THE CHALLENGES OF DIGITAL WORK IN PORTUGAL

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1. The challenges of digital economy.

1.1. The Digital Agenda for Europe 2010/2020 and Portugal's Digital Agenda.

In May 2010 the European Commission adopted the Communication *A Digital Agenda for Europe* (COM (2010) 245 final), setting out a strategy for the digital economy by 2020, which was one of the seven flagship initiatives under the *Europe 2020 Strategy*, presents policies aimed at maximizing the benefits of the digital age for all sectors of society and the economy, especialy the creation of a digital single market as well as the improvement of ICT skills and application.

The *Digital Agenda for Europe*[1] has considered the expansion of digital technologies to all sectors of the economy and this digitalization of the economy will imply a broad set of changes in the production and business models of companies, requiring a reinforcement of innovation policies[2]. As is well known, innovation policies play an

1 EUROPEAN COMMISSION, *A Digital Agenda for Europe*, Communication from the Commission to the European parliament, the Council, the European economic and social committee and the Committee of the regions COM (2010) 245 final/2, Brussels, 2010 (https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:0245:FIN:EN:PDF); *Agenda Portugal Digital*-Resolução do Conselho de Ministros n.º 112/2012, 31.12.2012; COUNCIL MEETING (2010), *Council conclusions on Digital Agenda for Europe 3017th Transport, Telecommunications and Energy*, Council meeting: Brussels; EUROPEAN COMMISSION, *The EU explained: Digital Agenda for Europe*, European Commission Directorate-General for Communication Citizens information, 1049, Brussels 2014.

2 And reinforcing the EU's position as a key player in the international ICT arena. The continued success of modern ICT depends on international openness and cooperation, an internet free of restrictions on traffic, sites, platforms and the type of equipment to be attached, and free of censorship. It also depends on our ability to handle global challenges, such as international governance, security, inappropriate content and malpractice, privacy and data protection (EUROPEAN COMMISSION, *Europe's Digital Competitiveness Report Main achievements of the i2010 strategy 2005-2009*, Communication from the Commission to the European parliament, the Council, the European economic and social committee and the Committee of the regions, Brussels, 2010).

important role in the balanced development of countries, since they wish to bring companies closer to universities and research centers in order to take advantage of their scientific and technical capacity. If the more industrialized economies want to remain competitive, they need to affirm their potential for productivity and growth, and the digitalization of the economy will play an important role, since it will allow for greater flexibility in production and, consequently, greater productivity.

In Portugal, in December 2012, the *Agenda Portugal Digital* was approved, aiming to develop the digital economy. In line with the priorities of the *Digital Agenda for Europe* and the *Europe 2020 Strategy*, the *Agenda Portugal Digital* has as its central objective the creation of qualified employment, increasing the employability of workers[3]. The economy will be influenced by technological change and the way it is assimilated by society, taking advantage of the opportunities offered by the digital skills development strategy, supporting the development and expansion of digital employment. And this development will result either from the promotion of ICT-based learning practices or the widespread formation of assets, employees, or the unemployed[4].

As this is a priority in Portugal, a strategy for digital employability will be based not only on a set of European guidelines but also on national initiatives such as the *Horizon 2020 Program*. In addition, this strategy will seek to streamline business models and capture opportunities in the global market.

Presented in 2017 by the GEP/MTSSS, *The Green Paper on Labor Relations 2016* (a study that identifies a set of changes and problems in the labor market in Portugal in the last decade) stresses that "the new digital economy is based on a technological revolution that has changed the way we live, work and relate, incorporating significant changes in scale, speed and complexity"[5] and if education has been seen as the best way to prepare people for this complexity, the aim will be to prepare for the impact of these changes on the job market.

