Legal Issues in the Digital Economy:

The Impact of Disruptive Technologies in the Labour Market

ADAPT LABOUR STUDIES BOOK-SERIES

International School of Higher Education in Labour and Industrial Relations

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Edited by

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INTRODUCTION

LEGAL ISSUES IN THE DIGITAL ECONOMY: THE IMPACT OF DISRUPTIVE TECHNOLOGIES IN THE LABOUR MARKET

VALERIA FILÌ AND FEDERICO COSTANTINI

1. Society and Technology: between "Disruptive Technologies" and "Regulatory Sandboxes"

One of the most relevant human features, which differentiates us from other living species, is artefact production. In human history – and even before that – we have witnessed an unceasing sequence of inventions or discoveries. The use of fire, the wheel, writing, gunpowder, steam, and electricity are nice examples in this connection. Each innovation introduces changes to the existing social system which, even when minor, can be significant. Of course, progress takes place in a given context and can be related to certain effects. Outcomes can be observed from several perspectives – short, medium and long-term ones – and from different angles – social, cultural and economic ones – but cannot always be foreseen. Some consequences can be hidden, underestimated or overrated; the history of thought provides numerous examples of these misjudgements.

Technology enables one to manipulate natural elements (Bacon, 1620) and also to influence other people. In the last century, an extraordinary increase has been reported in technological advancements having an enormous social impact – from atomic energy to biochemistry – as well as a proliferation of misleading predictions. Assessment is affected by bias – public opinion is particularly prone to it – particularly when the observer is not directly involved in the facts under scrutiny.

Especially with the most recent innovations, lay people lack a true understanding of technology, progressively widening the gap between expectations and reality, real prospects and false promises. If we use devices of which we cannot appreciate the mechanisms, then maybe we should not

be so confident when evaluating their social impact or when speculating on their development. We should admit that we are surrounded by "black boxes", and acknowledge that we depend on them, both individually and collectively.

According to a widely accepted economic theory developed eighty years ago, technology is inherently "destructive". Societal reliance on technology and the economic impact of consequential uncertainty have been theorized in one of the most influential books of the twentieth century, Capitalism, socialism, and democracy (Schumpeter, 1942), which reframed concepts developed by Nikolai Kondratieff and Karl Marx. The argument is that the whole economy is based on a succession of cycles of "destruction and creation", which are made possible by technological innovation. Hence, social changes – which are so deep that every cycle creates radically new balances in society – are driven neither by political governments nor by working masses, but by entrepreneurs. Social innovators are those who own the keys of technology, take responsibility for the risks arising from their use and – consequently – profit from them. Schumpeter's book marked the emergence of a new social actor – the hi-tech businessman – and of a novel economic approach based on "endogenous growth" – which soon spread worldwide and indirectly nurtured an individualistic and philosophical perspective (Rand, 1961). It can be said that, without it, Silicon Valley tycoons would have not been proliferated.

At the end of the millennium, the idea of "disruptive innovation" acquired a specific meaning in marketing studies. The expression was used to denote an innovation model involving technological advancement in products or services suitable to destroy pre-existent markets and create new ones, addressing the most demanding and profitable customers whose needs remained unfulfilled by incumbent competitors (Christensen & Bower, 1996). Unlike "sustained" technologies, which do not require the creation of new business models, "disruptive" ones entail neither an evolution nor a revolution, but a "game changer" (Yu & Hang, 2010). An example of this is the 2007 debut of Apple's iPhone, which was disruptive for laptops as primary network access points (Christensen et al., 2015).

Consequently, it should come as no surprise that in economic theory, technology is considered to be both a mean for cyclic "destruction" and a tool for market "disruption". Critics can oppose this argument claiming that, from a practical perspective, changes are a natural component of our society and thus, ultimately, a certain balance has always been restored and ever will. A counter-argument to this theory is represented by the recent diffusion of "regulatory sandboxes", especially in financial markets (Ringe & Ruof, 2018). In different countries, legislators are creating special legal frameworks

in order to test new technologies and financial tools, where requirements are reduced, protocols are softened, and fines are suspended (Zetzsche et al., 2017). Experimenting on the social impact of these innovations has a twofold purpose. On the one hand, people involved in sandboxes are, harshly said, voluntary guinea pigs; on the other hand, these regulations allow one to minimise possible drawbacks, thus reducing uncertainty.

In conclusion, the relationship between us, as humans, and our artefacts, is still undefined. Technology is driving social transformation, while society has also become "proactive," being more open to embracing innovation but also more vulnerable to its undesirable consequences.

2. Disruptive Technologies, the Labour Market and Decent Working Conditions

The Fourth Industrial Revolution, smart factories, robotics and Artificial Intelligence, the Internet of Things, mobile devices and their applications – in one word, the "disruptive innovation" referred to before – have been creating new employment opportunities, concurrently dismantling various traditional jobs, deeply altering societies and reshaping human relationships.

It has already been written about the breakup of the bonds between productivity and employment (Rifkin, 2014) led by the second machine age (Brynjolfsson et al., 2014). It caused a short-circuiting of capitalism in which now there are more goods than buyers (Valenduc et al., 2019). This perspective could be regarded as both pessimistic and realistic. At any rate, it should be taken into consideration seriously, because it allows scholars to interpret and monitor the new phenomena and suggests adopting the required actions and solutions that should be undertaken by governments and institutions.

