# DIGITALIZATION AND THE FUTURE OF WORK

## FUTURE OF WORK: DIGITAL FUTURES IN ASIA SERIES

**About Pacta**

Pacta is a Bengaluru (India) based boutique law and policy think tank dedicated to supporting civil society organizations, universities, and non-profit initiatives. It has an unflinching commitment to provide legal and policy consulting support for public service delivery. Acknowledging the crucial role of research and scholarship for social development, Pacta engages in law and policy research through self-driven and collaborative projects.

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# Digitalization and the Future of Work

## Chapter 1: Introduction: Tracking Digitalization

The Covid-19 pandemic has caused profound financial ripples around the world, along with grave socio-economic repercussions for ordinary people. At the height of the pandemic, preventive lockdown measures ranged from complete restriction on non-essential movements, as witnessed in most Asian countries, to public recommendations and instructions to reduce non-essential trips, as seen in Japan (Hale et al., 2021). To survive lockdown(s), several economic activities perforce became digitalized. This affected businesses and work, especially informal employment which accounts for the majority of the employment in South Asia and Southeast Asia (Allard, 2020). The sectors which could not be effectively digitalized suffered severe losses as social distancing abruptly halted lives.

At the peak of the first wave of Covid-19 in June 2020, the economic growth rate in East Asia and the Pacific Region had dwindled to a mere 0.5 percent (Vashakmadze, 2021). Although economic indicators have since recovered significantly, societies are yet to recuperate from the impact of the pandemic and its exacerbating effect on pre-existing inequalities and vulnerabilities (World Bank, n.d.). A study by Pew Research Centre suggests that around 75 million more people have been pushed below the poverty line in India in its aftermath (Kochhar, 2021). The report notes that other South Asian countries, including Bangladesh, Sri Lanka, and Nepal have witnessed an estimated 75 percent increase in poverty (Kochhar, 2021b). Southeast Asian countries have also registered a sharp rise in poverty (Lakner et al., 2020).

Although wrought with hardships, the pandemic is also a prophetic moment, offering a glimpse into the future of work. It has catalyzed the prevailing trends of digitization and automation in labor and employment, as well as industrial development. Touted as the 'Fourth Industrial Revolution', or 4IR, the near future is characterized by the 'Internet of Things' (IoT), Artificial Intelligence (AI), augmented reality, and advanced manufacturing technologies such as 3-D printing. This ongoing trend has received a significant boost during the Covid-19 pandemic.

One of the key drivers of growing digitalization includes investments in the digital space. Increasing number of countries in Asia are attempting to foster digitalization among enter-

prises to make their economies more future-ready. Such a push is reflected by several government-led initiatives and policies to provide a support system for, among others, AI, machine learning, healthcare technology, financial technology, and education technology. For instance, in India, technology-enabled services are among the key start-up areas, with several technology start-ups reportedly having received private funding amounting to approximately USD 9.3 billion in 2020 (Singh, 2020). In Singapore, government and private sector enterprises have, since the pandemic, offered support through the Innovation Advisors Program (IAP) to over 500 Small and Medium Enterprises to digitalize their businesses and ensure local businesses can emerge stronger from the crisis (Tan, 2021).

With growing digitalization and changing nature of entrepreneurship, nature of work is also transforming. The rise of digital platforms is creating new forms of workforce which poses unique challenges to the rights of those involved. Further, 4IR is expected to shape the future of work by inducing deskilling of millions of workers and triggering further deindustrialization in developing countries. At the same time, it is also expected to create new kinds of jobs and augment existing jobs that are heavily dependent on human mediation.

Such a push by countries towards digitalisation has led to creation of new work opportunities and brought along challenges for the workers. Towards this, this paper captures some of the trends which are beginning to take shape and are expected to substantially transform the near future of work. This includes the growing prevalence of artificial intelligence and digitalization across employment, education and reskilling, and businesses in key economies in South Asia (India, Pakistan, Bangladesh, Sri Lanka, Nepal), Southeast Asia (Indonesia, Thailand, Philippines, Malaysia, Singapore) and East Asia (South Korea, Japan, China).

In light of the discussion around future of work, the second chapter reflects on the emergence of digital platforms. With the growing digitalization and changing nature of entrepreneurship, such platforms led to the creation of a new form of workforce i.e., platform workers who are often categorized as independent workers but treated as employees. Such an ambiguous categorization poses a threat of violation of labor rights of such workers. This chapter highlights the platform economy and the risks associated with it.

The emergence of digital platforms also points towards the automation of activities such as teaching, delivery, translation, et cetera. Digitalisation has catalysed the growth of artificial intelligence and automation in countries as evidenced by the use of robots and automated machines in education, healthcare, hospitality and other field. Chapter three traces the deployment of AI, policies and initiatives undertaken by countries to promote AI. This is followed by the analysis of risks and challenges associated with the deployment of AI.

Emergence of digital platforms, artificial intelligence and automation has led to the creation of a new form of workforce and is expected to shape the future of work by inducing deskilling of millions of workers and triggering further deindustrialization in developing countries. At the same time, it is also expected to create new kinds of jobs and augment existing jobs that are heavily dependent on human mediation. To address the challenges posed in the form of deskilling, chapter four examines the need for education and skilling initiatives to be undertaken by countries.

While digitalisation may potentially open floodgates of opportunities, such opportunities are likely to suffer from present socio-economic disparities. Chapter five highlights that women are more likely to face impediments in adapting to digitalization due to the intrinsic nature of the work that host large proportions of women workers. Together with the disproportionate burden of household responsibility, which aggravated during Covid-19, and unequal access to technological know-how, they can experience greater difficulties than men in the digital future.

The need to brace against these challenges and ensure an equitable transition warrants an examination of the future(s) of work. Chapter six brings together policy recommendations that address the policy challenges posed to the future of work.

## Chapter 2: Platform Economy

In the past decade, a massive shift has been observed from offline businesses to online platforms as economies get digitalized. From *kirana* (local grocers) stores and local vegetable vendors to high-end restaurants, businesses are moving their services online. Studies suggest that, globally, there has been a three-fold increase in the number of web-based online platforms between 2018 and 2020 (Jha, 2021).

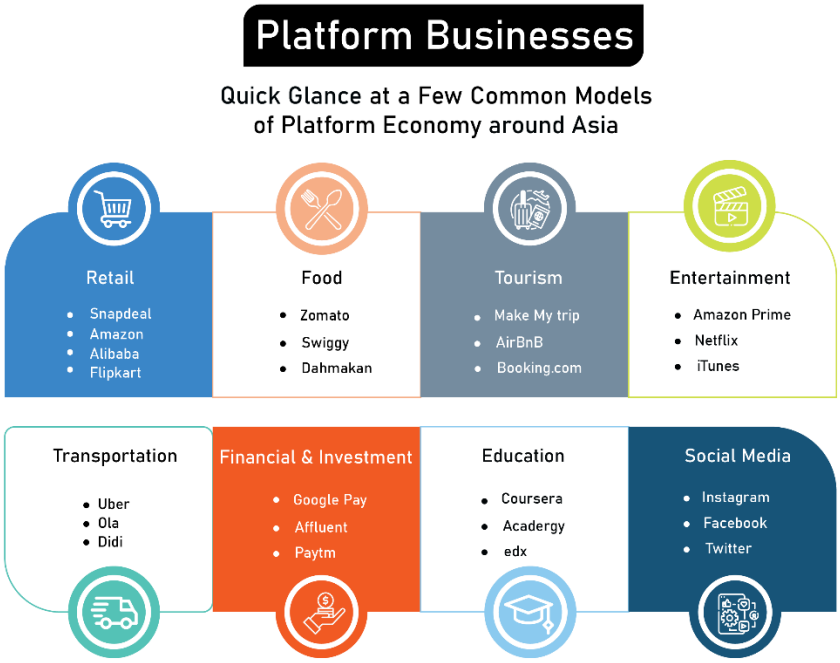


Figure 1. Platform Businesses in Asia

A platform acts as the digital interface wherein interaction occurs at three levels – consumer, platform, and service/goods provider (Daisy Chan, 2018). Based on how it is delivered, work on digital labor platforms is conventionally classified into two categories – location-based and cloud-based work (Hennie Bester, 2020). The former, also referred to as 'on-demand app-based work' is an amalgamation of online and offline methods. Work on cloud-based platforms, also known as 'crowdwork', is performed exclusively online from anywhere in the world.

