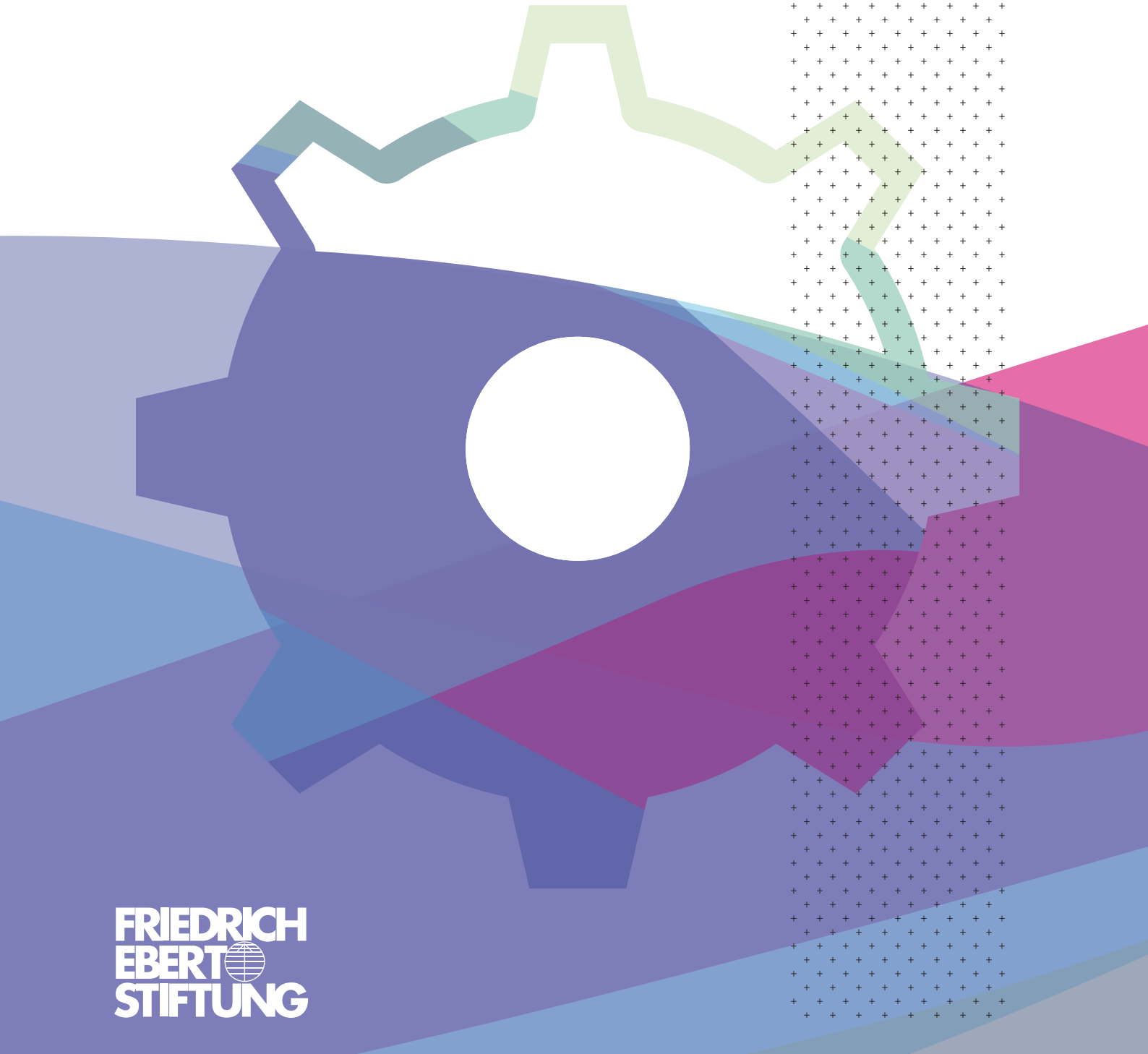
Unionism and the Future of Work in ASEAN

Challenges and Strategic Choices

Dr. Rene E. Ofreneo



FRIEDRICH EBERT STIFTUNG

Unionism and the Future of Work in ASEAN
Challenges and Strategic Choices

December 2019

Contents

Introduction X

I. Labour and the Technology Revolution in ASEAN: An Outline of Policy Challenges 2

Embracing change, building resilience 2

Fourth Industrial Revolution compared with the first three Industrial Revolutions: What are the rules? 2

Threat of job disruption in the ASEAN region 4

Industrial restructuring under the Fourth Industrial Revolution: The trend towards a leaner human resources management system 6

The war for talents and the tripartite call for training and education that is fit for purpose 7

Rise of freelance workforce: The "invisibles" and the "visibles" 8

Policy response to Fourth Industrial Revolution labour concerns 10

The importance of social dialogue to address economic, technological and labour issues 11

II. How is the Fourth Industrial Revolution Shaping the ASEAN Labour Markets? 14

Some characteristics and trends in the ASEAN labour market 14

Impact of Fourth Industrial Revolution on the ASEAN labour market: Disruptions, displacements and emerging labour concerns 17

Structure of the ASEAN labour market: Likely changes in industry, agriculture and services sectors 18

Participation in Factory Asia and GVCs of multinational companies: Is reshoring happening 19

Shrinking agricultural labour force in the ASEAN region 22

Fourth Industrial Revolution and job creation in the expanding services sector 23

ASEAN banking: incremental technology adoption/adaptation, gradual regional integration 24

Deepening inequalities, growing labour precarity 26

III. A Closer Look at Fourth Industrial Revolution by Select ASEAN and East Asian Trade Unions: Labour Issues and Policy Options 27

Labour fears and concerns 27

Union responses 29

Meeting the challenges of readiness, disruption and displacement: trade union proposals and ideas 30

IV. Conclusions

Charting Just Transition Pathway for Job-Full Technological Transformation in ASEAN 36

The transition programme should be translated into a forward-looking social contract 37

Bibliography 39

Endnotes 41

List of Tables

Table 1. Filipino freelancers registered with Upwork, January 2016 9
Table 2. Wage and non-wage employment in the ASEAN region, 2010 15
Table 3. Rates of unionization in South-East Asia, 2000 19
Table 4. ASEAN population and per capita GDP, 2017 19
Table 5. Typology of ASEAN Member States in technological development 21

List of Boxes

Box 1. Role of harmonious union-management relations in the survival and transformation of a telegram company ... 13
Box 2. Singapore tripartite agreement on skills and other programs 31
Box 3. On partnership building under the Fourth Industrial Revolution and the role of unions 33
Box 4. Skills and work rules issues in e-commerce in Viet Nam 34
Box 5. UNI Global's ethical guidelines on the use of artificial intelligence 35

Abbreviations

AI	artificial intelligence
AEC	ASEAN Economic Community
ASEAN	Association of Southeast Asian Nations
ASETUC	ASEAN Services Employees Trade Union Council
GDP	gross domestic product
ICT	information and communications technology
ICTS	Information and Communication Technology Services Committee (UNI Apro)
ILO	International Labour Organization
IT	information technology
NTUC	National Trade Union Congress
RCPI	Radio Communications Philippines, Inc.
RFID	radio frequency identification
SME	small and medium-sized enterprise
STEM	science, technology, engineering and mathematic
UNI Apro	Union Network International Asia & Pacific Regional Organization
USSC	Universal Storefront Services Corp.

Acknowledgements

The study presented here was conducted for the Asia and Pacific Regional Organization of the Union Network International (UNI Apro) and the Association of Service Employees Trade Union Council, in preparation for the Ninth ASEAN Regional Tripartite Social Dialogue Conference in Singapore in October 2018, which both organizations co-hosted, with funding assistance from Friedrich-Ebert-Stiftung.

Rene E. Ofreneo, Professor Emeritus and Former Dean of the School of Labour and Industrial Relations at the University of the Philippines, led the study, with research assistance from Cristina Calleja. The study also received assistance from Jay Choi, UNI Apro coordinator in the Republic of Korea, during the World Congress of the International Labour and Employment Relations Association in July 2018. The study was undertaken under the supervision of Christopher Ng, Regional Secretary of UNI Apro.

Introduction

This study is an inquiry on how trade unions in Member States of the Association of Southeast Asian Nations (ASEAN) are affected by and responding to the changes ushered in by the technology revolution, popularly referred to as Industry 4.0, which is a shorthand for the Fourth Industrial Revolution. The inquiry singled out trade unions in the services sector, now the biggest and dominant sector within the ASEAN economy and how they are managing the manifold changes and challenges imposed by the Fourth Industrial Revolution.

The ten Member States of ASEAN, individually and as a bloc, are all affected by the digital and technological storm—the advent of robotics, the Internet of Things, artificial intelligence, 3D printing, new life sciences—that is transforming the structure and operations of industry and business almost everywhere. This digital and technological storm has serious (mass and social media often use the term "disruptive") implications for workers in terms of hiring, training, work assignments, compensation, job security and social protection. Hence, the known and unknown implications have led to the buzz term "future of work", which has become the name for a 2015–2019 programme of the International Labour Organization (ILO) that was launched as part of its centenary celebration for 2019.

The "future of work" is also found in the title of numerous studies and articles appearing in Europe and the United States on the changing nature of work under the Fourth Industrial Revolution. As with this study, most of those researchers are asking what indeed is the shape of work under the ceaseless technology revolution taking place in the world today?

Yet, not much has been written about the future of work in the ASEAN region and in the larger East Asia region, which includes China, Japan and the Republic of Korea. There is even scarcer information on how trade unions in ASEAN and the three other East Asian countries are affected and responding to the future of work phenomenon. This information gap cannot be underestimated, given that the leaders in the adoption of technological changes are the global or multinational corporations, which have transformed Asia as the leading goods and service suppliers for global value chains they have managed over the past three to four decades. These multinational corporations are reshaping the global value chains, with some dire consequences for jobs, through the adoption or application of new technology in running a business.

The study presented here is the result of a cooperation programme between the ASEAN Services Employees Trade Union Council (ASETUC) and Friedrich-Ebert-Stiftung. The research was asked to fill an information gap on how the digital and technological storm is already impacting industries, the labour market and society generally in each ASEAN country and in the region and how trade unions in the services sector are responding to the changes. Ideally, the results of the study will help the ASEAN Services Employees Trade Union Council and its affiliates define their position on the future of work phenomenon and amplify policy options that they can present to their social partners (at the national and regional levels) in public forums or across collective bargaining tables.

The study

This is an action-oriented research project. The research team was tasked with both mapping the emerging labour and industrial relations issues under the Fourth Industrial Revolution in the ASEAN region and presenting these issues, in the form of a general background paper, to the representatives of social partners—governments, employers, trade unions, academia and the ASEAN Secretariat—during the Ninth ASEAN Regional Tripartite Social Dialogue Conference in Singapore (in October 2018).

Titled *Riding the Waves of Digital Revolution by Strengthening Social Partnership*, the paper (see the Annex) outlined the historical march of humanity from the First to the Fourth Industrial Revolutions, the labour and industrial relations rules and issues that have resulted from this historical transition, the essence of the current technology changes, the associated job displacement and disruption fears around the world and in the ASEAN region, the rise of new jobs and new industries and the challenge of how social partners can

manage business and work adjustments together. The paper ended with a summary of the call by the ASEAN Secretary-General, Dato Lim Jock Hoi, for Member States to embrace innovation while strengthening the ASEAN community.

Instead of contesting the main issues raised in the paper, the conference participants essentially validated the research team's perspective by elaborating the same concerns and citing their individual country experiences that reinforced those issues.

In preparing the paper, the research team virtually surfed through voluminous materials on the Fourth Industrial Revolution and the future of work. Of course, the discourse on the technology revolution and its supposedly disruptive impact is not new. Jeremy Rifkin had an extensive documentation of the impact on jobs of rapid technological changes in his book of 23 years ago, *The End of Work*.[1] What is new is that almost everyone is talking about it, prompted in part by the endless flow of new future of work materials produced by the ILO and research institutions worldwide.

As noted, little was found on the Fourth Industrial Revolution in the ASEAN region and its impact on unionism and industrial relations. Two major publications focusing on the future of work in the ASEAN region were published by the ILO in 2016. But they covered mainly the issue of how technology is changing enterprises and what are the jobs at risk;[2] they hardly mentioned unionism and industrial relations.

The research team thus interviewed officers from a number of unions in ASEAN, East Asia and South Asia. They also participated in the meeting of the Asia and Pacific Regional Organization of the Union Network International (UNI Apro) Committee on Information Communication and Technology Services in Hanoi (in August 2018), which was attended by union representatives from Bangladesh, Hong Kong, India, Indonesia, Japan, the Republic of Korea, Malaysia, Singapore, Taiwan and Vietnam. The research team also attended the World Congress of the International Labour and Employment Relations Association in the Republic of Korea (in July 2018) and interviewed the Korean affiliate union representatives of UNI Apro. Similar interviews were conducted with UNI Apro affiliates in the Philippines.

For this study, the main tasks of the research team were as follows:

1. Assist the ASEAN Services Employees Trade Union Council in the preparation, conduct and documentation of the Ninth ASEAN Regional Tripartite Social Dialogue Conference.
2. Analyse the impact of the Fourth Industrial Revolution on unionism and industrial relations in the ASEAN Member States, particularly on how unions are responding and/or what they are contemplating to undertake in relation to associated changes.

In relation to those tasks, the research team:

- **a.** identified business, technological and labour market trends and development challenges in the services sector in select ASEAN and East Asian countries;
- **b.** analysed the impact of artificial intelligence and other Fourth Industrial Revolution technologies, both positive and disruptive, on business and work organization in the services sector;
- **c.** outlined possible policy options and responses that trade unions could adopt due to the above changes;
- **d.** formulated alternative policies and development programmes needed for job and union security, stability and sustainability in the fast-changing services sector of ASEAN and East Asian countries; and
- **e.** assembled key points that the social partners in ASEAN and East Asia may agree upon to enhance the social and labour dimensions of service restructuring in a modernizing and globalizing services sector.

This report is organized in four sections: overview of the Fourth Industrial Revolution challenges in the ASEAN region; the changing structure of the ASEAN services sector, trade union views and perceptions (on the Fourth Industrial Revolution, disruptions, responses, policy options, proposals); and conclusions.

I. Labour and the Technology Revolution in ASEAN: An Outline of Policy Challenges

Embracing change, building resilience

In recognizing the digital and technological revolution rolling across ASEAN Member States, affecting the bloc in its vision of one economic, social and secure community, ASEAN Secretary-General Dato Lim Jock Hoi called for "Embracing Change, Building Resilience"[3] as the theme for his tenure (2018–2022). As Hoi pointed out, the transformation process is "both complex and unprecedented."[4]

And yet, ASEAN countries have been a major adopter of technology. Internet use and internet-based economies are growing rapidly. The majority of the young population in the region, mostly millennials, are making extensive use of cellular and smart phones, actively connecting and communicating to family, friends and social, business and work partners within and across national boundaries. The region is also home to Uber's global competitors—Go-Jek and Grab, developed by Indonesian and Malaysian techies, respectively.

Thus, there is a need for the region to be fortified against the possible downsides of the technology revolution—hence, the call of the Secretary-General for resilience building. The technology revolution, particularly the robotization and automation of various business and work processes, is still in its incipient stage. Some countries are fully aware of the need to be Fourth Industrial Revolution-ready, while others are still grappling with basic non-automation concerns, such as the immunization of poor children against common diseases and improvement in the lives of persons working in the informal sector (which accounts for about two-thirds of the ASEAN labour force).[5] Artificial intelligence-enabled technologies, while delivering productivity to investors and users, are likely to create disruptions to workers who are to be displaced or, in the word of some trade unionists, "redundated."

It is abundantly clear that there are winners and losers in any technological transformation. The big question now is: Will there be more winners than losers? Relatedly, how do governments ensure a smoother or conflict-free transition in the technological adoption or adaptation process? Is a just transition possible? These are the questions that leaders of the ASEAN Services Employees Trade Union Council and UNI Apro have been raising for years. These major Fourth Industrial Revolution issues must be analysed and brought to the bargaining table and social forums.

This section outlines six major concerns raised by the ASEAN Services Employees Trade Union Council and UNI Apro:

- How different is the Fourth Industrial Revolution from the first three and what are the rules for work?
- How serious is the threat of job disruption in the ASEAN region due to automation and robotization?
- How does technology facilitate business disruption?
- Why is the skills issue important to trade unions and not only ASEAN Member States?
- What is the gig economy and who are the freelancers?
- s there room for social dialogue on disruptions and technology modernization?

Fourth Industrial Revolution compared with the first three Industrial Revolutions: What are the rules for work?

It was Klaus Schwab, Chairman of the World Economic Forum, who popularized the term Fourth Industrial Revolution.[6] The club of business and government leaders, who constitute the Forum, adopted the term as the theme for their 2016 gathering. Since then, the World Economic Forum has continued organizing global and regional forums on the Fourth Industrial Revolution.

As Schwab defined in his seminal paper, the Fourth Industrial Revolution means "the inexorable shift from simple digitalization (the Third Industrial Revolution)" to a complex set of emerging technology breakthroughs in such fields as artificial intelligence, robotics, the Internet of Things, autonomous vehicles, 3D printing, nanotechnology, biotechnology, materials science, energy storage and quantum computing.[7]

That shift is best understood with a clarification of the previous Industrial Revolutions: According to economic historians, there are three epochal Industrial Revolutions. The first occurred in the eighteenth and nineteenth centuries, when the factory system, powered by the steam engine and new machines, replaced the cottage or home-based production of textiles and various goods in Europe and, subsequently, in America and elsewhere. The revolution was amply celebrated in the 1776 book of Adam Smith, *The Wealth of Nations*,[8] which described the explosive growth of production under the extended division of labour in a capitalist factory system. The book also advanced the thesis that nations prosper because of the "invisible hand" that unleashes the spirits among capitalists as they build factories and trade goods everywhere.