In Western societies, the latest, fast-and-furious processes challenge the legal frameworks of EU Member States, especially the ones that are based on labor and social security law models shaped in the Second Industrial Revolution. Traditional legal categories and instruments begin to waver under the bullets of the disruptive changes, as – it is a matter of fact – "changes generate changes" (Landes, 1969).

On these grounds, legal scholars are facing these phenomena to understand where we are and where we are going, focusing on old and new legal categories to mastermind new labor market policies. Disruptive technologies are challenging both workers and enterprises, altering social protection systems, traditional employment relationships and the balance between rights and duties, which has been achieved painstakingly. The decrease in the needed workforce and the increase in new jobs linked to

non-standard and independent forms of work require serious reflections about the future of work, social security models and social rights in general (Meda, 2016). Both the simplest and most mundane skills and the most complex and intellectual ones could be replaced by the new machines (Frey et al., 2013).

The extreme flexibility and uncertainty in which a great number of digital workers live, are well represented by the expression «tap workers», commonly used to refer to the typical workers of the gig/on-demand economy based on digital platforms (known as "the platform economy") (Barberis et al., 2017). Furthermore, new forms of discrimination and inequalities must be faced, as an unavoidable side effect of the second machine age (Brynjolfsson et al., 2014; Valenduc et al., 2016).

All these changes put a strain on the old legal frameworks and compel one to rethink legal instruments, measures, and categories to interpret and govern the above-mentioned phenomena. However, their global dimension imposes a supra-national approach, because single national systems are unavoidably powerless when facing the effects of the Fourth Industrial Revolution and the global nature of the platform/collaborative economy.

Digitalization of work is blurring the boundaries between dependent work and self-employment, while new needs are surfacing for the workers of the "middle ground". Workers' rights, which were hard-won during the 20th century in Europe, are jeopardized by this unstoppable social and economic process, and coordinated actions by EU institutions and Member States are more important than ever.

EU efforts to define some guidelines for the future of workers and enterprises in the digital era are welcome, but not yet sufficient, as will be demonstrated in the following chapters.

The European Pillar of Social Rights [COM(2017) 251] – jointly proclaimed in November 2017 by the European Parliament, Council, and Commission and commonly regarded as the last chance for social Europe – certainly marks a pivotal step forward in achieving the 'AAA social rating' for the EU. It lays down principles and rights to support fair, well-functioning and inclusive labor markets and welfare systems.

European institutions have been taking concrete initiatives to put the European Pillar of Social Rights into practice, including among others the Directive «on work-life balance for parents and carers, repealing Council Directive 2010/18/EU» (procedure 2017/0085/COD), and the Recommendation «on access to social protection for workers and self-employed» (procedure 2018/0059/NLE).

In order to take account of the new forms of employment, on 16 April 2019 the European Parliament adopted a directive «on transparent and

predictable working conditions in the European Union» repealing Directive 91/533/EEC [P8_TA(2019)0379].

The purpose of this document is precisely that of improving working conditions by promoting more secure and predictable employment while ensuring labour market adaptability pursuant to Principles No. 5 (on «Secure and adaptable employment») and No. 7 (on «information about employment conditions and protections in case of dismissals») of the European Pillar of Social Rights.

It is interesting to focus on the "whereas-texts" n. 4 and 7 in which it is stated that «(4) Since the adoption of Council Directive 91/533/EEC, labor markets have undergone far-reaching changes due to demographic developments and digitalization leading to the creation of new forms of employment, which have enhanced innovation, job creation, and labor market growth. Some new forms of employment vary significantly from traditional employment relationships with regard to predictability, creating uncertainty with regard to the applicable rights and the social protection of the workers concerned. In this evolving world of work, there is, therefore, an increased need for workers to be fully informed about their essential working conditions, which should occur in a timely manner and in written form to which workers have easy access. In order adequately to frame the development of new forms of employment, workers in the Union should also be provided with a number of new minimum rights aiming to promote security and predictability in employment relationships while achieving upward convergence across the Member States and preserving labor market adaptability. […] (7) The Commission has undertaken a two-phase consultation with the social partners, in accordance with Article 154 of the Treaty on the Functioning of the European Union, on the improvement of the scope and effectiveness of Directive 91/533/EEC and the broadening of its objectives in order to establish new rights for workers. This did not result in an agreement among the social partners to enter into negotiations on those matters. However, as confirmed by the outcome of the open public consultations that sought the views of various stakeholders and citizens, it is important to take action at Union level in this area by modernizing and adapting the current legal framework to new developments».

These statements mean that the European Parliament is fully conscious of the inherent limits of the aforementioned directive, but also confident about future initiatives.

As regards the limits, it must be added that the directive does not deal with social protection (i.e. it does not enforce Principle No. 12), and its scope is confined to dependent work, not taking into account self-employment. In this respect, opting for a traditional approach has led

institutions to miss the opportunity to establish a minimum set of common rules for all workers, regardless of their employment relationship, thus excluding many platform workers who are mainly self-employed. Moreover, Member States may decide not to apply the obligations laid down in the directive to several categories of workers, restricting its scope even further (Article No. 1).