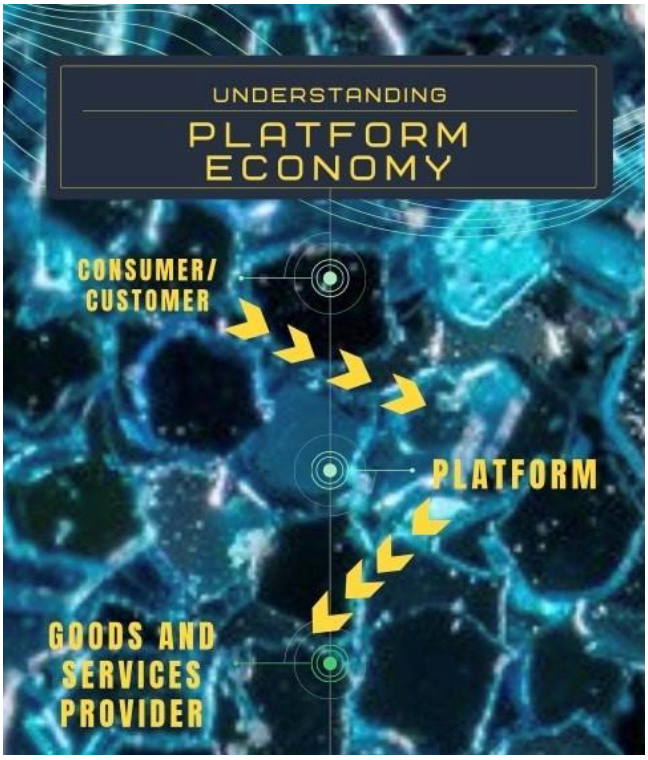


Figure 2. Understanding Platform Economy

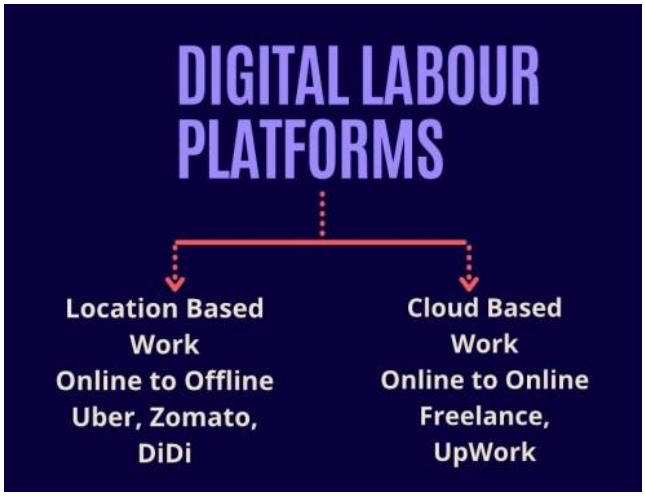


Figure 3. Digital Labor Platforms

## 2.1 Platform Economy: Trends in Asia

In Asia, the combined value of digital platform companies accounted for 20 percent of the total GDP of the region, as of 2017 (Asian Economic Integration Report 2021, 2021). As per a survey conducted by the Centre for Global Enterprise in 2016, there are 62 major[1] on-

[1] To narrow the list and reveal the most significant platforms, the list was narrowed by selecting companies that had: 1) secured investment funding of at least $1 million, or 2) were companies that operated a portfolio of platform companies in Asia. This resulted in a final list of 62 platform companies.

demand app-based platforms across Asia: 32 in China, 17 in Northeast Asia (Japan and Korea), 9 in India, and 3 in the Association of Southeast Asian Nations (ASEAN) (Evans, 2016). A few platforms have been listed in the figure 4 below.


Figure 4. Platforms in India, China and Japan
Source: Centre for Global Enterprise

Asian countries have also become the hub of crowdworkers in the world (see Figure 5). India, in particular, is home to a large number of informal workers (Nearly 81% of the Employed in India are in the Informal Sector: ILO, 2018), and acts as the largest supplier of platform crowdworkers in the world followed by Bangladesh (Lehdonvirta, 2017).

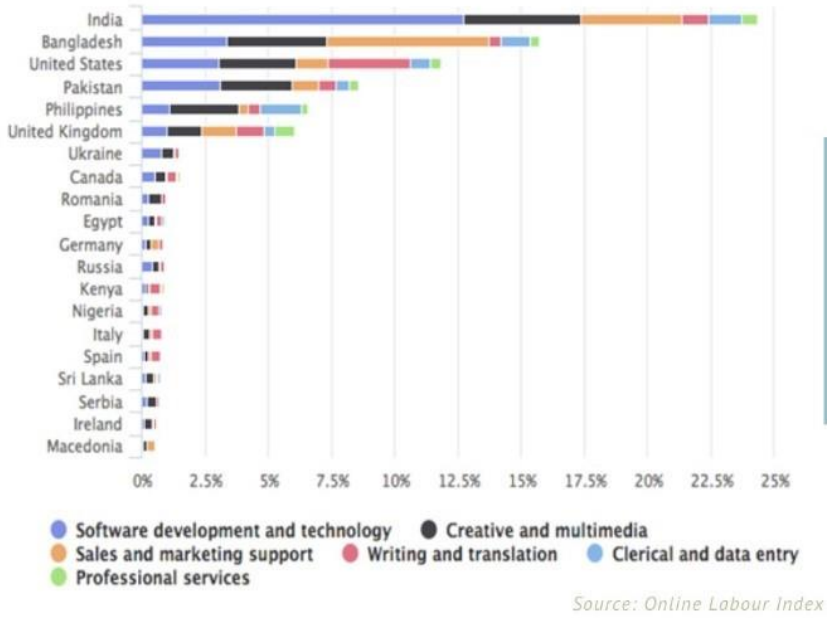


Figure 5. Supply of Crowdworkers
Source: Online Labor Index (2020)

The Online Labour Index – which provides the gig economy equivalent of conventional labor market statistics – further classifies crowdworkers in Asia into six main categories to help trace workers associated with each profession elaborated in Figures 6 and 7.

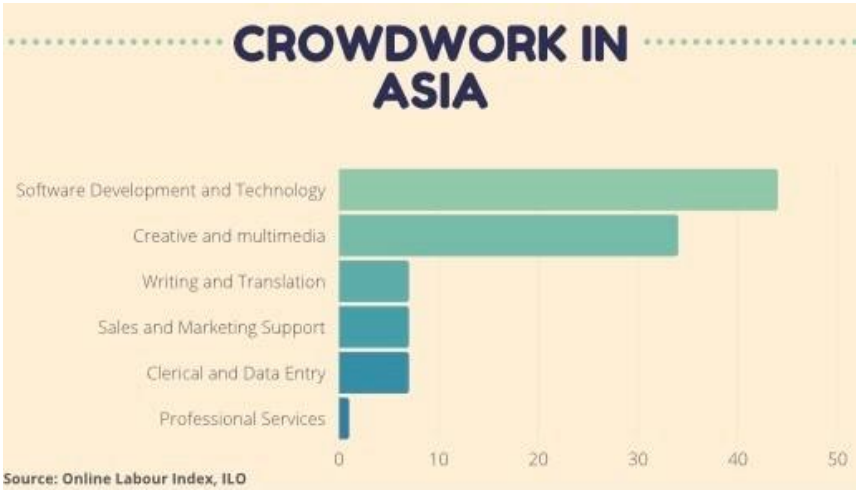


Figure 6. Crowdwork in Asia
Source: Online Labor Index, ILO (2020)

