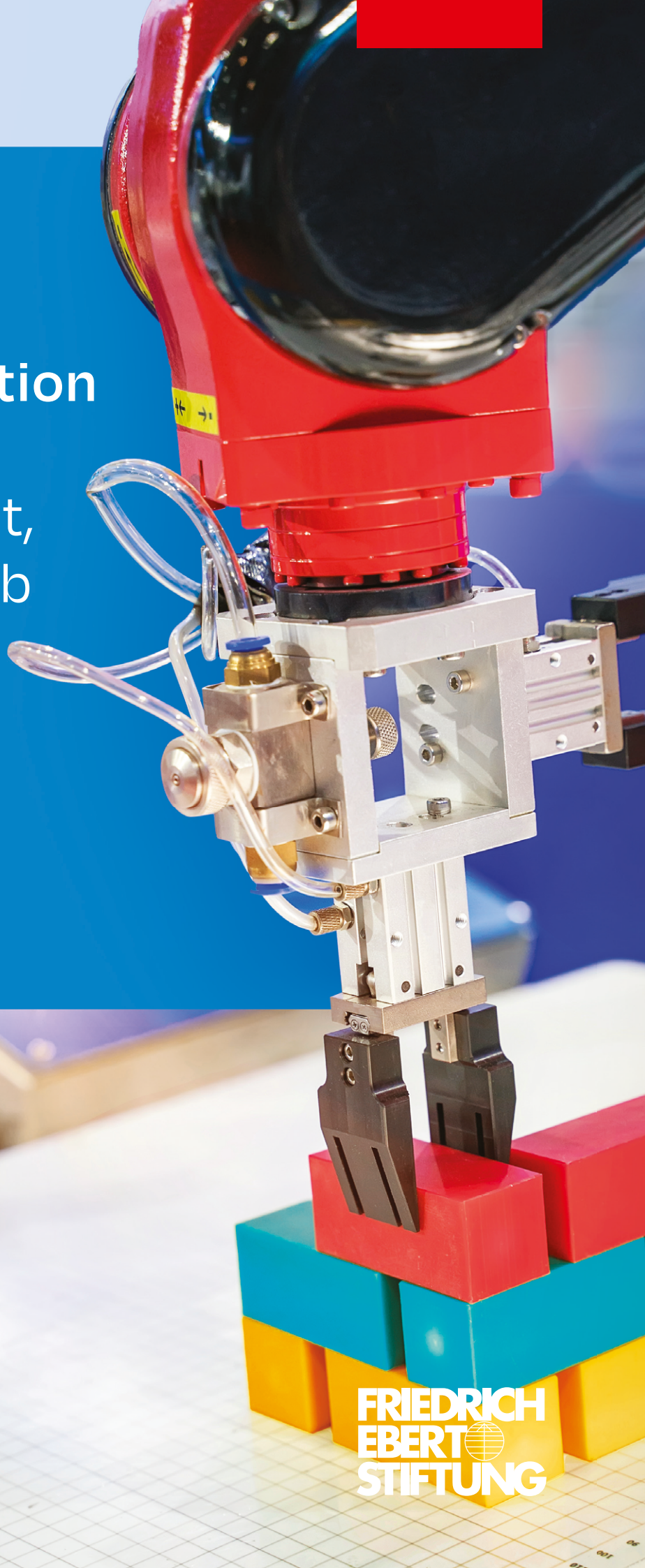


AI and the Transformation of Work: Employment, Skills and Job Quality



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FOREWORD

Rapid developments in artificial intelligence (AI) and automation technologies are set to transform the nature of work and the workplace itself. Advanced software systems with high degrees of autonomy are expected to perform a broad range of functions that are carried out by humans today. While the adoption of AI at workplaces is expected to positively impact the organisation of work by increasing operational efficiency, enabling informed decisions to be made faster while speeding up product and service innovation, new technologies can also have a negative impact on working conditions and the well-being of million of workers around the globe. Emerging evidence suggest that AI has the potential to contribute to an erosion of the middle class and a 'job polarisation' that may inexorably lead to a greater economic disparity between highly skilled jobs and low-skilled jobs which would be too costly to automate.

This current publication is based on three student papers as part of the PhD Summer School 2023 – AI and the Transformation of Work: Employment, Skills and Job Quality. The summer school was organised by the FES Competence Centre on the Future of Work in Berlin in cooperation with the Weizenbaum Institute for the Networked Society.

The summer school explored research questions relating to the anticipated future impact of artificial intelligence on workers. The summer school focused on a range of topics in particular, including algorithmic management, changes in management strategies, discrimination at the workplace, involvement of trade unions in regulating the use of AI and changes in work organisation.

The summer school brought together 16 PhD students from different European universities, e.g. from France, Germany, Greece, the Netherlands, Spain and the UK, and was supported by four academic researchers: Prof. Dr. Martin Krzywdzinski, Dr. Florian Butollo, Dr. Nuno Boavida and Dr. Miriam Rosa.

The current publication looks at the impact of algorithmic management on the employment relationship and the ways trade unions view artificial intelligence at the workplace.

1

MANAGERS IN THE LOOP: ALGORITHMIC MANAGEMENT AND MANAGERIAL TASK TRANSFORMATION IN TRADITIONAL ORGANISATIONS

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ABSTRACT

As algorithmic management (AM) solutions are increasingly deployed in traditional organisations, it is important to understand how managers adapt to the capabilities of these systems that potentially outperform them. Based on a single-case study, this research aims to explore the interaction between managers and AM technologies, with a focus on how learning algorithms are reshaping workforce scheduling. While AM first came into use in platform organisations, thereby completely replacing managers, we find that AM systems and managers tend to work together in traditional organisations. Furthermore, our study critically analyses the impact of AM on managers' tasks, shedding light on how managers' work is changing while introducing the concept of the "manager in the loop", and suggesting how managers in traditional organisations might adopt AM solutions. From this perspective, we reveal a changing landscape where human supervision and guidance blends with algorithmic systems, challenging the previously "ominous" view of these systems by showing that managerial tasks still remain.

1.1 INTRODUCTION

"What Does It Mean to Be a Manager Today?" is the title of an article published in the Harvard Business Review by Kropp et al. (2021). This question is particularly interesting in light of the increasing use of algorithmic management (AM), i.e. "learning algorithms that carry out coordination and control functions traditionally performed by managers" (Möhlmann et al., 2021, p. 2001). Platform organisations have led the way with AM, a subarea of artificial intelligence (AI) registering advances at present. It is intended to replace human management tasks, especially the interaction between workers and managers. Some mechanisms of AM are also gaining traction in traditional organisations, where AM mechanisms tend to complement human managerial tasks instead of fully replacing them (Giraud et al., 2022). In this context, human managers closely interact with algorithms to perform a task, with this also being characterised as an augmentation of managerial tasks (Grønsund & Aanestad, 2020). Oftentimes, augmentation and automation of managerial tasks is orches-

trated by AM-specific information systems (AMIS), i.e., dedicated software tools and systems (Meijerink & Bondarouk, 2023; Cram & Wiener, 2020), which are commonly adopted as standard software solutions rather than being developed in-house from scratch, such as *Quinyx* or *Microsoft Viva*. For instance, retail companies rely on AMIS like *Quinyx* to replace manual employee scheduling – a typical managerial task – (Kraut et al., 2005) with automated scheduling (Parent-Rochelleau & Parker, 2021). Human managers follow this up, reviewing and evaluating the algorithmically generated schedules (Raisch & Krakowski, 2021).

From an organisation's perspective, the adoption of AM-specific information systems offers various benefits, including improved efficiency and productivity in employee management (e.g., Schaupp, 2022). However, this implementation also gives rise to significant concerns, particularly for the above-mentioned 'traditional' type of managers, who potentially find themselves in an identity crisis when delegating tasks to algorithms that may outperform them. As a result, managers must "develop new skills to stay relevant in an AI-based competitive environment" (Giraud et al., 2022, p. 1). Furthermore, the integration of algorithms to automate or augment managerial tasks disrupts traditional hierarchical structures, leading to a substantial shift in managerial decision-making and responsibilities (Giermindl et al., 2021; Tarafdar et al., 2022): Historically, organisations have oftentimes followed a "centralised [decision-making] management philosophy" (Lippert et al., 2023, p. 5282). The adoption of AM, however, enables a decentralised form of automated decision-making, thereby fostering a more flexible managerial approach than ever before (Schildt, 2017). On the one hand, this enables companies to remain competitive, but on the other, this disruption translates into uncertainty for managers. To date, a considerable body of research conducted on AM has accumulated, focusing primarily on its implications for workers in both platform organisations (e.g., Wiener et al., 2021) and traditional organisations (e.g., Kellogg et al., 2020). Only a few studies investigate the implications of AM for managers in traditional organisations (e.g., Gal et al., 2020; Meijerink & Bondarouk, 2023). Apart from

one study carried out by Giraud et al. (2022), none of these studies seek to empirically explore the shift of managerial tasks and responsibilities in light of the use of AMIS. Against this backdrop, this study sets out to analyse the following research question: *How do managerial tasks and responsibilities change with the adoption of AM-specific information systems?*

To approach this research question in a comprehensive manner, we draw on a single-case study based on Yin (2018), thus relying on data from multiple sources. This procedure encompasses a structured literature review based on Webster and Watson (2002) and three in-depth interviews from *Booklore*, a Canadian book and merchandise retail chain. By integrating both theoretical and practical perspectives, our study seeks to establish a strong connection between research and real-world applications of AM. This study also aims to contribute to the ongoing discourse within the field of AM by offering a well-structured guide for practitioners, policymakers, and other stakeholders, such as employers' associations. We consider it crucial for managers to understand AM mechanisms and how they affect their responsibilities.

1.2 THEORETICAL BACKGROUND

According to Giraud et al. (2022) and Langer and Landers (2021), with regard to the implementation of AM-specific information systems (AMIS), managerial tasks can be classified into three categories: replaced, augmented, or unaffected. In the following, with AM and AMIS, we look at technical concepts, approaches, and tools intended to replace managerial tasks fully or partially. Managerial augmentation or automation refers to the manner of working with algorithms and AM-specific information systems, i.e., operational modes in working with algorithms.

ALGORITHMIC MANAGEMENT IN TRADITIONAL ORGANISATIONS

Algorithmic management (AM) in traditional organisations is defined as “a diverse set of technological tools and techniques to remotely manage workforces, relying on data collection and surveillance of workers to enable automated or semi-automated decision-making” (Mateescu & Nguyen, 2019, p. 1). Basically, AM refers to tasks and responsibilities of middle managers (e.g., Jarrahi et al., 2021; Baiocco et al., 2022). Middle managers have a unique position in organisations: With their operational domain expertise, they act as intermediaries between top management and the first level of supervision (Wooldridge & Floyd, 1990; Dopson & Stewart, 1990). Their tasks are highly diverse and complex, “with their roles constantly shifting between contradictory subject positions, being both the controller and controlled” (Kieran, 2016, p. 68; cf. Harding et al., 2014).

Accordingly, algorithms are increasingly carrying out coordination and control tasks that were previously performed by middle managers to manage the workforce (Möhlmann et al., 2021). Thereby, mechanisms of algorithmic control (AC) are fully or partially capable of executing managerial control tasks such as goal-setting and monitoring of work,

performance management, compensation, and job termination (Parent-Rochelleau & Parker, 2021; Giermindl et al., 2021). Further AC mechanisms include, among other things, algorithmic recommendations, i.e. issuing implicit or explicit work instructions, algorithmic rewarding, i.e., granting monetary or non-monetary rewards (Kellogg et al., 2020). Managerial coordination relates to allocating and planning tasks or resources and especially scheduling of employees (Kraut et al., 2005; Parent-Rochelleau & Parker, 2021). In the context of AM, which aims at the “best match between labour requirements and supply” (Parent-Rochelleau & Parker, 2021, p. 7), the notion of algorithmic matching has gained prominence (Möhlmann et al., 2021). Algorithmic matching describes the full or partial automation of managerial coordination, such as scheduling employees to shifts and assigning tasks or employees to customers, based on algorithmically analysed “real-time customer traffic, deadlines, real-time monitoring of fluctuating demand” (Parent-Rochelleau & Parker, 2021, p. 7). Generally, the mechanisms of AC and algorithmic matching operate in a highly synergetic manner: That is, outputs of AC mechanisms (e.g., algorithmic employee performance-rating, behavioral monitoring) are used as input for algorithmic-matching (e.g., performance-based scheduling, location-based matching).

