central aim is to facilitate the researchers in the field of AI; help them establish and grow AI industry following international trends and seek solutions to indigenous problems through AI."

Affiliated labs

- Deep Learning Lab
- Intelligent Robotics Lab
- Medical Imaging and Diagnostics Lab
- SmartCity Lab
- Neurocomputation Lab
- Intelligent Information Processing Lab
- Intelligent System Design Lab
- Intelligent Criminology Lab
- Agent-based COmputational Modeling Lab

Source: NCAI website

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2. HRD 4/4 – AI

Furthermore, the government announced its plan to invest PKR 1.1 billion to start a 3-year project on AI, establishing 9 AI-focused labs across the country through this project.

Outline of the AI focused labs in

Intelligent robotics and Deep learning

National University of Sciences and Technology (Two labs)

Smart city and Neuro-computation

Nadirshaw Eduljee Dinshaw University of Engineering and Technology Karachi (Two labs)

Medical imaging and diagnostics

COMSATS Institute of Information Technology

Intelligent criminology

University of Engineering and Technology Lahore

Computational modeling.

Punjab University

Source: The nation website

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3. ICT companies in Pakistan

As a result, Pakistan has both of various multinational giant ICT companies in the mainly BPO field, and proven AI start-ups in the AI field.

Major ICT companies in Pakistan - BPO and AI fields

BPO field	AI field
Over decades	Nowadays
Major multinationals	**Promising Local Startups**
IBM, Microsoft, hp, DELL, Mentor Graphics, intel, ORACLE, SIEMENS, teradata, vmware, S&P Global, Symantec	XYLEXA, base, Botsify, LAD, afiniti, ADDO AI, AquaAgro, VISIONX
■ R&D facilities, Consulting service centers, BPO support services	■ A wide range of AI startups in a wide range of industries. Some of them are US-based and funded by investors in Silicon valley.

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4. The Pakistani major AI companies

The Pakistani AI companies in the field are various and active worldwide.

Examples of AI companies in Pakistan

Xylexa

- Developing a computer-aided diagnostics platform using Artificial Intelligence and image processing approaches to provide an automated, accurate, timely, and cost-effective medical image diagnosis.

Love For Data

- Love For Data is an emerging predictive analytics company that works with businesses by utilizing publicly available data and incorporating it with organizational data to produce actionable insights.

BaseH

- Developing AI software solutions that allow organizations to do only 20% of the work with the rest value added by baseH themselves. Its main product is an AI content writer called "Dante" based on natural language generation technologies, and is currently being used to write closing reports for the Pakistan Stock Exchange.

Botsify

- Botsify is an AI chatbot compatible with popular platforms such as Facebook Messenger, SMS, Whatsapp and websites. It automates customer support and lead generation in more than 190 languages without any coding knowledge from the clients.

The above AI companies are examples. We have more ICT companies in the field in Pakistan.

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Additional Values

of business with Pakistani companies

14

5. Additional Values of business with Pakistani companies

1. Geographical Advantages:

Accessing to South, Central and West Asia helps Japanese companies to extend their business globally.

Pakistan is strategically located between South Asia, Central Asia, China, South Asia and West Asia.

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5. Additional Values of business with Pakistani companies

2. Historical Advantages:

Accessing to UK and US economies helps Japanese companies to extend their business globally.

- Pakistan became independent from the British Empire in 1947, and now the UK is Pakistan's second largest export partner.
- The entire IT-BPO industry in Pakistan is said to be built on top of strong business ties with clients in the United States, represented in US-based large enterprises such as Bentley, IBM, Mentor Graphics, S&P Global Market, Symantec, Teradata and VMware establishing consulting service centers, R&D facilities and BPO support services in Pakistan.

