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UNDERSTANDING THE FUTURE OF WORK
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1. EXECUTIVE SUMMARY

Industrial and technological revolutions have historically resulted in the growth of economies and productivity, as well as the creation of new jobs. Despite short-term challenges arising from the replacement of manual labour and the need to upscale skills and competencies, the pace of transformation allowed time for education and training to catch up, and to equip low and mid-skilled workers with the new skills and competencies required to function productively.

Today, many studies show that technology is being adopted at an exponential rate, replacing middle-level skills that were once considered uniquely human and placing the world of work in a state of flux. Dynamic processes such as digitalisation, the growth of the digital economy and technological advances, coupled with profound changes in the organisation of work, globalisation, demographic change, environmental challenges, as well as new ways of organising the production of goods and the delivery of services, provide a myriad of opportunities to society while at the same time presenting considerable challenges.

With the new and affordable capabilities made possible by automation, a significant number of new job opportunities and new markets will continue to be created. At the same time, existing jobs or tasks could disappear or be re-designed. These changes in capabilities and skills needs and the transformation in the organisation of work will better cater to the needs of individuals and companies. They will also provide for different work opportunities, accommodate better work-life balance and provide easier access to income opportunities, wherever they arise. But they also pose challenges with regard to future forms of employment, the polarisation of skills, the adequacy of existing legal, institutional or social protection frameworks, among others.

This document has two parts: Part I (Chapters 2 to 4) looks at the trends in the world of work and Part II (Chapter 5) explores possible policy responses.

Trends in the World of Work

Rather than decisively predicting a future scenario of massive job losses, recent analysis indicates that in general terms new technological changes will not necessarily or directly lead to high unemployment, but will undoubtedly require workers to learn and update skills much more quickly than in the past. The key difference compared with earlier technological revolutions is the speed of transformation enabled by the pace of new learning capacities of machines and the fact that, this time around, automation is affecting the service sector intensively.

As was the case in past technological revolutions, it is difficult to predict with 100 per cent accuracy which skills will be more in demand in the future. However, it is becoming clearer that vulnerability to automation will not so much depend on whether the work concerned is manual or white-collar, high or low qualified, but whether or not it is routine. STEM skills as well as the intensive development of particular sectors, like health and social care, are emerging as future drivers of job opportunities. But many future tasks and jobs will also require more emotional and personal skills, such as persuasiveness, creativity, empathy, leadership, teamwork capacities, among others.

The way businesses are operating is also changing; new and innovative companies are already “operating globally without being big”. A powerful online network will make a critical difference to their development and the availability of appropriately tailored services will also be crucial. At the same time, autonomous, output/result-based and project-oriented tasks and

jobs could be increasing, allowing people to shape their own career under less fixed structures and divisions and within constantly changing teams and networks.

This, together with the emergence and expansion of the on-demand economy could mean that the classical employment relationship gives way to a more detached, mutual self-interested culture that is often more transient. In this context, workplace flexibility, both in terms of working time and location, is one of the most salient characteristics of the new world of work.

Policies responses

Institutions will need to be much more ambitious in providing enhanced access to lifelong learning and educational opportunities. To inform investment decisions on education and skills, as well as to inform individual career choices in an ongoing challenging environment, it will be essential to rely on more real-time, finely-tuned, holistic and dynamic data. Informal and online learning will grow in prominence and policies should be prepared to channel and stimulate it properly. The education sector will need to work much more closely with business to ensure that programmes are developed and continuously updated to meet future skills requirements.

Critical to avoiding structural unemployment will be public support for enabling job transitions and mobility. Depending on the geographical context, social protection schemes and benefits may need to be created or developed further to respond to this new reality without creating strains on sustainability or incurring unnecessary costs for business. At the same time, the evolution and penetration of the on-demand economy will need proper follow-up based on the collection of appropriate labour market statistics that provide policymakers with information on recent developments and how these are affecting the employment relationship.

Making progress towards a more globally recognised skills set can facilitate not just mobility, but also access to new opportunities for businesses and individuals worldwide. Maximising the skills development potential of the female workforce will also be a critical driver of success in many geographical contexts.

To harness the momentum of the digital era, many economies will have to substantially improve access to both the internet and new digital tools as they will be drivers of new income opportunities. However, the digital economy also requires a strong 'analogue' foundation of regulations that create a vibrant business climate and let firms leverage digital technologies to compete and innovate. It will be key therefore to modernise excessive regulatory burdens, including Employment Protection Legislation (EPL) and administrative regulations that hinder the uptake of income and jobs opportunities in the new scenario.

A remote and disperse workforce will make working time less relevant as a monitoring tool from a legal and human resources perspective. At the same time, more sophisticated tools to monitor productivity will lead to improvement in overall workplace productivity, but will require careful and smart human resources policies. The intense increase in the amount of data collection at the workplace could also need careful approaches from management.

From an industrial relations perspective, the way workers communicate individually and collectively with management, using digital tools and in a more global labour market, could have significant consequences which call for further reflection. The future role of employers' and business organisations and trade unions in this context will also need to be further thought through, as will the role of social dialogue.

2. JOB CREATION AND TRANSFORMATION: LABOUR MARKET FLUCTUATIONS

Transformations in the world of work have direct implications for the labour market.

A. Job creation versus job transformation

The latest technological revolution is characterised by a faster rate of change, continuous transformation and greater volatility than its predecessors. This phenomenon is anticipated to engender significant churns to the global workforce, creating new kinds of jobs and changing or replacing old ones. Jobs in this context are no longer considered to be within the traditional employment contract. The concept of employment itself is changing and it looks likely that more ‘work’ and ‘tasks’ will be created and undertaken in the future. As a result, self-employment could be the new ‘traditional’ form of employment.

There is as yet insufficient data on whether the new technologies will ultimately create more jobs than they destroy, or instead move the world to a different, lower-employment equilibrium. However, some economic literature finds that while there is some substitution of automation for human labour, complementary jobs are often created and new work roles emerge to develop and support the new technology. There certainly will be new jobs (high and lower skilled), but concentrated in certain regions/urbanisations. So far, there is “zero evidence” (Autor, 2015) that artificial intelligence is having a new and significantly different impact on employment.

However, it is also the case that **productivity and economic growth have been decelerating in the majority of countries,** notably in the advanced economies. This slowdown dates back to around 2000 (OECD, 2016i). While this may partly reflect measurement issues (IOE, 2015), a common set of unsettling trends lies behind the aggregate economic and productivity slowdown: the slow diffusion of productivity growth across firms within industries, the decline in the growth rate of investment in knowledge-based capital and the reduction in the pace of creation of new businesses and hence job creation. This is why other sources (including the World Economic Forum 2016) report that current trends could lead to a net employment impact of job losses amounting to 5.1 million between 2015 and 2020. This is a result of a total loss of 7.1 million occupations of which two thirds are concentrated in routine white-collar office functions and a total gain of two million jobs in Science, Technology, Engineering and Mathematics (STEM) – related domains. In addition, data from the U.S. confirms that STEM skills will represent 14 out of the 35 fastest growing skills by 2022. A gain of (at least) 5 million lower skilled jobs especially in the service sectors is predicted¹.

Cost reduction impacts should not be neglected. Recently, Bank of America Merrill Lynch predicted that by 2025 the ‘annual creative disruption impact’ from artificial intelligence could amount to between 14 and 33 trillion USD, including a 9 trillion USD reduction in employment costs resulting from the enabled automation of knowledge work (The Economist, 2016ii).

The **key difference compared with other technological revolutions could be the speed of transformation**². This has to do with another qualitative differential element: the learning capacities of machines. The artificial intelligence technique known as ‘**deep learning**’ now

¹ Reference will be added.

² According to the McKinsey Global Institute (2012), technological innovation enabled by artificial Intelligence is happening ten times faster and at 300 times the scale or roughly 3000 times the impact of the Industrial Revolution. **New software can be shared globally by millions of people immediately, or in a matter of a few months, after its development,** even though it can take time to implement it due to complex regulation and market fragmentation.

allows systems to learn and improve by crunching lots of examples rather than being explicitly programmed³. This is being used to power internet search engines; block spam e-mails; suggest e-mail replies; translate web pages; perform voice recognition; undertake image recognition in the healthcare sector (X-rays and CT scans); detect credit card fraud; steer self-driving cars and delivery drones; stack supermarket shelves or move items around in warehouse. **Machines can now search mountains of legal documents, write market reports and sports event summaries.** To some extent machines can now write their own software (The Economist, 2016ii).

Added to this, the **'sharing and collaborative economy'** is quickly incorporating artificial intelligence. Deep learning will soon be applied in every industry where there is any kind of data: from genes, to images, or to language. Google⁴, Facebook, IBM, Amazon and Microsoft are trying to make use of such cloud-based services. ⁵.

