

ALGORITHMIC MANAGEMENT: ORGANIZATIONAL CHALLENGES AND ETHICAL IMPLICATIONS

Andrei JOSAN^{a*}, *Cristina ALPOPI*^b

^{a, b} *Bucharest University of Economic Studies, Romania*

ABSTRACT

The paper aims to contribute to the growing research literature on algorithmic management (AM) and to provide a conceptual framework for its analysis, given that the importance of the topic is increasing as the use of AM expands and intensifies in more and more industries and economic sectors. The paper considers that AM should be understood as a digital evolution of pre-existing trends in the organization of economic activity that have manifested themselves over time, especially with the emergence of scientific management. Algorithmic management has a disruptive potential because it considerably increases the organizational ability to control economic processes and work based on the massive capacity to collect, store and process information through digital technologies, algorithms and Artificial Intelligence (AI). In the case of algorithmic management, these increasingly sophisticated and complex technologies are combined and used to reorganize control and reconfigure the balance of power within economic organizations.

KEYWORDS: *algorithmic management, ethics, work organization.*

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1. INTRODUCTION

The concept of algorithmic management (AM) refers to the use of algorithms, especially *Artificial Intelligence* (AI) and *Machine Learning* (ML), in organizational processes of employee performance management and evaluation. AM, increasingly used in industry, logistics, retail and *the gig economy*, fundamentally reconfigures the way work is structured and supervised. The purpose of this paper is to examine the dual impact of AM, both in terms of organizational challenges and the ethical concerns it generates. On the one hand, organizations can streamline processes and improve efficiency, but on the other hand, AM increases the risk of undermining employee autonomy, exacerbating *biases* and creating privacy issues. The importance of this topic stems from the widespread adoption of algorithmic systems in numerous industries. In sectors that are part of *the gig economy*, companies such as Amazon, Glovo or Uber, rely heavily on algorithms and AI to assign tasks, evaluate employee performance and ensure their compliance to achieve corporate goals. As these systems become increasingly powerful and ubiquitous, it becomes critical to understand both the benefits of AM and the potential negative effects on employees and organizational structures. Existing data suggests that AM can accelerate and widen existing cracks in labor relations (through outsourcing, franchising, digital platforms, etc.) and also contribute to worsening working conditions by increasing standardization and reducing opportunities to use employees' intrinsic skills. The analysis of the use of AM in the case of digital platforms and logistics highlights the danger of intensifying effort in the

* Corresponding author. E-mail address: andrei.josan@rei.ase.ro

workplace and creating new sources of algorithmic insecurity that have the potential to generate employee opposition to it.

2. LITERATURE REVIEW

2.1 Historical context

The emergence of AM is part of a broader historical trend towards the mechanization and automation of work. Although AM seems, at first glance, a new thing, if viewed through the prism of its underlying mechanisms, it seems to be a continuation of long-standing historical trends towards the rationalization or bureaucratization of economic activity and work organization. Therefore, AM can be seen as a modernized variant of scientific management that has gone through totally or partially digitized variants, as is the case with the *Just-in-Time Production* or *Lean Manufacturing* system. Although the ubiquitous use of digital technologies can turn it into a force with significant disruptive potential, it should be emphasized that algorithmic management, although it is based on digital technologies and information, always involves organizational and institutional choices and decisions regarding the specific use of those digital technologies. As a technical-social process (Jarrahi et al., 2021), AM is shaped by socio-institutional and organizational factors that contribute to its development and results (Baiocco et al., 2022).

Historically, the principles of *scientific management* developed by Taylor (2012) were among the first systematic efforts to optimize work processes through standardization and through detailed measurement of employee performance. With the invention of computers, the internet, and *Artificial Intelligence* (AI), these principles have evolved and metamorphosed into today's algorithmic systems capable of making autonomous decisions based on the processing and analysis of enormous amounts of data. The emergence of *scientific management* in the first decades of the twentieth century occurred in a period of intensifying conflict between capital and labor for control and for the establishment of working conditions in the new world of industrialized labor. *Scientific management* legitimized the emergence of the new class of managers, a new *knowledge class*. The first decades of the 21st century mark a new period in which new actors, this time software engineers and not mechanical engineers, are the champions of al AM (Birnbaum & Somers, 2023).