Unlike platform organisations in which AM has emerged, traditional organisations oftentimes prioritize augmentation instead of a full automation of managerial tasks with AM-specific software. This augmentation is in particular reflected by a “partial automation of specific tasks, resulting in a division of labour between the human and the technology, where novel tasks also emerge and ensure a continued need” (Grønsund & Aanestad, 2020, p. 2) for human managers: For instance, in the context of knowledge work, *Microsoft Viva* is used to perform algorithmic control mechanisms designed to enhance worker productivity, i.e., algorithmic recommending: Through a comprehensive analysis of historical calendar data, these systems provide recommendations regarding future focus and appropriate break times, thereby contributing to an improvement in employees' performance and the achievement of organisational goals (Ekandjo et al., 2021; Hirsch et al., 2023). These recommendations might then be used in further decisions.

In terms of the augmentation of managerial tasks, it is important at this juncture to mention that the augmentation of managerial tasks surpasses the utilisation of algorithms within decision support systems (DSS), where decisions are algorithmically *prepared*. Specifically, a DSS is a tool that *aids* decision-makers in the decision-making process by providing information and analytical support (Power, 2002), whereas augmenting managerial tasks with AM-specific information systems involves the use of technology to assist managers in *performing their responsibilities*, potentially including the use of automation and algorithms (Raisch & Krakowski, 2021; Giraud et al., 2022).

1.3 RESEARCH METHODOLOGY

In order to answer our research question, we draw on a single-case study design (Yin, 2018), focusing on *Booklore*, an organisation at the cutting edge of automation in employee scheduling. The selection of this single case design is justified by its revealing nature. It provides unique insights into the transformation of managerial tasks and responsibilities with the introduction of AMIS, which is a contemporary phenomenon (Paré, 2004).

CASE SELECTION

Booklore is a Canadian book and merchandise retail chain with stores in all Canadian provinces, employing approximately 4,800 store employees. We placed a focus on *Booklore*, as they adopted *Quinyx*, an AM-specific workforce management software, early on. The eponymous company *Quinyx* was initially founded in Sweden in 2005. Since then, *Quinyx* has grown at an ever-quicken pace, and is now one of the market leaders in cloud-based and AI-driven workforce management, specializing in retail, warehousing, hospitality and logistics (Quinyx, 2023). Interestingly, *Quinyx* is also being used in platform-like food-delivery organisations, such as *Flink*, thus suggesting that AM mechanisms used in platform organisations are being adopted in traditional organisations (Lippert et al., 2023).

DATA COLLECTION

We used various sources of evidence for our single-case study: First, to familiarise ourselves with the field and to gain a knowledge of the state of the art in AI-driven workforce management, we scoured the literature with an appropriate search term based on our research question. Here we used a methodological approach to systematic literature reviews suggested by Webster and Watson (2002). With this approach, we identified 41 relevant studies. As algorithmic management in traditional organisations is a relatively new phenomenon, we enriched the academic literature with practical reports, such as by Forrester (Forrester, 2022) and Gartner (Grinter et al., 2022).

Using the current pool of knowledge as a foundation, we put together an interview guide to conduct in-depth interviews, which served as our primary source of evidence. The screening of market and practitioners' reports in particular led us to *Quinyx* and its customers as potential interview partners. After screening *Quinyx*'s customer success stories, we proactively reached out to several managers via LinkedIn, inviting them to share their insights and experience with us. Among the respondents, *Booklore* emerged as our primary and valuable partner for this case study. Three in-depth interviews lasting approximately 44 to 45 minutes were conducted via Zoom. After requesting some contextual information, such as company size and the underlying business model, we asked which systems were used to manage their workforce and when, why, and how the respondents decided to use the system/systems. We then asked to what degree they automate their workforce management and their experience and gains in efficiency, the main implications for managers, as well as potential critical voices by employees. The interviews were recorded and transcribed.

DATA ANALYSIS

We analysed the underlying final sample of 41 studies and the interview transcripts with MAXQDA using top-down (i.e., deductive) coding in an initial coding cycle. Here we derived the codes from the current leading and frequently used theoretical frameworks from the literature, i.e., Möhlmann et al. (2021) and Kellogg et al. (2020) for the mechanisms of algorithmic management. Furthermore, we used Parent-Rochelleau and Parker's (2021) seminal work for algorithmic workforce management in traditional organisations. To determine the shift of managerial tasks i.e., the augmentation or automation of managerial roles, we also used Kellogg et al. (2020), Jarrahi et al. (2021) and Raisch and Krakowski (2021) as a theory-sensitizing lens. In a second coding cycle, however, initial, i.e., open coding (Saldaña, 2021) played a much more dominant role. This approach allowed us to identify newly emerging themes and patterns within the data.

1.4 RESULTS

SHIFTED MANAGERIAL TASKS AND RESPONSIBILITIES

In the following section, we address changing managerial responsibility for employee scheduling, which in turn serves as a representative example of other managerial tasks. Generally, shift planning is 'a hot topic' in various industries. Especially the in-depth interviews provided us with valuable first-hand insight and a comprehensive understanding of the managerial task transformation process. In talking to managers directly affected by the deployment of an AMIS, i.e. *Quinyx*, we gained valuable insight into the implications produced by adopting AM-specific information systems for algorithmic matching on managerial roles and responsibilities. The insights from the systematic literature analysis in particular helped us to validate interviewees' responses in the coding process and to establish a broader context for our findings, i.e., to adapt our findings to other managerial tasks and responsibilities in the area of workforce management. Usually, the employee scheduling process, a key managerial task, comprises six steps, as described by Bürgy et al. (2019):

- (1) *Workload forecasting*: Based on historical customer traffic and sales data, this step estimates the expected workload at a specific time.
- (2) *Demand estimation*: Using the workload forecast, the number of employees required is determined.
- (3) *Schedule creation*: The initial schedule is formulated to match labour demand and supply, while adhering to regulatory rules and employee preferences.
- (4) *Real-time adjustments (recourse actions)*: If needed, modifications are made in real time to accommodate unforeseen changes or issues.
- (5) *Assessing results*: Schedules that are executed are analysed and stored, allowing for improvements in future scheduling processes.
- (6) *Data analysis and improvements*: Evaluation of the data collected from previous schedules helps optimise the overall scheduling process.

Booklore features fully automated steps (1) to (4), as well as step (6) using *Quinyx*. This automated approach targets sales floor employee coverage and task assignment, resulting in a 75% reduction in the time required for scheduling tasks, as Leah, senior director of operations and profitability at *Booklore*, told us.

In essence, both companies still assess the results of an AI-generated schedule manually, as Cecilia, associate general manager at *Booklore* describes:

"The piece that the AI generates is purely the sales floor, hourly employee coverage. That's the only thing that the AI generates [...]. The edits that I make are mostly based on not so much like adjusting what the AI has given, but there are some parameters that Booklore has put in that I adjust a little bit for my specific store, such as make sure that the distribution of hours across the employees makes sense with what we understand their needs and skills to be."

Another store manager, Noah, stated the following when asked about the main impact from adoption of *Quinyx* in his view:

"...the biggest impact of Quinyx itself has actually just been that it's a bit more modern than our previous system, it's faster, it's easier to use, it's more intuitive, and it's more collaborative. [...]. The automation of [creating employee schedules] makes it easy for me to reach out to other leaders that we have, more people who are able to execute the schedule and execute that work, which makes our workload more dynamic."

And further:

First author: *"Is the automated scheduling a problem when it comes to manager-employee interaction?"*
Noah: *"Absolutely not. No, because we still have conversations about availability."*

There is, however, also an effect on employees' working times in terms of automatically created shifts:

"Now we have these like kind of shorter, more targeted shifts [...] and these shorter shifts make it harder to fill up a person's schedule if they want to work more than 25 hours a week. I have noticed like when we first started with Quinyx they were giving like three-hour shifts, three and a half hours and those were very difficult to sell to the team and already what we have noticed is that we get less and less of those three hour shifts and it's more in the four and a half and five hours. And we've been on Quinyx for a few months now, so we get more of those shifts and less of those three-hour shifts. And so, I'm not sure what is actually prompting that..." (Cecilia, *Booklore*)

In essence, Cecilia's elaborations show that *Booklore* relies on augmentation, i.e., on a close interaction between the managers and the AMIS *Quinyx*. As shown above, workforce management, i.e. employee scheduling, consists of several process steps, thus making it necessary to acquire a blended understanding of automation and augmentation of managerial tasks in traditional organisations, as according to Raisch and Krakowski (2021), "augmentation is both the driver and outcome of automation" (p. 25).

ALGORITHMIC OCCUPATIONS AND COMPETENCIES

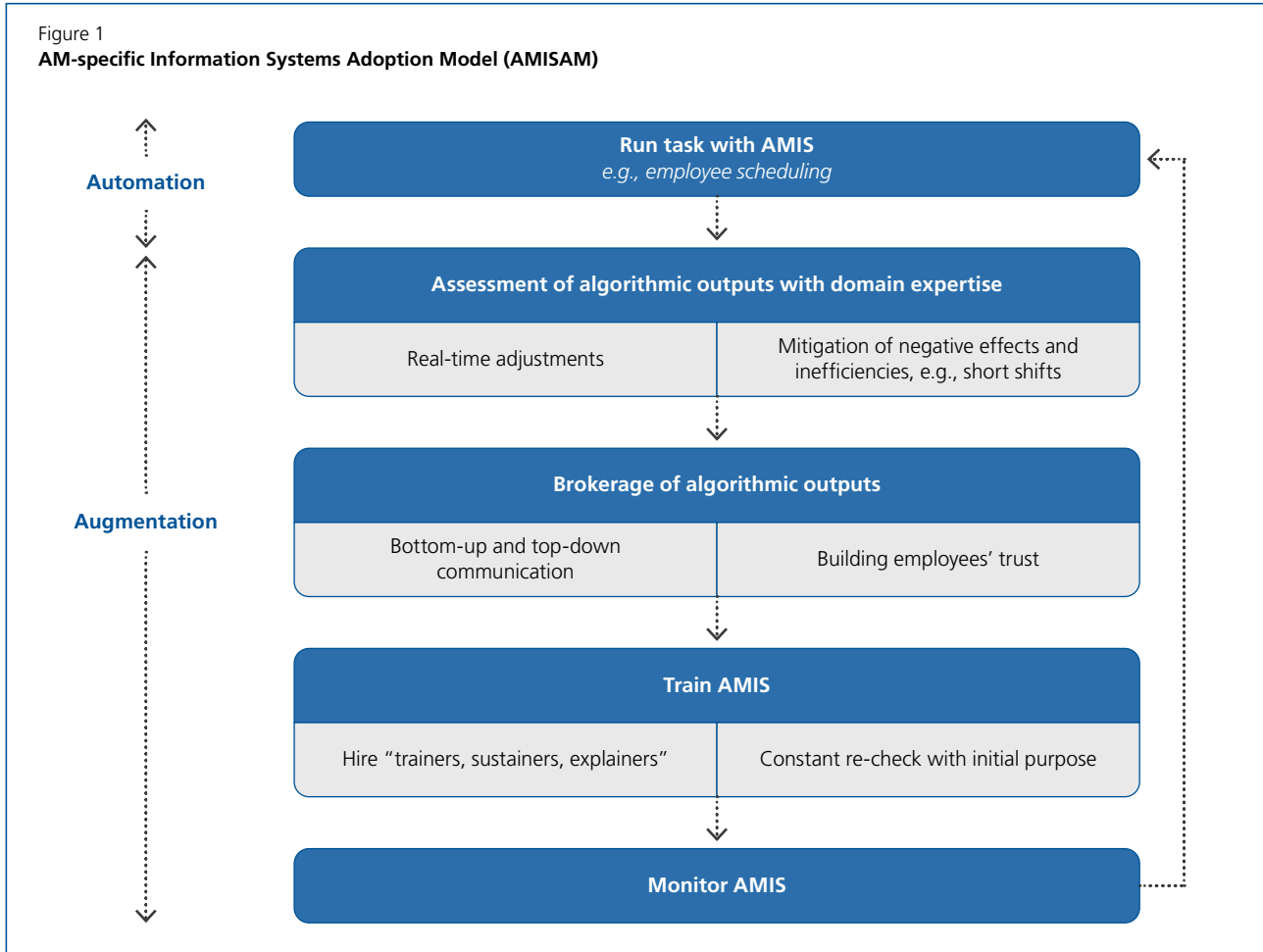
Based on our analysis of the literature, we found that the automation of tasks and responsibilities requires the reconfiguration of existing work, thus requiring new competencies (Jarrahi et al., 2021). Especially as AMIS are not "off the shelf" or "plug and play" technologies (Kellogg et al., 2020, p. 388), a new expertise is needed, which is also referred to as "algorithmic occupations" (Kellogg et al., 2020; Selenko et al., 2022). Thus, Kellogg et al. (2020) suggest establishing algorithmic brokerage, which is defined as communicating "the logic and value of the algorithmic systems to various groups in the organisation" (p. 389) with the overarching goal of gaining worker acceptance. Accordingly, Jarrahi et al. (2021) suggest hiring "trainers, explainers, and sustainers" (p. 6) in order to shed light on black-box algorithmic systems. Gal et al. (2020) suggest establishing a new role called "algorithmists", i.e., "people who are tasked with monitoring the ecosystem of algorithms and their human companions" (p. 10). In addition, Jarrahi et al. (2021) point to the necessity of developing "skills that help workers in developing symbiotic relationships with algorithms" (p. 6), which is also in line with considerations relating to managerial augmentation as elaborated in the previous section.