As stated in this *Green Paper 2016*, according to the *Digital Economy and Society Index* (DESI)[6], in 2016, Portugal was the 9th country in Europe regarding integration of digital technology by companies, increasing three places from 2015 to 2016, a position that shows the importance of the work challenge in the new digital economy. In addition, Portuguese industry still has little technological intensity compared to European industry. By 2015 Portugal had half the European average of people employed in high and medium-high technology industries; 3% of people employed in Portugal worked in these industries, compared with 5.7% of people employed in the EU28. On the other hand, according to this *Green Paper 2016*, "since 2012 there are more people employed in high-intensity knowledge services than in low-intensity

3 The *Agenda Portugal Digital* also aims to promote the widespread use of ICT, and stimulate an increase in ICT exports and retention of talent in Portuguese companies through the development of digital skills, supporting the expansion of the centers generating digital employment in Portugal.

4 This dynamization of business investment in Portugal in ICT development activities must operate at three levels: increase the capacity to generate spin off universities and R&D institutes, or start ups with a global vocation; to strengthen the presence in the international markets by Portuguese companies operating on the basis of ICT, reinforcing their participation in European programs and international partnerships; and attract international companies to Portugal, by international scientific networks.

5 G. DRAY (Coord.), *Livro Verde sobre as Relações Laborais 2016*, GEP-MTSSS, Lisbon, 2016, p. 183.

6 *Digital Economy and Society Index* (https://digital-agenda-data.eu/datasets/desi/visualizations).

knowledge services. From 2008 to 2015, there were an additional 181 thousand people employed in the first and less 132 thousand in the last one" [7].

Considering that the development of digital employment has been very dynamic –given its average annual growth since 2000– this development poses decisive employment challenges, in particular the need to implement an integrated strategy for digital employability with workers and businesses[8], in the double meaning of modernizing the business based on the knowledge economy and of internationalizing technology-based companies, a prerequisite for the countrys business competitiveness and development.

Given the need to combat the estimated deficit for the next years of ICT professionals, it is crucial to create conditions for digital employability, building a new economic identity based on digital knowledge, especially since 2017 Portugal presented a proportion (of total unemployment) of long-term unemployment of 57.5%, that affects particularly middle-aged workers. These workers, being unemployed, find it very difficult to return to the labor market if they do not benefit from retraining, given the lack of available employment for all their skills.

1.2. The effects of digital work in European economies.

The digitalization of the economy sets a shift around digitally linked production (including suppliers, factories, distributors, and even the product itself) within a highly integrated value chain, and relies on a number of innovative technological developments, both within companies and between companies. This will allow greater flexibility in production, automation of production processes, data transmission, and the use of robots[9]. The automation of production, the transmission of data on a product as it passes through the production chain, or the use of configurable robots, means that a variety of different products can be produced in the same production unit. The ability to respond quickly to changing production requirements (because of the ability to quickly set up machines to fit the specifications required by customers) will greatly increase business competitiveness.

In Europe, the industrial sector is crucial to the economy and continues to be the engine of growth and employment. However, the relative contribution of industry to the European economy is declining and digitization can help to reverse this decline, which is due, on the one hand, to increased production in other parts of the world, especially the relocation of labor to countries with lower costs outside the EU and, on the other hand, to the expansion of the services sector.

It should be noted that since 2012, in response to this relative decline in industry, the European Commission has set the goal of industrial production to account for 20% of

[7] G. DRAY (Coord.), *Livro Verde sobre as Relações Laborais 2016*, *ob. cit.*, 2016, p. 185.
[8] In this respect, the initiative of the *Grand Coalition for Digital Jobs*, developed by the European Commission requires creation in each Member State of a *Coalition for Digital Jobs*, bringing together education and training.
[9] P. GERBERT, *et al.*, *Industry 4.0: The Future of Productivity and Growth in manufacturing industries*, BCG/Boston Consulting Group, 2015; T. MILON, *et al.*, *Five Lessons from the Frontlines of Industry 4.0*, BCG/Boston Consulting Group, 2017.

total value added in the EU by 2020[10]. In its report "For a European Industrial Renaissance", the European Commission emphasized that digital technologies are essential for increasing European productivity by redefining business models, and creating new products and services. With innovative development in information digitization and system integration –and by encompassing modular structures and cyber-physical systems that monitor physical processes, creating a virtual copy of the physical world, making decentralized decisions– there is greater cooperation in real time and services are offered and used by various stakeholders in the value chain.