This initiative must be regarded as a significant one. The workers' right to be informed of the essential aspects of the employment relationship is fully granted. Information must be very detailed and provided within specific timing (Chapter II). Besides, the big news concerns the setting of minimum requirements relating to working conditions (Chapter III), i.e., the maximum duration of any probationary period, parallel employment, minimum predictability of work, complementary measures for on-demand contracts, a transition to another form of employment, and mandatory training. In this sense, the directive provides that «Member States may allow the social partners to maintain, negotiate, conclude and enforce collective agreements, in conformity with the national law or practice, which, while respecting the overall protection of workers, establish arrangements concerning the working conditions of workers which differ from those above mentioned» (Article No. 14). In other words, Member States can derogate the aforementioned provisions only through trade unions and collective agreements, which are regarded as guarantors of workers' rights.

Yet little consideration has been given to the galaxy of self-employed workers, so the impact of this directive on platform workers will be less decisive than it was supposed to be.

Finally, another remark can be made in relation to vocational education and training. The directive «on transparent and predictable working conditions in the European Union» does little in this respect. Article 13 prescribes that «Member States shall ensure that where an employer is required by Union or national law or by collective agreements to provide training to a worker to carry out the work for which he or she is employed, such training shall be provided to the worker free of cost, shall count as working time and, where possible, shall take place during working hours». The point is that workers' right to receive vocational education and training is not established in advance, not even for the most vulnerable categories.

During the last decades, in a worker's survival kit – made up of social rights and protection against the lack of employment – the role of vocational education and training has become not only relevant but really crucial. Firstly, initiatives against the digital divide should be taken to give the elderly the chance to find another job and the young that of accessing the labor market with the skills required to compete and survive (Negreiro,

2015). Secondly, life-long learning policies are essential to promote long-term employability, especially in the digital labor market (see Council Recommendation 22 May 2018 on key competencies for lifelong learning, 2018/C 189/01). Both public and private education systems, especially those cooperating with trade unions, should play an essential role in the implementation of active labor market policies. Supporting the role of vocational education and training in industrial relations, trade unions could bridge the increasing gap within the working class (Vandaele, 2018). The above-mentioned directive does not take a further step in that direction, but it certainly bolsters the achieved results, also helping collective bargaining in this area.

In conclusion, the challenges posed by new technologies need to be addressed seriously and in depth from a theoretical and practical point of view. EU institutions and Member States, trade unions, scholars, citizens and enterprises, hold an important role, especially considering that this is an ongoing issue.

3. Chapters Overview

The book offers a multidisciplinary and critical analysis of both theoretical and practical legal issues concerning the emerging disruptive technologies and their impact on the European labor market and workers' life. The papers cover different disciplines – legal informatics, labor law, social security law, civil law, and tort law – in order to offer scholars and legal specialists a full picture of the changes, challenges, and opportunities, from a European Union Law perspective.

The utility of the book is strictly connected to its originality: it could be useful for those who need to understand the new phenomena from a multidisciplinary point of view, combining a theoretical with a practical approach.

In the first chapter, «The Digital Use of Human Beings: from Cybernetics to Collaborative Economy», Costantini draws an overview of ethical issues regarding labour conditions in digital environments. She addresses concerns arising from information control, considering three perspectives: cooperation among human beings (new forms of work organization, e.g. the implementation of "Agile" software); the interaction between humans and machines ("decentralized" business models and the "collaborative economy"); the exchange among machines (workers who are replaced by Artificial Intelligence).

In the second chapter, «Working for an Internet Platform: New Challenges for Courts», Recchia points out that the digital era has been

changing employment relationships dramatically, causing a considerable degree of legal uncertainty as to which rules apply in the platform economy. A certain degree of inadequacy is manifesting in the same founding categories of labor law, i.e., the bipartite - and in some legal contexts, tripartite - employment/self-employment taxonomy. For the courts, it is a matter famously described by the metaphor of being faced with "a square peg and asked to choose between two round holes". The author analyzes available case law in a comparative perspective, considering similarities and obstacles related to the more general need to respond to gig economy workers' protection. Ultimately, the Uber, Foodora, and Deliveroo cases will help one to question whether the concept of legal subordination and its main elements can govern new forms of employment in the context of the gig economy.

In the third chapter, «Working with an Internet Platform: Facing Old and New Risks», Caffio highlights that the ever-increasing development of platform work is producing new issues and new challenges for existing European and national legal frameworks. Starting from a reconnaissance of the risks related to Occupational Safety and Health (OSH) issues, control powers, the processing of personal data, the occupational illnesses and injuries faced by platform workers, the author analyses the suitability of current legislation to give effective responses in terms of prevention and remedies. The aim is to point out the shortcomings in European and national regulatory contexts as regards the protection of these ways of working, in order to encourage lawmakers' action.

In the fourth chapter, «Platform Work as a Chance for a More Inclusive Labour Market,» Carchio shows how technological advances will both create new jobs and heavy losses. Therefore, although there are important and noticeable benefits for a range of workers, there are also many risks and costs that affect the livelihoods of digital workers. For this reason, it is crucial to address emerging forms of on-demand work, promoting labor market inclusiveness and high-quality jobs, in their multiple dimensions of earnings quality, labor market security and quality of working environments, especially for the weakest groups of workers. The author focuses on how platform jobs could be quality jobs for some categories of workers that are particularly vulnerable in the labour market – e.g. working mothers and caregivers, people with disabilities and aged workers – ensuring them wide participation in innovation activities. Considering that low employment rates are often linked to social exclusion, insufficient levels of well-being, poor working conditions and scarce career prospects, it is interesting to explore how new jobs could affect labor market inequalities, reducing the persistent difficulties when accessing the job market.