*For US, a historical perspective on the ICT industry

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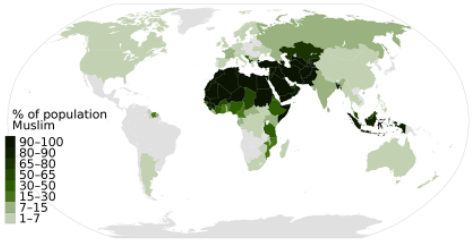
5. Additional Values of business with Pakistani companies

3. Cultural Advantages:

Accessing to Islamic economies helps Japanese companies to extend their business globally.

World Muslim population by percentage(2014)



Source: M Tracy Hunter - Own work, CC BY-SA 3.0,

- Pakistan is a Muslim country.
- World Muslim population is **1.9 billion**
- There are about 50 Muslim majority countries.

Source: Pew Research Center

5. Additional Values of business with Pakistani companies

4. Economic (cost) Advantages:

Unit costs for IT engineers are also lower and more cost effective than in North America and Europe.

Hourly rate of software developers in Pakistan (USD, 2018)

USD 25 - 30

Savings on annual operational expenses (OPEX) as compared to North America and Europe.

Up-to 70%

Source: Worldbank, PSEB

6. Japan specific

Pakistan has been gaining expertise for having business with Japanese companies through collaborations with Japanese organizations / companies in both the public and private sectors.

Pakistani government

- Ignite and JETRO (Japan External Trade Organization) held a startup pitching event in Karachi (2018)

Pakistani companies

ADDO AI ✖ **Japanese insurance company**

Outline	Monitoring and data analysis of elderly and youth driving behaviors in Japan
Team	30 Pakistani IT engineers teamed up with Japanese bilingual staff from a Japanese insurance company
Location	ADDO AI in Lahore, Pakistan
Term	3 months

- Pakistani AI company, ADDO AI has partnered with a large Japanese insurance company.

Source: JETRO

7. Conclusion

We believe it is beneficial for Japanese companies to have a business with Pakistani ICT companies. And that can contribute to the development of both countries.

8. Contact

Please feel free to contact us if you are interested in Pakistani ICT companies.

Pakistan Software Export Board (PSEB)

- Pakistan Software Export Board (PSEB) is an apex Government body mandated to promote Pakistan's IT industry in local and international markets. PSEB facilitates the IT industry through a series of projects and programs in infrastructure development, human capital development, company capability development, international marketing, strategy and research, and the promotion of innovation and technologies.
- Government incentives to the international outsourcing community include 100% equity ownership, 100% repatriation of capital and dividends, and income tax exemption for IT exports till June 2025. Pakistan has a large talent-pool of English-speaking, cost-competitive and skilled workforce, many internationally-certified companies and reliable telecoms infrastructure. PSEB works extensively with international trade associations, commerce bodies and the media to promote Pakistan's IT industry. PSEB has more than 3000 active IT/ITeS companies, which possess expertise in custom software development, enterprise Resource planning (ERP), financial solutions, mobile content, document management, enterprise computing and business process outsourcing (BPO).

Information
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UAN: +92-51-111-333-666
Telephone: +92-51-9204074
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www.pseb.org.pk

Pakistan Embassy Tokyo Japan

Information
Address: 4-6-17, Minami-Azabu Minato-Ku, Tokyo 106-0047
Telephone: 03-5421-7741
Fax: 03-5421-3610

www.pakistanembassytokyo.com

Source: Pakistan Software Export Board website

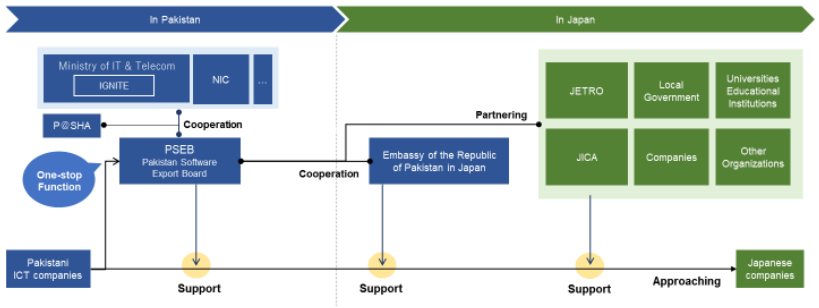
Action Plan

Scheme of Japanese market entry:

For Pakistani ICT companies

Establishing a one-stop function in cooperation with the Pakistan Embassy, the Japanese government, private companies and academic institutions in Japan

Overview

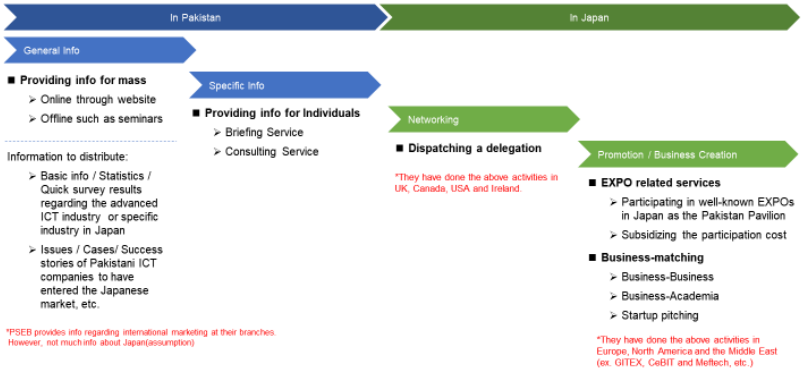


Programs for Pakistani advanced ICT companies:

For Pakistani ICT companies

It would be more effective for PSEB to secure more resources to make their programs/content richer.

Overview of suggested programs



Appealing-approach to Japanese companies:

To Japanese companies

Conducting based on a behavioral process of the Japanese companies' vendor selection.

Customer journey map for the target customer in this project

	Information gathering	Business meeting	Vendor selection	Contract
Action	• Google searching • Reading newspapers, books and magazines. • Visiting websites of potential Sier and industry associations. • Downloading relevant materials (white papers, etc.). • Attending seminars/webinars. • Attending an industry trade show. • Attending a pitch event • Asking people you know • Getting to know through social networking timelines, ads around town, etc.	• Attending relevant EXPO and business matching events. • Contacting several prospective vendors that you have narrowed down through information gathering. • Having a specific business meeting per company.	• The vendor with the highest expectations is selected after a comparative study in terms of quality, delivery time, cost, possibility of collaboration, and after-sales support. • Obtaining final approval of the business internally and make a contract. • If not approved, going back to planning or collecting information.	
Touch-points	Organic search, Newspaper, books, magazines, White Paper, Sier website, Seminar, Webinar, EXPO, Pitching event, Friends colleagues, SNS, Ads	Appointment, Offline Meeting, Online Meeting, EXPO, Business matching, Brochures, Proposals Quotation	Brochures, Proposals, etc., Quotation, A, B, C	

*Blue font: field Pakistan Gov. can support

Appealing-approach to Japanese companies – Information gathering phase:

To Japanese companies

Quick actions to optimize or create online contents fitted to Japanese companies are suggested.

Recommended countermeasures per customer touchpoints

Touchpoint	Countermeasures	Touchpoint	Countermeasures
Organic search	• Making the existing PSEB website content available in Japanese (the content includes local IT events) • Creating a promotion video for the Japanese market.	EXPO	• Participating in EXPOs related to ICT in Japan as the Pakistan Pavilion • Participating in conferences for specific industry themes *See next page for details
Newspaper, books, magazines	• Issuing press releases to get media coverage when participating in EXPOs in Japan.	Pitching event	• Partnering with the organizers of an ICT-related start-up pitch event in Japan *See next page for details
Sier, other related organization website	• Encouraging Pakistani companies interested in entering the Japanese market and the related organizations to make their own websites available in Japanese (Providing subsidies is an option).	Friends Colleagues	• (Uncontrollable)
White Paper	• Providing more specific info such as ICT industry reports on Pakistan, etc. on the PSEB website. • Encouraging Pakistani companies interested in the Japanese market to make their content available in Japanese.	SNS	• Posting info on SNS as well (Facebook and Twitter) when posting the same info on website *UGC: Uncontrollable
Seminar, Webinar	• Co-organizing seminars with governmental organizations such as JICA and JETRO, as well as Japanese companies about the Pakistani ICT industry and the related companies and investments.	Ads	• Considering various types of online advertising at the time of events (listing ads and SNS ads)

