Platform economy (PE) is a digital innovation undergoing gradual, but certain global expansion. The PE is an internet-based technology that utilizes smart-phone applications or websites for administering, requesting, providing, remunerating and evaluating work that delivers a range of offline and online consumer services. Offline services in a PE typically include professional driving, cleaning services and food delivery. While, online services include desk-jobs like translation, web-designing and proofreading. Individuals who render these services are often called service providers. Sharing economy, gig-economy and on-demand economy are also nomenclatures designated to the PE.

This think piece is a modest overview of the occupational safety and health (OSH) implications of the PE. It further delves into potential measures that labour inspections (LIs) could consider to better protect the workers in the PE. Today, most workers globally still acquire employment in the traditional or the informal economy. Likely, over the next decade, a critical mass of workers will gradually shift from the traditional economy to the PE. This shift may include a wide spectrum of occupations such as nurses, cleaners, painters, and programmers. At this time a small proportion of occupations are directly impacted by the PE. The OSH concern is principally for workers who are dependent on the PE as a primary source of income. Globally, labour inspections will benefit from being mindful of this gradual, but imminent shift of workers from the traditional economy to the PE, and its implications for occupational safety and health (OSH).

The service providers in the PE are essentially performing the same tasks and exposed to similar OSH risks as the workers in the traditional economy. For example a cleaner hired from a cleaning service business and a cleaner hired from a digital platform are both performing cleaning tasks. They are likely exposed to the same workplace hazards. The difference, however, is the apparent absence of a traditional employer in the PE, and the job is restricted to a specific time-bound task demanded by a customer. Instead of the traditional employer, the service provider is dealing with a vague digital entity on a daily basis. Thus, the service provider has much in common with a worker in terms of tasks, risks, and remuneration. For this think piece the service provider has been designated the term – platform worker.

A classic example of offline services in PE is the taxi ride. A request for a ride is sent by a customer using a smart-phone through an internet-based digital platform. A registered driver with the platform is notified by the app on her/his smart-phone of a potential customer seeking a ride. The notification to a driver is a function of algorithms that accounts for among other things, driver’s availability, geographical proximity to the departure point, number of drivers in the area, and demand for rides at the time. After the completion of the ride, the driver is notified on the costs incurred on the smart-phone app, and the customer makes an electronic app-based payment. The customer then receives a receipt, and can also provide feedback (ratings) to the platform for the services rendered using the app. In the case of a ride service, the transaction loop is tripartite arrangement and involves a platform worker who is typically the vehicle owner, a digital platform, and the customer seeking a ride. Nevertheless, there are complex variations where the vehicle owner and the person driving the vehicle may be different people. In some instances, one person may own many vehicles and solicit several drivers to operate these vehicles. In this case,
the owner of several vehicles is a subcontractor between the digital platform and platform workers.

In the traditional economy, a large transport company may outsource part of its business to the subcontractor who owns several vehicles and then hires several professional drivers. In most instances, the drivers are considered employees, and the transport company along with subcontractor, would harbor the role of the employer depending on the national regulations at play. In contrast, neither the platform, nor the individual owning several vehicles are necessarily considered an employer in the PE. Furthermore, contract drivers are frequently designated as individual service providers. Regardless of the type of work (e.g., food delivery, cleaning services) workers may follow a tri-party arrangement similar to that of the platform-based taxi service. As with ride-based services, other forms of work may be subject to complex working arrangements where a single subcontractor acts as an intermediary between the platform and assigning a specific job to the platform worker who provides labour to at the customers site of preference.

The online services in the PE may be performed anytime and anywhere in the world untethered by OSH regulations of a nation state.

For example, an urgent website designing job for a customer in Sweden could be expedited by a platform at low-wages by a home-based website designer in India. It is impossible to enforce either the Swedish or Indian wages and working time regulations to a platform worker in the privacy of his household. The difference in contrast to offline services is that the online platform worker and customer may encounter each other only in the digital world.

The salient features of both online or offline services is the singular use of the digital platforms along with the non-standard nature of employment, and the apparent absence of the traditional employer. Organization of work-tasks in the PE is undoubtedly efficient for the platforms as the supply of labour is hired, only subject to demand, thus cutting costs and liability. PE also provides consumers a high level of efficiency, range of choices, and convenience at a reasonable cost. The platform worker benefits from the PE as it provides both additional and/or a main source of income. The technological innovation apparently could be a win-win for everyone involved, but perhaps someone, somewhere and somehow must pay the cost of convenience, choice, and efficiency. Plausibly these costs are partially offset by compromising the OSH of the platform worker as well as failure to provide workers’ compensation.