In the fifth chapter, «Platform Workers' Needs and Social Security Challenges», Filì focuses on the fact that new forms of employment need novel social security protection. On the one hand, a significant share of digital workers operating as independent contractors or self-employed workers make up a variegated group; on the other hand, there is a growing number of working people who, due to their employment relationship or self-employment status, are left without sufficient access to social protection. The author underlines that there are EU institutions and Member States initiatives to support self-employed and non-standard workers who are not sufficiently protected by traditional social protection systems – especially in relation to motherhood, healthcare, unemployment, pensions, poverty, and social exclusion – therefore meeting the increasing demand for protection. It is stressed that ensuring decent work for non-standard and self-employed workers depends on the decent level of social security coverage granted to them.

In the sixth chapter, «Some Reflections on the Utilization of Artificial Intelligence in Liberal Professions», Parini highlights that, given the various challenges related to technological innovation and the increasing utilization of Artificial Intelligence (AI), lawyers will be confronted with several problems when evaluating the ability of the legal system to offer new remedies. This quickly and constantly evolving scenario impacts on different branches of the law. Machine learning has a deeply significant and disruptive impact on regulation. The ability of Artificial Intelligence to evolve and learn from past experience – and to adopt autonomous decisions, sometimes in an unpredictable way – raises issues which need to be solved to ensure legal certainty, even in terms of liability. Moreover, the widespread use of AI systems not only supporting professionals in repetitive tasks but even replacing them altogether, requires some consideration, especially in relation to the performance of tasks which have traditionally been reserved to "protected professions", with further problems related to contractual negotiation and liability.

In the seventh chapter, «Smart Contracts, Legal-tech Professions, and Civil Law Issues», Castellani shows how innovation and technology have entered the legal field, affecting the law of contract. AI represents a challenge for society as well as for the law. Smart contracts are used in this context and in those employing blockchain technology, on which the now-famous Bitcoin software is also based. This decentralized architecture, with intent to simplifying processes and reducing costs, certainly contributes to making smart contracts a particularly attractive instrument also in legal tech. The rapid diffusion of this technology has raised questions on the EU level related to the need for uniform legislation, which guarantees a consistent

approach to the various problems resulting from the application of these instruments. One example of this is how the decentralization provided by these new instruments can produce the risk of overcoming the limits of lawfulness and worthwhileness, concurrently raising doubts and problems of governability and monitoring.

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CHAPTER I

THE DIGITAL USE OF HUMAN BEINGS: LABOUR IN THE "INFORMATION AGE"

FEDERICO COSTANTINI

1. Introduction

1.1. An Overview: the "Human" Use of Human Beings

The meaning of our everyday efforts has been an open question for humankind since its origins. Labour is epitomised in many mythological figures – from Hephaestus to the Demiurge – and in the Bible – the image of Adam's forehead sweat – as the symbol of the human condition. Such denotation is twofold, as everyone knows from her/his professional experience, since it celebrates the human ability to grasp the understanding of natural elements and to craft malleable matter, but also the fact that the onuses sometimes are heavier to carry than gratifications.

Work is a complex endeavour also because is a structured social activity, organised by customs, laws and institutions. In this regard, Samuel Pufendorf, who is widely credited as the first legal philosopher of the contemporary age, connoted the human condition as *imbecillitas* (Pufendorf, 1759) due to our innate physical and moral weakness demanding us to reach out to other people (Todescan, 2001). This expression enlightens with extraordinary precision the primary source of social conflict. Indeed, as learned from the early reflections of Western culture (Aristotle [1253b]), we are "political animals", since an individual is naturally bound to her/his community. Yet struggles arise when we are in need of others' assistance or are required to contribute to other people's businesses: some are likely to intervene as driven by altruism; others act only by interest; still others are more willing to acknowledge the assistance received, while opportunists simply forget very easily who offered them help. In Pufendorf's view, a sad universal truth is expressed, still valid in current times.

Moreover, the remuneration of our work hangs on a very difficult balance between our dignity, the untouchable value we hold as human beings, and the price of our time and efforts. As maintained by Immanuel Kant, there is a moral limit under which work should be forbidden, a kind of sacred threshold which nobody should demand us to infringe: an individual should not be regarded as "a mere instrument", but as "a purpose in itself". In this sense, the expression "*Zweck an sich selbst*" (Kant, 1911 p. 429) means that we can "use" other people, allowing them to work for us, without "abusing" them, e.g. humiliating and subjugating one to our mere willpower. However, according to Georg Hegel, and in considering the famous dynamic opposition between the master and the servant – "*Herrschaft und Knechtschaft*" – we can argue that every servant can overwhelm and subjugate her/his own master, if only she/he learned the secrets of the job she/he is meant to carry out. Opposing Kant's perspective, the fact that the servant overcomes her/his limit is precisely what is required to reach better status. In Hegel's perspective, we can claim that the real goal of a job is not completing the task assigned, nor being paid for it, but becoming something else, changing our nature (Hegel, 1968). Everyone can appreciate that both perspectives are challenged by the real world. The distinction between "use" and "abuse" brought by Kant is quite vague in many cases, while the fact that a servant could become a master, as stated by Hegel, almost always remains a wishful dream.