Appealing-approach to Japanese companies – Business meeting phase:

To Japanese companies

The 1st priority is to participate in well-known ICT EXPOs as the Pakistan Pavilion.

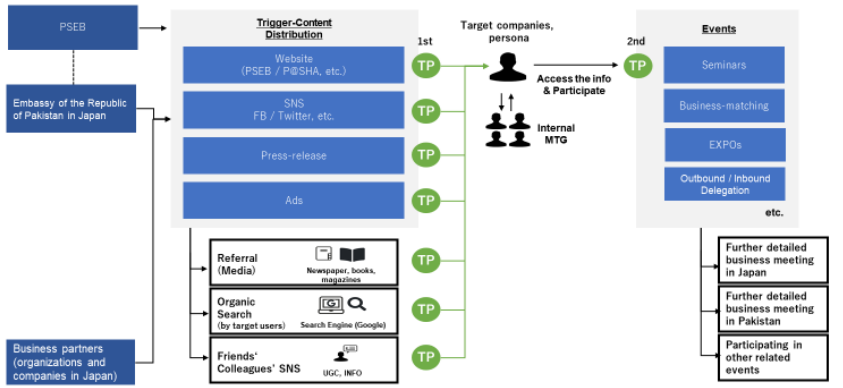
Overview of Initiatives for Each Event

	EXPO (1st)	Business Matching	Pitching Event
Goal	• Increasing the recognition of Pakistani ICT companies in Japan and realizing business with Japanese companies.	• Realizing business between Pakistani ICT companies and Japanese companies on specific themes.	• Increasing the recognition of Pakistani ICT startups in Japan and realizing business with Japanese companies..
Approach	• Applying to participate in a prominent Japanese exhibition as the Pakistan Pavilion • Embassy of Pakistan speaks at the seminar held at the exhibition. • Participating in conferences for specific industry themes as a supporting member.	• Applying to cooperate the organizers of business matching, such as JICA, JETRO, local government, and companies, that hold business-matching events on a regular basis.	• Applying to co-operate the organizers of business matching, such as JICA, JETRO, local government, and companies, that hold startups pitching events on a regular basis.
Events / Partners (candidates)	**EXPOs:** • Japan IT week • CEATECH, Japan • Wireless Japan • Maker Faire Tokyo **Conferences:** • TBU • TBU	• JICA • JETRO • Local government • Innovation Leaders Summit (PROJECT NIPPON)	• Deloitte • Plug and Play
Note	• The widest reach. Effectively reachable and can be branded as a country by exhibiting as a pavilion. • Recommended as the most prioritized activity.	• The event can be combined with seminars and dispatching-a-delegation event together for efficient promotion. • Business matching is especially useful when the priority is to realize business with Japanese companies, as it allows to set a theme by industry axis.	

Appealing-approach to Japanese companies – Expected flow and process

To Japanese companies

Distributing triggered content to create the first customer touchpoints,
and connecting to secondary customer touchpoints, such as events that can be deeply engaged.



Key Actions 1/2

Focusing on one KPI in each phase of information gathering and business meeting.