The Second Industrial Revolution dates from the late nineteenth century up to the early decades of the twentieth century and manifested in advances in steel making, railway construction, gas exploration and oil refining, telegraph communication, chemical formulation, electrification and development of the bicycle and automotive. This period also experienced a transformation of the factory system into a mass production system involving giant conveyor belts, thousands of workers and the application of the ideas of Frederick Taylor on "scientific management" (alternatively known as the "one best-way" approach in business operation, derived from the experiments done by human resource managers on how to arrange work based on time-and-motion studies).

The Third Industrial Revolution is largely based on the information and communication technology (ICT) revolution. The ICT revolution began as early as in the 1950s with the development of digital systems and rapid advances in computing power, which enabled new ways of generating, processing and sharing information. The ICT revolution intensified in the past three to four decades with the digitization of the analogue system of communication, the launching of communication satellites, the development of the personal computer and microprocessors, the emergence and commercialization of cellular communication, the spread of the internet and the endless discovery of ICT uses in various phases of commerce and aspects of life.

The Fourth Industrial Revolution builds on the ICT advances. It represents the fusion of cyber and physical systems to provide entirely new capabilities for people and machines. Schwab asserted that the Fourth Industrial Revolution represents entirely new ways in which technology becomes embedded within societies and even our human bodies, as exemplified by the technology breakthroughs.[10] The breakthroughs include a host of mind-boggling innovations and discoveries, such as physical objects now duplicated through the 3D printing and the use of new materials, while *Google* has successfully piloted the production of the "autonomous car" sans driver.

However fascinating these technological advances are, the most important concern for trade unions is clarity on the rules for work engagement. What are the work rules? What are the rights and benefits that accrue to workers?

In the First Industrial Revolution, the wealth created by the pioneer capitalists and industrialists was appropriated by a few who ignored the rights of the proletariat to eight-hour workdays, better working conditions and unionism. These rights took two centuries of working-class struggle before they came to be recognized in many countries.

The ILO, which is celebrating its centenary this 2019, was preceded by the rise of Bolshevism in Eastern Europe and the United States and with the victorious Allied Forces, after winning World War I, pressured to include its formation as part of the Treaty of Versailles.[11] In the 1920s, the term "industrial relations" was coined by institutional economists who saw the importance of industrial peace in the stabilization of an economy.[12] And it was US President Franklin Delano Roosevelt who presided over the American economic recovery from the Great Depression of the 1930s by stimulating the economy through government deficit spending (whose soundness was later validated by the macroeconomic theory of John Maynard Keynes) and the empowerment of the working class (by recognizing their rights to unionize, conclude collective bargaining agreements and receive a pension in a social security system). After World War II, these rights were further strengthened in Australia, Japan, New Zealand, North America and Western Europe through the institutionalization of welfare states and welfare programmes, partly in response to the expansion of

Communist influence in Eastern Europe, China, Vietnam and other countries.

In brief, a kind of unwritten social contract, based on the recognition of the rights and entitlements of social partners in a tripartite system, was promoted in developed capitalist countries. The mass production system under the Second Industrial Revolution was somehow strengthened by the tripartite rules for the post-war "industrial democracy" of capitalist countries, as John Dunlop wrote in his book, *Industrial Relations Systems*.[13] Eventually, in the newly independent countries of Asia, the Dunlopian tripartite system of industrial relations was adopted, primarily for the emerging formal sector of economies.

Under the Third Industrial Revolution, the globalization of industrial production through outsourcing began to erode the old industrial relations rules. In particular, the decades of the 1980s onward became dominated by "free trade" thinking, also known as the "Washington Consensus," in national and global trade and investment policy formulation. To attract investments, some countries even went to the extreme in promising a "union-free" environment in special-purpose export processing zones, where enterprises, engaged in re-export manufacturing, were enticed to come and invest. Soon, the culture of a "race to the bottom" operating in a borderless global economy had become the norm rather than the exception. Thus, to trade unions, a critical concern under the Fourth Industrial Revolution is whether the new technological advances will deepen and exacerbate this phenomenon of a race to the bottom, or the race to lower labour standards, which means ignoring the rights of workers to decent work standards and decent compensation.

Are workers better off or not under the Fourth Industrial Revolution?

What is needed now for the full development of the Fourth Industrial Revolution in each country of ASEAN region is a transition programme that safeguards the rights of workers. Can we have a Fourth Industrial Revolution that works for all? Can we have guaranteed minimum basic income and universal social protection for all, as floated by the World Bank in its 2019 *World Development Report* on the changing nature of work?[14] And can humanity secure social justice in the digital era? These are challenges ILO asks its tripartite social partners.

Threat of job disruption in the ASEAN region

The often repeated topic related to the Fourth Industrial Revolution is "disruption"—disruption of business, of work and eventually disruption and/or termination of jobs. It is a given that the arrival of any new technological product in the workplace has a disruptive impact on jobs, which often leads to some form of technology-triggered unemployment.

In the past, such unemployment was offset by the growth of new investments and jobs in related industries, such as farm mechanization, which spurred the growth of the agro-processing industry. This time, however, as described by Martin Ford in *The Rise of the Robots*,[15] job displacement in some industries can be massive, and job losses cannot offset easily. Which is why Ford is pushing for a "basic income guarantee" for all citizens regardless of whether they have a job or not. In Europe, the basic income proposal is called "universal basic income", which has generated intense policy debates within the European trade union movement.

Globally, there are numerous discussions about labour displacement due to robotization and automation. A study by the Global McKinsey Institute[16] came to the following conclusions with regard to the increasing automation of workplaces in the world:

- Global productivity will rise between 0.8 per cent and 1.4 per cent annually due to automation.
- Five per cent of all occupations can be automated, while 60 per cent of all occupations have 30 per cent constituent activities that can be automated.
- Full automation will not happen overnight. The adoption of automation depends on five factors: technical feasibility, cost of developing the technology, labour market dynamics (or labour supply-demand factors in a given economy), economic benefits, and regulatory and social acceptance.
- The economic sectors most vulnerable to automation are accommodation and food services, manufacturing, agriculture, transportation, warehousing, retail and wholesale trade, mining, construction, utilities, finance and insurance.

- The countries leading in robotization and automation are China, India, Japan and the United States.

In **South-East Asia and the Asia-Pacific region**, the threat of massive job displacement under the Fourth Industrial Revolution is real. As previously noted, the Asia-Pacific region is a beneficiary, in terms of jobs, of the relocation or outsourcing of labour-intensive facilities by multinational corporations through their global value chains in the auto parts industry, electronics and semiconductor industry, the garment industry, the footwear industry, the toy industry, the furniture industry, etc. All these global value chain-related industries are collectively called "Factory Asia". But most of them are vulnerable, in terms of jobs, to the advances in automation. Thus, the question bothering ASEAN and other Asian countries: Will Factory Asia, a phenomenon at the turn of the millennium, disappear?

In 2016, the ILO conducted twin studies on how technology is changing enterprises and the risks to jobholders in industries that are likely to be the subject of automation and robotization.[17] The twin studies involved five ASEAN countries (Cambodia, Indonesia, Philippines, Thailand and Vietnam) and found that many sectors in those economies were highly vulnerable to the endless advances in automation, digitalization, application development and cloud computing. The studies additionally found:

- 56 per cent of all employment in the five countries are at high risk of displacement due to technology over the next decade or two;
- industries with high vulnerability to automation are hotels and restaurants, wholesale and retail trade, and construction and manufacturing;
- certain occupations, such as garment production operators, shop sales assistants and office clerks, face extreme risk of automation; and
- more women workers are employed in the high-risk industries.

In manufacturing, the auto, electronics, textile-clothing and footwear industries are at risk due to robotization, 3D printing and computer-aided design and computer-aided manufacturing processes. These industries are experiencing the rise of co-worker robots, or "cobots", in workplaces, with robots that can sew or stitch things together ("sewbots") and robots that can do various functions around the shop floor ("locobots").

The problem here is that these industries happen to be the major drivers of ASEAN economic growth through the global value chains of multinationals. These multinational corporations now have the option to withdraw investments in a labour-intensive facility in the region and take low-cost manufacturing back to their home country, such as what Adidas did when it set up fully automated "speed" manufacturing plants to produce shoes in Germany in 2016 and in the United States (Atlanta) in 2017.[18]

Over the past few decades, technology has enabled supply chains to scatter around the globe, including across the Asia-Pacific region, in particular in ASEAN countries. This has created substantive investment and job opportunities in a number of developing economies. However, with the technology revolution, those supply chains are now being disrupted. Customization technology, such as 3D printing, is enabling production to be carried out closer to markets, especially in sectors like textiles, clothing and footwear, where speed of delivery, from production to market, matters to consumers. Ultimately, the ASEAN textiles, clothing and footwear sectors may no longer be able to offer jobs to millions of workers looking for formal employment opportunities.

Even the relatively new industries outsourced globally—online customer service and business process or back-office work—are vulnerable to artificial intelligence-interactive communication, software automation and do-it-yourself technological breakthroughs. India and the Philippines are the most vulnerable to these technological advances.

Patrick Azanza, a manager of several call centre facilities, informed the research team that employment in the Philippine call centres is likely to drop to less than 50 per cent in five years[19] due to increasingly adopted cloud technology, artificial intelligence-interactive communication and software automation. Another disrupter, the do-it-yourself management of back-office tasks, will not only make economic sense but will also enable companies to protect corporate information from leaking and reduce the risk of internal data abuse.

The employment total in the Philippine call centre and business process outsourcing sector is one million persons currently, while in India, the IT and ICT-enabled services sector has around four million employees. At the moment, there are no reports of massive displacement in the Philippine call centre and business process outsourcing sector. But compensation rates for new labour entrants have been going down. The declining wage rates support the observation that low wages tend to delay technological modernization. Such development also tends to perpetuate poverty.

Aside from robotization and automation, another job-displacing technology is additive manufacturing, which is not yet fully developed or applied in the region. Globally, additive manufacturing, or 3D printing, is being developed in high-tech industries, such as aerospace. The technology has evolved to the extent that it can produce almost any component using metal, plastic, mixed materials and even human tissue. The ability of Adidas to produce shoes on demand (based on consumer's specifications for colour, design, etc.) in two days shows the magic of 3D printing and explains why the reshoring of Adidas facilities from the labour-intensive Asia-Pacific region back to the American and European home base has become not only practical but also profitable.

The Internet of Things allows electronic devices to communicate with each other without human assistance. For example, a fault in production machinery can be communicated directly to a supplier. The Internet of Things will be used to optimize production processes by collecting and exchanging data, thereby improving monitoring and decision-making.

A number of critical advancements are contributing to the rise of the Internet of Things. These include steep declines in the cost of sensors, bandwidth and information processing; the rise of data analytics; and increased smartphone use and connectivity.

Corroborating findings. The findings of the twin ILO studies cited previously were echoed by the findings of a study by *Cisco* and Oxford Economics[20] on six ASEAN countries. In their study, the two institutions concluded that the Singaporean labour market is the most vulnerable to job disruption. However, the researchers also noted that Singapore has an "exceptional enabling environment" for innovation and digital transformation and has modern and upgradeable infrastructure, all of which can facilitate adjustments in business and the labour market.

After Singapore are Vietnam and Thailand, with agriculture cited as very vulnerable. And these two countries happen to be the agribusiness powers in the region. Indonesia, Malaysia and the Philippines follow them. The rate of technological change in these latter three countries are somehow slowed by what *Cisco* and Oxford see as institutional, political and regulatory constraints.

Industrial restructuring under the Fourth Industrial Revolution: The trend towards a leaner human resources management system

The reality is that job demand, upward or downward, will depend on the direction of business or industrial restructuring that is facilitated by technology advancement. In turn, this restructuring will depend on the business and human resources management practices of a corporation or firm.

In the consultations by the research team with selected employers, human resources managers and trade union leaders during the Ninth ASEAN Regional Tripartite Social Dialogue Conference in Singapore (in October 2018), there was unanimity in the observation that technology adoption and adaptation and/or business modernization tend to reduce the overall demand for workers. Machines and new technical processes lessen the demand for labour power, especially in labour-intensive and repetitive work processes, such as automotive parts assembly or garment sewing. Eventually, all these developments will lead to an overhaul of the existing business and work organization.

The atomization of work processes into smaller packages enables employers to outsource some tasks, just like what is happening under the global division of labour or global value chains of the multinational corporations. Human resources management and supervision can also be tighter with the electronic monitoring systems, such as CCTV cameras. A manager can be miles away from their

factory or business and still supervise work as if they had not left the place. This can apply to outsourced businesses because the principal company can monitor online the quality of work being done in partner outsourcing companies.

Of course, competition can also intensify. Thus, the mergers, acquisitions and consolidations—a phenomenon that became highly visible in the aftermath of the 1997-1998 Asian financial crisis and the 2007-2010 global financial crisis—are likely to become a big trend if technology-based competition deepens. To a certain extent, this is already occurring in the telecoms sector, where rivals seek unity to prevent entry of bigger rivals. This is also evident in the banking sector, with fewer and fewer banks still standing. Even the relatively new fintech industry (focused largely on flexible payment systems) is gradually being merged with the big bank players. Needless to say, the mergers, acquisitions and consolidations phenomenon and re-engineering exercises in the name of technology modernization are having displacement impact.

A major concern close to the heart of ASEAN and other Asian-Pacific trade unionists is the issue of labour "flexibilization."[21] Corporations, in the name of competition and modernization, are scouting for talent and investing in skills development to maintain modern operations. Most likely, the individuals will be given multiple tasks, especially in the handling of different aspects of technology management. As human resources managers put it, multiskilling for multitasking purposes is the key. For example, the retail sector will more frequently use sophisticated sensors and tags to track goods and manage stock and, for this purpose, is likely to hire higher-skilled workers who can manage the Internet of Things technology and run data analytics.

But also in the name of competition and modernization, there is the issue of low-end flexibilization, which is a critical concern for trade unionists. Instead of becoming regular or permanent employees, many workers at the low end of the labour market are perpetually placed on a temporary or casual status through such measures as project-to-project hiring and company utilization of the services of outside agencies employing part-time or non-regular workers. This practice is likely to be maintained by many employers and human resources managers. Moreover, with the advent of technology modernization, robotization and automation, some corporations are likely to reduce the overall hiring of non-regular employees because technology can do the casual or repetitive work around the clock and every day of the week without any complaint or extra overtime benefits.

The "war for talent" and the tripartite call for training and education that are fit for purpose

In almost all the interviews and surveys conducted by the research team, the issue of enhanced skills in critical occupations kept surfacing. Some employers and human resources managers even cited the "war for talent"—the practice of companies at home or overseas to poach from other companies for needed skills and talent. The "war for talent" has become common on the technical side of the IT and ICT-enabled industries because it takes time to develop talent and, sometimes, it is more expensive to undertake training after paying a hiring bonus for poached talent.

Yet, education and training infrastructure have been slow to evolve in ASEAN countries. Traditionally, it is difficult to determine actual or needed enterprise and industry skills and thus develop formal education and training programmes capable of developing those skills—on time. Many education and vocational training institutions and systems in the region are not capable of responding to the changing needs of enterprises induced by fast-paced technological changes. They lack qualified educators and instructors who can develop the right curriculum for new workers, mostly millennials who cannot relate to their ageing teachers or those belonging to the post-war generation. The formal education structures and programmes are often not prepared for the requirements of the Fourth Industrial Revolution. They are no longer fit for purpose. New and innovative ways of preparing young people with industry-relevant and forward-looking skills are a big challenge to education and training service providers, be they from government or the private sector.

Without doubt, there will be increased demand for workers with relevant skills and greater technical competencies. However, because only 13 per cent

of ASEAN workers occupy high-skill jobs (such as managers, professionals or technicians), enormous challenges in education, training and labour force upgrading lie ahead. Specifically, policy direction needs to be targeted at improving the teaching of science, technology, engineering and mathematic (STEM) subjects. In the twin ILO studies (discussed previously), expertise in the STEM areas was cited as critical in most sectors, especially in the automotive and electrical and electronics sectors. The demand for technically capable individuals is also rising in the retail, textile, clothing and footwear sectors. Hence, there should be increased effort to encourage more students to take STEM-related courses and, in particular, to promote female enrolment.

Rise of the freelance workforce: The "invisibles" and the "visibles"

The reduction of the paid workforce in the formal sector of the economy is likely to decline as the technology revolution keeps rolling. This will be partly offset by the rise of the gig economy, in which workers get online job orders or payments for services delivered online. They are the online freelancers.

Freelancing, of course, is not a new economic activity. It has always been part of the capitalist system. A freelancer is a person who sells work or a service without any regular salary because they are independent contractors. Some people freelance full time, while others work part time, possibly to augment income from a regular paid job. Some of them register as consultants of a professional association that then offers their services to a bigger market.

Many freelancers are simply on their own and market their services by relying on the reputation and network they develop through the years, for example, as an expert tax accountant for individuals or companies. Given the nature of freelancing, government tax people have difficulty monitoring the work and income of freelancers, particularly those who work from home or render services to clients without issuing any official receipt because they are not formally registered as a business. In this sense, many freelancers are part of the informal economy.

What is new in the freelancing business is the significantly growing number of online freelancers worldwide. In the Asia-Pacific region, India and the Philippines are cited as the online freelance leaders, after the United States. This is obviously because they are also the global leaders in online customer service and business processing services that have been outsourced by the big corporations of Europe and North America. But online freelancing is happening all over the region. For example, Filipino English tutors provide English tutorials using "Skype English", while Singaporean Mandarin tutors provide Mandarin tutorials using "Skype Mandarin."