It is very likely that these changes will not directly lead to high unemployment, but will speed up the current trend of automation, as technological change has done before, requiring workers to learn new skills much more quickly than in the past (The Economist, 2016ii). **It is therefore important to properly anticipate and understand the impact of such change.**

B. Are these trends global?

Despite the reported trends, **the impact of change on the labour market is not uniform across regions, let alone countries.** There are predictions of significant differences across advanced and developing countries by 2020 (McKinsey Global Institute, 2012i). A potential **global shortage of about 38 - 40 million high-skilled workers** is projected, with a 16 - 18 million shortage in the advanced economies. On the other hand, **a potential surplus of 90 - 95 million low-skilled workers is projected with a majority (58 million) in developing and emerging economies.** A **potential shortage of 45 million middle-skilled individuals in developing countries** is also projected⁶.

For advanced economies, these imbalances could lead to more long-term and structural joblessness as more youths may lack the employable skills to replace the many older workers retiring from the labour market. In developing economies, an inadequate supply of highly skilled workers could slow a nation's development into higher value-added industries and hinder the productivity gains. In general, the polarisation of incomes between high and low-skilled individuals could become more pronounced, leading to frustration among the middle-skilled, widespread perceptions of unfairness and social tensions (Jaison and Richard, 2012). **If policy action is efficient and proactively addresses bridging the skills gap, it is more likely that the outcome could be positive, both in developing and developed countries.**

³ This can be done at a higher or lower level of supervision (supervised learning, unsupervised learning or reinforcement learning are three different techniques used according to specific needs).

⁴ Google is using "deep learning" to boost the quality of web-search results, understand commands spoken into smartphones and help people search their photos for particular images, for instance.

⁵ The next step will surely be "transfer learning" which will allow machines to build on previously acquired knowledge, rather than having to be trained from scratch every time.

⁶ These potential imbalances were projected using current patterns in demographics and in the demand and supply of labour. In this analysis, educational attainment was used as a proxy for skills. While a useful proxy, the quality of formal education varies across countries and training apprenticeship can be more important than formal education in occupations. In addition, current demographic and labour demand and supply trends do not account for any shocks that could occur during the projected period. Thus, these projections need to be interpreted with caution.

The impact of ongoing globalisation and automation could also result in a loss of the competitive cost advantage currently offered by low-wage, developing countries⁷.

Evidence shows that the **patterns of change in occupational composition differ widely across countries**. While **some countries increased the share of high-skills-intensive and middle-skills-intensive jobs, others demonstrated job polarisation**, that is, they reduced the share of medium-skills-intensive jobs and enhanced the share of high- and low-skills-intensive jobs, and some countries just increased the share of medium-skilled jobs⁸. This requires an analysis of technological change and changing jobs profiles (ILO 2015).

One feature must underlie all policy responses: an effective and efficient answer to addressing polarisation and the subsequent income inequalities, which requires policies to promote sustainable economic growth, taking into account the specific structural drivers of income inequality in each economy and complementing pro-growth policies with growth-friendly enablers of social inclusion.

As a result, automation could have a much bigger impact in developing economies than in rich ones (Autor, D.H., 2015), because much of the comparative advantage enjoyed by the former is due to the lower cost of human resources. If automation makes **developed countries less dependent on this workforce**, developing countries could **weaken their capacity to compete in a global market**.

Developing countries will not raise the 45 per cent of manufacturing employment that Britain achieved before World War I (Dani Rodrik of Harvard University stresses that industrialisation has already achieved its maximum employment capacity in **Brazil, India and China** with a share of no more than 15 per cent (The Economist, 2016ii). In fact, **China recently overtook America as the largest market for industrial automation** (CitiGroup, 2016). Therefore, **emerging economies in Africa and South America will find it harder to achieve economic growth by simply moving workers from agricultural employment to factories and will need to find new growth models**. It will be more difficult to build a middle class and countries “**may have high income inequality baked into their core economic structures**” (The Economist, 2016ii). Policymakers in developing countries will increasingly need to consider how to tackle educational and welfare policies to prevent this.

C. Improved efficiency of the labour market

Access to **advanced digital processes is bringing more efficiency to the labour market by contributing to better matching of employers’ needs with individuals’ skills**. For instance, there have been affirmations of the growing importance of the internet as a job search channel, which allows an enterprise to have access to the global talent pool (Sakurai and Okubo, 2015). Technology also allows enterprises that continue facing recruitment challenges in their own labour market to seek talented individuals outside of their countries. For example, while more than 50 per cent of American companies use digital channels, only 20 per cent of individuals recruited via Upwork are based in the U.S. (MIT Technology Review, 2015). This reinforces the ability of companies to reach out to global talent. In addition, the use of ‘new ways of intermediation’ or ‘digital intermediation’ through digital platforms has also allowed

⁷ In a survey conducted by Citi GPS, 70 per cent of Citi clients believe that automation and the developments in 3D printing will encourage companies to move their manufacturing process closer to home, with North America gaining the biggest advantage from this development and China having the most to lose.

⁸ Most African countries face low levels of technological advancement and only a small number of African countries generated substantial dynamics in transforming their economies.

individuals to access new markets and use their skills to better respond to the demands of particular clients worldwide.

D. Profound demographic changes

Globally, the number of elderly people is expected to more than double by 2050, increasing from 841 million in 2013 to more than 2 billion. **The ageing population is already a reality for advanced economies where it is creating serious strains on social security schemes.** With a large proportion of workers reaching retirement age, the size of the working-age population is reduced and the old-age dependency ratio⁹ grows. Many countries have already started to undertake important structural reforms to pensions schemes, and there is no doubt that demographic trends in many developed countries will lead to increased pension and healthcare costs.

In general, developing countries can respond to the strains of ageing populations in advanced economies as they have a surplus of young people. Young people can be a positive force for development when well equipped with up-to-date knowledge and relevant skills. The limitation of many developing countries lies, however, in inadequate human capital investment, and many do not have adequate health or educational systems in place, which curbs the ability of young people to reach their full productive potential. While advanced economies can tap into the dividend of youth bulges in the developing countries, there is a **clear need to further improve labour mobility and better optimise supply and demand in skills needed across borders.**

3. TECHNOLOGICAL CHANGE AND NEW SKILLS

Technological developments have always replaced manual tasks and changed jobs. In fact, predictions that automation will make humans redundant have been made since the first Industrial Revolution, with the advent of personal computers in the 1980s and are prevalent today. There is no doubt that technology and innovation go hand in hand with economic growth, resulting in wealth accumulation and allowing for reinvestment in research and development and further innovation-led productivity. In addition, technological progress in services may create job opportunities in developing countries through outsourcing from developed countries.

For instance, it has been found that in the American workforce between 1982 and 2012, **employment grew significantly faster in occupations** (for example, graphic design) **that made more use of computers**, as automation sped up one aspect of a job, **enabling workers to do the other parts better. Similarly, the automation of shopping through e-commerce, along with more accurate recommendations, encourages people to buy more and has recently increased overall employment in retailing. Therefore, any analysis should avoid the fallacy that there is a finite amount of work to do.**

While there is no doubt that this trend has intensified in recent years and can be expected to increase in the short term, **it is difficult to predict with 100 per cent accuracy which jobs will be created in the future. The question is how society can properly absorb, in the middle and long term, the impact of technological change, especially in relation to the automation of work.**

⁹ The ratio of older dependents (people older than 64) to the working-age population (those aged between 15 and 64)

A. Future automation: more exposed jobs

Recent literature and company practices show that more and more time-intensive routine tasks and jobs are being automated. However, **what determines vulnerability to automation will not so much depend on whether the work concerned is manual or white-collar but whether or not it is routine**¹⁰.

Automation is **not just affecting activities that traditionally have been subject to digitalisation** in the manufacturing sector, but also a diverse and wide range of jobs in other subsectors. For example, research by Frey and Osborne (2013) found that jobs in **transportation, logistics**, as well as **office and administrative support**, are at 'high risk' of automation.

Occupations within the **service industry** are also highly vulnerable to automation, despite recent job growth in this sector. Activities such as insurance underwriters and telemarketers, for example, could be highly affected. Automation can now affect jobs that once seemed impossible to automate, from radiologists to clerks (The Economist, 2016ii). This trend has intensified exponentially in recent years, with estimates that close to 47 per cent of total U.S. jobs are at risk of automation (Frey and Osborne, 2013)¹¹. Subsequent studies put the equivalent figure at **35 per cent of the workforce in the U.K.** (where more people work in creative fields less susceptible to automation) **and 49 per cent in Japan. More recent sources stipulate that a relatively lower percentage of jobs (nine per cent in OECD countries) will be automated** (OECD, 2016ii).

On some occasions, a specific job will not necessarily disappear but many aspects of it will be automated, therefore requiring fewer workers. Jobs will be increasingly divided into tasks. This could be the case, for example, for activities such as legal discovery (computerisation of law), handling documents or medical diagnosis.¹²

There is also a growing concern about '**job polarisation**', where middle-skill jobs (such as in manufacturing) are declining but both **low-skill** and **high-skill jobs** are **expanding**. **The stagnation of median wages** in many Western countries is cited as **evidence that automation** is already having an effect, though it is hard to disentangle the **impact of offshoring** which has also moved many routine jobs (including manufacturing and call-centre work) to low-wage countries in the developing world.

