

2019 Asian Approaches to Development Cooperation (AADC)

Industrial Revolution 4.0 and the Future of Work : Implications for Asian Development Cooperation

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Seoul, Korea



INTRODUCTION

Organized jointly by the Korea Development Institute (KDI) School of Public Policy and Management and The Asia Foundation, the “Asian Approaches to Development Cooperation” (AADC) dialogue series brings together development experts and government officials from the Asia region and beyond to share perspectives and to facilitate mutual learning between and among “emerging” and “traditional” development actors.

Now in its 9th year, the series began in 2011 with a focus on Asian approaches to development cooperation, then a novel topic of discussion in the changing aid landscape. Over the years, the dialogues have approached Asian development cooperation from different angles: pro-poor inclusive growth (2012), climate change mitigation and adaptation (2013), social mobility (2014), the future of South-South cooperation in the region (2015), role of non-state actors in Asian development cooperation (2016), approaches that Asian countries undertook in tackling the Sustainable Development Goals (SDGs) on urbanization and female empowerment (2017) via their cooperation programs, and conflict prevention and peacebuilding (2018).

This year’s AADC dialogue discussed how Asian development cooperation could factor in the features of industrial revolution 4.0 (4IR) and to address the challenges posed by the future of work. The discussion included exploring present structural readiness in respective national contexts for the changing technological landscape, examining new types of partnerships in preparing for the transition, reviewing private sector-led strategies in tackling these challenges, and identifying areas of region-wide cooperation for mutual competitiveness. The dialogue was held in Seoul, Korea. This report covers the proceedings and outcomes of the Seoul meeting, featuring presentations and discussions by development experts, innovators, activists, and practitioners from governments, companies, academia, NGOs, and multilateral organizations across Asia.

OBJECTIVES OF DIALOGUE SERIES

- To identify some of the key challenges 4IR poses for the region.
- To discuss Asian South-South cooperation approaches and region-wide development cooperation projects in adapting to technological change.
- To contribute to the incorporation of Asian experience and perspective to the future of work literature.
- To promote mutual interest, learning, understanding, and opportunities for collaboration and cooperation between and amongst Asian countries and experts as well as with traditional donors and regional bodies.
- To formulate concrete policy recommendations for an Asian-led development scheme to better address the challenges in the emerging 4IR era.

OPENING CEREMONY

Ms. Anthea Mulakala, Senior Director, International Development Cooperation at The Asia Foundation, moderated the opening session and welcomed all participants and guests.

Mr. Gordon Hein, Senior Vice President of Programs at The Asia Foundation, stressed the need to undertake discussions about the social implication of digital technology within the Asian context. He shared key initiatives that the Foundation has implemented in leveraging technology for its further impact and reach. The dialogue presents an opportunity to uncover new insights in addressing common future of work challenges and to conceive policy recommendations to manage technology in the 4IR era.

In his welcome address, **Sohn Wook**, Associate Dean at KDI School of Public Policy and Management, explained the relevance of the topic in the face of growing concern of the disruptive impact of 4IR on jobs and human capital. New technologies presented both challenges and opportunities to developing economies, thereby requiring adequate understanding and analyses of these changes. To ameliorate the effects of technology in aggravating the existing global wealth imbalance while leveraging technological trends, he stressed the need for development cooperation in managing the impact.



KEYNOTE SPEECH

The keynote speech featured:

Baasanjav Ganbold

Head of East and North-East Asia Office
United Nations Economic and Social Commission for Asia
and the Pacific



Mr. Baasanjav Ganbold introduced the challenges and opportunities posed by 4IR for Asia and explored potential areas for the region’s development cooperation in navigating the technological transformation. Digitalization has polarized the labor market, with technology augmenting skills at one end and replacing existing positions in another. It has also infused further instability in labor structures, driving independent contracts-based employment as the norm. According to Mr. Ganbold, these trajectories are likely to be continued and contribute to further country-wide and global inequality under current policies. However, new opportunities emerged alongside these risks. The change has pushed governments to rethink their social protection systems, redefine work and leisure relationships, and tap into new skills and potential via capacity-enhancing technology. Therefore, as increased emphasis of STI (Science, Technology, and Innovation) in UN SDGs illustrate, incorporating a technological dimension for development schemes is vital. Accordingly, Mr. Ganbold identified three main areas for Asian development cooperation: mainstreaming of STI in ODA, data sharing, and peer learning. The inclusion of STI initiatives in development schemes could create new cooperation regimes that facilitate capacity-building for sustainable development in partner countries. Additionally, the gathering of resources through the use of data can unlock increased socio-economic benefits across Asia. The region also houses leading innovators such as Japan, Korea, and China. Utilizing their decades-long know how of technology-led economic growth and relevant STI policies could create learning opportunities to identify alternative STI policy tools to drive growth for the larger region.

FRAMING SPEECH

The framing speech featured:

Randeep Sudan

Founder
Board Advisor
Former Digital Strategy Advisor & ICT Practice Manager
The World Bank



Mr. Randeep Sudan introduced the implications for the future of work in the 4IR context. There has been a steady decrease in average corporate lifespans, while companies have lost and gained market value in ever quickened pace. These factors have accelerated corporate dynamics, which in turn introduced radical re-structuring of employment patterns in the corporate world. The changing environment demands new roles and skills. Therefore, Mr. Sudan called for a focus on capabilities rather than skills in governments' responses to the future of work. Instead of the conventional focus of re-skilling, up-skilling, and lifelong learning, Mr. Sudan suggested enduring capabilities that went beyond skills. These enduring capabilities required a list of essentials such as strategic foresight, defining of core social values, access to expertise, and capacity to identify problems. To cultivate these enduring capabilities, Mr. Sudan stressed the need for governments to engage in long-term strategizing. In coping with these challenges regionally, Mr. Sudan advised for a pan Asian strategic futures agency that has its nodes embedded at the highest governmental level of each country. This would set up an institutional structure for long-term strategic planning with regional connections. Mr. Sudan further advocated for an integrated digital platform that pooled together diverse data points, which would then inform policy makers of the relevant market trends such as projected technological course, patent filings, hiring data from job posting sites. Additionally, Mr. Sudan expressed a need for a Smart Contracts based expert network that governments, SMEs, and individuals can access. The establishment of such network would monetize through multiple cycles of reuse, making access to expertise affordable. Lastly, Mr. Sudan urged an ambitious program of digital twins that went beyond critical infrastructure. Having a fully digitized replica of places, objects, and processes could generate vast amount of data, unlocking invaluable potential for AR/VR/MR applications.

Q&A/Discussion:

Participants asked for further clarification on the concept of 'digital twins.' **Mr. Sudan** elaborated that digital twins referred to the digital replication of the physical realm. These included digital identities of individuals, which can range from health data to possessed skills sets, and digital models of processes or objects. Digital twinning allows for a virtual reenactment of the physical and of processes, further allowing to redesign physical spaces and to efficiently train individuals with new skills. Mr Sudan stressed that the initiation of a digital twin program could kick start efforts to compile data and the standardization on how to appropriately use data. The digital twin program could directly address the shortage of data that many developing countries face, enabling for an upscaling of government projects.

Participants were also curious about the mission of Singapore’s strategic futures agency and some of its concrete policy outcomes. Mr. Sudan emphasized the organizational set up of Singapore’s Center for Strategic Futures (CSF) for the country’s success. The institution’s core mission was to make sense of the surrounding complexity and to factor that in for policy planning. CSF gathered top decision makers from various government departments to identify the most impending social agenda in respect to their respective organization. Therefore, in effect, the institution identified the agendas that had the maximum touch points in the government, which were then raised in the government’s prioritization. From such organizational set up, Mr. Sudan emphasized that Singapore identified ‘autonomous vehicles’ as a government priority as early as 2012 and the future of work, which it then promptly directed resources to address these needs.

CHALLENGES AND PREPARATION FROM ASIAN PARTNER COUNTRIES

This session explored the readiness of Asian countries for the future of work -- including the labor market/demand shifts, retraining needs, limited internet access, and social protection measures.