With the use of sensors, the expansion of wireless communication, the deployment of robots and smarter machines, as well as the development of "big data" analyses, we anticipate greater flexibility in manufacturing, mass customization and an increase in quality and productivity. However, alongside these benefits with the digitization of the economy, the challenges are many and must be addressed namely the need to address legal data protection, liability and intellectual property issues, and working conditions.

In this regard, the *Eurofound yearbook 2017: Living and working in Europe* explains that "technology is steadily displacing humans across jobs and sectors, but public protest has been muted, perhaps because this has not led to employment on any grand scale - look to the recession for that. It has caused the loss of specific jobs – semi-skilled routine jobs in manufacturing, especially, but also in services – the number of travel agents in the US has halved since 2000, for instance"[11].

But, as Eurofound's research has highlighted, "a job comprises a bundle of tasks, some of which are more easily automated than others. So what is more likely than a massive annihilation of jobs, in the medium term at least, is that routine and repetitive tasks will be automated, while tasks requiring human abilities –problem solving, creativity and social skills– are recombined into new occupations. More jobs in the future could potentially have more variety, be more stimulating and more rewarding. But each new possibility opened by digital innovation seems to raise both opportunities and challenges. Telework, for instance, offers workers greater flexibility to manage their working time, but constant connectivity can pressurise workers to be available around the clock".

2. The challenges of digital work in Portugal.

2.1. New forms of employment.

Portugal has a very large tertiary sector and an industrial sector supported by small and medium-sized enterprises –in a different way than in countries such as Germany, Italy, France or the United Kingdom, with large companies– so the question is how the Portuguese SMEs will react to the digital switchover. Then there are the problems of the labor market: as mentioned above, Portugal has a high level of long unemployment that affects mainly middle-aged workers. The *Green Paper on Labor Relations 2016* recognizes that understanding work in the digital age poses a challenge to the legislator

[10] R. DAVIES, *Industry 4.0 Digitalisation for productivity and growth*, European Parliamentary Research Service, European Union, 2015.
[11] EUROFOUND, *Eurofound yearbook 2017: Living and working in Europe*, May 2018, Dublin, 2018, p. 67.

because the new economy is based on a technological revolution that has changed the way we live, work and relate, generating forms of socially fragile jobs, including temporary jobs with irregular hours[12]. In view of this scenario, it is essential to ensure the promotion of good working conditions –for example in training, safety and health at work– because in order to reap the full benefits of the digital industrial revolution, companies need to invest not only in ICT and equipment, but also in good working conditions, ensuring decent employment[13].

It should also be noted that the digitization of the economy and labor will give rise to a variety of legal issues, including worker supervision and intellectual property. Of course, with the large amounts of data shared on the network, it is necessary to clarify who owns the industrial data and to be sure that this data will not be used by competitors or collaborators in an illegal way. Managing data generated by smart devices will require a set of rules on privacy and copyright, which will ensure reliance on data protection.

The digitization of production will result in a wide range of changes in production processes, results, and business models, since we will face greater flexibility in production, process automation, data transmission and the use of robots. Jobs that involve routine (and more procedural) tasks become easier to automate; instead jobs that involve analytical or managerial skills, and require accountability, are harder to replace with machines.

As we know, we are facing a "new culture of employment and work"[14] and changes in the structure of the employer-worker relationship lead to a tendency to reduce the number of workers in companies. And if in Portugal the level of long-term unemployment is high (particularly among the population aged 45 and over) it will be a strategic goal to develop digital employability especially with this population group. As emphasized by Eurofound "a person who has been long-term unemployed in the previous five years will earn 11% less than someone who has not had a spell of long-term unemployment, and while the gap lessens if the person stays in work, this pay penalty persists over time"[15]. If social cohesion is central to our society, we must respond to the problem of job destruction especially among older workers. In Portugal the majority of the population in long-term unemployment is in the age group of 45 or older and, thus, we must avoid that it accentuates the labor segmentation of the labor market.