Since the end of the nineteenth century, three management styles have emerged in different historical periods as a solution to problems specific to each historical stage. Initially, *scientific management*, which appeared in the new industrial production plants at the end of the nineteenth century and the beginning of the twentieth century, had as its main object of activity *the supervision* of work. For Taylor and his followers, *scientific management* was practiced in the service of *efficiency* by identifying the best ways, formulas, and procedures for performing job duties within the division of labor system. Subsequently, a second management style developed was *collaborative management* or *post-bureaucratic management*, a product of the post-industrial era (Bell, 1973), initially within the *start-up* culture in the *high-tech* and *new media* sectors in Silicon Valley, California and in Silicon Alley in New York (Neff, 2015) and, later, in the R&D departments of large corporations in fields such as engineering and pharmaceuticals, its objective being *to coordinate* specialists in fields where innovation is essential, both in its classic form that involves the application of theoretical knowledge in a specific field, and, in particular, in sectors whose development relies heavily on the recombination of innovations through the application of theoretical knowledge from different scientific fields. *Collaborative/post-bureaucratic management* was not a type of "management without managers" because it involved the coordination of multidisciplinary teams, composed of people with different specializations (software engineers, system engineers, marketing specialists, biologists, business strategy specialists, etc.). The aim of these multidisciplinary teams was to innovate at a rapid pace in a process in which there was a transition from "*sequential engineering*" to "*simultaneous engineering*" (Dorf & Sabel, 1998). If the typical organizational form for scientific

management was *the factory* of the industrial age, by contrast, the emblematic form of the post-bureaucratic/industrial management style is *the project*, both in the case of *agile start-ups* and the R&D teams of large corporations, while the organizational form that corresponds, although not exclusively, to algorithmic management is *the platform* (Stark & Vanden Broeck, 2024). Plantin et al., (2018), Frenken and Fuenfschilling (2020) and Power (2022) have identified and analyzed the increasingly extensive process of "*platformization*" through which more and more economic, political, social and cultural activities are algorithmically managed through a platform-based model. The process of "platformization", as a precursor to the introduction of algorithmic management, has precedents in the case of IT firms, call-centers and business process outsourcing (BPO) where collaboration, coordination and monitoring of work globally for specific projects is carried out through virtual platforms in a system defined by Aneesh as "algocratic governance" (Aneesh, 2009). Within the BPO model, the organization of work implied the implementation of techno-bureaucratic control, while the supervision of work processes was possible with the generalization of IT&C technologies.

2.2 Current landscape

The concept of AM was first introduced in 2015 by Lee et al. who defined it in relation to software algorithms that take over managerial functions and all institutional processes that support algorithms in practice, algorithmic management involving the allocation, optimization and evaluation of human work through algorithms (Lee et al., 2015). The use of algorithms – defined as processes or sets of rules that must be followed step by step for calculations or other operations for the purpose of solving problems – has a history dating back to at least the nineteenth century, being identified in the way Weber (2015) analyzed the objective step-by-step procedures that characterize the decision-making process in modern bureaucracies (Fourcade & Healy, 2017). Weber defined bureaucracy as a form of organization that has the following characteristics: (1) a well-defined hierarchy; (2) specialization of work and selection based on qualification; (3) formal rules and regulations applied impersonally. These elements, especially the impersonal application of rules, directly connect all kinds of bureaucracies to algorithmic management. According to Weber, the history of human civilization can be understood as a process of increasing bureaucratization of an increasing number of activities, a process in which the characteristic elements have registered a tendency of increasing hierarchization, specialization and depersonalization in the application of rules. Weber believed that this was an inexorable process because, in his view, bureaucracy was the most efficient and rational form of organizing human activity. However, Weber was worried because, in his view, bureaucracy could lead to an increasing asphyxiation of human freedom due to the bureaucratic exercise of rationalized control based on codified rules applied impersonally for the purpose of increasing efficiency (Weber, 2015).