Why the surge in online freelancing? The answer is obvious: The internet has opened up many opportunities, such as web designing, copy editing, writing, providing customer service, e-marketing, consulting, engineering, architecture, data analytics, accounting and IT networking. The estimate of freelancers in the Philippines is huge, at around 1.5 million persons. This estimate includes persons working in the call centre or the business process outsourcing sector, which, officially, has generated a million jobs alone. The 2016 registry of *Upwork*, the leading agency in the United States matching freelancers and clients online, listed more than 300,000 Filipino freelancers, while *OnlineJobs.ph*, the Philippine version of Upwork, claimed 250,000 registered members (see table 1).[22]

Most of the jobs listed in table 1 are similar to what many workers in the formal non-voice or business process outsourcing segment of the ICT-enabled sector are doing. In short, the online freelancers are servicing mostly rich individuals or small enterprises in developed countries; in contrast, the bigger business process outsourcing companies in the Philippines mainly service corporations in Europe and the United States, such as those listed in the Fortune 500.

Most of the online freelancers are women. Some people freelance to pursue personal passions, such as creative designing, which they are not able to do in regular office work. Many freelancers come from different backgrounds and work experiences. Some are displaced employees, while others are college graduates who are unable to find a quality job. A number of enterprising students are into freelancing because it is a source of extra income.

Freelancing provides high income and work satisfaction for individuals with a good reputation and good-paying clients. But the majority are not as lucky; the reality is that freelance work is still casual work and can be precarious. There is no job security, no health insurance, no paid holidays, no retirement benefits, etc. Often, freelancers compete with one another for the same clients, resulting more often than not in a virtual race to the bottom in pricing and output.

There are, of course, success stories. In the websites of freelance matching institutions, some freelancers who have become "virtual assistants" of wealthy clients overseas give positive testimonies on how the situation of their family has improved due to online freelancing. The virtual assistants are joined by accountants, adjunct professors, English tutors, coders, financial analysts, IT programmers, managerial consultants and media specialists.

Freelance associations based on skills or know-how are also emerging. Associations of freelance workers doing similar jobs usually flock to *Facebook* and organize themselves online.

However, union formation is difficult to sustain. First, meeting physically to thresh out complex organizational issues is not easy. Second, gig work is not uniform; it varies from minimal to complicated work. Third, transactions are concluded in a personal, isolated manner.

Uberization-the visible side of the gig economy

The gig economy, reliant upon the use of a digital platform, has a physical, or visible, side, too. Online retailing and ride-hailing services are good examples. In fact, the terms "gig economy" and "sharing economy" were associated originally with the ride-hailing business of US-based *Uber*. A gig, initially equated to a paid musical performance, is now a "one-ride gig" for a private car owner who has transformed their vehicle into an on-demand taxi. *Grab* and *Go-Jek*, which have defeated *Uber* in the ASEAN market, are turning these car owner-taxi drivers into freelancers and independent contractors.

The "uberization" of work is spreading into other industries also using a digital platform, such as those advertising, selling and delivering goods or services with help from online facilities. Many simply use the still-to-be-regulated social media. The gig economy also benefits persons with talent and business ideas that can be marketed via the internet. For example, those who transform their home into a bed-and-breakfast mini hotel are giving big hotels competition in attracting dollar-wary tourists through savvy and attractive online marketing. People can become self-employed or small business owners at the click of the computer mouse and transact business anywhere in the world at a time most convenient for them. Starting a business under the digital revolution seems easy. This is why the gig economy is expanding exponentially.

Table 1: Filipino freelancers registered with Upwork, January 2016.

Source: Table 3.2 of Jorien Oprins, "Employment in the Online Outsourcing Industry and Impact Sourcing Industry: Dream or Reality for Filipinos Living at the Bottom of the Pyramid?", master's thesis (Amsterdam: Graduate School of Social Science, University of Amsterdam, 2016).

Job category	Number
Administrative support	124,092
Customer service	89,879
Writing	85,396
Design and creative	52,357
Accounting and consulting	40,078
IT and networking	15,795
Engineering and architecture	10,465
Data science and analytics	6,917

But it is also problematic for labour regulators. For instance, are *Uber* and *Grab* drivers employees? Is there an employer-employee relationship when the service terms of reference refer to the individual service provider as a contractor, not as an employee? How about the self-employed techno-entrepreneurs? How about those linked by *Upwork* with principal companies in Australia, Europe, New Zealand and the United States?

Of course, in real life, freelancing is not necessarily an easy affair. It involves a series of hits and misses in job contracts concluded or business deals consummated. Sometimes, there are problems in payment for services, delivered or undelivered. It is great for persons with outstanding talents and have an established reputation or brand that needs limited marketing. But for the average freelancer dependent on online signals, sustainability can be a problem. A good transaction can be followed by long periods of inactivity. And an online assignment can be exhausting and bad for health.

Some European and North American labour activist-researchers are insisting that freelancers also belong to a new global class called the "precariat"[23] because they lack social and economic protection. Few freelancers buy social insurance. And because they are not considered regular employees, they do not enjoy paid holidays, leave benefits and other privileges accorded to regular employees.

This brings us back to the issue of employer-employee relations. Can the so-called independent contractors be considered employees, too? In the gig economy, the employer-employee relationship issue arises when participating freelancers or independent contractors become dependent on the central coordination provided by the big platform providers through the use of the ICT tools. The platform managers give direction on what to do for each job or gig and at what price to collect for such undertaking. This is what is happening in the case of *Uber* and *Grab*, which have become multi-country on-demand taxi business operations.

Not surprising, it did not take long before one driver filed a case against *Uber*. The woman driver, Barbara Ann Berwick, claimed in 2015 that she was an *Uber* employee, not an independent contractor, and as such, should be reimbursed for the various expenses she incurred as a driver of *Uber* for eight weeks. *Uber* argued that it is merely an "app" that connects drivers and passengers and has no control over the hours logged in by driver-contractors. The California Labour Commission sided with Berwick and asked *Uber* to reimburse her.

Uber appealed the case to a higher court. And in a class action suit that followed and involved almost 400,000 drivers in California and Massachusetts, *Uber* entered into a compromise agreement. *Uber* would pay the drivers in the two states more than 100 million US dollars in compensation; however, the position of *Uber* that the drivers should be considered and treated as independent contractors was upheld.[24] To *Uber*, maintaining the independent contractor status of the drivers is victory enough. However, there are similar labour complaints being filed in other countries where *Uber* operates.

The struggle for decent work conditions and appropriate labour rules in a cyber environment has only just begun. One big problem facing freelancers is the lack of standards on contracts, fees and work metrics. Practices vary and change over time. Some of them encounter problems with payment, which is the added reason why *Upwork* and *OnlineJobs.ph* have become important mediating institutions and why clarification on the employer-employee relationship in the case of *Grab* and *Go-Jek* is equally important.

Policy response to the Fourth Industrial Revolution labour concerns

The research team's review of published and online materials on the Fourth Industrial Revolution indicated that most of the policies tackled by Asian governments deal with how to strengthen the readiness of the industry for technology-driven competition. Most of those recommendations focused on how to make governments and business organizations creative and resilient, how to strengthen a country's IT infrastructure and how to develop the skills needed under the technology revolution.

The following policy recommendations by a group of Chinese, Japanese and Korean academics and researchers[25] sum up most of the recommendations

being tackled in government policy bodies in the Asia-Pacific region:

- upgrade industry integration of research and development, design thinking, service, marketing and manufacturing for higher added values;
- strengthen the links between academia and industry and their collaborations for industrial development;
- improve the smart industrial supply chain ecosystem;
- facilitate start-up businesses through various platforms;
- enhance the development of self-sustainable products and services;
- enhance the professional competency of critical technologies;
- establish government-led standards and common infrastructure for technology development;
- strengthen technological and vocational training and talent development systems, including design and business development competency;
- institute public policy, funding, incubation, accelerator and tax benefits systems; and
- introduce structural policy initiatives and incentives to ensure that appropriate resources can be supportive of talent development.

These issues have been taken up exhaustively in the policy-making bodies of China, Japan and the Republic of Korea. In the ASEAN region, Singapore is seriously addressing the same issues under its Industry 4.0 programme. However, there are no available documents indicating that these issues have been taken up in a systematic, comprehensive and continuous manner in other South-East Asian countries.

As to labour issues associated with robotization and automation, all governments in the ASEAN region have expressed concern over the possible displacement impact of technology. But such concern has not yet translated into formal and specific policies to prepare the labour market for Fourth Industrial Revolution-related displacements, with the exception of Singapore. The Singaporean Government has developed a skills training programme, called SkillsFuture for Digital Workplace, which is open to both employed and retired workers.

One explanation for the seeming lackadaisical attitude to the Fourth Industrial Revolution is that, despite the dire forecasts, mass displacement has not happened. What is actually taking place across the ASEAN region is the incremental introduction or adoption and adaptation of technologies—not the wholesale transformation of an economic sector, let alone the whole economy.

Thus, even in the ranks of the trade unions, there are no concrete or specific demands beyond the general call for protection and safety nets for workers who might be affected. Even the labour issues related to *Uber*, *Grab*, *Go-Jek* and online freelancing have not elicited any formal inquiry from trade unions or protest on any anti-labour aspects of such work. The issue of skills training, retraining and upskilling, popular among development economists, is not a popular issue among the trade unions, probably because most unions are engaged in the day-to-day struggle for the preservation and advancement of workers' entitlements (higher wages, better benefits, etc.) and job retention and regularization for their members.

In sum, most of the organized workers' groups in the ASEAN region have not gone beyond making general statements about their fears regarding the Fourth Industrial Revolution. But collective awareness of the Fourth Industrial Revolution is rising, and labour's voice on its social dimensions is most likely to also rise across the region.

The importance of social dialogue to address economic, technological and labour issues

Based on the economic, social and labour impacts of the technology revolution in all countries and on the ASEAN region as a bloc, it is critically important for governments and the tripartite social partners to engage in social dialogue on the Fourth Industrial Revolution and craft forward-looking policies. Foremost among the issues is the overall readiness or preparedness of the social partners and the society as a whole to the multi-sided social and labour dimensions of the Revolution.

Yet, according to a scanning of materials on the Fourth Industrial Revolution in the ASEAN region, it appears that most governments and social partners have not gone beyond the level of organizing forums or general awareness-raising on its nature. There are only scant

materials on policy choices and what can be done, including possible tripartite agreements on policy concerns related to the Fourth Industrial Revolution, such as:

- new labour laws to govern or protect work done online;
- reform of the education system, in close coordination with industry and unions;
- bipartite and tripartite agreement to smoothen the system of technology adoption or adaptation to minimize labour displacements and conflicts;
- intensification of job creation programmes to offset job losses due to the technology revolution;
- code of ethics to prevent talent or skills poaching and to promote industry cooperation in training;
- identification of programmes promoting digital inclusion; and
- preparedness of industry and economies to cope with the Fourth Industrial Revolution.

In relation to these issues, Singapore stands out with its Social Partnership 4.0, which uses the tripartite system to discuss related issues. Within that process, the parties commit to undertake, together, reforms or measures agreed upon, such as programmes on job modifications to enable ageing workers to continue working. There are also joint programmes on skills modification to enable both employers and employees to make businesses competitive and jobs sustainable.[26]

Elsewhere, the Malaysian Employers Federation has partnership programmes with unions to tackle adjustment issues related to the changing economic and technology environment.[27] In the case of *Hero Supermarket* of Indonesia, both the employer and union maintain a strong partnership programme that includes dialogue on modernization issues and job security.[28]

The point is that a primary ingredient for helping an industry succeed in the Fourth Industrial Revolution environment is frank and honest social dialogue that leads to an agreement on how business and jobs can survive and adjust to the manifold requirements of the technology revolution.

Social dialogue, after all, is a driver of innovation, productivity and competitiveness. Social dialogue is needed in crafting measures to make countries and industries position or reposition themselves in a competitive global and regional economy.

Indeed, how is the Fourth Industrial Revolution impacting the ASEAN labour markets? The quick answer is that there is no clear or definitive response, despite a number of studies predicting or projecting job displacement due to robotization and automation.

The Fourth Industrial Revolution is not the only factor that is influencing the direction of the labour market of any country in the ASEAN region. Foremost among the other factors is the long-running ASEAN programme promoting economic community-hood through regional economic integration projects that facilitate intra-regional investment and trade, all of which have direct impact on investment and job generation and even the flow of skills across the region. Other factors include global integration of individual national markets through membership in the World Trade Organization and various free trade agreements and participation in the global value chain production of multinational companies, electronics assembly and auto parts manufacturing.

What is evident is that the technologies represented by the Fourth Industrial Revolution are being adopted or embraced by different ASEAN countries largely in an incremental manner, not wholesale or in one swoop. Keep in mind, the digitalization process has been taking plac in various industries across the region at varying speeds and levels of development since the 1990s. Certainly, the Fourth Industrial Revolution and related technologies are contributing to the dizzying array of changes in the business and labour landscapes across the region. The technological changes, such as the ICT-based upgrading of industry or business operations, are blending with other changes arising from the reorganization of business and work due to mergers, consolidations, re-engineering, outsourcing, new business models and other forms of business adjustment in an expanded, liberalized and globalized economic environment.

This changing economic environment is fuelled partly by the efforts of ASEAN to push, since 2007, its vision of an ASEAN Economic Community (AEC).[29] The AEC project envisions the formation of an integrated ASEAN economic bloc and transformation of the region into one

single market and one production base. This integration vision is to be attained through a number of economic liberalization measures aimed at promoting the free flow of goods, services, capital and skilled labour[30] within or across the bloc.

The point is that the Fourth Industrial Revolution and related technologies have become another instrument in shaping the structure of South-East Asia's economy as a regional economy. This structural transformation naturally will have significant impact on the labour markets.

However, the changes are not taking place in a linear or homogenous manner. The ASEAN region consists of ten countries at ten different levels of development and ten different levels of readiness for the Fourth Industrial Revolution.

The next section outlines some characteristics, with short analysis of the most likely impact of the Fourth Industrial Revolution on the formal side of the ASEAN labour markets, followed by an illustrative example of how technological modernization is affecting a critical industry: banking.

Box 1: Role of harmonious union-management relations in the transformation of telegram company.

Source: Interview with Deobel Deocares, President RCPI union, July 10, 2018.

Radio Communications Philippines, Inc. (RCPI) was founded in 1958 as a telegram company. It sent its last telegram on September 20, 2013. Today, it carries a new name-Universal Storefront Services Corp. (USSC).

The relationship between the union and management in the 1980s and 1990s was tumultuous. These were the decades digital communications rendered the RCPI telegram and telex business obsolete. In the 1960s and 1970s, RCPI was unrivalled in the Philippine communications industry because there were no mobile phones, no text messaging, no email, no chat rooms, no social media and no internet.

To preserve jobs and workers' benefits in the crisis decades of the 1980s and 1990s, the union went on several strikes, while management pushed a series of painful downsizing measures. In the 1980s, RCPI had 5,000 employees; by the end of the 1990s, they had fewer than 2,000 workers. Worse, financial bleeding bankrupted the company.

In the 2000s, the new owner tried to promote a business recovery programme by diversifying the services offered. It sought the support and cooperation of the union in this recovery programme. Gradually, RCPI became USSC, a remittance company, offering money transfer services, cell phone top-up, transport ticketing services and payment-collection services. Throughout the RCPI–USSC transformation process, involving business and technology adjustments, the union and management kept informing and consulting one another. In the early 2000s, the number of employees was down to a few hundred. Today, it is more than 2,000 once again. And union-management relations have remained stable.

Although the nature of the business has radically changed, the union has maintained the original name of its organization—the RCPI Employees Union. Clearly, the mature union-management relationship is an important element in the survival and successful transformation of the company, business- and technology-wise.

II. How Is the Fourth Industrial Revolution. Shaping the ASEAN Labour Markets?

Some characteristics and trends in the ASEAN labour markets

The ASEAN labour markets continue to evolve in a dynamic and complex way. They are not homogenous because, like an economy, a labour market is uneven and segmented, both at the national and regional levels. The following major characteristics of these labour markets stand out.

a. Large informal economy

The overwhelming majority of workers are in the informal sector or informal economy, particularly in Cambodia, Laos, Myanmar and Vietnam and in the original ASEAN countries Indonesia, Philippines and Thailand. In measuring the size of the informal sector or economy, the ILO uses the concept of "vulnerable employment," defined as the totality of (a) the own-account or self-employed, composed mostly of "non-employing" operators of farms or family microbusinesses, and (b) the contributing family members (counted in some countries as unpaid family workers) who cannot find jobs outside the home or family. The ILO regards the total of these two categories of workers as the size of the informal sector of an economy.[31]

The informal sector or economy in the ASEAN region covers more than half of the labour force. Vulnerable employment accounts for 62.3 per cent of total employment in South-East Asia.[32] The huge size of the informal sector or economy is due mainly to the uneven historical and economic development of the ASEAN countries. The five largest economies of ASEAN (Indonesia, Malaysia, Philippines, Singapore and Thailand) have a substantial wage labour force, ranging from 33.1 per cent in Indonesia to as high as 90 per cent in Singapore, based on ASEAN statistics for 2010 (see table 2). Malaysia, the second most industrially developed South-East Asian country, had a wage labour force of 78.9 per cent in 2010. In the four ASEAN countries Cambodia, Laos, Myanmar and Vietnam the wage labour force is rapidly growing due to the marketization policies being pursued by these countries. However, as of 2010, the wage workers constituted only 21.4 per cent in Viet Nam; in the other three countries, it was less than 20 per cent.

b. Flexibilizing the formal sector

As table 2 indicates, the formal sector is relatively narrow, except in the more developed countries of Singapore and Malaysia. With a population of fewer than half a million, Brunei Darussalam's labour market is largely formal, although its labour force is dominated by migrant workers.