It is a fact that workplaces have changed radically in last two centuries, due to technological improvements – steam power, coal, oil, electric energy, telephones, ICT – and, in general, through a more rational approach to production processes. If modern thought was rooted on the faith that knowledge and rationality can bring power to rule over nature, in the attempt to imitate God's act of creation (Ellul, 1954), in the contemporary approach technology has become the topic of a specific field of investigation for many scholars (Kapp, 1877), though its meaning has been disputed. It is worth mentioning the famous debate held in Davos in March 1929 between Ernst Cassirer and Martin Heidegger (Gordon, 2012). While the first provided an optimistic portray of human potential – as would be expected from a post-Kantian philosopher – the second, at the time a young and irreverent promising scholar, opposed a nihilistic perspective in which technology was alleged to be the example of the inconsistency of the Being. According to the chronicles, Heidegger emerged from the discussion as the representative of a new philosophical wave, commonly known as "existentialism", which spread worldwide and still influences our vision of the world. Paradoxically, while engineers

were inventing most of the devices still used nowadays – e.g. the television – philosophers were upholding the futility of human efforts to apprehend reality.

Recently, the social impact of technology has been under specific scrutiny. On that note, the remarks by Michael Foucault on the social and cultural repercussions brought by modernization (Foucault, 1975) are particularly evocative. According to him, in the contemporary age, we can observe the same pattern in human behaviour within different contexts, such as prisons, companies, schools and army barracks: in each of them, we find restricted spaces, uniform clothing, strict discipline, structured hierarchy, severe punishments, timely-cadenced activities. Under the view of Foucault – which was bound to a materialistic philosophical perspective – the condition of alienation suffered by individuals is the direct and unavoidable consequence of the emerging bourgeois class. Technology is envisioned as the sharpened tool used by capitalism to mould the whole society according to the needs of the production system and, as the practical expression of modern rationalism, is claimed to be the *causa causarum* of the frustration of single individuals and the oppression of the working class. We may observe that, of course, social processes and historical developments are far more complicated, but, as we know from the history of political movements, a simple equation is a good story to tell and an easy explanation to believe in. Without technology, there would be no industry; without industry, no proletarians; and without proletarians, one could finally achieve social justice.

Against the demonization of technology stood one of the most brilliant minds of the twentieth century, Norbert Wiener, a pioneer in several fields of scientific research. Together with other scholars, he founded a discipline called "cybernetics" (Wiener, 1948), aimed at shaping a unified theory of interaction among humans, animals and machines. According to this perspective, technology is not just a human invention, but the basic structure of a sophisticated ecosystem in which every slice of reality – be it psychological, social, organic, mechanical, physical – is translated into forms of control and communication. Since each empirical phenomenon, whether natural or artificial, can be represented in the flow of "information", everything is, in a way, technological. In a nutshell, technology can be found in nature so that everyone can benefit from it, regardless of her/his social status, or of her/his human – or even animal – condition.

In his most famous book, *The Human Use of Human Beings*, Wiener claimed that cybernetics could have allowed a "human" use of technology towards other people (Wiener, 1954), respectful of their dignity and so, we

could add, compliant with Kant's moral imperative. In this sense, technology should have been regarded not as a dumb instrument in the hands of a caste of wealthy oligarchs, but as the tangible opportunity to expand further the connection among the components of the social system and to tighten its lattice, reducing political and social conflict. According to Wiener, such approach should have enabled one to reduce the economic misbalances generated by the early industrial mass-production system, bringing about the emergence of a "flattened", "decentralized" – and thus peaceful – interaction between employers and employees.

1.2 Ethical and Legal Issues in the "Digital" Use of Human Beings

Currently, things are even more uncertain than they were for Wiener, since additional concerns have emerged besides those that were already known at his time. Indeed, in the last decades, automation and ICT have spread worldwide at a very fast pace. Hence technological advancements have created new professional profiles and great career opportunities, but also a considerable number of job losses and displacements. Moreover, information is concentrating in the hands of few people, who have now the power not only to interfere with social processes at an aggregate level, but also to intrude into individual behaviour and personal choices. Surveillance systems are being deployed in public and private spaces, collecting an enormous amount of personal and non-personal data, which are handled by sophisticated artificial agents in order to provide feedback suitable to bring a proactively accurate analysis of business processes and to profile entire populations. These innovations, coupled with those promised by the biotech industry – genetic human empowerment, above all – allow one to question if humankind, in the future, would be different from the way we know it: few individuals could flourish as technological demigods as all the rest might plunge into the abyss of a short, poor and nescient life. While some authors look forward to witnessing the advent of "singularity" (Kurzweil, 2005), others seem to be cautious, underlining its threats (Harari, 2018).