Although algorithms have a relatively long history, their use has recently taken on a different dimension in terms of *quality* due to the extraordinary advances in computing power of computers and the ability to collect and process digital data. Consequently, the conceptualization of AM as the opposite of "use of algorithms in management" has begun to be centered around software algorithms defined as computer-programmed procedures for the purpose of transforming *input* data into a *desired output* (Kellogg et al., 2020). Therefore, the concept of AM currently refers to the use of this type of algorithm-based software for the control of an organization (Wood, 2021). Detailed research, such as that conducted by Dong & McIntyre (2014), has shown that digital platforms and advanced algorithms transform the very *nature* of work by automating tasks that were previously performed by humans (Dong & McIntyre, 2014).

The dominant contemporary perspective considers that AM is nothing more than an amplification of scientific management with the same characteristics – bureaucratic, rule-based and concerned with efficiency – and, therefore, terms such as "*scientific management 2.0*" (Schildt, 2017), "*digital*

Taylorism" (Günsel & Yamen, 2020; Gautie et al., 2020), "*the new scientific management*" (Birnbaum & Somers, 2023), or "*Taylorism on steroids*" (Noponen et al., 2023) to emphasize the continuity between the two types of management over time (Stark & Vanden Broeck, 2024). Although there is a temptation to analyze algorithmic management through the prism of a new conflict between capital and labor, exacerbated at the beginning of the twenty-first century by economic crises and against the background of major technological transformations represented by the Industrial Revolution 4.0, such a dichotomous approach runs the risk of leaving out of the analysis important processes and structures for the study of AM.

Stark & Vanden Broeck point out that, despite some similarities, algorithmic management should not be understood as a mere extension of scientific management because it operates within a different worldview in the sense that, if scientific management considers humans as programmable machines, AM considers programmable machines capable of learning (Stark & Vanden Broeck, 2024). In the conception of the two authors who attempt a theorization of AM taking into account the broader perspective of major changes in both *the form* and *structure* of the organization of the twenty-first century, it should be theorized in relation to the fundamental changes suffered by organizations, changes that reconfigure the relationships and roles between various *users* such as managers, engineers, consumers, professionals, workers and other manufacturers and suppliers. A special attention is paid to the erosion of the boundaries of 21st century organizations, given that AM responds and simultaneously contributes to a process in which many of the most important actors and many activities are no longer within the company, but are part of a complex network (*complex entanglement*) that involves the flow of information and relationships between all networked actors. From this perspective, algorithmic management, erroneously considered by many researchers as a contemporary variant of a sophisticated work supervision system, is, in Stark & Vanden Broeck's conception, an attempt to co-opt these heterogeneous actors, wherever they may be, within the organizational space. The theoretical project of the two authors is not limited only to the development of a new theory of the firm, nor does it aim at a new theory of the "algorithmic society" ("*the Black Box Society*"), like the one developed by Pasquale (2015), but represents an attempt to theorize a management style organized around the algorithmic practices that appear within organizations apparently devoid of the boundaries of traditionally organized companies (*boundless organizations*) (Stark & Vanden Broeck, 2024).

This perspective is similar to that developed by Roque (2022) which highlights the fact that AM exercised for the coordination and supervision of work outside the traditional boundaries of the firm considers these sites as *workplaces* or "*digital factories*" that take over the coordination, supervision and disciplinary functions of traditional organisations in a system where the expansion of the use of AM leads to an intensification of the exploitation of work that is increasingly fragmented, decomposed and tightly controlled (Roque, 2022; Moore & Woodcock, 2021; Stark & Vanden Broeck, 2024). Kellog et al. (2020) also described the algorithmic organization of workplaces as a "contested terrain", a perspective also found in the analysis of Schusler et al. (2021), who rethought digital platforms as contested relational structures (Schusler et al., 2021).