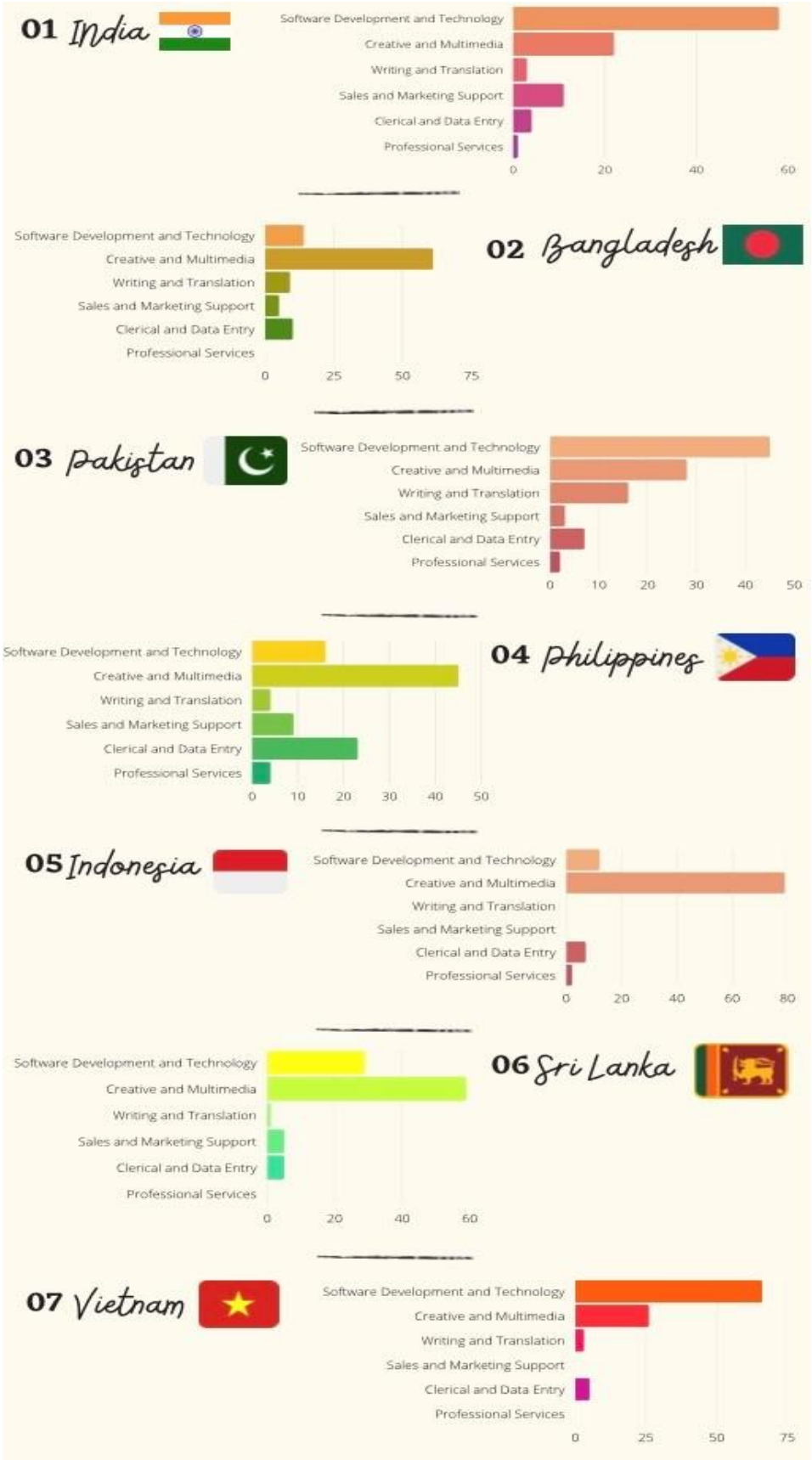


Figure 7. Crowdwork in Asia
Source: Online Labor Index (2020)

In China, the number of individuals providing services through platforms has increased from 50 million (6.5 percent) in 2015 to 75 million (9.7 percent) in 2018 (Zhou, 2020). According to a McKinsey survey, around 540 million individuals will benefit from 'online talent platforms'[2] by 2025 (Robinson, 2015).

Table 1: Potential Impact of Online Talent Platforms

| **Countries** | **% of Employees** |
|---|---|
| Singapore | 1.9 |
| South Korea | 1.8 |
| Japan | 1.6 |
| Philippines | 2.9 |
| Indonesia | 2.7 |
| Malaysia | 2.0 |
| India | 2.2 |
| Thailand | 1.3 |
| China | 1.7 |

Source: McKinsey Global Institute Analysis

Even as platforms are being perceived as the harbingers of new employment opportunities in the digitalized world, platform workers face job insecurity, and are subjected to degrading and exploitative work conditions under the garb of autonomy (Platform Workers' Fight for Rights & Dignity - an Explainer, n.d.). They are saddled with erratic working hours and irregular income – that often does not adhere to minimum wage standards (Fairwork India, 2020) – and denied social protection rights (Forde et al., 2017).

[2] Online Talent Platforms are marketplaces and tools that can connect individuals to the right work opportunities.

Classification of platform workers as independent contractors rather than employees makes them ineligible for social security benefits under the labor laws. For instance, platform drivers or delivery riders are often titled as 'partners' or 'delivery partners' to indicate that they have the autonomy to decide work timings and assignments to be undertaken. In reality, platforms such as Grab, Gojek, and Uber impose minimum daily acceptance rates for drivers and riders to continue searching for orders and claim incentives/bonuses (Nastiti, n.d.). In China, Meituan penalizes workers in the event of refusal to accept orders even though the route and time restrictions may make the trip impossible (Rothschild, n.d.). In India, drivers on ride-hailing platforms are denied health claims or sick leave (Salve, 2019).

### 2.2. Policy Challenges

#### Challenge 1: Lack of Decent Work and Social Protection Rights

Productive work, a fair income, a safe workplace, social protections, prospects for social development and integration, the freedom for people to express their concerns, the ability to organize and participate in decisions, and equal opportunity and fair treatment are among the indicators of decent work (Decent Work). For platform workers, these continue to be far-fetched goals. One key reason is the lack of a standard employer-employee relationship between workers and the platform, which puts them at a disadvantage. Their non-standard employment status and the lack of statutory protections under countries' legal systems suggest that platform workers are more adversely impacted than others (World Economic Forum, 2020). In Japan, for instance, food delivery workers classified as contractors rather than employees by Uber Eats, are denied essential benefits such as accident insurance and paid holidays (Hamza, 2021).

Often, platforms contend that they play the role of an intermediary while workers function as self-employed or independent contractors (Berg & De Stefano, 2016; Prassl & Risak, 2016). This is further consolidated by the terms and agreements of the employment contract (De Stefano et al., 2021). By classifying workers as independent contractors in its terms and conditions, Gojek, for instance, is able to escape compliance with labor laws and avoid employer contributions to social security schemes ("Driver Services Agreement | GOJEK SG", 2020).

Due to the asymmetry of power involved, service agreements formulated by platforms leave no scope for workers to negotiate the terms, thus making it a 'take it or leave it' model. The terms of service often give platforms the power to deactivate a worker's account without providing any reason and prior notice (OECD, 2019). Similarly, under crowdwork arrangements, platforms can reject assignments/work of the platform workers without stating a reason.

While platforms claim that they do not "employ" platform workers, the question has been presented before and variously interpreted by courts across multiple jurisdictions in Asia.

Case 1: National Labour Relations Commission (NLRC), South Korea (De Stefano et al., 2021)

The Commission scrutinized the degree of control and direction imposed on the driver by Tada, a ride-hailing service in South Korea. The NLRC observed that the driver was subjected to an extensive set of work rules and restrictions such as start/end hours, mandatory response to ride requests, attire and conduct during the ride, etc. Therefore, the NLRC held that the driver was an employee and thus eligible to employee benefits under the Labor Standards Act.

Case 2: The eDaijia, China (Yu Liu, 2019)

The court in Beijing ruled that drivers of the eDaijia platform were independent contractors, and therefore, liable for their own actions. However, a Shanghai court, in a similar case, held that drivers were employees of eDaijia, thus making the company liable for the actions of its drivers.

Courts have arrived at different conclusions with respect to the employment status of platform workers. Their reasoning often revolves around the extent of control and direction imposed by platforms over the functioning of workers – as held by Employment Appeal Tribunal, U.K. in the case of Uber v. Aslam[3], Farrar, Dawson and others (*Uber B.V. v Y Aslam*, 2017). These factors are crucial in determining the employment status of the platform

[3] In Uber v Aslam, Farra, Dawson and others, the employment tribunal held that drivers are workers under the Employment Rights Act and are entitled to minimum wage and holiday pay.

worker given that the traditional outlook towards social protections is predicated on the existence of employer-employee relationship.

A few countries have avoided the qualification of an existing employer-employee relationship to provide social protection rights and enforced laws without conferring the status of 'employees' to platform workers.

Table 2: Laws Regulating Platform Workers

| STATUS | COUNTRY | LEGISLATION |
|---|---|---|
| Countries with Laws for Platform Workers | India | Social Security Code, 2020 requires mandatory registration of platform workers on an online portal. The Code confers power in the government to frame welfare schemes for platform workers related to life and disability cover, accidental insurance, health and maternity, old age, and other benefits. |
| | South Korea | Labour Standards Act – governs working conditions of employees. It covers platforms workers within its ambit as an employee has been defined as a person, regardless of the occupation, who offers labour to business or a workplace for the purpose of earning wages. |
| | Philippines | Freelance Workers Protection Act - covers taxation, compensation, and contract law for freelancers. Registration with the Bureau of Internal revenue, mandatory contract with clients, and protection from client retaliation are a few features of the Act. |
| | Japan | Improvement of Transparency and Fairness in Trading on Specified Digital Platforms, 2020 obliges digital platform operators to disclose terms and conditions for the use of their platforms and to take certain measures to promote mutual understanding of digital transactions. |

| STATUS | COUNTRY | LEGISLATION |
|---|---|---|
| Countries Drafting Laws for Platform Workers | Philippines | Philippine Statistical Authority defines the gig economy workers as part of the underemployed labor force or persons who express the desire to have additional hours of work in their present job, or have an additional job, or have a new job with longer working hours. Although the authorities have time and again pressed the need to formulate statutes, the same is yet to be determined. |
| | Pakistan | The Mazdoor ka Ehsaas Programme, launched by Prime Minister Imran Khan on the eve of Labour Day, aims to provide social protection to the informal economy workers. Additionally, the Centre for Labour Research has already been working on gig economy issues. They recently drafted a Protection of Home-Based Workers Law for Islamabad Capital Territory which has been approved by the Federal Cabinet and will soon be submitted to the national Parliament. A first of its kind, the proposed legislation recognises gig work and gives online workers the right to social protection, including sickness benefits, work injury benefits and old-age benefits. |

While countries are dwelling on the extension of social protection rights to platform workers, it is essential to go beyond the traditional employer-employee framework, since the working conditions are different for platform workers. For instance, a platform worker may be associated with multiple platforms at a time (Ola Mobility Institute, 2021). In such an event, the responsibility to provide social security benefits shall delve upon which entity. Such possibilities, unique to platform work, have to be accounted for and laws have to be designed to best protect the platform workers. The policies must be designed to account for the varied nature of platform work.