B. Sectors and skills in demand

Considering the job growth in the service sector, automation can be expected to impact activities differently: the growth of the online marketplace for physical goods is already overtaken by the growth of online services, which could be an even bigger and more powerful development than took place in physical goods (McKinsey Global Institute, 2012ii).

Many jobs in the **health and social care sector** are estimated to grow by almost 30 per cent in the U.S. (and 62 per cent of the new STEM jobs will be within the healthcare sector) and probably in many other developed economies in the coming decade (MIT Technology Review,

¹⁰For instance, **a highly trained and specialised radiologist may now be in greater danger of being replaced by a machine than his own executive assistant.**

¹¹ More pessimistic is Jerry Kaplan, ("Humans Need Not Apply"), predicting upheaval in the labour market and Martin Ford, author of "Rise of the Robots" who refers to a "jobless future", The Economist, 2016ii.

¹² Watson, the robot is able to perform a diagnosis on the basis of a database of all x-rays taken in a hospital and all registered associated conditions.

2015). Profiles that will be more in demand include industrial organisation psychologists, genetic counsellors, physicians' assistants, and occupational or physical therapists¹³.

Without doubt, the declining cost of data storage and the increase in processing speeds will make **data scientists**, database administrators and IT security administrators highly demanded occupations. It is already challenging in many labour markets to find qualified expertise in these areas.

Any prediction of future skills needs cannot afford to underestimate the impact of developments in **robotics, genetics, nanotechnology and 3D printing**, which are already presenting challenges in terms of skills sourcing. Closely related are **STEM skills**, which will be increasingly in demand. At the same time, at least a basic level of programming is becoming a **horizontal skill** required for many traditional activities.

The **energy and green sector** will lead to a growing number of jobs, also interlinked with IT competencies: specialists in predictive analytical software will be increasingly required for managing and monitoring energy consumption. Areas closely related to the green economy are civil and petroleum engineering, which will also grow in the coming decade.

Research also identifies growth in tasks and jobs requiring **emotional and personal skills, such as persuasiveness, creativity, strategic approaches, analytical capacity, communication skills, innovative thinking, flexibility and social skills** (The Economist, 2016ii). Such skills have been shown to contribute to job creation; young innovative firms that possess them have been responsible for almost half of the jobs created in OECD Member states ¹⁴(OECD, 2016ii).

4. CHANGES IN BUSINESS MODELS AND WAYS OF WORKING

New business models are developing using technology that taps into the 'human cloud' and work is increasingly digitalised¹⁵. This has direct consequences for companies, the workplace and the workforce.

A. Changes in companies

Increasingly, companies are additionally providing services rather than products alone. Multinationals with high market shares are now investing in service provisions as part of their product delivery. Manufacturing and services are growing increasingly interdependent, resulting in the 'servitisation' of manufacturing. Service is more often the 'competitive point of difference' in the marketplace.

In addition, the on-demand economy **continues to compel companies to focus on their core competencies and to outsource** all other activities **in a cost-effective manner**, bundling activities in shared service centres. Routine activities previously outsourced to other companies are now redirected to individuals or to computers. It is therefore easier for new businesses to enter the market at lower cost, thus creating competition for established companies.

¹³ The number of nursing assistants increased in Britain by 909 per cent, teaching assistants by 580 per cent and care workers by 168 per cent (Deloitte). **A more precise reference will be added.**

¹⁴ **A more precise reference will be added.**

¹⁵ The rise of the gig economy, however, still represents a low percentage of the entire workforce (De Stefano, 2016).

New and innovative companies have the luxury of ‘operating globally without being big’ as their operations are no longer subject, to the extent they were in the past, to barriers such as capital or assets. In addition, start-up costs are decreasing, even though companies need to put in place an infrastructure for the processing of electronic data. Due to the increased fragmentation of production functions and on-demand production, professional management of (global) supply chains is a key driver of success for many companies. As a result, **the availability of appropriate services for business is a pre-condition for enterprise development**; to assess the feasibility of projects, boost innovation capacity, strengthen expansion opportunities (and create jobs) and facilitate day-to-day operations.

Today’s exporting companies implement ‘multi-domestic’ strategies rather than export strategies, establishing themselves inside their target markets rather than selling to them remotely. Companies may establish ‘centres of excellence’ as resources for themselves and others for particular services or functions (such as engineering and biology).

B. Changes in the ways we work

1) Global talent competition and new forms of work

In addition, access to a pool of resources worldwide is leading to an **intensification of international competition for talent**. Digital platforms connect individuals all over the world with work opportunities and also connect companies with job seekers and with clients and consumers. The ‘human cloud’ allows companies to access a pool of talented and ‘start-up minded’ individuals previously unavailable and often at lower cost.

All kinds of talent are being sourced globally and borders are beginning to ‘disappear’. New global freelancing platforms such as Upwork or TaskRabbit are enabling online work around the globe, creating competition among workers. More opportunities arise, especially for the young and skilled unemployed and more facilities are provided for consumers and companies to find an appropriate service at a lower price. These new digital forms of intermediation enhance the efficiency of the labour market but it is still uncertain whether they will challenge the traditional concept of work or not.

Autonomous, output/result-based and project-oriented tasks and jobs could be increasing, allowing people to shape their own career under less fixed structures and divisions and with constantly changing teams and networks¹⁶. New forms of work are emerging (crowdworking, teleworking, pooling of workers, portfolio work, among others) and a job for life is no longer the reality for many¹⁷. Workers are developing their reputation based on client satisfaction. Part-time workers will likely increase, as many providers of services will be complementing another job. But workers also require a new skills set to determine how to efficiently network, how to reinforce reputation and how to identify the best customers.

2) Working time and remote work

Workplace flexibility, both in terms of **working time and location**, is the **most salient characteristic of the new world of work**. The definition of ‘the workplace’ now encompasses anywhere an individual performs their duties. For many, work is no longer a place to go to, but a task to perform. **A dispersed, distributed and remote workforce, combining different**

¹⁶ Self-employed and independent workers in some sectors, specifically white-collar services and STEM jobs are growing in number (even though jobs are actually decreasing in other sectors, such as agriculture or retail).

¹⁷ It is estimated that less than 20 per cent of the working population has a full-time, open-ended contract, according to the World Employment and Social Outlook (International Labour Office, 2015).

forms of work relationships, working conditions and locations is increasing. What is certain is that the traditional '9-to-5' workday is becoming less usual as more and more members of the workforce perform remotely.

This type of flexibility makes life easier for many individuals with family responsibilities and those needing a better work-life balance. However, working time will less likely be used as a monitoring tool for workers' productivity and the separation between private and working time may become difficult.

3) Individual productivity

New technologies will enable companies to **better evaluate individual productivity using available data**, allowing them to compensate individuals in line with their performance. This could increase productivity and the capacity of companies to distinguish between the more and the less productive employees.

Challenges to human resources management may arise as a consequence, especially in monitoring and recording individuals' performance. To address these, some enterprises and national institutions have already developed policies and tools to ensure that the privacy of individuals is protected.

In terms of productivity, a role is also played by customers, who increasingly influence business success and workers' employability. Customer ratings or customer engagement (accessing and reading a newspaper article, for example) play an increasing role and digitalisation allows measuring of workers' performances and determining their added value to the company.

4) Worker Autonomy

Employment flexibility goes hand in hand with autonomy and empowerment (especially in higher skilled jobs), which fosters creativity, motivation, a sense of responsibility, ownership and an entrepreneurial approach. Social bonds between the worker and the company are decreasing; the old culture of loyalty that once characterised the employment relationship has given way to **a more detached, mutual self-interested culture that is often more transient**. To compensate for this, the working environment will need to be less hierarchical with a free flow of ideas and the possibility of having more direct access to management.

Decision making is speeding up: better availability of data and logistics networking mean that decisions will more often be made at different levels, increasing the relative value of roles rather than relying solely on hierarchical positions. Workers are requested to perform and deliver more, but they also request more in exchange in order to be retained.

The way in which individuals interact with the provider of tasks will also change fundamentally. Work meetings and personal instruction will be progressively replaced with social media, email, skype, and other IT software tools. **Individuals will be increasingly responsible for their own development and training**, and hence for their own employability **(even though reinforcing employability should continue to be a shared responsibility between society, employers and workers)**. They will need to develop their own reputation, based on client satisfaction; to acquire skills that enable them to network efficiently, improve their performance and identify their best customers. Workers are no longer focussed on one career, but on different careers, sometimes in more than one country or industry.

New technologies and social networks are also **enabling platforms for people applying for a job** and the **character, quality and effort of a person's social connections** are increasingly key.

5. CHALLENGES AND OPPORTUNITIES: POLICY QUESTIONS

These trends frame the basis for reflection on the opportunities and risks of the present and future world of work. Employers' and business organisation leaders need to start anticipating the policy implications and to reflect on how they themselves, and the institutions within which they operate, need to adapt in order to serve their members' needs and concerns.

This Chapter has three parts; the section on **people** looks at how individuals/workers need to change in a new world of work; the section on **institutions** looks at how institutions (which include governments, employers' organisations, unions, and other civil society groups) need to adapt to the changes and finally the section on the **work environment** considers how the workplace will evolve and how human resource policies will need to adapt. While reflecting on possible answers, this paper does not propose hard and fast solutions - rather they are presented for discussion and reflection, keeping in mind the different country contexts and circumstances.