Moderated by **Taejong Kim**, professor at KDI School of Public Policy and Management, the sessions featured:

Fahmida Khatun

Executive Director
Centre for Policy Dialogue, Bangladesh

Saowaruj Rattanakhamfu

Senior Research Fellow
Thailand Development Research Institute

Zothan Mawii

Research Fellow
Tandem Research India

Lim Ratha

Deputy Director
Cambodia Development Center



Ms. Fahmida Khatun identified key policy areas for South Asian countries to undertake in confronting the challenges posed by 4IR and to harness accompanying opportunities. Ms. Khatun

pointed out that South Asian countries have yet to experience the dividends of the 3IR, with countries still mired in low productivity and a large informal sector comprising the overall economy. Currently on the verge of 4IR, it then becomes all the more important to discuss how the 4IR will further transform labor market dynamics and to identify specific high-risk sectors that will be particularly affected. Ms. Khatun emphasized the need to analyze technology absorption potential for each country and to quantify the possible effects of job creation and losses. This would require a comprehensive effort on part of the government to address the futures of work. In addressing these challenges, Ms. Khatun stressed the need to account for the existing inequalities. There has been rising discrimination against specific demographic segments and polarization in job distribution. Accordingly, Ms. Khatun emphasized a complementary educational policy alongside proactive labor policies to ensure that the benefits of technology could be shared society wide. The current public expenditure allocated for education proved generally inadequate for the South Asian region, recording only 2% from the overall GDP for Bangladesh. Realigning academic curriculum to market requirements was also vital in formulating better policies in face of changing technological needs. Lastly, Ms. Khatun pressed for fostering private sector development in light of the characteristically overblown public sectors in the region. Private sector development was crucial in infusing a healthy balance of competition and diversity to the economy. In realizing benefits from 4IR, Ms. Khatun stressed the distributional aspects of growth, where employment opportunities would take precedence over mere quantitative increase in economic growth.

Ms. Saowaruj Rattanakhmfu presented on Thailand's preparedness and its challenges in the 4IR era. The country set up Eastern Economic Corridor (EEC) initiative as part of its flagship project to implement the Thailand 4.0 vision. The EEC identified key industrial sectors such as robotics and automation to facilitate growth via generous government incentives. Due to these initiatives, Thailand's usage of robots increased, which also propelled faster industrial outputs for these sectors. Despite increased adoption of robotics and automation in the country's production, Thailand still lagged behind Asia and world average number of industrial robots. 61% of Thai factories were still dependent on mass production- a production process characteristic of the second industrial revolution. Additionally, Ms. Rattanakhmfu explained that most of the robotic components were imported with high import tariff rates and some that were locally produced suffered from limited performance and precision. Similarly, foreign firms mainly developed the software platform while Thai firms developed software for only specific tasks, thereby making the demand for those domestically produced very limited in scale. Thailand also has a large ICT workforce but there is an under-utilization of these human resources, with only 15% of workers with computer-related degrees working in ICT occupations. Ms. Rattanakhmfu explained that the current curricula of computer-related fields were outdated and did not meet industrial demands. Therefore, Ms. Rattanakhmfu advised that international cooperation in driving technology innovation and strengthening development of local talent be business-led and demand oriented.

Ms. Zothan Mawii explained the implications of future of work in the Indian context. She forecasted that India is unlikely to experience a 'hallowing out' of its low-medium skilled jobs in face of increased automation, as these jobs on the lower end already comprises a small part within the formal economy. However, low-medium skill jobs such as cashiers, shop floor assistants, and telemarketers did constitute as important entry points for higher level jobs. With automation replacing many of these entry-level jobs, it is projected to reduce labor mobility within the overall

Indian economy. Ms. Mawii further pointed out that automation adoption will be slow in India. Having an economy primarily powered by labor-intensive industries, replacement effects from automation will likely only occur in small pockets of the overall economy -mainly the niche areas such as the IT, financial, and legal sectors. 4IR is also likely to reinforce and reproduce existing informality within the Indian economy. Gig work is a large portion of India's labor market. Most workers work for multiple employers on a piece-rate basis, often lacking access to formal social protection mechanisms. The growth of digital platforms in the 4IR era is projected to further entrench such informal arrangements in the labor market, particularly affecting marginalized communities and women who are already the primary labor force in the unorganized sector. Despite the potential of digital platforms to diversify economic actors, many are not equipped with the skills sets that technology demands. Thus, marginalized communities lack the capacity to leverage technology, thereby increasing the likelihood that technology will further exacerbate persisting social inequities. Accordingly, Ms. Mawii advised for policy strategies for skills upgradation and accreditation for digital literacy to ensure smooth navigation across sectors where employment opportunities will be increasingly dispersed. Lastly, she emphasized for a collective strategy with similarly placed Asian countries to safeguard against further deterioration of working conditions in becoming the global outpost for low paid, online work.

Ms. Lim Ratha stressed taking a fundamental approach in confronting the challenges of the 4IR. The 4IR will undoubtedly cause significant social disruptions, in common with the technological revolutions that have preceded it. In anticipation for its uprooting social effects, Ms. Ratha introduced key challenges that developing countries must address in overcoming their late start in technological efforts. First, she stressed the importance of enhancing accessibility and affordability for modern technology. Equipping the populations with the tools of modern technology will be crucial in developing countries' catch up efforts. Ms. Ratha further emphasized the importance of strategizing for the development of skilled workers. Making the transition in current labor-intensive economic arrangements to the needs of the 4IR will be crucial in securing future pool of skilled workers. Additionally, developing countries should capitalize on sectors that industrialized countries have evolved out of but still in demand in the 4IR. Identifying these niche opportunities would be important in maintaining competitiveness in the coming era. Lastly, Ms. Ratha advised for steps to improve policy alignment across borders for efficient resource utilization and to harness on the potential of various partnerships, including public-private partnerships and region-wide cooperation, to amplify social well-being using technology. After establishing its goal to make the country a digital economy by 2050, Cambodia cooperated with countries such as Korea and Japan to create a master plan for its ICT framework. There were some positive signs in Cambodia, with 300 startups created that focused on key sectors such as fintech, digital media, e-commerce and logistics, and digital marketplace.

Q&A/Discussion

Participants asked about how national policies are aligning with policies on a regional level. **Ms. Ratha** explained that within the ASEAN framework for ICT policies, there was a region wide consensus on the need for education reform to cope with 4IR challenges. Cambodia initiated the 'new generation school' pilot project that focused on nurturing talent pertaining to STEM in effort to prepare the country for the forthcoming technological needs. Ms. Ratha further elaborated that there has also been regional cooperation to commonly address how to expand financial access to young entrepreneurs and to construct modern infrastructure that supports technological demands.

Participants were mainly curious about the changing economic dynamics of competitiveness and its impact on Asian development models. Traditionally, Asian countries have relied on industries with low wages for their economic development. With labor cost forecasted to be less significant in the face of automation, will such dynamics undermine Asia's comparative advantage in production? **Ms. Khatun** commented that although Asian developing countries have not kept pace with the technological revolution, still stifled from low access to electricity and internet, there are other factors of production such as the low overall cost of living that can attract foreign investment. The lower cost of living, corporate tax cuts, and other enabling policies can act as additional incentives to compensate for the decreasing significance of lower wages for the time being. **Ms. Mawii** explained that the reshoring is likely to affect certain sectors dependent on manual labor, which is particularly vulnerable to being replaced by automation. Service and IT sectors that are off shored to developing countries are likely to remain outsourced, with their skills less substitutable by machines. However, Ms. Mawii projected that such sector-specific damage will intensify social inequities within these developing economies, with skilled workers paid increasingly more while routine jobs get increasingly replaced.

On the question concerning how Thailand can contribute in the South-South cooperation set up in the context of 4IR. **Ms. Rattanakhomfu** explained that labor-intensive industries were most vulnerable to the technological change posed by 4IR. With a large garment sector, Thailand is similarly susceptible to disruptions in the 4IR with other developing countries. In such context, Ms. Rattanakhomfu suggested for collective strategizing with similarly situated economies.

PRIVATE SECTOR STRATEGIES AND SOLUTIONS

This session presented private sector approaches on tackling future of work challenges in Asian contexts amidst the 4IR.