With digital work, training is crucial. As several OECD reports emphasize[16], there are two major challenges: first, adult learning systems need to be improved and

[12] It should be noted that in 2016 Eurofound identified new forms of employment, characterized by innovative ways of performing work and the use of digital technologies, as well as by the possibility that work could be provided from anywhere and at any time.

[13] In this sense, R. DAVIES, *Industry 4.0 Digitalisation for productivity and growth*, European Parliamentary Research Service, European Union, Brussels, 2015.

[14] P. MORIN, *La grande mutation du travail et de I'emploi*, Editions d'Organisation, Paris, 1997. Thus, for Morin, there are three orders of explanatory factors of the "new culture" that explain the main changes in work and in employment: economic factors, technical factors and sociological factors.

[15] EUROFOUND, *Eurofound yearbook 2017: Living and working in Europe*, May 2018, Dublin, 2018, p. 18.

[16] OECD, *Policy priorities for international trade and jobs: Trade and employment in a fast-changing world*, OECD, Paris, 2012; OECD, "Measuring the Internet Economy: A Contribution to the Research

mainstreamed; second, the risk of automation and the offer of job-related training are not distributed equally across countries and socio-demographic groups. As the low-skilled labor market is most affected by automation, it is clear that in countries where these sectors are prominent, the risk of high unemployment rates is higher. The OECD recommends the following: education systems need to acknowledge the technological change and adapt to the digital context in extending the skills necessary to function in an automated society. More precisely, skills such as cognitive and social intelligence will be of utmost importance; effective and well-targeted adult learning should be promoted as a key policy tool for those workers already in the workforce, with the goal of adaptation or reorientation; good practices and jobs with a smaller proportion of routine tasks should be promoted.

The multiple forms of labor contracts and the atomization of workplaces will further disperse work, and membership of a company will generate socially fragile forms of employment with some social inconveniences: temporary employment with irregular hours, multiple employers and variable incomes[17].

In the Information Society, innovation-generating knowledge and so-called "technology of the intellect" are the protagonists, capable of responding to very complex problems that arise, in particular, from the use of information systems. The internet is seen as a key platform that can help persons find new business opportunities and create new and better jobs. But at the same time, the internet is forcing a significant reorganization of companies, and that has repercussions on employment[18].

The *Eurofound of 2016* portrayed nine new forms of employment, characterized by a new standard of employment, i.e. a new way of performing work using digital technologies and the possibility that the work could be provided from any location and anytime.[19] If work in the new digital economy is generally associated with precarious working conditions for the majority of workers –in terms of training, safety, health at work and greater isolation– it is essential to ensure the promotion of good working conditions in the new digital economy, considering the estimated increased geographical and working time flexibility and, also, the increase in the difficulties in reconciling work life and personal and family life[20].

In addition, according to *the Green Paper 2016:* "by 2015, the top 15 of the largest Internet companies were dominated almost entirely by operators of electronic platforms for information, goods and services". Now electronic platforms have important implications for employment, especially because people tend to work provisionally, irregularly, on a part-time basis, on telework, or in combination with other activities and

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Agenda", *OECD Digital Economy Papers, n.º 226,* 2013*;* OECD, *In It Together: Why Less Inequality Benefttts All,* OECD, Paris, 2015; OECD, *New forms of work in the digital economy*, OECD Digital Economy Papers n.º 260, 2016a; OECD, *Skills Matter: Further Results from the Survey of Adult Skills*, OECD, Paris, 2016b.

[17] G. REBELO, "Breves reflexões acerca da reorganização laboral na década de 1990", *Working Paper/Departamento de Economia e Gestão/ ULHT*, Lisboa, 2002, pp. 1-21.

