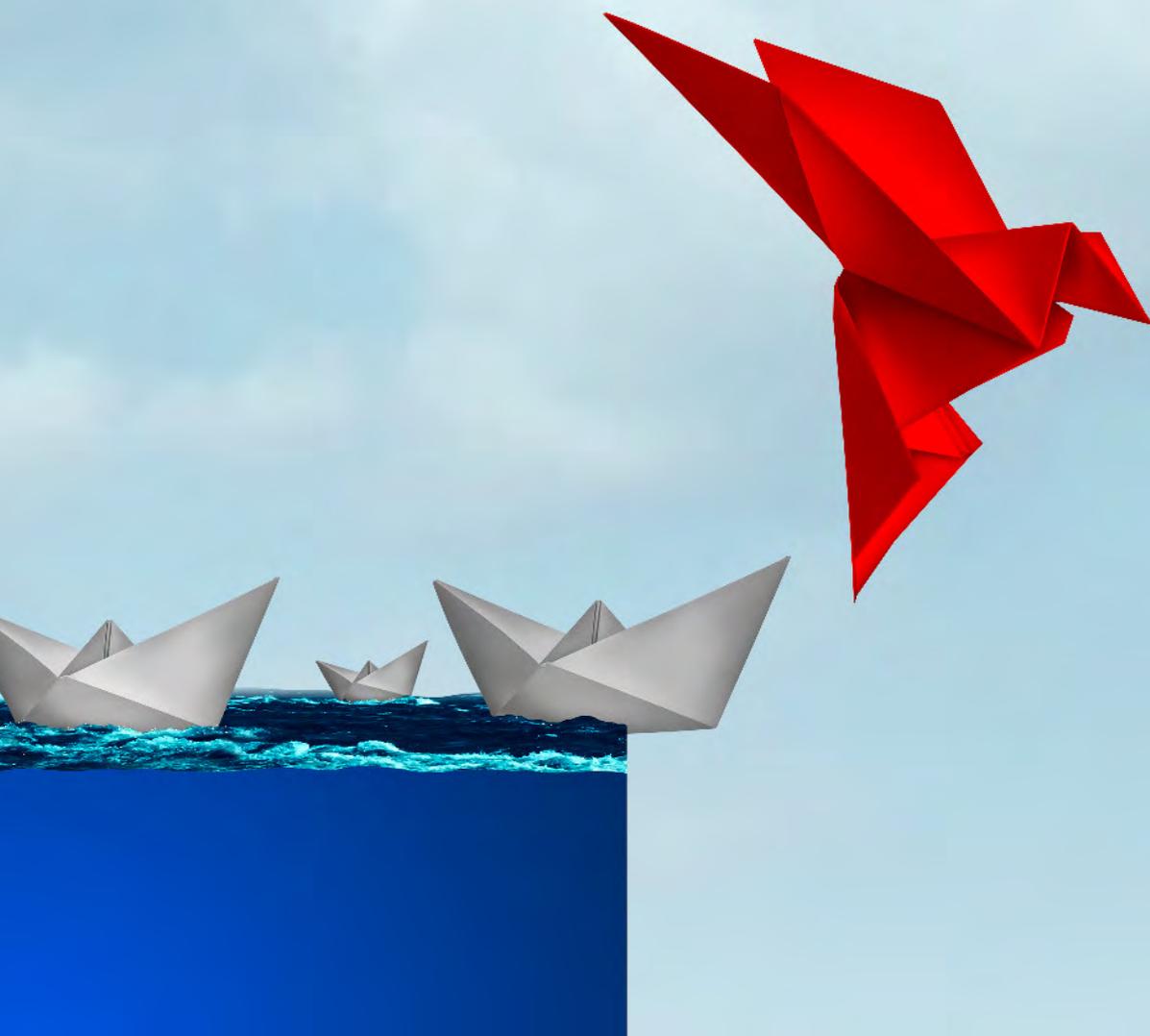




POLICIES
FOR
ENHANCING
PRODUCTIVITY
WITH
NEW SKILLS



The Asian Productivity Organization (APO) is an intergovernmental organization that promotes productivity as a key enabler for socioeconomic development and organizational and enterprise growth. It promotes productivity improvement tools, techniques, and methodologies; supports the National Productivity Organizations of its members; conducts research on productivity trends; and disseminates productivity information, analyses, and data. The APO was established in 1961 and comprises 21 members.

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POLICIES FOR ENHANCING PRODUCTIVITY WITH NEW SKILLS

Policies for Enhancing Productivity with New Skills

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FOREWORD

Digital transformation is reshaping the labor market in unprecedented ways, creating new opportunities for workers and employers as well as new challenges and risks. This poses questions such as how to harness the potential of digital technologies to enhance productivity, innovation, and inclusion while ensuring that workers have the skills and competencies to adapt to the changing demands and expectations of the digital economy. For policymakers, concerns over the design and implementation of effective policies and programs to support skill development and labor market transitions are also raised.

These are some of the issues that this publication addresses, based on the latest research and evidence from 11 APO economies. It analyzes the impact of digital transformation on the labor market, focusing on the three dimensions of employment, wages, and skills. It examines how digital technologies affect the quantity, quality, and distribution of jobs as well as the supply of and demand for skills. It also discusses how different groups, such as women, youth, older workers, low-skilled workers, and migrants, are affected by digital transformation.

Policies for Enhancing Productivity with New Skills provides a comprehensive overview of policies and recommendations to enhance productivity in the digital era. It covers four principal areas: education and training; labor market regulation; social protection; and social dialogue. The importance of developing holistic policy frameworks to address the multiple dimensions and challenges of skill development and labor market adaptation is addressed, along with the need for collaboration and coordination among government agencies, employers, workers, educators, and civil society.

The APO hopes that this publication will inspire policymakers, productivity practitioners, researchers, and all interested in skill development and labor market policies in the context of digital transformation. *Policies for Enhancing Productivity with New Skills* is also an invitation to readers and policymakers to share their own views and experiences on this critical issue. By working together, we can create a more productive, innovative, inclusive labor market for the future.

The APO extends sincere gratitude to the chief and national experts who conducted the research and wrote this publication.

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OVERVIEW

DIGITAL TRANSFORMATION AND LABOR MARKET

Introduction

The rise of digital economy is driving digitization of various industries, gradually affecting all social structures and lifestyles and leading to the development of disruptive and innovative emerging services. According to an analysis of the World Economic Forum (WEF) [17], digital innovation may use digital technology to practice different types of innovative business-and-operation models in various application industries in future. This development, called 'digital transformation,' covers professional services, retail, telecommunications, automotive, healthcare, manufacturing, and other industry sectors. Also, in the digital economy, the cost of science and technology is gradually reduced as the technology matures, and the application of new technology is gradually popularized, driving the combined effect of artificial intelligence (AI), cloud computing, and the internet of things (IoT), resulting in many breakthroughs. These include: digital transformation of the industry; enhancement in added value of products and services under the development of new lifestyles; and construction of innovative service applications. These have prompted enterprises to accelerate the adjustment of their work organizations and gradually change their organizational cultures, and begin paying attention to digital skills development needs of their employees.

With rapid development, the digital economy has driven various industries to use digital technologies and automation to create new job opportunities and new ways of working. Coupled with the maturing of technologies such as big data, cloud computing, and the IoT, the global economy has entered a new era of development. As pointed out in the Digital Economy report released by the United Nations Conference on Trade and Development [14], automation will have an increasing impact on service-based jobs and the need for emerging digital skills. Based on a report by Oxford Economics [11], robots will replace up to 20 million factory jobs by 2030. Forbes also reported on 27 October 2020 that the USA would need to replace 85 million jobs by 2025 due to automation, apart from an estimated more than 60 million jobs lost during the COVID-19 pandemic [18]. In September 2018, Cisco Systems and Oxford Economics [12] conducted a joint research and forecasted that by 2028, 6.6 million jobs across the six largest ASEAN economies of Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam would be made redundant through more widespread adoption of technology. These studies indicate that, due to the impact of technological development, there is a problem of technological unemployment. Therefore, the issue of meeting the supply and demand ends of the labor market must be addressed as soon as possible.

On the whole, the development and application of digital technology will inevitably have an impact on the labor market, regardless of the industry. This has caused considerable discussion, especially with regard to the emergence of new types of job opportunities, changes in the working environment, and changes in the labor market. Regulatory conditions need to be improved in order to make changes in employment demand, create flexibility in employment patterns, and promote equality in income distribution. New types of talents for the development of digital trends in future, big data analyses, and other information-related processing are required. To avoid technology-driven

structural unemployment, member countries will require skill adjustments, policies, and programs commensurate with the evolving demands of the labor market. Many current labor force skills are likely to become irrelevant in the near future, with new, more specialized ones emerging.

In light of the above, this research will investigate changing labor market demands and suggest how policymakers, governments, and relevant stakeholders should prepare the workforce in a timely manner. This research aims at examining policies and programs that will prepare the labor force to meet the changing labor market demands for new skills. Specifically, this research focuses on enabling policymakers to cope with fluid labor market dynamics in member countries. In doing so, experts from each selected member country evaluate the labor supply-and-demand situation under the digital economy trend, to (1) serve as a reference for the content of vocational training and employment services for meeting the functions or abilities required by the domestic industries; (2) strengthen the training-course service information; and (3) improve various employment service measures to strengthen the vocational training and employment services required for the industry.

Definition and Trends in Digital Transformation

Since around 2010, the development of various information and communication (ICT) technologies such as cloud computing, mobile technology, and social networks has been driving a paradigm shift in business models. These shifts have generated new market rules, brought up new business opportunities and models, and caused changes in the interests of the industry. As early as 2016, a Citibank research report [4] proposed five global digital disruptions, namely the IoT, social media, mobile, analytics, and cloud. These five digital disruptions have caused major changes in the consumption habits and environments. In order for the industry to grow profitably and maintain considerable competitiveness, continuous investments in industrial innovation, which is a key requisite for digital transformation, is necessary. WEF [15] indicates that digital transformation can have direct impact on the competitiveness, industrial economy, and enterprise development of various countries. All industries must engage in digital transformation and adopt corresponding digital tools and technologies to innovate and transform their respective products and services to embrace new business models under the digital wave.

Definition of Digital Transformation

The definition of digital transformation varies widely, while mainly emphasizing the changes in business investment caused by innovative technologies. For example, digital transformation is the use of digital technology to transform a service or business by replacing non-digital or manual processes with digital ones or by replacing older digital technologies with newer ones. In particular, the new technologies developed by the ICT industry have become the core driving the development of the digital economy and have a direct impact on the digital transformation of the industry. In addition to increasing efficiency through automation, digital technology solutions can also enable new types of innovation and creativity, rather than simply enhancing and supporting traditional approaches [6].

OOSGA [10] points out that digital transformation is often discussed in conjunction with digitization. Digitization refers to the process of digitizing information, which can include text, picture, audio, etc. Transformation represents the process of combining digital technology with existing operational processes. Thus, it can be understood that digital transformation refers to a broader concept that is applied at all levels of the organization, through integration of innovative technologies, to improve process efficiency, including operational processes, for supporting functions such as marketing and sales, research and development, etc. In addition, from the

perspective of the process and purpose of digital transformation, the definition of digital transformation is “using innovative technology to change existing business or operation models to create new value and sustainable business advantages.” In order to achieve the goal of transformation, it basically needs to go through four stages: (1) understanding the unique digital transformation opportunities of the industry; (2) conceiving the overall digital transformation strategy of the enterprise; (3) connecting the digital strategy of the front, middle, and back offices of the enterprise; and (4) reshaping the corporate culture. At the same time, it is customer oriented and provides the best customer experience. Through the integration of strategies, tools, and culture of front-end, middle-end, and back-end services, it gradually leads to a “connected enterprise.”

Mugge, *et al* [7] pointed out that digital transformation is to digitize and unify the processes between the management, marketing, business, customer service, human resources, IT, and other departments of the enterprise, so that the processes between different units can be digitized and unified. Each unit can thus provide better service quality and user experience in its respective domain. Therefore, Hanelt, *et al* [5] hold that digital transformation is not just the introduction of high-tech or digital technology for product sales or service provisioning. Instead, it is necessary to combine the overall operations strategy of the enterprise and the mutual application of digital technology to create maximum value through products and services. With more efficient and accurate services, enterprises can deliver greater customer experiences in a win-win manner.

From a broader perspective, digital transformation not only emphasizes digital technology and the purpose of transformation, but also involves the overall transformation of an organization. WEF [16] pointed out that digital transformation is the process of bringing new business opportunities. With the gradual development of various digital technologies and continuous reduction in costs, companies use emerging technologies to completely change their business models and create new business models, operational processes, and digital products and services. According to OOSGA [10], digital transformation is a process of combining digital technology and existing business models, from business processes, value propositions, customer experience, and digital culture, to complete transformation into an extremely sensitive organization that is constantly updated and transformed with experience as its core.

Since the meaning of digital transformation varies across industries, it is difficult to pin down a complete definition that fits all. Generally speaking, digital transformation is defined as the application of digital technology to a business area, resulting in a fundamental change in the way the business operates and delivers value to customers. Beyond that, digital transformation is also a cultural change that requires organizations to constantly challenge the status quo, experiment frequently, and adapt to failure. This means that organizations need to abandon long-established business processes in favor of changing models [13]. In other words, digital transformation is an enterprise-wide transformation, and involves a comprehensive change management project. The failure or disruption of digital transformation is often a cultural issue rather than a technical dilemma. As Bughin, *et al* [2] pointed out in McKinsey’s “Why digital strategies fail” report, imperfect planning, uncoordinated goals, and unclear strategies are the main reasons for a failed digital transformation project in most companies.

Overall, digital transformation should include digital technology applications and innovative business models. In addition to the application and development of various digital technologies, it also covers the destructive changes and transformations caused by internal processes, strategy formulation, service development, and product design of the organization. The corresponding

product or service innovations are continuous transformation processes to improve profitability and growth. Therefore, in terms of innovative business models, the focus and sequence of digital transformation vary with the attributes of various industries. In industries that rarely interact with customers, organizations may first transform operational processes; simplify the management of the organization and the business flows between departments by integrating digital technologies; and introduce new technologies to make engineering processes more efficient. In contrast, in industries with high levels of customer interaction, organizations may apply digital transformation for value proposition. They may discuss the products and services being provided from a fundamental level and focus more on the level of delivery and customer experience [10].

Trends in Digital Transformation

Many major countries in the world have made digital transformation a policy priority. For example, Japan's Society 5.0 [19] and Singapore's Smart Nation [20] both focus on the digital transformation of industry, government, and society driven by forward-looking technologies. The EU plans to accelerate digital transformation of EU companies with Invest EU [21], Digital Europe [22], Horizon Europe, and other programs, trying to improve the digital capability of people. From the perspective of digital policies in EU, digital transformation has become a top policy priority at national levels. At the same time, the wave of digital transformation is emerging in the world. In addition to the active promotion of digital transformation strategies by governments, industries are also embracing emerging technologies, developing new types of products or services, and grasping the huge business opportunities brought about by digital transformation.

Digital transformation is gradually changing the face of the world. Governments and global enterprises are eager to understand the impact of the development of widely used technologies. However, these technologies are quite different from the ones that industries would apply for their manufacturing processes or service provisioning. It is difficult for government policymakers to rely on past experiences to assess the potential impacts or benefits of these emerging technologies. Based on these considerations, the OECD [9] has proposed nine actions in response to the dilemma of measuring and evaluating digital transformation in the digital age, so as to grasp the development of social, economic, and industrial digitalization. Snapshots of the nine action plans for digital transformation proposed by the OECD report are given below:

Action 1: Make the Digital Economy Visible in Economic Statistics

This action plan argues that relevant indicators suitable for measuring digital transformation and its impact should be established to complement existing indicators. Examples include, classifying and defining industries, enterprises, and transactions under digital transformation; measuring a country's GDP under digital transformation; and measuring international trade flows. On the basis of existing statistical surveys, OECD recommends, strengthening the survey with usage of digital products and platforms by enterprises and individuals, the trend of enterprises and consumers using e-commerce for sales and consumption, the habits of people using online platforms, etc.

Action 2: Understand the Economic Impacts of Digital Transformation

The adoption of digital technologies is a part of the production process of an enterprise that drives labor and capital production efficiency of the enterprise. The OECD recommends that the adoption of emerging ICT and digital technologies, appropriate classification and definition adjustments, etc., should be regularly reviewed and investigated; and differences in various aspects should be analyzed to understand the general situation of technology adoption in different sectors, along with the gaps with respect to government policies. All kinds of data

should be connected in series to maximize the benefits of data. At the same time, while ensuring the reliability and safety of data, as many people as possible should be able use it for research and analyses.

Action 3: Encourage Measurement of Digital Transformation's Impacts on Social Goals and People's Well-being

Digital transformation affects all aspects of people's lives, and governments around the world hope to achieve their vision-and-development goals through digital transformation. However, there is still insufficient evidence for the impact of digitization on social well-being, such as on mental health, social life experience, etc. The OECD suggests that existing surveys should include surveys on digital usage behavior to form cross-sectional panel data to understand the causal relationship between various factors. It also suggests developing new statistical tools, methods, and surveys to understand discussions on issues such as dissemination of disinformation and hate speech and the resulting impacts on adults as well as children.

Action 4: Design New and Interdisciplinary Approaches to Data Collection

The scale and scope of digitization is not easy to define, but many online actions leave behind a 'trace' of usage. Therefore, a variety of different tools can be used to filter, collect, and organize information. While these tools can help crawl information across different platforms, there are still doubts about the quality of their statistics. The OECD recommends that national statistical offices, regulatory agencies, internet service providers (ISPs), experts, scholars, international organizations, etc., should work together to develop a unified international framework or standard to facilitate the collection and consolidation of data and to improve the availability of follow-up data as well as their applicability.

Action 5: Monitor Technologies Underpinning Digital Transformation , notably IoT, AI, and Blockchain

The application of IoT is quite extensive, and it is expected to show exponential growth in future. AI has the potential to revolutionize production patterns and help address global challenges such as health, transportation, and environmental sustainability. Blockchain also has the potential to transform business models in industries such as finance, transportation, agriculture, and supply chain management. These digital data tools should have a unified framework to define and understand data flows and quantify their socioeconomic impact. The OECD recommends that international uniform definitions and classification standards for AI and blockchain should be developed, along with the policies needed for their evaluation and measurement. In terms of IoT, it is recommended that there should be a classification standard for its application fields, as well as the evaluation of the most important factors affecting IoT and the construction of its related indicators. At the same time, it is suggested that stakeholders in the ecosystem should actively engage in discussions to facilitate the collection and subsequent analysis of relevant data. In addition, policymakers are encouraged to develop tools and methodologies to measure the diffusion benefits of these key technologies, as well as their impact on productivity.

Action 6: Improve the Measurement of Data and Data Flows

The scale of data usage and its impact on business models and production processes is a growing concern. Digitization makes the flow of data faster and cheaper, and different units can use the data simultaneously (even across borders) without detracting others from the use of data for their desired analyses. The value of data is further enhanced as it gets widely used. The OECD recommends that the roles and characteristics of data in business models and production processes should be studied, methods of measuring data flows and stocks should be developed, and methods of measuring knowledge assets should be improved, including data and its impact on production, productivity, and competitiveness.

Action 7: Define and Measure Skills Needs for Digital Transformation

The development of the digital economy and applications may result in skills requirements such as big data analysis, cloud computing, and mobile device applications. It may also lead to new business models, work models, and job types, thereby making it more complex to manage human resources. The OECD recommends that a country's statistics, whether collected by its public sector or private sector, on skills, occupations, and industries should be leveraged and made more consistent with classification. At the same time, it encourages the use of existing multinational datasets and strengthening the correlation data between employers and employees, such as personal work skills, job nature, and content. It also suggests using online job search databases to analyze the time it takes for vacancies related to digitalization to be filled, and consequently understand the labor market's supply-and-demand dynamics for related jobs. At the same time, expert opinion should be solicited to understand the new skills that these emerging jobs may require and the differences that exist between countries in terms of such skills.

Action 8: Measure Trust in Online Environments

As many activities of individual enterprises and governments have moved to the internet, risk management related to information security and privacy has become an important issue in policymaking. At present, network security is measured by various firewall records, cookies, and browser-side security software statistics, but the measurement method still needs further development. The OECD recommends that a more reliable and comprehensive dataset on data security and digital risks should be developed, along with a database of information security incidents that both public and private sectors can trust and share in an open manner. In addition, further research should be done on consumer attitudes and behaviors to strengthen trust in online interactions. Further, internet-based statistics should be explored to measure network reliability and actively improve the quality of statistical data.

Action 9: Establish an Impact Assessment Framework for Digital Governments

Governments all over the world have adopted digital methods to provide various innovative services. The use of digital technology can improve the efficiency of the government, increase the willingness of the people to participate in public policies, and garner feedback on policies more quickly. The OECD recommends that governments should prioritize the establishment of a framework for assessing the impact of digitalization and the development of new statistical tools to assess the impact of digital technology on the relationship between the government and its people and businesses. Particularly, consideration should be given to the extent to which specific groups are affected (such as the elderly, low-income families, single parents, the disabled, etc.) for understanding the benefits of the digital government for the public. At the same time, measures should be formulated for evaluating the impact of the adoption of emerging technologies (such as AI and blockchain) on government services and finding ways for promoting data sharing in the public sector. The possible consequences of digital integration within the government, along with the obstacles, should be actively evaluated.

On the whole, the digital economy is gradually changing the appearance of the world. The development of widely applied technologies such as the IoT, cloud computing, and AI is completely different from the industrial manifestation of traditional product manufacturing or service provisioning. Therefore, it is difficult for government policymakers to rely on past experience to assess the possible impacts or benefits of these emerging technologies. In the face of the digital age, governments around the world need more open, reliable, flexible, and internationally comparable statistical data and systems to support their policy planning and impact assessments, so as to have a more comprehensive understanding of their development and dynamics. In particular,

we would like to highlight several points in the action strategy in the aforementioned OECD report: (1) use public- and private-sector statistics on skills, occupations, and industries to establish consistent classification standards; (2) use datasets to strengthen the correlation data between employers and employees, such as personal work skills, job nature, and content; (3) analyze the time it takes to fill vacancies in jobs related to digitalization, and understand the labor market of related jobs, to have an overview of supply and demand; and (4) through the collection of expert opinions, understand new skills that may be required for emerging jobs. It can be seen that the emerging issues of occupation and employment arising from digital transformation are worthy of in-depth exploration and investment by governments.

The Digital Economy and its Impact on Work Capability

The development of digital technology has profoundly affected the development of various industrial fields. It is necessary to understand the impact of the digital economy on jobs as a result of digital transformation.

Implications of Digital Economy

According to the Bureau of Economic Analysis of the US Department of Commerce, the digital economy is defined as the digital transformation of the economy, i.e., the economic activities carried out or facilitated by digital computing technology, including infrastructure supporting the operation of digital technology, and user-generated digital content in transactions and economic activities [1]. From the point of view of digital innovation, the OECD [8] stated that “the use of information and communication technology can lead to changes in production processes, marketing methods or organizational behaviors, thereby bringing opportunities and challenges to economic activities such as life, employment, and productivity.” The digital economy includes the application of information and communication technology and the combination of cross-domain technology to drive major changes in production, marketing, and business models. The models, mainly sharing economy, platform economy, and digital economy, are described as follows:

Sharing Economy

The sharing economy allows individuals or groups to reactivate their existing resources, whether tangible or intangible, through technology, providing services to others and also earning income. This model makes up for the shortcomings of traditional business models and satisfies consumers' demand for new types of services. It also creates new jobs and new business opportunities. The term sharing economy has been widely circulated since Uber was founded. In addition to car sharing, bike sharing and hotel sharing have also taken off.

Although the sharing economy has not yet matured, it is becoming more and more prosperous. In addition, the sharing economy has the characteristics of relatively low entry barriers and high service innovation, which is very beneficial to the development of many small and medium-sized enterprises (SMEs). However, it is worth noting that the sharing economy is worrisome because it disrupts the existing industry. For example, anyone can now provide taxi services through apps. This will have a certain impact on incumbents in the market.

Platform Economy

Due to the rapid growth of internet giants such as Amazon, Facebook, and Google, the success of these large platforms has led to new business models, thereby giving rise to the platform economy. These platforms, being rich in data and information, are able to provide matches between supply

and demand quite efficiently. Examples of such platforms include restaurant reservation service platforms, electronic payment service platforms, travel expert tour guide service platforms, laundry service platforms, etc. The platform generates a new ecosystem to provide consumers with better services. The value of the platform economy lies in the attraction of users both at the supply side and the demand side, with transactions getting facilitated by the platform. The more the number of users is on one side, the higher the value that is brought to users on the other side.

Digital Economy

The current development trend of the global data economy mainly offers three major business models:

- (1) **Data suppliers:** The industry introduces popular products or service platforms to the market, attracts the attention of a large number of users, and generates a large amount of usage data. The players earn profits through advertising channels or by providing data authorization.
- (2) **Data collection and trading platforms:** Such companies may collect data from data suppliers or other channels through multiple parties, and then provide customers with a single portal to access multiple data sources. Their role is to provide consumers with multiple data sources, thus making data easier to use or otherwise adding value to it.
- (3) **Products and services:** Product and service providers collect and analyze a large amount of data and provide application services required by customers according to their needs by specific fields, in order to increase customer service experience, assist managers in making decisions, and strengthen risk control.

Impact on Workers

Digital development will change the nature of work. The division of traditional work tasks will gradually shift to automation and intelligence, and the demand for digital skills in the labor market will grow significantly [14]. Workers displaced by digitalization will find it difficult to re-enter the workforce without retraining. In the process of digital transformation, workers are not opposed to new technologies such as automation or AI, but must think how to supervise and assist machines to perform work with corresponding new skills.

WEF [16] pointed out that automation will gradually replace repetitive, monotonous, and low value-added jobs. However, work that requires a high degree of communication, coordination, and creative thinking is still not easily replaced, and the proportion of work that requires human-machine collaboration will gradually increase in future. The augmentation strategy proposed by WEF [16] refers to workers improving work productivity with the assistance of machines and AI. Creative thinking of the worker will still have its superiority, and with the assistance of the machine, the worker can simplify complicated operational procedures.

Regarding the definition of the skill, the OECD [9] report pointed out that skills are the ability to help a person use knowledge and achieve goals. Their three main attributes are:

- (1) **Cognitive and metacognitive skills:** These include thinking strategies, including verbal and non-verbal, numbers, as well as critical thinking, creative thinking, and self-discipline and self-learning abilities.

- (2) **Social emotional competence:** This comprises a set of thinking, feeling, and behavioral patterns that help one develop oneself and build relationships at home, school, work, and society. It includes empathy, responsibility, self-efficacy, teamwork, cooperation, etc.
- (3) **Practical and physical skills:** These include a series of functional practical skills, including the ability to use new technologies, programming, data science, etc., as well as daily-life skills such as sports, living, selfcare, etc.

Bughin, *et al* [3] proposed in the McKinsey report, *Skill shift: Automation and the future of the workforce*, that as AI develops, the needs for future job skills change. Bughin, *et al* first defined 25 skills required by various industries (see Table 1), and then predicted the future demand trends of each skill. By 2030, the demand for technical skills will increase by 60%, the demand for social and emotional skills will increase by 26%, and the demand for higher cognitive skills will increase by 9%. In contrast, the need for physical and manual skills will drop by 11% while the need for basic cognitive skills will come down by 14%.

TABLE 1
SHIFTS IN SKILL NEEDS IN 2030.