AM-SPECIFIC INFORMATION SYSTEMS ADOPTION MODEL

The literature analysis as well as the in-depth interviews conducted led us to a consideration of adapted managerial tasks and responsibilities that especially encompass the automation of a task that was previously executed by human managers. For instance, we find that three out of six steps in the employee scheduling process, i.e., *workload forecasting*, *demand estimation* and *schedule creation* are susceptible to full automation. The fourth step, i.e., *real-time adjustments (recourse actions)* was found to be partially augmented. This also applies to the fifth and sixth steps, i.e., *assessing results and data analysis and improvements*, respectively.

Resulting from our methodological approach, we propose the AM-specific information system adoption model (AMISAM) depicted in Figure 1, a scheme that maps managerial task transformation in the context of adoption of AM-driven workforce management.

Figure 1
AM-specific Information Systems Adoption Model (AMISAM)



Building on the AMISAM, to mitigate negative effects and inefficiencies such as short shifts, we recommend that managers carefully evaluate algorithmically generated schedules by making real-time adjustments. Next, in line with Kellogg et al. (2020) the brokerage of algorithmic outputs constitutes a key step: Due to their unique position in the company, middle managers have to communicate algorithmically generated shift plans bottom-up and top-down. Especially for top-down communication, gaining employees' trust is crucial. Absence of trust was one of the main issues reported by *Booklore*. According to Glikson and Woolley (2020), trust in AI and in AMIS requires a human-centered approach that prioritises transparency, collaboration, and support. By defining and implementing trust-gaining strategies, managers can foster a positive relationship between employees and AI technology. Steps (4) to (6) of the initial shift planning process are now mapped in training the AMIS. Therefore, we recommend managers to hire AI specialists with algorithmic competencies to act as "trainers, explainers, and sustainers" (Jarrahi et al., 2021, p. 6). From our point of view, constant reviews from the perspective of the original reason for using the AMIS is fundamentally speaking relevant at all stages, but is especially necessary as a preparatory step for monitoring the AM-specific information system. These reviews should also include ethical considerations, such as team diversity during shifts, or a balanced distribution of workload among workers.

1.5 DISCUSSION

Based on a combination on both previous and new findings, we draw an aggregated picture of a new, future-oriented managerial task landscape. As highlighted earlier, managers must acquire new skills and adapt to evolving tasks to remain relevant (Giraud et al., 2022) in the era of algorithmic management. Considering the initial question of what it means to be a manager today, and how managerial tasks and responsibilities are changing with the adoption of AM-specific information systems, we forecast that managerial responsibilities will become significantly more diverse in the future, and due to their unique positions in organisations, especially for middle managers. We suggest that a general understanding of a 'traditional manager' needs to go beyond a traditional job description: With *assessment, algorithmic brokerage and articulation, as well as training and monitoring AM-specific information systems*, we indicate how the initial scope of managerial roles might be extended (Van Doorn et al., 2022). However, with the current impact on their tasks and decision-making competencies, managers, and especially middle managers might be faced with a high degree of uncertainty and especially role conflicts (Tarafdar et al., 2022). Moreover, a heavy reliance on technology entails numerous drawbacks, as highlighted by Leah from *Booklore*, who mentioned the repercussions of a recent cyber-attack resulting in the loss of critical data. Consequently, the full potential of AI in these systems may not be fully realised due to such data disrup-

tions. Cyber-attacks that compromise the integrity of initially trained datasets pose a significant threat to algorithmic systems, necessitating robust cybersecurity measures to safeguard against such perils.

THEORETICAL AND PRACTICAL CONTRIBUTION

Our study of how managerial tasks and responsibilities change with the adoption of AMIS offers two major contributions: First, it enhances an understanding of how managerial tasks and responsibilities are transformed through the adoption of AM-specific systems. By differentiating between augmentation and automation of managerial tasks, we extend the current understanding in the literature of augmentation and automation as being two distinguishable concepts, which is also in line with the finding of Raisch and Krakowski (2021). Second, with the AM-specific information systems adoption model (AMISAM) we demonstrate that only a small part of managerial tasks are being replaced by automation. Focusing on employee scheduling as a concrete example, we propose that the AMISAM can be extended to other managerial tasks that are currently partially handled by algorithms, such as performance management (e.g., Ekandjo et al., 2023). Thus, our model contributes to the ongoing (practical) discourse on the potential replacement of managerial tasks, thereby shedding light on how managers can be kept in the loop (Zanzotto, 2019).

LIMITATIONS AND FUTURE RESEARCH

Like all studies, our research also has limitations, offering interesting opportunities for future investigation. One notable limitation of our study is the relatively small sample size of empirical data. While our findings offer valuable insights, a larger and more diverse sample could enhance the generalisability of our conclusions. Furthermore, the organisation we studied is an early adopter of AMIS and had an open mind towards AI. This positive disposition could have influenced the implementation and outcomes of these systems, potentially limiting the scope of challenges identified. Future research should explore a broader range of organisations with varying degrees of maturity and attitudes towards AI to gain a more comprehensive understanding of the implications. We think it is particularly valuable to conduct longitudinal studies to investigate how AMIS changes over the course of time.

To address the limitations mentioned above and advance our field of knowledge, future research should seek to replicate our model and findings in diverse organisational settings. A longitudinal study that tracks the evolution of AMISAM over time can reveal how managerial tasks and responsibilities change as organisations become more accustomed to AI integration. This longitudinal approach should offer insight into the long-term effects of AM-specific information systems on managerial work and the organisational landscape. Moreover, there is a need to explore how AM-specific information systems impact specific managerial tasks above and beyond the employee scheduling example used in this

study. Investigating the adoption of these systems in various managerial domains, such as budgeting, performance evaluation, or decision-making, will provide a comprehensive view of their effects across different managerial functions.

1.6 CONCLUSION

To conclude, our study provides valuable insight into the transformation of managerial work through the adoption of AMIS. However, there are limitations that call for further investigation. By conducting larger-scale studies, exploring diverse organisational contexts, and adopting a longitudinal approach, researchers can build upon our work and contribute to a more comprehensive understanding of the future of managerial work in the era of algorithmic management. We hope our insights will inspire and guide researchers in this endeavor.

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2

THE MACHINE THAT WORE NO CLOTHES: INSIGHT INTO THE PHANTOM ALGORITHM THROUGH THE LENS OF AN AUTOMATED DISMISSAL

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ABSTRACT

The increasing reliance on algorithms in human resources management has raised concerns regarding their potential impact on work and employment relations. This article explores this issue through a case study of a European airline that deployed an algorithm to select 600 employees for dismissal during a post-COVID-19 restructuring. Despite initial promises of fairness and unbiasedness, the algorithm's outcome was precisely the opposite, with 90% of the selected employees ultimately accepting to leave by mutual termination agreement. Drawing on 22 interviews with workers and union representatives, the study reveals that this case of algorithmic termination was characterized by the erosion of four key pillars of the standard employment relationship: trust, transparency, fair treatment, and accountability. This, the authors argue, has significant implications, highlighting how the deployment of algorithmic tools can fracture the employment relationship from within, fostering insecurity and resentment even in workplaces previously characterized by harmony and cooperation, thereby potentially contributing to a broader reshaping of the norms that underpin the employment relationship.

2.1 INTRODUCTION

In the employment relationship of the Fordist era, there were two major players, a known boss and a known worker who is in possession of a legal contract defining the worker as such and setting out the terms and conditions for remuneration (ILO, 2007). However, this form of a supposedly traditional employment relationship involved a 'structured antagonism', where technologies were seen to exacerbate antagonisms by delineating unequal relations between workers and management in the labour process (Burnes et al, 1988; Briken et al., 2017). Post-Fordism and the move to service industries in advanced economies have led to weakened employment contracts, precarity and 'bogus' self-employment (Doellgast et al., 2021; Weil, 2014).

Increasingly, the employment relationship extends beyond strict legal parameters defining workers' subordination in exchange for employers' formal obligations (Dukes & Streeck, 2022; Watson, 2004). Indeed, an erosion of responsibility on the part of the state and employers (Ayudhya et. al., 2019; Weil, 2014; Adams-Prassl 2018, 2019), a rise in non-standard employment (Burchell et. al., 1999), expansion of the informal economy (Sassen, 1994), and developments of technologies to manage workers (Bailey, 2022; Briken et. al., 2017; Moore, 2018) have transformed employer decision-making advances, perhaps permanently. Workplace relations and the labour process are grounded in an "implicit" (Kreps, 1990), "normative" (Collins, 2014) or "psychological" (Robinson & Rousseau, 1994) contractual bond (also: Budd & Bhawe, 2017). However, both Fordist and post-Fordist expectations about worker protection involved some level of expectation regarding social protection, trust, privacy, and duty of care.

The perceived equilibrium in the employment relationship, however, may be undergoing rapid erosion. The introduction of 'algorithmic management' techniques may dramatically transform the employment relations setting (Kellogg et al., 2020; Moore, 2020; Upchurch, 2018). But what *exactly* changes in the employment relationship when algorithmic management (AM) is deployed? Contributing to the recently blossoming field of what we suggest calling *critical* algorithmic management studies, the present article introduces the notion of the *phantom algorithm* to unveil how algorithms – whether existing or not – can be leveraged by management to enhance its powers. The crux of our argument is that current digitalised environments, marked by opacity and immense power asymmetries, offer management the chance to exert spectacular affective and emotional, coercive pressures upon workers (Moore, 2018), where even the threat of a machinic decision-maker is present (such as an algorithm or another technological management tool). While several works have documented AM from various angles (Bucher et al., 2021; Irani, 2023; Rahman, 2021; Vieira, 2023), the current paper shows that this can occur even when the said algorithm's very existence is to be confirmed – thus rendering the imaginations, constructions and threats of there being an

objective, potentially artificially intelligent, algorithm, more important than the algorithm itself.