Moderated by **Kwang Kim**, Country Representative at The Asia Foundation, the session featured:

Regina Son Chief Communications Officer
IBM Korea

Jin Hee Bae Corporate Affairs Manager
Microsoft Korea

Changwon Lee Senior Research Fellow
Korea Labor Institute

Josh Choi Global Business Advisor
Korea Startup Forum



Ms. Jin Hee Bae introduced Microsoft’s skills and employability vision where every person has the skills, knowledge, and opportunity they need to succeed. This vision is becoming ever more pertinent in light of widening digital gap and increasing job replacement from technological disruptions. However, the current educational policies are not in line with future prospects for jobs. In this respect, Ms. Bae explained how Microsoft is working to ameliorate skills and employability gaps. Microsoft has been expanding its partnerships across the education and employment eco systems to support skills development in individuals. The company initiated its digital skills training since 2010, supported re-skilling of displaced workers, of which 50% are employed by Microsoft’s partners, and particularly targeted underserved communities in its programs to address the digital divide across social groups. As a result, 33 million young people participated in Microsoft’s digital skills program across the APAC region, 5000 workers were re-skilled, and 84% of the participants were from underserved communities. Ms. Bae elaborated that Microsoft has engaged in multilateral partnership, ranging from policy makers, service providers (non-profit, academia), and employers in an effort to support system-level adjustment to the technological change posed by 4IR. With the company’s resources, technological know-how, and its global network, Microsoft has contributed in cultivating on-demand workforce across the region. Ms. Bae concluded with a specific case where Microsoft partnered with Citibank in Korea to re-skill midcareer level bank tellers in data analytics so that they could be re-directed to on-demand tasks.

Mr. Josh Choi gave an entrepreneurial perspective in the changing employment landscape. Startups in Korea recorded about 150% employment growth rate, however, startups that had under 20 employees had a negligible effect on net job creation until their 5th year. Accordingly, the bulk of employment generation came from large startups, with 20-500 employees and they generated the greatest number of jobs in their initial 5 years. Mr. Choi advised for a policy shift from early stage innovation to high impact startups, defined by “firms who doubled their sales over the most recent four-year period and had an employment growth quantifier of two or more over the corresponding period”. While small in its overall share of startups, high impact startups accounted for almost all net job creation in the startup scene. Mr. Choi elaborated on the kinds of jobs that should be created in the 4IR. He stressed the importance of identifying unique human advantages, ones that did not compete but complemented to machines. In this respect, Mr. Choi identified new opportunities in the experience economy. There was a need for startups to move into “long tail” economies, where firms catered to individualized needs rather than simply meeting material needs in mass production. Consequently, Mr. Choi advised for an entrepreneurship focus shift from size to uniqueness and, correspondingly, also for an education focus shift from skills to experiences.

Ms. Regina Son introduced an IBM initiative which sought to address the shortage of appropriately skilled workers for the 4IR. P-Tech was a private-public education model that combined high school, college, and professional elements into a unified curriculum. P-Tech curriculum incorporated 650 SMEs and large enterprises as industry partners, who then cooperated with professionals from academia and the policy realm to put together a five-year program that nurtured industry-recognized young professionals. The curriculum was designed to include liberal arts courses, that satisfied high school course requirements, with professional learning, which trained students with on-demand skills. P-Tech graduates were then incorporated into IBM and other industry partners' eco system. Workplace learning curriculum was further divided to also include developing soft skills such as collaboration, communication, and analytical thinking. For the case of Korea, the first P-Tech school was opened in March 2019 with all 52 students majoring in AI software. Ms. Son concluded by emphasizing the need for private sector's engagement in providing its share of input for the appropriate formulation of educational policies in order to develop human capital relevant for the 4IR.

Mr. Changwon Lee discussed about workplace innovations in Korea. According to OECD Employment Outlook 2016, Korea lagged behind in high performance work ratios amongst other OECD member states. Corporations generally suffered from rigid hierarchies and unstructured workshops, which in turn yielded low productivity and innovativeness. In response, the government developed the "New Paradigm Consulting Service" to support workplace innovation for domestic companies. New Paradigm provided innovation-consulting services to various corporations, ranging from the manufacturing, services, and public sector, to coach these organizations in labor management, workplace learning, internal job creation, and productivity improvement methods. However, the program only lasted for 6 years, between 2004 and 2009, and was abruptly halted due to changed political conditions. Therefore, Mr. Lee emphasized the need for a self-sustaining momentum to implement workplace innovation schemes, outside of government, so that companies can continually adapt to the new industrial climate.

Q&A/ Discussion:

Participants asked about how governments can support the types of startups that are most likely to survive and contribute to greater job creation. **Mr. Choi** suggested for continual monitoring of startups that receive investment. He emphasized that startups that received investment should be obligated to report on their business performance and expected growth. In addition, government should set up a secondary evaluative system that judge further potential of the firm. Coupled with increased monitoring, government should support startups that experience difficulty in the practical implementation of ideas.

There were questions on how to direct technology to the benefit of society. **Mr. Choi** emphasized the need for prior education on ethical thinking along with the technical training of skills. Additionally, he suggested for a regular open dialogue that brings together policy makers and industry experts to discuss the social effects of new technology. **Ms. Son** added on to emphasize educating the youth on soft skills such as problem identification and problem-solving skills. Education policies should be designed holistically so that young professionals utilize technology with a broader understanding of social needs.

There was further discussion on the likelihood that companies will start their universities to train youths via their own skills development programs in light of the frustratingly slow education

reform. Ms. Son elaborated that private sector educational model addresses a specific sector of skills. While the traditional public education can better address higher and lower tiered skills with their respective public to PhD education programs, companies can provide better training for medium level skills that are more geared towards addressing specific corporate skills shortage.

Ms. Bae elaborated on private sector's role in education. She explained that Microsoft was working with parents to educate them on the types of skills that will be needed in the future, so that these parents can pressure the policy makers to accelerate education reform. Ms. Bae also emphasized how Microsoft is investing to retrain teachers in order to support innovative classroom environments.

OPPORTUNITIES FOR ASIAN SOUTH-SOUTH COOPERATION

This session discussed how provider governments are addressing future of work challenges through their SSC and development cooperation programs with partner countries.

Moderated by **Sohn Wook**, Associate Dean at KDI School of Public Policy and Management, the session featured:

Sabina Dewan	President & Executive Director JustJobs Network
Mori Junichi	Research Fellow JICA Research Institute
So Young Kim	Associate Professor KAIST
Yuri Yoon	Manager & Researcher ODA Research and Information Center KOICA



Ms. Sabine Dewan emphasized the need for more proactive decision making to ameliorate the disruptive effects of technology. She stressed for a more nuanced approach to technology, including for more discussion on the ethical components of technology, how to push for actual leveraging of technology for livelihood purposes that goes beyond mere accessibility, and close monitoring of the social effects of entrepreneurship. Ms. Dewan further outlined some key tenets of cooperation such as clear legal definitions across countries, partnership with the private sector to push for data sharing, remuneration framework for platform economy workers, strategies for skills training, and guidelines for social protections schemes.

Mr. Mori Junichi explained how Japan implemented the concept of translative adaptation in its development cooperation approach. Translative adaptation, which referred to the process of modifying an item when transplanting in another culture, was a constant theme throughout Japan's development assistance programs. Mr. Junichi elaborated that Japan held a unique advantage in an "ingredient-oriented" development projects, where the emphasis would be more on specified targeting including areas such as infrastructure, human resources, and firm capacity building rather than a more general "framework-oriented" projects that involved structural adjustment and standard development. Accordingly, Japan incorporated translative adaptation as its fundamental approach to its development cooperation schemes, encouraging partner countries to develop their own approaches that are relevant to each local context. As an example, Mr. Junichi cited Vietnam's experiences in skills development for machine tool operation. Contrary to the conventional path of moving upwards from using manual machines to computerized machining, Vietnam started from a midpoint in its skills development for machine operation, descending towards manual machines while also eventually ascending to 3D printing.

Ms. So Young Kim introduced a direction for policy formulation in the context of 4IR. Ms. Kim explained that technology should not be simply viewed as risks but as internal features of development. Accordingly, when devising policy actions pertaining to technology, there should be a policy shift from taking a "box ticking" approach to adopting "reflective action". Instead of a narrowed assessment of each individual technology's effect on the relevant stakeholder, there should be a prior understanding of the holistic technological landscape as part of steps to reflect on broader society. Accordingly, policy formulation should not only address the risks factors that technology creates, which in turn requires efforts to ameliorate its impact, but also on how to effectively utilize and promote technology for more social purposes. Ms. Kim concluded with comparing government AI readiness across countries. She noted that Korea ranked lower than China and India, largely due to the absence of privacy laws and data availability, along with lack of government procurement of advanced technological products and AI startups.