Skill category	Skills	Representative occupations	2030 needs
Physical and manual skills	General device operation-and-navigation skills	Drivers, production line workers	Down 11%
	General equipment maintenance and mechanical skills	Car and truck mechanics	
	Process and technical skills	Masons, roofers, electricians	
	Fine motor skills	Nursing physicians, food conditioners	
	Gross motor skills and strength	Machine feeder workers, cleaning machine workers, packing machine workers	
Basic cognitive skills	Basic literacy, numeracy, and communication skills	Cashiers, customer service representatives	Down 14%
	Basic data entry and processing skills	Typists, data entry operators, accountants	
Advanced cognitive skills	Advanced literacy skills	Editors, paralegals, writers	Up 9%
	Quantitative and statistical skills	Financial analysts, accountants	
	Critical thinking and decision-making skills	Doctors, insurers	
	Project management skills	Purchasing agents, front line supervisors	
	Processing and interpretation of complex information-related skills	Market research analysts, lawyers	
	Creativity	PR specialists, music composers	

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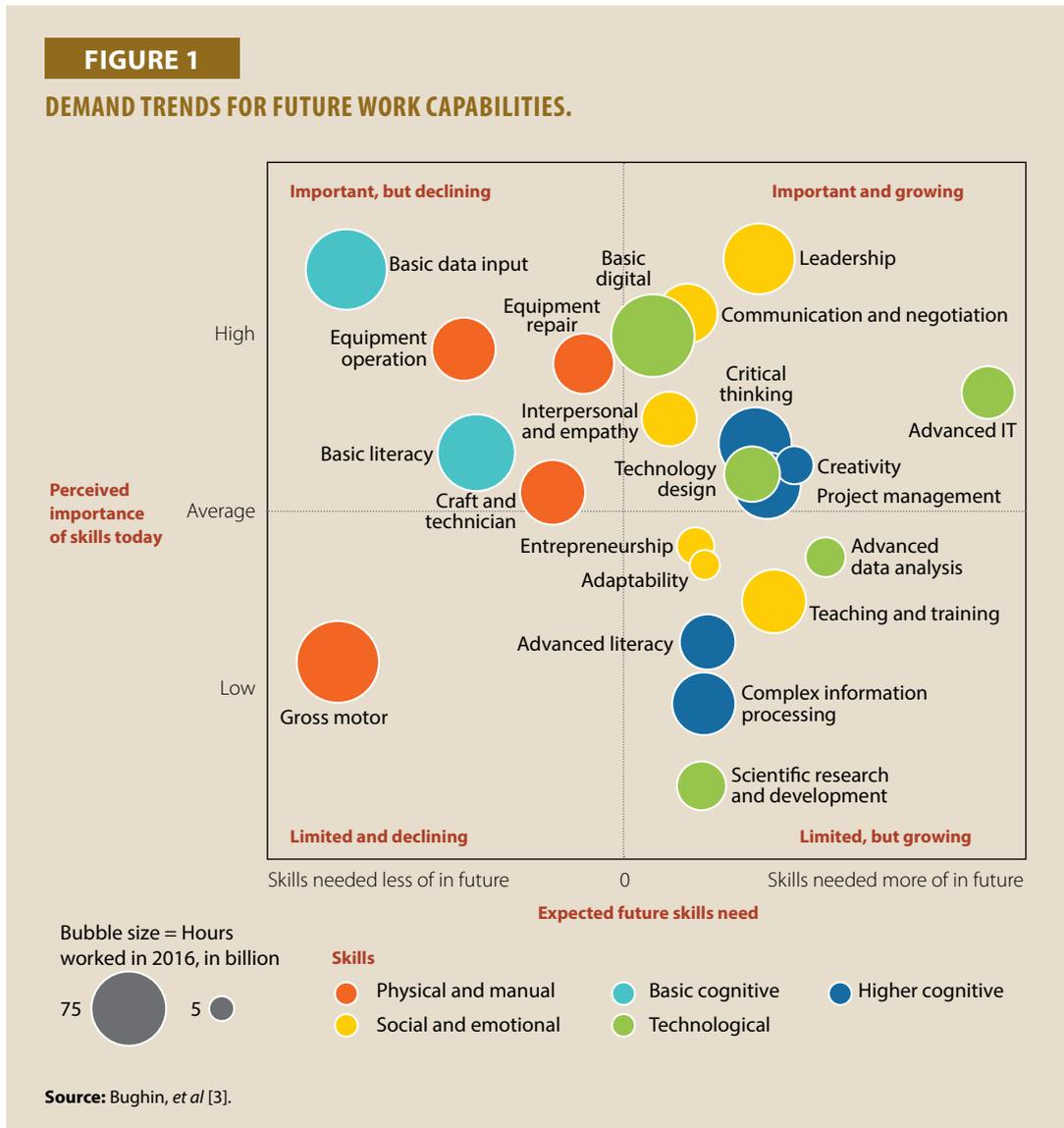
Skill category	Skills	Representative occupations	2030 needs
Social and emotional skills	Advanced communication and negotiation skills	Sales representatives, real estate agents	Up 26%
	Interpersonal skills and empathy	Counselors, social workers, therapists	
	Leadership and management skills	Managers, executives	
	Entrepreneurship and initiative-taking skills	Business development personnel, strategists	
	Adaptive and continuous learning skills	Emergency responders, case workers	
	Teaching and training skills	Teachers, lecturers, trainers	
Professional technology skills	Basic digital skills	Administrative assistants, computer manufacturers	Up 60%
	Advanced IT skills and programming	Software development, network administrator	
	Advanced data analysis and mathematical skills	Statisticians, business research analysts	
	Technical design, engineering, and maintenance skills	Engineers, robotics, product designers	
	Scientific research and development skills	Scientists	

Source: Revised from Bughin, *et al* [3].

Further, Bughin, *et al* [2, 3] predict the skill shift based on the current (Y-axis) and future (X-axis) skill needs (see Figure 1), to estimate the direction of training and transformation toward future skills. Among them, the first quadrant in the upper right corner pertains to job skills that are of high importance at present and need to grow in future, including leadership skills, high-level communication and negotiation skills, high-level IT technical skills, and critical thinking. The fourth quadrant in the lower right corner is about the job skills that are currently low in importance but need to grow in future, including advanced data analysis capabilities, complex information processing capabilities, teaching and training, and scientific research and development capabilities. Most importantly, the competencies in this quadrant provide the direction of future work training and transformation. In addition, the other two quadrants are the ability to work with declining demand in future. The second quadrant in the upper left corner represents skills that are currently the most important, such as typing, basic reading and writing, and equipment operation and maintenance. The third quadrant on the bottom left comprises work abilities that are no longer important and will not be needed in future, such as gross motor skills and strength.

Others like UNCTAD [14] propose a “digital skills pyramid,” which includes the lowest digital user skills, the middle digital specialist skills, and the top electronic skills or e-business skills:

Digital user competencies: These cover basic to advanced competencies, including competencies required to effectively use ICT tools, systems, and equipment to support non-ICT tasks or functions. User capabilities also include the use of the internet, apps, basic and advanced software, and specialized tools that support business-specific functions. Also included are basic digital literacy and digital information literacy.



Digital expert competencies: These are competencies required to research, develop, design, strategically plan, manage, produce, consult, market, sell, integrate, install, manage, maintain, support, and service ICT software and systems.

E-business competency: This includes business competency and technical savviness or technical competency, business acumen, and communication skills. This competency identifies how technology creates new business opportunities, new business models, and new ways of doing existing things. At the same time, one should be able to communicate business cases with banks and investors to raise funds. With these skills, one could become an e-leader or digital entrepreneur who can transform, embrace, and manage innovation through change.

Conclusion and Proposed Analysis Framework

According to the relevant literature’s review, as well as OECD recommendations, conducted in this chapter, some key points can be summarized as an important basis for follow-up research. The first is the definition of digital transformation. This research holds that digital transformation should

include digital technology applications and innovative business models. In terms of digital technology applications, they mainly involve various ICT technologies such as cloud computing, mobile technology, IoT, big data, and AI. These technologies underpin innovative business models that facilitate innovations in organizational process transformation, service development, product design, and customer service through the introduction of digital technology. Therefore, digital transformation not only pays attention to the introduction and application of digital technology but also to the possibility of innovations in internal processes, products, and services. The result of these product or service innovations can increase profits and spur sustainable business growth.

Second, in the development of the digital economy guided by digital transformation, it is necessary to understand the impact of digital transformation on the workforce. This includes analyzing the likelihood of filling vacancies in digitally related jobs, understanding the labor market supply and demand profiles for jobs facing digital transformation, and understanding new skills that may be required for emerging jobs. It can be seen that the emerging issues of occupation and employment arising from digital transformation are worthy of in-depth exploration and investment by governments.

Furthermore, the relevant definition of the digital economy is “the use of information and communication technology to drive changes in production processes, marketing methods or organizational behaviors, thereby bringing opportunities and challenges to economic activities such as life, employment, and productivity.” Based on this, digital economy also includes the application of ICT, but the point is that this combination can underpin production, marketing, and business models that are very different from the traditional ones.

Also, such a transition will have an impact on job and skill demands. As Bughin, *et al* [3] and UNCTAD [14] have pointed out, the focus of future job skills training and transformation includes leadership, high-level communication and negotiation skills, high-level IT technical skills, and critical thinking. High-level data analysis capabilities, complex information processing capabilities, teaching and training, and scientific research development capabilities, etc. are also important skills for the future. On the other hand, skills with declining demand include skills such as typing, basic reading and writing, and equipment operation and maintenance. In addition to the effective use of ICT tools, systems and equipment, the digital functions of the future will also include the ability to use the internet, apps, basic and advanced software, and professional tools that support business-specific functions. Even basic digital literacy is required. A more advanced digital function is the ability to develop and design digital applications and services. In addition to digital proficiency, the ability to create innovative business models is also required.

Based on the above, we propose a research framework as given in Figure 2, to better understand skill adjustments, policies, and programs commensurate with the evolving demands of the labor market in member countries. An inventory of the national training and reskilling strategies is the foundation of our work, followed by conduction of research, both quantitative and qualitative, to understand how technology meets shifting industry dynamics and the impacts on tasks, jobs, and workers. Finally, lessons learned and insights are generated through the collection of ideas from national experts, summarized as follow:

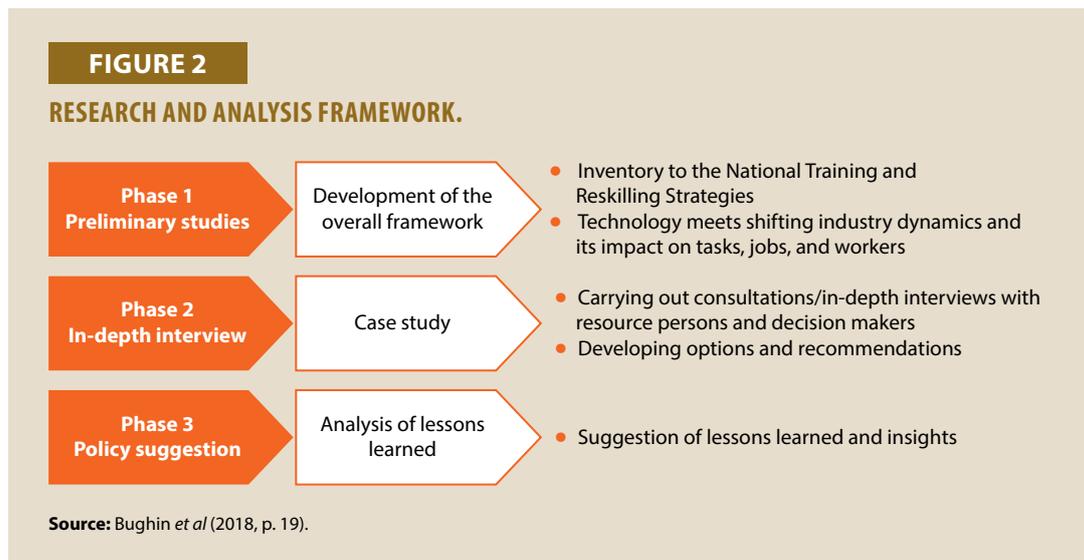
Bangladesh

Considering the large number of unemployed youth and other socioeconomic conditions, Bangladesh needs more resilient human-centered future of work. To ensure this, the country should apply the right national policies to deliver real benefits for all. Moreover, it should think for

establishing strong linkages between education, trainings, and jobs. The state should put importance on demand-based technical education. The number of quality training institutes should be increased. The government is making efforts to address the issues, which are praiseworthy.

Cambodia

Aiming to improve the quality of labor forces, the government has put more effort, especially in the current mandate, to improve the education and skills of labor forces by setting out several national and sectoral policies. From the demand side, there was also a structural shift in demand from agriculture to manufacturing and service sectors even during the pandemic period in 2020 and 2021. For instance, in the current labor market, employment has shifted from the less productive to more productive sectors and moved toward more skilled and higher-paid occupations. Given that, TVET needs a strong and modern system to supply labor forces as demanded by the market.



Fiji

The challenges of the Fiji labor market of the twenty-first century are rooted in the legacy of the colonial economic structure and human resource development. International economic demands have impacted Fiji’s economy to expose skill shortages and mismatches, especially of the youth and an enlarged informal sector. Skill mismatches include soft skills at workplaces. Critical responses in human resource development led by efforts to expand and extend TVET education appear to be the only strategic way forward to ensure economic growth and productivity. While labor migration to Australia and New Zealand contributes to addressing increasing unemployment, this appears insufficient to ensure economic development, the increasing volume of remittances notwithstanding. Investments in technologies for green jobs will impact the labor market with demands for new skills. Recent assessment of ‘Green employment in Fiji’ (GGGI, 2019) provides indications for employment creation in different sectors of the economy. This is underscored by demonstrable efforts by employers from all sectors to introduce climate friendly and energy-saving technologies. The enduring question will continue to be the availability of requisite skills and skills training from educational institutions to meet new labor market demands.

India

The government has made rapid and substantial responses to this crisis thus far with far-reaching policy changes to cope with the significant challenges to the labor market. As support to jobs via

job retention schemes is gradually wound down and more permanent structural demand shifts become evident, the challenge will be to ensure that the policies that are currently implemented are sufficient. This encompasses both the coverage of the individuals they reach and the extent to which investment in reskilling matches labor market needs. The latter will require good tools to identify the skills in demand and a strong dialog with the social partners and businesses, now and in future. Moreover, the effectiveness of new and adapted measures will also depend on their successful implementation.

IR Iran

Considering the favorable effects of the plans of the active labor market policy program in creating employment and consequently reducing the unemployment rate, to achieve the maximum goal of increasing employability for young people and university graduates requires coordination of higher education policies with economic policies, employment policies, science and technology policies, and industrial and commercial policies. To achieve this, the executive apparatus and relevant organizations must avoid sporadic actions in the field of job creation. At the same time, the basis of active policies is based on the use of unused capacities of existing workshops or the restoration of the capacity of workshops damaged by economic problems and the coronavirus disease. Given the limited capacity of unused economic workshops, this policy can in no way replace the development of employment through the creation or development of economic infrastructure capacity. Therefore, a part of the employment development goals should continue to be pursued through government support for the creation of new capacities, especially for the creation of new businesses and startups and entrepreneurial activities.

Nepal

Nepal aspires to achieve the aim of graduating from the least developed country (LDC) status by 2022 and becoming an upper middle-income-country (MIC) by 2030. In addition to various other strategies, special priority has to be given to improve skills and productivity of laborers to achieve the target faster. It is important to consider the important sectors for development like ICT, tourism, agro, and light manufacturing for increasing growth and productive employment. Employment opportunities should be provided to all for a safe, healthy, and competitive market. Vocational training and education should be top priorities in any sector so that the baseline of any labor is strong. Policy support to offer incentives for skills training programs including work-based learning under partnership with business and industry should be developed. Universities should be encouraged to offer degrees in occupational education or TVET, and organizational capacity should be enhanced to produce quality human resources. The government should also allocate budget for on-the-job training in partnership with the private sector.

Pakistan

The Government of Pakistan is also aiming to address this, and a program was initiated as Pakistan Talent Hunt Program as the Prime Minister had nominated 2022 as the Youth Year. Some of the initiatives taken in this regard included contracts with international athletes to train the youth of Pakistan. However, this should not be limited to just sports and other skilling areas should also be considered. A lot of training programs and training providers are in the market, but training is still fragmented with less provision in remote areas. Additionally, the quality of training is uneven. The government takes initiatives and develops strategies and programs, but several hazards exist for their implementation. One of the biggest problems is political turmoil and inconsistency in the implementation of strategies due to regime changes.

The Philippines

In the Philippines, a few years ago, the most significant catalyst for workplace change advanced in the form of digitalization or digital transformation. Many Filipino workers were alarmed that jobs would be replaced by AI, automation, or robots, and unemployed workers would increase. Those changes caused by digitalization have not gone away. Also, the COVID-19 pandemic has taken the future of work on a new path, a direction that is virtual and remote rather than physical and centralized, where an eight-to-five job and a five-day workweek are suddenly hard to imagine. Even before the pandemic, it would have been innocent to think that technology would continue to motivate changes in our daily lives and our workplaces, with the question always being how we respond to the changes brought about by disruptions. Industry 4.0 and the unexpected global health crisis have brought the pre-crisis vision of equitable, relevant, and quality skills development into more sharp focus, adding unanticipated urgency to the calls for reforms, specifically in labor policies while combining technology and innovation. Developing and enhancing skills (new skills, reskilling, and retooling) can contribute to structural transformation and economic growth by improving employability and labor productivity and becoming more competitive. Investments in learners and workforces can create a virtuous process, wherein relevant and quality skills boost productivity growth and foreign direct investment (FDI). This may result in more and better jobs, job offers for the incoming and current workforce of the country, and more public and private investments in the education and training system.

These challenges require government and business leaders to handle uncertainty, emotions, individuality, and vulnerability; and engage. We are already hearing about those who have risen to the challenge and their decisions concerning their workforce. How businesses and leaders behave during this challenging time will measure their future success. People do not forget how organizations and leaders behave in the most difficult times.

Sri Lanka

Vocational education and training (VET) for the labor market is discussed in depth. The Vocational Training Authority (VTA) is spearheading the delivery of relevant training in the country. Moreover, in Sri Lanka, there are a number of government ministries and agencies involved in VET training. Among them are the Ministry of Skills Development and Vocational Training, the Tertiary and Vocational Education Commission, the National Apprentice and Industrial Training Authority, the Department of Technical Education and Training, the Vocational Training Authority, and the National Youth Services Council. Further, the report conducts an evaluation of Sri Lanka's vocational training development strategy. In doing so, it has discussed the market transition opportunities like school-to-work transitions, labor market transitions, and occupational transition. Further, in this study, the impact of recent COVID-19 pandemic on Sri Lanka's labor market gaps is also assessed.

Thailand

Thailand has been working hard on human resource development. However, some challenges related to workforce preparation remain and even emerge more over time. In terms of skill development and trainings, an emphasis should be placed on both quantity and quality. The government should expand access to training opportunities to reach vulnerable groups including the poor, the elderly, and the women. At the same time, adequate training should be provided to upskill the Thai workforce to work in the 21st century. More advanced technology or STEM courses as well as soft-skill courses must be encouraged more. As the manpower policy involves multiple government organizations, efficient collaboration between relevant organizations will

enable Thailand to get prepared for these rapidly changing demands. There needs to be an effective platform that connects data on population, education, labor market, and training. Currently, the E-Workforce Ecosystem is aiming to address that. Yet the output and outcome of such a system is still invisible. Moreover, partnership with the private sector is crucial to ensure that trainings are provided with high quality and can serve the market demand. Finally, since Thailand's strategies are moving to lifelong learning, active policies should be initiated to encourage learning through measures such as learning subsidies or more incentives for learners and training providers.

Vietnam

Understanding the important role of human resources in socioeconomic development, the Vietnamese Communist Party has advocated a strategic breakthrough in human resource development (HRD). In order to concretize the Party's viewpoint, the National Assembly promulgated the Law on Higher Education in 2012 (amended in 2018); the Law on Vocational Education in 2014; the Labor Code in 2019; the Education Law on Education in 2019; the Law on Public Officials; and the Law on Public Officials. Lots of legal documents guiding the implementation of the laws as well as mechanisms and policies on HRD have been issued by the government. In addition, the Prime Minister approved the Vietnam Human Resource Development Strategy for the 2011–20 period and the Vietnam Human Resource Development Master Plan for the 2011–20 period, as well as the Vocational Training Development Strategy for 2011–20 period. These documents have created the legal framework and the driving force for HRD in terms of both quantity and quality. Vietnam continues to properly implement mechanisms and policies for development of vocational education and a skilled workforce and for further carrying out digital transformation and online training. There is a focus on training and retraining the workforce to bring about great changes in terms of size, quality, and efficiency of vocational education; ensure that learners acquire professional skills, digital skills, soft skills, entrepreneurship skills, languages, etc. required by the labor market; and strive to reach the vocational education level of ASEAN-4 countries by 2030 and of G20 countries by 2045. Also, there is a focus to increase communications activities and change the social consensus and mindset about development of vocational education and the position and role of the skilled workforce to mobilize participation and resources from the whole society. Particularly, enterprises' cooperation in developing a skilled workforce for Vietnam's development is sought.

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THE PHILIPPINES

Introduction

The Philippines is among the Asian countries having many skilled workers in various sectors. Skills are valuable in empowering a service-based economy. According to the International Labor Organization (ILO) [1], the world of work is undergoing a significant transformation process with the rise of new technologies, innovations, demographic shifts, climate change, globalization, and the impact of the COVID-19 crisis. These changes have led to disruptions, worldwide, including the Philippines, affecting economies, businesses, and the labor market, specifically employment opportunities. Furthermore, this disruption has led workers to adapt to technological changes in a hastened manner, by acquiring new skills that could address their upskilling and reskilling needs.

Lund, Madgavkar, *et al* [2] state that the range of workforce transitions set off by COVID-19 increases the importance for enterprises and policymakers to support additional training and education programs for workers. Establishments and governments have displayed extraordinary flexibility and adaptability in responding to the pandemic with purpose and innovation to retool the workforce in ways that point to enhanced productivity and a brighter future of work. Everybody has to step up for workforces and enterprises to bounce back, focusing on accelerating Industry 4.0 for surviving and resiliently recovering from the pandemic and facing the new normal [3].

The sudden upsurge of COVID-19 has quickened Industry 4.0 or Fourth Industrial Revolution (FIRe) adoption. However, it has caused an unanticipated change in the operation of establishments across sectors toward a mature state of digital transformation [4]. According to Davis [5], Industry 4.0 marks the advent of cyber-physical systems, involving new capabilities for all people and machines. The union of physical and digital technologies includes analytics, artificial intelligence (AI), cognitive computing, robotics, nanotechnology, internet of things (IoT), 3D printing, and other technological advancements brought about by FIRe [6].

This new era builds and extends the impact of digitalization in new and unanticipated ways. The future of work implies the possibility to evolve our workforces and workplaces. The widespread digitalization of business processes as well as of data and information has disrupted establishment models all over the globe. An individual working nine-to-five may observe that work seems to be changing faster than ever before. These significant changes threaten to create enormous social and economic disruptions. Digitalization causes jobs changes and job displacements due to the impact of emerging technologies on manufacturing and services sectors, and may cause anxiety due to automation or digitalization among individuals. The technological advancement could result in reconsidering the roles of individuals and organizations that will drive retooling and relearning for career stability and improvement. A collaboration of the government, the industry, and the academia should focus on developing strategies that will make the future of work productive and rewarding for everyone [7].

ILO has stated that the Philippines has urgently undertaken skills development against the new wave of technological innovation and demographic shifts [1]. The government has been crafting strategic policies and programs to help equip the Filipino workforce in the changing world of work. In 2018, discussions on the Philippine readiness on the future of work for FIRe were in place. The

government continues to spearhead programs that take advantage of emerging technologies to support the innovation capacity and competitiveness of establishments and the Filipino workforce, thereby leading to increased productivity. The Philippines, like other countries, sees a rapid increase in opportunities for productivity growth and development of technologies, even new business models, despite that countries are recovering from the pandemic. Skills development, upskilling, and reskilling form part of a strategy for building capacity in key priority industries with the emergence of new technologies, skills, roles, and capabilities. In this regard, Filipino workers need to collectively and individually have a sense of technological disruption. It is prompted by the pandemic's global disruptions and technological changes, while shaping the country's economic, social, and political outcomes in this new normal. A new mindset, along with new policies and institutions are necessary to bring about rapid changes and renewed thinking.

This report examines the current Philippine policies and programs that accelerate its human capital development to prepare Filipino workers to meet the changing labor market demands for new skills. These changes will also enable policymakers and even decisionmakers in enterprises to cope with fluid labor market dynamics in the Philippines. This report focuses on the Philippine Department of Labor and Employment initiatives on the current demand and technology-adept skills. The methodology of the study comprises (1) desk review of labor policies and initiatives of the government for the labor market; and (2) consultations with key responsible organizations in the government and other stakeholders.

Macroeconomic Setting in the Philippines

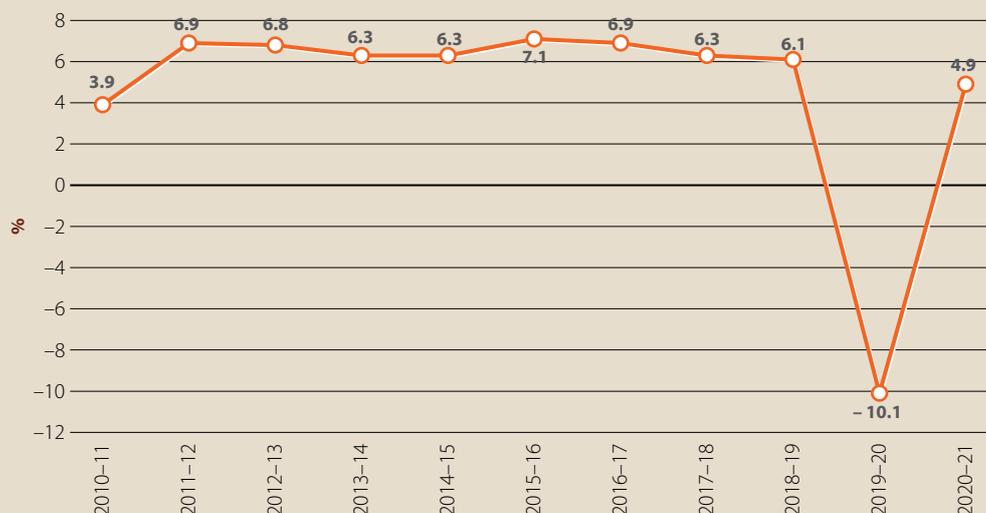
The Philippines has been one of the strong performers in the ASEAN region, having registered a robust economic performance averaging 6.2% from 2011 to 2019 (see Figure 1) amidst rising global uncertainties. Despite the downside of inflation in the country, economic developments have been brought about by fiscal reforms and public investment programs by the Duterte administration, including the 'Build, Build, Build' initiative. According to the World Bank, fast-tracking the implementation of recently approved reforms to help achieve inclusive growth and promote competition to generate quality jobs will enhance the impact of growth on poverty reduction in the Philippines [9].

The coronavirus outbreak and calamities such as volcanic eruptions and floods in the early part of 2020 and the latter part of 2021 have greatly affected the Philippine economy. The GDA slump by a negative 10.1% from 2019 to 2020, caused by prolonged lockdowns and strict quarantine measures that limited the movements of individuals. Businesses feared the surge of infections that caused some to close and focus on innovating, being creative, and becoming risk-takers to adapt to the new normal [10].

The Philippines is slowly bouncing back, having registered a positive growth of 4.9% in 2021 over 2020 (see Figure 1), in the third quarter. The main contributors to the growth have been industry at 7.6% and services at 4.6% (see Figure 2). Industries that contributed the most to the growth were food products, primary pharmaceutical products, and pharmaceutical preparations, which were considered essential during the pandemic. Employment continued to be there despite the pandemic through alternative work arrangements. The services sector sustained its momentum, accounting for approximately 60% of the GDP. The Philippine Statistical Authority (PSA) stated that the top contributors from this sector were wholesale and retail trade, repair of motor vehicles and motorcycles, professional and business services, and financial and insurance activities. Despite many unemployed workers in the country, Filipino workers proved to be resilient by way of

FIGURE 1

GROWTH RATE OF GROSS VALUE ADDED, 2011–21P.