Our conclusions are drawn from a case study of a large European airline company which applied a ‘phantom algorithm’ to fire several workers ranging from baggage handlers to technical staff, right at the beginning of the COVID-19 pandemic. As is widely known, the transportation industry was hit very severely during this period because travel was largely banned in most parts of the world (Suk and Kim, 2021). This company’s response to the pandemic was to start the restructuring process with the use of an algorithm early on to save costs. The company did not originally inform workers about the algorithm. Rather, there was a media leak. When workers approached the company with information learned from this leak, the company’s highest-ranking officials quickly assured the media that the process of algorithmic dismissal would be “blind, [and] unbiased” (SIC Notícias, 2021), allowing the company to “swiftly turn the page” (Campos and Lima, 2021). Managers’ claims here illuminate the audacity of the process because first of all they did not inform workers in a transparent manner (but workers nevertheless found out what was happening from a media leak); and later, they would neither disclose which algorithm had been used, or even *whether* an algorithm had been used in the first place. This twist in the tale is our crucial identification of the ‘phantom algorithm’, which displays a particularly worrisome feature of contemporary management practices departing from Fordist and post-Fordist industrial relations’ practices.

Against this background, this article makes a two-fold contribution. First, empirically, our fieldwork provides up-close knowledge of experiences of workers subjected to a process of *algorithmic termination*. Accounts of dismissals carried out with the assistance of an algorithm are not entirely new; however, the cases that have sparked the attention of scholars (Collins, 2022) emanate from the platform economy (Soper, 2021; Aloisi & De Stefano, 2022). Insightful and meaningful as those studies are, the fact that they are placed in a setting which differs from *conventional* workplaces constitutes a limitation (Jarrahi et al., 2021). Second, theoretically, due to the nature of the empirical material upon which we ground our study, we are able to contribute to a more substantive theory of how algorithmic management may not only be at odds with, but appear to be rewriting prevailing norms of employment relations. On the whole, we seek to draw attention to the major challenges faced by labour stakeholders at all workplaces where automated decision-making mechanisms are present.

2.2 THEORETICAL BACKGROUND

ALGORITHMIC MANAGEMENT, THE PHANTOM ALGORITHM AND IMPLICATIONS FOR THE EMPLOYMENT RELATIONSHIP

Algorithmic management in the work setting is defined by researchers at the Data & Society Research Institute as a ‘diverse set of technological tools and techniques to re-

motely manage workforces, relying on data collection and surveillance of workers to enable automated or semi-automated decision-making’ (Mateescu and Nguyen 2019, 1). Algorithms are used to ‘allocate, optimise, and evaluate’ work carried out by both traditional workers (e.g., subway engineers, warehouse workers, café workers, and delivery drivers) as well as new crowd-sourced workers on platforms who use technological applications and platforms (Uber, TaskRabbit, and Amazon mTurk) to find work (*ibid.*). AM operates via ‘software algorithms that assume managerial functions and [utilise] surrounding institutional devices that support [those] algorithms in practice’ (Lee et al., 2015: 1603). Existing managerial techniques are seen to be enhanced by algorithms (Kellogg et al, 2020; Leicht-Deobald et al, 2019; Shapiro, 2020; Upchurch, 2018). Rather than advancing the treatment of workers in a personalised and fair manner, algorithms reproduce and amplify discriminatory practices (Upchurch, 2018). Due to their seemingly inscrutable nature (Ajunwa, 2020; Burrell, 2016), algorithms are leveraged by managers to enforce and unilaterally impose their will (Vereycken et al., 2022), thereby undermining all the steps that have been made in the direction of a culture of workers’ increased participation and informed decision.

Algorithms rely on processes that rapidly change due to self-improvement techniques aided by machine learning. The larger the data set, the more complex the decision-making process of algorithms becomes. For this reason, the operation of algorithmic software at workplaces has been dubbed a ‘black box’ due to its seeming opacity to most human observers and to non-technical people (Ajunwa, 2020).

Proceeding beyond a ‘black box’ hypothesis, we should reflect in the direction of an ‘empty box’ hypothesis, where humans are in command, but are not transparent about the algorithm itself. When the exercise of power is unintelligible to the subjects of that power, a morally dubious arrangement could be afoot. Exercises of power must be (or at least *should* be) justified, presuming the process is justifiable, and for that to occur, the motivations for such exercises should be rendered transparent. If, for example, a manager takes disciplinary action against an employee, the employer has a duty to explain why this action is being taken and, in an ideal case, if data has been used by a manager to decide about when to initiate disciplinary action, a worker has the right to know what data has been used, why it was collected and how the decision has been reached.

Building on conceptualisations such as ‘algorithmic imaginary’ (Bucher, 2016), the insight offered by our current ‘algorithmic condition’ (Colman et al, 2018), and even the magical allure of algorithms inviting faith or fetish (Thomas et al., 2018), what we are calling the ‘phantom algorithm’¹

¹ The phantom algorithm in this case study is (obviously) not the same as the ‘Google Phantom Algorithm’, but both are interesting in that the machinic component was somehow obscured, not reported, and even possibly not predicted, known or understood by humans (even the humans who are responsible). The ‘Google Phantom Algorithm’ is a phenomenon that occurred in 2015, and was widely reported to have caused significant disruption and confusion and

goes over and beyond typical understandings of algorithmic management. The algorithmic management-related lifecycle has already begun to incorporate people analytics and algorithms to make decisions ranging from hiring to firing, and nodes of feedback and other notifications along the way in the platform economy and beyond. Hypotheses on automation in which robots and machines replace workers (Brynjolsson and McAfee 2014; Frey and Osborne, 2017) are rampant, and conceptual commitments looking at and automation for task replacement (Ernst, Merola and Samaan, 2018) are key, but we argue that instead the very idea of a machine's existence has entered the workplace in a way that must be reconsidered beyond these arguments. The phantom algorithm sees a number of characteristics that shift the balance toward technological autonomy, in which machines are assigned precedence over humans, whether or not they exist in the labour process. Evidence of trust, transparency and accountability deficits are demonstrated here as part of the power dynamics resulting from the introduction of the phantom algorithm in workplaces. Therefore, this article is not about machines used to make decisions as such. Specific attempts to normalise features of employment relationships add to the imbalance between workers and managers, where trust has been broken, where the duty of care is neglected and where accountability is reduced (see Moore and Joyce, 2020). The difference now is that merely a manager's statement that a machine has been used for decision-making gives managers the courage to fire workers, even during a crisis when workers are experiencing more psychosocial stress than usual.

Researchers and trade unionists have been sounding the alarm about the need to investigate the impact of algorithmic management on workers and workplace practices (Brionend; Allen & Masters, 2020) and there are myriad causes for concern. They have underscored that vast amounts of data are required for AI systems as well as algorithms to operate them, and that such data is generated through intense surveillance and monitoring of workers (Heiland, 2021), a phenomenon that is bound to increase as surveillance tools become cheaper and more capable. However, when it comes to the domain of abuses related to managerial prerogative, the weakening of trust, lack of transparency and rejection of management accountability associated with these technologies stands out as uniquely problematic for specific instrumental reasons.

The opaque, hyper-centralised, and depersonalised, often discriminatory processes and outcomes for which there is scarcely any accountability characterising algorithmic management practices are at odds with the norms and expectations associated with a post-Fordist version of any employ-

ment relationship. In the place of an increased space for workers' discretion, algorithmic managerial practices rely on insidious forms of monitoring and surveillance to collect data as granular as possible from workers' behavioural patterns (Mateescu & Nguyen, 2019). Consequently, instead of autonomy, creativity, and self-expression, algorithmic managerial practices induce workers to work for the data (Evans & Kitchin, 2018), causing them to act as artifactual humans (Demetis & Lee, 2018). This in turn, in some instances also as a by-product of equipment with devices worn to produce data, comes at the cost of workers' physical and mental health (Borle et al., 2021; Moore, 2020).

2.3 RESEARCH DESIGN AND METHODS

In the spring of 2020, the global COVID-19 pandemic was fully underway and Covid was raging. The entire global economy seemed to be shutting down. It was predicted that many industries would suffer and early signs of this were already taken as a justification for commencing mass restructuring projects at many companies (even where there was no obvious/immediate sign of a downturn). The peculiarity of this story was that it shed light on an HR practice that is still in the infancy of technological integration: apparently, the company had decided to use an algorithm as a decision-maker.

On 30 April 2021, the current article's respective author saw a news story in the headlines about Portugal's business environment, where the journalist had been given leaked information that one company intended to use an algorithm to decide who to fire. We set out to find workers who were being impacted by this company-led decision to see whether they would be interested in holding interviews. To overcome the expected difficulties of interviewee recruitment (Dundon & Ryan, 2010), our team of researchers applied snowball sampling as a participant recruitment strategy (Wasserman et al., 2014).

From April through August 2021, researchers interviewed 18 individual workers and 4 workers' representation structures (thus, $N = 22$). To enhance readability of the citations, the former are labelled "IndWorker" and the latter "WRep", with each designation being followed by a distinctive number. Our sample covers all relevant departments of this company: aircrew members, maintenance technicians and engineers, salespersons, logistics operators, IT developers, and contact centre staff. We interviewed workers *targeted by* and *not targeted by* the algorithm for each department. After the initial set of interviews was conducted, there were several follow-up conversations with some of the interviewees so that we could continue following the company's narrative.

Finally, throughout the entire research period, we tried to interview a representative of the airline's management board, HR department, or data protection officer (DPO). Attempts were stymied by the repeated dearth of answers from the first two and by the DPO's refusal citing the argument that "it would not be possible to provide such information given the

real terms losses for companies. While Google performs two algorithm changes a day, this one was rolled out without any announcement or apparent knowledge on the part of the company (Google). It was nicknamed 'Phantom Update'. See: <https://www.sistrix.com/ask-sistrix/google-updates-and-algorithm-changes/google-core-algorithm-update-phantom-update/>; <https://www.holisticseo.digital/theoretical-seo/phantom-update/>; <https://www.cnbc.com/2015/05/13/ntom-algorithm-update-hits-websites.html>

sensitive nature concerning the confidentiality of the business data”. To compensate for the absence of this company’s version of the facts in our research, we proxied the company’s narrative by carrying out content analysis of: i) secondary data sources, namely statements in the media; ii) emails sent by the company to its workforce, namely the standardised message informing workers targeted by the algorithm and an email rejecting further negotiations after the one and only meeting with HR in which a mutual termination agreement was proposed. Informed consent from interviewees was obtained orally and recorded while making a commitment to having testimonies fully anonymised and treated confidentially. As part of the effort to live up to the anonymity commitment, excerpts of the quotes that could allow authors of the statements to be identified were anonymised.

2.4 FINDINGS

THE ALGORITHMIC DISMISSAL

In the eyes of individual workers and their representatives who were interviewed, there is a common belief that the company under investigation here was – before the events depicted below – a place one would aspire to work at. With salaries well above the national average, various non-economic benefits, and a feeling of job security and stability were reported to be highly cherished by employees of a company that in several instances was awarded prizes as *Best place to work in the country* (Lopes, 2020). Additionally, the company had been rapidly expanding in previous years, and the Portuguese labour regulatory environment offers important safeguards against dismissals. Combined, these factors made the likelihood of mass redundancies a distant and unlikely event (WRep#4).

In this regard, the context of the COVID19 pandemic meant a definite rupture with the past. Faced with an abrupt and significant plunge in the number of passengers carried, the company first announced that, contrary to standard practice, temporary employees would not have their contracts renewed. In addition, to further reduce personnel expenses, a programme offering generous mutual severance arrangements (hereafter: MTA) was launched (IndWorker#2). In sum total, these two measures allowed the company to downsize its staff by more than 10%.

However, in the eyes of the board, this was still not enough. Already in the second half of 2020, it was apparent to all workers’ representatives interviewed that a massive lay-off was being prepared. The different unions operating within the company adopted various strategies to counter this looming threat. Some concluded agreements with the company that no dismissals would take place without a bilateral review of the impact of wage cuts in connection with the supposed need to shed additional personnel (WRep#1, WRep#4); others acceded to an additional wage cut in exchange for a commitment by the company that none of their affiliates would be included in the collective dismissal (WRep#2, WRep#3).