2.3 Theoretical frameworks

Theoretical contributions highlight the importance of studying the interaction between humans and technology in the workplace, with *socio-technical systems theory* being particularly relevant in examining how humans interact with algorithmic systems by considering both the social and technical dimensions of work (Baxter & Sommerville, 2011). Another useful theoretical framework for analysis is the concept of "*management through algorithms*" (Lee et al., 2015) which emphasizes how the decision-making process can be transferred from human managers to automated algorithm-based systems. Also, *decision-making models* constitute an alternative framework for theoretical analysis of how algorithms are the tools that make decisions based on huge amounts of *processed*

data (data patterns). Last but not least, the concept of "*surveillance capitalism*" developed by Zuboff (2019) represents a critical perspective on the way in which large companies collect employees and consumers/users data in order to maximize profits, which generates a whole series of ethical challenges and political issues.

3. ORGANIZATIONAL CHALLENGES OF ALGORITHMIC MANAGEMENT

Algorithmic management systems rely on data analysis to monitor employees productivity, assign tasks, and are able to make decisions regarding hiring or firing the workforce. Kellogg et al. (2020) highlight that, currently, AM is limited to reshaping control at the organizational level through: (1) *the automation of direction* (what needs to be done, in what order and in what duration of time and with different levels of accuracy); (2) *evaluation* (analyzing employees activity in order to correct mistakes, evaluating performance and identifying non-performing ones); and (3) *disciplines* (punishing or rewarding employees in order to encourage cooperation and enforce compliance) (Kellogg et al., 2020).

The use of AM systems has the potential to reconfigure the structure of organizations due to the fact that their mode of operation differs from that of traditional Weberian bureaucracies that imply the existence of a hierarchy of management levels. The tendency of algorithmic management systems is to flatten bureaucratic structures based on hierarchy in the traditional way by eliminating management functions at the lower levels (*low & middle management functions*) because algorithms have the ability to automatically and autonomously implement the rules of organization, allocation, control and supervision of work in economic organizations. In extreme cases of algorithmic management, only the top management level is necessary to establish the rules to be implemented, in which case AM systems simultaneously represent both a culmination and a transcendence of the bureaucratization process described by Weber (Baiocco et al., 2022).

3.1 Loss of human discretion and employee autonomy

AM systems often limit employees *autonomy* by constantly monitoring performance and forcing tasks to be performed. Platforms in *the gig economy* sector such as Amazon or Uber use algorithms to distribute tasks and monitor driver behavior through customer/user ratings, GPS and other detailed data. This algorithmic control diminishes workers' freedom to make decisions in the process of performing tasks, and this often leads to a lack of job satisfaction.

One of the most important organizational challenges of AM is the loss of freedom of action of employees who have to execute the decisions made by algorithms. Traditionally, managers use a combination of information and intuition in decision-making, while in an AM system, algorithms analyze large amounts of data to make decisions without human involvement, which can increase efficiency, but at the same time reduce flexibility and lead to concerns about the rigidity induced in the decision-making process. For example, companies operating in the warehouse field widely use algorithms to determine the pace at which employees handle and pack packages. If the algorithm used is too rigid, it may not take into account factors such as temporary fatigue (or even exhaustion) of employees or technical problems, unfairly penalizing them. Algorithms are frequently used for task assignment in the case of companies in traditional fields, such as those in industry, retail or the hospitality industry, where employees' work schedules are automatically computerized based on demand forecasting according to which specialized work teams are also formed (*skills matching model*) (Brione, 2020).

In the case of *platform work*, algorithms take over a range of managerial functions by automatically assigning tasks to workers via mobile devices, smartphones and computers, in a system that is increasingly prevalent in more and more sectors, in which workers are left with fewer and fewer options to refuse algorithmic task assignment (Veen et al., 2019). Lee et al. (2015) detailed how, in

the cases of Uber or Lyft, the app's setting of a time frame limited to 15 seconds from accessing the app to accept *the gig* leaves virtually no choice for ride-sharing drivers but to accept this algorithmic work allocation system. A study conducted by Rosenblat & Stark (2016) highlighted that by hiding key fare or destination information, *ride-sharing* platforms such as Uber further restrict drivers' ability to decline rides algorithmically assigned to them by the app, and furthermore, if they choose not to follow the most efficient route imposed by the instructions received through the app, their payment is suspended. Uber drivers are also required by the platform to charge maximum fares based on factors such as distance, city, and the number of *ride-sharing* drivers available in the area (Rosenblat & Stark, 2016).