## Challenge 2: Absence of Collective Bargaining Rights

Collective bargaining, as defined by ILO, indicates the negotiations between an employer and one/more worker organizations for determining working conditions and terms of employment; and regulating relations between employers and workers (*C154 - Collective Bargaining Convention, 1981*, 1981). It allows workers and companies to stand on the same footing and negotiate the pay scale/wages, working conditions, and tasks. The nature of

platform work makes it difficult for workers to interact and form associations/unions for collective bargaining. This, in turn, hinders their ability to negotiate for fair working conditions, pay scale, settlement of disputes, and other relevant discussions.

In an ecosystem where platform workers are already excluded from the protections provided by labor legislations, collective bargaining rights become crucial. However, statutorily, platform workers are not required to be represented in the trade unions, thus providing no statutory power and right to participate in collective bargaining. As per the International Trade Union Confederation (ITUC) Global Rights Index, 87 percent and 91 percent of the countries in the Asia-Pacific region have violated the right to establish or join a trade union and the right to collective bargaining, respectively across multiple sectors (ITUC, 2020). Further, since the claimed nature of the platform as only an intermediary between the worker and the consumer, platform workers are often put in a dicey position where they cannot decide the appropriate party for negotiation.

Platform workers' unique location in the platform economy leads to several challenges that are only heightened with the unjust terms and conditions of use of platforms. The unilateral nature of the platforms' terms forces platform workers to accept unequal work relationships where the platform exerts power over platform workers. The terms of service often give platforms the power to deactivate a worker's account without providing any reason and prior notice to them (OECD, 2019). At the same time, under crowd work arrangements, platforms have the power to reject the assignment/work of the platform workers without any reason. The terms and conditions are imposed on the platform workers with no scope for challenge and negotiation. In the organized sector, the unjust conditions at workplace are often challenged by the trade unions or associations. In the case of platform workers, the law does not mandate the constitution of a trade union as it mostly does in case of organized sector.

The nature of platform work further makes it difficult for workers to interact and form associations/unions for collective bargaining and hinders their ability to negotiate for fair working conditions, pay scale, settlement of disputes, and other relevant demands. In an ecosystem where platform workers are already excluded from the protections provided by labor legislations, collective bargaining rights become crucial.

The absence of statutory mandates does not restrict platform workers from collectivizing and organizing actions for ensuring better working conditions and pay. Efforts have been made to unionize and make collective representation against the unjust terms imposed on platform workers.

Surpassing the difficulties posed by the structure of digital platforms, the nature of work, and statutory challenges, several unions/associations have emerged in Asia with the intention of empowering the platform workers. All Indian Gig Workers Union, Indian Federation of App Based Transport Workers, and Ola Uber Drivers and Owners Association in India, Tokyo Young Contingent Workers' Union in Japan, National Delivery Champions Association in Singapore, and Riders Union in Korea are a few unions/associations.

The unions have taken up a range of initiatives from filing litigation, organizing strikes, and negotiating with employers and governments.

In India, the Indian Federation of App Based Transport Workers has filed a Public Interest Litigation (PIL) with the Supreme Court demanding social security benefits of app-based transport and delivery workers (Soni, 2021). Garda, an association of drivers in Indonesia, organized monthly demonstrations in Jakarta to agitate against unfair working conditions. Garda has entered into negotiations with the government to set minimum wages for motorbike taxis ("Delivery workers struggle in Indonesia - Angry Workers", 2019). A labor union formed by 17 delivery workers in Japan has provided a platform for food delivery workers for several work-related negotiations with Uber Eats (Hamza, 2021).

In China, such efforts have met with retaliation and sanctions. Chen Guojiang Mengzhu, a delivery worker in China, started documenting the plight of delivery workers in China, and in the process, realized the need to organize platform workers. By establishing Delivery Riders Alliance, Chen Guojiang called for workers to come together against the e-commerce corporation they worked for to demand better pay and working conditions. His efforts were met with sanctions. In October 2019, he was sent to detention for trying to organize a three-day strike among workers ahead of the country's major online shopping holiday. In April 2021, Chen Guojiang was sent to serve 5 years in jail (Feng, 2021).

Despite such pushbacks, the unions have brought attention towards the plight of platform workers, thus, pushing governments to initiate conversations around providing relevant protections under law (Hamza, 2021). Pertinent to note that the existence of unions by itself will not remedy the challenge and the same shall be accompanied with political will and commitment of employers.

## Chapter 3: Automation and AI

AI is being employed today across sectors ranging from healthcare, education, agriculture, and financial services. One of the major challenges plaguing AI is the necessity of face-to-face human interaction to ensure effective delivery of services. However, with the onset of Covid-19, this challenge turned into an advantage as socially distant engagement became necessary. During the pandemic, for instance, AI in the field of education was used for remotely-proctored examination, either with the support of 'human' proctors or 'artificially intelligent' proctors, due to the limitation in the use of physical examination. Medical tele-consultations, similarly, saw an increase during the pandemic. AI has also crept into the personal space of people as digital assistants Siri and Alexa, driverless cars, and robots become an integral part of our lifestyle. The Oxford Insights' evaluation of countries' readiness for AI[4] suggest that a few Asian countries are gearing towards becoming the leaders of this space in the next few years and are taking measures to achieve this objective ("AI Readiness Index 2020 — Oxford Insights", 2020).

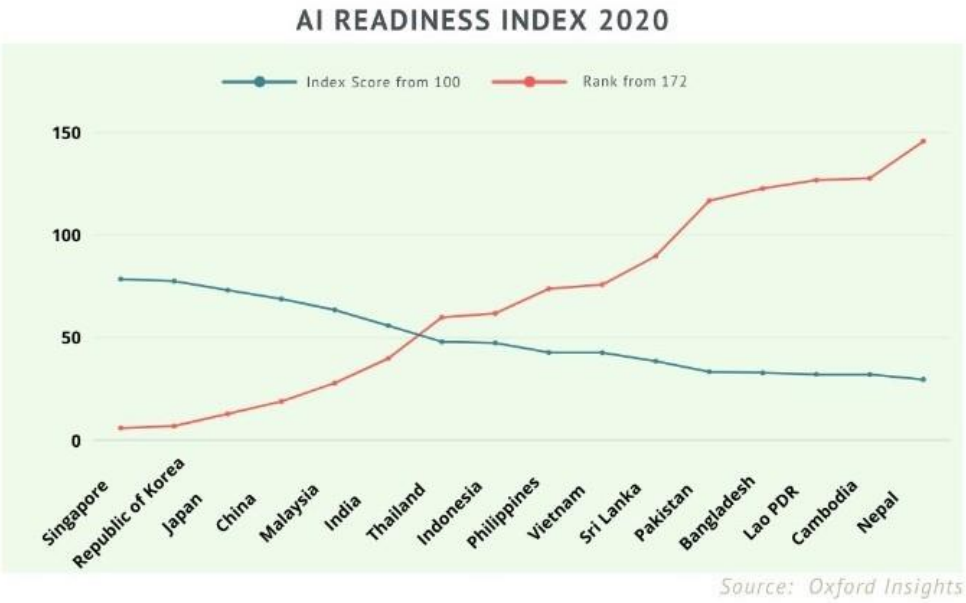


Figure 8. AI Readiness Index
Source: Oxford Insights

Countries in Asia have launched policies, programs, projects, and other measures to drive the development of AI and become the leading power. For instance, 12th National Economic and Social Development Plan (NESDB, n.d.) in Thailand, National Strategy for the

[4] Indicators include vision, governance and ethics, digital capacity, adaptability, size, innovation capacity, human capital, infrastructure, data availability and data representatives.

Development of Artificial Intelligence in Indonesia, and Artificial Intelligence Open Innovation Platforms Initiative in China focuses on developing AI in the field of education, science, health and other such public sector reforms. Countries such as China, Japan, India, and South Korea have made significant developments in the field, with others such as Bangladesh, Pakistan, Nepal, and others are slowly catching up.

The vision of the countries to develop and use AI has been furthered by the pandemic as efforts to avoid human contact while performing services proliferated. The activities that were earlier the prerogative of human workforce are now being automated. In China, the Foodom Robot restaurant in Foshan city employs robots for cooking dishes, taking orders, and delivering orders to the customers (Xinhua, 2020). The Qianxi Group utilized robots for preparing food in a hospital in Wuhan to eliminate transmission through human contact. In Japan, Pepper, a robot, is being used at hospitals to assist doctors, nurses by automating repetitive tasks (Musa, 2020). At the same time, Pepper was also being used for detecting if people are wearing masks or not and directing them to wear masks (Softbank Robotics, n.d.). SoftBank in collaboration with MasterCard has expanded the activity of Pepper to include allowing customers to make payments via their MasterCard account by using the robot's handheld tablet (Mastercard, 2016). Ubie, a Tokyo based health-tech startup, provides AI-based healthcare products, hospital SaaS products and AI symptom checkers (Crunchbase, n.d.). As on August 2020, the Indian AI market is valued at 6.4 billion USD that includes revenues from AI operations originating from India (Thomas, 2020). During the pandemic, India has registered the highest increase in use of AI as compared to the United States, United Kingdom and Japan (PwC, 2020.) In Kerala, AI is being used to deliver hand sanitizers and public health messages related to Covid-19 at the entrance of office buildings and in isolation wards (Oriel, 2020).