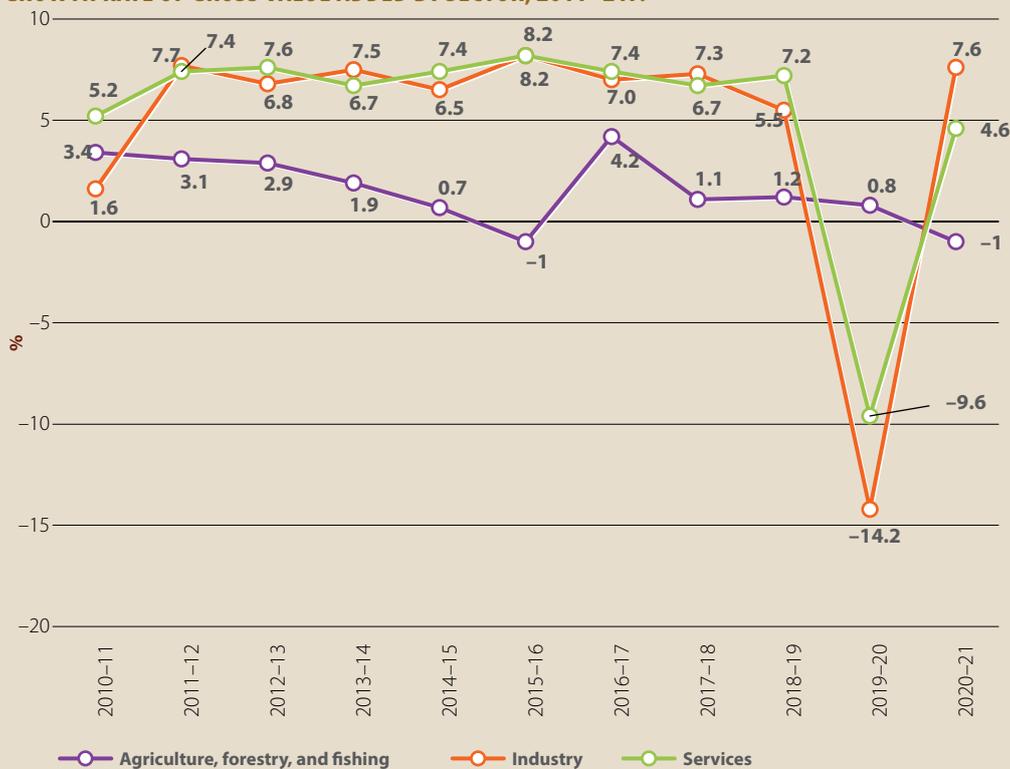
Note: At 2018 constant prices.

*2021P: Partial result, as of the third quarter.

Source: The National Accounts of the Philippines, Philippine Statistical Authority (PSA).

FIGURE 2

GROWTH RATE OF GROSS VALUE ADDED BY SECTOR, 2011–21P.



Note: At 2018 constant prices.

2021P: Partial result, as of the third quarter.

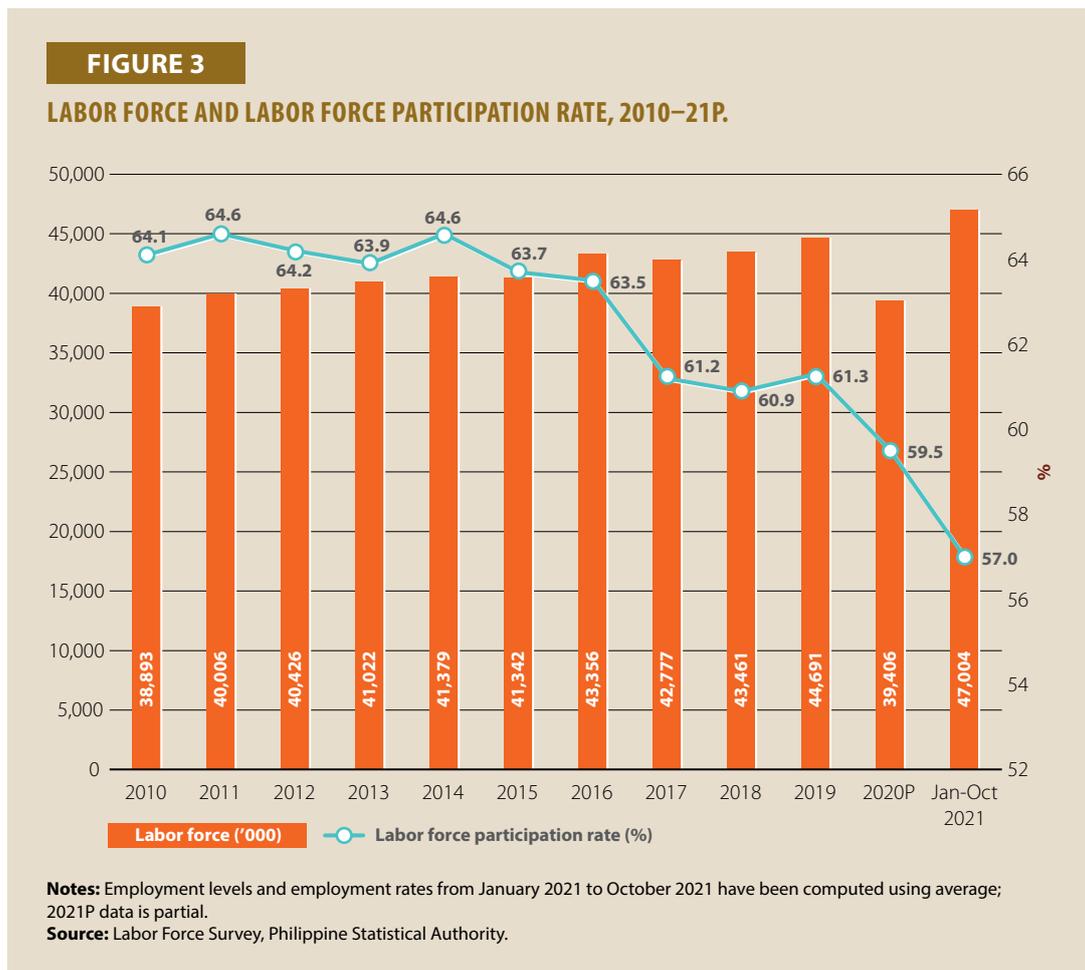
Source: The National Accounts of the Philippines, PSA.

building and venturing into new companies, amidst the rise of the gig economy, to provide for their families and survive. The crisis has created opportunities for a new class of innovators adapting to the new normal where most businesses have gone for digitalization.

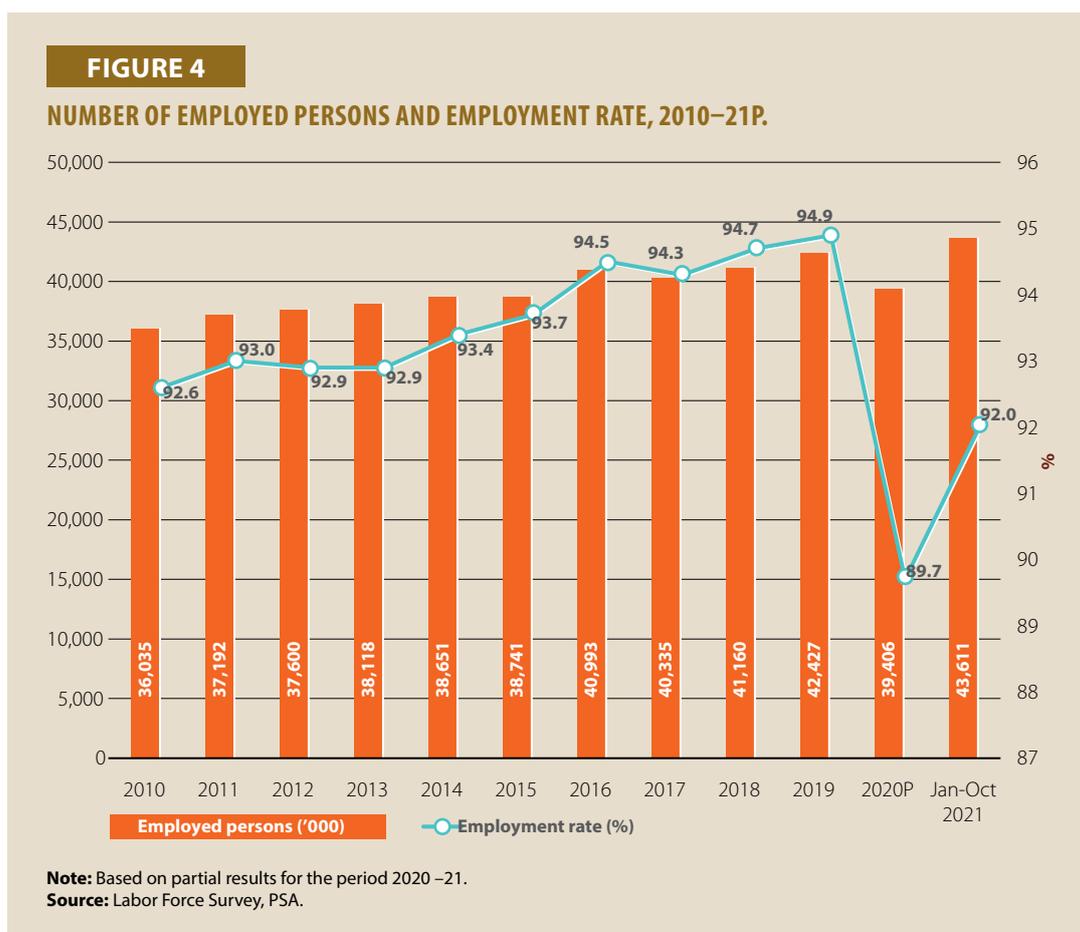
Labor and Employment Situation

One of the effective strategies in uplifting the lives of Filipinos out of poverty is providing them with productive employment. The PSA collects labor data through the Philippine Labor Force Survey (LFS) on a monthly basis to show how it has managed its employment program.

The Philippines’ total labor force went up from 38.9 million in 2010 to 44.7 million in 2019 (see Figure 3). In the first quarter of 2020, there was a decrease in Filipino workers who lost their jobs due to the global disruptions caused by COVID-19, with only 39.4 million left in the labor force.



The Philippines is slowly opening its economy and recovering from the impact of the pandemic. As seen in Figure 4, in the last ten years, the employment rate in the Philippines increased from 92.6% (36.04 million workers) in 2010 to 94.9% (42.4 million workers) in 2019. However, due to prolonged lockdowns, business shutdowns, and travel restrictions during the pandemic along with community quarantine measures taken by the government, the employment rate decreased to 89.7% (39.4 million workers) in 2020, marking a decrease of 5.2% from 2019; while in 2021, the employment rate increased to 92.0% on an average during the period from January 2021 to October 2021.



As is evident from Figure 5, the unemployment rate rose from 7.4% (2.9 million) in 2010 to 10.3% (1.5 million) in 2020. In 2019, unemployment rate was the lowest at 5.1% (1.1 million), with the NEDA reporting that the country effectively created jobs through ‘Build, Build, Build’ projects. The Philippines’ unemployment rate increased by 8.2% from January 2021 to October 2021, after a drop in 2019. It translated into an average of 3.8 million Filipinos without jobs, though the government had eased out the quarantine measures.

The country gradually eased out the quarantine restrictions and authorized more economic activities to resume.

Assessment of National Labor Training and Reskilling Strategies

After embarking upon a program of inclusive growth and poverty reduction under the previous Philippine Development Plan 2011–16, the country has slowly transformed from being an economic laggard to one of the best-performing economies in Asia. The Philippine Development Plan (PDP) 2017–22 is a medium-term plan anchored on a long-term plan for the next 25 years [12]. The Philippines’ vision for 2040 is ‘*Matatag, Maginhawa, at panatag na buhay*’ or ‘*AmBisyonNatin 2040*,’ wherein the country would be a prosperous middle-class society where no one is poor.

The Philippines has recognized the need to create quality jobs in various sectors to alleviate the plight of its people due to poverty. Chapter 10 of the revised PDP plan, titled “Human Capital Development Towards Greater Agility,” intends to strengthen strategies to transform the Philippines’



human capital toward greater agility for a healthy and resilient country [13]. Despite the accomplishments of the previous plan and administration, the Philippines needs to address challenges that impede the realization of Filipinos’ full potential. Combining the original and updated PDP 2017–2022, the difficulties in human capital development were identified to assess policies that would help the Philippines, its enterprises, and its workers to face and be ready for the changing market demands of the labor market, such as the rise of FIRE and the disruptions caused by the COVID-19 pandemic.

Chapter 14 of PDP 2017–2022, titled “Vigorously Advancing Science, Technology, and Innovation,” is where the plan for artificial intelligence (AI) development is. The chapter states that science, technology, and innovation (STI) play a vital role in economic and social progress. It is an essential driver of the long-term growth of an economy. The AI component in PDP 2017–22 focuses primarily on manufacturing as the government pushes its ‘Build, Build, Build’ infrastructure plan. The plan describes AI as one of the “most promising and potentially disruptive emerging technologies.”

However, a low level of innovation in the country is brought about by a weak STI culture; insufficient research and development (R&D) budgets; weaknesses in STI human capital; inadequate science and technology (S&T) human resources engaged in STI R&D; difficulty in increasing employment opportunities and retaining S&T human capital; absence of a vibrant intellectual property culture; weak linkages among players in the STI ecosystem; and inadequate STI infrastructure. Strategies were set in place to stimulate growth in STI, including promoting

commercialization and utilization of technologies from publicly funded R&D; development of a vibrant intellectual property rights (IPR) culture; provision of support mechanisms for startups and MSMEs in the regions; and supporting the R&D plan [14].

This report identifies five gaps or challenges that the government and the partners in the industry and academia need to prioritize to meet the changing labor market demands. These gaps, discussed in the next section, cut across sectors, including the rise of innovation and the digital transformation industry.

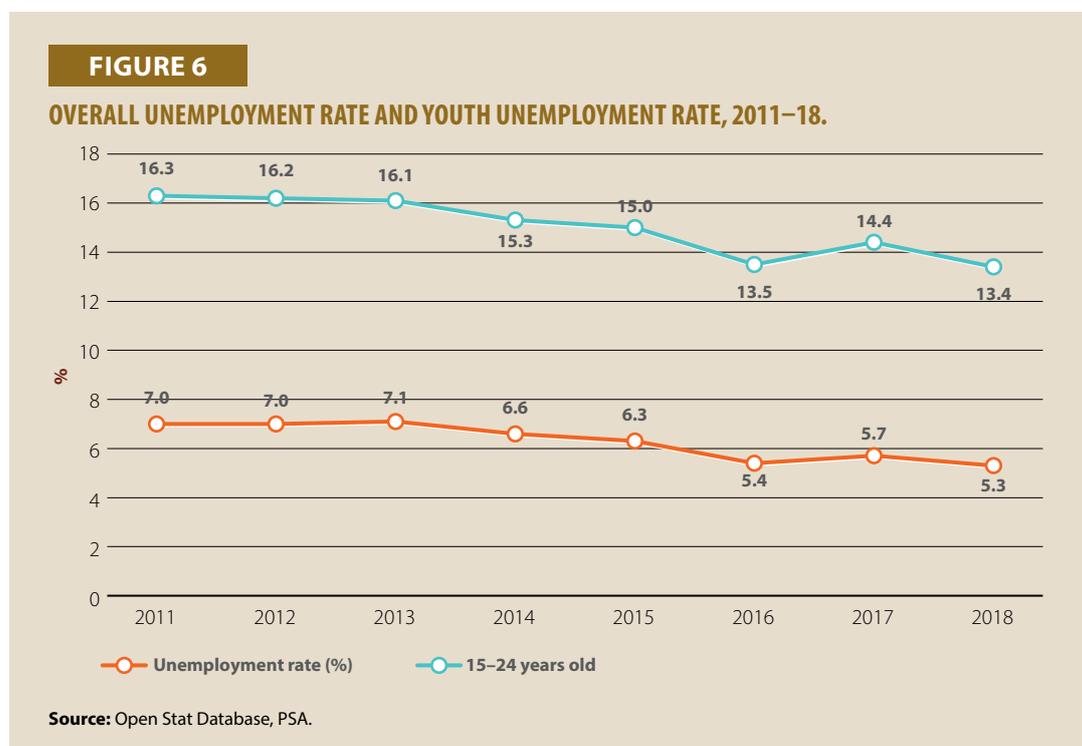
Gaps and Challenges

Underemployment Challenge

According to NEDA, PDP 2011–16 successfully attained the unemployment targets. However, the underemployment rate was higher than the unemployment rate, which could be attributed to a considerable component of laborers and lack of quality education and training. Unskilled workers comprise one-third of the total employment. Also, underemployment harms the economy. It directly contributes to the emigration of intelligent and skilled workers and professionals from one country to another for better income [15], which allows them to rise from poverty.

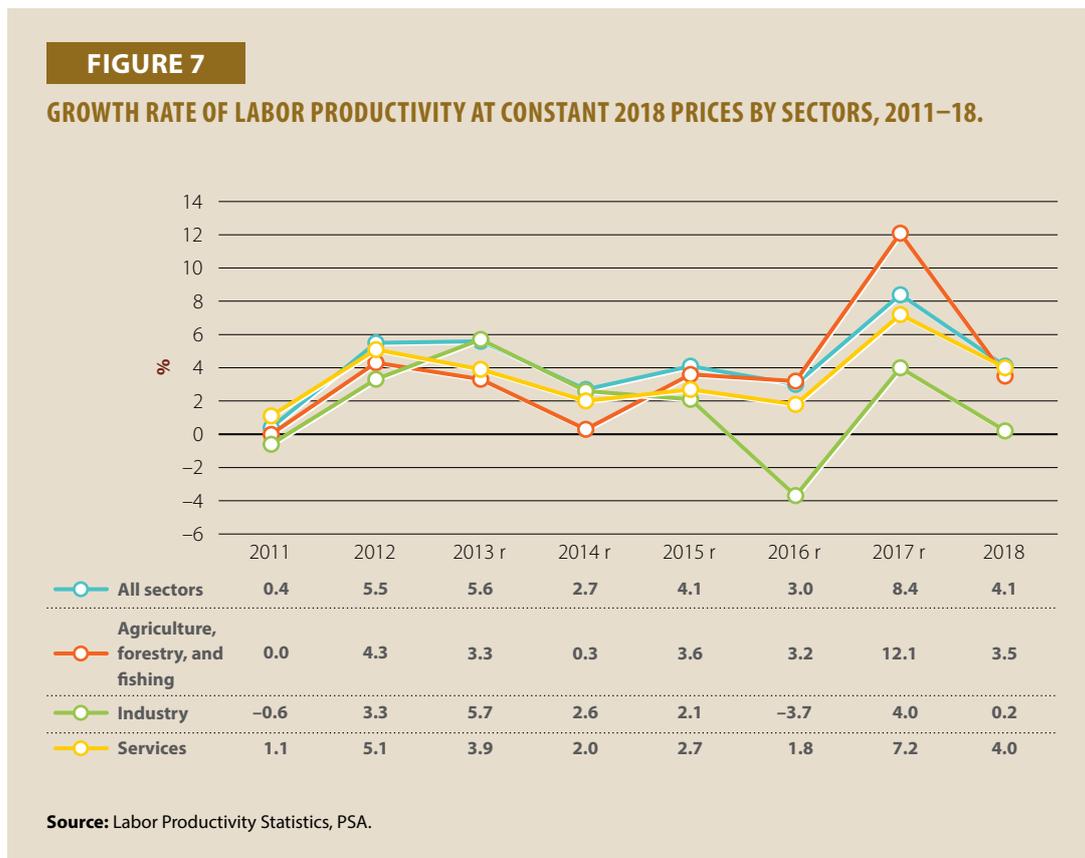
Youth Unemployment as a Necessary Focus of Intervention

The ILO has defined youth unemployment as an essential policy issue for many countries regardless of their stage of development [16]. Based on the PSA Open Stat database, the youth unemployment rate ranged from 16.3% in 2011 to 13.4% in 2018 [17], at twice the unemployment rate of the labor force (see Figure 6). According to PDP 2017-2022, youth unemployment rate was double the overall unemployment rate, which means that many Filipino youths were underutilized with skills not being enhanced by education, training, or employment. The DOLE Secretary has said that human capital is the key driver in promoting inclusive growth and sustainable economic development in the Philippines. So, the government should develop work-based training programs for the youth to prepare them for the world of work [18].



Labor Productivity remained below targets

Although industry and services sectors have improved over the years, they have remained below the target plan of 3.9% to 4.7%. As seen in Figure 7, from 2011 to 2019, labor productivity in agriculture, forestry, and fishing (AFF) and services sectors increased faster than the industry sector [19]. The positive increase in AFF may contribute to the government’s focus on expanding this sector’s opportunities. The growth in the services sector is the transition of workers from AFF, where the number of self-employed has increased, especially during the pandemic, and wages and incomes have become more flexible, which has resulted in growth in the number of employed workers in low-skilled and low-income categories. The shortage of workers on the needed technical and soft skills and work experience, along with lack of technological progress and innovation, have contributed to the slow increase in labor productivity. However, the decrease in 2020 was brought about by the effects of the pandemic, such as enterprise closure and job losses or displacements.



Weak Academia–industry Linkages

There have been various efforts to link the academia and the industry in the Philippines for two decades due to a decrease in the quality of new entry-level workers and fresh graduates. In a presentation from Philippine Business for Education (PBED) on academia–industry linkages, it was noted that there was a decline in the quality of higher education. Weak professional preparation due to lack of time and low quality of incoming college students resulted in a mismatch in education [20]. Inadequate support to pursue graduate studies (or embark on research and publish papers) and limited domestic and international partners to facilitate knowledge transfer may have contributed to the low performance of higher educational institutions (HEIs). Further, the absence of collaboration with industry partners contributed to the mismatch between skills (provided in schools and universities) and labor market requirements.

Enhancement of the Quality of Education

The government has implemented various reforms in the educational sector. Institutionalizing the K to 12 Basic Education Program and the Republic Act No. 10931 of 2017 or the Universal Access to Quality Tertiary Education Law will enable Filipinos to continuously develop skills to gain their full potential as productive members of a rapidly changing society and environment (see Table 1).

TABLE 1

COMPARISON OF K TO 12 WITH OLD BASIC EDUCATION SYSTEM IN THE PHILIPPINES.

Old basic education system	K to 12 basic education program
<ul style="list-style-type: none"> Learners lack mastery of essential competencies due to a congested ten-year primary education curriculum. Graduates of the old curriculum are often younger than 18 years and are not legally ready to be part of the labor force or start a business. Foreign countries saw that a ten-year curriculum was inadequate. They did not automatically acknowledge overseas Filipino workers (OFWs) as professionals abroad. Kindergarten is a strong foundation for lifelong learning and total development, though it is optional and not a prerequisite for entry to grade 1. The old education system delivers a broad curriculum that does not include enough practical applications. 	<ul style="list-style-type: none"> Learners lack mastery of essential competencies due to a congested ten-year primary education curriculum. Graduates of the old curriculum are often younger than 18 years old and are not legally ready to be part of the labor force or start a business. Foreign countries saw that a ten-year curriculum was inadequate. They do not automatically acknowledge OFWs as professionals abroad. Kindergarten is a strong foundation for lifelong learning and total development, though it is optional and not a pre-requisite for entry to grade 1. The old education system delivers a broad curriculum that does not include enough practical applications. <ul style="list-style-type: none"> Academic track: university or college preparation <ul style="list-style-type: none"> General academic strand Humanities and Social Science Stand Science, Technology, Engineering, and Mathematics strand Accountancy, Business and Management Strand Technical-Vocational Livelihood (TVL) Track (job-ready skills) Sports track: physical education and recreation Arts and Design track: design, performative and creative industry

Source: K12Philippines.

Before the disruptions brought about by the pandemic, the work landscape had been changing rapidly with the rise of FIRE. COVID-19 gave rise to unprecedented challenges, causing firms to migrate to new working arrangements to safeguard workers. The identified challenges show a growing demand for skilled workers; reskilling and upskilling of the current workforce; and at the same time developing the future workforce that would be able to adjust and succeed amidst changes. With the intensified adoption of remote and flexible work mechanisms, technology has a

critical role in redesigning and transforming individuals' work. The issue of jobs–skills mismatch pertains to its effect on the productivity of the Filipino workforce. Policies and programs intended to address the persistence of skills mismatch focus on the supply-side issue through education and training. It is also necessary to examine the demand side of the wage-setting practices.

This report identifies government policies that need to be strengthened and reviewed to improve labor market policies that influence changes in the labor market demands in the Philippines. These policies would impact the increase of linkages between skills development, productivity, and employment potential of Filipino workers, to address poverty reduction.

Labor Market Related Policies (Related Legal basis in achieving labor market governance)

Republic Act No. 10533

Republic Act No. 10533 is “An Act enhancing the Philippine basic education system by strengthening its curriculum and increasing the number of years for basic education, appropriating funds therefor and for other purposes.”

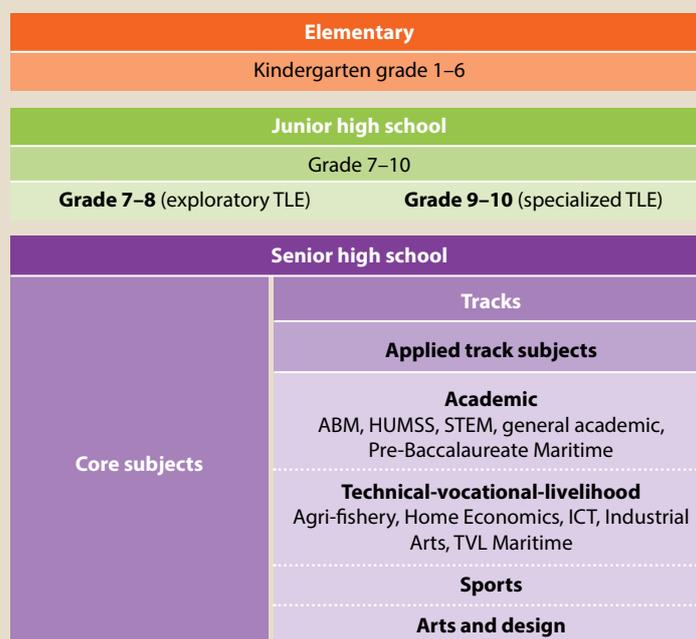
This law is also known as the “Enhanced Basic Education Act of 2013.” It was popularly called K to 12 because the act (RA 10533) enhanced the Philippine Basic Education System (PBES) by strengthening its curriculum and increasing the number of years for primary education. The policy aims to establish, maintain, and support a wholly adequate and integrated education system suitable to the needs of individuals, the country, and the society [21]. As cited in Republic Act No. 10533, it also aims to create a functional basic education system that will develop productive and responsible citizens equipped with essential competencies, skills, and values for both lifelong learning and employment. It has expanded the years of primary education from 10 years to 12 years. The additional two years were introduced in 2018, representing grades 11 and 12 in the primary education system through senior high school.

The implementation of the new Philippine education system will be at par with global standards. The government implemented the K to 12 programs to improve the country's education system for accelerating recognition of Filipino graduates and professionals across the world. The additional years in primary education provide time to master skills, develop lifelong learnings, and prepare the Filipino students for universities, employment, and entrepreneurship. Filipino students can master the skills and build core competencies that are essential to meet the demand of the changing labor market [22].

This policy is one of the top priorities of the Philippine government, for providing soft and hard skills training for Filipino learners. This would help them to develop and improve 21st-century skills such as critical thinking and problem solving; innovation and creativity; life and career skills; and information, media, and technology skills [23] to become a global and productive workforce.

However, with the implementation of the law, challenges have also come up. According to Ednave *et al*, some of the challenges are: lack of preparation and professional development; several people getting displaced over the five-year transition period since 2015; lack of teachers and classrooms to meet the demands of the program; excessive academic load on learners; and integration of learnings in real-life context. The shift to the K to 12 programs is a challenge for the government. This scheme will not rely on the government effort alone but on a collaboration with the private sector to implement nation-building by educating the Filipino workers.

FIGURE 8
K TO 12 BASIC CURRICULUM.



Source: K to 12 Basic Curriculum, Department of Education, the Philippines.