This contribution is focused on the ethical-legal issues raised by the impact of ICT on workers' conditions. Its aim is to address these questions from a theoretical perspective, hence the choice of the title, which recalls Wiener's book. The adjective "human" is substituted by "digital" as consideration is given to the approach known as the "Philosophy of Information" proposed by Luciano Floridi and other scholars in the last twenty years (Durante, 2017; Floridi, 2013b). According to this view, the

impact of technology in our existence is not just an everyday practical matter, but a theoretical challenge. As claimed in the *Onlife Manifesto*, a publication which envisions this perspective with great clarity, "ICTs are not mere tools but rather environmental forces that are increasingly affecting: 1. our self-conception (who we are); 2. our mutual interactions (how we socialise); 3. our conception of reality (our metaphysics); and 4. our interactions with reality (our agency)" (Floridi, 2015b p. 2). These few statements deserve a few clarifications before proceeding further.

On the first aspect, it is worth emphasizing that ICTs have produced an anthropological transformation since humans have become "Inforgs", namely "informational organisms living and interacting with other informational agents in the infosphere" (Floridi, 2015a p. 54).

On the second point, human communities have become part of a wider and complex structure in which relations are symbolised in terms of multi-agent systems, regardless of the fact that an agent is natural or artificial, human or not.

As for the third element, our world has become an "infosphere", a hybrid between the spiritual and the secular world, tangible matter and impalpable data (Floridi, 2014).

On the last aspect, it is claimed that there is a need for a radically new ethical framework, since the individual has become *homo poieticus*, namely "a demiurge, who takes care of reality, today conceptualized as the infosphere, to protect it and make it flourish" (Floridi, 2013a p. 175).

It is important to underline that this contribution intends to address the problem of "human use" from the "digital" perspective, yet without fully embracing it. The interesting fact – and the reason for its choice in this contribution – is that the "Philosophy of Information" can be seen as an evolution of "cybernetics", not only because it includes technology as a key element of our social ecosystem, but also because it investigates the opportunity to establish new criteria and moral values as tools for a new form of metaphysics.

1.3. Research Outline

This contribution proposes a threefold taxonomy under the tenet that labour does not involve only humans anymore. Indeed, "working" is not necessarily a human duty, since machines are not merely cooperating with us, but are also undertaking progressively more assignments without human supervision. Provided that, and depending on the degree of technological involvement, we can find: (1) traditional connections between humans, (2) more sophisticated interactions between humans and

machines and (3) exchanges of information between fully autonomous machines. This tripartite classification finds its rationale in the distinction brought by the "Philosophy of Information", in which information can be appreciated under three ontological modalities: (1) "information *as* reality" (*technological information*), for example, the electric signal transmitted and received regardless of content, (2) "information *about* reality" (*natural information*), such as data regarding natural phenomena, and (3) "information *for* reality" (*cultural information*) such as algorithms and procedures (Borgmann, 1999; Floridi, 2004). It is interesting to recall that the distinction of three levels of "complexity" was pivotal not only for the foundation of the theory of communication – for which information is "*technical*", "*semantic*" or "*influential*" (Weaver, 1949) – but also for the speculation on information control – the three layers of which are "*physical*", "*logical*" and "*content*" (Benkler, 2000) – during the rise of cyberlaw (Lessig, 2002).

Mentioning Wiener's work again, the "digital" use of human beings has not only many benefits and drawbacks, but also an intrinsic complexity. This contribution aims to provide a comprehensive overview of labour issues in a digital environment embracing every level of such complexity. In order to do so, it is divided into three sections, which correspond to the three models explained above.

In the first part, technology is considered to be an ecosystem of the interactions among human workers. Here, I will investigate how "virtualization" of labour resources influences tools, methods and procedures.

In the second part, technology ultimately defines in what way valuable resources – workload and retribution, above all – are distributed among workers: this issue is particularly relevant in the "collaborative" or "sharing" economy, where the pattern of interactions seems really "flattened" or "decentralized".

In the third part, technology is embodied in artificial agents, which can properly substitute human labour: I will analyse ethical and legal concerns related to the social impact of artificial intelligence, according to the most recent perspectives emerged in the European Union.

For each section, I will comment on the recent Proposal for a Directive COM(2017) 797 *on transparent and predictable working conditions in the European Union*, adopted by the European Parliament on 16 April 2019. To conclude, I will draw some final comments.

2. Human-human Interaction and the "Virtualization" of Labour Resources

2.1. Introduction: Industrial Production, Information Control and Labour

Control of information is essential in industrial production, yet this necessity is fulfilled in different ways and has evolved along with technological innovation. It can be useful to underline two crucial traits in the organisation of traditional industry: a unidirectional linear production and a highly centralized hierarchy. In this model, the fast-growing needs of the mass market is fulfilled by delivering goods or services through extremely standardized processes, which require accurate management of resources and continuous supervision. It is important that, also due to technological constraints, this surveillance is not incorporated into the workflow, but performed with external branches of the organisation and different professional profiles, hence the hierarchy remarked by Foucault. On the contrary, more recent "on demand" business models are intended to adapt rapidly to market transformations. To do so, productive resources are "virtualized", in that they are always available for supply, but utilised if and when required. In this configuration, the workflow needs to be "iterative" and organization has to be "flattened" and "decentralized". Indeed, production is divided into cycles which include phases of monitoring and loops of adjustment. The key point, here, is that control is an essential part of the workflow, often being undertaken directly by the workforce (Wysocki, 2014). This latter approach is adopted, as one might recall, in "lean" production – also known as the "Toyota Production System" – which was developed in Japan after the Second World War.