By the end of the first trimester of 2021, what everyone had been fearing became public. Following the recommendations made by an external consultancy hired to manage the entire restructuring process, Boston Consulting Group (BCG), the company announced the goal was to shed an additional 600 workers by the end of spring – if possible, to be attained through MTAs, if not through mass redundancies (Campos & Lima, 2021).

In contrast to what had happened up until then in the restructuring process, however, the appeal for voluntary exit was no longer couched in generic, abstract terms. In April, approximately 600 workers received an email from the company stating they were *“eligible for a unilateral measure of exit”* (excerpt from email) and that they should come to a meeting with the Human Resources department to discuss this matter. The email furthermore informed workers that the list of persons selected was drafted using a *“multi-criteria model adopted based (...) on parameters of Productivity/Absenteeism, Experience/Seniority, Contribution/Schooling and/or Limitations”* (excerpt from email). The company informed workers’ representatives that the “model” referred to in the email corresponded to an algorithm designed by BCG to select who would be dismissed in case these workers did not accept the MTA *voluntarily*.

The unconventional way the company was handling this collective dismissal was all over the Portuguese media. Commenting on the issue, the Minister of Infrastructure and Housing at the time claimed the use of an algorithm would ensure that persons would be selected for dismissal in a “blind, unbiased” manner (SIC Notícias, 2021). The same Minister is said to have assured worker representatives at a meeting that the list produced by the algorithm would be printed in his own office so that no human interference of any sort would compromise the algorithm’s objectivity (WRep#3).

TRUST, TRANSPARENCY, FAIR TREATMENT, AND ACCOUNTABILITY: OUTSTANDING DEFICITS

Trust. However appealing the promises made by the company and the Minister sounded, they were ultimately not met. If anything, the decision to initiate the collective dismissal in itself constituted a violation of the agreement with the unions in manifold ways (WRep#2, WRep#4). On top of this, as soon as the names of the individuals selected to leave were known, it was clear the additional cuts agreed between the company and the pilots and maintenance staff unions were worthless: 81 of the listed workers were members of these two occupational groups.

This particular *mistake* – never admitted to as such by the company until forced by the courts to rehire these workers (Machado & Martins, 2022) – is telling of the algorithm’s “blindness, but in a bad way” (IndWorker#18), but of course also of how the firm all too easily avoided collective negotiations with workers’ representatives and, by extension, workers’ voices themselves. In fact, when looking at the big picture, it is hard to see these decisions as mere errors of

model specification, as there are multiple indications that something was running parallel to the algorithm.

In [anonymised department], there is scarcely any supervisor who is involved in this [list]. We have situations where a supervisor used to be responsible for four people and now is responsible for one single person! (Wrep#2)

Someone warned me that in that section [worker's personal area on the company's web domain] one possibility to be transferred to [anonymised] would show up soon, so I grabbed the computer on that day and refresh, refresh, refresh, until that possibility was there... when it did, I pressed the button, and that's it! Then, I was called to an interview. (...) On [day after the interview, anonymised] they told me I was transferred. (IndWorker#10)

The algorithm was so precise that it called those persons who had had disputes with the bosses... When you consider the whole warehouse, where 150 people work, only 2 more guys were called! Weird, isn't it? In a group of 13 [the workers who had problems with the team leader], 7 are called, and in a group of 150, only 2... (IndWorker#17)

Unsurprisingly, listed or not workers perceived the entire process as an unprecedented episode of unfair treatment in their up until then trustful and stable relationship with the company. Several of our interviewees reported feeling like they were part of a workplace dominated by a "culture of fear" (IndWorker#17), where management enjoyed discretionary decision-making powers.

Transparency. Contributing to this negative appraisal from workers was the absence of transparency with relation to the criteria for selection. Contrary to any hopes of transparency stemming from the early indication of those criteria, the company systematically refused to specify which precise data was used to define each criterion and what their relative weights were. This prevented workers from scrutinising and reproducing the formula that led to their inclusion on the list. Indeed, not even the meeting with Human Resources offered any substantial clarification.

They just throw some stuff into the air... Education, days of leave of absence obviously, productivity... how does that unfold in practical terms? I don't know... (IndWorker#16)

The conversation [in the meeting with HR] always revolved around what the criteria [for selection] were. They don't say... Well, they do say, but then they are incapable of saying what the equation is... It is unbelievable that the company doesn't show the maths! (IndWorker#6)

In reality, the meetings only added confusion and opacity to the whole process. From the accounts of our interviewees, it

is clear that the company inverted 'experience / seniority' to produce a new (negative) criterion: workers' salary weight. Time and again, workers were told by HR that their cost to the company was the decisive factor behind the decision to dismiss them, even if that was never supposed to be a criterion in the first place. On top of this, although it was not among the reasons listed in the email or even remotely related to others that could serve as proxy for it, on several occasions workers' disciplinary record was also invoked as a justification. Some interviewees saw this to be a double punishment for something that had been resolved in the past.

A worker that was a subject of a disciplinary procedure in [anonymised], that served a sentence... then, in the following years, progressed in his career, passed the tests, and made it to [anonymised]. Now the company claims he is not a good professional, (...) and was now picked by the algorithm! (Wrep#1)

Fair treatment. The identification by workers of discriminatory patterns in the selection of those workers to be included on the list revealed how this process was also violating expectations of fair treatment. For instance, female workers with children, particularly lone mothers, were mainly targeted. The same thing happened with workers with health conditions who required regular treatment (*We even had one colleague who was hospitalised at the very moment she received the notification, with cancer no less.* (Wrep#1)). The reason behind this lies, once again, in the specification of standardised criteria that were exclusively focused on quantifiable measures and reduced workers' performance, abilities, and contribution to the company to one indicator, and blind to the individual specificities of people.

I know people who were called due to their absenteeism, but of course, you can't fire people based on justified absences, so they call it productivity... However, at the end of the day, they have nothing to show people but the number of times they were absent (IndWorker#6).

Before the actual collective dismissal, some situations ostensibly unlawful under Portuguese law – such as dismissing pregnant women – were rectified. Nevertheless, for others, illogical and unfair as the decision to dismiss them was, there was never more than a standardised email reiterating the offer of an MTA as the sole alternative to inclusion in the collective dismissal list.

It's normal that after you have been in a company for many years, you are invited to play a role in which they are not just holding on to the fact that you have a college degree. I mean, they like your work, (...), so you get promoted to that department. This algorithm also detects people who are not educated enough to be in their position. It was what happened with a colleague that has worked there [new department] for years; he is a super responsible guy who is never absent and was called precisely because of that. (IndWorker#3)

Accountability. This unconvincing but rather imposing approach was experienced differently by those on the dismissal list. On the one hand, throughout those months stated by the company to *take it or leave it*, approximately 90% eventually accepted the MTA and left. This does not mean they were all convinced of the fairness of the procedure, but rather that the company had broken their will to keep resisting.

One of the persons who was a role model to me was included on the list and ended up accepting the deal because he did not feel strong enough to deal with this process. (IndWorker#11)

On the other hand, among those who decided not to accept the MTA, the number of unanswered questions kept accumulating, in a crystal-clear demonstration that the once-cherished culture of giving workers access to information had been replaced by the unaccountable imposition of algorithms' output. For instance, when workers tried to reverse-engineer how the algorithm works and collect evidence for contesting its decisions, they encountered numerous obstacles in accessing their own personal data.

I have no report. I asked for my map of absent days and still didn't get it. They told me they would send it but no, no, no... I don't have anything and now they are not giving [us] anything (IndWorker#1)

I would have to go to the office and would only be granted the chance to see it [own personal record], but not to make a copy (IndWorker#13)

Uneasiness over the entire process was not exclusively felt by those on the dismissal list. Beyond genuine feelings of solidarity for their colleagues who were about to be laid off, the entire procedure was deemed to be in breach of core dimensions of workers' privacy, and with it, the trust and confidence expected in worker-employer relations.

It was never clear to us what data the BCG had access to. It is unclear whether some information given by workers to the company in the past, trusting it was confidential, then ended up in the hands of BCG, and whether this information was used in this process or not. Every time I asked about this, no one was able to give me a satisfactory answer. (IndWorker#7)

I had great results for being nice (...), which, in the meantime, [anonymised] has been made to disappear! Compliments written by passengers were removed from our emails! (IndWorker#14)

Unsurprisingly, even if quite uncommon in the history of the company, interviewees not included on the list consistently reported how the process had made them not only *"afraid to be included in the next wave [of dismissals] (IndWorker#16)"* but also – and perhaps primarily – that this was the beginning of a new era, where the use of automated decisions would make unfair decisions harder to scrutinise, fight against and, ultimately, hold the company accountable.

FROM "THE ALGORITHM SAID SO" TO "THERE'S NO ALGORITHM": THE MACHINE THAT WORE NO CLOTHES

Much of the company's strategy was built on inducing workers to perceive the algorithmic decision-making process as inescapable. To amplify the coercive effect of deploying an algorithm to select who should be dismissed, the company HR regularly tried to attribute human-like characteristics to it.

So, they [HR] told me: "The algorithm chose you to be here. It is not our fault. You are here because the algorithm believed you had to be here". Only this sort of things... There was never something like someone showing you a sheet and saying: "Because of this, that, or that, you are not needed here" (IndWorker#10)

Whenever humanising the algorithmic decisions was not sufficiently convincing, HR representatives seemed to be themselves the primary victims of 'cybernetic and informational machines' (...) generalised enslavement' (Lazzarato, 2011: 34), unable to formulate one single compelling argument and subsumed to the algorithm outcome – as if they were the actual machines!

The HR representative (...) started to explain the restructuring and I asked: "But why me? What was the criterion that this algorithm chose so that I have to be here?" So, she said: "The criteria for choosing you was your productivity" (...) And I replied: "That's a lie! I have high marks". So, she said: "No, no, no, it is also because... education! You don't have a college degree". And I answered: "Not true." She returned: "Ah! Then it's cost!" And I said: "Cost? I've been here for [anonymised] and you never raised my salary. You gotta be kidding me! (...) I wanna know why I'm here!" She answered: "Oh you are not able to understand..." That is, she was running out of arguments, and when I kept insisting, she said: "Well, it was the algorithm." (IndWorker#9)

They told me I was there [meeting with HR] due to my absenteeism and being overpaid for the tasks I perform. So, on this matter of being over-paid, I am literally in the middle of the table in my group. (...). On absenteeism, (...) I asked "What about this absenteeism?" and they said "We don't know, you have to email the HR to ask". So, I just laughed and remained silent, they want to fire me, but they can't even justify why. (IndWorker#17)

Faced with a generalised feeling of insecurity among the remaining workforce, with legal complications due to several workers' lawsuits, and with what soon became "bad press" (WRep#4), the company performed a strategical pirouette. In the last meeting with workers' representatives before issuing the final list of the collective dismissal, i.e. of those who had been *picked* by the algorithm, but had so far refused to accept the MTA, the company representatives announced *"there is no algorithm, there never was one." We were told that all the workers on the list are there because their heads of department explicitly indicated they should be fired!"*

(WRep#3). Later, however, via email, the company group sent out a breakdown of the criteria for selecting workers to make the dismissal list. Although the weighting for each criterion was discriminated by department (and, in some cases, even within each department, by occupation), the actual data on their score remained undisclosed, as well as information regarding each worker's score that would allow its verification or contestation, let alone any comparison with other workers who were not on the list.