The ability of algorithmically managed workers to ignore the targeting imposed through applications is thus severely restricted by the existence of *information asymmetries*. The centralization of algorithmic control can lead to the intensification of work and worsening working conditions, as the workload multiplies when the number of tasks to be performed increases or when the time allocated to completing these tasks decreases, with employees having to adapt their work pace to comply with the tasks set by the algorithms (Todoli-Signes, 2021). Empirical studies have highlighted a direct link between the adoption of algorithmic management technologies and the increase in the pace of computerized work in the context of organizations in traditional fields (Eurofound, 2020). In addition, the atomization implied by platformized algorithmic models of work organization in the case of organizations whose boundaries are blurred, as is the case in *the gig economy* where workers are hired temporarily on the basis of precarious contracts, has the consequence of forcing them to adopt an increasingly rapid pace of work in order to ensure the renewal of their contracts. Even in traditional sectors, for example in health, tourism or food, the contracting of the necessary staff from external sources carried out according to algorithmically determined factors can lead to an unpredictable work schedule that contributes to a decrease in workers' performance and worsening working conditions (Wood, 2021).

3.2 Data-driven-bias, transparency and accountability

Ethical problems can also arise in situations where the algorithms used in decision-making processes have errors that lead, for example, to the hiring or promotion of unsuitable employees, which can amplify inequalities within the company, especially if the data used to train the algorithms reflects discrimination that has historical roots. For example, research has shown that AI-powered HR systems can disproportionately favor the hiring of male candidates in tech fields because algorithms are trained through data that reflects historical experience with the gender distribution of professions (Binns, 2022).

Another significant challenge is the lack of transparency regarding the way algorithmic systems make decisions that has the potential to create situations, on the one hand, in which employees/workers do not understand how their performance is evaluated, and on the other hand, situations in which managers cannot explain or intervene in the decision-making process carried out by AM systems. This algorithmic opacity raises the question of *accountability*: Who is responsible in the situation where algorithmic systems make erroneous or unfair decisions?

Data-driven algorithms can unintentionally perpetuate embedded *biases* in the datasets used to train them, this problem being particularly specific to systems based on historical data, where past errors can be reproduced without being detected and corrected. Computerized algorithmic management systems have the potential to represent the culmination of the bureaucratization process anticipated by Weber (2015) given that in these systems the rules must be codified in an unambiguous way in order to be implemented algorithmically automatically. Therefore, all decisions made algorithmically are by definition impersonal. However, as the criticisms of algorithmic management systems from the perspective of technology ethics have pointed out, impersonal does not automatically mean fair, given that the rules themselves can be *biased* and *unfair* and, consequently, the decisions made by

algorithmic systems will also be erroneous and incorrect regardless of how impersonal their implementation may be.

From this ethical perspective, an additional problem of algorithmic management is generated by the increasingly extensive use of artificial intelligence in the decision-making process, a technology that allows computers to make decisions that maximize a series of parameters specified by humans, but whose specific rules on the basis of which decisions are made can be partially deduced by computers themselves from the data used to train them. Thus, these systems have the potential to position human intervention at a high level of abstraction of the organization's general objectives and strategies that computer systems will transform into rules for decision-making that will be implemented algorithmically. The problem is that these computer-generated rules can be *unknown* both to those affected by the decisions of the algorithmic system and even to those who algorithmically manage the organization, and this is a dystopian possibility that raises a number of other ethical concerns regarding accountability and transparency in the operation of algorithmic management systems (Baiocco et al., 2022).

Accountability is one of the central issues in the discussions around AM systems. When an algorithm makes a decision to fire an employee or reject a job candidate, one of the fundamental questions is: Who is responsible for this decision? Should the responsibility lie with the developers of the algorithm, the managers who use it, or the company as a whole? What happens if an algorithm mistakenly fires an employee due to a technical error in evaluating their performance? The dismissed employee would be in a situation where it would be almost impossible for him to hold someone accountable given that the dismissal decision was made automatically by the algorithms.