Republic Act No. 7686

The Republic Act 7686 is an “Act to strengthen manpower education and training in the Philippines by institutionalizing the dual training system as an instructional delivery system of technical and vocational education and training, providing the mechanism, appropriating funds therefor and for other purposes.” The Act was approved and signed on 25 February 1994.

The law, also known as the ‘Dual Training System (DTS) of 1994,’ institutionalizes the program in accredited public and private educational institutions; training centers; and agricultural, industrial, and service enterprises. It is an act to strengthen workers’ education and training by institutionalizing DTS as an instructional delivery system, combining technical and vocational education and training, providing the mechanism, and appropriating funds, among other things. It applies to all public and private educational institutions/training centers and the agricultural, industrial, and service establishments accredited to participate in the DTS. It encourages participation by employers in the system. It also permits a deduction from taxable income, of 50% of system expenses paid to the accredited DTS educational institutions, for their trainees. It sets out the employers, trainees, and accredited educational institutions/training centers.

DTS mandates the Technical Education and Skills Development Authority (TESDA) to promote, coordinate, and administer DTS and provide tax incentives to encourage the participation of companies in the program. The increase in the unemployment rate is one of the significant challenges in the Philippines that became apparent during the pandemic. Dernbach [24] has cited jobs–skills mismatch as one of the reasons for high unemployment, especially among the youth. The Philippine government is promoting DTS as an approach that specifically addresses the issue of jobs–skills mismatch. DTS promotes collaborations between technical–vocational institutions

(TVIs) and the industry. Local studies say that promoting industry partnership increases the employment rate. However, facilitating DTS is a challenge despite the government incentives to scale the program.

The training modality of DTS combines theoretical and practical training. The learning takes place in two venues: the school or the training center and the establishment or the workshop. The educational institution and the workplace together equip trainees with well-coordinated learning experiences and opportunities.

Trainees under the DTS spend at least 40% of the training/learning time in the school and 60% in practical training or immersion in the establishment. After the training, they are equipped with employable skills, work knowledge, and attitudes. In successfully facilitating DTS, there is a need to strengthen the advocacies and create more enticing incentives that would boost TVIs, NGOs, and businesses to engage in DTS.

Republic Act No. 10968

The Republic Act No. 10968 is an “Act institutionalizing the Philippine Qualifications Framework (PQF), establishing the PQF–National Coordinating Council (NCC) and appropriate funds therefor.”

The PQF was created through the Republic Act No. 10968 and Executive Order No. 83 in 2012. The program grants official recognition of value in the world of education and training, work, and job creation.

The law aims to assist individuals in moving quickly and readily between the education sector and the labor market by focusing on what a learner can demonstrate due to a learning experience. The shift to outcome-based education is the system that prepares Filipino students for the highest standards of a particular profession and makes them employable and ready to enter a labor force. It also refers to a formal certification that has completed specific learning outcomes relevant to the identified academic, industry, or community conditions. The framework is a collaborative strategy by the Department of Education (DepEd); TESDA; Commission on Higher Education (CHED); Professional Regulation Commission (PRC); and Department of Labor and Employment (DOLE) [25].

The program aims to provide benefits across sectors and stakeholders of education and training by encouraging lifelong learning of individuals. It ensures that training and educational institutions adhere to specific standards and achieve the same. It also provides employers with specific training standards and qualifications aligned with industry criteria. It also provides the government with common standards, taxonomy, and typology of qualifications as bases for granting approvals to partners or stakeholders.

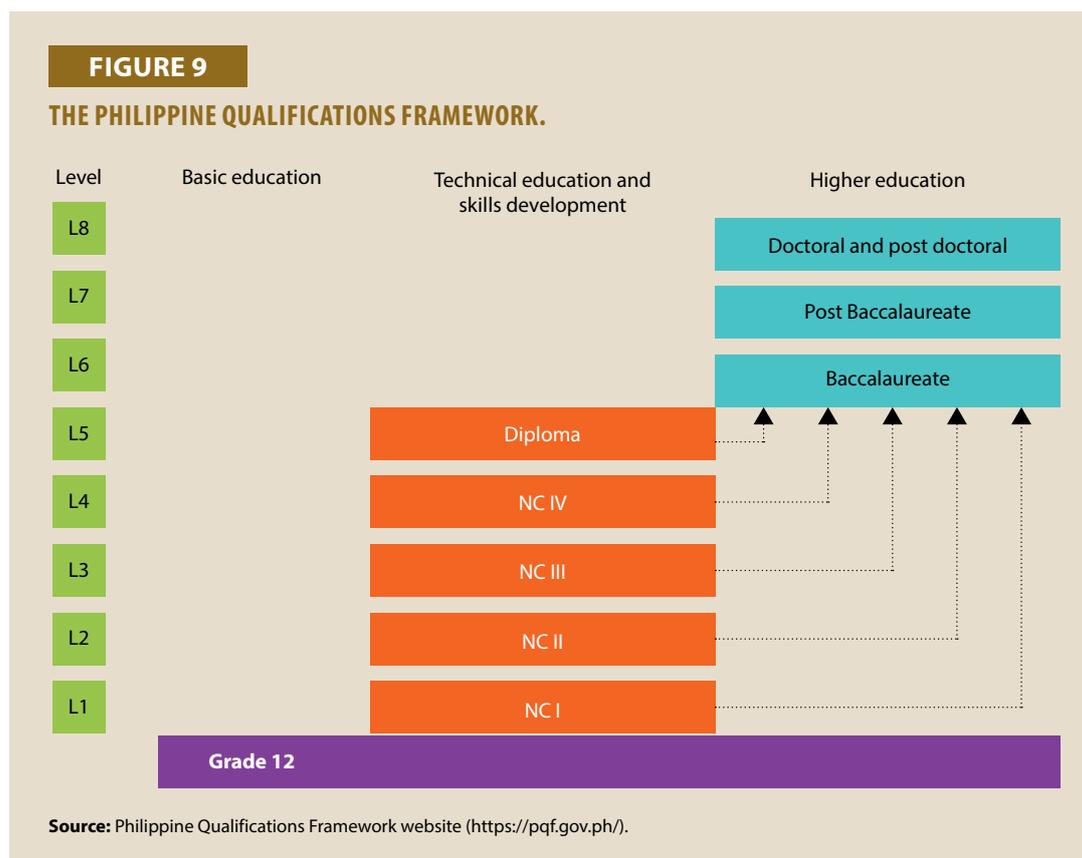
Based on the PQF website, the detailed objectives of the framework are

- to adopt national standards and levels of learning outcomes of education;
- to support the development and maintenance of pathways and equivalencies that enable access to qualifications, and to assist individuals in moving quickly and readily between different education and training sectors and between these sectors and the labor market;
- to align domestic qualification standards with the international qualifications framework; and

- to enhance recognition of the value and comparability of Filipino students and workforce qualifications and support the mobility of Filipino students and workers.

The PQF has eight levels of qualifications differentiated by descriptors of expected learning outcomes and three domains of (1) knowledge, skills, and values; (2) application; and (3) degree of independence, with sub-frameworks corresponding to the subsystems of the education and training system.

In contrast, the Commission on Higher Education Subsystem covers baccalaureate, postgraduate diploma, master’s degree, and doctorate that correspond to levels 7 to 8. The two subsystems interface in the provision of qualifications at level 5.



The labor market is concerned with unemployment and underemployment issues cutting across sectors and types of individuals. More people obtain capabilities that the labor market does not require, making it more difficult for employers to hire them. The framework serves as a quality-guaranteed national system for the development, recognition, and awarding of qualifications, based on standards of knowledge, skills, and values developed in different ways and methods by learners and workers of a particular country. Thus, the PQF will ensure that the standards and qualifications are consistent with job requirements/demands by the industry and needs. Likewise, it will provide a common understanding of standards, qualifications, and levels. It is competency-based and labor market-driven. It is an assessment-based qualification recognition. Employers can support the government as the country aligns the curriculum with the industries’ current and future skills requirements. The government considers that transparent and robust methods, stakeholder engagement and consultation, robust quality assurance strategies, and nationally endorsed results will build more trust and confidence in the system.

Republic Act No. 11293

The Republic Act No. 11293 is “An Act adopting innovation as vital component of the country’s development policies to drive inclusive development, promote the growth and national competitiveness of micro, small, and medium enterprises, appropriating funds therefor, and for other purposes.”

It is also known as the Philippine Innovation Act, which pursues innovation as a vital component of national development and sustainable economic growth. This act states that the government recognizes the crucial role of the business sector, academia, scientific community, and research institutions in driving economic growth through innovation. As AI is one of the key drivers of innovation, the Philippine AI Roadmap serves as one of the key declarations of this policy.

To support this act, it is important to:

- (1) promote, integrate and strengthen policies that engage with innovative businesses and entrepreneurs;
- (2) invest in education, science, technology, and innovation;
- (3) place innovation at the center of development policies;
- (4) promote a culture of strategic planning and innovation, put efficient institutions in place; and
- (5) strive to encourage potential innovations, and at the same time protect them from misappropriation.

Through the use of technologies, the adoption of AI is to strengthen inclusive innovation outlined in Section 11 of RA 11293, which mandates the National Innovation Council to “integrate policies to promote women’s participation and skills development.”

Executive Order No. 140

This executive order is for adopting the National Employment Recovery Strategy (NERS) 2021–22 and reinforcing job-generating programs through the NERS Task Force (Series of 2021).

The NERS program was the Philippine government’s master plan from 2021 to 2022 to revive the labor market. It anchored on the updated PDP 2017–22 and ‘ReCharge Ph’ through the expansion of the initiative of the ‘*Trabaho, Negosyo, Kabuhayan*’ (TNK), which aims to create decent jobs through promotion of entrepreneurship, as a collaboration project between the Department of Labor and Employment (DOLE) and the Department of Trade and Industry (DTI). The NERS project is a medium-term plan geared to create employment opportunities and improve the Filipino workforce’s employability while considering the changes in the labor market and the accelerated adoption of new technologies brought about by the pandemic [25]. DOLE and Bureau of Labor and Employment (BLE) mentioned in a Philippine News Agency interview dated 3 April 2021 that the program was about job preservation and employment creation.

The program aimed to create a policy environment that encouraged the generation and improved access to employment, livelihood, and training opportunities. It also sought to improve the employability and productivity of the Filipino workforce and take benefits from the opportunities

in the labor market brought about by the ‘new normal.’ It also aimed to support the existing and emerging businesses to preserve and create employment. The NERS Task Force anchored its accomplishments of programs in the NERS 8-Point Employment Recovery Agenda, which includes,

- (1) approval of the proposed wage subsidy for private-sector workers;
- (2) conducting a job summit;
- (3) supporting the passage of priority legislations and policies that strengthen economic and employment recovery;
- (4) enabling retooling and upskilling of workers;
- (5) full implementation of youth employability programs;
- (6) extending assistance to establishments through loans, deferments, and upgrading of processes;
- (7) providing social protection to vulnerable groups; and
- (8) monitoring and supporting continuous implementation of programs with a high impact on employment.

During the pre-summit dialog for workers in an NERS program, ILO Country Director Khalid Hassan said that ILO, together with the UN, was committed to supporting national stakeholders in the development and implementation of the program. The NERS program anchored on the ILO’s policy framework for responding to the socioeconomic impact of the COVID-19 crisis, from motivating the economy and employment; supporting businesses, employment, and incomes; and protecting workers in the workplace; to relying on social dialog for solutions.

TABLE 2

NERS ANCHORED ON THE ILO POLICY FRAMEWORK FOR TACKLING THE IMPACT OF COVID-19.

<p>Pillar 1</p> <ul style="list-style-type: none"> • Stimulating the economy and employment • Active fiscal policy • Accommodative monetary policy • Lending and providing financial support to specific sectors, including the health sector 	<p>Pillar 2</p> <ul style="list-style-type: none"> • Supporting enterprises, jobs, and incomes • Extending social protection for all • Implementing employment retention measures • Providing financial and other relief for enterprises
<p>Pillar 3</p> <ul style="list-style-type: none"> • Protecting workers in the workplace • Strengthening occupational safety and health measures • Adopting work arrangement (e.g., teleworking) • Preventing discrimination and exclusion • Providing health access for all • Expanding access to paid leave 	<p>Pillar 4</p> <ul style="list-style-type: none"> • Relying on social dialog for solutions • Strengthening the capacity and resilience of employers’ and workers’ organizations • Strengthening the capacity of governments • Strengthening social dialog, collective bargaining, and labor relations institutions and processes

Source: International Labor Organization.

In a November 2021 report, the DOLE said that as of August 2021, they had already generated 780,111 jobs. The majority of these jobs were in the construction sector, while others were in public administration services and IT-related upgrading of programs, both in the public and private sector [26].

Republic Act No. 6971

The Productivity Incentives Act of 1990, also known as Republic Act 6971, provides incentives to both labor and capital for voluntarily implementing programs that increase workers' sharing of the fruits of their labor. This Act applies to all business enterprises, with or without existing and duly recognized or certified labor organizations, including government-owned-and-controlled corporations performing proprietary functions, as well as all employees and workers, regardless of whether they are temporary, regular, supervisory, or managerial. The employers' group has always advocated for productivity to ensure that businesses establish and maintain a competitive edge. Labor is aware that as productivity rises, their total wages increase. The government has cited productivity as the key to attaining real growth without the inflationary effects of price increases.

Labor productivity is one of the most important indicators of a nation's economic development due to its close relationship with economic expansion, competitiveness, and living standards. According to the United Nations Development Programme and the National Economic Development Authority, labor productivity growth is one of the most important macroeconomic indicators for measuring progress toward the Sustainable Development Goals under Goal 8 or "Decent Work and Economic Growth," which aims to promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all.

The Act recognizes the right of labor to a fair share of the fruits of production, as well as the rights of businesses to reasonable returns on investments, expansion, and development. Incentives for productivity aim to encourage higher levels of productivity, preserve industrial peace and harmony, and promote shared responsibility between employees and employers. Through its Regional Tripartite Wages and Productivity Boards (RTWPBs), the National Wages and Productivity Commission (NWPC) provides technical assistance to create productivity-enhancing and gainsharing programs.

The Productivity Incentives Act is undergoing legislative amendment to loosen up its restrictive provisions. It promotes inclusive and sustainable productivity programs that would increase the country's labor productivity by mandating the creation of a Productivity Incentives Committee for businesses with ten or more employees; implementing productivity incentive programs; granting or distributing productivity incentives to workers; and establishing a system for establishments providing incentives to workers to receive tax incentives. The measure also encourages businesses to implement incentive programs that will strengthen the link between wages and workers' productivity and promote workplace equity and fairness. It will require the government to promote or develop a workplace culture and mindset of productivity as a way of life through advocacy programs and incorporate them into primary and higher education curricula as well as technical training. Culture is related to employee productivity and influences employee engagement. It promotes work-life balance and empowers and motivates employees. It promotes the coordinated implementation of productivity-related programs and initiatives through collaboration with government agencies that provide technical assistance to MSMEs. In addition, the amendments call for the establishment of a recognition system for productivity experts to certify highly qualified professionals whose work centers on assisting MSMEs with the application of productivity tools and productivity-related activities, such as consulting and training.

The Act aims to strengthen competitiveness, skills, and the productivity-wage linkage, wherein higher productivity will be realized by encouraging enterprises to play a vital role in reskilling and upskilling their workforces and, concurrently, strengthening the bipartite workplace mechanism as the main instrument in setting better terms and conditions of work, which will benefit both workers and management.

Industry Drivers and Key Employment Generators in the Philippines

Through DOLE, the Philippine Department of Labor and Employment (BLE), in its ‘JobsFit Labor Market Information (LMI) Report,’ has identified industries/sectors with the most significant potential to produce employment opportunities and absorb the bulk of the Philippines workforce in the coming years. These identified industries/sectors are called Key Employment Generators (KEGs). DOLE–BLE conducted a review of the relevant labor market and economic indicators, and projected industry share in the gross domestic product (GDP), gross national product (GNP), foreign direct investments (FDIs), and inputs gathered through consultations with stakeholders [27].

TABLE 3

TOP TEN KEY EMPLOYMENT GENERATORS.

IT/business process management (BPM)	Agribusiness
Wholesale and retail trade	Banking and finance
Transport and logistics	Hotel, restaurant, and tourism
Manufacturing	Education
Construction	Health and wellness

Source: JobsFit 2022 LMI Report, Bureau of Labor and Employment.

The top ten KEGs identified are listed below:

- (1) **IT/business process management (BPM):** IT–BPM covers voice and non-voice complex services. IT-BPM service experts have significantly increased, and the industry will continue to be a vital one in the following years. Currently, the Philippines is considered a global market leader in this industry.
- (2) **Wholesale and retail trade:** This industry sector covers the wholesale and retail sale of goods and the rendering of services incidental to the sale of such goods as well as their distribution. With the government’s investments in telecommunication and IT infrastructures to strengthen the expanding IT–BPM industry, the benefits will spill over to other sectors, including wholesale and retail trade.
- (3) **Transport and logistics:** The transport industry covers air, water, and mass rail transport, while logistics covers airports and seaports, passenger/intermodal terminals, cargo terminals, container yards, and warehouses. The aviation industry aims to reach new heights with the national and local government’s extensive promotions for prime tourist destinations. At the same time, the maritime sector continues to have a demand for Filipino seafarers abroad. Through the Department of Public Works and Highways (DPWH), with its advocacy to improve the country’s national road network, it aims to generate employment opportunities.

- (4) **Manufacturing:** This industry covers the physical or chemical transformation of materials, substances, or components into new products. As the government pushes through the manufacturing industry roadmap, it will strengthen the industry and help create employment opportunities in the priority sectors of electronics, food processing, automotive, chemicals, iron and steel, and garments.
- (5) **Construction:** This industry includes horizontal and vertical construction projects. Horizontal construction involves heavy equipment to move tons of earth materials to complete buildings, airfields, etc. On the other hand, vertical construction is anything built from the ground up. The current administration's top priority project is the 'Build, Build, Build' project. Infrastructure building and development of industries have been accelerated, yielding robust growth across the archipelago, creating jobs, and uplifting the lives of Filipinos.
- (6) **Agribusiness:** This sector is generally the retail aspect related to agriculture or agricultural activities. It is quite diverse as it encompasses input production, farm operations and management, equipment and supplies manufacturing, food/non-food processing, trading, and retailing. The *Kapatid Mentor Me* program, a Department of Agriculture and Go Negosyo act pioneered in 2017, aims to reinforce rural development and create sustainable economics by tapping agri-workers and promoting agripreneurship across the country.
- (7) **Banking and finance:** This industry encompasses financial service activities including insurance, reinsurance, and pension funding; and activities to support financial services. As the Philippine economy grows, the foreseen growth in the number of business establishments will demand workers with skills to set up books, prepare taxes and payrolls, and provide financial analysis and advice. The role of financial intermediation in the economy continues to grow and create more significant opportunities for increasing employment within the next few years.
- (8) **Hotel and restaurant, and tourism:** This industry includes tourism-related enterprises such as restaurants, food chains, and accommodation establishments that include but are not limited to hotels, resorts, apartments, motels, bed-and-breakfast facilities, and tourist inns. During the pre-pandemic era, visitor arrivals were around 8.2 million in 2019. However, due to the COVID-19 pandemic, the industry experienced an abrupt fall in tourist arrivals, resulting in a demand plunge causing thousands of job losses and economic hardships and closing of several establishments. The Asian Development Bank (ADB) recommends promoting domestic tourism to offset the recession in foreign tourist arrivals.
- (9) **Education:** The education sector includes education at any level or for any profession, oral or written, and by radio, television, or other means of communication. It also provides education by different institutions in the regular school system at various levels as well as adult education, literacy programs, etc. Implementing the K to 12 programs is a government initiative to improve the country's educational system. Hence, this sector will continue to employ the country's workforce.
- (10) **Health and wellness:** This industry covers the establishment and operation of medical facilities such as primary, secondary, and tertiary hospitals; ambulatory clinics; and spas that cater to the overall well-being of people. It includes operations of hotel spas, therapeutic centers, traditional and alternative healing, and medical care services.

ASSESSMENT OF SECTORS THAT HAVE AFFECTED THE CHANGING LABOR MARKET DEMAND

A questionnaire was sent to partners to validate sectors/industries and occupations that impact the changes brought about by digital transformation, pandemic, and other disruptions that will make a difference in the labor market for stakeholders. The Employers Confederation of the Philippines (ECOP) identified these areas of concern.

A. Sectors in which technology has a significantly negative impact on employment

Sectors in which technology has a significantly negative impact on employment	Accommodation and food service activities	Real estate activities	Wholesale and retail trade
Gross value added (In million PHP)	At current prices	At current prices	At current prices
Source: National Accounts of the Philippines, Philippine Statistics Authority	2019 PHP 431,778	2019 PHP 692,011	2019 PHP 3,410,296
	2020 PHP 253,656	2020 PHP 487,130	2020 PHP 3,257,598
	At constant 2018 prices	At constant 2018 prices	At constant 2018 prices
	2019 PHP 425,692	2019 PHP 689,362	2019 PHP 3,410,296
	2020 PHP 232,389	2020 PHP 469,236	2020 PHP 3,257,598
Employment (in thousands) National		2019: 42,429 2020: 39,379 ^P	
Employment rate	2019: 4.5 2020: 3.7 ^P	2019: 0.5 2020: 0.5 ^P	2019: 19.9 2020: 20.5 ^P
Underemployment (in thousands)		2019: 5,933 2020: 6,395 ^P	
Unemployment (in thousands)		2019: 2,263 2020: 4,501 ^P	
Likely impact of technology's adoption in the sector's domestic market	Workers who do manual jobs (waiters/waitresses, room attendants, housekeeping) will be highly affected if establishments adopt technological improvements	Services can now be conducted virtually, without the physical presence of brokers, as enabled by online real estate platforms	Consumers can now order online, and opt for delivery of services. In physical stores, companies now have the option to adopt contactless checkout options, and thus obviate the need for cashiers and baggers

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Sectors in which technology has a significantly negative impact on employment	Accommodation and food service activities	Real estate activities	Wholesale and retail trade
Apparent need for reskilling for businesses to do a technological change	Highly needed	Highly needed	Highly needed
Risk of a sustained reduction in the size of addressable market due to changing consumer preferences and enterprise practices	High	High	High
Risk of sustained loss of exports and employment as global and regional value chains are reconfigured	At high risk	At high risk	At high risk
Apparent scope for skills to help enterprises to adjust to the changing environment and meet changing customer needs	Soft skills development	Soft skills development	Soft skills development
Potential to promote inclusion	Adapt diversity and inclusion policies and practices	Adapt diversity and inclusion policies and practices	Adapt diversity and inclusion policies and practices

P= Partial results

B. Identified sectors and occupations in which technology increases demand for skills or is likely to drive structural change in the sector or industry, changing the set of skills demanded

Sectors and occupations in which technology increases demand for skills or is likely to drive structural changes in the sector, changing the set of skills demanded	Mining and quarrying	Manufacturing	Financial and insurance services
Substantial need for more trained workers in an occupation or sector to respond to technology changes		Organization-wide retooling and retraining	Organization-wide retooling and retraining
Substantial need for more trained workers in an occupation or sector to produce goods or services needed nationally or internationally to respond to technology changes		Very much needed	

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Sectors and occupations in which technology increases demand for skills or is likely to drive structural changes in the sector, changing the set of skills demanded	Mining and quarrying	Manufacturing	Financial and insurance services
Potential for incremental growth in sales in a well-established sector arising from market changes resulting from a technology change	Highly likely	Highly likely	Highly likely
Potential for the sector to diversify into new products or services that will be in demand as a consequence of the technology change		Highly likely	Highly likely
Apparent scope for more or better skills to help businesses change or innovate to take advantage of market opportunities driven by the technology and to generate decent employment	Highly needed	Highly needed	Highly needed
Potential to promote inclusion	Adapt diversity and inclusion policies and practices	Adapt diversity and inclusion policies and practices	Adapt diversity and inclusion policies and practices

C. Identified groups of individuals needing training, reskilling and upskilling

Groups of individuals needing training, reskilling, and upskilling	Manufacturing	Real estate activities	Financial and insurance services
Groups that were affected the most by a technological change	Production line workers	Real estate agents	Bank tellers/insurance brokers
Groups, could an intervention make the most significant difference	All	All	All
Are there existing strategies for the target group or similar target groups that could be scaled up or applied to the group?			

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Groups of individuals needing training, reskilling, and upskilling	Manufacturing	Real estate activities	Financial and insurance services
Are there innovative strategies that could be applied to the target group? Perhaps there could be use of mobile technologies to develop basic IT skills or use of distance or blended learning by those who already have IT and literacy skills and have access to smart-phones or other IT devices.	Soft skills development	Soft skills development	Soft skills development
Groups that could safely be reached through interventions during a technological change	All	All	All
For which groups is the risk of being out of employment most severe?	Rank-and-file employees	Rank-and-file employees	Rank-and-file employees
Are there groups of individuals who need new skills to mitigate the change? For example, workers moving to smallholding or subsistence agriculture may not have the agronomy skills required.	Women workers New entrants	New entrants	New entrants

The overwhelming impact on hard-hit and vulnerable groups, young people, women, and the low-paid and low-skilled workforce requires dedicated support for decent work opportunities. Recovery strategies also need to address the pre-crisis future of work trends, ranging from digitalization, demographic changes, and environmental and climate changes to globalization in the fast-changing world of work. These changes also came to force during the pandemic through increased digitalization. In building a better future of work, it is crucial to invest in people's capabilities; decent and sustainable employment, and a world of work that can help push in the right direction toward a lasting, sustainable, and inclusive recovery. One such push should focus on green recovery strategies that promote a just transition to a more inclusive and sustainable world of work. Skills and tasks (or roles) are two critical concepts discussed between jobs and digitalization. The changing role content of jobs has significant implications for skills demand.

Labor Market Transition Opportunities

The future of the Filipino workplace post-COVID-19, i.e., the new normal, is already here to stay. It is business, but it is far from the usual that we did before. COVID-19 has underscored the need to go digital without lengthy preparations by enterprises. The pandemic has driven micro, small, and medium enterprises (MSMEs) to adapt to technological changes. The strict quarantine measures imposed by the Philippine government on 16 March 2020 left many establishments with no other options but to go digital, automate, and innovate. Establishment owners knew that offering their services online was a way to survive during the unprecedented time. The pandemic transformed ideas about how and where workers could work, through flexibility, adaptability, and technology in the workplace.

Adopting Digital Technology

Telecommunications networks and digital technologies became essential during the prolonged lockdown, and the acceleration of digital transformation was crucial for a fast economic recovery. It supercharged individuals' ability to do their best. According to LinkedIn, digital transformation defines adapting to newly available technologies and changes in customer expectations, societal shifts, and industry disruptions. In responding to these shifts, businesses need to become more customer-focused, agile, adaptive to new opportunities, and efficient to stay competitive.

Earlier, in the Philippines, it seemed that it would take years for enterprises and workers to shift to the world of digital technologies. The pandemic situation pushed the workers and industries into freelance opportunities and jobs amenable for alternative work arrangements across sectors, including

- (1) web and software development;
- (2) information technology;
- (3) sales and marketing;
- (4) data science and analytics;
- (5) digital marketing and advertising;
- (6) engineering and architecture;
- (7) admin support;

- (8) design and creatives;
- (9) writing;
- (10) legal administration;
- (11) customer service;
- (12) accounting; and
- (13) consultancy.

However, due to the shift in work dynamics with prolonged lockdown measures and strengthened health-and-safety protocols, many establishments went on to adopt a more flexible work setup with off-site monitoring arrangements.

Job Opportunities and Relevant Skills

In the wake of COVID-19, the quarantine measures and health protocols on how we live and work have impacted our daily lives. However, as restrictions were lifted, thoughts inevitably turned to what the ‘new normal,’ and, better yet, ‘better normal’ would look like. Many things can still be sources of disruptions, but it is safe to assume that it is implausible that the country will go back to ‘business as usual.’ When the government imposed quarantine and movement restrictions in the first quarter of 2020, enterprises had to alter their business processes by implementing business continuity plans and changing work locations of their workers overnight. For many, this accelerated an existing journey toward having a more digital and remote workforce. For other organizations, the event marked the beginning of the new journey, as transformations cannot be done overnight. Enterprises have a real chance to plan their future and determine what they want their ‘new normal’ and eventually the ‘better normal’ to look like from a business model, workforce, or skills perspective.