Objective	Pakistani advanced ICT companies' Japanese market entry
KGI	Pakistani advanced ICT companies' market shares in Japan *Ratio of Pakistani advanced ICT companies dealing with Japanese companies (compared to other foreign-affiliated companies) considering the project characteristics *Fixed-point monitoring evaluation by questionnaire at exhibitions, technology conferences, etc.
CSF based on Customer behavior	Target customers' behavior Information gathering / Business meeting ① How efficiently is content reaching the target segment? ② How deeply can the target segment understand value before biz meeting? ③ How much support service can make business meeting smooth
KPI	Ratio of Japanese companies that recognize Pakistan as an advanced ICT country: 10% *Since 0% of Japanese companies answered "Trustworthy" in the seminar held during this project, setting 10% as a goal can be achieved by having 1 out of 10 companies. *Conducting fixed-point monitoring to enable evaluation under same conditions. Business matching/support ratio: 50% (among companies participated in programs) *18% of Japanese companies answered that they have anxiety about communication *Although approximately 20% companies have problems with communication, Pakistan is still in the phase of creating effective results in Japan, so that targeting 80% or more of the 8% not to miss contracts.

* Since it is a KPI item and value for the first year as an initial hypothesis, it is assumed that it will be refined in actual operation.
*Setting KGI in the first year as a qualitative goal and quantifying it by survey results when conducting KPI fixed point monitoring evaluation at the end of the first year.

Key Actions 2/2

The key actions are measures to be able to reach wider, appeal value deeper and to solve communication issues.

CSF based on customer behavior	Target customers' customer behavior Information gathering / Business meeting ① How efficiently is content reaching to the target segment? ② How deeply the target segment can understand value before biz meeting? ③ How much support-service can make business meeting smooth		
KPI	Ratio of Japanese companies recognizing Pakistan as an advanced ICT country: 10% *Number of Japanese companies answering "Trustworthy" is 0% in the seminar held during this project so that setting 10% is a goal to be able to achieve one out of 10 companies. *Conducting fixed-point monitoring to enable evaluation under same conditions.		Business matching/support ratio: 50% (among companies participated in programs) *18% of Japanese companies answered anxiety about communication *Although approximately 20% of companies have problems with communication, Pakistan is still in the phase of creating effective results in Japan, so it is targeting 80% or more of the 8% not to miss contracts.
Key ACTION sub-KPI	Appealing commitment	Dispatching a delegation (along with EXPOs)	Once a year
	Widely reaching by an online approach	Distributing a press release	8 times a year
		Creating Japanese pages for PSEB / P@SHA website	All existing pages
	Participation in events to be able to understand values deeply	Exhibiting at the Pakistan Pavilion at well-known EXPOs	Twice a year
		Participation in startup pitch events	Twice a year
		Participation in technical councils	Twice a year
		Holding seminars / webinars including pitches	Twice a year
			Developing business matching service
			Developing business support service for Business meeting preparation
			Developing business support service for business meeting

* Since it is a KPI item and value for the first year as an initial hypothesis, it is assumed that it will be refined in actual operation.
*Setting KGI in the first year as a qualitative goal and quantifying it by survey results when conducting KPI fixed point monitoring evaluation at the end of the first year.

Project Schedule

A research / planning phase for a year, and an execution phase for one and a half year.

Timeline

① Research / Planning Phase — 1 Year
- Researching and planning a Japanese branch office — 11 months
- Final approval — 1 month

② Execution Phase — 1~1.5 Year
- Developing a Japanese branch office — 1~1.5 Year
- Developing programs — 1 year
  - Information provision programs for general
  - Information provision programs for individual companies
  - Business creation programs
  - Professional services (Legal / Accounting / Labor)
- Launch a Japanese branch office

Establishing a Japanese branch office is preferable in aspect of the project objective but not mandatory.

*Organization that oversees activities in Japan

Researching and planning a Japanese branch office as well as finalizing outline of programs.

Building channels, Taking programs specific and launching them as well as establishing the Japanese branch office based on the plan.

* The above is a model case because they are affected by the Pakistan's ongoing national strategy, budget, and measures.