4. ETHICAL IMPLICATIONS

4.1 Surveillance and privacy concerns

The use of AM systems involves extensive supervision of employees, especially by collecting data on their performance. Ethical problems arise when this collected data is used to monitor employees without their consent by violating aspects related to their privacy. AM surveillance can be extremely invasive and intrusive, especially in the case of systems that track the way the keyboard is used, precise GPS location or even by monitoring employees physiological data, such as *heart rate* monitoring. For example, Amazon has been criticized for using monitoring technologies that include *wristbands* that track employees' movements to ensure efficiency. This type of situation raises a number of important questions regarding the limits that employers should respect in the use of surveillance technologies and the impact that these technologies have on the mental health and well-being of employees.

4.2 Workplace alienation and the impact on Gig workers

AM systems can lead to the alienation of employees as human aspects of traditional management such as empathy, inter-human communication, and moral judgment are replaced by algorithmic decision-making processes. This can create a depersonalized work environment where employees feel treated as numbers and not individuals. Rosenblat (2018) analyzed the consequences of using AM in the case of Uber and highlighted that Uber drivers feel alienated by the platform's algorithmic management that reduces interactions with human managers and creates a sense of alienation within the company (Rosenblat, 2018).

Employees in *the gig economy* sector are particularly vulnerable to the ethical issues generated by algorithmic management, as their activity is often mediated entirely by algorithms, sometimes with very little (or even no intervention) or human supervision. Research conducted by Cherry (2023) in the case of Lyft or Deliveroo platforms has highlighted the fact that drivers are affected by what the

author calls "algorithmic wage discrimination", with revenues being determined by algorithms in an opaque/non-transparent way that generates an inconsistent revenue stream (Cherry, 2023).

5. POLICY AND REGULATION: BALANCING EFFICIENCY AND ETHICS

To ensure that AM system is both effective and ethical, companies must strike a balance between maximizing labor productivity and protecting employee rights. This could involve the introduction of '*algorithmic audits*' to assess *fairness, justice, objectivity, impartiality* and *transparency*) decisions made by algorithms. Companies should also ensure that employees have access to human managers to mediate disputes when they arise within the company as a result of decisions made by algorithms. The General Data Protection Regulation (GDPR) legislation that has been introduced in the European Union (EU) already regulates a number of aspects of the algorithmic decision-making process, especially those related to data privacy and transparency. However, additional regulations are needed to ensure that employees in AM-based industries are protected by addressing potential issues that may arise with respect to *autonomy, fairness, accountability, and justice*.

With the introduction and adoption of AM and AI systems on an increasing scale, there is a voluntary surrender to these technological artifacts of previously exclusively human prerogatives in terms of decision-making in organizations, and this increase in *artificial autonomy* can undermine *human autonomy*. *The Montreal Declaration* (2017), developed under the auspices of the University of Montreal, articulates the need to find a balance between humans and artificial systems in decision-making by emphasizing that the development of artificial intelligence (AI) must promote the autonomy of all human beings. The ethical principles enunciated by the European Commission (EU) in *The Statement on Artificial Intelligence, Robotics and "Autonomous" Systems* (2018) emphasize that autonomous systems must not affect the freedom of human beings to set their own standards and norms, while the *House of Lords Artificial Intelligence Committee* (2018) took an even stricter stance that AI systems must never have the power to injure, destroy or mislead human beings. Also, the principles enunciated by *The Asilomar AI Principles* (2017), developed under the auspices of *The Future of Life Institute*, support the principle of autonomy in the sense that human beings must have the possibility to choose how and whether to delegate decisions to AI systems in order to meet goals chosen by humans. There is a consensus on policies to regulate artificial systems that the autonomy of human beings must be maintained, protected and promoted, and the autonomy of artificial systems must be restricted. Human autonomy must be protected or restored by introducing the notion of *meta-autonomy* or a model of "deciding to delegate" (Floridi, 2023). Human beings should maintain the power to decide which decisions to make and which to prioritize, and also have the freedom to choose when delegation to artificial systems is necessary. However, any delegation of the decision-making process must be able to be "overridable" in principle by ultimately adopting the power "*to decide to decide*" (Floridi, 2023).