The common union concern in the organizable formal sector is that the sector, limited as it is and dominated by numerous small and micro-enterprises, is increasingly subjected to flexibilization measures by employers. Today, virtually all unions across the ASEAN region are unanimous in their denunciation of the flexibilization trend, which they claim continues to grow in various forms. The use of informal or flexible labour practices in the formal labour market of the three big middle-income ASEAN countries of Indonesia, Philippines and Thailand is illustrative, as the following explains.

In the region's largest economy, Indonesia, both the informal economy and the informalizing wage market have been expanding, especially in the aftermath of the Asian financial crisis that began in 1997. Indonesia's informal sector employment went up dramatically—from 62.8 per cent in 1997 to 70.8 per cent in 2003.[33] Labour researcher Indrasari Tjandraningsih blames the enactment of Labour Law No. 13/2003 for the surge in the informalization of work in the formal labour market.[34] She explained that the law "legalized" the hiring of short-term casual workers, usually through third-party service-contracting agencies. The downsizing of regular employment in many companies has been accompanied by the increased hiring of more casual and non-regular or temporary workers as well as agency or subcontracted workers.

In the Philippines, the casual and temporary workers outnumber regular workers in most industries. The Philippine Bureau of Labour and Employment Statistics, in its sample surveys on non-regular hiring, has concluded

that there is a rising trend of flexibilization and that about one-third of the workforce is non-regular. However, their statistics are grossly understated because company responses are limited to direct hires, regular and non-regular. Companies do not consider the employees of third-party service or labour contractors as their own employees even if they are placed by contractors on a temporary basis to do various jobs in the work premises owned by the principal company.[35]

The pattern of a huge informal economy and an informalizing formal labour market is apparent in Thailand. The 1997–1998 Asian financial crisis, which started in Thailand, helped expand the informal economy and deepen the formal-informal subcontracting system, with formal economy investors engaging informal economy subcontractors in the sewing of garments, weaving of special textiles, the production of mulberry products and the growing of certain crops (contract farming).[36]

Throughout the developing ASEAN countries, there is also mobility of labour between or among sectors; for example, unskilled workers in small and medium-sized enterprises going into agriculture during the cultivation periods and later joining informal construction brigades. As in other South-East Asian countries, the statistics are unable to capture the various forms of labour flexibility in the formal labour market, such as human resources dispatching and the hiring of casual and temporary workers.

c. Migrant workers circulating everywhere

Another reality in the ASEAN labour market is the increasing number of migrant workers "circulating" within the region or crossing borders. In Brunei Darussalam, Malaysia and Singapore (as well as Thailand), the employment of foreign migrants is the solution to labour shortages in these cash-rich countries. For these countries, the partial or selective relaxation of strict migration rules and the issuance of work permits to foreign workers is the easiest and simplest way of finding semi-skilled workers.

The ILO Regional Office, citing a World Bank study, estimated the number of migrants coming from ASEAN countries who are circulating or working within the

Table 2: Wage and non-wage employment in the ASEAN region, 2010.

Source: ILO, Labour and Social Trends in ASEAN (Bangkok, 2010).

Country	Labour force (000s)	Sector shares in employment as a percentage of total employment*			Wage and salaried workers as a percentage of total employed*
		Agriculture	*Industry*	*Services*	
Brunei Darussalam	202	4.2	**46.7**	49.1	**NA**
Cambodia	8,050	72.3	8.5	19.8	**14.0**
Indonesia	117,578	39.7	17.5	41.5	**33.1**
Lao PDR	3,179	82.2	9.3	8.6	**NA**
Malaysia	12,250	13.8	26.9	59.5	**78.9**
Myanmar	27,337	62.7	12.2	25.1	**NA**
Philippines	39,639	34.3	14.5	51.1	**51.4**
Singapore	2,632	NA	21.8	77.1	**90.0**
Thailand	38,977	41.5	19.5	39.0	**42.6**
Vietnam	47,936	52.2	19.2	28.6	**21.4**

Note: *Most recent data available for each country. NA-not available.

region at 6.8 million as of 2013.[37] They were mostly workers from the less developed ASEAN countries working in the more developed destination countries, such as Brunei Darussalam, Malaysia, Singapore and Thailand. Given the large number of unregistered migrants (people crossing from Myanmar into Thailand, moving from Indonesia to Malaysia or criss-crossing within the Mekong area), the 6.8 million statistic is obviously conservative. Nonetheless, without doubt, the cross-border mobility of labour is growing and is likely to intensify as the region pushes more and more towards fuller economic liberalization.

The city states of Brunei Darussalam and Singapore have the most acute need for foreign workers, the former because of its rich oil resources and the latter because of its enormous economic transformation. Migrants constituted around 40 per cent of Singapore's labour force in 2015, according to a Japanese study.[38]

The two countries with the biggest number of foreign migrants in the region are Malaysia and Thailand. The estimate for Malaysia varies, anywhere between 2 million and 3 million (documented and undocumented) persons. The resource-rich country has a long history of attracting labour migrants, first to work in the plantations and forest sector in its post-independence period, then in the electronics assembly sector in the 1970s and 1980s, and today, in the services sector (tourism and so on). As for Thailand, Kevin Hewison and Woradul Tularak[39] reported that the country had close to 2 million migrant workers in 2010 from Myanmar, along with workers from neighbouring Cambodia and the Lao People's Democratic Republic.

d. A "war for talents"

The flows of intra-ASEAN migration are not linear. Manolo Abella, a former ILO expert on migration, estimated that about 40 per cent of the 230,000 Singaporean migrant workers in 2007 were in Malaysia occupying high-skill positions, while 73 per cent of the 1.5 million overseas Malaysian workers were employed in Singapore.[40] In the same manner, Thailand is a large labour-sending country as well as receiver. Indonesia, the Philippines and Vietnam remain the largest labour-sending countries in the region, but these countries are also hosting growing communities of expatriate managers, professionals and skilled workers coming from various ASEAN and other countries. In short, ASEAN countries are becoming both labour-sending and labour-receiving countries.

The migration flows are cutting across all skill and job categories. This is why one major challenge for human resources managers today is how to develop, manage and retain talent. It is more economical for companies in a rush to build up investment projects to poach skills and talent at home and overseas rather than engage in time-consuming training exercises for middle-level and technical personnel. Poaching is also made easier by online recruitment practices, the ASEAN visa of 21 days for citizens and the inclusion of the "free flow of skilled labour" in the original AEC 2015 blueprint. The systems of equivalency, such as the mutual recognition agreements for select professions and the proposed ASEAN qualifications referencing framework, are facilitating the flow. A growing number of highly mobile professionals and experts are being deployed within the region and beyond through online recruitment and tourism-hiring arrangements (professionals come in as tourists and then apply directly to companies in tourist destinations).

In the Philippines, industries have long been complaining about the loss of skills and talent since the 1970s, when the programme for short-term migration for work was instituted on an originally temporary basis. Then, the complaint was about the difficulty of finding good electricians, plumbers and other skilled construction workers because the best workers were being hired en masse to work in the Middle East. Today, the complaint is about the loss of "mission-critical skills,"[41] meaning skills possessed by personnel who are not easy to replace and train, such as production engineers and pilots, without which companies and airlines would have to cease operating. Schools are also complaining about the loss of English and math teachers. The booming call centre industry, however, has become accustomed to talent piracy by competing companies, which openly advertise extra pay and bonuses for persons ready to work in call centre cubicles without any need for training.

e. Limited reach of unions

Outside the large informal sector or economy, a new world of work is taking shape in the formal sector under globalization and a more liberalized and integrated ASEAN region. However, the impact on the tripartite social partners—unions, employers and government—is somewhat confusing, policy-wise.

Unions, which have limited reach in the region (see table 3), generally take a negative view of the developments. They see the trend towards flexibilization and leaner work arrangements as further eroding the base of unionism. Abuses associated with casual and short-term hiring arrangements under informalization are usually tempered by protective labour laws or labour standards enacted by the State to prevent the arbitrary termination of employees, dismissal without due process and withdrawal of benefits because employees are categorized as non-regular. Teri Caraway[42] argued in 2010 that there is a wide gap between de jure protection reflected in the labour law system and the de facto enforcement of these standards. The widening gap between paper protection and actual enforcement naturally "exerts downward pressure on labour standards and increases the actual level of labour market flexibility."

According to Caraway, employers argue that the old ways of doing business in the context of a secure or protected national market are gone. Under globalization, business has to be nimble and should have the flexibility to increase or reduce jobs, wages and benefits, depending on the fluctuations in the market for their goods and services. And because they are also competing within their national boundaries, they cannot afford to not keep abreast of business practices adopted by competitors overseas, such as outsourcing of production. Human resources management has also become challenging; for example: How does one manage a diverse workforce composed of foreign migrants and domestic citizens? How does one retain talent while keeping middle management and short-term rank-and-file workers happy and productive? How does one deal with the unions or worker representatives in a globalized work setting or environment?

Impact of the Fourth Industrial Revolution on the ASEAN labour market: displacements, disruptions and emerging labour concerns

Given the foregoing structure and distribution of the labour force in ASEAN, how would the Fourth Industrial Revolution impact on the labour market? The following is a brief outline of likely changes and emerging labour concerns.

First, displacements and disruptions are not going to happen in one swoop.

Earlier, this study summarized the projections made by two ILO studies and the Cisco-Oxford study on the displacement impact of automation and robotization in key sectors in select ASEAN countries. Accordingly, around 56 per cent of all employment in the five ASEAN countries Cambodia, Indonesia, Philippines, Thailand and the Philippines is vulnerable to displacement due to automation in the next two decades.[43] Cisco-Oxford, which covers the six ASEAN countries Indonesia, Malaysia, Philippines, Singapore, Thailand and Vienam gives a more precise number of workers to be "redundated" up to 2028 – 6.6 million workers.[44]

However, automation does not happen overnight, especially when it comes to the whole economy. The Fourth Industrial Revolution is likely to usher changes in a gradual or incremental manner, within an industry and across the different sectors of an economy.

One explanation for the gradual or incremental diffusion of the constellation of Fourth Industrial Revolution technologies is the costing of each new technology to investors and to each country. Those who have the capacity to procure a given technology and apply it in a big and profitable way would naturally go through the process of calculating the relative cost of buying and employing the technology in relation to the cost of replacing local labour hires. In less developed countries, where the cost of labour remains very low, there is less incentive to procure an expensive technology, such as a robot or automated system, especially if the technology is relatively new or untested in the market.

At the ASEAN level, the wide development gaps between or among the member countries must be considered. The economic bloc is composed of ten countries at ten different levels of development (see table 3). This unevenness is vividly reflected in the per capita GDP statistics for each country. Singapore's per capita of 57,722 US dollars is 44 times that of Myanmar's per capital GDP of 1,299 US dollars. In between these two, the other eight ASEAN countries occupy markedly different rungs of the GDP ladder. The difficulty of closing the development gaps among them is one of the major explanations why the ASEAN goal of transforming the region into one economic community is taking time, despite the various intra-ASEAN trade facilitation programmes that have been adopted since the 1990s.

Second, the speed of technology diffusion depends on the readiness of each country.

Undoubtedly, the Fourth Industrial Revolution—through displacement and disruptions—is likely to affect the structure of the economy and the labour market of each of the ten ASEAN countries. All have been integrated with the global economy and have been relatively open to the introduction of the latest technology in the conduct of business and industry, as reflected in the widespread use of the internet and internet-based technology across the region.

However, the speed and breadth of the adoption and diffusion of the new technology in each of the ten ASEAN countries varies. And they are likely to be influenced by the following readiness issues:

Level of economic openness of a country. No country is immune to the Fourth Industrial Revolution. The more integrated a country is with the global economy, the greater will be the impact of the Fourth Industrial Revolution, which is now a motor of globalization, especially in the integration or linking of markets. Under the AEC vision and blueprints (2015–2025),[45] all the ASEAN countries are committed to economic openness. In the ASEAN region, Singapore seems particularly challenged, along with Malaysia, Thailand, the Philippines, Indonesia and Vietnam.

Level of technological and industrial development of a given country. The more developed the technical base is in a country, the greater will be the impact of the Fourth Industrial Revolution. This is particularly true for countries with a sophisticated or technologically advanced industrial base.

The Cisco-Oxford study is unequivocal in stating that the most significant impact of the Fourth Industrial Revolution will be on the more developed ASEAN countries. These countries have more developed infrastructure and human resources needed to go higher up the rungs of the digital ladder.

Of course, there is a great deal of unevenness in technology innovation and technology management across the region and even within each country. Knowledge acquisition and technology adoption and adaptation, as well as overall technological development, depend on a number of factors, such as the existence of basic knowledge infrastructure (schools and laboratories), government policy and budget support, private sector investors and adopters, foreign investors, internet connectivity, diffusion of knowledge, technology transfer and so on.

Table 5 presents a rough typology of the stages of technological development for the different ASEAN Member States.

Structure of the ASEAN labour market: Most likely changes in the industry, agriculture and services sectors

Under the Fourth Industrial Revolution, the economy and labour market of each country are going to experience structural changes. The Fourth Industrial Revolution, together with economic globalization, is now a major factor in the shaping or reshaping of the economy at the national, regional and global levels. Wholesale or incremental, the introduction of any major technology is bound to alter the complexion of the economy and its labour market.

Some major structural issues in the economy and labour market of the ASEAN countries:

Participation in Factory Asia and global value chains of multinational companies: Is reshoring happening?

A major structural issue related to the Fourth Industrial Revolution's impact on the ASEAN region is the participation of each country in the global value chains of multinational companies.

The global value chain facilities in ASEAN and other Asian-Pacific countries emerged as part of the global technological advances in the 1970s and 1980s, when

Table 3: Rates of unionization in South-East Asia, 2000.

Source: Extracted from table 1 of Teri Caraway, "Labour Standards and Labour Market Flexibility in East Asia", Studies in Comparative International Development 45, no. 2 (2010): 228.

Country	Unionization rate
Myanmar	0.0
Cambodia	1.0
Indonesia	2.6
Lao PDR	3.0
Thailand	3.1
Malaysia	8.3
Vietnam	10.0
Philippines	12.3
Singapore	15.7

Table 4: ASEAN population and per capita GDP, 2017.

Source: ASEAN Statistical Yearbook 2018.

Country	Population (000s)	Per capita GDP (US$)
Brunei Darussalam	421	28,986
Cambodia	15,718	1,421
Indonesia	261,891	3,872
Lao PDR	6,753	2,531
Malaysia	32,050	9,899
Myanmar	53,388	1,299
Philippines	104,921	2,992
Singapore	5,621	57,722
Thailand	67,653	6,736
Vietnam	93,672	2,390
	642,079 (Total)	**4,308 (Average)**

multinational companies in Europe, the United States and Japan succeeded in atomizing industrial production, rather dividing it into two major clusters: the capital-, knowledge- and skills-intensive cluster and the labour-intensive, low-tech cluster. The former was retained in the developed countries, while the latter was outsourced to developing countries. This gave rise to what the German trade union researchers in the 1980s called the "new international division of labour."[46]

Based on the new international division of labour framework, multinational companies relocated their labour-intensive facilities -mostly those related to electronics, semiconductors, auto parts, auto assembly, clothing, textiles, footwear and furniture- to cheaper industrial locations, mostly in special economic zones or export processing zones established by host countries to capture foreign direct investment. In Asia, the new international division of labour eventually gave birth to what is now popularly referred to as "Factory Asia".

With the advances in automation and robotization, these labour-intensive processes are now vulnerable to possible "reshoring", or a reversal of the new international division of labour. There are reports that some European and American multinational companies are contemplating to do so, as illustrated by the case of Adidas of Germany.

However, there are no indications that such a process of reshoring is happening in a major way. Most of the economic processing zone facilities across the region are still in place.

There are possibilities that some outsourced activities will be subjected to robotization, automation and technological upgrading right in the host countries, which means business and labour displacements are likely not to happen. Or, if there will be labour displacement, it will not be due to the relocation of these facilities back to their home countries but because of the shrinking demand for assembly workers.

To a certain extent, this is happening with the Japanese production networks in the ASEAN region. Japanese offshore industrial investors have been active in promoting "industrial upgrading" in some host countries, such as the Philippines and Thailand. Japanese industrial consultants, for example, are pushing for the development of "science cities" in Thailand, openly nudging the Japanese-led auto assembly to blend with the AEC programme to take advantage of the growing business opportunities in the "evolving southern economic corridor" connecting four countries (Thailand, Cambodia, Lao PDR and Myanmar) and to strengthen the industrial clusters that have benefited from Japanese investments.[47] Thus, the projected dismantling of the outsourced auto parts and auto assembly industries has become less likely, and the decline in blue-collar assembly work is likely to be offset by increases in expanded business opportunities arising from increased investments in the proposed science cities.

In short, the likelihood of massive job displacement happening in Asia due to the impact of robotization and automation of Factory Asia is not a certitude. What is clear is that there will be adjustments or disruptions here and there. This, to a certain extent, is what has been happening since 2000, the reference year used by Klaus Schwab and others in dating the starting year for the Fourth Industrial Revolution.

But should the multinational companies increase or intensify the application of more robots and automation in the production chains associated with Factory Asia (automotive and auto parts assembly, electronic and semiconductor assembly and the textile, clothing and footwear industries), the ASEAN countries hosting low-technology assembly plants or production facilities for these industries are likely to be affected. This, in essence, is what the ILO study, *ASEAN in Transformation* (2016), is suggesting. The study claims there will be a hollowing out of auto parts production in Indonesia, Malaysia and Thailand; electronic and semiconductor assembly work in Indonesia, the Philippines, Thailand and Vietnam; and the production of textiles, clothing and footwear in Cambodia, Thailand and Vietnam.