Ms. Yuri Yoon explained that technology development is becoming a central concern for developing countries, as it is likely to have a direct impact on the achievement of other social indicators such as education and social inequality. In the World Economic Forum Report, it was reported that ASEAN youth wanted more on the job training and working overseas opportunities as a path to skills development. Accordingly, KOICA was implementing more STI-focused development projects such as its Creative Technology Solution (CTS) Program and Technical and Vocational Education and Training (TVET). KOICA was supporting projects to establish R&D infrastructure and cultivating core researchers in STEM fields via its CTS Program. For TVET, it partnered with the private sector by linking up youths with vocational training, which then incorporated them into firms' production chain after training. Ms. Yoon concluded that KOICA

was looking to expand ICT components into the education and infrastructure development projects, and to increase the scale for these programs via partnering with the private sector.

Q&A/Discussion:

Ms. Kim stressed that Korea's capacity in the ICT sector is overestimated. Although Korea is recognized as a leading country in IT, Ms. Kim pointed out that Korea has a very narrow competitive margin within the spectrum of the ICT sector. Even within the semiconductor industry, Korea is competitive in a particular department of the wider industry. Therefore, Ms. Kim explained that Korea's lack of AI specialists and data scientists is not surprising, considering that Korea lacks investment for basic science.

Ms. Dewan explained that the technological change will be just as applicable to the service sector. As technology restructures economic activities in industry 4.0, the technological effect will translate over to the service sector, given the interconnectedness between sectors. The logistics of service sectors will be impacted by the technological features of 4IR. Ms. Dewan identified global value chains and taxation as areas with strong regional implications in the 4IR. She explained that as production becomes more automated, the global value chain is likely to significantly diminish, or even collapse, in scale. She emphasized that the relationship between the technological aspects of 4IR and the geographical dynamics of global value chain require further research.

Mr. Junichi commented that the relative size of the domestic market was a key variable affecting the concerned country's prospects to remain as a production site in the global value chain. He explained that while larger economies provide an incentive for technological investment to firms, it is unlikely that smaller economies will attract as much investment for cutting-edge technologies due to an insufficient domestic market size. Therefore, larger economies within developing Asia will proceed faster in its adoption for 4IR technologies, which will in turn affect prospects to remain as a production site in the global value chain. He cited the case of India and Vietnam and noted that India was proceeding faster in automation than Vietnam.

Ms. Yoon specifically mentioned KOICA's recent projects with Vietnam to establish smart cities. KOICA promised to give comprehensive support for effective implementation of the project. Ms. Yoon stressed that these initiatives will further attract partnerships within the private sector.

REGIONAL/ INTERNATIONAL IMPERATIVES

The moderated discussion among experts explored on the types of policies, regulations, and institutional architecture needed for the Future of Work transition in Asia.

Moderated by **Anthea Mulakala**, Senior Director of International Development Cooperation of The Asia Foundation, the session featured:

Paul Vandenberg

Senior Economist
Asian Development Bank

Stephan Klingebiel Director
UNDP Seoul Policy Centre for Global Development Partnerships

Apichai Sunchindah Independent Development Specialist

John Karr Senior Director
Technology Programs
The Asia Foundation



Q1. ■ How are the FOW challenges we have been discussing being addressed at the regional level in Asia? If they are not being addressed, what are the main constraints (political, economic, institutional)?

Mr. John Karr explained that there was a big knowledge constraint particularly pertaining to net employment in the 4IR. There has been much speculations on sector-wide reduction in employment, with many of them lacking hard evidence in their projections. Mr. Karr noted that economic history suggests technology would be a net creator of jobs, albeit with dislocation.

Mr. Paul Vandenberg shared Mr. Karr’s thoughts that much of the expectations for the future of work was mainly driven by fear. Mr. Vandenberg pointed out that job loss due to automation would be accompanied with more employment opportunities in the aggregate when there was sufficient time for adjustment from the dislocation of jobs. Accordingly, it was crucial to conduct good knowledge work about the impact of technology and that regional and international organizations can provide the intellectual leadership in this regard. Additionally, Mr. Vandenberg identified the educational reform as another institutional constraint that many developing countries faced. Accordingly, development cooperation projects must factor such technological trends when supporting the educational sector in partner countries, so that their skilled workforce could stay relevant in the upcoming years.

Mr. Apichai Sunchindah commented that ASEAN faced a unique challenge. Given the scale of the organization and its state centric characteristics, ASEAN was institutionally constrained to formulate a cohesive regional approach to the challenges of the 4IR. Mr. Sunchindah projected that ASEAN would create a super committee to confront these challenges once there was consensus to act regionally. Simultaneously, if ASEAN were to overcome such institutional struggles, the region would witness a swift implementation of its 4IR strategies due to its large scale of regional cooperation. In effect, the institutional scale of ASEAN presented both challenges and opportunities for a cohesive regional approach in 4IR strategies.

Q2. ▣ From your respective organizational perspective, what are some actions being taken in preparing the region for technological change, and how are you engaging the private sector into your partnership?

Mr. John Karr explained that Asian Foundation is working with Microsoft to research the dynamics of the future of work within the context of ASEAN. The research focuses on the capacity of firms and states, whether they are equipped with the data and the analytic capability to collect information on labor market shifts in real time. Additionally, Asia Foundation addresses improving existing government policies and training tools in the up-skilling and re-skilling of workforces amidst varying skills demand from the industrial sector. Mr. Karr added that, referring back to the previous question, domestic politics was a big constraint in instituting the necessary transitions. With developing countries deriving much of their growth via labor over the years, it has also produced entrenched interests around such economic arrangements. The transition towards a digital economy will require uprooting these local interests, along with generating a technical consensus on the way forward. The Asia Foundation will be addressing these 4IR challenges through its publications in the coming months. The institution was also collaborating with APEC to discuss policy matters in the 4IR context. On the whole, The Asia Foundation is playing a role in driving consensus, within each domestic context, on the need for structural reform that supports the new industrial climate and in supporting reformers who will initiate these changes.

Mr. Stephan Klingebiel mentioned two instances of private sector partnerships with the UNDP. UNDP cooperated with Samsung, where the recent line of the company's phones had a preinstalled application that showcased SDG goals and linked interested consumers with ways to contribute in UN's mission. Additionally, Mr. Klingebiel introduced UNDP's partnership with IKEA in India. UNDP connected IKEA, which was in need of specialized skills and sophisticated labor force, with women in India, who were hampered from joining the labor market due to local regulations and cultural norms. IKEA provided specialized training to nurture the necessary skills to incorporate women in India into its production process.

Mr. Paul Vandenberg highlighted some of Asian Development Bank's work with Indonesia. The Indonesian government requested a full mapping of demanded skills across sectors and industries. Approached conventionally, this was an expensive enterprise, which required a survey of each sector's needs. Coupled with the costly nature of the work, the effort was so time consuming that once the report was fully compiled, it was at best relevant for a short time due to rapidly changing skills demands. "Web scraping", which gathers all data put out by job recruitment sites to determine industrial needs was a faster, more relevant method to investigate

on skills demands. However, Mr. Vandenberg distinguished that the “web scraping” approach only worked in economies that had a well-represented labor market data on these job sites. Mr. Vandenberg concluded that Asian Development Bank was looking to expand cooperation with the private sector, specifically with Amazon Web Service, in an effort to upgrade people in their skills to utilize digital platforms.

Mr. John Karr emphasized the need to establish relationships with the private sector in an effort to open up the proprietary data to formulate solutions for many social concerns pertaining to future of work challenges.

Q3. ■ Is there a role for ASEAN to play in enabling partnerships with the private sector?

Mr. Apichai Sunchindah highlighted that ASEAN incorporated the private sector with its BAC (Business Advisory Council) department, which holds regular events in parallel with the summits. ASEAN-BAC is proposing for guidelines in skills development for 4IR and initiating the AHEAD (ASEAN Human Empowerment and Development) program to address these development challenges. Mr. Sunchindah highlighted that the key for the partnership was how the public and the private sector interfaced with each other, with the private sector having its own reluctance to work with the slower public sector. The partnership scheme gets even more complicated once multinational corporations are included, which then involves global bargain components.

Q4. ■ What can China do in factoring in these future of work challenges? How can regional and multilateral organization engage China in their development schemes for the 4IR?

Mr. John Karr explained that if future of work were to trigger re-shoring, then China would struggle. If firms could manufacture products in developed countries via robots, corporations could bypass the whole China factor, which is a difficult equation just on its own, and the comprehensive management costs involved with offshoring.