5.1. People

Getting and retaining a good job has always been one of the most important lifelong objectives of the vast majority of people across diverse geographies, cultures and demographics. A job allows individuals to participate in society, to contribute to their community and generate income to support themselves and their dependents. In addition, for many people, jobs are an important part of self-identity. While the number of jobs in the economy seems to be on the decline, the future does seem to promise an abundance of work. But work may not always resemble 'traditional' jobs in the way in which it is organised and executed, rather it may be more task-based. Work may fulfil some aspects of a job such as provide benefits to meet basic necessities, but it may leave out other elements such as adequate social protection. Thus, it is important for individuals to adapt to a future where job mobility may increase substantially and to find complementary ways to meet their needs and expectations for a comfortable life.

A. Employment patterns

How to ensure that individuals are adequately prepared for a future in which there may no longer be one permanent job for life?

As stated in Chapters 2-4, new, flexible and diverse forms of work will increase in number. For instance, a constellation of internet-enabled companies matches available workers with quick jobs, most prominently Uber (for transportation), Seamless (for meal deliveries), Helpling (for house cleaners), and TaskRabbit (for reliable help at home). In addition, online markets like Craigslist and eBay have made it easier for people to take on small independent projects. Although the on-demand economy is still far from being a major part of the employment picture, the number of workers involved has grown significantly in many countries¹⁸.

¹⁸ By 50 per cent since 2010 in the U.S., according to the Bureau of Labour Statistics.

On-demand apps also spread the work around by carving up jobs into smaller pieces of work, which allows more people to compete for them. However, these new arrangements challenge the existing definitions of employer and employee. If the future involves a declining number of permanent employment contracts, individuals need to change their mindsets and adapt by seeking out various work opportunities. This trend signals new opportunities, but could also lead to higher levels of uncertainty and predictability in an individual's working life.

Those that are more versatile and adaptable in this future are bound to be rewarded. At the same time, **individuals will increasingly need to pay more attention to their own development and training**, and hence their own employability, **even if this should be a responsibility that is shared between society, employers and workers. Public (and private) institutions will need to be much more ambitious in providing enhanced access to lifelong learning and educational opportunities. This will be key in ensuring that competencies remain up-to-date and in facilitating smooth transitions when changing jobs. Such efforts should also include the provision of appropriate access to online or digital training as a complementary tool for improving skills and competencies.** More needs to be done by both public and private stakeholders in ensuring that individuals are adequately prepared for the future in terms of attitudes towards work. Innovative and refreshing solutions need to be explored to prepare individuals so that they can better adapt to the new reality where individuals are already moving between different jobs and tasks.

What kind of support mechanisms need to be in place to facilitate transitions between different forms of work and in-and-out of work? Who should be responsible for this – Employers? Individuals? The State?

For many, particularly the highly skilled, changes in the world of work offer a wide variety of job opportunities with potentially higher wages and longer term career paths worldwide. For others, these changes may mean a higher risk of losing their jobs. This can have knock-on impacts for productivity and economic output, poverty and the individual's personal well-being, social mobility and the overall robustness of the national economy.

As individuals transition from having more jobs to having more work, one emerging need could be **more public or private support to make the transition as smooth, successful and painless as possible.** Social protection and other public and private schemes need to further develop a much more supportive function especially for those who are constantly changing jobs - freelancers and the self-employed, among others. But the development of such systems will require financial resources and will need to be made taking account of the sustainability of existing systems, as well as of the economy as a whole. Individual responsibility could also play a more prominent role, resulting in the development of private schemes.

At the same time, there will be a need for much more targeted and efficient labour market re-activation programmes ('back-to-work' programmes) to ensure that those needing support are better able to respond to the new demands of the workplace. Measuring the impact of existing labour market policy programmes will be more crucial than ever.

How to channel and boost the opportunities brought by new IT apps so that a growing number of individuals are able to access different forms of work opportunities?

One means of empowering the individual is to provide up-to-date information about the demand for and supply of labour and specific skill sets. **Big data analytics offer the potential to model workforce deployment for the whole economy in a cost effective and timely manner.** Furthermore, by **modelling career pathways and outcomes over time** there is the potential to identify factors most consistently associated with successful career transitions in response to technological advancements such as training investments, financial resources, access to technology and, most importantly, the criteria, such as education level, industry sector, geographic location, and age. However, to inform individual career choices in the fast-changing digital economy, **more real-time and fine-grained modelling, drawing upon holistic and dynamic data, will be required.** Since older, unskilled workers appear to be already experiencing dislocation (due to the shift away from manufacturing and into service delivery), it may be useful to initially focus on labour market transitions within this population by **identifying the resources and initiatives that have had more impact and success in supporting transition** to alternative long-term and meaningful work.

To inform investment decisions on capital, education and redeployment of workers in a continually changing environment, **it is essential to be able to count on good measurement and data.** Much of the value delivered by the digital economy is not captured by traditional measures of a country's output, such as GDP. For example, the **value of access to work opportunities online** is not yet captured in official labour market statistics, which makes it difficult to measure the value of technology in providing individuals with access to work. More needs to be done in terms of data collection in order to **better understand how we are progressing in the digital economy and to better leverage the benefits of technological progress** to seek out new avenues of income. Social media, open government data, sensor technology and the growth of the internet do provide new measures and analytics to enlighten our understanding of the digital economy and society. However, there are ethical and regulatory issues, notably data privacy challenges, that need to be resolved before the full potential of big data can be realised.

How to ensure that informality does not increase as a result of the growing diversity of work forms?

Challenges of fair competition and regulation will need to be addressed, particularly in the context of the new digital economy, where information on work opportunities is readily available and can reach all corners of the world. There are other regulatory matters that arise related to, for example, data privacy, safety of workers or jurisdiction when it comes to paying income taxes. In addition, it is important to create a favourable business climate that allows firms to leverage digital technologies to compete and innovate in a global level playing field.

The first step to addressing these challenges is to **collect appropriate labour market statistics that provide policymakers with information on recent developments.** In addition, there is a need to arrive at **appropriate and objective definitions of the new forms of work, so that they can be easily identified.** Labour market statistics can help to better understand these new developments and to come up with suitable levels of institutional or regulatory action, so as to enable a vibrant business climate and to allow individuals to adapt and transition from employers to workers and entrepreneurs.

The lack of such information will result in these forms of work going undetected. This will lead to a thriving informal economy that does not contribute to the country's economic and social development. Informality can also be tackled through the use of **private and public employment services that seek to address the information gaps in the labour market.**

B. Skills and Global Talent Competition

How to provide workers with the soft, creative and innovation skills that will help to compensate for the decreasing demand for routine, automated jobs and thus mitigate job polarisation? How to ensure that employers and workers assume new attitudes towards lifelong learning? How to encourage more students into STEM education?

It is clear that skills will be one of the most critical factors shaping workforce outcomes in the future. As stated earlier, the current youth employment crisis characterised by both unemployment and skills shortages can be viewed as a sign that educational systems and training providers in many countries are far from equipping new workforce entrants with the skill sets required in the current labour market. Beyond this, **positive attitudes towards upgrading one's skills or upskilling can undoubtedly make a difference.**

While STEM skills will certainly be in demand, current concerns around participation in STEM education require efforts from decision-makers and educators to make STEM subjects attractive to current and future students, especially females, who are currently under-represented, and integrate them into the wider curriculum at all levels of education. Core STEM knowledge and skills aside, the rise of an ageing population in some countries means that the **healthcare and elderly care sectors could become large employers, requiring yet other skills.** Job polarisation between high and low skilled workers cannot easily be mitigated by the mere reinforcement of STEM skills and healthcare services; they also require the acquisition of **soft skills and creative and inter-relational competencies.**

The development of 'soft' skills in students and individuals generally is far from the agenda of many education and training providers today and the development and integration of quality training programmes on communication, innovation, teamwork, good presentations skills, creativity, perseverance, sociability, curiosity, among others, will be extremely important for the future of individuals, and highly valued by employers. In addition, **continued and growing investment in qualitative training and education** will be necessary to keep up with developments in digital technology.

How education is delivered is important, but individuals must adopt positive attitudes towards learning. Those needing to re-skill or making important educational investments need to understand where the demand for workers lies, the type of skills required and the income-earning potential. More targeted learning, with a proper assessment of impact, will be important to secure the productive and well-paid jobs of the future.

To achieve this, it is clear that the education sector **will need to work much more closely with business to ensure that programmes are developed with future skills needs in mind.** These partnerships, while present in many countries, are far from optimal and need to be more ambitious, especially in developing countries.

However, education and training institutions may not have sufficient resources to meet future needs for re-skilling and training. The demand for lifelong learning may call for a renewed focus on workplace learning (including apprenticeships). Digital technology will in the

short term provide many more channels for affordable and efficient online training, allowing more workers to update their competencies and improve their skills. In fact, online courses, with short video lectures, discussion boards for students and systems to grade coursework automatically, have become widely used (**Massive Open Online Courses - MOOCs**)¹⁹.