Nonetheless, everything remains fluid. Forecasts on the possible shape of global value chains and Factory Asia are still couched in the uncertain adverbs "would" or "should". A recent study by four scholars (Lee, Wong, Intarakurmnerd and Limapornvanich, 2019), listed four

Table 5:Typology of ASEAN Member States in technological development.

Source: Typology developed by Rajah Rasiah, cited in Intal et al., 2014, p. 199.

Phases	Country	Some innovation activities
Frontier	Singapore	Reliance on basic research and R&D laboratories in support of creative accumulation activities; connected to frontier nodes of knowledge; comparative advantage in high-tech products; generates design and invention patents.
Catch-up	Malaysia	Developmental research as source of technological catch-up; access to foreign knowledge through licensing, acquisition of foreign companies and imitation; upgrading in global value chains; rising capacity with high-tech products; initiation of commercially viable R&D.
Higher learning	Indonesia, Philippines, Thailand, Vietnam	Learning by doing and imitation; integration in global value chains and regional production networks; access to foreign sources of knowledge; imports of material and capital goods; moving up to the catch-up phase.
Initial conditions	Cambodia, Lao PDR, Myanmar	Integration in the global economy; emergence of demand for technology; moving up to the higher learning phase.

development options for multinational companies with global value chain facilities in South-East Asia in relation to the Fourth Industrial Revolution challenges:

- stay in the same location but adopt new technologies to remain competitive;
- return to home country;
- move to a neighbouring country with lower wage rates; and
- stay in the same location but diversify the business with some help from the Fourth Industrial Revolution.

That 2019 study analysed the electronic industry situation in Penang, Malaysia's high-tech city, and the automotive sector of Thailand. Their conclusion: The Fourth Industrial Revolution is a "blessing" in these two industries because both happen to be moving up the value chain.[48] In the case of Penang, multinational companies, such as *Intel and Motorola*, have stayed on because Penang has become an ideal site for higher value-added engineering services, partly due to the support given by the Penang government for R&D infrastructure and upgrading of skills needed by electronics investors.

In Thailand, a similar government-industry R&D and skills cooperation programme has been supporting the continuous upgrading of the auto industry. This upgrading programme is complemented by the availability of cheap migrant workers from neighbouring countries (Cambodia, Lao PDR and Myanmar), who are assigned to do the low-tech labour-intensive production processes, while Thai skilled workers and professionals focus on the more sophisticated aspects of auto production. And as pointed out earlier, the Japanese auto investors are committed to keeping Thailand as an auto hub due to it being at the centre of a bigger auto sub-regional market involving Cambodia, Lao PDR and Myanmar.

These two examples indicate that the threat of industrial hollowing out or displacement is unlikely in sites where the continued viability of industries is assured because of the market prospects (such as the Thai auto market) and investors enjoy government support, especially programmes for industrial upgrading in situ. Unfortunately, these two examples appear to be exceptional in relation to the constellation of global value chain facilities operating in other ASEAN countries.

In Cambodia, Lao PDR and Myanmar, the question is: Can they maintain their hold on the garments and other labour-intensive industries? Can low wages and repressed labour organizing somehow offset the advantages of automation, robotization and higher production made possible by other Fourth Industrial Revolution technologies? A positive answer to these questions means job retention. At the

same time, it also means development remains stuck at low level.

For Singapore, the Fourth Industrial Revolution brings enormous opportunities but also notable challenges as it enjoys the "frontier" status in technology development (see Table 4). And yet, it is also hailed as the most prepared. It has a whole-of-economy approach to strategizing its Fourth Industrial Revolution readiness that involves industry, labour, academia and government. It has drawn up enabling programmes based on a proactive system of tripartite consultation and cooperation (see the discussion in the next section).

Among the global value chains for services, such as offshored online-delivered customer and back-office services, the Philippines stands out in the ASEAN region (India is the other Asian destination for such services). ILO projections point to a substantial decline due to software automation and the rise of the interactive chatbots. Based on interviews by the research team with industry informants, the decline has already started in the voice segment of the industry but largely in an incremental manner, not in a big way. As to the non-voice segment, the industry players in the Philippines have been discussing the possibility of climbing the higher rungs of the industry, such as specialized programming and mobile phone applications for various services that require higher skills and technical proficiency.

In sum, the section outlines the emerging trends and challenges in the global value chain system in South-East Asia that is neither complete nor exhaustive. There is a need to further supplement the Cisco-Oxford, ILO and other studies cited in this review with a more in-depth analysis of each global value chain-linked industry and the impact of the Fourth Industrial Revolution country by country. For example, global value chains-related investments are reported in the business media to be on the rise for instance in Vietnam, fuelled partly by the migration of some global value chain companies from China to Vietnam as a result of the United States–China trade war. But is it also fuelled by the Fourth Industrial Revolution and the efforts of China to move upward on the technology ladder?

Shrinking agricultural labour force in the ASEAN region

The big loser in the Fourth Industrial Revolution is the agriculture sector. In the Cisco-Oxford study, the majority of workers to be displaced up to 2028 will come from the agriculture sector, at around 5.7 million people.[49]

This is not surprising because it was the trend globally under the three previous Industrial Revolutions. Fewer and fewer agricultural workers are being employed as more and more agricultural machineries are introduced, for example, animal-driven ploughs being replaced by tractors and teams of agricultural workers replaced by machine harvesters. With the Fourth Industrial Revolution, more technological innovations are invading the rural sector, such as the drones and satellites mapping soil and flowering conditions in the commercial farms and plantations under the control of big corporations and multinational companies.

In the ASEAN region, agricultural modernization is aided further by programmes related to the vision of transforming the member countries into a single market and one production base, through the ASEAN Free Trade Agreement and the ASEAN Investment Agreement. These twin agreements are facilitating the freer flow of agricultural products and agriculture-based investments throughout the region. This explains why agribusiness corporations, such as *Charoen Phokphand* in Thailand, *San Miguel Corporation* in the Philippines, the palm oil interests in Malaysia and the big food processors in Singapore, are all over the region actively putting up trading posts and managing plantations and production facilities in the various ASEAN countries.

These home-grown ASEAN agribusiness corporations are joined by trader-investors coming from the "dialogue partners": Australia, China, Japan, Republic of Korea, New Zealand and the United States. These dialogue partners, minus the United States but including India, are moving closer to forging the world's largest free-trade arrangement: the Regional Comprehensive Economic Partnership (RCEP), which, like the ASEAN Free Trade Agreement, provides for the freer flow of goods and investments within the region.

Naturally, the big agribusiness corporations from the ASEAN countries and from the dialogue partners employ the latest agricultural machinery and technology, which is requiring fewer workers. The multinational investors in the five biggest agricultural producer-exporter countries (Indonesia, Malaysia, Philippines, Thailand and Vietnam) have been

spending on agricultural modernization, such as drones for monitoring conditions, the spraying of chemicals through planes, the harvesting of agricultural produce through giant bloomers, the seamless delivery of agricultural inputs and outputs through modern logistical systems and the calendaring and programming of agricultural activities with ICT help.

Nonetheless, in some ASEAN countries, there are efforts to temper or moderate the adverse impact of labour displacement in agriculture. In socialist Vietnam and social protection-conscious Thailand, labour displacement in the countryside is subjected to some form of social regulations. In Vietnam, one of the biggest employers is the Agricultural Bank, with more than 100,000 workers. These bank workers provide credit and technical assistance to millions of small farmers nationwide. It is unthinkable that Vietnam will allow the large army of small farmers to disappear overnight.

In Thailand, past and present governments have been competing for popular support among the small rural producers through a variety of rural welfare and agricultural subsidy programmes. This competition continues to contribute to the political divisions in the country.

Fourth Industrial Revolution and job creation in the expanding services sector

In the Cisco-Oxford study, the services sector is projected to grow bigger in the six ASEAN countries in the coming years. The jobs projected to be created by the sector between 2018 and 2028 are as follows:[50]

- 1.8 million in wholesale and retail,
- 0.4 million in hotels and restaurants,
- 0.2 million in IT and communications,
- 0.2 million in finance and insurance,
- 0.2 million in education,
- 0.2 million in public administration,
- 0.1 million in health care,
- 0.1 million in arts and entertainment, and
- 0.1 million in professional services.

The problem is that these projections are not necessarily the result of the Fourth Industrial Revolution alone. What is also occurring is that the services sector has been expanding by leaps and bounds across the ASEAN region since the turn of the millennium.[51] In the 1970s-1990s, some ASEAN countries, such as Indonesia, Malaysia and Thailand, became major participants in Factory Asia by hosting global value chain-related production facilities in the auto assembly, auto parts, electronics, semiconductor, garment, textiles and footwear industries. After adopting a policy of market opening in the 1990s, Cambodia and Vietnam became active players in Factory Asia.

According to Jesus Felipe, in a paper published by the Asian Development Bank, the "industrial dynamism" that characterized growth in the leading ASEAN countries before the turn of the millennium is now being eclipsed by the tremendous expansion of the services sector across the region.[52] Obviously, this structural transformation is the natural outcome of the globalization processes and the sharp decline of the agriculture sector in the ASEAN region.

Is the Fourth Industrial Revolution creating jobs for the services sector and the economy as a whole? The answer is that it is responsible for the creation of some but not all of the services sector jobs. Labour statisticians still need to generate the statistical data on how many service jobs are being created by the Fourth Industrial Revolution and what are those that are the outcome of the natural expansion of the sector as a whole. For example, jobs have bloomed in the ICT-related industries, such as the packaging, distribution and marketing of mobile phones. On the other hand, there is a continuous expansion of the informal sector in the less developed ASEAN countries. Many jobs in the informal sector are marginal and low skill.

In the case of the Philippines, which is an industrial laggard in the ASEAN region, services has become the growth leader. The country has become a major beneficiary of the global offshoring of ICT-enabled online services, such as customer and back-office activities for large American and European companies. The job gains from the offshored customer and back-office operations are supplemented by new jobs secured by enterprising Filipino freelancers enlisting in *Upwork* and other online networking agencies. To complete the picture on the growth of the services sector, many industries in the country are boosted by the consumption needs of migrant families for education, health and other services. The Philippines had more than 10 million overseas migrant workers (in a population of 100 million) in 2011 remitting close to 30 billion US dollars a year.[53]

But service industries across the ASEAN region are reconfiguring in relation to the Fourth Industrial Revolution, although not in a radical or holistic manner. Technology adoption and adaptation have been incremental or gradual. Lenovo,[54] for instance, listed the following industries as partly affected by the application of artificial intelligence:

- Finance-some companies using artificial intelligence systems to forecast stock trends and to help investors through the employment of robo-financial advisors.
- Health care-artificial intelligence nurses serving as nursing assistants and helping make diagnoses based on accumulated patient data.
- Logistics-artificial intelligence technology tracking the movement and maintenance of goods.
- Sales-artificial intelligence-enhancing service delivery throughout the sales pipeline.
- Insurance-artificial intelligence preventing accidents and minimizing injuries, such as the wearing of gadgets that provide timely warning on rising blood pressure and so on.

Two outstanding examples of Fourth Industrial Revolution-bred industries are the formation of the *Go-Jek* motorbike-taxi ride-hailing business in Indonesia in 2010 and the *Grab* taxi ride-hailing company in Malaysia in 2012 by young local techies. Both the *Go-Jek* and *Grab* businesses are built around a mobile smartphone app that utilizes cloud-based technology to provide ride-hailing, delivery and logistics services. They do not own their fleet of taxis and motorbikes. They simply link participating drivers and motorbike and car owners with commuters seeking convenient and comfortable rides or service delivery through online apps. In the process, these companies have created thousands of jobs in ASEAN countries by creating the ride-hailing and special service and logistics industries.[55]

Go-Jek has diversified its service offerings to include food delivery from restaurants (Go-Food), food delivery from stores (Go-Mart), home cleaning (Go-Clean), massage services at customers' location (Go-Massage) and electronic payment services (Go-Pay). *Go-Jek* has more than 900,000 contracted drivers.

Grab has significantly expanded its operations across the ASEAN region. It provides services in Cambodia, Indonesia, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam. *Grab* also has a fintech business, GrabPay.[56]

ASEAN banking: Incremental technology adoption and adaptation, gradual regional integration

Under the blueprint for the AEC (2015 and 2025), the ASEAN banking industry is programmed to become fully integrated and able to provide banking services for a region that is projected to become a single market and one production base. However, the integration process has moved in a gradual or slow-by-slow process, meaning no one swoop integration. Similarly, technology innovations are being adopted by the banks in a gradual or incremental manner.

The slow-by-slow process is due, to a great extent, to the unwritten ASEAN rule: No major ASEAN policy shall be adopted without the consensus of all Member States. Thus, the original blueprint or road map for the attainment of the AEC goals was adopted in 2007, with 2015 as the completion year; but this completion year has since been extended to 2025. The AEC 2025 is virtually a restatement of AEC 2015.

There are also lingering reservations among the ASEAN Member States on the desirability of full liberalization of the banking industry, given the painful lessons of the 1997–1998 Asian financial crisis. This crisis, precipitated partly by the unilateral financial liberalization measures undertaken by the individual ASEAN countries in the 1990s, shook the confidence of ASEAN States on having programmes for liberalization of their financial systems. Thus came the need for national and regional safeguards, such as stricter registration requirements in the application of banks for operation in another ASEAN country.

Eventually, the financial liberalization was reflected in the gradual adoption and adaptation of technology and digitalization promoting a unified ASEAN banking industry.

Now, a brief backgrounding detour on economic and financial integration in the ASEAN region. As mentioned earlier, under the AEC 2015 and AEC 2025 blueprints, the overarching goal is to transform South-East Asia into *one single market* and *one production base*, characterized by the following:

- free flow of goods
- free flow of services
- free flow of investment
- free flow of capital and free flow of skilled labour.

On the free flow of goods, the primary integration instrument is the ASEAN Free Trade Agreement, which has been in place since the mid-1990s. The liberalization of intra-ASEAN trade under that agreement was accelerated with the adoption in 2007 of the trade-facilitating ASEAN Trade in Goods Agreement, the completion of the ASEAN tariff-harmonization programme and the introduction of other trade-boosting measures, such as the ASEAN single-window system (to smoothen the entry of ASEAN goods through each country's customs doors). As of 2010, ASEAN reported that import duties for 99.7 per cent of the total tariff lines of the six original ASEAN members (Brunei Darussalam, Indonesia, Malaysia, Philippines, Singapore and Thailand) had been abolished or reduced to zero. The figure for the later members (Cambodia, Lao PDR, Myanmar and Vietnam) was 98.9 per cent of all tariff lines, or up to 5 per cent as originally conceived for the whole of ASEAN.[57]

On services, investment, capital and skilled labour, ASEAN has instituted liberalization programmes, such as the ASEAN Framework Agreement on Services, the ASEAN Investment Agreement, the ASEAN Capital Market Development and the adoption of mutual recognition agreements for the different professions.

Had ASEAN then become one seamless regional economy in 2015, in accordance with the original AEC blueprint? The answer is a clear NO. The year passed without any formal ASEAN announcement that the region was fully integrated. What happened instead was the replacement of the AEC 2015 with AEC 2025, which seeks to consolidate the various liberalization programmes.

The ASEAN Member States had balked at the speed at which the most important segment of the economy, financial services, would be opened up. Thus, the financial integration target under the AEC 2015 was postponed to 2020, and the ASEAN Member States were given elbow room to calibrate the adoption and implementation of their banking-liberalization measures, based on their national development priorities, but in accordance with the ASEAN Bank Integration Framework, which was adopted in 2014.

There is no denying that there have been tremendous changes in the structure of the ASEAN banking industry, despite the piecemeal or step-by-step modernizing of the banks as well as the slow-by-slow efforts of the different financial institutions to promote cross-border coordination and networking. ASEAN banks have become bigger, again in accordance with the development framework for bank integration, and there has been a steady process of digitalization of various aspects of bank operations. They have also forged networking ties with one another within the region, with some of these efforts resulting in mergers and new bank partnerships across borders.

One of the fears of the bank unions is that modernization and integration will lead to massive job displacement, for example, the proliferation of ATMs would mean fewer teller jobs as simple transactions are digitalized. And yet, the scenario of massive job disruption has not taken place. There are now 93 ATMs per 100,000 people in Thailand, 43 in Malaysia, 40 in Indonesia and 19 in the Philippines.[58] So far, there are no major bank job disruptions in these countries.

One reason is the growth of the economy and the consequent proliferation of bank branches. Another is the effort of bank executives and human resources managers to transform the work of bank employees, for example, tellers, into service counsellors.

A major development in the financial sector is the boom of the fintech industry, which is, essentially, a product of the convergence of IT and finance. An early concern was that the popularity of fintech would subvert bank operations and bank relations with their customers or clients. Fintech makes is easy for bank clients to make payments or transfer cash through their mobile telephone devices. Fintech also enables freelancers and e-companies, such as *Alibaba* and *Tencent* of China and the ride-hailing *Grab* and *Go-Jek* companies, to conduct their business flexibly and take "leading positions across the entire electronic payment service sector in Southeast Asia."[56]

And yet, there has been no major bank employment disruption due to the rise of the fintech industry. Instead, there has been complementarity in the services of the banking industry and the fintech industry and the blending of the high-tech and low-tech financial services in what Iwasaki calls "hybrid business models."[60]

There are other new technologies being adopted by the ASEAN banks, for example: mobile assistant, bank chatbots, bank selfies, person-to-person schemes, integrated billing,

cloud computing, crowd funding, big data assistance and so on. But as repeatedly pointed out, there has been no major job displacement. Although the same cannot be said regarding the smaller and undercapitalized rural savings and thrift banks. Like the fintech companies, they probably are now being merged or aligned with the operations of the big banks.