Workers' representatives diverge in their interpretation of whether there was ever any algorithm or not in the first place. What is quite widespread, however – including among individual workers – is the feeling that the whole lay-off process was a “witchhunt” (WRep#2), designed to get rid of critical voices within the company or those who “don't have friends in high places” (IndWorker#13), the algorithm being a mere instrument to enforce this. One worker commented that:

Out of the, let's say, 5000 names given by that algorithm, they then chose who should go and who should stay. So, the algorithm stopped being an algorithm and became a selection... a selection disguised as algorithm. (IndWorker#17)

It appears that in the face of the partial lack of basic credibility of a supposedly *unbiased algorithm* narrative, the company chose to shut down this line of argumentation and resort to the most effective way to convince workers of the impossibility of resisting or detain this process by simply informing them that they had been individually handpicked by their bosses. After the failure of this narrative, the company began to explicitly tell workers that there was no other way but to leave the company. Nevertheless, to prevent any legal action that could attempt to stop such unjustified, unacceptable criterion, parallel to this the company further developed its algorithmic tale to ‘prove’ that its actions were unbiased.

2.5 DISCUSSION AND CONCLUSION

We started the present article by investigating what the employment of algorithmic management techniques changes in the employment relationship. Even if power relations are inherently unequal at the workplace, the specific practices associated with the use of algorithmic management demonstrate management bravado in ways that exacerbate already existing techniques of discipline and control. Rather than looking at ‘best practices’ for technology at work, we identify ‘worst practices’ in connection with the use of algorithmic tools as demonstrated by our case study. Concurring with Irani's (2023) conclusions when researching the way algorithmic management is weaponised against Amazon workers, our findings illustrate that this fraying of the employment relationship is taking place whether or not any machine is being used at all by bringing evidence from a “conventional” workplace to the fore.

The literature indicates how algorithmic management involves forms of opaque, standardised decision-making that relies on breaching workers' privacy and undermining their individuality and autonomous decision-making, in turn leading to unfair, discriminatory outcomes that are incompatible with the development of trust and, in some cases, even with companies leveraging this to fulfil their total productive potential (Brione, n.d.; Kellogg et al., 2020). The use of algorithmic management by employers has been and will continue to be a “contested terrain” (Kellogg et al., 2020) and, as the findings in this article show, there is good reason for this. The usual tension between managerial prerogatives and employees' participation (Vereycken et al., 2022) acquires, in times of crises, the form of a metaphorical steamroller that strongly undermines not only workers' rights, but also – perhaps primarily – their ability to question and especially resist employers' decisions. This is made possible by algorithms' known opacity, which helps employers in circumventing labour laws by creating a “legality” all their own (Heiland, 2021; Reid-Musson et al., 2021).

The difference here was that management's assertion that a machine was used in the decision-making gave managers the courage to fire workers, even during a crisis when workers were experiencing more psychosocial stress than usual. Remarkably, this process was conducted by a phantom machine, whose existence was simultaneously confirmed and denied by management. As indicated by our findings, if it is not possible to locate the machine, ascertain its functionality or confirm its usage, then collective bargaining power is weakened, and workers are likely to find themselves in an even weaker position than before. Unmistakably, this case demonstrates a series of failures on the part of a large company in several ways. As discussed, the employment relationship was compromised because not only did the company attempt to utilise a seeming algorithm to make explicit decisions about workers. Its approach also appears patently indefensible. There is a quite new landscape of workplace relations outlined within this case study set against a backdrop of very standard industrial relations practices within the traditional employment relationship. What stands out is the seemingly blatant disregard both for any trust-building, transparency, fair treatment, and accountability, which weakened workers' position significantly in the early stages of this process. Workers discovered they were going to be fired by a purported algorithm in the media. When workers began to ask for the reasons for their dismissal and the technical justification for such, they were given no specific or reliable answers and the algorithm seemed to vanish as quickly as it had appeared, with parallels to a nightmare.

The findings and claims related in this paper are of course limited by the dynamic and incredibly complex nature of industrial relations in particular, and social relations in general. Here, we offer merely a snapshot of a very fast-moving target in the guise of a very specific application of an algorithmic tool. Further research should focus on broader application of algorithmic management in companies' everyday practice as well as how trust and accountability can be re-established despite the use of quantified solutions based on potentially

non-existent machines that lead to qualified problems within the new form of employment relationship we identify – the algorithmic employment relationship. As always, the future of work will ultimately depend on workers and their representative structures not conforming, effectively denouncing, and resisting all algorithms – phantom or otherwise – used to deprive them of rights and frustrate their rightful aspirations.

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3

TRADE UNIONS IN FRANCE AND GERMANY ADDRESSING THE IMPACT OF AI ON EXECUTIVE PROFESSIONS

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ABSTRACT

According to some institutes or researchers, artificial intelligence has been gathering momentum for several years now, and its recent developments, such as text and image generation, have turned it into an unavoidable topic relating to current transformation of the workplace. In addition, against the background of unceasing predictions in the media about the disappearance of jobs, this article aims to examine the current impact of artificial intelligence on specific professions and explore how the future of this technology is being evaluated. To this end, the article employs an analysis of a documentary body composed of videos, journals, and notices produced by labour unions specifically targeting executive occupations. The article also aims to compare strategies and proposals that have been implemented by German and French trade unions. The research has sought to pinpoint the various issues relating to artificial intelligence identified by labour unions based on their strategic orientation and shifts in the treatment of this subject over the past years. In professions where unionisation is sometimes stigmatised, these are sectors in which certain tasks are directly affected by AI. The definition of artificial intelligence, both for union members and institutions, the level of regulation, and analysis of the impact of AI on work (revealing discrepancies in professions relevant to the unions) are topics that stand out the most in the documentation that has been produced.

3.1 INTRODUCTION

Artificial intelligence was the subject of lively discussions and controversies in the media sphere during the first half of 2023. This is also the year in which the AI Act was tabled for debate in the European Parliament, giving rise to debates in other arenas. Debates quickly ignited with the arrival of Chat-GPT, characterised as a revolution and a major upheaval. As with every new wave of innovation, this one is being hailed as a revolution and raises a host of questions, particularly a central one being: what is the impact of AI on work? Among the hypotheses that have been forwarded is the notion that artificial intelligence could “eliminate” certain professions. While some researchers have shown that such claims recur

cyclically and that AI can undoubtedly have effects on work and workers, these effects may not necessarily align with those predicted by “futurologists” (Carbonell, 2022).

It should be underscored that AI is not something new, emerging solely in the guise of Chat-GPT. This new manifestation of an already existing phenomenon has enhanced certain potential offered by AI, however. In their documentation, labour unions manoeuvre dialectically between a political approach to technology and artificial intelligence, analysing its consequences for labour. Given that it is not a novel phenomenon, being generated just a few months previously, the organisations’ documentation can be characterised as solid both in France and Germany. Studying this phenomenon through the lens of these sources allows for a theoretical contribution to AI analyses and also provides a broader perspective on often intense debates.

An IFOP study (IFOP – Talan survey: French people and generative AI, 2023) reveals that “68% of French people who use generative AI at the workplace hide it from their superiors”. The study also highlights a generational divide concerning the use of artificial intelligence, as “49% of those under 35 precisely understand what generative AI refers to, whereas only 31% of those over 35 do”. The study specifies these different types of usage: 34% of respondents use it to increase their knowledge. For 31%, it serves as a research tool, similar to a search engine. 26% utilise it for translation purposes, and 20% to enhance productivity. Another 20% use it to generate texts, such as recommendation letters, articles, and emails. In Germany, IG Metall published a study (2019) conducted with employee representatives from 2,000 companies, indicating that nearly 50% of the companies either did not have a strategy or had an insufficient strategy to deal with digital transformations. At the heart of the issues? Adapting their offerings and training.

Beyond op-eds and public positions, other stakeholders have also produced analyses of artificial intelligence, notably labour unions. What perspectives do these actors have regarding these innovations? Another interesting element to consider is the way employees make use of AI. Above and beyond the rhetoric, do employees have access to such

tools in their work? How do they actually make use of and integrate these tools? And how has this changed their work? In this context, the objective is to understand artificial intelligence by taking those who are responsible for the production process in consulting firms as the starting point. This can involve consultants, engineers, public sector professions or, more broadly, many actors constituting a domain that is particularly interesting because it focuses on professions in which unions are often less present, and where “*social dialogue has allowed for the domestication of labour conflicts*”, (Giraud, 2013), and where unionisation in the private sector situation is perceived as a “*challenge to the trust relationship with the employer*” (Mias, 2022).

3.2 THEORETICAL AND METHODOLOGICAL FRAMEWORK

This article relies on a qualitative methodology. The documentary bases produced by labour unions on artificial intelligence have also been analysed. This research is based on documentation on artificial intelligence issues produced by trade unions since 2018. While it primarily consists of articles, videos have also been viewed. The documents were collected by conducting searches on trade unions’ websites or by contacting them, and their providing links and documentation in response.

STATE OF THE ART: THERE IS A SUBSTANTIAL BODY OF LITERATURE, BUT THERE IS RELATIVELY LESS FOCUS ON THE PERCEPTION OF AI BY LABOUR UNIONS.

WHAT IS ARTIFICIAL INTELLIGENCE?

In a report published in 2016, France Stratégie cited a subject that “*benefits from a dynamic, a momentum that crystallizes attention and energy*”. In practice, artificial intelligence is already pervasive (Cazals, Cazals, 2020) and is not an unprecedented phenomenon. The term “*artificial intelligence*” was coined by a group of computer scientists in 1956 during the Dartmouth Summer Project². In a more philosophical sense, the notion is even older, as seen, for instance, in the Frankenstein story (Turcq, 2019). While in contemporary times AI is perceived as being linked to deep learning, this definition has evolved since its inception, when it was merely about teaching machines to perform tasks, such as playing chess. With the advent of massive data, this understanding has expanded

to encompass possibilities like prediction, in connection with data analytics.

Flights of imagination that AI gives rise to are often fraught with anxieties, with AI being seen as a threat to jobs, and afflicted with the notion that this form of intelligence could become uncontrollable or dangerous depending on whoever controls it, thereby building on an imagery reminiscent of Frankenstein. Although a longstanding concept, artificial intelligence became a “*public issue*” (Kirtchik, 2019) in the second half of the decade after 2010 owing to the recent breakthroughs in “*deep learning*” facilitated by investments from multinational digital giants (Kirtchik, *op cit.*).

From this perspective, artificial intelligence is both a reflection of a certain degree of technical and technological advancement as well as a promise (how far will it go? What are upcoming innovations?). This second element can be particularly anxiety-inducing when AI is considered in a stronger vein, namely as a “*generalist intelligence surpassing that of humans*” (Kirtchik, 2019). Nevertheless, the very nature of this intelligence is a subject of debate. According to Luc Julia, the author of *Artificial intelligence does not exist*, intelligence can be defined as

“*breaking the rules, innovating, being interested in what is different, in what is unknown. [...] Being intelligent is being curious, having curiosities*”.

Artificial intelligence does none of these things, however. He prefers the term “*augmented intelligence*”, placing AI in its rightful place as a means to assist and improve human intelligence rather than a substitute for it. While not using the same terms, this idea is shared by several researchers, such as Jean-Marie Peretti. In the same vein, MIT’s economist David Autor (2015) directly questions the advantages of humans compared to machines. He identifies four advantages, namely adaptability, flexibility, problem-solving ability and social interactions.

The Nora-Minc report³ (December 1977) argued that computerisation would constitute a threat to the banking sector, insurance, commerce, and services. Throughout the second half of the 20th century, numerous authors and specialists succumbed to the allure of technological determinism regarding computerisation and artificial intelligence. These analyses supported theses such as Jeremy Rifkin’s “*end of work*”. However, as time passed, effects were measured, but they never indicated any developments coming even close to the revolution predicted by these various authors. The study *The Future of Employment: How susceptible are jobs to computerisation?* (Carl Benedikt Frey and Michael A. Osborne, 2013) forecasted that 47% of US jobs were likely

² The Dartmouth Summer Research Project on Artificial Intelligence lasted eight weeks. It was a huge kind brainstorming session in the context of the ascendancy of cybernetics. Twelve professors and researchers took part in the project : Dr. Marvin Minsky, Dr. Julian Bigelow, Professor D.M. Mackay, Mr. Ray Solomonoff, John Holland, Dr. John McCarthy, Claude Shannon, Nathaniel Rochester, Oliver Selfridge, Dr. Allen Newell, Professor Herbert Simon. According to McCarthy and Minsky, “*artificial intelligence was based on the conjecture that all cognitive faculties, especially reasoning, computation, perception, memory, and even scientific discovery or artistic creativity, could be described with such precision that it should be possible to reproduce them using a computer*” (Ganascia, 2017).