[18] OECD, "Measuring the Internet Economy: A Contribution to the Research Agenda", *OECD Digital Economy Papers, n.º 226*, 2013.

[19] And being typically developed by skilled, younger workers in service sectors, especially in the area of information technologies and creative industries, operating in the international market.

[20] G. REBELO, *Trabalho, Emprego e Segurança Social*, Sílabo, Lisboa, 2017.

forms of income. These online platforms tend to grow, thus raising complex issues for industrial relations and demanding their regulation[21].

A key question is whether the people who use these platforms are self-employed, since the definition of this status will determine the individual's protection at work and social security level. On the other hand, it is necessary to reflect on the working conditions provided by these digital platforms, from the point of view of social protection, particularly, protection against unfair dismissal, safety standards, and issues related to the sustainability of Social Security.

At the international level there have been debates on emerging regulation that seek to respond to these challenges. Under this plan, the status of worker will be granted according to certain criteria, such as the instructions given and the economic dependence of the activity provider. However, the use of more than one online work platform will lead to a multiplication of employment status. In this respect, the use of various platforms also makes social security protection more complex. Portuguese labor law does not provide a specific legislative framework regarding this: accordingly, the qualification of work carried out in the digital economy as subordinate or service work must necessarily follow the general contractual regime provided for in Articles 11 and 12 of the Portuguese Labor Code, insofar as what i tis that constitutes a work situation carried out with legal subordination. On the other hand, in the case of subordinate work normally performed outside the company and through the use of information and communication technologies, teleworking should be used as provided by the Portuguese Labor Code.[22]

In Portuguese labor law, one of the long-established ethical values is “contractual stability”, considering the idea of stable integration of the worker in the organization and it is this integration that must continue to be secured in the digital age of work. Thus, it will be urgent to discuss the need for legislative interventions around these new jobs, which are estimated to have a strong labor impact and the collective effort of sustainability of the Social Security system.

2.2. Occupational safety and health.

A reconfiguration of the work associated with digital technology introduces aspects of rupture with the traditional archetypes that, in an attempt of adaptation, evolved from the Fordist industrial organization based on a relation between authority, hierarchy and subordination. The structuring dimensions of space (the work place), of time (the duration of work, rest and articulation of personal and family life) and work processes (the production lines of goods and services) within a heterodetermined organization are called into question. The notions of subordination, organizational insertion and control of work take different forms. If until now the conductive forces of these dimensions were markedly centripetal and from the top to the base, a centrifugal movement in the opposite direction is to be expected.

[21] G. DRAY, *Livro Verde sobre as Relações Laborais 2016, ob. cit*, 2016, p. 186; OCDE, *New forms of work in the digital economy, OECD Digital Economy Pape*rs n.º 260, 2016.

[22] On the rules for equal treatment between teleworkers and other workers, on the privacy of teleworkers, G. REBELO, *Teletrabalho e Privacidade – Contributos e Desafios para o Direito do Trabalho*, RHEditora, Lisbon, 2004.

The new organization of work may involve physical disconnection of the worker from the company or even from the employer and his co-workers and not conform to the borders of the nation-state. But digitization allows one to increase the capacity to conform the work performance through greater standardization and the control over execution of the work can increase significantly. Consequently, the social relations of work are weakened because of the tendency toward individualization and loss of the sense of belonging[23].

These issues are of particular relevance in the field of occupational safety and health (OSH). The OSH legal framework (centered on Law No. 102/2009 of 10 September, which establishes the legal regime for occupational safety and health) has evolved toward a definition of principles, methodologies and processes approaching occupational risks and guiding preventive action. This legal framework has the potential to influence the organizational performance of any type of productive organization and a range of employment relationships that do not go beyond the traditional employment contract. It aims to adopt processes of continuous improvement of working conditions[24].