Mr. Paul Vandenberg pointed out that China was the world’s largest purchaser of robots. There was another possibility that China bandwagons on industry 4.0 to implement robots in their production line, effectively retaining much of its production capacity while undergoing the technological change themselves. Additionally, Mr. Vandenberg identified ongoing security concerns of Chinese surveillance in implementing Chinese technology such as the 5G network.

Mr. Stephan Klingebiel stressed for more discussion on the development consequences of China’s BRI initiative in relation to 4IR.

Q&A/Discussion

Mr. Gordon Hein pointed out that private sector’s increasing role in the development of skills for youths can create a healthy competitive dynamic that accelerates for education reform, where many Asian educational bureaucracies are overly centralized and lacking adaptability to the skills demanded in the private sector.

Ms. Saowaruj Rattanakhomfu pointed out that private sector’s involvement in education in Thailand was inevitable considering 20 ministers of education and the overblown bureaucracy.

The constant shuffling of ministerial level officials made it impossible to retain policy continuity in education. Ms. Rattanakhamfu further elaborated that web scraping and survey methods could be used complementarily depending on circumstances. In order to assess future demands of skills, surveying leading companies on prospective skills needs would be more appropriate, given the absence of online data for future demands.

Mr. John Karr elaborated that private companies should unlock their proprietary data, when doing so would be central in formulating better social solutions such as in the case of employment problems in the coming 4IR. Therefore, partnerships with the private sector should be brokered politically to help reorient private sector's impact on society.

AUTHOR'S WORKSHOP

Jointly organized by the Korea School of Public Policy and Management and The Asia Foundation, the Seoul Author's Workshop provided a forum for focused discussion on the forthcoming publication about the 4IR challenges in respect to development cooperation. At the workshop, participants shared draft thesis statements to discuss and improve the direction of their papers.

INTRODUCTION TO DEVELOPING AN OUTLINE



Suzan Nolan, Director of BlueSky International, briefed the authors on the components of a strong outline. She cautioned the authors about the word limit – 5,000 words– which will require their chapters to be focused and not too wide-ranging. She also reminded the authors to be aware of their audience, and to assume that readers do not possess background knowledge of the authors' topics.

PRESENTATION, DISCUSSION, AND CHOICE OF THESIS STATEMENTS

Each author presented three thesis statements, which were then critiqued by the editors and authors. Thesis statements were edited on the spot. Based on the discussions, the authors chose and improved upon one thesis statement and built an outline, which was presented and discussed on Day 3.



Rethinking National Strategies on the Future of Work

Mr. Randeep Sudan

Former Digital Strategy Advisor & ICT Practice Manager at The World Bank

New Thesis:

National strategies on the future of work (FoW) should be formulated differently from conventional strategies of development, which are unable to keep pace with fast-changing technologies and business models. Policymakers should leverage strategic futures thinking, real-time analytics, and shorter execution cycles while formulating FoW strategies. Policymakers should also support the development of human and organizational capabilities using blockchain-based expert networks and initiatives like digital twinning.



**ASEAN Online Platform for Innovative Development Cooperation
in the Context of the Future of Work**

Apichai Sunchindah
Independent Development Specialist

New Thesis:

The 4IR era has heralded the production of an immense amount of data and information but much of this is not in the public domain and not readily accessible nor optimally structured or utilized. Therefore, ASEAN should demonstrate its relevance by creating an open information clearinghouse in order to tap into this rich resource for advancing the region's and the individual member countries' development goals.



From Digital Literacy to Digital Fluency: Bridging the Digital Gender Divide

Zothan Mawii
Research Fellow at Tandem Research India

New Thesis:

Since work is increasingly mediated by new technology, digital access or basic digital literacy alone will not be enough to leverage women's opportunities presented by digital technologies. A digital gender divide exacerbates existing inequities in the labour market. Digital fluency or the ability to select and use appropriate digital technologies for a specific outcome will be crucial for women to access work opportunities. India should bolster women's labour force participation through initiatives to build digital fluency through partnerships between the public and private sector.



**How to enhance the digital workforce
through strategic public-private partnership in Thailand**

Saowaruj Rattankhamfu

Senior Research Fellow at Thailand Development Research Institute

New Thesis:

Since the education system in Thailand cannot adequately supply a sufficiently-skilful digital workforce needed for industry, high-technology companies have pursued partnerships with the public sector; and in turn the public sector should encourage such partnerships along with international capital investments in order to create the needed 4IR workforce.



**Digital Data Sharing as the precondition for a full-fledged
and inclusive digital workforce in Cambodia**

Lim Ratha

Deputy Director at the Cambodia Development Center

New Thesis:

In order to face employment challenges such as skill gaps... and to ensure that the 4IR will not leave any citizen behind, Asian governments, private sectors, civil societies and cooperation agencies must share data in order to co-create viable solutions. Cambodia has demonstrated how

such sharing can occur in the banking and telecommunication sectors, and even the agricultural sectors that might be an inspiration for other countries.

SHARING DRAFT OUTLINES

Based on the discussions of the day before, authors presented their new thesis statements and supporting statements and received feedback from the group. The discussion reminded authors to focus on Asian development cooperation and 4IR challenges, as well as to present a clear argument in their thesis statements. Through this session, authors worked on wording and content and were able to focus their thesis statements further. [Final outlines were submitted by the end of the workshop \(see Appendix\).](#)

PREPARING PAPERS FOR PUBLICATION

Suzan Nolan of BlueSky International, briefed authors on the critical components of a publishable paper. Using examples and exercises she reviewed how authors should use the active voice when writing, how to properly cite sources and paraphrase, and how to build a bibliography.

Anthea Mulakala also mentioned that the writers should use real-world examples in their papers to strengthen their arguments and to make their ideas more concrete.

Subject	Deadline	Note
First Drafts	Jan, 2020	Due to Anthea. Based on outline agreed at Author’s workshop
Second Drafts	March, 2020	Due to Anthea. After receiving feedback on first draft with inputs from BlueSky
Third Drafts	April, 2020	Due to Anthea. (If needed), after receiving feedback on second draft
Drafts passed to BlueSky	May, 2020	After content, citations, and length are satisfactory to Anthea
At least 3 rounds of editing with BlueSky	July-September, 2020	Copy editing for diction, grammar, connective tissue
Final Drafts	October, 2020	Multiple back and forth edits between authors and editors (Suzan Nolan)
Final Publication	December, 2020	Manuscript published

APPENDIX : FINAL THESIS STATEMENTS AND OUTLINES

1. Artemy Izmetiev, Stephan Klingebiel

The Role of Development Cooperation in formulating transitional policy frameworks for the Future of Work

Thesis Statement:

The Fourth Industrial Revolution will disrupt industries and markets worldwide, likely affecting developing countries disproportionately, exacerbating inequalities [such as XYZ] that have worsened over the past 25 years. While development cooperation has an important role to play in addressing capacity gaps, managing risks and exploiting opportunities, current practices mostly focus on spreading the benefits of technology and fail to address the most fundamental challenges. In order to fulfil the promise of “leaving no one behind”, at the heart of the agenda 2030, governments, civil society and the private sector should work together to address the most critical threats to equality of opportunity, social justice, decent work standards, personal privacy [etc] with an equitable and ethical regulation and policy framework

1st supporting topic

Reducing skills mismatch and mitigating rapidly growing income inequality will be the biggest challenges in the coming years due to the 4IR. These challenges have far-reaching implications as they may require restructuring existing education systems and welfare policies. It is necessary to find a balance between rewarding companies for innovation while simultaneously implementing income redistribution policies that reduce extreme wealth inequality and guarantee a certain standard of living among individuals. While a set of policy measures is being debated (including progressive taxation, more adequate pension systems and UBI) many developing countries may find their implementation unaffordable.

Furthermore, there is a need for greater mentorship to inform individuals of a rapidly transforming labour market and the future of jobs. Government efforts to reduce skills mismatch need to include retraining opportunities, affordable education and the encouragement of women/girls into STEM education. Greater encouragement of women into STEM is crucial to the future of work and an inclusive job market. Failing to take advantage of the intellectual capacities of half the population would be a major blunder as we transition to a labour market that necessitates innovation, life-long learning, and critical thinking.

2nd supporting topic

A judicious use of technology combined with the right policy mix, can enable some countries to leapfrog others in their development paths. This is because they are farther away from the technological frontier, hence have more to gain from embracing the latest technology. They typically do not have large legacy systems, hence the inertia stemming from massive sunk costs does not hold them back. At the same time, they often face more constrained fiscal space and have less human capital than developed countries.