At the same time, ‘adaptive learning’ (courses tailored for each student) could finally be a reality thanks to new machine-learning techniques that could make learning not just more flexible but also more inclusive. In any case, there is a growing consensus that the online training trend will also change the way education is delivered. A key challenge will not so much be specialisation; learning to learn (or to relearn) will be critical as knowledge becomes obsolete more quickly. Lifelong learning will need to apply to more and more workers and its impact will need to improve to ensure real employability.²⁰ The traditional apprenticeship model will also have to be reshaped in many countries. Innovative and more diverse schemes to combine education with learning on the job will be needed²¹.

How can global employers better compete in the global competition for talent? How to ensure a level playing field for all individuals and companies across the globe?

There will be an ongoing demand for higher skills (and for lower skills) and businesses will be increasingly competing for talented individuals at a global level as a result of the possibilities that digitalisation provides. Individuals will have access to many more opportunities beyond the borders of their countries of origin. In this context, the role played by private employment agencies is likely to increase. In any case, it is very likely that **countries that offer the best terms and conditions to high-skilled individuals** will be the winners in tomorrow’s economy. Of course, **each country will have to assess its own skills needs, but this will need to be undertaken against the backdrop of a global skills market.**

Leveraging the potential of digital technology would be one way to facilitate access to global talent as well as providing more opportunities to individuals. Many households in developing countries already have a mobile phone and internet, allowing access to online platforms in search of work. As the number of internet users has more than tripled in a decade, businesses and individuals are becoming more and more connected.

However, improving **access to both internet and new digital tools will become crucially important in providing new income opportunities.** (In many geographies, this access remains limited.)

IT skills will be an enormous driver of success in the future labour market. Policymakers will have to be mindful to ensure that future generations and the active population are equipped

¹⁹ In 2012 Mr Thrun founded an online-education start-up called Udacity, and Mr Ng co-founded another, called Coursera. That same year Harvard University and the Massachusetts Institute of Technology got together to form edX, a non-profit MOOC provider, headed by Anant Agarwal, the head of MIT’s artificial-intelligence laboratory. The MOOC boom illustrated the enormous potential for delivering education online, in bite-sized chunks (The Economist. The return of the machinery question).

²⁰ For instance, new educational programmes offering affordable “nanodegrees” on data science or programming, which can be obtained in a few months alongside a job, or websites (like Lynda.com, owned by LinkedIn), provide a wide range of courses (management, leadership) and could become increasingly powerful instruments to reinforce employability.

²¹ For example, Siemens, a German industrial giant, has launched a four-year “earn and learn” programme for apprentices at its wind-turbine factory in Charlotte, North Carolina. Apprentices graduate with a degree in mechatronics from a local community college, certification from the local department of labour—and no student debt (The return of the machinery question. The Economist).

with the **appropriate skills** (IT literacy and basic programming, among others) as this will provide greater opportunities in a global market.

The digital economy also requires a strong ‘analogue’ foundation of **regulations that create a vibrant business climate and let firms leverage digital technologies to compete and innovate.**

Digital technologies are not shortcuts to development, but they can be a valuable enabler and accelerator. Online business registries ease market entry for new and innovative firms. **Well-designed IT training schemes** will help individuals upgrade their skills and access global opportunities outside their national contexts. However, for digital technologies to benefit everyone everywhere, there is a need to close the remaining digital divide, especially in internet access (World Bank, 2016).

Maximising the potential of the **female workforce** will also be a driver of success in many geographical contexts. Ensuring the appropriate use of half of the world’s available talent pool arguably has significant bearing on a country’s growth and development as shown in the U.S. If no additional women had joined the paid economy since 1970, output in the U.S. would be 75 per cent lower (McKinsey & Company, 2011). Their human capital and knowledge will further improve the economy’s output, productivity and knowledge base. Women are also more likely to have more highly developed soft skills, making them an important resource to address the skills mismatch (IOE, 2016ii).

Vis-à-vis the global talent competition, is there any need to ensure more widespread (international) recognition of skills and competencies?

Challenges here relate to the absence of a universal classification of skills that would allow the verification of the competencies of an individual in a global talent market with some degree of accuracy. **Having a particular set of skills recognised across the globe can facilitate not just mobility, but also access to new opportunities for businesses and individuals alike.** Such schemes are already in place in some regions and countries. The Association of Southeast Asian Nations (ASEAN) uses Mutual Recognition Agreements (MRAs) to facilitate a ‘freer’ movement of skilled labour. To date, MRAs in ASEAN have been completed for engineers, nurses, surveying service providers, architects, accounting service providers, medical practitioners, dental practitioners and tourism professionals. At the European level, intensive efforts have also been undertaken over recent decades, although the recognition of skills remains predominantly a domestic affair.

One of the main reasons for such recognition remaining within the scope of domestic policies is the **complexity of the different education systems.** While mutual recognition of skills would allow individuals to transition across countries, not only physically but also virtually, current challenges surrounding existing MRAs need to be addressed to allow a new generation of MRAs to better facilitate such transitions.

Another challenge lies in **negotiating mutual recognition, which is a complex and time consuming process** in light of the wide disparities in development levels, educational and professional standards and the role of national professional bodies. Extending these systems to all professions therefore requires significant commitment from the relevant actors. Furthermore, while facilitating the mobility of workers, skills recognition does not automatically mean labour market access; there still needs to be official approval of work visas which are

subject to domestic rules and regulations. Such agreements may also vary to include skill sets that are transferable across professions, on top of being transferable across countries. Ultimately, how such agreements will be formulated and concluded will largely depend on policymakers, and the business contribution to the processes can go a long way in addressing current challenges. Equally important and not yet addressed are validation systems for non-formal learning, which is becoming more and more relevant in the global talent competition.

More co-operation between education institutions, public authorities and employers over certification would contribute to progress in this area.

5.2. Institutions

Changes to the traditional employment relationship model call for reflection on existing regulations in order to respond to and accommodate new forms of work (ILO, 2015).

A. Labour Regulations and Institutions

Is the regulatory framework for labour contracts sufficient to deal with new forms of work? Is it flexible enough to facilitate business and job creation rather than simply obstructing new forms of employment?

Technological change, the 'human cloud' offering different skill sets and the ability to work at different costs from various countries are revolutionising the traditional employment relationship. The classic dichotomy of an employee and a self-employed person and the basic concept of employment could be at risk, especially when it comes to activities linked to the gig economy. **Definitions of employment could become blurred** and consequently affect both employees and employers, leading to legal uncertainty.

In fact, **litigation on the classification of workers in the gig economy is already underway in some European and U.S. courts and could affect other jurisdictions, both in developing and developed countries.** Companies in the gig economy have been known to include specific clauses in agreements that attempt to discharge the company from responsibility (including financial responsibility) in the event of subsequent reclassification of the employment relationship. Given this legal uncertainty, companies such as Alfred, Instacart and Munchery have decided to reclassify their workers as employees (De Stefano, 2016).

Other countries have been offering alternatives to the dichotomy of employee/self-employed, such as an intermediate category of 'worker' who would benefit from some of the traditional employee's rights. In some cases, this has created further confusion among users, practitioners and the courts. The question is made more complex as individuals providing services in the gig economy are task-oriented and often offer services to individuals/employers who are also constantly changing. **The jury is out on whether to consider these individuals as dependent workers (i.e. employees) or part of a new third category.**

In any case, the basic notion of 'legal or organisational subordination' that characterises many legal definitions of the 'employee' could be of less and less relevance for some of the new workers who innovate and exercise their tasks with greater autonomy. Therefore, a new **reflection on the employment relationship in the gig economy is needed** in order to identify solutions that not only help to preserve job opportunities, but at the same time avoid legal uncertainties.

Closely linked to this reflection is another: **the excessive regulatory burdens, including Employment Protection Legislation (EPL) and other administrative regulations** that hinder the harnessing of opportunities provided by the new realities of work in terms of new incomes and job opportunities. The debate on regulatory burdens that restrict employment and economic growth needs to be relaunched on the basis of the new forms of work. Digitalisation could become an even more powerful means to cutting much of the red tape that restricts business activities. This would be a very positive added value afforded by new digitalised business models.

While the controversy over the use of new digital platforms persists in some European Union countries, in other regions, for example Latin America, similar platforms are well established and offer new job opportunities. **It is important to bear in mind that any policy consisting of merely prohibiting new models of business from operating because of outdated regulation (not just labour regulation but tax, corporate, competition regulation, etc.) could halt innovation and the growth of new job opportunities.**

Many public institutions and decision-makers are already anticipating the new reality. **In Italy, for instance, a proposal named the Sharing Economy Act has recently been presented to the Parliament.** The idea is to create a framework for digital and similar platforms, as well as a register of platforms which will come under the supervision of the Antitrust and Consumer Protection Agency. In order to get registered, the platforms will have to present a clear 'business policy' on sales conditions and data protection policy. However, the distinction between platforms and real businesses is not entirely clear and may create additional challenges. At the same time, the Act fixes a threshold of 10,000 Euros of profit per year. For profits below this limit, earnings would be considered as linked to the new 'sharing economy' and taxed at a lower rate (10 per cent). For profits above this limit, earnings would be subjected to the normal rate of taxation for self-employed or employees. According to projections, the government would receive tax payments of between 150 million and 3 billion Euros by 2025 (Biagio, 2016). The sharing economy can bring important benefits. However, the main obstacle to such policies relates to the complexity and widespread diversity of digital platforms. A one-size-fits-all regulation may not be appropriate for the whole sharing economy. **In any case, there will not be one universal solution: each country, according to its own regulatory context and traditions,** as well as the specificities of its own labour market, will need to anticipate the new reality and assess whether national regulation will still be adequate in the new employment landscape. Flexibility remains key.