However, it should be borne in mind that the list of general principles guiding preventive action (avoiding risks, assessing risks that cannot be avoided, tackling risks at source...) implies an ability to characterize occupational risks arising from work activities with a degree of detail and sufficiency adequate to enable the choice of preventive measures. The fact is that the (de)materialization of digital work and its organization involves uncertainties about the risks engendered for the health and safety of employees. A delimitation of the scope of the general principles of prevention may leave out a set of risks insufficiently characterized by science and technology.

It must therefore be keept in mind that the principles of prevention are not to be confused with the precautionary principle. This is aimed at managing risks that are insufficiently characterized or for which science and technology have failed to achieve the necessary consensus[25].

The human impact of digitization can therefore be seen as diverse dimensions and challenges. Prolonged exposure to electromagnetic fields and their light effects may have an impact on human health, the outlines of which are not yet widely understood. Discord over the subject and the possible proliferation of studies may complicate the approach[26]. Sedentarization and working with visual display equipment can lead to physical and mental impairment with an impact on cardiovascular diseases, tendinitis and other work-related musculoskeletal disorders.

Also, mobility demands, cross-border travel, the submission to states of availability and the cumulative use of digital technologies pose particular problems of acceptance of the risk of human failure in motor vehicle driving. These aspects should be taken into

[23] M. M. ROXO (Coord.), *Trabalho sem fronteiras? - O papel da regulação*, Almedina, Coimbra, 2017.
[24] M. M. ROXO, *Direito da Segurança e Saúde no Trabalho - Da Prescrição do Seguro à Definição do Desempenho*, Almedina, Coimbra, 2011.
[25] EUROPEAN COMMISSION, *Communication from the Commission on the precautionary principle*, COM/2000/0001 final, Brussels, 2000.
[26] EUROPEAN COMMISSION, *Non-binding guide to good practice for implementing Directive 2013/35/EU Electromagnetic Fields.* Vol. 1 Practical guide, Publications Office of the European Union, Luxembourg, 2015.

account in the configuration of safety devices and procedures in traditional vehicles and in future autonomous vehicles.

The proliferation of the use of nanotechnologies does not correspond to a sufficient scientific advance that estimates its impact on human health. It may be hypothesized that we are dealing with a pandora's box similar to the one that in the recent past has resulted from the massive use of asbestos[27].

Finally, the risks arising from the work hypersolicitation and the potential for aggression to the dignity of the worker should be considered. The blurred lines between work and non work, the standardization of work processes, the potential of digital control, video surveillance, and geo-localization are some of the aspects that, in the limit, can give rise to a modern slavery of a virtual proletariat. Prioritization of ethical issues, and protection of personal data and intellectual property becomes central.

This raises the question of whether such challenges should not correspond to a consistent legislative adaptation involving coordination at a supranational level (the role of the European Union and the International Labor Organization).

2.3. Working time.

An important subject related to the challenges of digital work in Portugal is the reduction of working time. Portugal is one of the European countries that suffered most from the social consequences of the international financial crisis 2007/2008, due mainly to the increase in the uncertainty of maintaining a job as well as the increase in long working hours (50 or more hours per week). The OECD points out that Portugal was one of the European countries experiencing one of the most serious declines in various indicators of well-being, especially with regard to the working hours[28].

In view of the increase in long working hours in Portugal in recent years, it is also important to highlight the crucial role of labor law in reducing working time, particularly by strengthening legal solutions to ensure a balance between professional activity and personal and family life.

In Germany, in May 2017 the largest metallurgical union in the world, IG Metall, published the results of a survey on working time[29], carried out in the different sectors of German industry. It was concluded that 70.7% of the workers were "satisfied" with the working time practiced (35 hours per week) and also identified factors that contribute positively to the satisfaction of working time, namely autonomy of working time and better health and safety conditions. Over 80 per cent of workers in Germany currently use digital information or communication technology (ICT) in their work[30]. The German Federal Ministry of Labor and Social Affairs published a white