This is based on the DOLE’s ‘JobsFit COVID-19 Labor Market Information Report’ titled, ‘How the Pandemic is Reshaping the Philippine Labor Market,’ conducted and consolidated by DOLE Bureau of Labor and Employment (DOLE-BLE).

In-demand Occupations

Based on the report, from the list of the identified KEGs, a total of 79 occupations were identified as in-demand occupations (see Table 4), highlighted in italics. They can also be found in the JobsFit 2022 LMI Report.

TABLE 4

LIST OF IN-DEMAND OCCUPATIONS, 2020–22.

Rank	Occupation	Rank	Occupation
1	Accountant	41	IT manager
2	Accounting personnel	42	Laborer
3	Administrative clerk	43	Laundry worker

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Rank	Occupation	Rank	Occupation
4	App and game developer	44	Lineman
5	Bagger	45	Loans and credit officer
6	Call center agent	46	Mason
7	Caregiver (home-based)	47	Medical and radiologic technologist
8	Carpenter	48	Medical doctor
9	Cashier	49	Medical researcher
10	Civil engineer	50	Medical writer
11	Collector	51	Mining engineer
12	College instructor	52	Network engineer
13	Computer service technician	53	Nurse
14	Construction worker	54	Online seller
15	Customer relations officer	55	Online teacher
16	Customer service representative	56	Pharmacist
17	Cyber security expert	57	Pipe fitter
18	Data development engineer	58	Porter
19	Data encoder	59	Production worker
20	Database manager	60	Programmer
21	Delivery personnel	61	Promodizer
22	Delivery riders	62	Psychologist
23	Digital marketer	63	Quality assurance personnel
24	Digital marketing officer	64	Sales associate
25	Direct sales agent	65	Salesman/saleslady
26	Drilling machine operator	66	Security guard
27	Driver	67	Senior project engineer
28	Electrician	68	Service crew
29	Enumerator	69	Skilled worker
30	Factory worker	70	Software developer
31	Farmer	71	Steelman
32	Financial advisor	72	System a

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Rank	Occupation	Rank	Occupation
33	Fisherman	73	Teacher
34	Food and beverage manager	74	Waiter/waitress
35	Freelancer	75	Website designer
36	Graphic designer	76	Website developer
37	Heavy equipment operator	77	Welder
38	Household attendant	78	Wellness trainer
39	Information technologist	79	Utility worker
40	IT consultant		

Source: DOLE Regional Offices and COVID-19 LMI Survey.

Green Occupations

As we transition to sustainable development, green jobs become more critical to meet the demands of the green economy in terms of skills, credentials, and knowledge. These green occupations are found in the manufacturing and construction sectors and in emerging green industries that concern energy efficiency, pollution control, environment preservation, and climate mitigation. In 2016, the Philippine Green Jobs Act of 2016 (RA 10771) was signed into law. This law provides a policy framework for fostering low-carbon, resilient, and sustainable growth and decent job creation by giving incentives to enterprises generating green jobs and focusing on developing human capital to enable and sustain the transition to a greener economy. Table 5 identifies the list of green careers based on the results of the COVID-19 LMI survey report.

TABLE 5

LIST OF GREEN OCCUPATIONS.

Rank	Occupation	Rank	Occupation
1	Compliance officer/manager	28	Logistics assistant
2	Compliance specialist	29	Maintenance technician
3	Construction worker	30	Marketing manager
4	Drilling machine operator	31	Mining engineer
5	Driver	32	Production engineer
6	Factory worker	33	Production operator
7	Financial advisor	34	Production supervisor
8	Forklift operator	35	Risk control specialist
9	Heavy equipment operator	36	Skilled worker
10	Industrial engineer	37	Steelman

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Rank	Occupation	Rank	Occupation
11	Inspection manager	38	Supply chain analyst
12	Inspector	39	Technician
13	Laborer	40	Warehouseman
14	Call center agents	41	Mason
15	Forestry/forester	42	Teacher
16	Sales personnel	43	Farm laborer
17	Farmer	44	Agriculturist
18	Carpenter	45	Administrative aide
19	Agribusiness	46	Welder
20	Agricultural technician	47	Recycling worker
21	Urban farmers	48	Motor vehicle emission control technician
22	Civil engineer	49	Agricultural workers
23	Environmental specialist	50	Garbage collector
24	Cultivation agriculturist	51	Aqua culture technician
25	PCO-pollution control	52	Solar technician
26	Solid waste management equipment operator	53	Urban gardener
27	Farm technician aide	54	Fisherman

Source: DOLE-BLE COVID-19 LMI Survey.

Freelance Occupations

In the Philippines, more Filipinos ventured into freelance work amidst the pandemic, and the freelance economy will continue to grow even higher. Freelance jobs are essential since there are tasks that outsourced service providers can efficiently do. These jobs are contract work, independent contract, consultancy, and contract-to-hire. Table 6 shows the freelance occupations highlighted by industry groups. The Philippine House Subcommittee on Labor Relations had proposed a measure that would seek to provide hazard pay and night shift differential to freelancers.

TABLE 6

LIST OF FREELANCE OCCUPATIONS IN THE PHILIPPINES, 2020–22.

Rank	Occupation	Rank	Occupation
1	IT specialist	21	Logistics assistant
2	Sales executive	22	IT developer
3	Customer service assistant	23	IT programmer

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Rank	Occupation	Rank	Occupation
4	Marketing staff	24	Data analyst
5	Accounting staff	25	Admin staff
6	Clearing specialist	26	Front desk staff
7	Office associates	27	Digital marketer
8	Driver	28	Insurance agent
9	Carpenter	29	Teacher
10	Mason	30	Farmer
11	Massage therapist	31	Tour guide
12	Manicurist	32	Gardener
13	Pedicurist	33	Sales representative
14	Online seller	34	Skilled worker
15	Construction worker	35	Dance instructor
16	Graphic designer	36	Private tutor/teacher
17	Caregiver	37	Encoder
18	Housekeeper	38	Gym instructor
19	Hairdresser	39	Welder
20	Laborer	40	Plumber

Source: DOLE-BLE COVID-19 LMI Survey.

Soft Skills or 21st Century Skills

Most employers look for viable traits and behaviors rather than skills and competencies. This is where soft skills or 21st-century skills play an essential role in establishing oneself at work or in other areas of life. They are holistic and classified as learning, literacy, or life skills. Below are the top soft skills that employers look for in a jobseeker:

- (1) team play;
- (2) social awareness;
- (3) problem sensitivity;
- (4) self-motivation;
- (5) planning and organizing;
- (6) decision making;

- (7) creative problem solving;
- (8) innovation;
- (9) English functional skill and comprehension; and
- (10) multitasking.

The world of work continues to evolve. The need for skills development also evolves to keep up with the demands of the labor market, given the challenges and opportunities presented by the COVID-19 crisis and FIRE. The following skills are dominant in the COVID-19 LMI Survey:

- (1) financial literacy (functional math);
- (2) digital literacy (word processing, and spreadsheet and electronic mail management skills);
- (3) occupational safety and health skills;
- (4) integrity (physical, mental, and reproductive health); and
- (5) stress tolerance.

Labor and Employment Initiative Programs

In recent years, there have been challenges and opportunities associated with the transition to Industry 4.0. These challenges escalated while the opportunities also grew with the sudden arrival of the COVID-19 pandemic. The pandemic also hurried the arrival of the ‘future of work’ embodied in the era of FIRE. As a general policy thrust about such challenges and opportunities, the Philippines is preparing its workforce, mainly the Filipino youth, through skills development, skills qualifications and alignment, up-to-date labor market information (LMI), and timely policy research and advocacy. DOLE’s mandate is to promote full employment, and its mission is to develop and protect human resources. Hence, DOLE is committed to some key relevant endeavors discussed ahead.

JobStart Philippines Program

DOLE believes in the value of partnership between the government and the private sector toward workforce skills development. The department collaborates with partner employers from the private sector to implement DOLE’s flagship youth skills development and employment facilitation initiative, i.e., the JobStart Philippines program. With a pilot test done in 2014–15 and institutionalized in 2016 through the Republic Act (RA) No. 10869, JobStart helps the youth to be more employable through a full-cycle employment facilitation framework that involves the following: life skills training (LST) with one-on-one career coaching; technical training; job matching; and referrals to partner employers either for further specialized training and internship or for decent employment. While face-to-face registration for the program was still allowed, online registration was implemented through the JobStart Digitization initiative in consideration of the restrictions enforced by the government due to COVID-19.

Special Program for the Employment of Students

This program provides poor but deserving Filipino youth the opportunity to augment their income to finish their education and gain on-the-job experience for increased employability and improved

practical skills on the job. Further improvement on the benefits of this program, the DOLE, through the BLE, is considering the inclusion of a specialized LST module as part of the orientation for Special Program for the Employment of Students (SPES) beneficiaries. Amidst the continuous enforcement of community quarantine in the country, SPES was implemented in areas under the General Community Quarantine (GCQ) and Modified General Community Quarantine (MGCQ) classifications. Should a site under GCQ or MGCQ relapse into Enhanced Community Quarantine (ECQ) or Modified Enhanced Community Quarantine (MECQ), the program's implementation would immediately be suspended and permitted to resume only once the GCQ or MGCQ status had been restored. Partner employers/establishments of the program were encouraged to adopt alternative work arrangements (e.g., work from home). Should SPES beneficiaries be required to report to work on sites physically, they could only fulfill desk works or related tasks that would not require them to travel or stay outside for an indefinite period. Likewise, SPES beneficiaries were assigned to work within their respective areas or barangays to reduce their exposure from unintended COVID-19 risks through interzonal or intrazonal travel.

Government Internship Program

DOLE's Government Internship Program (GIP) provides internship opportunities for high-school, technical–vocational, or college graduates aged 18–30 years who intend to pursue careers in the public sector, either at the local or national level. Like the SPES implementation during the ongoing pandemic, heads of partner agencies were also encouraged to allow alternative work arrangements for GIP beneficiaries. Likewise, should GIP beneficiaries be required to report physically to offices of partner agencies, tasks were limited to desk works as beneficiaries are discouraged from engaging in assignments that would expose them to the COVID-19 virus (e.g., contract tracing, cleaning/disinfection of quarantine facilities, and distribution of food packs in quarantine facilities).

Career Guidance Advocacy Program

DOLE's Career Guidance Advocacy Program (CGAP) aims to immerse parents and students in the realities of the labor market and convince career advocates to use career guidance as an effective tool in addressing the job–skill mismatch. To expand the program's reach in response to the demands of Industry 4.0 and the increased digitized communication during the pandemic, the department, through the BLE, is developing the Enhanced Career Guidance and Employment Coaching modules and the CGAP microsite where interested stakeholders can access self-taught modules. These include modules on life skills, LMI, basic productivity, and other information materials from relevant government agencies such as NWPC, DepEd, CHED, TESDA, DOST, and PRC. While the CGAP microsite is being developed, the Public Employment Service Offices (PESOs) all over the Philippines are currently conducting career fairs via video conferencing platforms such as Zoom.

Other DOLE Initiatives Related to Employment Facilitation and Improvement

Inter-agency Partnership on Skills Framework and Roadmap for Industry 4.0

DOLE is collaborating with TESDA, DTI, CHED, and DepED in developing a Skills Framework and Roadmap for Industry 4.0 to prepare workers for in-demand jobs in the future through lifelong learning. Toward this end, the DOLE and the said agencies inked a partnership with the Singaporean government, which has a robust policy on lifelong learning and development of skills for the future through its SkillsFuture Singapore program.

Working Closely with TESDA to Fully Implement NTESDP 2018–22

Consequently, DOLE is an active member of the Inter-agency Committee on the National Technical Education and Skills Development Plan (NTESDP) 2018–22, which incorporates strategies and

interventions to adapt the workforce to the demands of Industry 4.0. As such, the department is working closely with TESDA to fully implement the said plan, mainly through alignment of program priorities and budget planning. Among the salient strategies and interventions of the plan are: (1) creation of a conducive and enabling environment for the development and quality service delivery of the TVET sector; (2) ensuring that industries with economic and employment growth potentials are provided with the required quantity of quality workers; and (3) preparation of the Philippine workforce for the challenges posed by FIRE.

Enhancement of the Education-employment Linkage through PQF

DOLE, together with other concerned government agencies, has contributed to the enhancement of the education–employment linkage system in the country by proactively advocating for the institutionalization of the PQF, which culminated into a law with the Republic Act (RA) No. 10968 in 2018. Further, it contributed to the formulation of the PQF Law’s Implementing Rules and Regulations (IRR) released in 2019. The PQF is a “quality-assured national system for the development, recognition, and award of qualifications based on standards of knowledge, skills, and values acquired in different ways and methods by learners and workers.”

Policy Research and Advocacy

The Institute of Labor Studies (ILS), the research arm of DOLE, has spearheaded various social dialog events on FIRE and the changing world of work in terms of policy research and advocacy. Other DOLE agencies such as the National Wages and Productivity Commission (NWPC) also conduct dialogs and conferences on digital transformation and productivity of Filipino enterprises and workforce.

Updated LMI Report on Future Skills in the Light of COVID-19

The DOLE, through the BLE, released the ‘JobsFit 2022 LMI Report’ in 2018, which identified various industries that were projected to create jobs, as well as the corresponding skills needed in the Philippines by 2022. However, after the coronavirus crisis hurried the arrival of the ‘future of work,’ the said LMI Report had to be updated. In November 2020, DOLE–BLE published the ‘JobsFit COVID-19 LMI Report’ to tackle how the COVID-19 pandemic was reshaping the Philippine labor market and what consequent changes were in the future skills needs.

Leveraging Productivity Mechanisms Effectively and Efficiently Through Productivity Trainings

Government and social stakeholders are jointly responsible for achieving the objective of increasing income-earning capacity. As the government restricts local travel, prohibits mass gatherings, imposes social distancing and other workplace health protocols, and prescribes remote work arrangements, the spread of the COVID-19 pandemic challenges organizations to rethink their approach to conducting trainings, seminars, and orientations. The government’s sustained provision of technical assistance may enable the achievement of one of these objectives. The National Wages and Productivity Commission (NWPC), an agency attached with the DOLE, provides training and technical assistance to MSMEs on productivity improvement and incentives through its Productivity Toolbox programs, and, which highlights the various NWPC productivity training programs and technical assistances. These initiatives are geared toward enhancing the capacity and motivation of businesses to implement productivity technologies for the continuous growth and development of the enterprise and its workers. The Productivity Toolbox employs a “ladderized approach” to learning and application, in which the training programs provided depend on the enterprise’s ability to implement technologies and make system enhancements.

- **Basic training:** This training is on basic productivity, values, working environment, and business system training. Productivity 101; ISTIV Values; 7S of Good Housekeeping; and ISTIV Bayanihan are the training programs.
- **Intermediate training:** This training applies productivity innovations to company improvement needs. ISTIV Succeeding in Business; Green My Enterprise; Service Quality; Retail Merchandising; Lean Management; and Social Media Marketing are the training programs.
- **Advanced training:** Businesses must be imaginative and involved to become productivity champions. The program encompasses all firm activities and supply chain. Training packages include gainsharing (GS) to inspire entrepreneurs to take productivity-based GS initiatives; Service Quality for Tourism Value Chain; Green My Enterprise for Hotel Industry; and Incentivizing Performance.

Given that one of the NWPC's dual mandates is to promote productivity improvement, its primary responsibility is to assist enterprises, especially MSMEs, in recovering and continuously enhancing enterprises' and workers' productivity in response to the new normal.

The NWPC condenses its training modules into a webinar format for use by its regional counterparts, the RTWPBs, when conducting productivity training for MSMEs. And during the pandemic, new productivity programs were implemented to improve worker skills and assist enterprises to recover from interruptions. Examples include Work Life Balance Leading to Productivity; Business Continuity and Resiliency Planning: Driving Productivity in the Better Normal; Work Ethics of a Productive Worker; and Productive Career Choice.

Strategic Policy Direction for Cultivating New Talent for Future

Strategic Policy Directions on Changing Labor Market Demands

Based on the updated PDP 2017–22 report's Chapter 10, "Transforming Human Capital Development towards Greater Agility Socioeconomic Report 2021," reviving labor market recovery is contingent on the dual disruption of the current global health crisis improving access to digital technology. Before COVID-19, the work landscape changed rapidly with the rise of FIRE or Industry 4.0. However, the pandemic has brought about unforeseen challenges, moving enterprises to new working arrangements to protect workers from COVID-19. The intensified adoption of remote and flexible work arrangements, technologies, and innovation plays a vital role in redesigning and transforming individuals' work and workplace environments. The challenge is to retool and upskill the current workforce and develop the future workforce so as to adapt and thrive amidst the changing labor market demands. There is a need to ensure that the alternative work arrangements will not reduce the well-being of Filipino workers or expose them to any forms of occupational and health hazards. Through the updated PDP 2017–22, the Philippine government aims to accelerate human capital development, focusing on the strategic framework guiding its goal, which are to:

- (1) improve the nutrition and health outcomes for all;
- (2) enhance the income earning ability and adaptability of Filipinos; and
- (3) ensure a flexible lifelong learning opportunity for all Filipinos.

TABLE 7

STRATEGIC FRAMEWORK TO TRANSFORM HUMAN CAPITAL DEVELOPMENT TOWARD GREATER AGILITY.

Goal		
Human capital development toward greater agility		
Sectoral outcomes		
Improved nutrition and health outcomes for all	Enhanced income-earning ability and adaptability	Flexible lifelong learning opportunities for all ensure
Subsectoral outcomes		
<ol style="list-style-type: none"> 1. Guaranteed care at all life stages 2. Ensuring a responsive and resilient health system 3. Sustained equitable health financing 4. Cross-cutting strategies: <ul style="list-style-type: none"> • Institute a fully integrated and interoperable health information system and database. • Strengthen health research and development, and evidence-based decision making. • Elicit multi-sector, multi-stakeholder support for nutrition and health. • Ensure transparency, accountability, and regulatory measures in nutrition and health sector. • Strengthen leadership, management, capabilities, coordination, and support mechanism. 	<ol style="list-style-type: none"> 1. Improved employability. 2. Improved productivity. 3. Enhanced labor mobility and income security. 	<ol style="list-style-type: none"> 4. Achieving quality, accessible, relevant, and liberating basic education for all 5. Improving quality of higher and technical education and research for equity and global competitiveness. 6. Cross-cutting strategies: <ul style="list-style-type: none"> • Develop future-ready adult learning interventions. • Modernize learning and teaching materials and methods. • Promote graduate scholarships and teacher training programs. • Maximize government–academia–industry collaborations and international partnerships to ensure alignment of competencies and labor requirements. • Formulate guidelines on internationalization of education. • Develop an action plan to operationalize the Philippine Qualifications Framework. • Develop an accessible sporting culture.

Source: Updated Philippine Development Plan 2017 to 2022, National Economic Development Authority.

Amidst the anticipations on the Philippines’ recovery from the pandemic and automation and digitalization, in Table 7, the government identifies the effective strategies for the labor sector, based on the updated PDP 2017–22. Its focus is on the sectoral outcome by, “increasing income-earning ability and enhancing the adaptability of workers to the changing demands of the labor market. In Table 8, the National Economic Development Authority (NEDA) indicates the updated indicators and revised targets and result matrices for increasing the income-earning ability and enhancing the adaptability of the Filipino workforce [13].

According to NEDA’s Updated PDP 2017–22, 2020 targets were set prior to the onset of the COVID-19 pandemic and retained in the mid-term update. The 2021, 2022, and end-of-plan targets were adjusted to take into consideration the effects of the pandemic.

TABLE 8

UPDATED PLAN TARGETS AND RESULT MATRIX TO INCREASE INCOME-EARNING ADAPTABILITY OF FILIPINOS.

Indicator	Baseline (year)	Target				Actual		
		2020	2021	2022	End of plan	2019	2020	2021
Sectoral outcome: Income-earning ability increased and adaptability enhanced								
Decrease in percentage of youth not in education, employment, or training (NEET) (cumulative)	23.0 (2015)	17.5–19.5	18.0–20.0	17.0–19.0	17.0–19.0	18.7	18.7	16.8 (January to October)
Subsectoral outcome 1: Employability improved								
Reduced duration of school-to-work transition of college graduates (in years)	2 (2008)	None	N/A	0.75–1.0	0.75–1.0	N/A	N/A	N/A
Reduced duration of school-to-work transition of high school graduates (in years)	4(2008)	None	N/A	0.75–1.0	0.75–1.0	N/A	N/A	N/A
Decreased duration of school-to-work transition of TESDA graduates (in months)	3.0 (2015)	3.5	3.5	3.25	3.25	3.42	3.35	N/A
Decreased percentage of discouraged workers (%)	12.50 (2014)	11.0	11.5	11.0	11.0	12.4	3.9	4.7 (January to October)
Reduced unemployment rate of college graduates	7.3 (2016)	7.2–7.5	10.0	8.0	8.0	6.7	12.4	9.6 (January to October)
Increased employment rate of TVET graduates	66.2 (2016)	72	68.9	69.4	69.39	84.2	70.5	N/A
Increased percentage of females with advanced degrees employed (% cumulative)	79.4(2018)	80.0	81.0	82.0	82.0	78.7	75.7	65.5 (January to October)
Increased labor force participation rate of women (%)	50.1 (2015)	50.5	48.5–50.0	48.5–50.5	48.5–50.5	47.6	45.8	50.9 (January to October)
Subsectoral outcome 2: Productivity improved								
Increased labor productivity in industry sector (% growth)	2.1 (2015)	3.0–4.0	2.5–3.6	4.40–4.65	4.40 – 4.65	2.0	–2.3	–5.1 (January to September)
Increased labor productivity in service sector (% growth)	2.7 (2015)	4.0–5.0	(1.02–0.13)	5.35–5.61	5.35–5.61	1.6	–0.7	–6.7 (January to September)
Subsectoral outcome 3: Enhanced labor mobility and income security								
Share of employees in precarious work among the total employed	18.9 (2016)	18.1	18.0	17.9	17.9	22.2	23.8	26.0 (January to October)
Share of waged and salaried workers in precarious work among the total waged and salaried workers (in %)	30.7 (2016)	28.5	28.4	28.3	28.3	26.3	27.4	29.6 (January to October)

Source: Updated PDP 2017–2022, National Economic Development Authority.

Identified strategies will improve the ability of Filipino individuals to operate and thrive in the digital environment. The strategic direction is toward expanding and strengthening the upskilling and retooling programs and employment facilitation services provided to workers and individuals, mainly by using digital technologies. The strategies identified are expected to improve individuals' access to employment opportunities and ensure their employability and productivity [13]. This translates into increased income-earning ability and enhanced adaptability of workers. The strategies for accelerating human capital development are divided into three categories:

(1) Improving employability

- Further advance skills development and retooling of workers through continuing education, training, and digital learning.
- Boost and expand employment facilitation services.
- Strengthen and expand internship, apprenticeship, and dual training programs, making them more anticipatory and geared toward future skills.
- Ensure flexible work arrangements and allow members of the workforce to balance their household and work duties.

(2) Improving productivity

- Enhance the delivery of capacity-building programs in productivity-based incentive schemes and business continuity plans.
- Ensure safety and health of workers amidst increased adoption of flexible working arrangements.
- Nurture workplace harmony.

(3) Enhancing labor mobility and income security

- Enhance income support and emergency employment.

Policies and programs related to these strategies should be evaluated and assessed to be further enhance and strengthen to achieve the full potential of Filipinos and transform the Philippines human capital for a healthy and resilient economy.

Developing New Talents and Skills for the Future Filipino Workforce

Over the years, there have been significant improvements in the employment situation of the Philippines. The concurrent efforts to address the prevailing jobs–skills mismatch underlying the country's unemployment and underemployment problems have been making progress with DOLE and other agencies implementing various employment programs and projects. Timely, relevant, and accurate labor market information (LMI) is needed to inform the Filipino students, workers, and employers. The JobsFit LMI report is a documentation report enumerating the industries that will create jobs and skills needed for the future. JobsFit LMI is also used in developing industry career guides (ICG) and career information pamphlets (CIP) that serve as

tools in helping students and job seekers make more informed education, training, and career choices [28].

DOLE–BLE identifies the following inputs and information limited to the JobsFit Labor Reports, highlighting the in-demand and hard-to-fill occupations of the key industries projected to be the primary sources of employment in the Philippines, on the strategic policy directives for cultivating new talents of the future:

Sectors Influenced by Technology Change and Advancement

A part of the JobsFit LMI Report is on emerging jobs that are relatively new to in-demand and hard-to-fill occupations and did not exist in the labor market before. These specified jobs refer to professions that resulted from technological advancements and innovations in the world of work. It can be observed in the report that the majority of the occupations belong to the IT–BPM sector. According to the Business Process Association of the Philippines (BPAP), more than 10 years ago, the Philippines were leading the IT–BPM industry, which has transformed into an omnichannel delivery model and continues to provide the niche in business process services to various industries. As stated on the BPAP website, the industry generates 1.23 million direct jobs and 4.08 million indirect jobs nationwide, contributing to the local economy with an estimated USD24.7 billion in revenue [29]. The emerging jobs identified are [30]: business process analyst; design engineer; evisceration processor; mobile app developer; search engine optimization analyst; data scientist; electronic mail and chat support agent; genomicist; nanotechnologist; and social media analyst.

With these identified emerging jobs belonging to the IT–BPM sector, the industry will shift to high-value services by attracting highly skilled talents and developing a globally competitive Filipino workforce to create an ecosystem that promotes lifelong learning.

Special Technical Skills Required

The COVID-19 pandemic, the growing role of Industry 4.0 and technology, the increasing number of green jobs brought about by climate change, the shift in demographics, urbanization, and the globalization of value chains are changing the world of work and skills demanded by the industries. To thrive in the 21st-century labor market, an individual needs comprehensive skills to contribute to structural transformation and economic growth by improving one’s employability and labor productivity. Investment in a high-skilled workforce can create a successful cycle, wherein relevant and quality skills of workers will enable an increase in productivity growth and foreign direct investment. A greater number of high skilled workers will result in more and better jobs for the workforce and increase public and private investment in the education and training system. It will also increase the potential for employability and productivity for both the current and future workforces.

The pandemic shifted the trend from softs skills to digital and technical skills. This shift in direction is due to the change in labor demand and work arrangements caused by lockdowns and prolonged quarantine restrictions. According to the World Bank, technical skills are the knowledge, expertise, and interactions needed to perform a specific task, including the mastery of required materials, tools, or technologies. Digital skills cut across sectors and draw on all of the above skills and illustrate the capability to access, manage, understand, integrate, communicate, evaluate, and develop information safely and appropriately [31]. The World Bank identifies the digital and technical skills as Microsoft Office applications; analysis; computer literacy; design; programming; typing skills; customer service; encoding data and documents; data analysis; and sales.

A combination of policies is required to allow workers to keep their skills up to date, help them shift between jobs, and assure that employers have a skilled, highly productive, and innovative workforce.

Core Employability Skills that are Valuable Across Sectors and Occupations

In the International Monetary Fund (IMF) report, ‘The Jobs of Tomorrow,’ Zahidi [32] said that some jobs would disappear and others would eventually emerge as the world is experiencing dual disruptions in the form of COVID-19 and Industry 4.0. The workforce is automating faster than expected, displacing millions of jobs in the next five years. Automation, digitalization, and global health disruption have created a double disruption scenario for workers [32]. The WEF Future of Jobs Report 2020 maps out the jobs and skills of the future, tracking the pace of change based on inputs from business leaders and human resource experts from all over the world. The report aims to describe the effect of pandemic-related disruptions identified in the more comprehensive context of longer-term technology trends and the expected outlook for technology adoption, jobs, and skills in the next five years [33].