**Occupational Safety and Health Challenges:**

Professional drivers in the traditional economy risk long working-hours, violence, threats, working alone, demanding night-shifts, poorly maintained vehicles and poor wages. Platform drivers are exposed to identical risks. Moreover, platform drivers are subjected to ongoing digital surveillance. The platforms keep track of drivers using global positioning systems (GPS) 24/7 to maintain accessibility and determine transportation costs depending on the number of vehicles available in the area, traffic situation, and demand for the ride service. Also, drivers endure the pressure of customer ratings. Such surveillance data obtained from the driver are fed into algorithms that the platform utilizes to assign the next job to the driver. Job security for the driver in the PE is thus intricately linked to surveillance data collected by the platform. Constant surveillance and burden of being persistently evaluated is detrimental to the psychosocial working environment. Together these physical and psychosocial risks may compromise the health and safety of PE drivers.

Online office-based services in the PE are comparable to the desk-jobs in traditional economy which are prone to among other things poor ergonomic designs, high work-intensity, indoor air quality, long work hours, cyber-bulling, sedentary tasks, and solitary work. Desk-jobs, in general, are therefore predisposed to musculoskeletal and psychosocial disorders. Akin to the professional drivers in the PE, workers rendering online-services are subject to constant evaluations and surveillance that may compound levels of psychosocial stress.

In the traditional economy, some pioneering employers are advocating workplace wellness or health promotion programs to encourage a healthy lifestyle, work-life balance, and social well-being for both manual and sedentary jobs. Such em-
ployer initiatives acknowledge that a healthy worker is a productive worker and that the health of the worker mandates a holistic approach at, and beyond the workplace. Emerging research suggests that sedentary work is a major risk attributing to the global burden of non-communicable diseases. The seeming absence of the employer, and subsequently an employer-initiated health promotion programs may predispose the sedentary online platform worker to chronic diseases. Research suggests that non-standard employment such as temporary work harbors a higher risk of injuries compared to those with permanent work. Moreover, temporary work, coupled with poor wages and ceaseless fear of job loss is collectively a cause of enduring psychological stress. Chronic stress leads to a biological response resulting in excessive levels of the hormone cortisol; a hormone implicated in a range of debilitating conditions like cardiovascular diseases, hypertension, and diabetes.

PE will facilitate inclusion and offer flexibility to workers who typically have been excluded from the intractable labour market. For example, the PE will enable disabled workers to gain rewarding online-jobs in web-designing or programming. PE will provide more autonomy to workers who by choice would like a fixed amount of work and only at specific times. However, a large majority of workers in the future would still seek job security, and a stable income to plan a foreseeable future for themselves and their families. These developments may concurrently hazard the exclusion of workers employed in certain low skill occupations. Educated, tech-savvy young people could gain easy access to platform work because of their comparative advantage at maneuvering, and probably manipulating technology to their advantage. Elderly and low skill workers, however, stand to lose income opportunities because of their lack of familiarity with and ability to navigate the new technological terrain. The PE also provides tech-savvy students with temporary work that yields supplementary income. In that sense, PE would potentially reward workers based on their digital aptitude to maneuver technology rather than the physical capability to offer diligent manual labour. Thus, the PE could instigate income and occupational health disparities in the traditional labour market by excluding low skill, less educated and technologically unsavvy workers from acquiring gainful work. Traditional workers unable to adapt to the platform technology will be thrust in to precarious jobs with low income and tenuous OSH protections. Such a development will potentiate a race to the bottom between the platform worker and those workers in the traditional economy perpetuating the base of undeclared work (grey economy) in the labour market.

Emerging technologies such as Artificial Intelligence, 3D printing and Robotization are certain to improve safety and health of workers. However, there is little evidence indicating that PE as a technological innovation will mitigate the inherent OSH risks for the online or offline platform worker. PE will likely impact the health of platform workers through hazardous physical conditions; adverse psychosocial conditions; poor wages; temporary, insecure work, including the risk of job loss and exclusion from work-life. Moreover, the technological disruption in some cases will catalyze the inadvertent expansion of undeclared work, and occupational health inequalities.

**Opportunities for Labour Inspections:**

Historically, labour inspections evolved as part of a state response to temper the hazardous health effects of work. For example, both asbestos and white phosphorus were technological marvels that were with time abated with regulatory interventions to prevent the insidious impact of these substances on the health of workers. Our past experiences with new technologies should inform our effort to shape the future. It must be underscored that technological change today as compared to the last century is exponential, while regulatory interventions initiated by LIs tend to be logarithmic. This model for developing regulatory interventions is far from sustainable given the pace of technological change. PE is a novel technology of our times, but as with all other new technologies a precautionary approach is mandated with regards to understanding potential OSH risks posed to the platform workers.

**Definitions of a worker and employer in the PE remain a contentious issue for regulators.**

In 2017, a Hague judgement concluded that a digital platform providing transportation services is not a web-based information service, but a transportation business, and therefore an employer. Efforts are being made in some countries to redefine the traditional concepts of workers and
employers, such that platform workers are brought under the auspices of OSH regulations. Judicial definitions will continue to evolve and refine with time, hopefully to provide improved health and social protections to the platform worker. Nevertheless, labour inspectors should deliberate practical approaches for better protecting the health and safety of platform workers.