In this section, we focus on "lean" production not only because it seems to be currently deployed in many "as-a-service" business models (Sharma, 2015), but also due to the fact that it is "flexible". This method is well expressed by the PDCA acronym (Plan, Do, Check, Act), originally coined by W. Edwards Demming, an officer of the US army, who was inspired by studies on cybernetics.

2.2. Labour Forces from "Flexibility" to "Agility": The Case of the "Agile Manifesto"

The "lean" process of production started to attract academic interest in the span of a few years. More than thirty years ago, two scholars in a famous contribution noted that it presents interesting features. The most

important one was that the success of the method mostly depended on the joint effort of workers. In the authors' view, the behavioral pattern of workgroup members resembled a "scrum" in a rugby match: "Under the rugby approach, the product development process emerges from the constant interaction of a hand-picked, multidisciplinary team whose members work together from start to finish. Rather than moving in defined, highly structured stages, the process is born out of the team members' interplay" (Takeuchi & Nonaka, 1986 p. 138). In other words, teams were able, under given conditions, to improve productivity spontaneously, as a self-regulating organization, bringing extraordinary "flexibility" to the whole process. We can observe that in a "flexible" workflow, feedback is not only a part of it, but also the joint effort of every worker involved. Control becomes a personal commitment and a value shared by the team.

Recently, there has been a further evolution which has spread worldwide from the field of software development to other economic sectors. In 2001, a group of software engineers issued a document called the "Agile Manifesto" in which their theses were condensed in few words: "Individuals and interactions over processes and tools; working software over comprehensive documentation; customer collaboration over contract negotiation; responding to change over following a plan" (Beck et al, 2001). This seminal declaration sparkled rapidly, morphing into a kind of pragmatic philosophy, whose potentials have been exploited with remarkable results (Sutherland, 2014). Many companies and institutions have implemented this method, not only increasing their productivity, but also developing strategies to take advantage of "uncertainty" (Taleb, 2012).

It may be remarked that "agility" is different from "flexibility". While the latter still relies on the prevalence of the process and regards changes as mere fine-tuning corrections – structure over function, in a nutshell – the former is a proclamation of the primacy of transformation over routine – function over structure – in the attempt to convey individual problem-solving skills to the benefit of the entire team and so, indirectly, increasing overall productivity.

The fact that a working methodology, invented in the context of the digital economy, could be adopted in different fields, should not be surprising. Today ICTs not only are deeply embedded in most workplaces – we may think of telecommuting – but often an entire working environment is shared on online platforms: workflows are monitored remotely, and individual tasks are assigned through digital interfaces.

2.3. Conclusion: "Agility" and Creativity

Digital technologies – or, to be more precise, the mind-set shaped around them – have an impact on the interaction among workers. The cybernetic concept of control has going through three different stages. At first, in the traditional model, it was seen as an external surveillance system of individual behaviour; then, in the "flexible" pattern, as an internal commitment – "a moral one", I could say – to openness and transparency towards the teammates; eventually, in the "agile" approach, as the *ars inveniendi* of new ways to bring order to chaos. We can argue that this shift is made possible by a major assumption: labour in itself has become a kind of information, namely, a way to organize the world according to a given purpose. That is the reason why, in the digital era, labour can be ideally separated from individuals: the workload is not necessarily a human matter, and its purpose may not be self-determined by the worker.

It is noteworthy that the issues raised in this paragraph fall into the scope of the EU Proposal of Directive (2017)797. Article 9 sets limits to the predictability of work, imposing on employers a preliminary notification of reference hours and days and allowing employees to refuse work if the notice requirement is not complied with. These limits do not apply if the employer assigns a task to be achieved. However, in such a case, the worker is free to determine the time schedule.

We could agree that these provisions could protect workers from the malevolent "virtualization" of labour in "flexible" environments. Indeed, they seem to apply easily to permanent staff. Nevertheless, these safeguards appear inadequate to deal with the excessive use of "agile" methodology, particularly when involving freelance workers. "On demand" production models entail a complicated sequence of choices, which can be problematic to contradict, especially when workers are directly involved in decision-making.

3. Human-machine Interaction: Decentralization and the "Platform" economy

3.1. Decentralization, Social Computing and the "Peer-to-peer Economy"

In general, the flow of information in a given system can fall into three models – "centralized", "decentralized" and "distributed" – depending on information management. In the first, control is allocated to a single

fulcrum; in the second, it is assigned to certain nodes; in the third, information is pooled among all components (Baran, 1962). In the last fifty years, sociologists and psychologists investigating the pattern of social interaction have discovered that connections among human beings can be represented in terms of "decentralized" networks (Milgram, 1967). In this sense, certain nodes in the network can have more links and share more information, just as some of us are more "popular" than others. This model could be regarded as the standard configuration of human social relationships, even though historically prevailing "centralized" social systems (a State or a Church, for example) and "distributed" ones (communitarian settlements, for example) have been occasionally witnessed. The point is that we, as human beings, are designed to inhabit "distributed" ecosystems, where limited control is coupled with shared resources. Here, social authority and group extension find their dynamics and quite a precarious balance, as history has shown.