In the JobsFit LMI Report, DOLE–BLE mention the skills that employers demand in five years. The findings from the DOLE–BLE COVID-19 LMI survey were considered complementary to the WEF report on the 2020 Future of Jobs. According to the data from the WEF Future of Jobs Survey, formal upskilling appears to be closely focused on technology usage and design skills. In contrast, emotional intelligence skills are less frequently targeted in that formal reskilling provision. According to the Future of Jobs survey conducted by the World Economic Forum, the top 15 skills are [34]:

- (1) analytical thinking and innovation;
- (2) active learning and learning strategies;
- (3) complex problem-solving;
- (4) critical thinking and analysis;
- (5) creativity, originality, and initiative;
- (6) leadership and social influence;
- (7) technology use, monitoring, and control;
- (8) technology design and programming;
- (9) resilience, stress tolerance, and flexibility;
- (10) reasoning, problem-solving, and ideation;
- (11) emotional intelligence;
- (12) troubleshooting and user experience;
- (13) service orientation;
- (14) systems analysis and evaluation; and
- (15) persuasion and negation.

Since its 2016 edition, the WEF report has tracked the cross-functional skills that are increasing in demand and emphasizes learner reskilling and upskilling efforts on personal development and self-management skills within the context of the pandemic. The employer group sees these top 15 skills as rising prominence in the lead up to 2025.

On a final note, for the Philippines a few years ago, the most significant catalyst for workplace change advanced in the form of digitalization or digital transformation. Many Filipino workers were alarmed that jobs would be replaced by artificial intelligence, automation, or robots; and unemployed workers would increase. Those changes caused by digitalization have not gone away. Still, the COVID-19 pandemic has taken the future of work on a new path, in a direction that is virtual and remote rather than physical and centralized, a direction where an eight-to-five job and a five-day workweek is suddenly hard to imagine. Even before the pandemic, it would have been naive to think that technology would continue to motivate changes in our daily lives and our workplaces. The question always is, how we respond to the changes brought about by disruptions.

Industry 4.0 and the unexpected global health crisis have brought the pre-crisis vision of equitable, relevant, and quality skills development into more sharp relief, adding unanticipated urgency to calls for reforms, specifically in the labor policies and combining technology and innovation. Developing and enhancing skills (new skills, reskilling, and retooling) can contribute to structural transformation and economic growth by improving employability and labor productivity and becoming more competitive. Investments in learners and workforces can create a virtuous process, wherein relevant and quality skills boost productivity growth and foreign direct investment. This may result in more and better jobs, job offers for the incoming and current workforce of the country, and more public and private investment in the education and training system.

These challenges require government and business leaders to handle uncertainty, emotions, individuality, and vulnerability; and engage. We are already hearing about those who have risen to the challenge and their decisions concerning their workforce. How businesses and leaders behave during this challenging time will measure their future success; people do not forget how organizations and people behave in the most difficult times.

All workers need essential skills in this pandemic-stricken environment, i.e., learning and re-learning. With establishment closing down, individuals losing their jobs, and organizations and enterprises redesigning their business models, we will all need to adapt to these changes, either by learning new skills, new technologies, new ways of working, or even making a shift to new jobs and careers. A new future is here in the ‘new normal,’ and perhaps a ‘better normal’ lies ahead. Whatever our circumstances, our working lives are changing, and we need to adapt. So, an ‘always on’ approach to learning will equip us for the future ahead, no matter what it has in store.

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CONCLUSION:

PROSPECTS OF LABOR MARKET POLICIES AND RECOMMENDATIONS

Lessons from Member Countries

The impact of technological changes on work is real. Although it will take a long time to replace labor, in the long run, job opportunities in all walks of life will be greatly affected, including many white-collar careers, such as lawyers, accountants, and programmers, which were once seen as guaranteed routes to at least a middle-class living. These shifts in demand indicate that some skills are either obsolete or need to be restructured. At the same time, we can also observe that the demand for soft skills, such as good English proficiency, analytical skills, people skills, communication skills, digital skills, and resilience, is rising across member countries. Governments in these countries are preparing their citizens for this demand shift, either actively (by equipping them with the capabilities demanded by the market), or passively (by maintaining their livelihoods with safety nets). After reviewing the labor market policies, including surveys or in-depth interviews with stakeholders, or secondary statistical data from member countries, experts have indicated that skill levels have been improved through educational or vocational training systems over the past decade. However, with the growth of the market, either international or domestic, employers in all member countries have more or less noted insufficiency of skills when recruiting workers. Industrial Revolution 4.0 (IR4) is mentioned by almost all the experts as a catalyst for shifts in skill demands in their countries. Lessons from member countries (in alphabetical order) are discussed in this chapter.

Cambodia

Aiming at improving the quality of labor forces, the Cambodian government has put in more efforts, especially in its current mandate, to improve the education and skill levels of labor forces by setting out several national and sectoral policies. From the demand side too, there has been a structural shift in demand from agriculture to manufacturing and services. It was the case even during the pandemic period of 2020–21. For instance, in the current labor market, employment has shifted from less productive to more productive sectors and to better-skilled and higher-paid occupations. Given that, technical and vocational education and training (TVET) needs a strong and modern system to supply labor forces as demanded by the market.

Currently, the TVET system in Cambodia is under the management of the Directorate General of TVET (DGTVET) with supervision and direction from the National Training Board (NTB). The number of TVET graduates, especially in priority fields like electronics, electricals, mechanics, IT, and business, have increased in recent years. To create an enabling environment, the DGTVET, under the Ministry of Labour and Vocational Training, launched a distance learning program and an e-learning platform to assist learning and teaching during and after the pandemic. These initiatives are expected to contribute toward increasing both the quantity and quality of TVET graduates.

Review of National Labor Training and Reskilling Strategies

The Cambodian government has set out several policies to improve the quality of education in Cambodia. There is also a clear vision and commitment to improving the quality of the labor force. Also, the labor forces with upper-secondary and post-secondary education have seen improvement over time. However, there is still a gap to fill as the majority of the country's labor force still have a low education level (most of them have only primary school education or below), and the government continues to improve the education level of the labor force. Human resource development is one of the priority fields in the Rectangular Strategy Phase IV while the Ministry of Education Youth and Sports is working to improve the quality of education by focusing on (1) improving teachers' qualifications with concrete incentives; (2) expanding the scope of schools by investing in building schools at the village level; (3) strengthening comprehensive inspections to ensure the quality of education; (4) promoting technical education in upper secondary schools; (5) providing skills education for the job market; and (6) developing comprehensive curricula and textbooks.

TVET is an important element of education in Cambodia. The Royal Government of Cambodia (RGC) has made education and training a priority, especially in the current mandate, by focusing on human resource development, including the improvement of the TVET system. This is to meet the demands of the labor market in order to contribute to poverty alleviation and improvement of livelihoods of Cambodia's people as well as to sustain economic development. The findings are summarized below.

Skill Shortages and Skill Gaps

Educational attainment has been improving over time across all levels in Cambodia. In spite of the achievement, training quality still presents a challenge, given that technical skills are not yet fully responsive to the current and future demands of the labor market. Based on Cambodian employers' perceptions, skill shortages and skill gaps remain. The hard-to-fill vacancies can be due to the quality or number of vacancies, or both, while skill shortages can be due to lack of skills, qualifications, and experience. This reflects that Cambodia needs to reskill or upskill its current labor force and produce a more skilled labor force for the labor market.

Increased Prominence of Soft Skills

Soft skills are regularly regarded as the main concern by the Cambodian employers. It is a key demand of the current labor market. In the current workforce, both general-education and TVET graduates are lacking these skills. There was not much improvement in 2021, with most of the employers in both ICT and non-ICT firms claiming that communication, language, digital, leadership, and management skills were among the top skill shortages among their current labor forces.

Reoriented Focus on Competency-based Learning

The skills gap is expected to reduce due to high commitments from the Cambodian government. The NTB has approved competency-based learning materials for soft skills and numeracy skills from CQF levels 1 to 4 to be applied to all training institutions nationwide. These materials have already been uploaded to the e-learning platform of DGTVET for all schools to access and apply. The six modules in each CQF level aim at addressing the skill problems facing the labor market such as communication, problem-solving, leadership and management, teamwork, and numeracy.

Labor Market Transition Opportunities

The Industrial Revolution 4.0 (IR4) is a catalyst and driver for the growth of small- and medium-sized enterprises that are the mainstay for job creation and income generation in Cambodia.

Cambodia faces relatively more challenges in adopting new technologies compared with the more advanced countries due to its businesses and human resources having relatively limited capacity. The capacity of the country to use new technology is limited. The level of ICT infrastructure as well as the percentage of its population that can access the internet is relatively low. The adjusted years of schooling for Cambodia were only 6.8 while neighboring countries like Vietnam and Thailand had 12.7 and 15.0, respectively, in 2020. What is more, the majority of its labor force are not in high-skill employments.

Opportunities

The opportunity for Cambodia lies in catching up with more advanced countries in the region during and after the COVID-19 crisis. In the last two years, Cambodia has increased the use of mobile apps for e-commerce and e-learning. Also, this crisis provided opportunities for Cambodia's businesses in agro-tech, mobile, and fintech to learn and adopt new skills and technologies. There is also a positive development trend for distance learning in Cambodia that has allowed students and teachers to use new technologies during and after COVID-19. It is also an opportunity for trainers to use digital technology platforms to produce online training content in order to share with students and teach them. This new TVET training enabling environment provides a wider opportunity for skills development, including upskilling and reskilling of Cambodian workforces.

Employment Transition

The employment share of agriculture has gradually decreased from 57.4% in 2004 to only 35.5% in 2019 while the employment shares of both service and industrial sectors have increased. The agricultural sector, however, was an important source of employment in Cambodia during the years 2020 and 2021 because this sector is understood to have absorbed employees who temporarily lost their jobs in the service and industrial sector in the wake of the COVID-19 pandemic. For the industrial sector, the share of employment had rapidly increased between 2014 and 2019, likely due to the speed of economic and industrial transformation in the country.

Status of Employment

The employment status of workers in Cambodia has gradually changed from own-account workers, self-employed, and unpaid family workers to that of paid employees. In 2009, paid employment accounted for only around 27% of the labor force while vulnerable employments accounted for around 73%. Based on the available data before COVID-19, in 2017, the share of paid employments had gone up to 51% while that of vulnerable employments had come down to 49%.

Occupational Transition

In terms of skills demand, the trend has changed in Cambodia. While growth in employment took place in the industrial and services sectors, there was a declining trend in the agricultural sector. This reflects that the current labor market is gradually demanding more medium- and high-skilled workers. Occupations such as plant-and-machine operators and assemblers, and clerical support workers grew more than double while occupations in skilled agriculture, forestry, and fishery decreased by around 25% during the same period. This shifting trend may reflect that more formal technical vocational training is required to equip those who move from one occupation to another, especially to occupations that require high skills.

Sectoral Transition

The structural shift in employment away from agriculture, along with the internal rural-to-urban migration trend, has resulted in services and manufacturing sectors absorbing many low-skilled

workers. Two main subsectors in which employment has significantly increased are garments and construction. Employment shares of other emerging manufacturing subsectors have also increased, thanks to the government's efforts to set various policies to diversify its industries and export both products and destinations. With the three recently signed free trade agreements (FTAs), namely, Regional Comprehensive Economic Partnership (RCEP), Cambodia–China FTA, and Cambodia–Korea FTA, employments in new emerging sectors, especially in non-garment manufacturing, digital, and ICT, are expected to increase. This means that TVET needs to play a more effective role in building medium-skilled and skilled labor forces for responding to the demands of the labor market. Some labor forces that may shift away from agriculture and are unable to find jobs in other sectors may end up in either formal or informal employment in industry and services sectors such as trade, and hotel and restaurant.

Strategic Policy Directions for Cultivating New Talent for Future

National TVET Policy 2017–25

In line with the aforementioned policies, the National Technical Vocational Education and Training Policy (TVET) 2017–25 set out the framework to develop a strategy in TVET for labor forces with better response to the demands of current and future labor markets. This policy also contributes to industrial diversification and creation of decent jobs while ensuring high quality and productivity of labor forces to better compete with other competitive countries in the regions and beyond. The National TVET policy lays out four goals that include: (1) improving the quality of TVET to meet national and international standards; (2) increasing access to TVET for job creation; (3) promoting public–private partnership and engaging with relevant stakeholders for a sustainable TVET system; and (4) improving the governance of TVET.

TVET Strategic Action Plan 2019–23

Building upon the above-mentioned national policies, and the achievements of the previous TVET strategic plan 2014–18, DGTvet under the MLVT set up the TVET Strategic Action Plan 2019–23, aimed at addressing the labor market demands by setting out five main goals. Last, but not least, in 2020, the government adopted the Cambodia Digital Economy and Society Policy Framework 2021–35. These were aimed at building a vibrant digital economy and society by laying the foundations to promote digital adoption and transformation among all social actors including the state, citizens, and businesses, to accelerate new economic growth and promote social welfare in the new normal. One of the policy directions is to “build digital citizens” by focusing on promoting digital skills training and providing guidance on digital skills and careers (by leaders) to catch up with the development of digital technology usage in current and future labor markets.

Fiji

The challenges of the Fiji labor market of the twenty-first century are rooted in the legacy of the colonial economic structure and human resource development. International economic demands have impacted Fiji's economy to expose its skill shortages and mismatches, especially among the youth; and have led to an enlarged informal sector. Skill mismatches include soft skills at workplaces. A critical response to human resource development, led by efforts to expand and extend TVET education, appears to be the only strategic way forward to ensure economic growth and productivity. While labor migration to Australia and New Zealand contributes to addressing increasing unemployment, it appears insufficient to ensure economic development (the increasing volume of remittance notwithstanding). Investments in technologies for green jobs will have impact on the labor market with demands for new skills. A recent assessment of ‘green

employment in Fiji’ provides indications for employment creation in different sectors of the economy. This is underscored by demonstrable efforts by industry employers from all sectors to introduce climate friendly and energy-saving technologies. The enduring question will continue to be the availability of requisite skills and training from educational institutions to meet the new labor market demands.

Fiji’s economy remains susceptible to adverse outcomes determined by multiple factors. These include its geography and environment, international commodity prices, changes/crisis in advanced economies, and international trade agreements and internal issue of indigenous land ownership with implications for land use. A post-independence diversification of the economy, especially with tourism and manufacturing, has broadened the country’s economic base. It is nevertheless impacted by perennially unmet labor demands due to skill shortages and mismatches between education and industry needs, along with limited productivity. Agriculture remains significant in the country’s economy and society, and its share of total national employment is over 40%. More recently, the exports sector has expanded to include fish, garments, and niche products.

Of relevance to Fiji’s development strategies, with implications for a fragile labor market, are (1) the existential threat of climate change and the required skills to complement and sustain new adaptation/mitigation-related technologies for the economy; (2) the deficit of skills partly due to an enduring migration and demonstrable skill mismatch between the education and the industry; and (3) the ‘youth bulge’ with limited skills. The policy challenge for economic growth and development is skilling/reskilling, especially of youth, to complement a changing labor market with demands and skills generated by new technologies and opportunities for innovation and entrepreneurship.

Review of National Labor Training and Reskilling Strategies

Efforts to reset TVET education were revitalized with a government policy paper on ‘Technical, Vocational, Enterprise Education and Training’ in 2007. This was meant to provide standards for the many TVET providers and a clear, manageable, and quality-assured structure for the effective delivery of TVET programs through schools, private institutions, non-formal training providers, relevant ministries, and tertiary institutions. The renewed strategy required the many TVET providers to administer programs that met established criteria. These were:

- meeting national standards of accreditation;
- allowing learners to achieve optimal holistic education and training outcomes;
- addressing community needs, resource utilization, labor market, and business needs;
- promoting lifelong learning; and addressing issues such as those pertaining to equity, inclusion, access, gender, and people with disabilities.

The critical challenge for TVET education at this stage included an effective coordinating authority for policy, planning, management, implementation, assessment, and supervision. This underpinned the establishment of the Fiji High Education Commission (FHEC) with a mandate to provide quality assurance in the post-secondary school education training sector, including TVET delivery, and to develop the Fiji Qualification Framework (FQF). To promote a new attitude, a name change was introduced in 2013, and TVET became Technology Employment Skills Training (TEST). Other strategies included the mainstreaming of TVET subjects within the secondary school

curriculum to enhance their availability and reduce the stigma attached to them. The establishment of the Fiji National University in 2009, described as entailing ‘the most significant TVET reform in Fiji’ was a demonstrable government objective to enhance the stature and visibility of TVET education. With its five colleges and as a dual sector with over 30,000 students, it provided a pathway from TVET to higher degree programs with university accreditation.

Critical support from development partners, especially Australia, has contributed to enabling an effective TVET training in Fiji (and the regional South Pacific). The National Employment Policy, 2018 endorsed the revitalization of TVET education with a suggestion for more effective alignment between education and training providers and employers. The policy also recognized the need for skill training to take advantage of the new technologies that will drive climate-change-induced green economy and green jobs as the country seeks to enhance sustainable development through its key sectors.

Labor Market Transition Opportunities

Tourism has emerged over the past two decades to become the dominant sector and the economic lifeline of Fiji, thanks to the determined, enterprising, and proactive attitude of the industry stakeholders as they engage with the government to explore relevant concessions in the face of multiple challenges. Interviews with hotels’ managements show there is a keen interest in digitizing relevant aspects of the sector, especially in areas of accommodation and human resources to enhance efficiency, though aspects of traditional booking systems still exist. COVID-19-related effects were primarily in readjustment of employments and jobs for many. The recent easing of COVID-19 restrictions on travel, together with a regime of preventive strategies, has seen a bouncing back of the industry.

Other areas of industry-related investments include the revamping of the international airport and acquisitions of additional and new aircrafts. Recent investments in fuel-efficient fleets were aimed at expanding the fleet size and enhancing passenger/visitor numbers by around 27% or 1.7 million, over a five-year period. This appears to have been successful with positive implications for the labor market. The accommodation sector has been resilient in the face of significant reductions in passenger bookings but with the optimism of a bounce back. In response to the challenges of climate change, hotels and resorts with high energy costs are adopting climate friendly strategies with measures such as installation of solar panels and recycling. The domino effect of tourism provides a combination of direct and indirect employment to over 140,000 people with added contribution to, and higher share of GDP. These also include employment creation in rural and outer-island areas where resorts linked with villages provide employment and livelihood for locals.

The manufacturing industry has also remained resilient and retained workers. Significantly, and in response to climate-change challenges, there is evidence of a restructuring of the industry accompanied by reskilling of workers and decent jobs. The three manufacturing facilities that were visited had all taken to new technologies accompanied by retraining. A resurgence in the garments industry has also contributed to the provision of employment.

Strategic Policy Directions for Cultivating New Talent for Future

Through its dialogs and consultations, the National Employment Policy (NEP) has provided 10 policy areas, which, as noted, ‘will change as new variables intervene in the labor market.’ Thus, the NEP will be reviewed on a periodic basis to ensure its relevance and applicability to address Fiji’s real labor market needs. The 10 policy priorities are to:

- create more opportunities for the young people aged 15–24 years to follow clear pathways from education to productive employment;
- promote private investments to create jobs;
- boost action on a just transition of the workforce as well as creation of decent work and quality jobs in the context of climate change by identifying and promoting green jobs and new green skillsets;
- promote self-employment in the formal economy;
- promote access to overseas employment opportunities;
- create more income-generating opportunities for those reliant on subsistence activities for their livelihood;
- promote greater gender equality in employment and working conditions;
- make it easier for disabled persons and the elderly to earn;
- eliminate child labor and social injustice in workplaces; and
- strengthen good-faith employment relations and promote safe and productivity driven workplaces.

India

India is currently facing a shortage of technological skills in spite of being favored with a demographic dividend. This is primarily because the institutions responsible for skilling the population seem to be inefficient in catering to skill-related demands of the industry. Second, a sizeable percentage of India's working population is engaged in the economy as a casual or informal labor force, which mainly remains outside the ambit of the formal education-and-training system. Third, majority of the policies deployed are more focused on imparting basic formal education instead of focusing on the skill development of the present and future labor forces.

India's problem is more of a quantitative rather than qualitative skill gap between what is needed and what is available. Thus, it is imperative that requisite and adequate skilling of the labor force should be done at a faster rate than the current rate of economic growth, providing equal and sustainable opportunities of livelihoods to all sections of the society in an era of technological revolution. Also, changing technologies and shifting globalization patterns are bringing manufacturing-led development strategies into question. Technologies such as internet of things (IoT), advanced robotics and three-dimensional (3D) printing are causing production facilities to be shifted to economically attractive locations, thereby threatening significant disruptions in employment, particularly for low-skilled workers.

Review of National Labor Training and Reskilling Strategies

India's most pressing labor market challenge going forward will be to generate a large number of good jobs. These jobs tend to be formal-sector jobs. Two obstacles to job creation in the formal

sector are regulation-induced taxes on formal workers and spatial mismatch between workers and jobs. Encouragingly, to deal with these obstacles, firms and workers are finding solutions that are even more varied than the obstacles themselves, as we have described in this chapter. Meeting the challenges ahead will require more of such ingenuity, and the private sector, state governments, and the central government will all have important roles to play.

Measures to shore up labor demand were essential in the early phases of this crisis and the speed of their application demonstrated their use in fighting immediate and acute demand shocks. As the recovery proceeds, training programs that are responsive to business needs are essential so that displaced workers can be easily reintegrated into the labor market. Particular attention should be given to more vulnerable workers, such as the young and low skilled, so that programs can address specific needs and provide opportunities that enable an inclusive and widely shared recovery.

Governments have provided rapid and substantial responses to this crisis thus far with far reaching policy changes to cope up with the significant challenges to their labor markets. As support to jobs via job retention schemes is gradually wound down and more permanent structural demand shifts become evident, the challenge will be to ensure that the policies they have currently implemented are sufficient. This encompasses both the coverage of the individuals they reach and the extent to which investment in reskilling matches the labor market needs. The latter will require good tools to identify the skills in demand and strong dialogs with the social partners and businesses now as well as in future. Moreover, the effectiveness of new and adapted measures will also depend on their successful implementation.

Labor Market Transition Opportunities

With automation and technological adoption comes the risk of exacerbating income inequality in a number of ways. On one hand, changing skill demands in the labor market driven by technological adoption will require individuals to invest in upskilling and reskilling. Individuals who are better able to quickly adapt to these changes and make private investments are already on the right side of income distribution. Not only will reskilling and upskilling be crucial, but basic digital skills will also be essential for individuals to adapt to changing demands. In the Indian context, the gender divide is also a concern when it comes to internet usage and digital literacy, with 70% of internet users in India being males. This presents a risk of greater inequality of opportunities and outcomes, including wages for India's women, as digital literacy becomes increasingly important for accessing job opportunities and employability.

At the same time, however, high-skilled workers' wages increase at a faster pace than those of low-skilled workers. This is evident in India's manufacturing sector, where the wages of production workers declined as a share of total wages, from 58% to 49% between 2000 and 2012, while the wage share of supervisors and managers increased from 26% to 36% during the same period.

The relatively faster growth of capital-intensive industries in recent decades will likely lead to greater concentrations of income among owners of equipment, machines, firms, and technologies, rather than among workers. This is already occurring in India's manufacturing sector, where the share of gross value addition (GVA) paid in wages to workers decreased from 22.2% to 14.3% between 2000–01 and 2011–12.

Technological adoption and digitization also present an opportunity to reduce inequalities by bringing new workers into the workforce; increasing wages; and replacing jobs that are hazardous

and where employers fail to provide for the workers' welfare. India must find ways of leveraging this opportunity, while managing the real risks of increasing inequality.

However, if substitution of labor for the sake of replacement picks up momentum, the effects can be catastrophic. The failure of these technologies to bring about substantial increases in productivity will result in technological unemployment of an unprecedented scale.

It has been argued that automobile manufacturers have 'learnt' from the foregoing events (such as strikes) and increased automation in their plants. The period revolving these strikes witnessed a 27% increase in the purchase of industrial robots by the automobile industry. COVID-19 has shown the relative elasticity of labor supply like never seen before and will surely add weight to this. Perverse incentives and socially undesirable impetuses must be kept under check.

The new-age digital skills include emerging technologies such as big data analytics, artificial intelligence (AI), machine learning (ML), automation, cloud computing, cyber security, IoT, robotics, and telemedicine. There is a severe shortage of such skills, given that the demand during the recent years in particular has been exponential, but the supply has been moderate. Technology service providers have witnessed around 30% growth in digital deals, 80% jump in cloud spending, and 15% rise in customer experience spending since the coronavirus outbreak.

The number of workers in India requiring digital skills will need to increase nine times by 2025. The average worker will need to develop seven new digital skills by 2025 to keep pace with technological advancements and the corresponding demand, according to a recent report commissioned by Amazon Web Services (AWS). This will amount to a total of 3.9 billion digital skill trainings from 2020 to 2025. At present, digitally skilled workers represent only 12% of India's workforce.

The impact of automation in India will also vary substantially between sectors, occupations, and geographies. In manufacturing, for example, evidence points to a decreasing demand for middle-skilled workers and increasing demand for low- and high-skilled workers. In the services sector, low-skilled and manual tasks are at the greatest risk of automation.

Through some of the recent studies, three major findings offer significant reasons for optimism. First, a new research suggests that automation is more likely to replace tasks and activities within an occupation rather than completely eliminate jobs. Second, greater demand due to rising incomes is likely to offset job displacement due to automation, which is particularly the case in developing Asian market including India, as per Asian Development Bank (ADB). Third, technology adoption will not be economically feasible at all levels, and therefore, displacement due to automation will not be immediate or as widespread as previously predicted.

Firms in India exist on a spectrum from very low-tech to those leading in innovation and technology. Technological changes and digitization will affect low-tech and high-tech firms differently. The pace of digital change and technological adoption varies vastly across firms and, consequently, so does the risk of job displacement or the opportunity for job creation. Skill requirements too vary between firms with dissimilar levels of technological adoption.

A recent study has found that new jobs are majorly concentrated in the non-routine and cognitive categories requiring higher-order cognitive and soft skills that are less susceptible to automation. A study by PriceWaterhouseCoopers (PWC) shows that emerging technologies support additional

jobs that are more difficult to automate, primarily in the services sector. ADB finds that the demand for jobs that require a non-routine cognitive task is growing faster than the demand for jobs requiring routine and manual tasks. Analyses of four economies in developing Asia show that over the past decade, employment in jobs intensive in non-routine cognitive tasks expanded 2.6 times faster than the total employment. Examples of non-routine cognitive jobs include those of researchers and managers. Routine manual tasks, such as assembly line workers, and routine cognitive tasks, such as data collection, are more likely to be displaced by automation than the non-routine cognitive ones.

Recent reports have attempted to estimate the potential impact of automation on jobs in India. A 2017 McKinsey report, for example, explores how automation will impact employment by analyzing the feasibility of automating individual activities and capabilities within occupations. The report finds that 52% of Indian jobs can be automated using proven technologies. A second report finds that enough new jobs will be created to offset those displaced by automation and to accommodate a growing labor force. Instead of mass job displacement driven by technological adoption, there will likely be a simultaneous process of job creation in different sectors and occupations, leading to a shift of workers instead of a net displacement. The kinds of occupations projected to see significant increases in employment in India include construction workers; jobs in unpredictable environments, such as machinists and cooks; jobs requiring customer interaction; and care providers.

Strategic Policy Directions for Cultivating New Talent for Future

The Indian government has recognized the need to impart skills to place them in a better position in the ruthless market. Ministry of Skill Development and Entrepreneurship has launched various schemes toward this end. Pradhan Mantri Kaushal Vikas Yojana (PMKVY), a flagship scheme of the government, aims at skilling the youth in industry-demanded skills. ‘Skills Acquisition and Knowledge Awareness for Livelihood Promotion’ also has similar aspirations. Projects in the past have indicated that attempts at scaling up skilling of the workforce have not met with increase in labor demand or job creation as expected. These, and other efforts by the government, though well-intentioned, may not be the steps in the right direction. A key requirement for workers in the coming years would be their ability to undertake cognitive tasks. Though routine tasks in general get automated, routine manual tasks are usually affected worse than their cognitive counterparts.