Development policies and trajectories will need to be re-evaluated within this context.

They will need to move away from traditional development paths and create new ones.

This can create new opportunities for development cooperation and increases the importance of technology transfers, knowledge sharing, data sharing, and technical training. Current models, often biased towards promotion of benefits of 4IR, often fail on the most important aspects—policy and regulatory frameworks. Development organizations have an important role to play here, since they have a comparative advantage in the realm of policy research, implementation mechanisms/models and knowledge sharing.

3rd supporting topic

In the long-run, 4IR will have primarily positive impact on development, gender equity and quality of life, however the transition period can be extraordinarily demanding without adequate response by the government, private sector and civil society. Furthermore, there are certain challenges that are specific to developing countries and will have a greater impact on those economies. For example, automation will have a major impact on manufacturing and agricultural sectors and will greatly reduce the amount of low-skilled jobs available. This process will have the greatest impact on certain developing countries, where a large majority of jobs are in those sectors and it will result in greater challenges for income inequality and poverty reduction, in the short-run.

The role of development cooperation can be to manage this transition; to mitigate negative consequences associated with increased inequality and vulnerability in certain sectors. This role will include addressing challenges specific to developing countries and finding solutions for specific country-contexts. It will also include restructuring education systems and formulating legal frameworks that respond to issues related to privacy, data collection and anti-trust regulation.

Conclusion

1. Current trends of adoption of technological innovation in many developing countries send a warning signal of the possible consequences of the 4IR on the labor market and socio-economic development. In the context of the 4IR, “leaving no one behind” would require more equal distribution of its benefits and better mechanisms for sharing the risks and rents/revenues. At the same time, at present, the focus on the spread of the benefits of technology is inadequate and does not address the most important issues related to necessary legal frameworks and regulations.
2. Development cooperation has a role to play to smoothen the transition process, by making it people-centered. In order for it to do so, genuine partnership among various stakeholders –governments, civil society, private sector –is required. North-South and South-South and triangular cooperation –all have a role.
3. Development cooperation can play a major role in supporting countries as they formulate policies to manage the disruption that the 4IR will bring to economies, societies and politics. This context requires policy formulation to take a long-term horizon; it cannot be reactionary as in most cases. It requires long-term investments in education, changes to the structure of the education system, encouragement of youth into the right sectors, plus redistributive taxes, privacy rules, anti-trust and anti-monopoly regulation etc. It also requires formulation of coherent strategies to ensure maximum synergy of development cooperation with other polices.

Rethinking National Strategies on the Future of Work

Thesis statement

National strategies on the future of work (FoW) should be formulated differently from conventional strategies of development, which are unable to keep pace with fast-changing technologies and business models. Policymakers should leverage strategic futures thinking, real-time analytics, and shorter execution cycles while formulating FoW strategies. Policymakers should also support the development of human and organizational capabilities using blockchain-based expert networks and initiatives like digital twinning. There are opportunities for policymakers to forge regional alliances to be more effective in pursuing strategies on the future of work.

1st supporting topic

National FoW strategies tend to follow conventional approaches of near term thinking and slow refresh cycles. We will review and compare a sample of national FoW strategies using a set of well-defined criteria. Such criteria could tentatively include strategic futures thinking, lifelong learning, helping workers through transitions, gig economy, social protection, gender equality, labor market analytics, real-time data capture, data sharing, labor market regulation, public-private partnerships, development of skills vs. capabilities and strategy refresh rates. We intend to refine these criteria in the course of our research.

We will highlight the example of Singapore's approach to FoW as representative of good practice.

After the exercise, we hope to demonstrate the following weaknesses in most national strategies:

1. lack of strategic futures thinking and slow refresh rates for strategies,
2. missing labor market analytics and real-time data capture and sharing,
3. generic broad-brush approaches instead of agile and actionable responses to fast-changing labor markets, and
4. an exclusive focus on skills without a complementary approach to developing capabilities.

2nd supporting topic

Strategic futures thinking and faster strategy cycles are critical to addressing emerging FoW issues. We will discuss the approach adopted by Singapore's Centre for Strategic Futures in this regard. Besides, we will also present successful examples drawn from the private sector, including Cognitive Edge and Scifutures.org.

While pursuing over the horizon opportunities, policymakers should refresh FoW strategies in shorter cycles – an example being Singapore's move from biennial to quarterly reviews of emerging strategic issues.

3rd supporting topic

Data is critical to designing effective FoW strategies. We will look at existing labor market-related data collected by a sample of governments, as also by private sector players like Burning Glass, EMSI, and LinkedIn Talent Insights.

We will establish the importance of real-time data capture and its implications for designing just in time training programs, systematically developing talent pools, and attracting employment creating investments. We will discuss using data for developing skills adjacency maps that can prove invaluable in offering skilling pathways for individuals.

4th supporting topic

The development of enduring capabilities will be critical for preparing for FoW in addition to the development of short-term skills. We will discuss OECD's conceptual learning framework and research from Deloitte's Center for the Edge on the development of such capabilities. We will argue that organizations and individuals should develop capabilities through active and collaborative problem-solving. Governments, in partnership with the private sector, should create a national and local inventory of problems with clearly identified problem owners (an excellent example of this approach being Singapore's Hackcelerator program for Fintech).

We will emphasize the importance of expert networks in helping problem solve and support transitions to new jobs and business models. We will discuss currently available expert networks and describe some promising approaches for making expertise affordable using blockchain and smart contracts.

We will describe a potential program on digital twinning that can help countries to better prepare for future disruptions in labor markets and enable faster development of skills and capabilities.

Conclusions

1. Governments should incorporate strategic futures perspectives while developing FoW strategies. They should refresh such perspectives over faster strategy cycles.
2. Governments should support the acquisition and analysis of data that will allow insights drawn from a holistic understanding of foundational shifts taking place in the economy and society, as also identify opportunities and challenges that are more immediate and require agile responses.
3. Governments should support the development of enduring capabilities in addition to skills for both individuals and organizations.
4. Such capabilities are best developed with help from expert networks and through initiatives like digital twinning.
5. There are opportunities for regional collaboration in pursuing 1- 4 above.

3. Apichai Sunchindah

ASEAN Online Platform for Innovative Development Cooperation in the Context of the Future of Work

Thesis Statement:

The 4IR era has heralded the production of an immense amount of data and information but much of this is not in the public domain and not readily accessible nor optimally structured or utilized. Therefore, ASEAN should demonstrate its relevance by creating an open information clearinghouse in order to tap into this rich resource for advancing the region's and the individual member countries' development goals.

Introduction

In connection with the roll out of its 4IR strategy expected in 2020, ASEAN should then establish a digital platform to collect, store, share and leverage the wealth of knowledge and experience from within the Southeast region and beyond for innovative development cooperation purposes particularly in relation to the Future of Work (FOW) issues.

1st Supporting Topic

Numerous information portals exist within the various ASEAN sectoral areas of cooperation but most of them operate in siloed fashion and have restricted access which limits the full utility of such systems by the wider public.

Limited to government officials

Not kept up to date; expensive to maintain; underutilized Examples

2nd Supporting Topic

- ASEAN has often been criticized (CITATIONS) as being bureaucratic, elitist, top-down or merely a talk shop. The 4IR or digital revolution could provide the timely opportunity as the change agent for ASEAN to live up to its aspirations of being truly people centered and responsive especially to such critical human well-being matters like jobs and employment prospects and risks.

3rd Supporting Topic

The essence of an open platform would be to help define ASEAN priorities on key development challenges pertaining to 4IR such as the Future of Work and create a more transparent and accessible pathway (or mechanism) that allows many other actors to align with, contribute to, and invest in progress towards these priorities.

Open governance systems tend to promote transparency and accountability and be less prone to corruption and illegal practices

- Drawing inspiration from the Singapore Government's GovTech agency, and the Indian Government's "India Stack" open data project, this approach acknowledges that there are many ways to solve a problem, and governments within ASEAN can benefit from opening up the process for innovation and diversity of ideas.

4th Supporting Topic

For ASEAN to be a catalyst in this way, it will need to facilitate and/or enable the broad spectrum of entities to work within its overall framework and would help better ensure ASEAN's relevance and visibility in the eyes of the public in its response to the imperatives brought about by such challenges as the FOW in the 4IR context.