Is the existing international regime on applicable law sufficient to deal with mobile workers?

The scenario of a dispersed and mobile workforce raises questions in terms of applicable law in many work-related areas, such as working conditions, health and safety, social security regulation, as well as data protection. Individuals working at a distance using digital means are increasingly operating in different jurisdictions. The definition of mobility is changing as it includes people moving to where the jobs are (migration) as well as jobs moving to where people live (outsourcing, shared service centres, among others) and more and more tasks are moving (via digital intermediation) to people everywhere.

It is not just that an increasing number of individuals are operating from different countries but that a single individual could also be constantly changing the country where they are providing an online service. This is already intensifying, affecting both

developed and developing countries (for instance, accountants working from remote locations, teleworkers working a substantial part of their working life in a second country of residence and mobile workers working for different employers and changing the country where they provide their service). These specific situations have arisen in the past, but the trend is growing and increasing in complexity. **International private law already provides solutions regarding applicable law, such as those related to the jurisdiction where the service is provided or those referring to the employer's permanent address or the worker's residence. These solutions are not entirely satisfactory** and it will be important to reflect on the adequacy of existing tools provided by both national and international private law to anticipate future challenges around remote workers in the gig economy and similar scenarios.

Do existing regulations on working time accommodate the new scenario? What about teleworking?

Worker mobility and the increasing use of flexible working time arrangements also raise questions on **working time regulations. Measuring working time is less and less relevant as a monitoring tool for productivity from a human resources perspective.** It is becoming increasingly challenging to differentiate between private life and working time. Mobile and teleworkers are working from diverse locations and their own working time arrangements are increasingly integrated with their own autonomy to organise their work. It is not necessarily the working time that defines the workload, but the result and completion of the task. In these contexts, existing complex and protective working time regulation, as defined at national, regional or international level, could become obsolete or too difficult to apply.

A further challenge related to working time could arise from a health and safety perspective due to the **permanent connection to work** via online devices. However, this poses questions that are already being tackled rather efficiently from a human resources management perspective rather than from a regulatory one. Some proposed legal 'solutions' to create an 'obligation to disconnect' are more theoretical than practical as they are difficult to implement and monitor from a mere technical perspective (Jean-Emmanuel, 2015).

In relation to working time, the autonomy of workers raises another regulatory question: whether labour regulation needs to adapt to the context of **teleworking**. Teleworking has developed significantly over the last decade, mainly in developed economies, and it has already been the subject of regulatory initiatives in some, mainly European, countries. Such initiatives include the 2002 European Framework Agreement on Telework. Human resources policies and codes of conduct are already adapting themselves to this trend. It is important that policymakers understand the value of telework as a driver of change in increasing individual productivity and retaining and motivating employees. It is far from certain if further regulatory action is needed as it could add more complexity and act as a deterrent to developing telework further.

What are the legal and other challenges when monitoring workers' productivity?

Human resources monitoring practices on workers' productivity are being intensively developed, thanks to new IT tools. Legal provisions on data protection in many countries already provide individuals with a right to access personal data. But conflict of interests regarding the quality and quantity of data that an employer can collect could (and are)

emerging (for instance in medical tests and productivity data, among others). This is also related to the right of the employee to access these data or request their deletion. **A debate should be anticipated on the legal framework applicable to data collection at the workplace due to the growing amount of data that businesses are handling.**

Beyond this, from a human resources perspective, **monitoring productivity** by means of more sophisticated tools will surely lead to improvement in overall workplace productivity, thanks to better follow up and compensation of individual productivity. However, there are some growing allegations of this trend adding to stress and demotivating workers, creating a feeling of being permanently under supervision. There are also suggestions that attention to physical health and safety risks will move towards a focus on risks to mental health. These allegations are not yet evidence-based, as many of the potential challenges are being addressed through smart human resource policies which try to ensure that monitoring does not interfere with an individual's privacy or create a climate of surveillance. But preparation by businesses is required to counter, if necessary, the need for new regulatory approaches in this area.

B. Social Protection

How can individuals be more efficiently incentivised to assume greater responsibility for their insurance schemes throughout their careers, including during work transition? Is there any need to adapt social protection and benefits beyond the classical employment contract? Is there any room for manoeuvre to improve the portability of social protection rights?

It is highly likely that in the new scenario a significant percentage of workers will have several sources of incomes (which could mean more security in terms of income stability); be less dependent on one single employer, and transition more frequently in and out of work. These individuals engaged in new forms of work will need to assume **greater autonomy and responsibility** for their own careers and income security (pensions, benefits, credit and housing loans and paid leave). Increasing transitions across and between jobs, and periods in and out of work, may impact individuals' rights and access to social protection schemes. It is important that the welfare of these individuals is given appropriate attention and that they are not left to face the consequences of these new trends on their own. Welfare systems will need to provide further support in transitions when finding new jobs proves difficult. However, any such assistance should not allow welfare support to become a disincentive to work.

With this in mind, social protection schemes, both private and public, will need to adapt to a greater number of self-employed needing coverage, and employees will need to have the possibility to collect social protection benefits from different employers and countries. **Current social protection schemes and benefits may need to develop further to respond to this new reality without creating strains on sustainability or incurring unnecessary costs for business.**

Some analysts that predict massive job losses as a result of automation and artificial intelligence are calling for a **universal basic income** that individuals would receive regardless of whether they are working or not, or regardless of what their wages or alternative incomes are. This proposal (which was mooted by Stuart Mill among others during the Industrial Revolution) is seen as a way to avoid discouragement of part-time workers or freelancers willing to work more or to spend more of their free time on training. Concerns over AI and

automation have also led to calls for a **stronger safety net to protect people from labour-market disruption and help them switch to new jobs.**

This would be regressive and would reduce income needed for the poorest, while giving the wealthier resources that they do not need. Even more so if the goal is to provide a higher living income for individuals, in which case fiscal pressure would increase and growth would not be stimulated. A more creative approach based on earned income tax incentives or tax credits could be a more practical alternative, if needed. A universal basic income may also exacerbate the poverty trap, discouraging individuals from working, or from looking to acquire new competencies.

The growth of an ageing population in some regions and countries is already creating sustainability challenges to existing social protection schemes. This has already been discussed extensively in many developed countries in recent years and it is not a completely new challenge, but it will undoubtedly affect the future of work. In other areas of the world, **new social protection schemes will also have to deal** with sustainability needs linked to a large population at risk of poverty. Each country will need to create its own sustainable model, but the emergence and further development of so-called ‘third pillars’ will play an increasing role in many systems.

The portability of social protection contributions will also need to be addressed due to the increasing number of individuals who change jobs and tasks within and outside a single border. Efforts to remove excessive regulatory and institutional barriers for cross-border portability will need to be more ambitious. The future pensions of many individuals will depend on this portability.

How to ensure the sustainability of existing and new social protection systems and efficiently tackle income inequalities at the same time?

The sustainability of social protection systems is already under threat in many developed countries, due, among other factors, to a growing ageing population. Immediate action is needed and already the subject of much heated political debate, not just in developed countries but also in some emerging economies. **Systems experiencing sustainability risks will need to be identified and countries will need to implement their own policy mix to tackle them.** The sooner this action is taken, the less disruptive it will be.

Discussions on how developing countries will further develop their social protection schemes are not insignificant either. These are linked to the ambitious objective of the 2030 Development Agenda to reduce global poverty by half. The ILO’s ‘social protection floor’ concept may be useful as it deals with the fundamental needs of individuals, but caution is called for when learning lessons from past experiences especially where developed countries offer overgenerous social protection schemes. **An exchange of not only the successful but also the less successful experiences, as well as practical and technical assistance based on these lessons,** is necessary to assist in the development of feasible and practical social protection schemes. It is also critical to bear in mind the limited fiscal space of developing economies. An over-ambitious approach in the development of such schemes could become counterproductive for growth, and unsustainable in the medium term. Promoting transitions from informality to formality will also require realistic and practical approaches so that individuals in the informal sector are not excluded from social protection schemes.

5.3. Work environment

Institutions and regulations governing the workplace will need to adapt in order to accommodate the demands not only of enterprises but also of the individuals with which these enterprises engage. In addition, social dialogue and industrial relations, as well as human resources policies, will need to anticipate the new scenario.

A. Human Resources

Are companies already tackling human resource challenges in managing, monitoring, controlling and evaluating a nomadic and dispersed workforce? To what extent will working time continue to be a human resources tool to measure and monitor productivity?