IR Iran

Review of National Labor Training and Reskilling Strategies

University Graduate Internship Plan

By the end of 2020, 39,283 employers of economic enterprises had registered their desire to participate in the internship system and enjoy its benefits, including the internship system. It is worth mentioning that the number of contracts concluded for the admission of interns by the mentioned workshops reached 50,501 contracts by the end of 2020. Some of the most important challenges facing the implementation of the graduate internship program are:

- (1) Temporary closure and stagnation in the activities of many economic enterprises in the country due to the outbreak of coronavirus disease has weakened the financial strength of economic enterprises and their ability of developing or even maintaining the existing activities.
- (2) Not considering the associate degree to enjoy the benefits of the plan, even though employers welcome graduates with associate degrees, the opportunities for internship training, and consequently, for employment for this group have been limited.

- (3) Studies performed on the results of the pilot implementation of the project in previous years indicate that after the end of the probationary period, at least 21% of the interns were employed in the same firm of the internship and entry into the labor market for other interns' skills upgrades were facilitated in the same field.

Employer Insurance Exemption

The implementation of the Employer Insurance Exemption Plan resulted in 7,383 firms benefiting from government insurance support, which ultimately created new job opportunities for 18,180 university graduates by the end of 2020. The creation of this number of jobs had created a cost of 2,672 billion rials for the government by the end of 2020.

The per capita job creation cost in this plan is 147 million rials, which is much lower than the per capita cost of job creation in the sectors of agriculture, industry, and services. In this regard, the implementation of the employment-creating plan of employer insurance exemption is very cost-effective for the government. In addition, the maximum two-year support period for the employer provides a relatively good opportunity for the recruited workforce to accumulate sufficient knowledge, experience, and skills in doing the work and be profitable for the employer.

Skills Plan in the Real Work Environment

The Organization of Technical and Vocational Education of IR Iran, in terms of its mission, structure, and goals, has the highest compliance with the provisions of the plan and has been primarily responsible for the implementation of the plan in recent years. Other agencies such as the Ministry of Cooperatives, Labour and Social Welfare and Social Security, have had the necessary cooperation in the implementation of this project. The main objectives of the plan are: (1) familiarity of young job seekers with the business environment, gaining experience and preparation, and building self-confidence in skills to enter the field of employment and entrepreneurship; (2) preservation and sustainability of traditional and indigenous jobs; (3) assisting active enterprises in identifying and attracting talented and capable workforce; and (4) reducing the costs of attracting and employing unskilled workers and using the capacity and ability of practical training of economic enterprises.

The Wage Subsidy Payment

Of the 23,340 contracts, 62% are for male job seekers and 38% are for female job seekers. With the implementation of the wage subsidy scheme, male job seekers have been attracted more than female job seekers to the participating enterprises. The significant difference between the percentages is debatable from a policy point of view because women make up more than half of our country's population, and if their enormous capacity is not used in economic activities, the country will undoubtedly face difficulties in economic development and growth. A study of countries that have moved to higher levels of economic development shows that the presence of a trained and well-educated workforce, especially women, as one of the components and pillars of human capital, has been effective in the transition of such countries.

Labor Market Transition Opportunities

The Fourth Industrial Revolution is creating demand for millions of new jobs, with vast new opportunities for fulfilling people's potential and aspirations. The current situation in the Iranian economy is based on the intensification of economic sanctions against the country and the need to implement the general policies of the resistance economy by increasing support for domestic production and efforts to provide appropriate production infrastructure, especially in the industrial

sector (as a growth engine of the economy). The private sector in IR Iran is largely dominated by microenterprises in terms of numbers, particularly when trade and services are considered. There have been several supply-oriented initiatives to create jobs in small and medium enterprises (SMEs) through cash incentives. However, the overall conducive policy and regulatory environment is more critical for sustained growth in the creation of jobs in small enterprises. Women entrepreneurs face particularly difficult social and procedural barriers in starting and operating enterprises, which need to be considered in improving the policy and regulatory environment.

There has been a singular focus on industrial firms without much attention to trade and service sectors, which have greater potential for job creation. At present, several ministries are involved in the promotion of small enterprises, with at least four ministries involved in the registration, licensing, and certification of the activities of small enterprises. So far, entrepreneurs have felt that no particular benefit is received by complying with the various regulatory requirements. Moreover, the compliance cost differential has been two-thirds of what it costs in establishing and operating a formal business. It is essential that a mechanism for coordination among various ministries is created and the regulatory provisions are simplified.

All small enterprises suffer from problems of outdated technologies, poor quality, and unstandardized products signifying the lack of business development services. Although these enterprises have greater efficiency in the use of capital for the creation of jobs and thereby are more labor-intensive, their labor productivity, however, remains low. Small enterprises are squeezed out of the banking system due to a larger share of the public sector in institutional credit. Targeted lending to the public sector and specific firms has not made the situation easier for small borrowers, who are often unable to offer the kind of collateral desired by banks. Nonbank loans are exorbitantly costly at the rate of at least 25%, thereby undercutting the competitiveness and growth opportunities for small enterprises.

Strategic Policy Directions for Cultivating New Talent for the future

Some notable observations are:

- (1) Review and amend the executive instructions of the internship plan to facilitate the participation of economic enterprises active in the private and cooperative sectors, especially due to the closure and stagnation of activities of some economic enterprises during the coronavirus outbreak in IR Iran.
- (2) Promote a more effective participation of some executive bodies in the field of informing and identifying the receiving units and removing the obstacles and problems.
- (3) Use the capacities of organizations such as, Chamber of Commerce, Industry, Mining and Agriculture; Cooperative Chamber; and Chamber of Guilds and Organizations of the Building Engineering System, Agricultural Engineering System, and Natural Resources.
- (4) Provide appropriate information to students and graduates by universities and higher education centers.
- (5) Review the number and capacity of fields and academic orientations; modify the content of courses; and increase the provision of practical and applied education of university fields of study based on the needs and capacities of regions and the labor market.

- (6) Lay the groundwork for the implementation of this plan in the Seventh Development Plan by applying the necessary reforms, including providing internship grants based on the extent of enjoyment or deprivation of the region;
- (7) Reap the favorable effects of active labor market policy programs, including graduate internship program and employer insurance exemption on increasing employment and graduation.
- (8) It should be noted that achieving the maximum goal of creating employment and increasing employability for graduate students is associated with economic policies, employment policy, science and technology policy, and industrial and commercial policies. So, to achieve the goal, the executive apparatus and relevant organizations must avoid sporadic actions in the field of job creation.
- (9) Given the economic downturn and the crises caused by sanctions and the outbreak of the coronavirus, which have led to slow economic growth and employment growth throughout the country, the following is recommended in connection with the implementation of the wage subsidy scheme:
 - (10) Considering the positive achievement of the wage subsidy payment plan in 16 provinces of the country, its cost-effectiveness compared with the bank facility payment plans, and the vulnerability of all provinces to the spread of coronavirus, this plan should be implemented in all provinces of the country.
 - (11) The target group of the project should be extended from primary jobs to other vulnerable groups such as female and male heads of households.
 - (12) In addition to the wage subsidy scheme, in times of recession and slow economic and employment growth, successful active schemes and programs of other countries should be applied. These could be public service programs in areas such as health services in public health clinics, sustainable housing, private tutoring, and environmental protection.
 - (13) Creation of small-scale infrastructure should be done to enable the unemployed, especially young people, to play an active role in the society and in national development, introduce them to new skills, and increase their employability.
 - (14) The results of surveys conducted in the informal economy and informal employment in the labor market confirm the tendency of a relatively wide range of labor force, especially the unskilled or semi-skilled labor to work with wage conditions less than the annual approval of the Supreme Employment Council.

Nepal

Review of National Labor Training and Reskilling Strategies

Enhanced Vocational Education and Training Project

Enhanced Vocational Education and Training Project (EVENT) has been carrying out training programs in different occupations and conducting training under result-based and voucher-based schemes. The primary beneficiaries of the project are approximately 115,000 Nepali youths, who will get access to short-term skills training, technical education, and the opportunity for certifying

their existing skills. The institutions providing Technical School Leaving Certificate (TSLC)/ Diploma, which are part of the project, will benefit through improved facilities, trained instructors, use of high-quality teaching and learning materials, and improved delivery processes including regular monitoring and evaluation.

Skills Development Project

The Skills Development Project (SDP), financed by the ADB and the Government of Nepal, was established to support the government to implement key aspects of the Technical and Vocational Education and Training (TVET) Policy 2012. The project being run under the Ministry of Education, Science and Technology is being implemented by the Council for Technical Education and Vocational Training (CTEVT) through a Project Implementation Unit (PIU). The SDP is helping the government to (1) initiate strategic sectoral reforms that aim to improve overall management and performance of all sectors; (2) improve the quality and relevance of public training; and (3) increase the private sector's engagement in training delivery and job placement. Each intervention has been designed to increase the efficiency and result-orientation of the TVET system, making it more market-driven. The impact of the project will be increased employability of the Nepalese workforce. Its outcome will be the establishment of a market-responsive and social- and gender-inclusive TVET system [28].

National Vocational Qualification System

The Nepal Vocational Qualifications System (NVQS) Project, a bilateral initiative between the Government of Nepal and the Government of Switzerland, is funded by the Swiss Agency for Development and Cooperation (SDC) and implemented by the Council for Technical Education and Vocational Training (CTEVT)/National Skill Testing Board (NSTB) with full technical assistance provided by the Swiss Foundation for Technical Cooperation (the Swiss contact). The overall goal is to contribute to systemic changes in the TVET system to enable women and men, including disadvantaged groups, to get access to increased employment and self-employment and to perform at higher productivity levels.

Enhanced Skills for Sustainable and Rewarding Employment

Enhanced Skills for Sustainable and Rewarding Employment (ENSSURE) is a project funded by the Government of Nepal and the SDC. The ultimate aim of the project is to help Nepalese workers, particularly from disadvantaged groups, to benefit from continuous employment and an improved standard of living.

The project will achieve the following three interrelated outcomes:

- (1) at workers' level (both female and male workers improve their employability);
- (2) at employers' level (partner companies establish a favorable work environment); and
- (3) at the system level (the TVET system is expanded and is more inclusive of the private sector).

TVET Practical Partnership Program SAKCHYAMTA.

TVET Practical Partnership Program is a project funded by the European Union and implemented by the British Council and CTEVT. Over the course of four years, the project aims to contribute to Nepal's inclusive and sustainable growth through investment in human capital and by creating better employment opportunities [28].

The specific objectives of this project are to strengthen and implement more effective policy in the TVET sector that is responsive to labor market needs. The program will pilot an integrated public partnership approach in three key economic sectors: (1) agriculture; (2) construction; and (3) tourism, offering opportunities for promoting the transition to a greener, climate-resilient, and low-emission economy.

Labor Market Transition Opportunities

The Overseas Development Institute (ODI) has surveyed 43 businesses in four sectors (tourism, ICT, light manufacturing, and agro-processing). The survey reveals that the labor market is tight in many sectors. All these sectors have the potential to expand. These four sectors could help Nepal to transform the economy and create various employment opportunities. There could be other sectors like hydropower, education, and health, which may directly or indirectly support Nepal in improving its productive capacity.

Creating productive employment opportunities and shifting the existing surplus and unproductive labor in agriculture to service sectors such as industry, trade, tourism, education, and health as well as employing young workers can contribute to a structural change in the economy. The extensive use of automation, robotics, and digitalization will have serious implications for skills, competences, jobs, and professions. The development of Industry 4.0 will be accompanied by a change in tasks and requirements for workers in the factory.

Strategic Policy Directions for Cultivating New Talent for Future

The Nepalese government has made TVET a top priority to create jobs in the country and help reduce poverty. To achieve a faster economic growth to attain the goal of a middle-income country (MIC), Nepal, as discussed in the earlier section, needs to develop its productive capacity. Skill development is the key to achieving productive capacity and could help Nepal achieve the MIC status faster. The TVET system should be able to adapt to the fast-changing nature of workplaces and impart training accordingly so that the graduates are competent enough to deliver.

Direction and Solutions to Develop Professional Skills for VET Workers

The most challenging issue with the present TVET system is to mitigate the mismatch between the existing training programs and the needs of the labor market. The industry can work together with the government to set up occupational standards that are required in the working environment and define levels of competence to perform the designated tasks. Such arrangements should be legally mandated with clearly assigned roles and responsibilities. It would be easier to engage employers at the implementation level. They can contribute to industry-specific soft-skill-training programs. In addition to the regular technical classroom training programs, on-the-job training programs and apprenticeships can be included with the support of employers. Trainees would benefit from working in the real world of work with some level of income. Employers would be willing to participate as they can retain the talented trainees within their organizations.

Direction of Strategy for VET Development in the Period 2021–30

The industry is suffering from the fact that the majority of skilled and semi-skilled workers in the industry are not suitably trained for minimum levels of competencies that are required to accomplish their respective tasks. The TVET system should be able to adapt to this fast-changing nature of the workplace and impart training accordingly so that the graduates are competent enough to deliver. TVET training carriers and workers pertaining to the specified IR4 abilities need to set and enable an IR4 working environment. The CTEVT Strategic Plan integrated the 2030 Strategic Vision with

a mission statement, goals to achieve the vision, and strategies to achieve each goal. Each strategy was developed with response activities, action plans, and indicators, but the detailed action plan to meet its objectives was never finalized. The development of strategic plans, supported by comprehensive action plans, should be mandatory for all TVET organizations. This desired outcome will be achieved only if evidence-based TVET strategies are developed, human resources are properly produced and capacitated, infrastructures are adequately developed, and the private sector is properly engaged and involved. Within the MoEST TVET function, the authority should establish interdepartmental coordination, and the technical committee should develop strategic plans to ensure coordinated planning and management.

Program to Support Development of VET Labor Market up to 2030

Nepal aspires to achieve the aim of graduating from the least-developed-country (LDC) status by 2022 and become an upper MIC by 2030. In addition to various other strategies, special priority has to be given to improve skills and productivity of workers to achieve the target faster. It is important to consider the key sectors for development, e.g., ICT, tourism, agro, and light manufacturing, for increasing growth and productive employment. Employment opportunities should be provided to all, with a safe, healthy, and competitive market. Vocational training and education should be the top priority in any sector so that the baseline of any worker is strong.

Special programs, including the Prime Minister Employment Program (PMEP), should be leveraged. Labor productivity needs to be increased by developing the capacity of the labor force based on the demand of the labor market, and necessary arrangements should be made for migrant workers to acquire skills through necessary training and coaching before departure. Coordination with the National Technical Training Institute should be maintained to impart skills to those who are looking for employment to meet market demands and are registered with the authority.

A National Planning Commission or CTEVT mainframe is needed to collect both supply and demand information using a labor management information system (LMIS); MoEST/CTEVT should have a legal mandate to coordinate the system; and trained professionals should strengthen the Employment Information and Support centers under MoLESS. Employment information centers should be expanded at all local levels and integrated into the employment system of the organized sector.

Policy support to offer incentives for skills training programs, including work-based learning in partnership with businesses and the industry, should be developed. Universities should be encouraged to offer degrees in occupational education or TVET, and organizational capacity should be enhanced to produce quality human resources. The government should also allocate budget for on-the-job training in partnership with the private sector.

Pakistan

Review of National Labor Training and Reskilling Strategies

In Pakistan, there is no comprehensive information on skill development. Even publicly funded services are not routinely collected and analyzed. There is no systematic or complete census of TVET activities that encompass both the public and private sectors as well as non-governmental organizations' operations. There is little sustained review of the investment in skills development, though it is typical to hear comments that persons who complete training lack the abilities that the

labor market demands. There is no national structure for developing and validating qualifications or certifying the talents of those who successfully finish training programs. Some businesses in the private sector, notably exporters and those with international ties, give world-class training, but they are in the minority. According to estimates, less than 10% of employed workers obtain training. The policy is not functioning because there are only around 22,000 apprentices at present. Because of the perceived costs, many firms are hesitant to invest in training.

The government requires a commitment to the development of a national integrated TVET system. As a result, a single national certification system for recording and recognizing qualifications, as well as quality assurance standards and processes, should be implemented. It should be investigated how the existing reliance on public funds might be reduced. In order to meet the TVET Policy's goals, the government should continue to seek funding from international donors. Mutual trust between national and provincial TVET entities, as well as among education and training providers, should be encouraged.

Labor Market Transition Opportunities

Private institutions currently provide 70% of higher education and 40% of primary and secondary education. There is no similar engagement with TVET, and the private-sector organizations may play a bigger role by training more of their own employees and contributing more broadly to TVET reform. A more competent workforce will be an advantage and contribute to growth, while lack of skills will stymie and frustrate development. To fulfil the demands of a changing economy, training supply must be linked with industrial and economic policies.

Around 59% of the population is aged 15–59 years, while 27% is aged 15–29 years. Only if the young have skills that are compatible with the demands of a contemporary economy will this youth bulge convert into economic gains [1]. However, the transition of Pakistan's young population to work is slow.

The dynamics of the market are changing and the statistics regarding the employment patterns of the market are also showing interesting facts. First, the number of employees is increasing with the decline of self-employment, which is the sign of a more organized workforce. Second, entrepreneurship, which had grown earlier and then declined, has now emerged again. Third, a growth in unpaid family workers was seen earlier but now it has decreased.

Strategic Policy Directions for Cultivating New Talent for Future

Direction and Solutions to Develop Professional Skills for Pakistani Workers

Skill development is considered as a key factor in the time of fourth industrial revolution, especially for Pakistan. For low- and middle-income economies, the lack of professional and management skills in youths may lead to unemployment or resistance to acquire quality jobs with decent work environment. The issue is becoming more serious with rapidly changing economies that require more innovative skills. Workers need to be updated, flexible, and adaptive in order to exploit the market opportunities, both at national and international levels. Thus, the focus should be on the skills demanded in future. Competency-based training can play a vital role in professional development of labor. Thus, it can be assumed that professional skills can be enhanced by training in contemporary skills, especially soft skills, IT skills, and technical skills; and emphasis on competency-based training as well as on-the-job training.

Direction of Strategy for VET development in Pakistan in the period of 2021–30

Special attention to budgetary allocation by the government and private institutions is required to fulfill the skilling requirement of labor at this time of change. Assistance from foreign donors can

also be a good option. Another important issue is that the government had introduced some tax reliefs and incentives for apprenticeship providers, but provisioning of these incentives gets delayed due to bureaucratic procedures. Same bureaucratic hurdles are there in provisioning of trainings. There is a need to simplify the procedures in order to cope with challenges faced by TVET institutions. In addition, there is a need for a ‘skill development university’ and revision of curriculum. Also, the scale of skill development requires to be broadened.

Program to Support Development of Pakistan’s Labor Market up to 2030

The Government of Pakistan has initiated Prime Minister’s *Hunarmand Program*, also called ‘skills for all program.’ Similarly, the government has also introduced Youth Entrepreneurship Scheme and Prime Minister’s Startup Pakistan Program to instill the entrepreneurial spirit among youth and to provide loans ranging from PKR100,000 to PKR25 million with 3–5% markup for eight years.

Likewise, the fourth Industrial revolution has raised the demand of digital and e-learning-based education and such programs should be initiated. The government is aiming to address this, and a program is initiated as Pakistan talent hunt program as Prime Minister had nominated 2022 as the ‘Youth Year.’ Some of the initiatives taken in this regard are contracts with international athletes to train the youth of Pakistan.

Continuity of policies is necessary for gaining the true results of the initiated programs. Conclusively, it is a reality that labor market dynamics are changing in the time of IR4. This time is an opportunity as well as a threat for underdeveloped countries like Pakistan. If we see opportunities, then Pakistan has a huge bulge of young population that can potentially boost an economy if equipped in the right manner. Skills formation has become vital at this time. If the industry and the academia liaison is developed, growth opportunities are created, and better utilization of funding is done with continuation of policies, then Pakistan can emerge as a progressive country in this phase of transition.

The Philippines

Review of National Labor Training and Reskilling Strategies

The Philippines is preparing its workforce, mainly the Filipino youth, through skills development, skills qualifications, and alignment; ensuring up-to-date labor market information (LMI); and carrying out timely policy research and advocacy. The Department of Labour and Employment’s (DOLE)’s mandate is to promote full employment, and its mission is to develop and protect human resources. Particularly, DOLE is committed in the following relevant endeavors:

JobStart Philippines Program

DOLE collaborates with partner employers from the private sector to implement the flagship youth skills development and employment facilitation initiative, the ‘JobStart Philippines’ program. With a pilot done in 2014–15 and institutionalized in 2016 through the Republic Act (RA) No. 10869, JobStart helps the youth to be more employable through a full-cycle employment facilitation framework that involves the following: life skills training (LST) with one-on-one career coaching; technical training; job matching; and referrals to partner employers either for further specialized training, internship, or decent employment. While face-to-face registration for the program is still allowed, online registration is implemented through the JobStart Digitization initiative and in consideration of the restrictions enforced by the government due to COVID-19.

Special Program for the Employment of Students

Special Program for the Employment of Students (SPES) provides poor but deserving Filipino youth the opportunity to augment their income to finish their education and gain on-the-job experience for increased employability and practical skills. For further improving this program for its beneficiaries, the DOLE, through the Bureau of Local Employment (BLE), is considering the inclusion of a specialized LST module as part of the orientation for SPES beneficiaries. During the coronavirus spread, partner employers and establishments of the program were encouraged to adopt alternative work arrangements (e.g., work from home). Should SPES beneficiaries be required to report to work on-site physically, they could only fulfill desk work/s or related tasks that did not require them to travel or stay outside for an indefinite period. Likewise, SPES beneficiaries were assigned works within their respective areas or barangays to reduce their exposure from unintended COVID-19 risks due to interzonal or intrazonal travel.

Government Internship Program

DOLE's Government Internship Program (GIP) provides internship opportunities for high school, technical-vocational, or college graduates aged 18–30 years who intend to pursue careers in the public sector. Like the SPES implementation during the pandemic, heads of partner agencies were also encouraged to allow alternative work arrangements for GIP beneficiaries. Likewise, should GIP beneficiaries be required to report physically to offices of partner agencies, tasks were also limited to desk work/s as beneficiaries were discouraged from engaging in assignments that would expose them to COVID-19.

Career Guidance Advocacy Program

DOLE's Career Guidance Advocacy Program (CGAP) aims to immerse parents and students in the realities of the labor market and convince career advocates to use career guidance as an effective tool for addressing job–skill mismatches. To expand the program's reach in response to the demands of Industry 4.0 and the increased digitized communication during the pandemic, DOLE, through the BLE, was developing the Enhanced Career Guidance and Employment Coaching modules and the CGAP microsite where interested stakeholders could access self-taught modules. Included were modules on life skills, LMI, basic productivity, and other information materials from relevant government agencies such as NWPC, DepEd, CHED, TESDA, DOST, and PRC. While the CGAP microsite was being developed, the Public Employment Service Offices (PESOs) all over the Philippines were conducting career fairs via video conferencing platforms.

Labor Market Transition Opportunities

The pandemic drove micro, small, and medium enterprises (MSMEs) to adapt to technological changes. The strict quarantine measures imposed by the Philippine government since 16 March 2020 left many establishments with no other options but to go digital, automate, and innovate. Establishment owners knew that offering their services online was a way to survive during the unprecedented time. This pandemic transformed ideas about how and where workers could work and put flexibility, adaptability, and technology in the workplace.

Adopting Digital Technology

Adoption of digital technologies in the Philippines before the pandemic was slow and it could have taken years for enterprises and workers to make the shift. The pandemic situation caused a sudden shift and pushed workers and industries into freelance opportunities. Now, jobs amenable for alternative work arrangements can be found across sectors.

Job Opportunities and Relevant Skills

When the government imposed quarantine measures and restrictions in the first quarter of 2020, enterprises had to alter their businesses by implementing continuity plans and changing working locations of their workers overnight. As many as 79 occupations were identified as in-demand occupations by DOLE after the COVID-19 pandemic. The Philippine Green Jobs Act of 2016 (RA 10771) was another source of disruption. This law provides a policy framework for fostering low-carbon, resilient, and sustainable growth and decent job creation by giving incentives to enterprises generating green jobs and focusing on developing human capital to enable and sustain the transition to a greener economy. A list of green careers has also been identified by the department. In addition, more Filipinos ventured into freelance works amidst the pandemic, and the freelance economy continues to grow. Freelance jobs are essential since there are tasks that outsourced service providers can efficiently do. Lastly, most Philippine employers look for viable traits and behaviors rather than skills and competencies. This is where soft skills or 21st-century skills play an essential role in establishing oneself at work or in other areas of life.

Strategic Policy Directions for Cultivating New Talent for Future

Strategic Policy Directions on the Changing Labor Market Demands

There is a need to ensure that alternative work arrangements will not compromise the well-being of Filipino workers or expose them to any forms of occupational or health hazards. Through the updated PDP 2017–22, the Philippine government aims to accelerate human capital development, focusing on the strategic framework guiding its goal. It includes

- (1) improving the nutrition and health outcomes for all;
- (2) enhancing income earning ability and adaptability of Filipinos; and
- (3) ensuring a flexible lifelong learning opportunity for all Filipinos.

Amidst the anticipations for the Philippines' recovery from the pandemic and automation and digitalization, the government identifies effective strategies for the labor sector based on the updated PDP 2017–22. Its focus is on “increasing income-earning ability and enhancing the adaptability of workers to the changing demands of the labor market.” The National Economic Development Authority (NEDA) has provided the updated indicators and revised targets and result matrices for increasing the income-earning ability and enhancing the adaptability of the Filipino workforce.

The identified strategies will improve the ability of Filipino individuals to operate and thrive in the digital environment. The strategic direction is toward expanding and strengthening the upskilling and retooling programs and employment facilitation services given to workers and individuals, mainly through digital technologies. The strategies identified are expected to improve individuals' access to employment opportunities and ensure their employability and productivity, thereby translating into increased income-earning ability and enhanced adaptability of workers. Policies and programs related to these strategies should be evaluated and assessed to further improve, enhance, and strengthen to achieve the full potential of Filipinos and transform the human capital toward greater agility for a healthy and resilient economy.

Developing New Talents and Skills for the Future Filipino Workforce

DOLE highlights the in-demand and hard-to-fill occupations of the key industries, projected to be the primary source of employment in the Philippines, in the strategic policy directives for cultivating new talents of the future. These are:

- (1) **Sectors influenced by technology change and advancement:** The industry will shift to high-value services by attracting highly skilled talents and developing a globally competitive Filipino workforce to create an ecosystem that promotes lifelong learning.
- (2) **Special technical skills required:** A combination of policies is required to allow workers to keep their skills up to date, help them shift between jobs, and assure that employers have a skilled, highly productive, and innovative workforce.
- (3) **Core employability skills that are valuable across sectors and occupations:** In the JobsFit LMI Report, DOLE–BLE mentioned that employers demand skills in five years. The findings from the DOLE–BLE COVID-19 LMI survey were considered complementary to the WEF report on the 2020 Future of Jobs.

Sri Lanka

Review of National Labor Training and Reskilling Strategies

In Sri Lanka, the Vocational Training Authority (VTA) spearheads providing relevant training. VET in Sri Lanka is expected to offer special attention for its career-oriented courses geared toward the improvement of the country's economy. The Department of Technical Education and Training (DTET) operates with a network of 29 Technical Colleges throughout the country, while nine Colleges of Technology (upgraded from Technical Colleges) offer diploma-level courses within the National Vocational Qualification framework. Moreover, more than 38 Career Guidance Centers, and 21 Learning Resource Development Centers are also in operation in this system.

A centralized system where courses are consolidated would help ensure efficient tracking, grading, and teaching processes. In Sri Lanka, there are a number of government ministries and agencies involved in VET training. The development of a VET system is to prepare people for the work roles to meet the needs of a developing economy. In this regard, the Ministry of Skills Development and Vocational Training; the Tertiary and Vocational Education Commission; the National Apprentice and Industrial Training Authority; the Department of Technical Education and Training; the Vocational Training Authority; and the National Youth Services Council play prime roles.