In order to achieve such an open, accessible, useful platform, ASEAN must overcome the following challenges: XYZ

First step: identify problem

Second step: do research (describe it)

Describe key findings in general and as they pertain to Future of Work

My recommendations include ABC

Conclusion:

Creating a single integrated open platform working towards shared goals would enable more meaningful collaboration between entities resulting in collective benefits at large rather than restricted to a selected few entities at the moment which are often unnecessarily duplicating or competing with each other and thereby reducing the best use of resources, time and efforts.

From Digital Literacy to Digital Fluency: Bridging the Digital Gender Divide

Thesis Statement

Since work is increasingly mediated by new technology, digital access or basic digital literacy alone will not be enough to leverage women's opportunities presented by digital technologies. A digital gender divide exacerbates existing inequities in the labour market. Digital fluency or the ability to select and use appropriate digital technologies for a specific outcome will be crucial for women to access work opportunities. India should bolster women's labour force participation through initiatives to build digital fluency through partnerships between the public and private sector.

1st Supporting Topic

Work is increasingly mediated by new technologies and digital fluency is increasingly becoming extremely crucial to leverage new opportunities for work.

- The platform economy has grown exponentially in recent years. There are different kinds of digital work platforms that cater to workers with different levels of skills. For eg. On – demand services, location-based work platforms, online work, and job-matching platforms
- Some governments have recognised their potential to create job opportunities and formed partnerships with platforms or included them in national policies for job creation. Eg. India's memorandum of understanding with Uber, Airbnb etc.,¹ Philippines and Nigeria – national policies.²
- Job search platforms and online reputation systems are becoming more common, therefore establishing a digital identity or online presence is important not just for job opportunities but also to access financial services, insurance etc.³

2nd Supporting Topic

Women in India face numerous barriers to gaining digital fluency and therefore participating in the labour force

- Existing inequities in the market include 1. Women being relegated to low wage jobs 2. Gendered division of labour 3. Gender pay gap 4. Socio-economic norms. Digital gender divide will exacerbate this unequal access to work opportunities
- What is digital gender divide? How will this impact women's labour force participation?⁴

¹ <https://economictimes.indiatimes.com/small-biz/startups/nsdc-signs-deal-to-train-uber-ola-drivers/articleshow/57009681.cms?from=mdr>,
<https://www.medianama.com/2018/06/223-airbnb-rural-india/>,

² <https://fowigs.net/wp-content/uploads/2017/12/Capitulo1-2.pdf>

³ <https://www.cgap.org/research/publication/fintechs-and-financial-inclusion>, conversations with policy analysts in fintech and fintech startups

⁴ https://link.springer.com/chapter/10.1007/978-981-13-1414-8_14;
https://in.boell.org/sites/default/files/uploads/2013/10/gender_brouchure_xxiv_10_october_2017_final.pdf;
<http://www.forbesindia.com/blog/technology/digital-gender-gap-where-have-the-internets-women-gone/>;
<https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2019/02/Digital-Equity-Policy-Brief-W20-Japan.pdf>

3rd Supporting Topic

What is digital fluency? How is it different from digital literacy?⁵ Why will it be important to have digital fluency to access job opportunities?

- Digital fluency not just digital literacy will be important to leverage opportunities of digital economy in India. Digital literacy is the ability to operate a basic device with basic functionalities. For eg; being able to access the internet through a mobile device, use basic social media apps for entertainment, or to access crucial information related to public services, health etc.
- Digital fluency on the other hand involves a more rigorous engagement with digital tools allowing users to analyse, evaluate, and process multiple streams of information.
- As seen above...job platforms, technology to work processes etc.

4rd Supporting Topic

Government or PPP can support and enhance women's labour force participation in India by investing in digital fluency initiatives in

- Google and Tata Trust⁶ (*)
- Microsoft digital skilling Initiative (*)
- How useful have these initiatives been in enabling women's access to labour markets
- What are the gaps/successes/obstacles of these initiatives to enable women to leverage opportunities in the digital economy?

⁵ <https://www.futureworkiq.com/post/2017/11/24/digital-literacy-vs-digital-fluency>

⁶ Google contact from Saowaruj

How to enhance the digital workforce through strategic public-private partnership in Thailand?

Thesis statement:

Since the education system in Thailand cannot adequately supply a sufficiently-skillful digital workforce needed for industry, high-technology companies have pursued partnerships with the public sector; and in turn the public sector should encourage such partnerships along with international capital investments in order to create the needed 4IR workforce.

1st supporting topic:

Thailand has large pool of information and communication technology (ICT) and engineering graduates, but they lack the specific digital skills needed by industry. The main problems of education system in Thailand are that curricula are out-of-date, and some curricula do not contain enough essential IT contents, such as information systems technology and user experience design.

- Statistics to support (source: Labor Force Survey (for data on workforce), Office of Higher Education (for data on graduates and curricula))

2nd supporting topic:

In need of skilled digital workforce, the private sector-initiated training programs, labs, and technology showcase in partnership with the public sector to train workers to support their work.

- Case studies of LASI project (led by Denso) and Delta Automation Academy (led by Delta Electronics)
- Analyze why and how the above case studies are successful. (Interview with Denso and Delta for more information)

3rd supporting topic:

These case studies demonstrate why and how the public-private partnership (PPP) can enhance the digital skill of 4IR workforce to meet the industry's demand. However, the government can do more to encourage and scale up PPP projects like the above and others by learning from past experience and international best practices.

- In order to enhance the PPP, the government needs to overcome the limitations and challenges of existing policies (Interview with Denso and Delta for more information)
- They could also learn from best practices (e.g. Singapore and Taiwan) to promote these PPP projects
 - Singapore
 - <https://www.tech.gov.sg/media/technews/accelerating-digital-transformation-with-public-private-partnerships>]
 - http://mckinseychina.com/wp-content/uploads/2017/10/McKinsey_Taiwans-Digital-Imperative-EN.pdf
 - Taiwan
 - https://csis-prod.s3.amazonaws.com/s3fs-public/publication/190327_ChinaPowerProject_TUPP_WEB.pdf (page 17)

4th supporting topic:

In order to achieve and enhance PPP and increase FDI, I recommend Thailand better support the PPP projects to create a large pool of 4IR workforce as follows.

- Thailand should set the clear target to be a leading nation in the areas which it has comparative advantage, such as system integrators, through the PPP consultations, plans and implementations.
 - Which areas are Thailand's comparative advantage in digital workforce (to grasp the opportunities in gig economy)? Why?
 - How to promote them?
- The new approach on attracting FDI should focus more on the national ability to supply large pool of digital talents needed by companies by linking local universities and foreign companies working closely and efficiently. (How? Pilot project in the EEC? more detail)

6. Lim Ratha

"Digital Data Sharing as the precondition for a full-fledged and inclusive digital workforce in Cambodia"

Key words: Digital Data Sharing, Inclusive, Digital workforce, Cambodia.

Thesis Statement:

In order to face employment challenges such as skill gaps... and to ensure that the 4IR will not leave any citizen behind, Asian governments, private sectors, civil societies and cooperation agencies must share data in order to co-create viable solutions. Cambodia has demonstrated how such sharing can occur in the banking and telecommunication sectors, and even the agricultural sectors that might be an inspiration for other countries.

Introduction:

Asia, as many other regions around the world, cannot escape in this digital era from the fourth Industrial Revolution (4IR).
 an interesting collective approach in addressing common interest such as the digital skill gaps and ICT solutions for
 More and more Asian countries adopt digital economy as their new pathway of development. Despite the fact that the region has greater potentials for digital transformation, participation of digitally literate citizens is imperative for inclusive growth and full benefit of 4IR. To catch up with that, governments, private sector, civil societies and cooperation agency have made many individual efforts in the hope of catch up with the pace of technology development. Nevertheless, common solution through data sharing might be the best solution for all.