As to the bank unions, UNI Apro has long been telling its ASEAN bank union affiliates to have a social and digital clause in their collective bargaining agreements: bank employers and bank unions should collaborate with one another in the preservation of bank jobs in any modernization or technology adoption and adaptation process.

Deepening inequalities, growing labour precarity

As outlined earlier, the labour market in the ASEAN region, both at the national and regional levels, is uneven, segmented and unequal. Under the Fourth Industrial Revolution, these characteristics are unlikely to change.

Inequality is likely to persist and even deepen, with society and the labour market becoming divided between the "digitally included" and the "digitally excluded." Although mobile phones have almost become a universal necessity, the reality is that not all people are capable of paying for internet connection and taking advantage of knowledge advances under the Fourth Industrial Revolution. ASEAN-wide, there are 135 cellular phones per 100 people; yet, there are only 38.8 subscribers to the internet per 100 people. The excluded include the informal sector workers, who constitute two-thirds of the ASEAN labour force, the precariat in the formal sector and the micro informal entrepreneurs.

A major trade union concern is that technology innovation and/or adoption is often used as a major excuse to reorganize or re-engineer business and work. Such re-engineering exercises often target the positions held by trade union activists and organizers. Re-engineering can also lead to the wider practice of short-term or casual hiring, with companies investing mainly in applicants who are highly skilled and talented, and whose role in the Fourth Industrial Revolution has undeniably become important everywhere. The demand for workers doing routine and repetitive work is bound to decline with the rise of automation and robotization.

Job security for many workers is being eroded under economic globalization. The Fourth Industrial Revolution is likely to deepen such a trend. More and more jobs are being classified as project jobs, not regular jobs. Some advocates of neo-liberalism in the economy and in the labour market are even openly advocating for more flexible labour rules on labour hiring and labour protection in order to create more jobs for the working-age population. According to the head of the Philippine Foundation for Economic Freedom, one way of countering the job-displacement impact of the Fourth Industrial Revolution is to increase labour flexibility and keep the minimum wage untouched by ignoring labour demands for a wage adjustment.[62] This is an old and classic neo-liberal thesis: Cheaper labour means more investment and higher growth and employment. This has not happened in countries that have adopted this framework, as advocated by the World Bank and the International Monetary Fund for heavily indebted countries.

This chapter presents a summary of the views of a select group of trade union leaders in South-East Asia and East Asia. They are members of the ICT Service Committee of UNI Apro and were interviewed during an organizational meeting in Hanoi in August 2018. They represent UNI Apro unions from Hong Kong, Indonesia, Japan, Malaysia, Singapore, Republic of Korea, Taiwan and Vietnam.[63]

The interviews were supplemented by the research team's interviews with the officers of the UNI Apro Liaison Committee in the Philippines and the UNI Apro Liaison Committee in the Republic of Korea. The Research Team also interviewed Christy Hoffman, Secretary General of UNI Global, and Christopher Ng, Regional Secretary of UNI Apro, on what they think should be done to organize workers under the Fourth Industrial Revolution.

The views and perceptions of the unions are clustered as follows: emerging Fourth Industrial Revolution labour issues and concerns; trade union responses; and policy options and proposals. The interviews focused on major technological changes related to ICT, automation and robotization and not on the broader Fourth Industrial Revolution concept.

III. A Closer Look at the Fourth Industrial Revolution by Select ASEAN and East Asian Trade Unions: Labour Issues and Policy Options

Labour fears and concerns for the Fourth Industrial Revolution

The pace and extent of the technology revolution rolling across the ASEAN region as well as East Asia and South Asia vary. Hence, the impact on the labour market and industrial relations naturally varies. In East Asia, the technology revolution is advancing rapidly, compared with the less developed countries in South-East Asia.

The big ASEAN employers, such as the large commercial banks and telecom companies, have embraced the new technology with open arms. For example, commercial banks have rapidly adopted new digital banking tools, such as selfie banking, mobile assistant express and banking chatbots. The spread of the fintech industry is also phenomenal.

Still, the automation phenomenon is not happening wholesale or in one swoop, economy-wide, in the different ASEAN countries. But incremental or not, the introduction of new technologies in the workplace has given rise to the following common labour concerns.

1. **Difficult adjustment in the use or mastery of a new technology.** Rapid technological changes typically do not give workers, especially middle-aged or older workers, enough time to adjust to the work process or learn new knowledge or acquire new skills needed at work. Adjustment problems have become extremely difficult in high-speed technology-oriented countries, such as Japan and Malaysia, even if the threat of job displacement is much less in these two labour-short countries.

   Adjustment is also difficult in labour-surplus countries with no readiness programmes, no industry-worker or union consultation-information programmes and no government and industry support for transition adjustment, training and retraining. Worker-focused transition adjustment programmes are generally absent in most countries, with the exception of Singapore, where the National Trades Union Congress (NTUC) is leading such efforts.

2. **Lack of information sharing and lack of programmes to minimize the adverse impact of technology on labour.** Most industries do not disclose any acquisition or modernization plans that require the introduction of new technology and that have serious implications on the organization of work. Workers are generally kept in the dark until the new technology is introduced, which leads to difficult adjustment and job disruption and displacement issues. And yet, employers and human resources managers generally plan the adoption or procurement of new technology months ahead, even a year or so. The decision to have new technology is a business decision made long before it arrives.

   The problem is made worse by the lack of training and skills development programmes that would enable affected workers to adjust to the new technology. Employers generally do not invest in training and skills development for older employees. They find this expensive. Often, they resort to hiring new workers who can handle the new technology better at lower wage rates. In fact, the new technology is used to justify the re-engineering or reorganization of work, which often leads to the disruption of the standard work processes involving the older workers. This naturally leads to displacement of some workers, retention of only a few and general demoralization for the majority.

3. **Adverse psychological impact on older workers.** In Malaysia, Shafie Mammal reported the negative psychological impact on workers when an enterprise suddenly installs new technology without consulting or informing them. This

causes demoralization. The most affected are the middle-aged and retiring workers because they have the least capacity to learn or master the new technology. Some people leave or resign from the enterprise, even without compensation, due to frustration and embarrassment over their inability to adjust to the new technology. The situation becomes worse when enterprises announce on bulletin boards the names of people qualified to manage the new technology, implying that those not listed have limited skills.

4. **Precarious employment spreading.** Under economic globalization, precarious or non-regular employment is widespread. With the Fourth Industrial Revolution, this trend is spreading further. Technological changes are used by an increasing number of employers and human resources managers to "casualize" work and downsize the regular workforce. More and more, workers are hired on a short-term or project-to-project basis. In some countries, technological advancement is used to avoid employers' obligations or even repress workers' rights, such as the right to collective bargaining.

   Precarious labour hiring practices, such as agency hiring, have become more common. According to Exie Nidea of UNI Philippines, the big industry users of the new technology, such as media and entertainment companies, hardly do any hiring of workers, whether regular or non-regular. Instead, they outsource jobs to third-party service providers, talent agencies or job-contracting companies. Back-office jobs, such as accounting, payroll administration, supply chain management and HR services, are also outsourced. IT solutions are routinely outsourced. These include mobile phone application development, content management solutions, analytics, etc. Even some core functions of a business are outsourced, for example, newspapers outsource fact-checking and copy editing.

   This narrative on technology and job losses was reinforced by the representative from UNI South Korea on big data management, which has become a trend among big corporations. These companies use big data management in reorganizing business operations, such as with supermarkets, self-service and radio-frequency identification systems. In 7-11 stores, management has even introduced robot cashiers. Samsung has adopted Cello Square 3.0, a delivery platform combining the technology of blockchain, artificial intelligence and global logistics.

5. **Uncertain status as workers, with no social protection.** In Indonesia and other ASEAN countries, the protective labour laws cover mainly permanent and contractual workers. They do not cover on-demand and cloud workers, such as those working for Amazon or *Airbnb*. As a result, new industrial relations questions are emerging with no clear answers. Kun Abyoto, the UNI Apro ICTS Coordinator, explains that people working for *Go-Jek* or *Grab* are not considered employees. They are treated as "partners". When the *Go-Jek* or *Grab* drivers have an accident, the companies do not provide health and safety assistance. In short, these "partners" do not have the social security or social protection that is normally extended to regular workers.

6. **Missing social dialogue and consultation.** There is no tripartite social dialogue, consultation or even information sharing by industry and government. There are also no government-led digital road maps in most countries. This situation adds to the confusion or lack of understanding by workers and the unions on the possible impact of the Fourth Industrial Revolution on their jobs. The possible exception here is Singapore, which promotes a tripartite approach in the crafting and implementation of its digital readiness programmes (see box 2).

7. **Digital divide and exclusion.** Mastering ICT, especially hand-held ICT gadgets, is usuallly not a problem for millennials and young workers. The problem is the limited capacity of many workers to buy the ICT gadgets and connect to the internet. With mobile phones, the majority of workers usually have one to connect to their family and friends via texting. But few people can afford the expensive 3G and 4G high-end phones that can provide connectivity to

the internet and engage in ICT-enabled tasks, such as monitoring traffic hazards, sending e-mail messages and coordinating office and home activities while on the road.

8. **Limited awareness of the Fourth Industrial Revolution and its social, labour and trade union impacts.** The leaders and organizers of the trade unions are generally aware of the ICT-ushering changes in the world of work. However, the rank-and-file workers generally have a vague idea of how the technology will alter the organization of work. The Fourth Industrial Revolution, which is a multisided package or combination of new technologies, is a young phenomenon that is still being studied by the trade union movement.

   In short, there is a general awareness about the changing world of business and work due to rapid technological changes, whether ushered in by ICT or the broader Fourth Industrial Revolution. The problem is that the level of understanding by the rank-and-file workers on how technology is affecting work is not deep enough or even at the surface level. While some industry associations and big ASEAN corporations have technology and industry road maps, the unions do not.

Union responses

Most of the union responses to the Fourth Industrial Revolution are elementary: largely attempts to understand it, its impact on industry and business and the consequent changes in the labour and economic landscapes in each ASEAN country.

They bewail the lack of information on the Fourth Industrial Revolution and its impact in their particular industry or company. According to Kun Abyoto, one of the tasks of the UNI Apro ICTS Committee is to fill in the information gaps and help prepare unions and workers. He laments the absence of an industry transformation map involving the unions or a programme of technology innovation based on tripartite arrangement.

Hence, most of the union affiliates of UNI Apro have been conducting seminars and other awareness-raising programmes to orient trade union members on ICT and the Fourth Industrial Revolution. Part of these programmes is a reiteration of an old UNI Apro guideline on collective bargaining: the inclusion of a *technology clause*. Under this clause, there should be union-management consultation on the introduction of any job-displacing technology and union-management dialogue and agreement on how to preserve jobs, including the possible redeployment of an affected worker. The technology clause also includes programmes on skills development to help workers manage the new technology, adjust to a new work arrangement and find ways to give alternative work assignments or jobs to affected workers without any erosion of workers' wages, benefits and job security.

The initiation of *social dialogue* with industry and government was also cited by the UNI Apro organizers. They assert that, ideally, positive and constructive social dialogue should lead to *social partnership* on the promotion of business growth, job preservation and the mutual sharing of benefits. Unfortunately, social dialogue is not given importance by many industry players. Governments generally call for social dialogue; yet, not all governments undertake serious follow-up so that honest-to-goodness dialogue and joint problem-solving take place.

One example of the sound and sustained social dialogue is RCPI union and the *Universal Storefront Services Corporation* (USSC). As outlined in box 1, USCC was originally a telegram company. Over the past few decades, the corporation had to survive by adjusting to the changing technologies (shift to ICT-based communication systems). The riotous or conflict-ridden union and management relations of the 1980s gave way to more cooperative relations at the turn of the millennium. The union and corporation agreed to cooperate in making adjustments in the business model to ensure both business and job survival. Today, USSC is largely a fintech company. Somehow, business, jobs and the union have been preserved along with the institution of collective bargaining. Union membership, which shrunk to one-tenth or less at the height of the crisis in the 2000s (from the original 5,000 in the 1980s) is growing and now numbers more than 2,000 workers.

At the national tripartite level, a good example of productive social dialogue is found in Singapore. The unions affiliated with UNI, along with the other unions in the city state,

participate in tripartite discussions on how to prepare Singapore's workforce in the digital era (box 2).

Meeting the challenges of readiness, disruption and displacement: Trade union proposals and ideas

The affiliates of UNI Apro, especially the members of the ICTS Committee, have advanced a number of measures to meet the multifaceted challenges of the Fourth Industrial Revolution, in particular the issues of union and worker readiness and the difficult issues of disruption and displacement that likely to come about. The measures are clustered into two types: those addressed to the government and tripartite social partners and those addressed to the trade union movement.

What the government and social partners can do

1. Social dialogue on the Fourth Industrial Revolution and bipartite and tripartite social agreement on what can be done to maximize society's gains while minimizing the adverse impacts on workers is critical. Governments should urge industry to participate seriously in the dialogue process as a reflection of its genuine corporate social responsibility. At the same time, government and industry should treat organized labour with respect and as a reliable dialogue partner.

   The tripartite system—at the industry, national and ASEAN levels—should monitor the introduction of new technologies and their social and labour impacts. There should be full communication and transparency among the social partners, especially in identifying and addressing emerging labour problems under the Fourth Industrial Revolution.

   If job disruptions and displacements are unavoidable, the social partners should sit down together and develop programmes or measures to make the transition humane and minimally painful to the people affected. Win-win adjustment measures are easier achieved if there is communication, consultation and harmonizing among the social partners.

2. There should be a comprehensive programme of social protection for all parties. This should include access to skills development and adjustment or displacement assistance for workers affected by the Fourth Industrial Revolution. The unions are also open to the possible adoption of universal basic income, which is widely discussed in Europe. This was only mentioned in passing by some interviewees because it is considered by many unions as needing further study.

3. Skills development related to the new technologies is crucial. However, according to the union officials, in most cases, employers are hesitant to invest in skills development and would prefer to hire new workers instead. This posture of employers is reinforced by the reality that older workers find it difficult to learn new skills and master the new technologies; hence, skills programmes for older workers are more difficult to design and implement. The termination of services of ageing workers who are unable to handle the new technologies becomes common and naturally generates industrial conflict.

   This is where the government should enter and help design and co-finance appropriate training programmes. As it is, governments usually declare their commitment to skills development for workers. But there is a gap between policy declaration and policy implementation. And governments rarely provide opportunities for the upskilling, reskilling and multiskilling of workers presently at work or separated from work; most programmes target new labour entrants. Proof of this is the absence of adult schools and lifelong learning facilities in most of the ASEAN countries, with the possible exception of Singapore. Government–industry partnership in skills development is often mentioned but is rarely carried out.

   Government commitment to skills development can only be reaffirmed if there is an implementable programme with an enabling budget. This means more accessible training centres or facilities should be built. Skills training should be accompanied by a programme of skills certification. Fiscal incentives and other forms of assistance to employers who invest in training to prepare employees for the Fourth Industrial Revolution should also be promoted.

4. A major challenge to the tripartite social partners in each ASEAN country is how to address the policy and

legislative issues related to the missing social and labour rules in a new technological environment. What, for example, are the work rules for the freelancers and the ride-hailing transport workers? Where is the safety net for people affected by the Fourth Industrial Revolution? Is there an occupational safety and health programme for online workers?

What the trade union movement can do

5. Unions should be more strategic in their thinking. The way forward is to think smart and understand the Fourth Industrial Revolution and its manifold implications on the world of work. Union members should develop the ability to analyse the Fourth Industrial Revolution and the evolving economic and labour landscape in each country and across the region. Along this line, unions should develop in-depth economic and labour market analyses and outline viable policy alternatives, including readiness programmes for labour and other sectors.

Unions should develop their own Fourth Industrial Revolution transformation agenda to serve as a guide in collective bargaining agreement negotiation and dialogue with industry and government. They should also push industry and the government to adopt or consider the unions' Fourth Industrial Revolution development agenda. The idea is for society to appreciate the importance of a labour-centric or people-centric adjustment to the Fourth Industrial Revolution.

6. The union development alternatives should include the feasibility of developing fully funded and comprehensive social safety nets for all workers, vulnerable or not to the Fourth Industrial Revolution's advancement. These

Box 2: Singapore tripartite agreement on skills and other readiness programmes.

The unions in Singapore have been supporting various government programmes promoting the city state's readiness in the age of the Fourth Industrial Revolution. Singaporean industry has been cooperating in these programmes.

A major government programme involving tripartite social partners is the SkillsFuture for Digital Workplace. This programme is open to all Singaporean adults, including anyone returning to the workforce. The idea is to help individual workers understand the emerging technologies, how they impact work, how to interpret and use data and how to adopt a positive mindset for change, innovation and resilience.

The programme is also open to employers, especially from small and medium-sized enterprises. They are oriented on how to understand and manage technological changes to the workplace and how to take advantage of new opportunities in the Fourth Industrial Revolution.

SkillsFuture for Digital Workplace has a funding component that provides every interested Singaporean the means to re-skill, regardless of their current job or occupation, for a possible future career path. In short, no one need worry if they lose their job because there is opportunity for a second career path.

The UNI affiliates are supportive of the industry and tripartite social dialogues arranged by the National Trades Union Congress (NTUC), Singapore's labour centre. The NTUC sits with the Ministry of Manpower and employers. In the tripartite meetings, the NTUC brings to the tripartite table the various labour issues raised by the UNI affiliates and other labour groups in the weekly consultation meetings convened by the NTUC. Some of the consultation meetings have been transformed by the NTUC into "town hall" dialogue sessions to analyse labour issues fully and for the NTUC to come up with practical solutions that are beneficial to all parties and that can be elevated to tripartite discussions.