AI is not only undertaking monotonous tasks but also occupying the space where intelligence and decision-making abilities are required. In 2016, South Koreans and the world witnessed a Go (Yoo, 2021) match between the South Korean Grandmaster Lee Sedol and Alpha Go, an AI developed by Google's DeepMind Technologies (Borewic, 2016). AlphaGo reported victory over Lee Sedol by 4-1, thus establishing the ability and intelligence of AI. Tri Nhan, one of the first robots in Vietnam, is being employed in the field of

education to act as a teaching assistant. Tri Nhan can do math problems, translate Vietnamese to English and can answer questions in any field using Google search.

### 3.1 Analysis and Impact on Work

The aforementioned instances of use of AI and automation by countries in the fields ranging from education, healthcare to hospitality and offices indicates that AI is creeping into the workspace of humans as a substitute of human workforce.

While countries are focused on the developments which AI has made, there has been a persistent debate on the ability of AI to create more jobs or replace jobs (Frontier Economics, 2018). On one hand, AI is primarily considered a labor-replacing technology that will reshape the labor market. As done during COVID19, work that entails risks can be delegated to AI, thus reducing the risks of occupational hazards to workers (European Agency for Safety and Health at Work, 2021). Workers' skills in different sectors of production will become relatively less valuable, which may lower wages and standards of living, or even lead to job losses. The Nomura Research Institute in Japan has predicted that by 2035, Japan will witness exponential growth in AI and half of all jobs will be performed by AI robots (Gonzalez, 2021). On the other hand, it has been argued that the challenges to employment due to technological developments, machines, and innovation are one that humankind has overcome time and again (UNCTAD, 2020). AI may displace the employment of unskilled, low-skilled, and middle-skilled individuals, but it will also lead to the creation of a new category of employment. For instance, employment opportunities will be created in the field of AI management, data handling, and privacy issues associated with the use of automation and AI (Chuy et al., 2016). With automation, workers may be required to manage the functioning of AI, thus, allowing them autonomy over the AI and an opportunity to acquire new skills.

### 3.3 Policy Challenges

#### Challenge 1: Impact on Labor Rights

The use of AI is being extended towards making decisions about hiring, firing, promoting, performance management and other administrative decisions. For instance, in Korea more than 400 firms adopted AI hiring systems in 2019 (Chosum Daily 2018). AI may be biased

because of the data used in machine or deep learning, information available on internet or other information that the AI relies on for decision making (Yang et al 2021). Such bias may disadvantage the workers as the decision by AI may lead to job loss or less remuneration. The lack of transparency in the decision-making process and reasoning may make it difficult for the workers to challenge the decisions of AI. The employer may also utilize AI for monitoring the activities of workers and collecting data from workers which may raise privacy concerns for the workers. At times, such data may also be used to prevent the workers from exercising their right to unionise and conduct meetings (Deshpande et al., 2021). For instance, McDonalds in the USA had employed surveillance strategy via AI to identify the workers who were involved in the "Fight for 15$" movement and the measures taken by them to organise protests (Franceschi-Bicchierai& Kaori Gurley, 2021).

Along with the impact on employment opportunities, AI will also raise concern over the remuneration policies of organisations. The proliferation of AI will lead to tasks being automated and the employers being oriented towards employing AI since it does not demand social security benefits under labor laws. For instance, a robot does not fall sick, go on strike, is not entitled to sick leaves, minimum wages and other such benefits (Wisskirchen et al., 2017). This may rise as a challenge to the social security benefits available to workers as the employers may require them to work at low wages and without social security benefits.

### Challenge 2: Accountability of Employer, Employee and AI

Questions of criminal liability versus civil liability, accountability of an 'employer', inherent design defect, incorrect use of AI, etc. crop up leading to discussions around the liability for actions of AI. As an employer, when an AI is being employed to perform a task and damage has occurred pursuant to the functioning of AI, the question of liability of employer will become pertinent. In 2018, an Uber self-driving car got in a fatal accident causing the death of a lady on the road and the driver who was behind the wheel of the driverless car (BBC News, 2020). Under such circumstances, who is liable for the accident and death of the driver and the lady? Similarly, as a worker, if the person is handed over the task of managing the functioning of AI, what will be the extent of liability of worker in case of damage? The permissible extent of use of AI and the activities for which AI may be employed raises the concern of responsible use of AI.

To address the responsible and ethical use of AI, countries have put forth policies such as 'AI for All' strategy (Saran et all., 2018) in India, Ethical Guidelines for AI (Digital Thailand, 2019) in Thailand, Seoul PACT (Publicness, Accountability, Controllability, and Transparency) (Kim, 2019) in South Korea et cetera. Even though these policies intend to push towards the development of AI and ethical use by countries, such policies do not address the questions of accountability of AI.

# Chapter 4: Revamping the Education and Re-skilling Sector

## 4.1 Introduction

Advent of modern technology preludes job losses as well as job creations (Mckinsey, 2018). The World Economic Forum has estimated that, globally, more than eighty-five million jobs could be displaced by 2025 (Russo, 2020). South-East Asian countries are expected to be particularly impacted with an estimated 28 million jobs threatened by 2028 (Ali et al., 2018). People with jobs that involve physical activity in predictable environments are vulnerable to getting de-skilled during 4IR. Similarly, jobs that involve collection and processing of data are vulnerable as machines could perform these better, faster and cheaper (Manyika et al., 2017). Further, if 4IR reduces costs of production, it can lead to developed countries re-shoring production activities from developing countries (Stemler, 2019). This may lead to latter experiencing deindustrialization as they lose the comparative advantage of cheaper labor (Stemler, 2019).

Despite this, it is important not to succumb to the 'lump of labor fallacy' by assuming that 4IR is about job losses (Paul, 2018). Jobs that involve human emotions, social interactions, and other qualities that technology has not yet been able to replace may thrive in the coming future (Manyika et al., 2017). Further, the enhanced connectivity and technology infrastructure can facilitate breaking-up of the production chain by outsourcing certain manufacturing processes and services to places where the labor costs are low (Rajan, 2019). Thus, while job losses due to automation appear to be evident, opportunities that result from the impending AI and Technological Revolution must not be overlooked.

Reforms in the education and skilling sectors are vital to ensure that citizens better embrace technological change and equitably utilize opportunities presented by it. Empowering citizens to face the challenges posed by the transformation of work ought to begin with quality education. Experts suggest that automation and machine learning are not substitutes for human qualities such as empathy and creativity (Taylor, 2019). To leverage this, educational institutions must nurture these skills by facilitating learning through problem solving activities, empathy-building activities and encouraging critical thinking.

Digital learning plays a crucial role in education as it widens the students' access to study materials, enables personalized learning, and allows students to delve deeper into subjects

of their interest. Massive Open Online Courses are likely to become a key component of education with candidates more likely to prefer shorter programs and 'nanodegrees' in the form of certification as opposed to the conventional offline degree programs which involve multiple years of commitment (Amitabh, 2021).

Digital learning is also beginning to play a crucial role beyond formal schooling with the ideas of 'lifelong learning' and reskilling emerging as key components for preparing citizens to face the challenges posed by the 4IR (ILO, 2020). Attending college and obtaining degrees no longer delineate education from work. Technology-induced displacement of jobs could compel people to switch streams as the risk of one's skills becoming obsolete increases. Nanodegrees, being cheaper, shorter, and self-paced, can also play a pivotal role in reskilling, as candidates who are keen to acquire new skills or honing existing ones may not be willing to going back to a university for long degree programs. Though the budgetary allocations from governments in South Asia do not seem adequate (Bloch, 2020), private investment in this sector has risen exponentially in Asia (Holon IQ, 2020), even as). Thus, the need to revamp education and re-skilling has been recognized to meet the challenges posed by 4IR.

Recognizing the significance of education and skilling reformation, several Asian governments have planned and launched early responses to better embrace technology. Several countries in Asia have introduced policies and initiatives to reform the education system for the upcoming generations are. Re-skilling programs to prevent loss of employment and prepare the workforce for emerging employment opportunities have also been introduced. In particular, Republic of Korea, Japan, and Singapore have useful lessons to offer in terms of preparedness and institutional efficiency.

### 4.2 Trends in Asia


Figure 9: Education and Re-skilling Trends in Asia

Across Asia, state responses towards the challenges posed by the 4IR have been highly varied. While a few governments have strategic action plans in place, others continue to remain oblivious to the foreseeable challenges. Republic of Korea and Singapore have success-

fully planned and benefitted from robust regulatory institutions in the sectors of education and employment. These governments have proactively responded to technological changes and undertaken expeditious implementation of action plans. Further, India and China have launched action plans to ensure preparedness of young citizens and are key economies which are anticipated to lead the 4IR (Anil, 2017). On the other hand, efforts of governments in Afghanistan and Myanmar remain unclear or absent.