The National Apprentice and Industrial Training Authority (NAITA) is the leading agency in providing apprenticeship training and developing National Competency Standards. It manages three national training institutes: the Apprenticeship Training Institute (ATI); Automobile Engineering Training Institute (AETI) and Institute of Engineering Technology (IET), along with eight career guidance centers and 51 training centers. The National Youth Corps (NYC) organizes vocational training courses in urban and rural areas, and is responsible for the implementation of the entrepreneurship program and career guidance services.

The University for Vocational Technology (UNIVOTEC) provides degrees to people with NVQ qualifications, and those who work in the industry as well as those who wish to acquire degree-level education. UNIVOTEC delivers NVQ level-7 degree courses as well as training instructors for Colleges of Technology, along with assessors for course accreditation. It also develops curriculum and teaching and learning resources. SLIATE, under the Ministry of Higher Education manages and supervises 11 separate Advance Technical Institutes and five sections housed in the Technical Colleges. It also offers programs for Higher National Diplomas in civil engineering,

electrical engineering, quantity surveying, building service engineering, and agriculture; apart from National Diploma in business and finance.

Labor Market Transition Opportunities

The expansion of Sri Lanka's IT industry, mainly oriented at international markets, is likely to increase demand for high-skilled technical jobs around data analysis and cyber security. A large portion of Sri Lanka's youth could bear the burden of job losses in the retail industry, particularly those moving out of agriculture and plantations, for whom retail is an easy steppingstone into formal work. On the contrary, a rise in e-commerce is expected to match this development through technological feasibility and low investments.

Employment in the services sector will continue to grow during the next 14-year period while employment in the industry sector will grow at a slower pace. Employed population in the agriculture sector will continue to decline. When predicting occupational structures, it was also observed that occupations such as professionals, technicians, and associate professionals; services and sales workers; and plant or machine operators and assemblers will grow in future with an indication that more and more jobs will be created mainly in service and industry sectors.

Although a shift from agriculture to industries is a feature that is usually observed during the first phase of an economic growth, Sri Lanka will show a different status by skipping the industrial growth and moving directly from agriculture to services. This can be seen as an economic achievement because Sri Lanka has started leapfrogging from an agrarian economy to a services economy. A greater demand for employment will be generated in the services sector while the share of employed population in agricultural sector will gradually decline.

Strategic Policy Directions for Cultivating New Talent for Future

The Sri Lankan government had declared 2021–30 the decade of skills development in Sri Lanka. The National Policy Framework, 'Vistas of Prosperity and Splendour 2020–25' has identified 'a technology-based society' as one of the key policies. Some of the significant steps taken include

- (1) introduction of ICT policy for government and national ICT policy (ICTA);
- (2) establishing National Innovation Agency (Presidential Secretariat);
- (3) government-initiated program to provide 13 years of continued education to students (Ministry of Education);
- (4) introduction of technology stream (engineering technology, bio-system technology, science for technology) for advanced level (Ministry of Education);
- (5) proposing National Policy on science, technology, engineering, and mathematics (STEM) education, with 1% contribution to the GDP during the next decade expected from per student intake (Ministry of Education);
- (6) providing internship opportunities and conducting entrepreneurial development programs for the final-year university students (Ministry of Education);
- (7) introduction of National Policy Framework for SME Development (Ministry of Industries); and

- (8) launch of the National Export Strategy (NES) of Sri Lanka in 2018 to promote new export sectors (Ministry of Trade).

Direction and Solutions to Develop Professional Skills for Sri Lankan Workers

A wide gap exists between available skills and market demand in Sri Lanka. Many of the country's youth leave the formal school system without employable skills because their access to middle-level skills training and entry-level skills programs is inadequate. This is compounded by the low market relevance of TVET in the country. The Skills Sector Enhancement Program, supported by the ADB's results-based lending program, is helping provide the impetus to improve and ensure the effectiveness and efficiency of Sri Lanka's sector-wide reforms.

Direction of Strategy for VET Development in Sri Lanka during 2021–30

Sri Lanka has improved the quality assurance mechanism of all public and private TVET providers by developing a centralized management information system (MIS). This system has helped training centers manage training information from enrollment to graduation and deployment. It has also automated their training administration and resource management.

The implementation of a comprehensive vocational teacher development policy has complemented the new MIS. This initiative has upgraded instructors' skills through industry exposure training. It has provided performance management mechanisms, professional development, and allowances to retain and recruit qualified instructors.

To ensure that courses offered meet industry standards, training programs' effectiveness was also reviewed. Moreover, the project revised the National Vocation Quality (NVQ) level descriptors to upgrade the country's TVET standards to industry-recognized qualifications. These revisions were applied to all Tertiary and Vocational Education Commission-accredited programs and registered training providers.

Program to Support Development of Sri Lanka's Labor Market up to 2030

The Sri Lankan government is confronting these challenges head on through its Skills Sector Development Program, which is its first sector-wide, medium-term development program. It envisions a TVET sector that is efficient and ready to meet rapidly evolving labor market demands by 2020.

Thailand

Thailand is one of the fastest aging countries with an old-age dependency ratio that exceeds the ASEAN and OECD averages. The aging population has led to a shrinking labor force. Also, the labor force participation rate has been declining and was below 75% in 2020 compared with almost 80% in 2011. Another stylized fact in the Thai labor market is skill mismatch, which has also been a structural challenge in the country. This is a phenomenon when the proportion of workers with vocational education required by employers is far greater than that of job applicants with VET. In short, there seem to be too many university graduates, yet too few VET graduates, as compared with demands, resulting in a qualification mismatch. Moreover, the STEM manpower in Thailand is inadequate. This is one of the biggest challenges as STEM subjects will increasingly be essential for the country's development in the new world where technological advancement is causing a shift in jobs and skill demands.

Review of National Labor Training and Reskilling Strategies

Thailand's Manpower Development Strategy, 2017–36

In 2016, Thailand's Ministry of Labour issued the 20-Year Manpower Development Strategy (2017–36). The strategy places an emphasis on STEM manpower development which is consistent with the Thailand 4.0 agenda. The framework can be divided into four periods:

- **Productive manpower (2017–21):** The aim is to eliminate labor-related obstacles for the country's development, upgrade labor standards, promote multiskilled labor, and upskill the manpower.
- **Innovation workforce (2022–26):** The aim is to develop the workforce to apply technology and innovation for productivity enhancement, encourage the development of STEM skills for Thailand 4.0, amend regulations to suit employment in the digital era, and make the workforce ready for multicultural and cross-border work.
- **Brain power (2027–31):** The aim is to increase the number of STEM workers for high-productivity work in order to overcome the middle-income trap.
- **Creative workforce (2032–36):** The aim is to increase the number of STEM workers and create creative manpower with research and development skills for better work quality and efficiency.

Department of Skill Development Strategic Plan 2017–21

The Department of Skill Development (DSD) under the Ministry of Labour is responsible for providing skill development to workers as well as promoting skill standard tests. The DSD set its strategic plan during 2017–21. The plan outlines five strategies as follows:

- **Developing and upgrading labor skill standards to meet international standards:** The key indicators include an increase in the number of workers being tested for skill standards.
- **Skill training to meet the challenges of the Thailand 4.0 era:** This aims to prepare new workers and the unemployed to enter the labor market; upgrade workers' skills to keep up with the changes in technology; and develop a training system to be efficient, comprehensive, and easily accessible. The key indicators include an increase in the number of people trained in advanced technology courses.
- **Developing the potential of entrepreneurs and informal workers:** This is with the goal of developing skills for the informal sector; specific groups of workers (women, youth, people with disabilities, and the elderly); new entrepreneurs (startups); and community enterprises as well as increasing labor productivity and competitiveness of enterprises.
- **Promotion and development of skill development networks:** This is with the goal of enabling all establishments that are under the skill development law to develop skilled labor and create a network to expand the development of labor skills inclusively. The key indicators include an increase in the number of trained workers in advanced technology courses by private and public training providers.

- **Management of the organization and database system to be modern, flexible, and highly efficient:** This is with a strategy for the development of the database system, evaluation system, and skill development research system to be effective.

Overview of Skill Development Mechanism in Thailand

To develop employees' skills, enterprises or employers in Thailand can do in-house, on-the-job training or send their workers to be trained by private training providers. There are also public trainings supported by the government, such as trainings organized by the DSD. Employers in Thailand are required to pay a training levy to the government while the government gives incentives to motivate the enterprises to train their workers. This mechanism is supported by the Skill Development Promotion Act 2002 (SDPA). The idea was to stimulate the private sector and establishments to set up and register with the DSD as training providers for workplace learning.

Overview of Vocational Education and Training Strategies

In Thailand, VET is mostly offered by the Office of the Vocational Education Commission (OVEC), which is the organization under the Ministry of Education responsible for vocational and professional learning. Currently, there are 429 public colleges and 481 private colleges providing formal VET programs nationwide with 959,598 students. Moreover, blockchain was implemented mostly in the financial services, life sciences, and healthcare sectors, while IoT was deployed mostly in consumer, energy resources and industrials, and technology, media, and telecom sectors.

Labor Market Transition Opportunities

Technologies such as traditional web technology, mobile applications, and cloud have already been deployed by firms in Thailand while a smaller proportion of companies has implemented advanced technologies like data analytics, robotics, IoT, artificial intelligence (AI), blockchain, augmented reality (AR), and virtual reality (VR). Nevertheless, the adoption of advanced technologies has grown substantially, especially in the consumer industry, which exhibits the highest proportion of companies that have implemented AI after the pandemic.

The likelihood of automation is heterogenous across industries, jobs, and groups of workers. As the missing workforce stemming from aging population has been a major concern for companies, the sectors are seeking to adopt new technologies such as robots and automation to compensate for the missing workforce. What is more, low-skilled workers, women, and low-wage workers are facing higher risks of job automation while certain routine jobs such as shop sales assistants, food service counter attendants, cooks, office clerks, and accounting associate professionals are also incurring higher risks. This trend implies that disparities in the Thai labor market will be increased.

Occupational Transition

Deloitte Thailand elaborates that there are some roles that are highly important yet highly challenging to recruit. These include data analysts and scientists, digital transformation specialists, and digital marketing and strategy specialists. This is where the government should step in and design policies to cultivate the workforce in these high-demand fields. Thailand Development Research Institute (TDRI) also identifies other rising jobs resulting from global mega trends. These include jobs in digital economy, care, and green economies. Apart from specific and technical skills, these high-paying jobs also demand good English proficiency, analytical skills, people skills, communication skills, digital skills, and resilience. This suggests a rise in soft-skill needs.

Strategic Policy Directions for Cultivating New Talent for Future

Key Policies of the Ministry of Labour in 2022

The Ministry of Labour indicated the urgent policies to implement in 2022. One area of focus was to stimulate on-demand employment in the new economy by linking labor market data including labor skills between government agencies and the private sector. This was to provide the government with an information center on labor skills for use in training and development of workforces to meet changing market demands. The focus areas were to:

- Upskill, reskill, and newskill labor; provide training for the unemployed to have sufficient knowledge to work; increase labor productivity; and enable workers to return to the labor market. The Ministry of Labour promotes learning new ways of working, and increasing digital, technology, and innovation skills for both employed workers and new graduates through offline and online channels.
- Produce high-performing workforces to be able to adapt to new jobs resulting from the changes and risks in the new world context with the digital technology advancement. The Ministry of Labour must promote learning of skills for the future to respond to the country's manufacturing sector, support the new S-Curve, in line with the national strategy. This is a Thai labor market restructuring aiming to drive the country's economy as well as build the competitiveness of the country and its labor force.
- Develop professional skills for the new-generation youths who are increasing likely to become gig workers.
- Foster cooperation between the public sector, educational institutions, and the private sector in labor development to meet the demands of the labor market, support foreign investment, and create a balance in the labor market.

DSD Projects in the Budget Year of 2022

In line with the focus of the Ministry of Labour, the DSD was implementing certain projects in 2022 aimed at upgrading skills of the workforces. Remarkably, the emphasis has been on skill development that corresponds to technological changes and supports the target industry. The key projects are listed below:

- (1) The 'Advanced Technology Excellence Training Center' project aims to equip the labor force and entrepreneurs with knowledge and skills in accordance with six target industries including digital, robotics, smart electronics, logistics, next-gen automotive, and biofuel and biochemical.
- (2) Projects on 'Development of labour skills in the Eastern Economic Corridor (EEC) and Special Economic Zones (SEZ)' are notable.
- (3) The 'Develop the fundamentals of tourism industry' project aims to upskill and reskill for technological changes in the tourism industry. The project targets 4,624 participants in the high-value and medical tourism sector.
- (4) The 'Upgrading skill potential and labour capacity' project aims to develop the potential of workers to possess knowledge and skills in line with the future demands of the labor

market, technological advancement, and innovations. The DSD has targeted 10,500 persons to participate in this project.

- (5) The ‘Enhance workforce capacity with technology to support work in the 21st century’ project focuses on 16 skills across three groups (foundational literacies, competencies, and character qualities) for the 21st century by the WEF. This project targets 6,360 people to possess upgraded skills and offer high-quality work.

Vocational Education and Training

VET Strategy 2018–21

During 2018–21, the OVEC drove vocational education with the goal, “vocational education for preparing Thai people for the 21st century.” To achieve the goal, the key strategies were to

- increase the number of vocational students compared with academic students;
- develop an excellence center for vocational manpower development in target industries as well as in the EEC and special economic areas;
- encourage reskilling, upskilling, and newskilling through polytechnic and vocational colleges as well as through short-course trainings, aiming at bringing education to employment and providing skills for startups or businesses;
- increase OVEC management efficiency by focusing on budget usage for improving skills of teachers and students and providing more incentives to teachers and staffs; and
- develop vocational education to prepare Thai people for the 21st century through dual-vocational education and integration of technological, digital, and English skills in the learning courses.

VET Policy and Focus in 2022

Continuing with the previous strategies, the OVEC has set a strategy for vocational education development in 2022 with the theme of “Holistic and Area-based Vocational Education Development (HAVE).” Its key objectives are:

1. Providing education for future careers and building the country’s competitiveness by
 - developing and improving the Center of Vocational Manpower Networking Management (CVM) and the ‘Excellent Center,’ especially in the EEC area;
 - upskilling, reskilling, and newskilling under the Career and Entrepreneurship Center (CEC); and
 - partnering with the private sector and entrepreneurs to improve the quality of VET.
2. Upgrading and improving the quality of vocational education with an area-based approach by
 - enhancing VET quality by using big data at the provincial level;

- improving the operation of dual vocational education centers in each area to upgrade VET quality;
- developing VET curriculum, credit bank, and enhancement of knowledge and skills for future jobs and the 21st century; and
- developing professional skills through practical experiences.

As vocational education in Thailand will play a significant role in providing skilled workforces to support the development of S-Curve industries and the Thailand 4.0 agenda, VET strategies also need to focus on future skills arising from global megatrends and the COVID-19 pandemic. Since doing so alone may not be efficient, the OVEC has stepped in the right direction by collaborating with the private sector and entrepreneurs in providing training programs to ensure that the skilled labors produced correspond to the market needs.

E-Workforce Ecosystem

The E-Workforce Ecosystem is an intelligent platform for manpower information management and development of competence through lifelong learning in Thailand. This initiative aims to overcome a key limitation of human capital development in Thailand, which is the lack of integration of related organizations. The purpose of this project is to develop a single-platform database system that helps Thai people of all ages, business sectors, educational institutions, training providers, and policy makers to have access to a comprehensive labor database comprising personal information, education, training, and work status. This will lead to the design of assistance measures, incentive systems, social protection systems, and labor skill development systems that can track both quantitative and qualitative results through online channels.

Vietnam

According to the World Bank, Vietnam's Human Capital Index (HCI) increased from 0.66 to 0.69 in the 10-year period of 2010–20. Vietnam's HCI was higher than any other lower-middle-income country and many countries at multiples of Vietnam's income level, despite lower levels of public spending on health, education, and social protection. Vietnam is one of the countries with the highest HCI scores in the east Asia–Pacific region. This reflects the great achievements in general education and health over the years.

Review of National Labor Training and Reskilling Strategies

Overview of Vietnam's Human Resource Development Framework

Understanding the important role of human resources in socioeconomic development, the Vietnamese Communist Party has advocated a strategic breakthrough in human resource development (HRD). In order to concretize the Party's viewpoint, the National Assembly promulgated the Law on Higher Education in 2012 (amended in 2018); the Law on Vocational Education in 2014; the Labour Code in 2019; the Education Law in 2019; Law on Public Officials; and Law on Public Officials, among others. The government has issued many legal documents guiding the implementation of the laws as well as mechanisms and policies on HRD. In addition, the Prime Minister approved the Vietnam Human Resource Development Strategy for the 2011–20 period, the Vietnam Human Resource Development Master Plan for the 2011–20 period, and the Vocational Training Development Strategy for 2011–20 period. These documents have created a legal framework and the driving force for HRD in terms of both quantity and quality.

Vietnam Education System and the Vietnamese Qualification Framework

Vietnam's national education system is regulated through Decision 1981/QĐ-TTg approving the structural framework of the national education system. The Law on Education 2019 legalized the provisions of the national education system and the Vietnamese Qualifications Framework (VQF) in order to facilitate a smooth transition between education and training levels of the national education system. The structural framework of the national education system indicates education and training levels of the national education system while the VQF regulates qualification levels and learning outcomes of different education and training levels.

Under the Law, the national education system is an open and permeable system, consisting of formal education and continuing education. Education and training levels of the national education system include early childhood education, general education, vocational education, and higher education. Specifically, early childhood education includes nursery education and preprimary education; while general education consists of primary education, lower secondary education, and upper secondary education. Vocational education provides training at elementary, intermediate, and collegial levels along with other vocational training programs; while higher education provides training at bachelor's, master's, and doctor's levels.

Labor Market Transition Opportunities

Vietnam is in the process of industrialization, modernization, and international integration. IR4 opens up many opportunities in improving technologies and enhancing production capacity and competitiveness in the product chain; creates a big change in the form of the service business; creates lots of opportunities for innovative startups; significantly reduces transaction and transportation costs; boosts attractive and potential investment in the field of digital technology and the internet; and provides a great opportunity for industrial production with advanced science and technology levels.

However, although Vietnam has focused on IR4 policy reforms, in terms of workforce digital skills, the nation dropped from 92nd rank in 2019 to 96th rank in the 2020 Global Talent Competitiveness Index (GTCI). This implies a requirement for improving skills of workers to meet the needs of enterprises. The forecast for the impact of IR4 on employment in Vietnam shows that work efficiency will increase, while the restructuring of employment will likely decrease the number of jobs by 2.9 million to 3.8 million compared with the baseline (Vietnam Central Economic Commission, 2019). The majority of the job losses will be for unskilled workers (73%); followed by craftsmen and related workers (17%); machine, workshop equipment operators, and assemblers (6%); and skilled labor in agriculture, forestry, and fishery sectors (5%).

The sectors that will attract maximum workers include high-tech agriculture, energy, tourism, hotels, restaurants, logistics, services, medical, healthcare, beauty care, media, ICT, equipment maintenance, and construction. These are the sectors that require most workers to hold occupational skill certificates and be trained. It is estimated that these sectors will face difficulties in recruiting workers in the coming years.

Strategic Policy Directions for Cultivating New Talent for Future

Direction and Solutions for Vietnamese Workers' Skill Development

As per Vietnam's socioeconomic development strategy for the period of 2021–30, with a vision to 2045, Vietnam will become a developing country with modern industry, reaching the middle-income level and strive to become a high-income developed country by 2045. To achieve this goal, it is necessary to focus on developing high-quality human resources to meet the requirements of

IR4 and international integration. In addition, it is important to focus on renovating the VET system in an open and flexible direction, ensuring consistency with the policy of fundamental and comprehensive reforms in education and training, focusing on improving the quality of human resources, restructuring labor, forming a skilled workforce, increasing national competitiveness, and closely linking training and employment.

Resolution No. 52-NQ/TW of the Central Committee on a number of guidelines and policies to actively participate in IR4 sets out goals for Vietnam's next development period. In terms of HRD, the resolution indicates the need for 'strengthening VET and supporting skills training for job change.' The State has policies to support employees when participating in retraining or further training to improve their professional skills to change jobs.

On 4 February 2020, the Prime Minister issued the Directive 07/CT-TTG on solutions to promote national labor productivity, which requested relevant bodies from central to local levels, within their jurisdiction, to effectively direct and carry out major reform orientations to increase labor productivity in Vietnam. In particular, the MOLISA has the task of "improving policies to encourage enterprises to participate in VET activities; providing VET training programs delivery methods and assessment; linking training with enterprises, employers, and sustainable jobs; and promoting training, retraining workers, and training high-quality technical workers capable of participating in smart production and technology-based business model."

The Directive No. 24/CT-TTg, dated 28 May 2020, on promoting skilled workforce development to contribute to the improvement of productivity and national competitiveness in the new situation has been issued. Prime Minister requests ministries, central authorities, and local governments to focus on performing the following tasks: continue to properly implement mechanisms and policies for development of vocational education and a skilled workforce; further carry out digital transformation and online training, with a focus on retraining and regular training of the workforce to bring about great changes in terms of size, quality, and efficiency of vocational education; and ensure that learners acquire professional skills, digital skills, soft skills, entrepreneurship skills, languages, etc. required by the labor market. Vietnam is striving to reach the vocational education level of ASEAN-4 countries by 2030 and that of G20 countries by 2045; and increase communications activities, change social consensus, and mindsets about development of vocational education and the position and role of the skilled workforce to mobilize participation and resources from the whole society, especially enterprises' cooperation in developing a skilled workforce for Vietnam's development.

Direction of Vietnam VET Development Strategy for 2021–30, with Vision to 2045

VET development is one of the most important tasks for the country's socioeconomic development in order to take advantage of the golden population structure; contributing to improving the quality of human resources, labor productivity, quality, efficiency, and the economy's competitiveness; adapting to the rapid changes in the labor market; and meeting the requirements of the industrial revolution and international integration. Some of the focus areas include:

- focusing on VET training scale, structure, and quality; selectively absorbing international experience on VET institution models; and training key occupations and fields;
- developing VET to meet the labor market's needs in association with decent work, social security, and sustainable and inclusive development; maximizing learners' capacity; and promoting entrepreneurship and innovation;

- improving professional skills and good qualities of Vietnamese workers in the integration period, and gradually popularizing VET for young people;
- prioritizing budgetary allocation for VET in the total state budget expenditure for education and training as well as in programs and projects of branches and localities; and
- strengthening the socialization of VET in suitable areas, industries, and occupations.

Vocational education development is the responsibility of all levels of government, agencies, organizations, enterprises, VET institutions, and people. There is a need to focus on VET in development plans, programs, schemes, and projects across sectors and localities.

Program to Support Development of Vietnam's Labor Market up to 2030

The focus areas include:

- developing a comprehensive and sustainable labor market in a modern and effective direction, in line with the characteristics of each region and locality;
- the State playing the role of creating and supporting the development of the labor market by completing and improving the effectiveness and efficiency of mechanisms, policies, and legal documents on labor market development; and promoting administrative process reforms to limit risks related to workers' rights in the context of IR4; and
- actively integrating into the world and promoting the connection between domestic labor supply and demand in association with the international labor market.

Policy Recommendations

In the era of IR4, the role of technology is accelerated. Technological and digital adoptions are still low, both at the firm and the country level, and so, there is a need to raise awareness about the technology and its benefits as well as risks. At the same time, TVET training providers also need to work with the private sector in order to produce skilled labor forces, especially those having technical skills, soft skills, ICT skills, and digital skills. In future, more investment in technical manpower such as systems engineering, data analysis, and AI personnel will be required. These are important trends and policy experiences across member countries.

However, some challenges remain regarding skill gaps and shortages in the labor market for both technical and soft skills. To tackle these challenges, both the government and the private sector are working together aiming to cultivate qualified labor forces. The government should also develop soft-skills training materials and introduce them to all TVET training institutions to apply. In terms of skill development and training, an emphasis should be placed on both quantity and quality. The government should expand access to training opportunities to reach vulnerable groups including the poor, the elderly, and women. At the same time, adequate training should be provided to upskill the Thai workforce to work in the 21st century. More advanced technology or STEM courses as well as soft-skill courses must be encouraged more.

Besides, some firms in the private sector have also initiated training programs to fill the gaps in the labor market. Skill development is a long-term investment with proper planning and implementation.

More commitments from the private sector are also needed. After reviewing member countries, the following two guiding principles are suggested:

Do not hamper automation, and let the market experiment: Automation has the potential to bring in substantial improvements in the aggregate quality of life and work opportunities. The quest for realizing such a technology must not be thwarted by restrictive policies stemming from a Luddite paranoia. Hence, market forces should be left to interact freely. To enable market forces to realize the greatest benefits, it is crucial for the labor supply to be adequately equipped to withstand changing tides of automation. More specifically, labor must be skilled enough to shift jobs within and between sectors. Such mobility is possible if workers possess skills covering a range of tasks in demand, especially cognitive, both routine and non-routine.

Right to decent work (do not plan for mass technological unemployment but facilitate reinstatement): Work is essential to humans and provides benefits that transcend the individual person it originally concerned. Accordingly, policy must give space for automation, but at the same time ensure that the hollowing out of mid-skill jobs (and jobs in general) does not violate the labor's right to decent work. This can be achieved by skilling and facilitating mobility; incentivizing labor engagement; and having a social protection system in place. Another consideration to keep in mind is that interventions must be wary of making labor more expensive (higher monthly wages, extra contributions to labor funds, etc.) as that would bring down the relative cost of automation.

Based on these two principles, policy imperatives should be as follows:

Imperative 1: Skilling and Labor Mobility

It becomes important to re-envision skilling and education in general. Various labor competencies are determined by which schools people go to at a young age. Policymakers need to stop treating educational and skills training as they have conventionally been understood. Workers from all spheres will have to keep upskilling throughout their careers as and when disruptive technology keeps emerging. One cannot allow labor to compete solely on the privilege of good education received in childhood, and competencies have to be developed in individuals that go beyond specific tasks. An example of this is soft-skills training for integrating individuals into the hotels and accommodation industry, as these skills can be utilized in other jobs as well.

Imperative 2: Social Security

There is an urgent need for simultaneously devising a social security measure. The job polarizing effect of automation will result in two ills revolving social security. First, many mid-skill workers are displaced from formal employment structures where they received social security benefits. Second, the wage polarizing effect reduces the dispensable income available to workers, which could result in reduction in the income being utilized for health purposes. The role of the state in financing social-security scheme is important as the funding aspect should not burden the industry too much. Rather, if the industry considers the costs for engaging labor to be substantial, it would catalyze automation.

Imperative 3: Labor's Competitive Edge over Automation

Government policies can aim at giving labor a competitive edge over automation in industries where automation is intended to merely substitute labor with capital. This can be done by increasing the relative cost of capital, thereby disincentivizing automation. Other possible options include reduction in tax deductions for interest, increased cost of acquiring automation technology,

elimination of capital subsidies, and so on. More explicit moves include implementation of ‘robot taxes’ repeatedly promoted by Bill Gates.

Other Concerns

First, automation has also been suspected of deskilling labor due to its polarizing effect on jobs. Automation pushes existing mid-to-low-skill workers into low-to-unskilled work and reduces the aggregate skill composition. This has been observed even when automation brings about a strong reinstatement effect. Second, availability of opportunities and attempts at skilling may not be sufficient. Third, automation has become a tool for subverting democratic forces and progress. Specifically, the following concrete policy recommendations may be considered to facilitate sustainable employment in the face of changing skill demand with IR4:

- (1) improving the skill levels of human resources, given the recognized known needs of each field of activity;
- (2) holding training courses in areas required for the field of business activities;
- (3) facilitating the recruitment of skilled labor appropriate to each field of activity;
- (4) creating or strengthening educational and executive institutions and improving the skills of human resources using existing capacities;
- (5) helping workers absorb technical knowledge tailored to the real needs of each field of activity;
- (6) creating or supporting actors of venture capital or other similar types of investment;
- (7) facilitating the relationship between businesses and employment in each target activity;
- (8) facilitating the connection between the local businesses and their respective sectors;
- (9) facilitating the recruitment of temporary foreign skilled labor, if allowable; and
- (10) contributing to the direct presence of business units and workers in regional and global markets.

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POLICIES
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