[27] H. LOURO, T. BORGES, and M. J. SILVA, "Nanomateriais manufaturados: novos desafios para a saúde pública", *Revista Portuguesa de Saúde Pública*, 31(2), 2013, pp. 88-200.
[28] OECD, *Hours worked*, Paris, 2017a. https://data.oecd.org/emp/hours-worked.htm
[29] EurWORK, *Germany: Working time back on the social partners' agenda*, EurWORK - European Observatory of Working Life, 2017.
[30] *White Paper* https://www.bmas.de/SharedDocs/Downloads/EN/PDF-Publikationen/a883-white-paper.pdf?__blob=publicationFile&v=3

paper in March, 2017, that examined the possibility of increasing flexibility in working time (*White Paper on Work 4.0*[31]). Therefore, it will be important to identify new ways of organizing working time which allow for flexible work, respect the reconciliation of work and family life, and do not affect workers' health.

As the Nobel laureate and former chief economist at the World Bank, JOSEPH STLIGITZ, recently defended in an interview: "artificial intelligence and robotization have the potential to increase the productivity of the economy and, in principle, that could make everybody better off (…) but only if they are well managed"[32].

As STIGLITZ highlights some jobs may be fully replaced. Mostly these are low-skilled roles: truck drivers, cashiers or call center workers. But STIGLITZ sees reasons to be cautious about what that will mean for overall unemployment, because there is a strong demand for unskilled workers in education, the health service and care for older people. As STLIGLITZ points out "fresh policies are needed", because taxes are not enough. For STIGLITZ, these challenges are about labor bargaining power, intellectual property rights, and redefining and enforcing competition laws and corporate governance laws. As STLIGLITZ says: "If we don't change our overall economic and policy framework, what we're going towards is greater wage inequality, greater income and wealth inequality and probably more unemployment and a more divided society (…). By changing the rules, we could wind up with a richer society, with the fruits more equally divided, and quite possibly where people have a shorter working week. We've gone from a 60-hour working week to a 45-hour week and we could go to 30 or 25".

3. Conclusions.

As digitalisation is having different impacts in different countries –depending, in part, on technological development and domestic economy– the debates about digitalisation, in and outside Europe, are being conducted in several ways[33]. The digitization will generate a new paradigm of work and important changes in the structure of the employer-worker relationships.

In Portugal, with the digitization of the economy, it is necessary to avoid a more unequal society and it is necessary to anticipate an inclusive development model that seeks to integrate everyone. It is necessary to ensure that digitization means social progress, in particular by reducing working time, preventing the occupational hazards arising from the digitization (wich may lead to the mobilization of the precautionary

[31] *Weißbuch Arbeiten 4.0* (https://www.bmas.de/DE/Service/Medien/Publikationen/a883-weissbuch.html); B. BORGMANN, *et al.* , "Digitization and the German goverrnment's Work 4.0 white paper - Shaping the legal landscape of tomorrow: Is German labor law prepared for the future?", *Labor Law Magazine*, 2017 (https://www.laborlaw-magazine.com/2017/06/26/digitization-and-the-german-governments-work-4-0-white-paper/).

[32] THE GUARDIAN, "Joseph Stiglitz on artificial intelligence we're going towards a more divided society", September 2018 (https://www.theguardian.com/technology/2018/sep/08/joseph-stiglitz-on-artificial-intelligence-were-going-towards-a-more-divided-society, 8 September. As STIGLITZ argues: "artificial intelligence will affect our lives (...) On the back of the technology, we could build ourselves a richer society and perhaps enjoy a shorter working week, but there are countless pitfalls to avoid on the way".

[33] *White Paper – Re-Imaginig Work*, Federal Ministry of Labour and Social Affairs, Berlin https://www.bmas.de/SharedDocs/Downloads/EN/PDF-Publikationen/a883-white-paper.pdf?__blob=publicationFile&v=3.

principle taking into account the uncertainty of impacts on workers health) and improving peoples working and living conditions. In particular, working time flexibility and increased working time, as well as the occupational hazards associated with the hypersolicitation of work and the offense of the workers dignity, deserve special attention.

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