³ This report was commissioned by Valéry Giscard d’Estaing, who aimed to “*advance reflection on the means to lead the computerisation of society*” in the late 1970s, at a time when the strong growth following the end of World War II was slowing down (decrease in the profit rate, high inflation, reduced profitability of productive investments).

to be automated within the coming 10 to 20 years. This study received widespread media coverage, inundating certain media and academic arenas (for example, it was cited at the 2016 Davos Forum). It is now regularly cited (Carbonell, Casilli, Ferguson, Ezratty, Héry, Levert, Gadrey) as the perfect example of alarmist predictions regarding the impact of these developments on work, as the analysis failed to address problems at the right level. Other researchers contend that it is “tasks, rather than professions”, that “can be automated” (Méda, 2017): while tasks like automating the sending of emails for a consultant can be automated, it is perhaps going too far envisioning the entire profession being automated. More recently, the President of the European Economic and Social Committee (EESC), Gabriele Bischoff, affirmed updated figures from the OECD estimating that there is a risk of 14% of European jobs being automatable over a timeframe ranging from 15 to 20 years (Overview of the national strategies on work 4.0 – a coherent analysis of the role of social partners, 2019).

MIDDLE MANAGERS? EXECUTIVES? WHO ARE WE TALKING ABOUT?

At this stage, it should be clarified that the so-called *cadre* in French is understood as persons who, after completing higher education (which is usually lengthy) receive positions involving the performance of functions such as supervision, management, or middle management in an organisation. These individuals have a cadre employment contract that grants them a particular status. From a legal perspective, and sticking with the French example, Article L3111-2 of the Code du travail defines the status of executive cadres as follows:

“executives who have been entrusted with responsibilities that imply a great deal of independence in organising their schedules, who are authorised to make decisions largely on their own, and who receive compensation at the highest levels of the remuneration systems”.

A degression through Boltanski’s book, *The Cadres: The Formation of a Social Group*, is useful in putting the term in perspective. It is a “native term, used especially in the business field and specific to France” (Boltanski, 1982), describing a social group (defined in the book as a “principle of identity to which social agents accord their belief” which, concretely, is partly made up of people from similar schools and driven by a common *habitus*). Boltanski distinguishes between “diploma-holding executives” and “self-taught executives” (who have gradually been relegated to the margins of the groups during the institutionalisation of the group). The latter emerge either during the group’s formation or after its formation once it has established journals and diplomas from schools (business or engineering).

Boltanski notes that “cohesion persists because everyone finds some kind of symbolic benefit”. Lower-echelon executives cling to hard-earned titles (continuing education, acquisition of titles outside of working hours). Divisions are institutionalised in a vague space:

“if the category’s space and the field of companies where its members are employed were relatively transparently structured, agents whose objective chances of accessing high positions are lower would be discouraged from competing with those whose chances of accessing dominant positions are greater” (Boltanski, *op cit.*).

Correspondence between the French category of “cadre” and its English translations:

In organisation theory or the sociology of management, the term *cadre* can be translated in several ways, depending on the context. Here are some possible translations:

- Manager: This mostly corresponds to executives who have management responsibilities for teams or projects. It emphasises their role in leadership and coordination.
- Executive: This refers to executives who hold high-level positions of responsibility in the company, such as CEOs, CFOs, or HR directors. It emphasises their hierarchical position and decision-making power.
- Supervisor: This translation is often used to refer to executives with supervisory responsibilities for operational teams. It emphasises their role in control and monitoring.
- Middle manager: This can be applied to executives who hold intermediate positions in the company hierarchy, between first-tier managers and top-level executives. It emphasises their role in coordination and communication between different layers of the organisation.

Executives constitute a heterogeneous category, including, on the one hand, individuals working in administration or the public sector. For them, trade union involvement is not “stigmatised” (Pochic and Guillaume, 2009). If it is known, it will not necessarily hinder career advancements. This is where the highest percentage of union members among executives is to be found. On the other hand, there are individuals with engineering and executive profiles in the private sector (Pochic and Guillaume, *op cit.*). The German equivalent of the term *cadres* is *Fach- und Führungskräfte*. We will briefly describe what this status designates in Germany and where union members with this status are to be found. The CFTD union holds that

“the situation in Germany also appears to be partially characterised as ‘exclusionary’. Executives are generally considered as employees and covered by collective agreements. However, existing definitions do make reference to the exclusion from collective agreements for “*Aussertarifliche Angestellte*”. Senior executives (*Leitende Angestellte*) are defined by law but enjoy certain privileges, including a specific representative body known as “*Sprecherausschuss*”⁴.

⁴ https://www.cadrescftd.fr/sites/default/files/les_cadres_en_europe_et_leurs_syndicats_0.pdf

German unionism has been described as an accommodating form of unionism and differs from French unionism in several aspects. In the early 2000s, the Deutscher Gewerkschaftsbund (DGB) represented nearly 80% of union members, making the German union system a much more unified space than in France. It is also an institutionalised form of unionism (Lestrade, 2001), which has tangible consequences for the range of actions available to committed individuals. The only strikes considered lawful are those that fall within the framework of collective negotiations. Strikes relating to government policies therefore do not fall within the realm of possible labour mobilisation. When it comes to examining the unionisation rate among white-collar workers, the two countries in the study exhibit a similar level of involvement, with a low rate of unionisation among white-collar workers, ranging from 5% to 15%, in the Czech Republic, Germany, France, Bulgaria, Spain, and Poland' (Eurocadres, 2009).

THE NEED TO DECONSTRUCT THE NOTION AND THE USE OF NEW INFORMATION AND COMMUNICATION TECHNOLOGIES

To take a step back from certain omnipresent themes and portrayals permeating the media space, it is crucial to question this notion of new technology. The increased use of new information and communication technologies does not fail to have an impact on work. Without falling into what Jeanneret has deplored as "many articles on the subject continue to invoke history in a hallucinatory way and to make an immoderate use of the notion of revolution" (Jeanneret, 2007), and to fall into "unrepentant technical reductionism" (Jeanneret, *ibidem*) which "marginalizes the comprehension of their history, of their stakes, of their cultural effects, of their social appropriation" (Jeanneret, *ibidem*).

This article's objective is to place itself in this matrix of an understanding of the effects and appropriations. Use of these technologies have taken on massive dimensions since the 1990s and has given rise to various conjectures regarding their stages of their diffusion and appropriation in organisations (Bellon, Ben Youssef, M'Henni, 2007). It is also interesting to take a deeper look at these NICTs and use of them, as this allows us to deconstruct the notion of "systematic catching-up" when a new device is developed:

"for a vast majority of people, the perceptual and cognitive relationship to communication and information technologies will continue to be experienced as an alienation and a decrease in their power to act, this in the rapidity of the emergence of new products and arbitrary reconfiguration of entire systems" (Crary, 2014).

In *What is a Device*, Giorgio Agamben contends that "[today] there is no longer a single moment in the lives of individuals that is not shaped, contaminated, by a device". In this sense,

"submission to these devices is almost irresistible, given the apprehension of social and economic failure, the fear of being left behind, of being considered old-fashioned [...] Any new product or service is presented as essen-

tial to the bureaucratic organization of our lives; not to mention that an ever-increasing number of routines and needs begin to constitute this life that no one has really chosen" (Crary, *op cit.*).

These can be defined as "*all the products of economic activities, both industries and services, which contribute to the visualization, processing, storage and transmission of information by electronic means*" (Petit, 2006). Artificial intelligence alters work, its execution, tasks, and even the way an individual is trained to perform a job. We affirm and uphold the hypothesis that AI falls within a broad understanding of systems that reshape human activities, confronting them with new challenges.

3.3 ANALYSIS AND DISCUSSION

The body of documents consists of brochures, articles, and videos (including webinars) produced between 2017 and 2023. The organisations considered in this analysis are: first, on the French side: la Confédération Générale du Travail (CGT), Force Ouvrière (FO), Confédération française démocratique du travail (CFDT), la Confédération française des travailleurs chrétiens (CFTC), the Syntec Federation, and la Confédération française de l'encadrement – Confédération générale des cadres (CFE-CGC). Before delving into the analysis, to provide a rough picture: here are some statistics for each organisation from the years between 2009 and 2012 (report from the 17th Congress of UGICT-CGT, published in its monthly magazine Options, No. 597, May 2014) for the category of occupations "engineers-executives-supervisors-technicians": CFDT: 26.84%; CGT: 20.98%; CGC: 18.14%; FO: 13.83%; CFTC: 9.42%. How is the rate of unionisation evolving? "In the private sector, the decline in unionisation affects all socio-professional categories except executives: 7.9% of them are union members, which represents an increase of 0.7 points since 2013" (DARES, 2023).

Between 1980 and 2018, the union membership rate in Germany dropped from 32.5% to 16.7%. Based on data from 2008, the composition of the various unions looks as follows. First and foremost, the Deutscher Gewerkschaftsbund (Federation of German Trade Unions), with its eight affiliated unions, represented nearly 6.4 million members at the end of 2008, accounting for almost 80% of the German labour union movement's membership. Its constituents included various unions, among them the Vereinte Dienstleistungsgewerkschaft (ver.di), encompassing occupations like public services, commerce, banking, insurance, healthcare, transportation, port activities, media, social and educational services, printing, private services, and firefighters. The Beamtenbund (civil service union) subsumes nearly 40 unions and associations, with a membership of 1.28 million, including 920,000 civil servants (2008). The third German labour union federation, the smallest in the landscape, is the CGB (Christlicher Gewerkschaftsbund Deutschlands – Christian Union of Germany). In 2008, it comprised 16 unions and claimed to have 278,000 members (Dribbusch, 2010).

Published over a short period, these documents indicate different trajectories along which organisations' relationship with artificial intelligence has evolved. The topics covered in the articles can be classified as follows:

- Attempts at defining artificial intelligence in order to delineate what falls under AI and what does not,
- The impact of AI on work as a practice,
- Regulation of artificial intelligence.

Depending on their orientation and strategy, the unions do not devote equal attention to each and every dimension of artificial intelligence.

AN ATTEMPT TO DEFINE ARTIFICIAL INTELLIGENCE

First and foremost, it must be noted that the documentation highlights significant asymmetries in terms of the quantity of documentation and analyses provided. The CGT and CFDT exhibit much more substantial activity relating to the subject compared to the CFTC or FO. The unions do not seek to intervene or engage at the same level. While the CFDT insists that discussions should take place at the European level, the CGT is more focused on the national level. Both the CGT and CFDT have dedicated articles and even entire issues of their magazines (respectively entitled *Options* and *Cadres n°479*) to the topic of artificial intelligence for executives. On the other hand, the CFTC, particularly in the east of France, has organised dinner discussions and other events reflecting on AI. Machine-learning is incorporated into the unions' definition. While there have been some changes in definitions, these have been marginal, with initial work being related to the rise of AI integration in ERPs and software packages.

In the documentation, academic references are scarce, and the same ones are often repeatedly mentioned. Several documents make reference to the study previously cited by Frey and Osborne. This citation is surprising since it comes up in documents published long after this study. Despite criticism directed at these works, they attest to the widespread dissemination of this study. While CFE-CGC makes mention of it, adding that it is difficult to know exactly how many jobs are at risk, CFDT cites it along with other estimates. Force Ouvrière also makes reference to it, but without providing further details. It is interesting to note that, despite being extensively challenged by researchers due to its unverified estimates and questionable methods used to arrive at these figures, this study continues to circulate widely within the trade union world.