### Singapore

In 2016, the Singaporean government launched the Automation Support Package to provide grants, loans, and tax subsidies to assist organizations to train their employees and meet the costs of automation and digitalization (U-Wen, 2016). In the same year, Workforce Singapore, an authority under the Ministry of Manpower, implemented the 'Adapt and Grow' program to help workers adapt to new jobs and progress in their existing careers through upskilling and reskilling programs (Thapliyal, 2020). Under this program, employers in sectors such as aviation, food, and tourism receive financial aid to reskill workers and help them adapt to digitalization. Workers who participate in these upskilling and reskilling programs receive wage subsidies and other forms of financial support till they begin to earn again. The program underwent significant enhancement in 2020 as the pandemic-induced digitalization affected multitudes of people. Further, the government has announced plans to reform education and facilitate school children to study robotics, coding, and advanced science & technology courses (Goh, 2021).

### South Korea

In 2019, the Korean government unveiled the National Strategy for Artificial Intelligence to foster growth in technology and lead the global AI sector (Ministry of Science, 2019). During the COVID-19 pandemic, the government further strengthened its responses towards digitalization and automation (Yonhap, 2020). In 2020, it notified directives to incorporate subjects related to AI in the curriculums of high schools by 2021 (Ministry of Science, 2019). It also indicated its goal to re-train teachers and educate primary school students about the basics of computer programming, AI, and the ethical issues surrounding it by 2025. Remarkably, the government's policy initiatives focus on providing exposure to AI through playful activities to children as young as kindergarten students.

## Japan

In Japan, the government has been a fervent promotor of automation, digitalization, and the use of Artificial Intelligence. In 2017, the government produced program titled 'Society 5.0' (Cabinet Office, 2017) which aims to revamp the education system to ensure preparedness for technological change by focusing on human skills such as curiosity, leadership and communication. Further, the government has actively supported a strong culture of lifelong learning through legislative and financial support (Büdenbender, 2018). Private universities and employers who conduct such programs receive financial aid from the government. This emphasis on learning beyond formal education plays a crucial role in preparing for technological changes in the coming future.

## India

In 2018, *NITI Ayog*, the Government of India's think-tank, developed the National Strategy for Artificial Intelligence highlighting the potential for AI in leading social progress (NITI Ayog, 2018). Among others, the strategy emphasizes on promoting applied knowledge in school children through science and technology projects and activities in 'Tinkering Labs'. The strategy also recommends suggests financial incentives for private employers to encourage them to conduct reskilling programs for their employees.

Additionally, the newly released 'National Educational Policy, 2020' (NEP2020) seeks to introduce students to coding as early as in middle school (MHRD, 2020). NEP2020 places emphasis on enhancing science, technology, and mathematics (STEM) education at all levels and aims to promote lifelong learning through adult education programs as well as primary school education.

## China

In 2018, as part of the Thirteenth Five-Year Plan, Chinese government produced the Action Plan for Education Informatization 2.0 (Yan et al., 2020). The plan focuses on improving digital literacy and access to digital learning through substantial investments in Information and Communication Technology by the government.

## Bangladesh

Bangladesh's National Strategy for AI recommends policy reforms to prepare for 4IR with set timelines and identified targets (Govt of Bangladesh, 2019). The strategy intends to introduce personalized learning and AI at the school level. It proposes the establishment of a National AI Training Institute by the Ministry of Labor to design and conduct training programs on AI. Further, to tackle the adverse impacts of the pandemic, private actors have made significant contributions in Bangladesh. For instance, in 2020, Standard Chartered launched reskilling and upskilling programs for people who lost their jobs during the pandemic (Star Business, 2021). These programs focused on training candidates for jobs in the sectors of healthcare, agriculture, and technology.

## Pakistan

The Government of Pakistan's approach towards the AI and technology preparedness is characterized by collaboration with non-state actors as opposed to purely state-led interventions. The Government has partnered with the World Economic Forum to promote reskilling through a policy called *Parwaaz* (Khan, 2020). The policy delineates six 'priority sectors', including Information Technology, manufacturing, and hospitality, in which workers will be re-skilled and up-skilled to improve digital literacy, technical knowledge and entrepreneurial qualities. It also stresses on developing 'employability skills' such as critical thinking, problem solving, creativity, which will be crucial in the age of automation and digitalization. Further, in 2019, an educational forum called the 'Presidential Initiative for Artificial Intelligence and Computing' was launched to offer courses on AI and promote technical research (PIAIC, 2019). Irrespective of these efforts, foundational problems such as the inadequate quality of school and higher education and the glaring socio-economic inequality continue to be formidable challenges which could hinder Pakistan's capabilities to prepare for 4IR (Hunter, 2021).

### 4.3 Policy Challenges

#### Challenge 1: Supplanting Policy Initiatives with Tangible Targets and Financial Allocation

Policy initiatives by governments need to move beyond recommendatory guidelines and set precise goals and tangible targets. For instance, India's National Strategy for AI and the National Education Policy are of the nature of recommendations and do not contain binding obligations. Further, these programs suffered a setback during the pandemic (Nanda, 2021) due to delay in allocation of funds. Similarly, even as the National Strategy for AI in Bangladesh is a step towards the right direction, the strategy is yet to receive adequate budgetary allocations and infrastructural support to be considered as a material step towards AI preparedness.

#### Challenge 2: Addressing Foundational Flaws in Education Governance

Several countries in the region suffer from foundational flaws in the education system which need to be addressed alongside strategies for 4IR preparedness. For instance, India's public education system have persistently high drop-out rate in middle school (Gulankar, 2020), inadequate quality of primary education and severe socio-economic inequalities impacting learning opportunities (Randhawa, 2019). Similarly, Pakistan's education system suffers from glaring socio-economic inequality (Hunter, 2021). Unless resolved, these continue to pose formidable challenges in the workforce's capabilities to prepare for the technological revolution.

## Chapter 5: Women and the Future of Work

Socio-economic factors greatly impact one's potential to take advantage of the digital revolution. In terms of gender, asymmetry in participation of women and men in different sectors of the economy, often dictated by notions of gender-appropriate jobs, has resulted in a varied potential for women workers to maximize opportunities in an increasingly technological world. Factors such as literacy, digital know-how, and distribution of household responsibilities, are likely to further weaken the potential of women workers to utilize digital means to earn a livelihood.

With the data on the economic impact of the Covid-19 pandemic and the subsequent preventive measures still emerging, its varied impact on work opportunities and financial losses of men and women are gradually coming to light. Pre-existing gender gaps are believed to have widened during the pandemic, undoing decades of hard-earned progress towards gender equality. While sporadic anecdotal reports recount women successfully transitioning to digital means to sustain their livelihood (Fruman, 2021), larger evidence suggests disproportionate losses for women. Even as different societies have begun to shift back to normalcy, the true extent of the impact of the pandemic is yet to be realized. However, estimates and currently available data reveal unsettling differences based on gender in several countries, with India, Indonesia, Bangladesh, and Pakistan recording a decline in the gender parity index score (Crotti et al., 2021). Due to rapid digitalization during this period, the changes witnessed have a prophetic value for women's future of work.