First, the traditional tripartite framework could consider accommodating global platform businesses and representation of platform workers in their tripartite boards to a greater degree. A collaboration between labour inspectorates and the platform businesses will facilitate data sharing between platforms and regulators. Perhaps it might be wise to include multinational tech-business representation given the worldwide nature of the PE. The tripartite process assumes that the platform-worker has representation. The platform-worker, however, is a solitary worker competing with another platform-worker for the same job. Platform-workers lack an arena for either interacting or socializing given the veiled nature of their work where they are unlikely to encounter each other in a workplace setting. Hence, they are less likely to organize and collectively bargain for safe and healthy working conditions. State regulators could conceivably provide arenas, incentives and encouragement for the platform workers to organize. These measures together will enable an inclusive and consensus-based tripartite approach to future OSH regulations where LIs work in tandem with the flow of technological innovation rather than against it.

Second, there are prospects for integrating requirements of OSH regulation into the algorithms of the digital platform. For example, aligning the limitation of working-time regulations or integration of mandatory safety management programs into the platform software for the drivers including vehicle-based driver fatigue assessing technology. Such interventions draw inspiration from the principle of prevention through design, albeit not the physical design of the technology, rather the digital design of technology.

Third, regulations facilitating data sharing between several platforms that offer competing platform-based services deserves consideration. For example, a driver could be working for two or more taxi platforms concurrently which might mean working 24/7. This constitutes a health hazard for both the driver and the passengers. Data sharing between platforms will facilitate limiting the work-time for the platform workers which in turn will improve worker and consumer safety, product quality, and concurrently achieve regulatory compliance. Similar mechanisms may also be feasible for online-work that limits total work time in a week across several platforms. Data-sharing based regulation of online workplaces could potentially curtail the hazardous effects of long working hours, simultaneously ensuring a healthy platform worker that will yield superior customer service and quality product. LIs should explore data sharing agreements between regulatory agencies that deal with the environment, public health, road safety, food safety, social security, private insurance etc. For example, third-party food delivery platforms facilitate the delivery of food from a restaurant to a customer using freelance motor-cyclists (platform workers). Platforms involved in food delivery have at a minimum elements that concern food safety, traffic safety, and worker safety including workers’ compensation if the driver is injured on the job. Therefore, a collaborative approach to data-sharing based regulation of PE could ensure a smart regulatory regime.

Fourth, a central regulatory challenge in the PE is the fact that the platform, and the platform worker are separated by space, and time. Thus, identifying the proprietor of the platforms remains a complex issue, and even more compelling is the difficulty of enforcing OSH regulations given the transnational nature of the working arrangements. Global franchises work in different countries, and OSH regulations of local countries apply to these establishments. Drivers, painters or food delivery services can be inspected at a physical workplace, and the remotely placed platform could be held accountable for OSH. Enforcing OSH regulations for online platform workers is problematic given the working environment could be a household, café, or private vehicle. Such standards could include self-regulatory regimes vis-à-vis risk assessments for ergonomic design, lighting, air quality and work-hours for online platform work. Regulators might contemplate mandatory training programs integrated in to the platforms for workers with the aim of conducting, and documenting risk-assessments at their respective workplaces. Initiatives such as these could foster development of industry guidelines on physical activity and work-life balance in order to address risks related
to sedentary work. In addition, tele-inspections based on real-time video feed is not a farfetched idea given its applications in fields like telemedicine. Platforms could be required to provide real-time video access their online-service workers and workspaces. Real-time video inspections could facilitate inspection of the workplace and consultation with online-platform workers to better secure their safety and health.

Initiatives such as data-sharing and video surveillance are bound to raise concerns on ethics and confidentiality. However, these measures are proposed to nurture common good, solidarity, accountability and trust between the stakeholders. Subsequently, the need for individual privacy and confidentiality will be balanced by the collective interests of the labour market ensuring fair competition and protecting the platform worker.

As a minimum, relevant state authorities might consider training low skilled workers to be tech-savvy and better prepared for platform-based work. This will foster inclusion and create more opportunities to acquire high demand platform-based jobs such as cleaning services. Failing to provide equal access to jobs in the PE to low skilled working populations that may lack tech-savviness will encourage the expansion of the undeclared economy perpetuating income, health, and occupational health disparities.

Finally, technological innovations such as PE have OSH implications beyond the realm of nation-states, and therefore demand both local and global solutions. Therefore, investing in digitalization of the local and national LIIs is imperative such that they are equipped to embrace the challenges of the future. Big data, machine learning, artificial intelligence and video-based inspection technologies could be integral to guiding risk-based inspections and consultation operations. Critically, a global coalition constituting labour inspectorates and international agencies ought to consider synthesizing practical minimum international OSH standards for platform workers. Models for cross-border cooperation and enforcement are part of ongoing efforts in the European Union for tackling the challenges of undeclared work. These models may provide valuable insights for transnational enforcement of OSH regulations to protect the platform worker.

Over the last 100 years, the International Labour Organization (ILO) has assisted nation states and regions to secure a safe, healthy and productive workforce. ILO will remain pivotal in laying the groundwork for global coalitions, international conventions and tools to ensure a safe and healthy “Future of Work” for all workers, including the platform worker.