Although, at least at the level of the principles that should govern the operation of artificial systems and the way they interact with human actors, there is a consensus, *collective bargaining* – which is one of the most effective tools through which social partners can discourage employers using AM systems from violating employees' rights and exposing them to the negative impact of AM – have so far only in rare cases led to the conclusion of collective agreements for the regulation of AM technologies. Among these cases is, for example, that of the regulation of financial services in Denmark, through the agreement between *The Financial Services Union Denmark (Finasforbundet)* and *The Danish Employers' Association for the Financial Sector (FA)*. This agreement regulated how artificial technologies and systems will be introduced, used and developed in the banking system, stipulating that the parties to the agreement will work together to improve working conditions, job satisfaction and increase competitiveness with the introduction of these technologies and systems. The agreement states that employees have the right to co-decide how these technologies and systems

are implemented, thus being co-opted into the decision-making process, and if the saving banks have appointed a *technology advisory committee*, employee representatives on the committee have the right to propose the establishment of a group or subcommittee for each specific technology that must report to the advisory committee. In addition, the agreement states that it is the responsibility of the bank's management to inform both the committee and the employee representatives about the introduction, use and change of the technologies used by the bank through a written statement that must clarify the time frame, functionality, savings that will be made, what resources will be used and how the new technologies align with those already in place. In addition, the document must contain information on the potential consequences of new technological systems on the company, employees, the work environment and on the skills needed by employees, banking organizations being obliged to ensure the re-education and relocation of employees whose functions have become useless or outdated with the introduction of a new technology (Holubova, 2022).

Another example of an agreement reached between the social partners on the regulation of AM technologies is the completion of the Spanish labour legislation in 2021 to recognise the status of workers engaged in the delivery or distribution of consumer products via digital platforms as employees. The agreement calls for *algorithmic transparency* and gives workers the right not to be subject to decisions based solely on algorithmically automated variables. Companies are also obliged to inform trade unions about the use of analytics and/or artificial intelligence systems when decision-making processes concerning human resources and labour relations are based exclusively on digital models, without any human intervention. Moreover, the agreement considers *digital disconnection* a right whose regulation contributes to the health and well-being of employees by reducing technological *fatigue* and stress, improving the quality of the working environment. Among the measures agreed are the recognition of the right of workers not to use digital devices outside working hours, during breaks or holidays and the right of workers not to respond to any requests in professional matters after the end of working hours. Regarding digital transformation processes, companies must inform workers' legal representatives about the technological changes that will occur, if they are relevant and will have significant consequences for employment or for changing working conditions (Holubova, 2022).

The example of Spain, a pioneer in the field of regulating the use of algorithmic and artificial intelligence systems, has been followed by similar initiatives in other European countries, especially in the United Kingdom and the Netherlands, but the process of regulating these areas has generated opposition from employers' associations in the field of *On-Demand Service Platforms* alleging infringement of the basic principles of economic freedom and infringement of intellectual property rights.

6. CONCLUSIONS

AM technology creates both opportunities and challenges for organizations. AM systems can improve efficiency, but at the same time it generates significant organizational and ethical issues, which must be managed with great care. Although AM system is rapidly being adopted in many fields of activity, a process accompanied by legitimate concerns about the nature of work in the future and the related ethical challenges, research has highlighted the importance that human managers have and, probably, will continue to have, in organizations. For example, Ivanova et al. (2018) highlighted the fact that Deliveroo and Foodora, companies that use AM intensively, continue to have *dispatchers* who monitor drivers and couriers in real time and help solve problems that arise (Ivanova et al., 2018). This finding indicates that the adoption of algorithmic management in its ideal form in which algorithms fully take over managerial functions may actually be overestimated and that in reality the human component is, and probably will remain, an essential component within the managerial circuit.

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