Schedule for establishing a Japanese branch office

Planning sector / Marketing sector

Phase	Category	Tasks	Sector in charge	Phase1 1Q	2Q	3Q	4Q	Phase2 1Q	2Q	3Q	4Q	+ α 1Q	2Q	~
Research Planning	Researching and planning a Japanese branch office	Goal setting of the base (ex: role and responsibility among stakeholders)	Planning											
		Designing function of the base	Planning											
		Designing structure / organization of the base	Planning											
		Feasibility study for Japanese market to design programs	Marketing											
		Selecting programs (lineups)	Marketing											
		Identifying related events required by the provided program	Marketing											
		Extracting collaborative partner candidates (public and private) required for the provision program	Marketing											
		HR Planning for the base	Planning											
		Finalizing a budget for the base	Planning											
	Finalizing and approval	Final approval of the plan and budget	Planning											
Execution	Personal arrangement	Procedures such as visa, business traveling, etc.	Planning											
	Office search/Contract	Search and contract for the base in Japan	Planning											
	Office arrangement	Contracting & purchasing an office equipment, interiors, etc.	Planning											
	PR Tools arrangement	Selecting and registering PR tools and services	Marketing											
	PR the launch	Send press release (consider an opening ceremony if necessary)	Marketing											Buffer time

* The above is a model case because they are affected by the Pakistan's ongoing national strategy, budget, and measures.

Schedule for developing programs

Planning sector | Marketing sector

Programs	Category	Tasks	Sector in charge	Phase2 1	2	3	4	5	6	7	8	9	10	11	12	1Q	2Q	+ α ～
Programs for providing info for mass	Creating and distributing content	Planning content to distribute for mass *Planning for both of companies in the countries																
		Distinguish and align content for both of online and offline	Marketing															
		KPI setting and finalize the program including its timeline																
	Seminar	Planning themes for seminars/webinars																
		Selecting person in charge, locations, approaches per theme	Marketing															
		Planning and finalize business partners and the scheme																
	Website	Planning the website for the branch in Japan																
		Planning content on the website to distribute online specifically	Marketing															
		Creating and publish the website																
	Partners' website	Planning themes, a scheme and business partners	Marketing															
	Related organizations' website	Requesting the organizations to make their website content available to read in Japanese	Marketing															
	Press-release	Planning target media, a person in charge and operation for press-release	Marketing															
	Advertising	Planning target media, a person in charge and operation for ads (in the case of promote)	Marketing															
Programs for specific companies	Briefing	Planning the program specifically - Theme, a briefing menu, a person in charge, the way to provide, location, term, charge or not, KPI, etc.	Marketing															
	Consulting	Planning the program specifically - Theme, a consulting menu, a person in charge, the way to provide, location, term, charge or not, KPI, etc.	Marketing															
	Business matching and support	Planning the program specifically - Theme, a support menu, a person in charge, the way to provide, location, term, charge or not, KPI, etc.	Marketing															
Professional service	Law/Accounting/HR, etc.	Selecting business professionals in the field of law, Law/Accounting/HR	Marketing															
		Planning a scheme to provide services																
Business creation	Delegation	Planning a delegation programs such as setting goals, structure, organizing, announcing, etc.	Marketing															
	EXPO	Selecting EXPOs to participate																
		Planning a national pavilion such as exhibition area, booth designing, companies to participate, selection of translators, subsidies, etc.	Marketing															
		Planning a scheme of business-matching during the EXPOs																
		Planning and selecting speakers for promotion at events of the EXPOs																
	Technology conferences	Listing up technology conferences in Japan																
		Selecting the suitable conference to be able to be a member and meet the goal	Marketing															
		Developing an annual schedule																
	Pitching event	List up startup pitching event organizers in Japan																
		Selecting the suitable organizers to be able to join or work together	Marketing															
		Developing an annual schedule																Buffer time

* The above is a model case because they are affected by the Pakistan's ongoing national strategy, budget, and measures.

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