One of the main features of the changes in the world of work is workplace flexibility in terms of working time and location. **This is a great opportunity for both employers and workers, with advantages in terms of work-life balance, reduced stress related to commuting, increased productivity** and a push towards **more autonomy and creativity** at work. For the employer, the benefits range from having a more motivated workforce to an increase in business competitiveness. This is important as in many countries millennials are increasingly difficult to attract and retain as they are more open than their parents to the idea of changing jobs several times throughout their lifetime.

There are already human resources tools in widespread use that place the worker at the heart of the employment relationship. For more than a decade, the organisation of many companies has been shifting from **hierarchical structures towards much more collaborative and participatory organisations** where the employee tends to be more involved in a growing number of decisions.

Nevertheless, at the same time new human resource policy challenges are emerging. Perhaps one of the most relevant, as previously mentioned, is the way companies handle productivity measurement. New technologies will allow companies to **better evaluate individual productivity using available data**. This will also provide them with opportunities to compensate individuals in line with their performance and increase the capacity of companies to distinguish between the more and the less productive employee. In addition, the use of specific tools allows measuring workers' performances and determining their added value to the company.

Additional challenges for human resources management may arise in terms of respecting privacy and stimulating a collaborative work environment. However, a 'Big Brother' scenario where the individual is permanently under surveillance is still very far from reality and companies and public institutions are already anticipating it. Respect for data protection and privacy is becoming a developed practice and a legal requirement for human resources management in many fields (from medical and genetic tests, to personal access to the internet using work devices).

That said, the amount of information that employers will be gathering on individual or employee behaviours will increase enormously, and distinguishing in a clear-cut way between legitimate information relevant for the purposes of measuring productivity and information which should remain strictly in the private sphere may prove challenging. A

cautious and anticipatory human resources policy is needed to avoid unintended legal consequences for companies. Public authorities will also have a role to play in strengthening the necessary certainty without preventing companies from taking advantage of the new possibilities that the IT tools offer to stimulate individual productivity.

In terms of productivity, it is also important to anticipate the increasing role played by **customers** in influencing business success and workers' employability through customer ratings or engagement.

Human resource managers are also coping with the difficulties of monitoring a **disperse workforce**. On the one hand, working at a distance will help to attract and retain talent worldwide but, on the other, not all work or jobs are compatible with low levels of physical presence at the workplace. Physical presence during most of one's working time will continue to be a feature for many (if not most) jobs. However, in many cases this will be the choice of the individual. **The management of both types of employees simultaneously will not always be easy.** Problems can arise with different compensation packages, working time patterns, health and safety policies, promotion paths and training possibilities. Again, the need to anticipate such problems through innovative migration, employment and social protection policies that apply efficiently across national boundaries will be paramount.

B. Social Dialogue and Industrial Relations

Will there be pressure to differently channel the representation of a disperse workforce? Will there be any pressure/real need to set up new forms of workers' 'protection' and representation (regardless of the form of employment)?

Some international trade union organisations and academics fear that the future work scenario will **weaken collective labour relations and rights**. In their view, the emergence of types of work that do not take the form of dependent employment, the intense diversification of contracts and employment relationships, the increasing number of workers teleworking or distance working, among other factors, will not provide individuals with the same opportunities to come together to defend their rights and conditions. According to these sources, the bargaining power of workers will diminish and this will negatively affect job quality. In some cases, it is even claimed that this will give rise to modern forms of forced labour.

The question is whether the traditional collective channels used for workers' representation (that is, company trade union representation or company workers' representatives) will also be affected by this reality. It is too early to tell with any certainty whether these channels will disappear or be significantly eroded. However, workers' representation at the workplace is **already adapting to more spontaneous and virtual interaction** as a way of gaining traction for their representative role. At the same time, workers are starting to use online tools to present and defend their views, even collectively. Social media are also being increasingly used for this purpose. This is **raising quite significant challenges from a human resources and industrial relations management perspective.**

Currently, it is not clear whether future **workers will prefer less trade union activism** and opt for alternative forms of representation at the company level. It also remains to be seen if alternatives will be strengthened as a result of increased access to more direct communication IT tools with management.

Reflection on this should also extend to the possible emergence of **new forms of association or collective action in the future**. This activity will likely be different from that of traditional trade unions or workers' representations, undertaken by individuals who are not formally dependent workers (employees) but who work for several employers, providing a service under different forms of contracts. In fact, some associations are already emerging to defend the interests and rights of digital workers and other individuals. Electronic **means of communication** and interaction, such as social media, are already providing individuals with new ways to express their satisfaction, dissatisfaction, claims or proposals, and will certainly continue to be exploited, regardless of the form of employment.

Will the nature of and functions of social dialogue change (representative employers' and workers' organisations) beyond traditional collective bargaining or social dialogue?

Social dialogue is expressed in diverse ways depending on the country and is already evolving as a result of several factors, among which the economic and financial crisis. It is therefore difficult to generalise when it comes to social dialogue.

However, it is very likely that among the **new themes which social dialogue** (and collective bargaining) will need to consider and anticipate are those related to the new reality of work. This could involve the social partners (and governments) having the courage to take on board the new reality that dependent employment as such is changing, that working time patterns may no longer be useful in many contexts and that the way workers channel their representation could change.

The role of employers' and business organisations will be affected too as the concept of dependent employment comes under discussion. Business and employers' organisations may need to be more service-oriented, perhaps enlarging the scope of their membership to new kinds of businesses.

At the same time, beyond the legal representation granted by public authorities, the capacity of these organisations to exert influence may increasingly be based on the specific services provided to their members and by their capacity to be backed by them. Individual guidance to members, anticipatory lobbying services, authoritative and practical contributions based on daily company challenges will probably count more than ever. The new reputational challenges for businesses in the world of work will also require both a practical but also a sensitive approach by employers' organisations in areas related to the interaction between business and human rights.

It is important to bear in mind that in a more global scenario the growing phenomenon of **online campaigns** conducted by global trade unions are gaining traction, especially as a powerful tool to exert pressure on multinationals which are more exposed to global reputational risk linked to fundamental principles and rights at work. This trend is also leading to pressures from these global unions towards a kind of global 'social' dialogue involving interlocutors whose perspectives may not always reflect those of local employers and trade unions. **Businesses will therefore need to further anticipate and communicate with stakeholders to efficiently counter and respond to such campaigns.**

Conclusions

BIBLIOGRAPHY

Publications

- Allen & Overy, 2015, "[The Big Think: New forms of employment - the legal challenge](#)".
- Arntz, M., Gregory, T. and Zierahn, U., 2016, "[The Risk of Automation for Jobs in OECD countries: A Comparative Analysis](#)", OECD Social, Employment and Migration Working Papers No. 189, OECD Publishing, Paris.
- Autor, D.H., 2015, "[Why Are There Still So Many Jobs? The History and Future of Workplace Automation](#)", Journal of Economic Perspectives, 29(3), pg. 3-30.
- BUSINSSEUROPE, 2016, "[BUSINESSEUROPE Response to the public consultation on regulatory environment for platforms, online intermediaries, data and cloud computing and the collaborative economy](#)", Position Paper, Brussels.
- Citi group, 2016, "[Technology at Work v2.0](#)", Global Perspectives & Solutions, Citi GPS report together with Oxford Martin School.
- Cohen, M. and Sundararajan, A., 2015, "[Self-Regulation and Innovation in the Peer-to-Peer Sharing Economy](#)", The University of Chicago Law Review Dialogue 116, pg. 116-183.
- Council of Economic Advisers, 2016, "[Economic Report of the President](#)", Transmitted to the Congress of the United States, Washington D.C.
- Degryse, C., 2016, "[Digitalisation of the Economy and its Impact on Labour Markets](#)", European Trade Union Institute, Working Paper 2016.02.
- De Stefano, V., 2016, "[The rise of the "just-in-time workforce": On-demand work, crowdwork and labour protection in the "gig-economy"](#)", International Labour Office, Inclusive Labour Markets, Labour Relations and Working Conditions Branch, Conditions of Work and Employment Series, No. 71, Geneva.
- Eurofound, 2015, "[New forms of employment](#)", Publications Office of the European Union, Luxembourg.
- European Commission, 2002, "[Framework Agreement on Telework](#)", Brussels.
- Frey, C.B. and Osborne, M.A, 2013, "[The Future of Employment: How Susceptible are Jobs to Computerization?](#)", University of Oxford.
- German Confederation of Employers (BDA), 2015, "[Seize the opportunities of digitisation](#)", BDA Position Paper on the digitisation of business and the working world, Berlin.
- Goos, M., Konings J. and Rademakers E., 2016, "[Flexibility@Work 2016. the Future of Work in the digital age: evidence from OECD countries](#)", Randstad Annual Report.
- International Confederation of Private Employment Services (Ciett), Forthcoming 2016, "The Future of Work: Issues at stake and policy recommendations from the employment & recruitment industry", Position Paper, Brussels.
- International Labour Office (ILO), 2015, "[The Future of Work: Centenary Initiative](#)", Report of the Director General, Report I, Geneva.
- International Labour Organisation (ILO), 2012, "[R202 – Social Protection Floors Recommendation, 2012 \(No. 202\)](#)", Recommendation concerning National Floors of Social Protection, Adopted at 101st International Labour Conference 2012, Geneva.
- International Organisation of Employers (IOE), 2015, "[Measuring Productivity](#)", Factsheet, Geneva.