Topic 1: DESCRIBE EMPLOYMENT CHALLENGES AND WHY PEOPLE MIGHT BE LEFT BEHIND

Topic 2: Digital Data Sharing: the new good practice for overcoming 4IR's challenges

It's not happening or optimized, why not? – Privates sectors do not want to share/legal protection => it should sharing

Topic 3: Preliminary evidence of digital data sharing cooperation in Cambodia

Banking and telecom as example, Show the path way in Cambodia

Topic 4: AGRITECH: TO NOT LEAVE ANYBODY BEHIND: FARMER EXAMPLE (FAO's example, block chain)

- Contrast way of doing in Cambodia with other existing mechanism (if there is)
- How many farmer in all, effect on the livelihoods, on works and employment

Topic 5: Challenges to overcome and extra opportunity/ and how to make it happen

Conclusion

Suggestion for the way forward how to prepare the work

7. Soyoung Kim

Co-Designing Technology and Policy for Asian Development

Thesis statement

Emerging technologies driving the Fourth Industrial Revolution are impacting Asian societies with unprecedented scale and speed. How to meet the challenges of physical-biological-digital convergence of the Fourth Industrial Revolution requires reflective evaluation of existing models of growth and governance in Asia – especially the technology-for-growth model and the catch-up strategy). Successful socioeconomic and technological transformation in the face of the Fourth Industrial Revolution depends on how to re-imagine the potentials of emerging technologies and to reorganize technology policy in a way to integrate socioeconomic constraints and concerns into technological designs.

1st supporting topic

Often considered synonymous with digital transformation, the Fourth Industrial Revolution has recently taken its own prominence in government policies in Asian countries. While it is true that much of technological potential underlying the Fourth Industrial Revolution is based upon digital technologies, it must be noted that the Fourth Industrial Revolution is much more than simple applications of digital technologies to existing social and economic problems. Despite the criticisms about its historical nomenclature, the Fourth Industrial Revolution is distinct from major technological changes of the past in terms of a few features:

1. integration of physical-biological-digital worlds,
2. magnitude of disruptions to existing regulatory regimes, and
3. non-linearity of changes requiring transformative thinking in policy design

We provide prominent examples from several Asian countries showcasing such features including South Korea's explosive controversy over the ride-sharing platform, Tada.

2nd supporting topic

Recent changes brought by technologies driving the Fourth Industrial Revolution such as artificial intelligence, blockchain, Internet of Things, virtual/augmented reality, autonomous vehicles, drones, precision medicine, etc. pose fundamental challenges to the premises and assumptions that have governed the existing regulatory regimes and models of growth and development in Asia.

For example, the East Asian development model underpinning the remarkable growth of East Asian countries and benchmarked by other Asian countries to varying degrees presupposes strong government capabilities to “pick the winners” for strategic promotion, whether firms, sectors or technologies. In the face of the blurring of physical-biological-digital worlds, it is increasingly difficult to identify and promote a particular technology in the anticipation of future growth potentials, for the market effects or social impacts of a given technology can be much more expansive and extensive than assessed by current levels of expert knowledge. We highlight several country cases of regulatory challenges from the arrival or introduction of the aforementioned Fourth Industrial Revolution technologies including the problem of privacy protection in the AI-driven analysis of medical big data and the problem of worker protection in the gig economy.

3rd supporting topic

Regulatory challenges from emerging technologies of the Fourth Industrial Revolution require re-thinking of both technology and policy. This means moving away from the traditional mode of thinking in technology promotion policy developing technology first and policy afterward to the new approach of developing technology and policy simultaneously. Expanding the emerging technology governance framework that the World Economic Forum is pioneering through its Center for the Fourth Industrial Revolution, we will make the case that successful socioeconomic and technological transformation in the Fourth Industrial Revolution depends on how to reorganize technology policy in a way to integrate socioeconomic constraints and concerns into technological designs.

In particular, we explain four key features of co-designing technology and policy – namely, (i) thinking systems, not individual technologies, (ii) values and ethics integrated as core features of technology designs rather than bugs or side issues, (iii) empowering users rather than determining their choices, and (iv) thinking technological trajectories by design, not by default. This co-designing perspective requires us to re-imagine the potentials and risks of emerging technologies so that all stakeholders can proactively engage in the design process of technologies from the upstream development stages.

With this co-designing perspective, we will examine some of the prominent best practices of technology policymaking that are recently emerging in Asian countries and analyze factors or conditions favourable to successful transformation so that workable references can be developed in the near future.

Conclusions

1. Recent technological development underlying the Fourth Industrial Revolution is creating far-reaching impacts across different domains and sectors in Asian countries.
2. Existing regulatory regimes and growth models – especially the East Asian development model – are facing great challenges from the Fourth Industrial Revolution, as it is becoming increasingly hard for the government to rely on strategic promotion of a particular technology as it did before, due to unprecedented possibilities of technological convergence.
3. Such challenges require a re-thinking of emerging technology governance to move beyond the existing paradigm of technology policymaking of developing/promoting technology first and taking care of side effects or risks afterward.
4. Governments need to adopt the perspective of co-designing technology and policy and pilot best practices thereof so that key social constraints and concerns can be integrated from the upstream stage of technological design, which will result in much better regulatory outcomes.
5. This co-designing perspective will help to pioneer new approaches or strategies for socioeconomic development in the Asian region in the era of the Fourth Industrial Revolution.

Policy Agility for Skills Instability: Enhancing Regional Cooperation to Prepare for the Future of Work

Thesis statement

In an era of rapid technological change, policymakers must work across conventional boundaries - collaborating with new partners domestically and inter-regionally to improve data and evidentiary resources, enhance human capital, and develop agile policy responses to a changing economic landscape.

Introduction

The technologies that underlie the Fourth Industrial Revolution are notable for two reasons: the speed at which they have evolved and spread, and their close integration with or emulation of fundamental human abilities.

These new technologies - including artificial intelligence, the internet of things, additive manufacturing, and cloud computing, among others - are changing the shape of human labor by placing greater demands on workers' creative, communicative, and digital skills while devaluing rote and repetitive work and enabling many tasks to be accomplished online from anywhere in the world.

Such changes can be troubling for workers and employers accustomed to older technologies, leading to many tough questions around the future of work and, in some cases, distrust of newer stakeholders.

However, attempting to stave off disruptive innovation by preserving outdated modes of labor is not an effective long-term strategy, nor does it make the best use of the vast new resources available to policymakers.

Instead, Asian governments can harness the transformative potential of the Fourth Industrial Revolution to advance new partnerships and access new forms of knowledge within the region.

1st supporting topic

New (4IR) technologies - AI/ML, data analytics, IOT, additive manufacturing, etc. - are developing extremely rapidly and changing the skills requirements and job demands in Asia-Pacific economies. E.g. impacts on agriculture (IOT, data), manufacturing (AM, automation), etc. In general, humans will be required to do fewer rote/mechanical tasks and to do more knowledge-intensive work, communication, and creative problem-solving, often interfacing closely with newer digital systems. This has profound implications for jobs, skills development, and education.

2nd supporting topic

More broadly, Asia's regional economy is growing more interconnected through digital networks and labor migration. There is a global trend away from trade in goods and toward trade in services - especially in digital services, which are relatively unconstrained by borders. Migration of workers from LDCs and developing economies to AMICs and highly developed economies also has a significant impact on both sending and receiving countries, which should be considered when addressing 4IR transformation.

3rd supporting topic

Governments in Asia are attempting to understand and manage the change brought by 4IR, but it's a challenging task, hindered by limited data sharing and siloed decision-making. Most governments in Asia (and elsewhere) do not have even close to real-time visibility into the labor market, and trust and understanding between the technology industry and government regulators is often thin. On the other hand, some interesting positive case studies exist in AMICs/developed economies like Singapore (industry transformation maps) and Malaysia (critical occupations list). Without effective knowledge transfer and data-sharing among economies and across sectors/ministries, Asian governments are losing out on valuable resources that would help them prepare for 4IR changes.

4th supporting topic

A corollary aspect of 4IR is the empowerment of new actors in the digital economy – e.g. startup founders and software developers – to take on important roles and pave the way for future innovation. These actors are highly mobile and seek to scale quickly across the region (cf. Grab). Governments can work more collaboratively and productively with these entities to create forward-looking, regionally-harmonized policy frameworks that expand consumer choice while preserving safety and rights of vulnerable groups. By creating spaces for collaboration and experimentation - e.g. regulatory sandboxes and co-creation processes - governments can also better understand the future of the economy and the job market and take more effective, responsive actions to ensure the workforce has the skills/competencies to succeed.

Conclusions

An era of rapid technological change requires corresponding innovation and adaptation among governments. The adoption of "Industry 4.0" policy frameworks among many governments around the world is an important step that must be matched by a real commitment among policymakers to more dynamic, collaborative decision-making and communication. Fortunately, interesting and promising solutions exist across the region, particularly around the use of data and the creation of spaces for collaboration between governments and newly emerging digital economy actors. These activities are important because they imbue governments, educational institutions, employers, and workers with greater agility and resilience: qualities that are necessary for adaptation to the 4IR economy.