In the last twenty years, this "decentralized" design has been ousted by the massive deployment of ICTs, which have facilitated the exponential rise of what has been termed the "Networked Information Economy" (Benkler, 2006). A rising part of human communication has been conveyed through digital media, a phenomenon that has been known as "social computing" (Ala-Mutka et al., 2009), while pre-existing economic models have been empowered – such as "collaborative consumption" (Felson & Spaeth, 1978; Oh & Moon, 2016) – and others have been introduced. This broad category of "decentralized" economy has many names – "peer-to-peer", "collaborative", "sharing", "gig", "platform" economy – in the attempt to grasp the general concept, or to stress one specific aspect (Belk, 2014). The European Union, in Document COM(2016) 356 final, entitled *A European agenda for the collaborative economy*, provided an analytical definition (p. 3) identifying three categories of actors: (1) "service providers", which can operate as private individuals or professionals, (2) "users" of the services offered through online platforms, (3) "intermediaries", namely the owners of the platform where transactions are routed. According to this blueprint, "users" access online platforms to contact "service providers", who operate as their "peers" within the digital ecosystem managed by the "intermediator". In the "service provider" group, we can find a new type of worker, who has been named "prosumer", being a synthesis of two traditional categories: the "producer" and the "consumer".

3.2. "Platform Workers" and "Decentralization"

The social impact of the fast-growing category of this new type of workers, also named "platform workers", raises several issues, as explained by the European Group on Ethics in Science and New Technologies in Opinion n. 30 entitled *Future of Work, Future of Society*, released in December 2018, and the report published by the JRC (Pesole et al., 2018). One of the reasons of these concerns is that substantial aspects of the working conditions – e.g. the task assigned to the specific worker and their remuneration – are defined automatically by the online platform. "Intermediaries" not only build an economic ecosystem around the transactions among "service providers" and "users", but also exploit the latter using data collected by profiling individuals, analysing exchanges, and mining external databases. Hence, this structure allows massive and penetrating surveillance on "service providers", as well as definitive information asymmetry towards "users". The bitter irony is the lack of transparency in the "collaborative" economy, which can be exponentially more profitable than in traditional markets. Not for workers or consumers, of course, but for those who speculate on their needs and expectations.

We can observe that, in "decentralized" economy models, control of information is embedded in the process of sharing resources. Yet, the allocation of control does not have to be a detriment for the same parties who should benefit from it by feeding their energies into the system. Indeed, there are different kinds of "decentralization", as recently pointed out by a brilliant article posted on *Medium* by Vitalik Buterin, the inventor of Ethereum, a widely used distributed-ledger system (Buterin, 2017). He observes that "decentralization" can operate on three very different levels: (1) "architectural", depending on how many computers are involved and how they process information, (2) "political", depending on how the ownership of the system is distributed (3) "logical", depending on the configuration of interfaces and data structures. It is remarkable how Buterin applies this theoretical framework to human phenomena, arguing, for example, that common law is logically "centralized" – since it relies on certain social structures, law-making bodies – but architecturally and politically decentralized, because of the courts' interpretative discretion. According to this framework, the "collaborative economy" could be classified as architecturally and logically decentralized, but politically centralized. As observed in the EU document, platforms are usually owned by "intermediators", which are third-party entities. Needless to say, that leaves ultimate control out of the hands of "service providers" and "users". By default, workers are not fully in charge of the data governing their activities.

In his post, Buterin tries to make a distinction between beneficial and harmful coordination. In tackling what is defined as "a social challenge more than anything else", the author puts forward several remedies, most of which address the "protocol" formulation. Of course, in a "decentralized economy" this question stands differently than in cryptocurrencies, where the "consensus" of the users is of higher importance, yet the conclusion could be rather similar. In the "decentralized" economy, the difference between the "use" and "abuse" of human beings depends on the design of the ecosystem surrounding "service providers" and "users". The "protocol" becomes vital since joining a platform, more and more often and for many reasons, is not simply a matter of rational choice, as in cryptocurrencies, but of trust (Balkin, 2017; Pagallo, 2017). Those who own the platform, control transactions; as in gambling, the bench always wins.

3.3. Conclusion: Platform Owners and "Political" Decentralization

It can be agreed that in a specific system, control of information can be shaped according to different models – centralized, decentralized, distributed – and "decentralization" can be applied at different layers – physical, political or logical – multiplying the complexity of a system. Control allocation is independent from the distribution of resources, which can be shared among participants regardless of the model adopted.

In the case of the "collaborative" economy, one of the main issues is that "platform workers" do not own the "political" control of the system. In most cases, "intermediators" manipulate the exchanges among "service providers" and "users" in order to increase their benefit proactively. This advantage does not convert necessarily to an immediate and direct revenue, as the EU document seems to suggest, but at least to an advantage in terms of information.

The kind of activities that can be provided through this platform is almost infinite, from the most draining industrial jobs – as in "cyber-physical systems" (Lee, 2015) – to the most exhausting symbolic reasoning and conceptual organisation – as in "human computational systems" (Law & von Ahn, 2011). Yet it stands on clear criteria: humans are appointed to the tasks that by now machines cannot execute. If technological innovation improves the capabilities of artificial systems further, it is likely that humans will be overcome just to increase efficiency in the ecosystem. Perhaps that would be the end of the "collaborative economy", or better, the achievement of intermediaries' complete "political" control over the "decentralized" ecosystem.