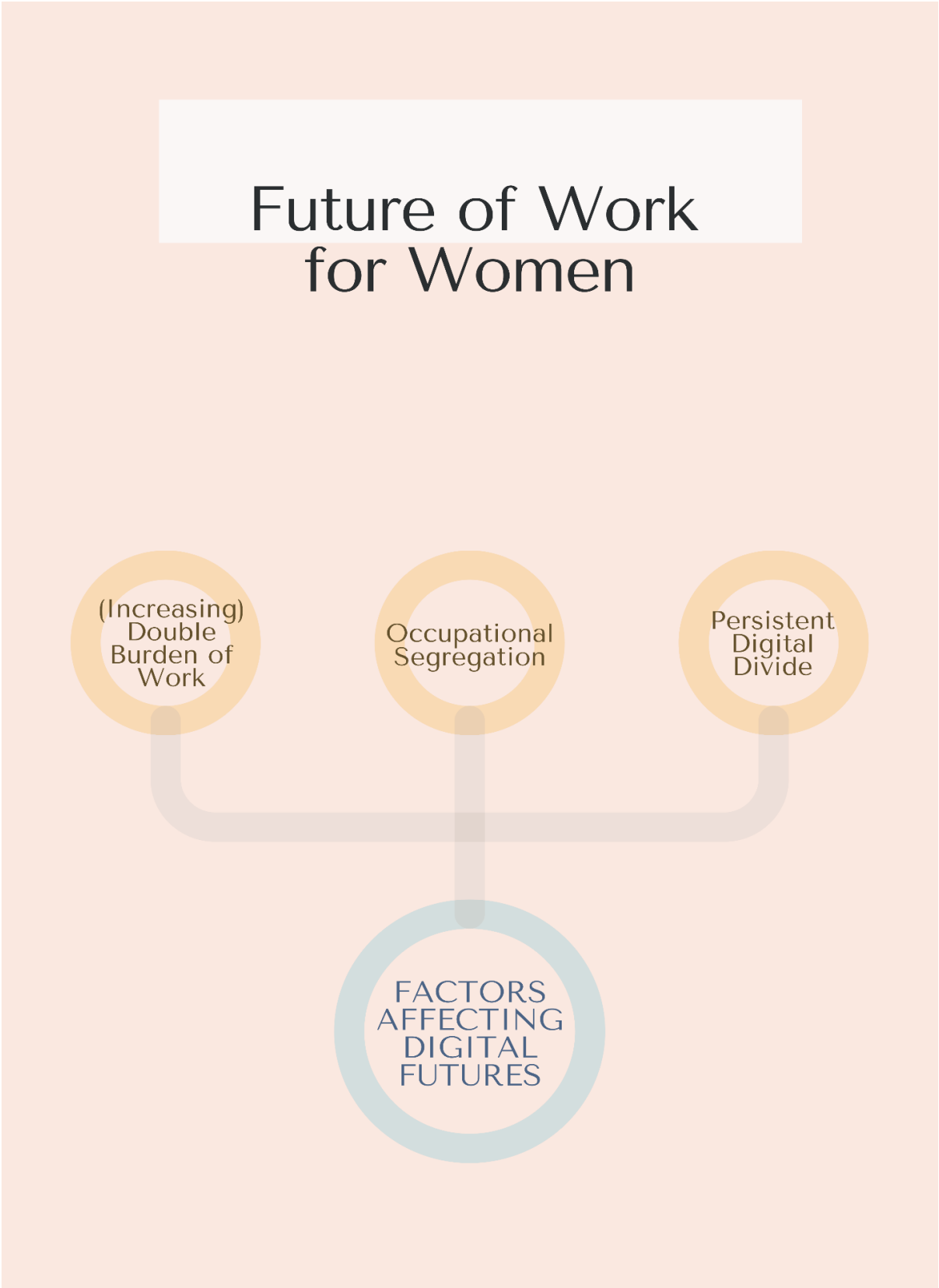


Figure 10. Future of Work for Women

## 5.1 Factors Affecting Women's Future in the Digital World

### 5.1.1 Gender-based Occupational Segregation

Asymmetrical sectoral concentration is indicative of the varying trajectories which men and women have in the digital future. The difference is starkly visible in the IT sector. A sample-based study by the World Economic Forum concluded that, around the world, women comprised of only 22 percent of AI professionals. This vast divide remains true for several Asian countries, including India, South Korea, Singapore, Japan and China (World Economic Forum, 2018). Fewer women in AI and technological innovation indicated the possibility of women to fall behind men in their efforts to transition to newer jobs in the digital future, if not interrupted by welfare measures.

Occupational segregation also exists in sectors other than AI and technology. For instance, women account for 80 percent of all domestic workers across Asia and the Pacific (ILO, 2013) and will suffer from a lack of potential to digitalization due to the intrinsic nature of the work. Further, as Figure 11 (ILOSTAT Database, 2021) suggests, a larger proportion of women than men are engaged as contributing family workers - i.e. engaged in self-employment in an establishment operated by a relative in the same household. These variations suggest vast differences in levels of financial vulnerability and potential for job growth between men and women, which can, in turn, widen the gender gap in the ability to adapt to digitalization.

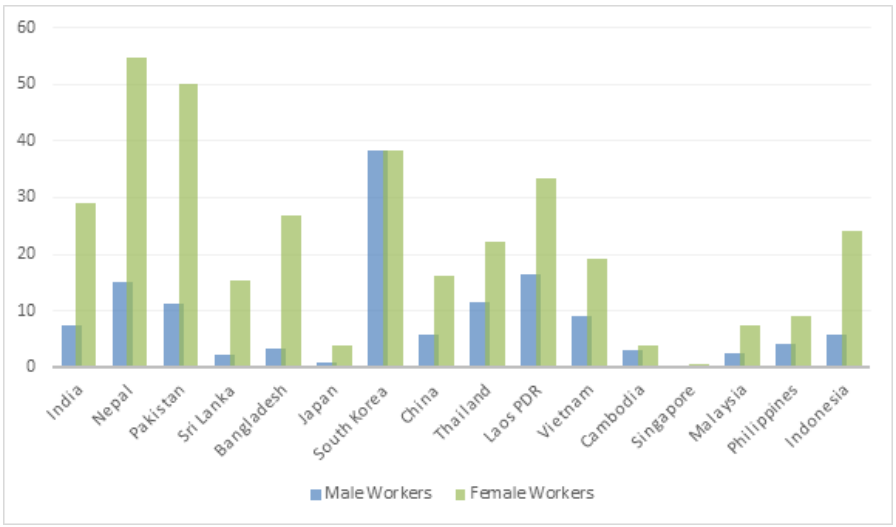


Figure 11: Male and Female Contributing Family Workers (also known as unpaid family workers) as Percentage of Total Male and Female Workers Respectively

During the COVID-19 pandemic, sectoral segregation led to varied losses for men and women. Women had above average representation in the 3 out of the 4 sectors which have been adversely impacted by COVID-19 pandemic and faced a decline in employment (Madgavkar et al., 2020). These sectors included accommodations and food services, retail and wholesale trade, other services such as arts, recreation, and public administration.

Additionally, lack of financial stability and job growth, both characteristics of the informal economy which disproportionally consist of women in South Asia (Bonnet et al., 2018), suggest further vulnerability of women's livelihoods. Where potential digitalization could happen, other factors, as describes below, have contributed towards a skewed effect based on gender.

### 5.1.2 Double Burden of Work

Gendered distribution of household responsibilities, as observed in most societies worldwide, is a contributing factor towards a weaker future of work for women. Data from before the pandemic suggests a highly skewed division of time spent on unpaid domestic and care work (ILO, 2018).


Figure 12. Time Spent on Paid and Unpaid Work among Men and Women

Further, a study by United Nations Women reported that, globally, increased responsibility of childcare and household work due to Covid-19 was borne predominantly by women, 60 percent of whom saw an increase in time spent on unpaid domestic work as opposed to 54 percent of men. This gap is exacerbated once the quantum of work is factored in: 28 percent women reported an increase in at least three unpaid activities, as opposed to only 16 percent of men (Patel, 2021; UN Women, 2020a). These trends are mirrored in South Asian and East Asian countries, including Bangladesh, Indonesia, Cambodia, Pakistan, Nepal, Philippines, and Thailand, where successive lockdowns have exacerbated the existing gendered division of unpaid household work (UN Women, 2020b). This is in line with the Global State of Small Business Report, which revealed that 31 percent female business leaders, as opposed to only 26 percent male business leaders, have reported an increase in the number of hours spent on domestic work since the pandemic started (Facebook et al., 2020). Although based on samples, these findings are likely to be reflective of generalized trends. As a consequence of larger time spent on unpaid work, women's financial independence and social standing are likely to be affected adversely by the pandemic, in the household and in the society at large.

### 5.1.3. Persistent Digital Divide

In the sectors where digitalization is flourishing, the lack of access to information and technical communication facilities limits the potential of women workers to adapt to digitalization. Even as the gender gap in ICT usage is closing around the world, South Asian countries, including Bangladesh, Sri Lanka, India, and Pakistan, continue to have the largest gender gap around the world, with women being 19 percent less likely to own a mobile phone and 36 percent less likely to have accessed internet in the last three months (GSMA, 2021). In these countries, the likelihood of smartphone ownership or regular internet usage by women is lower still. Similarly, South-East Asian countries, including Indonesia, Malaysia, Thailand, Singapore, reflect a persistent gender gap in internet usage (*World Telecommunication/ICT Indicators Database*, 2020). In Indonesia, while some evidence suggests near parity in basic internet access, meaningful connectivity, including regular internet use, access to smartphones, unlimited broadband connection and 4G connectivity, continue to be affected by a gender divide, with non-users reporting lack of digital skills as a key reason (Chair et al., 2020).

In addition to the lack of literacy and digital skills, sociological factors play a key role in the gender-based digital divide in Asia. In Bangladesh and Pakistan, family disapproval was noted to be a significant cause of mobile inaccessibility (GSMA, 2021). In India, safety concern was noted as a key barrier despite various governmental efforts towards the same, including measures to curb fake and harmful content. Together with affordability, globally the second most prominent cause, sociological factors substantially limit the potential of women to transition to digital means to sustain their work and employment, where such an option

# Private Initiatives

Started by Marieme Jamme, a Senegalese-born British businesswoman, iamtheCODE is a unique display of globalization and cross-border development initiative which aims to teach one million women and girls to code by 2030. This African-led initiative has a presence across 64 countries, including in China where it held the first UN Sustainable Development Goals Hackathon in 2017. IamtheCODE aims to reduce the gender-based digital divide that currently exists in China and other parts of Asia by investing in mentoring, local incubation programs, funding, and collaborative work in conventionally male-dominated STEM fields.