A special focus of SkillsFuture for Digital Workplace is the continued skilling of senior or retired workers. The latter are given the option to come back to work. In Singapore, the retirement age is 62. With this programme, people aged 62–65 are being helped in their possible re-employment so they can continue to be productive citizens.

safety nets should cover the rules for work under the Fourth Industrial Revolution, such as standards of work for people working at home and those hired online. The rules for work in the physical world should be complemented by the rules for work in the cyber world.

Labour should also be prepared to assume their responsibility in helping boost productivity, which is usually the rationale or excuse given for the introduction of any new technology. In Japan, unions have signed onto Fourth Industrial Revolution-related productivity agreements in the auto and other industries.

7. Unions, with the help of government and industry, can also undertake capacity building, including skills development, of their members. Helping workers adapt to the new technologies means the unions must also learn to master the technologies, especially in fleshing out the adjustment challenges needed. In developing training programmes for workers in meeting the challenges posed by the Fourth Industrial Revolution, the unions must push industry and government to bear the cost of training.

8. A special skills development programme needed should develop the capacity of the unions to bargain and negotiate effectively under the Fourth Industrial Revolution. The starting point is a deeper understanding of the Fourth Industrial Revolution and the social and labour impacts of the various technologies being introduced by enterprises. Through collective bargaining and social dialogue, unions should help define the rules that must be observed for the introduction of artificial intelligence or any other job-displacing technology in the workplace. The following should be discussed:

- issues related to liability, safety, security and privacy;
- adoption of rules for the Fourth Industrial Revolution era that will make the transition easier and minimize risks and displacement to both employers and employees.

Through collective negotiation and social dialogue, the unions should participate in the designing and implementing of policies.

9. In the Fourth Industrial Revolution era, stronger and more capable unions are needed. Unions should keep strengthening their ranks and their organization to attract the respect of government and employers. Only when unions are strong can they be respected, recognized and given a seat at the bipartite or tripartite table. Thus, the tasks of strengthening union ranks and building a stronger labour movement in the ASEAN region are critical.

Finally, the union interviewees all expressed support to the ten-point Ethical Guidelines in the use of artificial intelligence by industry, government and other sectors of society (box 4).

Box 3: On partnership building under the Fourth Industrial Revolution and the role of unions.

Shafie Mammal of UNI-MLC and the ASEAN Services Employees Trade Union Council (ASETUC) remarked that the ideal direction is to have smart and respectful partnership between a union and management in addressing the various dimensions of the Fourth Industrial Revolution and its impact on business and employment. Management should discuss with unions not only the traditional salary or personnel matters but also business and organizational matters brought about by the Fourth Industrial Revolution.

Management should share all relevant business and technological information with the entire workforce. And union members should try to understand the direction that their enterprises are taking and whether this is fair or not to the employees. "The idea is to make the workers and union feel they are true partners, and, therefore, they have to work hard to make the business prosper for the good of everyone," Mammal explained.

ASETUC believes genuine tripartism should lead to a win-win situation. There should be respect and care by and for the government, employers and workers. With trust and confidence, the tripartite system can work.

Mammal noted that policies that gain the trust and confidence of unions and employees are lacking in most industries. Many employers consider the union as an adversary that causes many problems. The point is that an enterprise should not be an island, operating without regard to the outside environment. Labour is a partner and so are industry and government. In this context, labour should assume that productivity is part of labour's duty, while the welfare and occupational safety and health of employees are part of the enterprise's duty. As for the government, it has the sacred task of promoting peace, harmony and prosperity.

Finally, the labour movement must work hard to create a positive image for the movement and be respected by government and industry. The labour movement should gain society's confidence. Mammal concluded: "In the new Fourth Industrial Revolution era, labour needs to have more diplomacy, more humility, more heart and, yes, more organized forces-without compromising rights!"

Box 4: Skills and work rules issues in e-commerce in Vietnam.

According to Nguyen Thanh Qui of UNI Commerce in Vietnam, the shift in technology means new ways of working and new skills. This is especially true in e-commerce and in the operations of big supermarket retailers. The challenge is how to help workers acquire the needed skills and maintain their jobs.

There is also need for new work rules. For example, work hours in a supermarket and other formal establishments total eight to ten hours a day. However, e-commerce must be available anytime during the 24 hours of each day. Whenever a buyer's purchase order comes through, workers typically must be there. In the changing business and technological environment, work hours can be longer and can be irregular. The Vietnamese Government is looking into this situation to develop new regulations for e-commerce.

UNI in Vietnam believes that more social dialogue is needed to promote genuine development. In this connection, the trade unions should develop their membership and trade union services so that their power can be improved. There should be a strengthening of the commitment of the members to the development goals of the unions. They should understand the aspirations of the workers—what they want and what are their needs—so that they can negotiate and dialogue with the employers in a positive and forward-looking manner.

For UNI in Vietnam, the Government should have a policy protecting workers' interest in the commerce and other sectors. Employers naturally seek more profits by enhancing productivity. This is the reason why these employers are developing or adopting new technology. Unions, on the other hand, want to protect their members' rights and interests. Hence, the Government should unite all social partners in a win-win future. This is why skills training and capacity building for all social partners in preparation or adjustment to the Fourth Industrial Revolution are critically important.

Box 5: UNI Global ethical guidelines on the use of artificial intelligence..

UNI Global Union has been calling on governments and employers to "co-create a just transition to a future of decent work." At the centre of this future are the new technologies that are being fuelled by artificial intelligence (AI), robotics, data and machine learning. UNI is demanding that designers and users of AI, particularly those who gather the building blocks of data and develop the data algorithms to produce the codes that drive the new technologies, safeguard the interests of workers and society. Advances in technology should help put people at the centre of development. Hence, UNI, in association with AI experts, has developed the following "10 commandments" on the ethical development and use of AI:

1. Demand that AI systems are transparent. (A transparent AI system is one in which it is possible to discover how and why the system made a decision, or in the case of a robot, acted the way it did. For users, transparency is important because it builds trust in, and understanding of, the system, by providing a simple way for the user to understand what the system is doing and why. For validation and certification of an AI system, transparency is important because it exposes the system's processes for scrutiny. If accidents occur, the AI system will need to be transparent and accountable to an accident investigator. Workers must have the right to demand transparency in the decisions and outcomes of AI systems as well as the underlying algorithms.)
2. Equip AI systems with an "ethical black box."
3. Make AI serve people and planet.
4. Adopt a human-in-command approach.
5. Ensure genderless, unbiased AI.
6. Share the benefits of AI systems.
7. Secure a just transition and ensure support for fundamental freedoms and rights. (It is the responsibility of States and enterprises to find solutions that provide all workers, in all forms of work, the right to and access to both. In addition, in a world in which the casualization or individualization of work is rising, all workers in all forms of work must have the same strong social and fundamental rights. All AI systems must include a check and balance on whether its deployment and augmentation go hand in hand with workers' rights, as laid out in human right laws, ILO conventions and collective agreements.)
8. Establish global governance mechanisms.
9. Ban the attribution of responsibility to robots. (Mistakes made by robots cannot be attributed to the robots but to the people behind the development and use of the robots.)
10. Ban the AI arms race. (Say no to the development of "lethal autonomous weapons, including cyber warfare.")

Conclusion

Charting a just transition pathway for job-full technological transformation in the ASEAN region

As outlined in this study and as fully ventilated in the Ninth ASEAN Regional Tripartite Social Dialogue Conference, the digital and technological revolution is rolling across South-East Asia, East Asia and the whole of the Asia-Pacific region. However, its impact in different countries to date varies. Some countries, such as Japan, the Republic of Korea and Singapore, are major technological adopters; others are embracing the latest advances on a selective and piecemeal basis.

The level of societal preparedness for the full impact of the Fourth Industrial Revolution also varies. Almost all governments, together with their industry and labour tripartite partners, agree on the importance of skills development, adjustment capacity building and the development of programmes to preserve and create jobs in this era. However, most of the discussions and proposed agreements are stagnating at that level. So far, only Singapore has come up with proactive programmes of adjustment and preparedness that are fully budgeted and are now being implemented, with the support of the tripartite partners. At the centre of Singapore's comprehensive readiness programme is the SkillsFuture for Digital Workplace, which provides skills-upgrading opportunities to adult citizens, employed or retired, complete with training allowances and a well-researched menu of training modules.

On job displacement, the touted massive job displacements that are predicted are still at the level of projection. That may be because the full Fourth Industrial Revolution is still to be realized, as pointed out by Christy Hoffman, General Secretary of UNI Global. However, we cannot deny the validity of the 2016 ILO study on the threat of automation and robotization on industries that have contributed to the making of factory Asia, such as the electronics, garments, auto parts, footwear and other labour-intensive industries that were relocated to Asia by multinational corporations in the 1980s to the 2000s to escape rising labour costs in the West. The technological revolution is making it possible for multinational corporations to reshore these industries back to their home countries, as illustrated by the action taken by *Adidas* of Germany, which set up new shoe factories in Germany and the United States.

The reshoring threat also applies to the online customer or call centre business outsourced by Fortune 500 and other multinational corporations to India, the Philippines and other Asian countries. Software automation, do-it-yourself and artificial intelligence-assisted interactive communications now make this possible. One call centre manager who participated in the research study boldly predicted a 50 per cent decline in five years of employment in the Philippine call centres. Some jobs are being created in the business process-outsourcing companies. But these are few and largely in the higher end of the industry, where talent and skills are highly prized. It is in the still-underregulated online freelancing business, mediated by institutions, such as *Upwork*, where Filipino online workers can possibly offset job losses in the formal call centres.

This brings us to the twin issues raised in this study and in the ASEAN Regional Tripartite Social Dialogue Conference—skills development and talent management. The Fourth Industrial Revolution requires not only a skilled workforce but it needs a workforce willing to continuously learn or acquire new skills and knowledge. Hence, the importance of education programmes, such as lifelong learning courses, to supplement what the formal education system (basic, technical and vocational education and training and tertiary) is already providing. Again, Singapore is ahead in this area, with its lifelong learning programme, SkillsFuture for Digital Workplace.

As to talent, there is a fierce competition in the region. Chief executive officers and human resources managers have been scouting for the best, the brightest and the most skilful persons to build up competitive IT firms, banks and so on. These talents are also the targets of those who want to build up their technology arsenal, in preparation for fiercer competition under the Fourth Industrial Revolution.

Charting a just transition programme: Importance of social dialogue and social responsibility of all the parties

Aside from a skills and knowledge-readiness programme, the charting of a Fourth Industrial Revolution pathway or a transition programme for the industrial relations actors and the whole of society is equally needed.

Just transition means the parties agree to make the adoption of technology and adaptation or adjustment to a new technology and business or work arrangement is fair to all concerned, particularly to affected workers who are likely to suffer the most. Yes, business owners, with their prerogative to manage business freely as they see fit, can unilaterally decide on technological changes in their enterprises. They can also hide any technological transformation plan for months or even years before they inform everyone that they must adjust—suddenly—to the reality of competition and the need for business and technological adjustment.

But in the context of the ASEAN precept of a "caring and sharing society", such business unilateralism can be considered inhumane and anti-labour. Enterprises have the social responsibility to inform, consult and work out with unions and government how jobs can be preserved, how new skills can be developed to keep workers in their jobs and how new jobs can be created to ensure that there are no job losers but new job gainers. This is where the government has, and should take, a central coordinating role to facilitate the dialogue process between parties.

Unions also have their social responsibility, as Christopher Ng of UNI Apro repeatedly puts it. Unions should not only be able to articulate the "justness" of worker demands, they should also show industry and government that they are reliable partners, committed to the productivity mission of business and are prepared to sit down with all the parties to discuss not only the sharing of gains and benefits but also the pains and losses, if needed.

Of course, a tripartite consensus on a smooth adjustment and transition can only happen if all parties have respect for one another are transparent to one another and committed to the common good. It is the common good that should guide the parties in charting what should constitute a just transition programme in each country.

The transition programme should be translated into a forward-looking social contract

The various adjustment and transition programmes and measures should constitute the social contract for the twenty-first century.

Along this line, the ILO and the various authors cited in this study, such as Ford, Reich and Rifkin, are all proposing some form of social contract under the technology revolution. In its recent publication, The Changing Nature of Work, the World Bank makes its own social contract proposal: skills development and education for all and a "flexible" labour market. The first part of the proposal has no enemies. The second part has raised the hackles of civil society organizations and trade unions because flexibility is closely associated with the phenomenon of growing and deepening labour precarity everywhere. With the new technology eroding the security of workers doing routine jobs, there is widespread fear that labour precarity is going to widen even more during the era of the Fourth Industrial Revolution.

But a social contract to define the rules of work and work governance in the twenty-first century is a must. There is a need for all parties to take a closer look at how the social contract should be shaped in the time of the Fourth Industrial Revolution.

The social contract at the end of World War II, built around full recognition of workers' rights to form unions, bargain collectively and participate in myriad social and economic policy-making, is credited for the growth and stability of many country members of the Organisation for Economic Co-operation and Development, from the 1940s to the 1970s. The problem is that economic globalization since the 1980s has triggered a race to the bottom among multinational corporations and other companies in many countries because they have been forced, by choice or by necessity, to develop competitiveness and markets by rolling back labour and social rights.

It is time that the race to the bottom be reversed. This should be at the core of any social contract.

We cannot, however, ignore the reality that the twenty-first century economy is radically different from the previous century, precisely because of the Third and Fourth Industrial Revolutions. The social partners have a difficult task of going beyond development slogans. They must look at how to craft policies on social and digital inclusion, design programmes for the retention of jobs and/or deployment to new jobs without any loss of compensation and entitlements and on the formulation of sustainable

economic and environmental policies that enable countries to grow without being subverted by threats of climate change and global value chain reshoring and so on. And on top of all this, there is a need to recognize the rights and secure the jobs of the marginalized as well as the new workers—the precarious and informal workers as well as the online and offline freelancers.

These tasks are not easy. Each country must design and/or redesign its agriculture and industrial development as well as social and labour rules based on society's needs. What is clear is that a new social contract requires full collaboration among all sectors of society, based on a unified vision of societal development for all. A practical approach along this line is for governments to take the lead by asking all parties to connect the Fourth Industrial Revolution with the 17 Sustainable Development Goals and sort out how each of them, such as freedom from hunger and jobs for all, can be met in the midst of technological change while building up needed social partnership.

Eventually, a just transition programme should have a corresponding line-up of both just transformation and just adjustment programmes to address each facet of social and economic life in the Fourth Industrial Revolution era.

Formulation of a trade union Fourth Industrial Revolution transformation agenda

Finally, the trade union movement needs to assert itself in helping shape the direction that the Fourth Industrial Revolution is taking. After all, workers are the most affected by the introduction of any new technology at the workplace. Whether done in a gradual or sweeping manner, the technology modernization of an enterprise has serious implications on the way work is done, jobs are graded and careers are built. The successful technological transformation of an industry also requires the mobilization of a skilled and tech-savvy workforce. A multisided just transition programme is indeed in order.

As it is, in most of the ASEAN and other Asia-Pacific countries, the trade unions appear like passive onlookers. Across the region, governments and industry associations have been organizing regional technology and the Fourth Industrial Revolution summits and conferences with no or limited participation of trade unions.

As propounded by the trade union interviewees in this study, the trade unions need to craft their own Fourth Industrial Revolution transformation blueprint, complete with proposals on just adjustment and transition measures. Crafting this blueprint is a must because it can serve as the unions' negotiating compass in persuading government and industry to make labour-friendly Fourth Industrial Revolution transition programmes and measures. The technology clause that is included by the UNI Apro unions in their company-level collective bargaining should be elevated to the industry, national and regional Fourth Industrial Revolution bipartite and tripartite agreements.

Of course, the unions can only have a say on the shape and direction of technology transformation if they are respected by the social partners and enjoy the support of government. Garnering this respect requires a strong trade union movement.

The UNI Apro unions need to strengthen their ranks, build stronger trade union unity, master the Fourth Industrial Revolution challenges and enhance their change-making skills. Then, and only then, can they take charge and convince industry and government to help shape a labour-friendly Fourth Industrial Revolution future.

Bibliography

Abella, M. "Issues in Labour Migration in Southeast Asia", paper for the Regional Workshop on "Labour Migration in Southeast Asia: What Role for Parliaments?" Manila, September 21–23, 2008 (unpublished).

Association of Southeast Asian Nations (ASEAN). ASEAN Economic Community Blueprint 2015. Jakarta: 2007, https://asean.org/asean-economic-community/.

Association of Southeast Asian Nations (ASEAN). ASEAN Economic Community Blueprint 2025. Jakarta: 2015, https://asean.org/asean-economic-community/.

Association of Southeast Asian Nations (ASEAN). ASEAN Services Report 2017: The Evolving Landscape Jakarta: 2017.

Caraway, T. "Labour Standards and Labour Market Flexibility in East Asia", Studies in Comparative International Development 45, no. 2 (2010): 225–249.

Chang, J., and P. Huyn. ASEAN in Transformation: The Future of Jobs at Risk of Automation, Working Paper No. 9. Geneva: International Labour Organization, 2016.

Chang, J., G. Rynhart, and P. Huyn. ASEAN in Transformation: How Technology Is Changing Jobs and Enterprises, Working Paper No. 10. Geneva: International Labour Organization, 2016.

Cisco Systems, and Oxford Economics. Technology and the Future of ASEAN Jobs. Singapore: Cisco Systems, 2018.

Dunlop, J. Industrial Relations Systems. New York: Holt Rinehart and Winston, 1958.

Fair Trade Alliance. Nationalist Development Agenda. Quezon City: 2006.