For its part, SYNTEC estimated that between 2019 and 2023, 7,500 jobs related to artificial intelligence would be created, specifically in the field of AI specialists, such as data engineers, data scientists/analysts, or machine-learning engineers. It is noteworthy that the positions adopted by the unions adopt cannot be termed technophobic. In its guide, the CGT states that it is opposed to "apocalyptic discourses, as work will not disappear". The CFDT describes itself as "neither technophobic nor technophilic". This positioning, which is not always stated explicitly, contradicts the reference to the study

made by Frey and Osborne, which – despite being questioned – could be interpreted as leaning in the direction of a technophobic position. Ver.di defines artificial intelligence as follows:

"Initially, the first truly proficient chess computers required years of being fed copious amounts of data. Nowadays, a simple input of the rules suffices. The chess computer then engages in millions of self-play games within a matter of days, autonomously improving itself. In today's context, AI primarily refers to machines learning independently. [...] Notably, image recognition, such as recognizing cats, has become commonplace. Machines are now capable of recognizing cats as such, even without specific cat breeds being pre-programmed. The machine learns to draw its own conclusions, much like a human. In fact, some systems even detect patterns in data, such as cats".

The CESI's report (2022) also mentions "job loss, deskilling, de-personalisation of work", but remains optimistic about the impact of digitalisation. It is also worth noting that this union in a 2019 document acknowledges that jobs are inevitably at risk due to AI:

"It's a fact: employees will lose their current jobs. Perhaps some professional categories will cease to exist, much like lamplighters, stokers, typesetters, and weavers are no longer found."

CFDT defines artificial intelligence as

"a digital technology that can perform human cognitive tasks in the areas of speech and language, visual recognition, robotics, and process and knowledge automation".

On the other hand, the CFTC considers it to be a "technology that, despite being relatively recent, has few real applications". This union believes that "today, the performance of AI remains relatively modest". In the realm of German trade unions and their literature, an effort to promote "awareness" and "information" can be discerned, with ver.di's documentation being disseminated among workers and companies. The documentation produced aims to stimulate discussions and fuel debates within companies or industries for regulatory purposes. In the documentation produced by the unions, the issues raised align with the continuity and renewal of "Gute Arbeit" approach. What does this entail? The German Confederation of Trade Unions (Deutscher Gewerkschaftsbund) defines "Gute Arbeit" as follows: "good work is work that meets the aspirations of the workers" (DGB-Index, 2007, p. 6). This has been a prominent topic since 2006 (Renard, Zimmermann, 2020). "Concisely, this definition makes the evaluation of work by workers, who are elevated to the level of experts in terms of their quality of work, a key element" (Renard, Zimmermann, op cit.). In the same vein, ver.di states with regard to AI, "*Dann mal los – für faire Arbeit und gute Perspektiven!*" (ver.di, 2020).

It is interesting to note that in a comparison of the documentation of French and German trade unions, the French unions tend to differentiate more sharply between digitisation, digitalisation, and artificial intelligence, whereas the German documentation treats these as lying more along a continuum, even with respect to recent developments.

THE IMPACT OF AI ON WORK

The CFDT and CFE-CGC discuss the Villani report (2018) in a relatively positive light, while the CGT laments the “strategic deadlocks on major digital issues and challenges in the AI component sectors” (Syndicoop, 2018). This report is the outcome of a parliamentary enquiry conducted from 8 September 2017 to 8 March 2018. It is interesting to note that the level of depth in the analyses varies between occupations. This observation holds true for all unions as they strive to closely examine the effects of AI on work. The CFE-CGC and CGT, in particular, present highly precise analyses regarding human resource issues. In 2018, the former proposed an ethical and digital charter for HR, which was then reviewed and edited by the CNIL (French Data Protection Authority). The CGT also offers several pages of analysis on HR in its guide on AI. What is this linked to? In white-collar functions, automation and digitisation of certain tasks extend back in time longer than in other areas, and the limitations of AI were also perceived more quickly. This is the case with algorithmic biases, which directly impact recruitment processes. As a result, there is more perspective and material with which to analyse this aspect in a precise manner, while the effects of AI on consulting professions appear to be more recent. The CFE-CGC states at the beginning of its charter that, following a study among its members, “92% identified the establishment of an ethical charter on the use of algorithms in recruitment and HR management as a priority”.

These are some of the concerns expressed by CFDT regarding AI:

“we may be faced with the following in the near future: facial recognition during recruitment; the exploitation of our personal data without our knowledge; intrusive surveillance during teleworking; sole decision-making by an algorithm in our professional journey; Or any other infringement on our rights” (UGICT, 2020).

On the part of the CGT, the issues are presented in its guide on artificial intelligence and can be summed up in five points. First, there is a concern about the relationship between humans and machines, specifically how to achieve the goal of liberating humans at work. The second subject is proximity management. The third one is about platformisation of companies, which involves controlling algorithms. The last two subjects are the impact of algorithms on recruitment and the risks of discrimination, and finally, deployment modalities, meaning how present-day AI will shape the organisations of the future. While organisations perceive certain uses of technology as posing a risk of discrimination, for example with regard to HR software, there is also a risk of work degradation (Braverman) if AI is not regulated. The CGT explains

that “the algorithm concretely determines the working conditions, as it is the one that issues the instructions to be followed” (CFDT Grand Est, 2022). Thus, the human-machine relationship is at stake, along with humans’ sovereignty over their work.

The Verdi service union has published its “guidelines for the use of artificial intelligence”. This union took up the topic in 2018, a time frame similar to that observed with the first French unions to address the issue, and also dedicated its annual summit in 2022 to artificial intelligence. Furthermore, the union is engaged in a joint project on this theme with IBM and the German Federal Ministry of Labour and Social Affairs. The union identifies 14 principles related to major themes associated with the development of artificial intelligence:

- Meaning/utility,
- Accessibility/barriers,
- Non-discrimination/inclusion/gender equality,
- Sustainability,
- Security/robustness/AI labeling,
- Job security/qualification opportunities,
- Flexibility and decision-making room,
- Health,
- Personal rights,
- Controllability,
- Traceability/explainability,
- Transparency,
- Data quality,
- Responsibility/liability.

The goal is to translate several proposals into both legislation and collective agreements, as well as to generate publications and articles for the public and experts. In terms of the strategy, Nadine Müller notes that the report will be “discussed internally, in each branch of the union, and, of course, in the IT and finance sectors, which are particularly affected”. Additionally, ver.di and the Beamtenbund are preparing a collective agreement on digital issues for the end of 2023.

In its document entitled “The Future of the Civil Service”, the DBB union argues that the future civil service needs to involve employees (collaboration), including in the design of public policies, as the civil service should “meaningfully leverage the opportunities presented by digital technologies, both in terms of hardware and ideology”. What makes this document interesting is its strong intertwining of digitisation, digitalisation, and artificial intelligence themes, which is rarely observed in its other documents. Several priorities are defined, including the importance of addressing and resolving the “ethical” dimension of digitisation to counter dehumanisation, while being mindful of various risks such as “devaluation of qualifications” and a potential increase in workload if automation only generates complex and challenging tasks. Regarding AI, “qualification is a key factor in this process and should take precedence over personnel modification measures”. The same message crops up in ver.di’s documentation:

“More than ever, on-the-job training will be essential. The faster progress accelerates through ‘machine learning,’ the more employees must continue learning. Therefore, we need a legal right to lifelong learning. Additionally, we propose a government-supported part-time continuing education program. All of this leads to us working and living better” (ver.di, 2019).

REGULATION OF ARTIFICIAL INTELLIGENCE

The question of regulation raises the issue of the most appropriate level to address the issue. It is interesting to note that for the unions that delve most deeply into an analysis of AI, the question of the level of action is relatively homogeneous. On the part of the CGT and CFDT, some of the analyses and work culminate in concrete proposals for laws and regulations. Both the CGT and CFDT agree on the importance of the European level when it comes to regulation (“a European legislative framework that moves away from any focus on GAFAM or other digital giants is necessary to break free from a monolithic vision that seeks to impose its methods and disregards the diversity of cultures and freedoms,” as described by CGT). The CGT contends that the role of AI is to “harness new technologies to successfully achieve the social-ecological transition, giving meaning to the use of these technologies and to the evolutions themselves” (Syndicoop, 2018). At the European level, the CGT holds that

“this requires accompanying it with a reflection on the pursued objectives, including in terms of management. Eurocadres has established a roadmap as part of the ongoing European negotiation on digital and work, whose mandate has been entrusted to Ugict-CGT” (Syndicoop, 2018).

On the German side, differences in terms of the level of action are linked to the structural differences mentioned at the beginning of this document. The company level appears to be emphasised much more, as does the individual level. However, similar to the French side, the European level is frequently invoked.

3.4 CONCLUSION

This analysis of a body consisting of textual materials or videos from various trade unions, specifically targeting branches of executives or advisory positions, reveals several elements. The unions show varying degrees of interest in the topic, as evidenced by the level of precision or quantity of documents produced on the subject. While artificial intelligence has dominated the media space for several months, it is worth noting that the topic is not new, and organisations have been producing analyses on the subject for several years. While it is a subject characterised by relatively little competition between unions, different strategies are at work regarding how to approach the topic: whether they participate in working groups or not, emphasising certain levels of regulation as opposed to other ones, and the analyses they conduct on the documentation and proposals emanating from the political field.

If not all unions display equal attention to AI, this is partly due to the weaker representation of certain unions. While some proposals may vary, it is important to note that this topic is not subject to major differences between the organisations that have addressed the topic of AI most intensely. Above and beyond “catastrophist” or highly categorical discourses, an analyses of documentation produced by the unions indicates that a precise analysis of the stakes in connection with AI and nuanced perspectives on the opportunities opened by AI has been performed. In this sense, interest in the effective transformations of AI in certain sectors has led to thorough analysis and a variety of proposals to enable emancipated work from certain constraints. Some unions also raised the question of the role of data in the ecological transition. Ultimately, this documentation contains certain analyses that have been overlooked in the media, yet they have advanced more since the second half of the 2010s than viewpoints that have been devoted more attention and are regularly fuelled by new advancements in the AI sector, such as the arrival of Chat-GPT. The comparison between French and German documentation is interesting in that it shows that, regarding the topic of artificial intelligence, despite differences in definition or strategy, the organisations in both countries, whose discourses tend to contrast methods (Ducange, 2014), are converging, particularly with regard to the central role of the European level on this issue. When the subject is approached through the ideological lens of trade unions or the major themes that guide their actions (e.g., “decent work”), strategies and documents can be seen to occasionally overlap.

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APPENDIX

Organisation	Title	Date
CGT	Intelligence artificielle et algorithme: pour quelle révolution ?	
CGT	Actes colloque: Où va l'IA ?	2018
CFDT	Un guide juridique pour une IA de confiance dans notre environnement professionnel	2021
CFDT	Intelligence artificielle et travail: une approche pour comprendre les enjeux	2022
CFDT	Intelligence artificielle: l'humain aux commandes	
SYNTEC	Syntec Numérique: "L'intelligence artificielle va se démocratiser dans les entreprises d'ici à trois ans"	2020
FO	Numérique et intelligence artificielle: les cadres FO s'emparent de la question	2020
CFTC	Dîner-Débat: L'Intelligence Artificielle – 20 juin 2019 à Strasbourg	2019
CFTC	Tribune Libre: Nouvelle philosophie managériale	2022
CFTC	L'intelligence artificielle: quels impacts sur l'emploi ?	2017
CFDT	Appréhender l'intelligence artificielle (Webinaire CFDT Cadres)	2021
CFDT	Négocier l'intelligence artificielle (Webinaire CFDT Cadres)	2021
CFDT	Réguler l'intelligence artificielle (Webinaire CFDT Cadres)	2021
CFE-CGC	Doctrine que la CFE-CGC sur l'IA	2019
CFE-CGC	Charte CFE-CGC Éthique Numérique RH	2021
European Economic and Social Committee	Overview of the national strategies on work 4.0: a coherent analysis of the role of the social partners	2019
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