In 2019, Alibaba Cloud, the cloud computing arm of Alibaba Group, also joined hands with iamthecode to provide tailored courses on topics such as cloud computing, data analysis, machine learning and cybersecurity.

In an attempt to reduce the gender-based divide in internet users in India, Google's Internet Saathi program conducts workshops on digital literacy for women in rural communities in India. These women, who are afterwards known as Internet Saathis - the Hindi word for a friend' - are sent back to their home villages to further educate other women about the existence and uses of the Internet. This program also helps further Google's mission to organize the world's information and make it universally accessible and useful. The results from this initiative have begun showing in the forms of financial successes and independence not only for the saathis, but also the other women in the villages who are now better equipped to deal with technology.

# Public Initiatives

In June 2021, China's State Council introduced a new long-term national plan to bring transformative improvement in citizens' scientific literacy rate. Titled 'National Action Plan for Scientific Literacy 2021-2035', the plan aims to provide greater investment in popularizing science, develop infrastructure for scientific education, improve scientific outreach, and promote international learning and cooperation. The policy targets 5 priority groups - teenagers, farmers, industrial workers, the elderly, civil servants, and officials. Although the main priority target groups do not include women as a specific group, the policy has made note of the gender disparity that exists in scientific literacy levels and aims to repair it.

In July 2021, thirteen departments in China, including the Ministry of Science and Technology, collectively issued a notice titled 'Several Measures to Support Female Technologists in Playing a Greater Role in Technological Innovation'. The notice outlined a comprehensive set of measures to ensure higher participation of women in the technology and scientific sectors, especially at higher-level positions, and create a pool of female scientists and technologists to lead innovation-driven development.

## 5.2 Policy Challenges

### Challenge 1: Reaching the Truly Disadvantaged

Measures to narrow the digital divide will fail to reach the truly disadvantaged unless policy measures recognize multiple intersecting disadvantages. Where rural areas have lower access to internet and telecommunication facilities, women in these areas suffer from a greater lack of access. Further, the intersection of class with gender makes inaccessibility more pronounced for those with limited financial means. Unless policy measures recognize multiple disadvantages, the resulting initiatives would fail to impact those who truly need support.

### Challenge 2: Providing Meaningful Access to Technology

While initiatives which provide access to technology are crucial towards reducing the digital divide, merely making provisions for internet and gadgets will fail to bring a transformative change. Accessibility issues arise due to lack of education and training for meaningful utilization of digital technologies. Thus, welfare initiatives must be comprehensive and respond to the root cause of inaccessibility by promoting digital literacy and skilling to transform the futures of work for women.

### Challenge 3: Tackling Social Prejudice in Diverse Cultural Contexts

Correcting social prejudices which inhibit women's participation in scientific and technological fields would require careful negotiation with diverse cultural contexts in different societies. This requires long-drawn sensitive interventions which acknowledge and respect cultural variations whilst also adhering to the agendas of women empowerment. Devising such initiatives require knowledge of intricate socio-political relations. This poses challenges for scaling of initiatives especially in cross-border contexts.

## 5.3 Conclusion

Women stand at a worse footing than men with respect to their potential to adopt the digital future of work. This is likely to impact their earnings, networking opportunities or access to information in the future. Further, as per the World Economic Forum, COVID-related automation and digitalization is likely to create additional hurdles for gender parity

by intensifying occupational gender-segregation, especially in the emerging job roles in cloud computing or data and AI (Crotti et al., 2021). To counter this, comprehensive governmental and non-governmental interventions are needed to ensure gender parity in the futures of work.

## Chapter 6: Policy Recommendations

Tracing the trends in key economies in South Asia (India, Pakistan, Bangladesh, Sri Lanka, Nepal), Southeast Asia (Indonesia, Thailand, Philippines, Malaysia, Singapore) and East Asia (South Korea, Japan, China) has pointed towards a plethora of opportunities created due to digitalization. At the same time, such trends brought forth a host of changes and challenges that are foreseeable in the near future of work.

Increased platformization is anticipated to bring forth drastic changes in the nature of employment with poor bargaining power among workers, high levels of informalism and challenges to the social security rights. This can worsen inequality and create oppressive work environments. Similarly, use of AI for hiring, firing, performance management, performance analysis leads to a set of challenges such as violation of privacy of workers, and unjustified performance analysis due to presence of bias in AI. This might mean loss of job, less remuneration or demotion at workplace for a worker. At the same time, lack of clarity on accountability/liability for damage caused due to the use of AI may prejudice the interests of workers.

While digitalisation may create opportunities, those living in countries with a challenged education system, inequality in access to learning opportunities, and lack of internet penetration are likely to struggle as they cope with deskilling and deindustrialization linked with the digital revolution.

The gendered nature of the current trajectory towards digitalization also poses severe risks which, unless intercepted, will result in a wider gender gap in the region. The preparedness for technological revolution requires a comprehensive reformation of education and skilling.

### Recommendation 1: Ensure Social Security Rights to Platform Workers

A legislative protection net must be provided to platform workers to ensure fair contracts and social security benefits. Towards this, governments must deliberate upon the nature of relationship between the platforms and platform workers. Re-defining the standards of determining employer-employee relationship and clarity in the status of platform workers under labour laws is pertinent to ensure social security benefits.

Alternatively, governments may extend social security benefits to platform workers by tying social security benefits to individuals, and not the nature of their work contract, to ensure that minimum standards of work are being followed. Further, governments must ensure that platforms build fair terms and conditions in the employment agreements and maintain minimum standards of work.

### Recommendation 2: Collective Bargaining Rights to Platform Workers

A documented due process is required to allow platform workers to raise their voices and negotiate with the platforms. Either the platforms or the government have to take steps to strengthen the voice of the workers. The platform workers must be entitled to negotiate the terms and conditions and raise challenges in case of exploitation of workers.

### Recommendation 3: Ensuring Favorable Labor Legislations for the Interest of Workers and AI

Policies and strategies around responsible development and use have to be devised to determine the boundaries within which AI may be employed by the employer. Governments shall resort to 'negotiating the algorithm' path wherein the workers, employers and representatives engage in dialogue to govern the introduction and use of new technologies at work. This will permit the workers and employers to co-decide purpose and procedures of data processing and ensure concrete participation of workers. This is to be followed by a human-in-command approach that ensures that every business decision that affects workers is validated by humans by following lawful and transparent procedures. Labor legislation also needs to address the potential instances of large-scale layoffs due to the use of AI.

### Recommendation 4: Responding to the Question of AI Liability

The question of legal liability for damages caused by AI remains unclear. Whether this must be borne by the employer, programmer, developer, designer, or any other person responsible for managing AI needs to be clarified through legislation. For instance, the European Union, in its report on 'the Safety and Liability Implications of Artificial Intelligence, the Internet of Things and Robotics', has suggested a strict liability regime to be adopted for AI so as to ensure that the victim is compensated regardless of the fault. Following this example,

governments in Asia may have to borrow the strict liability regime to address this question of accountability of AI. However, even then, to whom this strictly liability would be applied to must be assessed. For this, a risk-based approach must be considered (European Commission, 2020). The risk-based approach requires stringency of regulations to be proportional to the risk posed by AI

### Recommendation 5: Neutralizing the Digital Divide and Pre-existing Structural Drawbacks in the Education Sector

Along with initiatives for the promotion of digital learning, public policies must be geared towards reducing the 'Digital Divide' and addressing pre-existing drawbacks in the education sector. Digital learning during the pandemic has distinctively exposed the extent of the digital divide. South Asia suffers from a severe lack of internet accessibility with nearly 9 out of 10 children without access (UNICEF, 2020). This impacts the skills and knowledge of the upcoming generations and has a potential to lay the foundation for an inequitable future of work. This divide must be addressed by eradicating technological and financial barriers to accessing digital opportunities.

### Recommendation 6: Creating a Financially Safe Re-skilling and Learning Environment

Social security in the form of adjustment programs is vital to ensure that technology-induced displacement of jobs is not disruptive. Without such assistance from the government, displaced workers may struggle to sustain financially during the adjustment period and fail to equally undergo required upskilling.

Additionally, the exclusionary nature of conventional occupational licensing (Rajan, 2019) must be removed to ensure that displaced workers do not accept less lucrative jobs that do not require additional training.

### Recommendation 7: Context-based Interventions to Reduce Digital Divide

To ensure equitable opportunities in future, interventions to reduce the prevalent digital divide due to socio-economic factors, such as gender-based divide, are required. Such interventions must recognize the intersectional nature of digital divide and be viable for different cultural and socio-political contexts. Moreover, they should move beyond

simplistic provision of technical support and aim for education and training to provide meaningful opportunities. Failing to provide welfare initiatives at early stages of change would result in carrying forward of the current economic disparities into the digital futures.

In order to ensure that the futures of work do not have a detrimental impact on livelihoods, comprehensive initiatives by government and non-government actors are necessary. Further, these initiatives must be rooted in the values of inclusiveness and equity if we hope to welcome a future which does not carry the inequalities of today.

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