International Organisation of Employers (IOE), 2016, "[Female Talent: Unleashing its Full Potential for the Future](#)", Position Paper, Geneva.

Jaison, R.A. and Richard, D., 2012, "[Job Polarization and Rising Inequality in the Nation and the New York-Northern New Jersey Region](#)", Federal Reserve Bank of New York, Current Issues in Economics and Finance, 18(7).

Levy, F. and Murnane, R.J., 2005, "[The New Division of Labour: How Computers Are Creating the Next Job Market](#)", Reed Elsevier Inc., Princeton University Press, United States.

ManpowerGroup, 2016, "[Human Age 2.0, Future Forces at Work](#)", Research Paper.

McKinsey & Company, 2011, "[Women in the economy: Selected exhibits](#)", Addendum to special report "Unlocking the full potential of women in the US economy".

McKinsey Global Institute, 2012i, "[The world at work: Jobs, pay and skills for 3.5 billion people](#)", Report, McKinsey & Company.

McKinsey Global Institute, 2012ii, "[Help wanted: The future of work in advanced economies](#)", Discussion Paper, McKinsey & Company.

Organisation for Economic Cooperation and Development (OECD), 2016i, "[Economic Policy Reforms 2016: Going for Growth Interim Report](#)", OECD Publishing, Paris.

Organisation for Economic Cooperation and Development (OECD), 2016ii, "[Automation and Independent Work in a Digital Economy](#)", Policy Brief on The Future of Work, OECD Publishing, Paris.

Productivity Commission, 2016, "[Digital Disruption: What do governments need to do?](#)", Commission Research Paper, Canberra.

PricewaterhouseCoopers (PwC), 2015, "[The Future of Work, A journey to 2022](#)", Publication, Geneva.

Russell Sage Foundation, 2013, "[Rethinking workplace regulation – Beyond the standards contract of employment](#)", Edited by Stone, K.V.W. and Arthurs, H.

World Economic Forum (WEF), 2016, "[The Future of Jobs: Employment, Skills and Workforce Strategy for the Fourth Industrial Revolution](#)", Global Challenge Insight Report.

World Bank, 2016, "[Digital Dividends](#)", World Development Report, Washington DC: World Bank.

Website/ Articles in Newspapers or Magazines

Fox, K. and O'Connor, J., 2015, "[Five ways work will change in the future](#)", The Guardian.

MIT Technology Review, 2015, "[The Future of Work](#)", Business Report.

Nathan, D., 2015, "[A typology of employment systems: beyond the binary](#)", The World Bank, Job and Development Blog.

O' Connor, S., 2015, "[The Human Cloud: A new world of work](#)", Financial Times.

Sakurai, K. and Okubo, Y., 2015, "[Job Seeker Trends 2015: Channels, Search Time and Income Change](#)", BCG Perspectives.

Biagio, S., 2016, "[The Sharing Economy ACT](#)", Il Sole 24 ore.

The Economist, 2014 "[The onrushing wave](#)", Print Edition: The Future of Jobs.

The Economist, 2016i, "[The Impact on Jobs: Automation and Anxiety](#)", Special Report: Artificial Intelligence.

The Economist, 2016ii, "[The return of the machinery question](#)", Special Report, Artificial Intelligence.

Papers presented at a meeting or conference

Jean-Emmanuel, R., 2015, "Impacts of Digitalisation on the Regulation of Working Conditions", Keynote Speech for the 8th Annual Legal Seminar, Digitalisation and Labour Law, The Hague, the Netherlands.

Prassl, J., 2015, "Digitalisation, Self-Employment and Precarious Work: Recent developments in the UK", Keynote Paper for the 8th Annual Legal Seminar, Digitalisation and Labour law, The Hague, the Netherlands.

Ray, J., 2015, "Impacts of Digitalisation on the Regulation of Working Conditions", Keynote Paper for the 8th Annual Legal Seminar, Digitalisation and Labour law, The Hague, the Netherlands.

TERMS AND DEFINITIONS

Employment

Employment is defined in the “Resolution concerning statistics of the economically active employment, unemployment and underemployment”, adopted by the 13th International Conference of Labour Statisticians in Geneva in 1982 as follows: the “employed” comprise of all persons above a specific age who during a specified brief period, either one week or one day, in the following categories: “paid employment” and “self-employment”.

Flexible forms of work

Flexible forms of work refer to work that falls outside of the realm of traditional employment, including temporary or fixed-term contracts, temporary agency or dependent self-employment as well as part-time work.

Jobs

Jobs are classified with respect to the type of explicit or implicit contract of employment the person has with other persons or organisations. In this document, we refer to jobs as work or tasks that goes beyond a single employer-employee relationship.

Employment relationship

The employment relationship is the legal link between employers and employees. It exists when a person performs work or services under certain conditions in return for remuneration.

It is through the employment relationship, however defined, that reciprocal rights and obligations are created between the employer and employee. It has been, and continues to be, the main vehicle through which workers gain access to the rights and benefits associated with employment in the areas of labour law and social security.

The existence of an employment relationship is the condition that determines the application of the labour and social security law provisions addressed to employees. It is the key point of reference for determining the nature and extent of employers’ rights and obligations towards their workers.

Traditional employment relationship

The traditional employment relationship (elsewhere also referred to as the ‘standard’ employment relationship) elicits certain assumptions about the length of the employment relationship (that is permanent or for an unfixed period of time) and the condition of subordination of the employee to the directives, organisation and disciplinary rules of the employer, in exchange for remuneration.

New forms of work

Eurofound (2015) considers work that falls into one or more of the following categories as new forms of work:

- Relationships between employers and employees that are different from the established one-to-one employment relationship;
- Provision of work on a discontinuous or intermittent basis or for very limited periods of time rather than on a continuous or regular basis; and
- Networking and cooperation arrangements between the self-employed.

In addition, the relevant forms of work could be but do not necessarily have to be characterised by:

A place of work other than the premises of the employer, where the employee is mobile and works from multiple locations, possibly including their own office; and

Strong or prevalent support of information and communication technology (ICT) including mobile phones, personal computers, iPads or similar, where this technology changes the nature of work relationships or work patterns.

Digital intermediaries

Digital intermediaries bring together or facilitate transactions between third parties on the internet. They give access to, host, transmit and index content, products and services originated by third parties on the internet or provide internet-based services to third parties.

Digitalisation

Digitalisation at its simplest means the conversion of analogue information into digital information. As digitalisation capabilities extend, virtually every aspect of life is captured or stored in some digital form, and we move closer towards the networked interconnection of everyday objects. The impact of this is a real-time global exchange of information between multiple connected devices (fixed and mobile).

Human cloud

The human cloud is a type of workforce where tasks are performed remotely and on-demand by people who are not employees but independent workers.

The type of work stems from white-collar jobs – chopped into hundreds of discrete projects or tasks, then scattered into a virtual ‘cloud’ of willing workers who could be anywhere in the world, so long as they have an internet connection.

Digital platform/ IT platform/ Online platform

Digital/ IT platform refers to the software or hardware of a website. For example, Facebook is a digital platform.

Gig economy/ On-demand economy

“The gig economy is usually understood to include chiefly two forms of work: “crowdwork” and “on-demand work via apps”. The first term is usually referred to working activities that imply completing a series of tasks through online platforms. Typically, these platforms put in contact an indefinite number of organisations and individuals through the internet, potentially allowing connecting clients and workers on a global basis”.

“On-demand work via apps, on the other hand, is a form of work in which the execution of traditional working activities such as transport, cleaning and running errands, but also forms of clerical work, is channelled through apps managed by firms that also intervene in setting minimum quality standards of service and in the selection and management of the workforce” (De Stefano, 2016).

Collaborative economy/ Sharing economy

The collaborative economy is defined as initiatives based on horizontal networks and participation of a community. It is built on “distributed power and trust within communities as opposed to centralised institutions”, blurring the lines between producer and consumer. These communities meet and interact on online networks and peer-to-peer platforms, as well as in shared spaces.

The sharing economy is an umbrella term with a range of meanings, often used to describe online transactions. Originally used to refer to peer-to-peer-based sharing of access to goods and services, the term is now sometimes used in a broader sense. The term can include the sale of goods and services via online market places, including ones that are business-to-consumer, rather than peer-to-peer.

Independent/self-employed worker

An independent worker is a person who provides services to another party in an independent and non-subordinate manner, in exchange for a compensation.

Telework

Telework is a form of organising and/or performing work, using information technology, in the context of an employment contract/ relationship, where work, which could also be performed at the employer's premises, is carried out away from those premises on a regular basis.

Third pillar (social protection scheme)

Third pillars are defined as any type of private retirement product subscribed to by consumers on an individual basis (as opposed to occupational pensions), either voluntary or mandatory.