Felipe, J., and R. Hasan. "Labour Markets in Asia: Promoting Full, Productive and Decent Employment", in ADB Key Indicators 2005, Special Chapter. Manila: Asian Development Bank, 2005: 1–112.

Ford, M. The Rise of the Robots: Technology and the Threat of a Jobless Future. New York: Basic Books, 2015.

Gouping, L., H. Yun, and W. Aizhi. 2017. "Fourth Industrial Revolution: Technological Drivers, Impacts and Coping Methods", Chinese Geographical Science 27, no. 4 (2017): 626–637, www.springerlink.com/content/1002-0063.

G4S Cash Solutions. World Cash Report 2018. Utrecht: 2018.

Harari, Y. 21 Lessons for the 21st Century. New York: Spiegel and Rau, 2018.

Hawkins, A. "Uber scores a big win in legal fight to keep drivers as independent contractors", The Verge, September 25 (2018), www.theverge.com/2018/9/25/17901284/uber-drivers-independent-contractors-vs-employees-legal-fight.

Hitt, M., R. Ireland, and R. Hoskisson. Strategic Management: Competitiveness and Globalization. Boston: Cengage Learning, 2017.

Hoi, D. "Embracing Change, Building Resilience", ASEAN Economic Integration Brief. Jakarta: ASEAN Secretariat, 2018.

Hewison, K., and W. Tularak. "Thailand and Precarious Work: An Assessment", American Behavioral Scientist 57, no. 4 (2013): 444–467.

Intal, P., Y. Fukunaga, F. Kimura, P. Han, P. Dee, D. Narjoko, and S. Oum, S. ASEAN Rising: ASEAN and AEC Beyond 2015, Jakarta: Economic Research Institute for ASEAN and East Asia, 2014.

International Labour Office. Guide to the Millennium Development Goals: Employment Indicators. Geneva: 2009.

International Labour Organization. Labour and Social Trends in ASEAN. Bangkok: ILO Regional Office, 2010.

International Labour Organization. Migration in ASEAN in Figures: The International Labour Migration Statistics (ILMS) Database in ASEAN. Bangkok: 2015.

Iwasaki, K. "Singapore's Strategy for Attracting Highly-Skilled Foreign Human Resources", Pacific Business and Industries 15, no. 56 (2015): 2–27.

Iwasaki, K. "Emergence of Fintech Companies in Southeast Asia", Pacific Business and Industries, XVIII, no. 68 (2018).

Kaufman, B. The Global Evolution of Industrial Relations. Geneva: International Labour Office, 2004.

Lee, C. "100 years of ILO", PowerPoint presentation for the eighteenth International Labour and Employment Relations Association World Congress, Seoul, July 27, 2018.

Lee, M., J. Yun, A. Pyka, D. Won, F. Kodama, G. Schiuma, H. Park, J. Jeon, K. Park, K. Jung, M. Yan, S. Lee, and X. Zhao. "How to Respond to the Fourth Industrial Revolution, or the Second Information Technology Revolution," Journal of Open Innovation 4, no. 21 (2018), www.mdpi.com/journal/joitmc.

Lee, T. "How to Save the Web", Bangkok Year-End Review. Bangkok: Bangkok Post, 2019: 64–65.

McKinsey Global Institute. A Future That Works: Automation, Employment and Productivity. San Francisco: 2017.

Ofreneo, R. Asia & the Pacific: Advancing Decent Work Amidst Deepening Inequalities. Singapore: ITUC AP, 2013.

Oprins, J. "Employment in the Online Outsourcing Industry and Impact Sourcing Industry: Dream or Reality for Filipinos Living at the Bottom of the Pyramid?". Master's Thesis, Graduate School of Social Sciences, University of Amsterdam, 2016.

Oizumi, K., and K. Soejima, K. "Expanding Regional Supply Chains in the ASEAN Economic Community—The Potentials for Building Science Cities in Thailand", Pacific Business and Industries, XV, no. 55 (2015).

Reich, R. Saving Capitalism: For the Many, Not the Few. New York: Vintage Books, 2016.

Rifkin, J. The End of Work: The Decline of the Labour Force and the Dawn of the Post-Market Era. New York: Putnam Books, 1995.

Ryder, G. The Future of Work Centenary: Report of the Director-General. Geneva: International Labour Office, 2015.

Schwab, K. "The Fourth Industrial Revolution: What It Means, How to Respond" (2016), www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/.

Smith, A. An Inquiry on the Nature and Causes of the Wealth of Nations (1776, reproduced by various publishers).

Tabuga, K. "20 of Filipinos on Online Freelancing", paper submitted to the University of Philippines School of Labour and Industrial Relations (unpublished).

Taylor, F. The Principles of Scientific Management (New York, Norton Library, 1967, but first published in 1911).

Tjandraningsih, I. "State-Sponsored Precarious Work in Indonesia", American Behavioral Scientist 57, no. 4 (2013): 403–419.

Thanachaisethavut, B., and V. Charoelert, V. "Extending Labour Protection to the Informal Economy in Thailand, in D. Tajgman, ed., Extending Labour Law to All Workers: Promoting Decent Work in the Informal Economy in Cambodia, Thailand and Mongolia. Bangkok: International Labour Organization, 2006: 68–104.

World Bank. The Changing Nature of Work, World Development Report 2019. Washington, D.C.: 2018).

UNI Global Union. Top 10 Principles for Ethical Artificial Intelligence. Nyons: 2017.

Interviews

Interviews with trade union representatives who attended the ICTS Committee Meeting of the UNI Apro in Hanoi (August 28–29, 2018). Representatives from Hong Kong, Indonesia, Japan, the Republic of Korea, Malaysia, Singapore, Taiwan and Viet Nam were interviewed by the research team. The team also interviewed Christy Hoffman, General Secretary of UNI Global Union, who keynoted the ICTS Meeting.

Interviews with affiliates of UNI Apro in the Republic of Korea, July 25–26, 2018, with assistance from Jay Choi.

Interviews with affiliates of UNI Apro in the Philippines, July 10–11, 2018.

Interviews with select participants of the ninth ASEAN Regional Tripartite Social Dialogue Conference in Singapore, October 9–10, 2018.

Endnotes

1. Jeremy Rifkin, The End of Work: The Decline of the Labour Force and the Dawn of the Post-Market Era (New York: Putnam Books, 1995).
2. Jay-Hee Chang, and Phu Huynh, ASEAN in Transformation: The Future of Jobs at Risk of Automation, Working Paper No. 9 (Geneva: International Labour Organization, 2016); Jay-Hee Chang, Gary Rynhart, and Phu Huynh, ASEAN in Transformation: How Technology Is Changing Jobs and Enterprises, Working Paper No. 10 (Geneva: International Labour Organization, 2016).
3. Dato Lim Jock Hoi, "Embracing Change, Building Resilience", ASEAN Economic Integration Brief (Jakarta: ASEAN Secretariat, 2018).
4. Dato Lim Jock Hoi, "Embracing Change, Building Resilience", ASEAN Economic Integration Brief (Jakarta: ASEAN Secretariat, 2018).
5. Rene E. Ofreneo, Asia & the Pacific: Advancing Decent Work Amidst Deepening Inequalities (Singapore: ITUC AP, 2013).
6. Klaus Schwab, "The Fourth Industrial Revolution: What it means, how to respond" (2016), https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/.
7. Ibid.
8. Adam Smith, An Inquiry on the Nature and Causes of the Wealth of Nations (1776, reproduced by various publishers).
9. Frederick Taylor, The Principles of Scientific Management (New York: Norton Library, 1967, first published in 1911).
10. Klaus Schwab, "The Fourth Industrial Revolution: What it means, how to respond" (2016), https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/.
11. Succinctly summed up by Changhee Lee, in his PowerPoint presentation "100 years of ILO", in the eighteenth International Labour and Employment Relations Association World Congress, Seoul, July 27, 2018.
12. See Bruce Kaufman, The Global Evolution of Industrial Relations Geneva: International Labour Office, 2004).
13. John Dunlop, Industrial Relations Systems (New York: Holt Rinehart and Winston, 2004, but first published in 1958).
14. World Bank, The Changing Nature of Work, World Development Report 2019 (Washington: World Bank, 2018).
15. Martin Ford, The Rise of the Robots (London: One World Publications, 2015).
16. McKinsey Global Institute, A Future That Works: Automation, Employment and Productivity (San Francisco: 2017).
17. Jay-Hee Chang, and Phu Huynh, ASEAN in Transformation: The Future of Jobs at Risk of Automation, Working Paper No. 9 (Geneva: International Labour Organization, 2016); Jay-Hee Chang, Gary Rynhart, and Phu Huynh, ASEAN in Transformation: How Technology Is Changing Jobs and Enterprises, Working Paper No. 10, (Geneva: International Labour Organization, 2016).
18. Dennis Green, "Adidas just opened a futuristic new factory—and it will dramatically change how shoes are sold", Business Insider (April 25, 2018), www.businessinsider.com/adidas-high-tech-speedfactory-begins-production-2018-4.
19. Interview with Patrick Azanza, July 30, 2018. Dr Azanza manages several call centres with links with American and European corporations.
20. Cisco Systems and Oxford Economics, Technology and the future of ASEAN Jobs (Singapore: 2018).
21. Fully discussed in R. Ofreneo, Asia and the Pacific: Advancing Decent Work Amidst Deepening Inequalities (Singapore: ITUC AP, 2013).
22. Kim Tabuga, "Perceptions of Filipinos on Online Freelancing", paper submitted to the University of Philippines School of Labour and Industrial Relations (unpublished: 2018).
23. A term that has been around since the 1980s that refers to people who have no occupational identity or narrative to give to their lives, which creates existential insecurity. It includes people who, for the first time in history, have education above the level of labour they can expect to obtain. Another unique feature is that the precariat must do much work for labour that is neither recognized nor remunerated. See www.weforum.org/agenda/2016/11/precariat-global-class-rise-of-populism/, accessed 30 May 2019.
24. Andrew J. Hawkins, "Uber scores a big win in legal fight to keep drivers as independent contractors", The Verge (September 25, 2018), www.theverge.com/2018/9/25/17901284/uber-drivers-independent-contractors-vs-employees-legal-fight.
25. MinHwa Lee, JinHyo Yun, Andreas Pyka, DongKyu Won, Fumio Kodama, Giovanni Schiuma, HangSik Park, Joenghwan Jeon, KyungBae Park, KwanHo Jung, Min-Ren Yan, SamYoul Lee and Xiaofei Zhao, "How to Respond to the Fourth Industrial Revolution, or the Second Information Technology Revolution", Journal of Open Innovation 4, no. 21 (2018), www.mdpi.com/journal/joitmc.
26. From the presentations by the Singapore tripartite participants in the ninth ASEAN Regional Tripartite Social Dialogue Conference.

27. Presentation of the Malaysian Employers Federation in the ninth ASEAN Regional Tripartite Social Dialogue Conference.
28. As presented in the ninth ASEAN Regional Tripartite Social Dialogue Conference by Farizan Fajari Wardan, ASETUC researcher.
29. There have been two AEC blueprints: the ASEAN Economic Community Blueprint 2015 adopted by ASEAN in 2007 and the ASEAN Economic Community Blueprint 2025. The latter is a continuation of the economic liberalization and integration programmes outlined in the former.
30. For a comprehensive assessment of the state of AEC implementation, see Ponciano Intal, Yoshifumi Fukunaga, Fukunari Kimura, Phoumin Han, Philippa Dee, Dionisius Narjoko and Sothea Oum, ASEAN Rising: ASEAN and AEC Beyond 2015 (Jakarta: Economic Research Institute for ASEAN and East Asia, 2014).
31. This ILO concept of "vulnerable employment" tends to underestimate the size of the informal economy and informal sector because wage workers in unregistered or unmonitored micro enterprises (home-based, farm-based and in informal markets and settlements) are obviously excluded. See ILO discussion of vulnerable employment in International Labour Office, Guide to the Millennium Development Goals: Employment Indicators (Geneva: 2009).
32. ILO, Guide to the Millennium Development Goals (Geneva: 2009).
33. Jesus Felipe, and Rana Hasan, "Labour Markets in Asia: Promoting Full, Productive and Decent Employment", ADB Key Indicators 2005, Special Chapter (Manila: ADB, 2005), 1–112.
34. Indrasari Tjandraningsih, "State-Sponsored Precarious Work in Indonesia", American Behavioral Scientist 57, no. 4 (2013): 403–419.
35. Rene Ofreneo, Asia & the Pacific: Advancing Decent Work Amidst Deepening Inequalities (Singapore: ITUC, 2013).
36. Bundit Thanachaisethavut, and Voravith Charoelert, "Extending Labour Protection to the Informal Economy in Thailand", D. Tajgman, ed., Extending Labour Law to All Workers: Promoting Decent Work in the Informal Economy in Cambodia, Thailand and Mongolia (Bangkok: ILO, 2006), 68–104.
37. International Labour Organization, Migration in ASEAN in Figures: The International Labour Migration Statistics (ILMS) Database in ASEAN (Bangkok: 2015).
38. Kaori Iwasaki, "Singapore's Strategy for Attracting Highly-Skilled Foreign Human Resources", Pacific Business and Industries 15, no. 56 (2015): 2–27. Tokyo: Japan Research Institute.
39. ibid
40. Manolo Abella, "Issues in Labour Migration in Southeast Asia," paper for the Regional Workshop on Labour Migration in Southeast Asia: What Role for Parliaments?, in Manila, September 21–23, 2008 (unpublished).
41. The term was originally coined in 2005 by the Philippine Fair Trade Alliance and its allied industry affiliates, which were alarmed over the rapid loss to the overseas labour market of hard-to-train professionals and skilled workers, such as pilots and aircraft mechanics. The term was subsequently adopted by the Philippine Overseas Employment Administration in Resolution No. 1 for 2006. See Fair Trade Alliance, Nationalist Development Agenda (Quezon City: 2006).
42. Teri Caraway, "Labour Standards and Labour Market Flexibility in East Asia", Studies in Comparative International Development 45, no. 2 (2010): 225–249.
43. Jay-Hee Chang, and Phu Huynh, ASEAN in Transformation: The Future of Jobs at Risk of Automation, Working Paper No. 9 (Geneva: International Labour Organization, 2016), p. 12.
44. Cisco Systems and Oxford Economics, Technology and the future of ASEAN Jobs (Singapore: 2018), p. 3.
45. ASEAN Economic Community Blueprint 2015; and the ASEAN Economic Community Blueprint 2025.
46. Folker Frobel, Jurgen Heinrichs, and Otto Kreye, 1980, The New International Division of Labour: Structural Unemployment in Industrialized Countries and Industrialization in Developing Countries (Starnberg: Max Planck Institute, 1980).
47. See Keiichiro Oizumi and Katsuhiro Soejima, "Expanding Regional Supply Chains in the ASEAN Economic Community – The Potentials for Building Science Cities in Thailand", in Pacific Business and Industries, XV, no. 55(Tokyo: RIM, 2015).
48. Keun Lee, Chan-Yuan Wong, Patarapong Intarakamnerd and Chaiyatorn Limapornvanich, "Is the Fourth Industrial Revolution a Window of Opportunity for Upgrading or Reinforcing the Middle-Income Trap? Asian Model of Development in Southeast Asia", in Journal of Economic Policy Reform, 2019. DOI: 10.1080/17487870.2019.1565411, p. 16.
49. Cisco Systems and Oxford Economics, Technology and the future of ASEAN Jobs (Singapore: 2018), p. 3.
50. ibid.

51. Jesus Felipe, Asian Industrial Transformation: The Role of Manufacturing and Global Value Chains (Part I), ADB Working Paper No. 549 (Manila: ADB, 2018).
52. ibid., p. 6.
53. Commission on Overseas Filipinos, Handbook on Overseas Filipinos (Manila, 2012).
54. Michael Ngan, "How artificial intelligence is changing the world, one industry at a time", in Business World.
55. Kaori Iwasaki, "Emergence of Fintech Companies in Southeast Asia", in Pacific Business and Industries, XVIII, no. 68 (Tokyo: RIM, 2018).
56. ibid.
57. Ponciano Intal, Yoshifumi Fukunaga, Fukunari Kimura, Phoumin Han, Philippa Dee, Dionisius Narjoko and Sothea Oum, ASEAN Rising: ASEAN and AEC Beyond 2015 (Jakarta: Economic Research Institute for ASEAN and East Asia, 2014), p. 121.
58. Data from G4S 2018, "Cash and Non-Cash Components in Select Asian Economies", in World Cash Report 2018.
59. Kaori Iwasaki, "Emergence of Fintech Companies in Southeast Asia", in Pacific Business and Industries, XVIII, 68, Tokyo: RIM, 2018.
60. ibid.
61. Data from ASEAN Secretariat, Jakarta.
62. Calixto Chikiamco, "Coping with FIRe", Business World, December 10, 2018.
63. Participants from Australia and South Asia (India, Bangladesh and Nepal) were not interviewed due to the focus of the study being the ASEAN region.

About the author
Dr. Rene E. Ofreneo is Professor Emeritus and former Dean of the School of Labour and Industrial Relations at the University of the Philippines.

Imprint

Office for Regional Cooperation in Asia
7500A Beach Road, The Plaza
#12-320/321/322
Singapore, 199591

Responsible:
Mirco Guenther | Managing Director

Phone: +65 6297 6760 I Fax: +65 6297 6762
Website: www.fes-asia.org
Friedrich-Ebert-Stiftung Singapore

To order publication:
infor@fes.asia

Friedrich-Ebert-Stiftung (FES) is the oldest political foundation in Germany. Founded in 1925, FES is named after Friedrich Ebert, the first democratically elected president of Germany.

This publication is part of a series under Core Labour Standards Plus (CLS+), a regional project coordinated by the FES Office for Regional Cooperation is Asia based in Singapore.