

## AN ALGORITHMIC MANAGEMENT AND THE PARADOX OF THE BANI WORLD: THE BALANCE BETWEEN EFFICIENCY AND HUMAN-CENTRIC LEADERSHIP

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**Purpose:** This study examines the paradox of algorithmic management in contemporary organizations operating under BANI (brittle, anxious, nonlinear, incomprehensible) conditions. The article investigates how different configurations of algorithmic management contribute to organizational vulnerabilities and how responsible algorithmic management practices can support adaptive and human-centric leadership.

**Design/methodology/approach:** The study adopts a mixed-methods approach combining a systematic literature review (2020-2025) with secondary analysis of large-scale European datasets, including the AIM-WORK survey and OECD data. Descriptive statistics and cross-tabulations are used to examine the prevalence and configurations of algorithmic management, while theoretical interpretation links empirical patterns to BANI-related vulnerabilities and leadership dynamics.

**Findings:** The results show that algorithmic management is widespread in European workplaces, particularly in task allocation and scheduling, but its intensity and form vary significantly across occupations and countries. High levels of algorithmic autonomy, opacity, and rigidity are associated with increased organizational brittleness, employee anxiety, and incomprehensibility. Conversely, organizations implementing transparency-by-design, explainable AI, and human-in-the-loop governance exhibit higher trust, perceived fairness, and adaptive capacity. Responsible algorithmic management enables leaders to balance efficiency with empathy, sense-making, and relational coordination.

**Research limitations/implications:** The study relies on cross-sectional secondary data, limiting causal inference and longitudinal analysis. Leadership outcomes are operationalized indirectly through work-design and governance indicators rather than direct behavioral measures. Future research should employ longitudinal and qualitative designs to explore how responsible algorithmic practices shape leadership behaviors and organizational resilience over time.

**Originality/value (research gap):** This study addresses a critical gap by empirically linking algorithmic management configurations to BANI-related organizational vulnerabilities and by integrating responsible AI governance with theories of human-centric and adaptive leadership. By combining large-scale European evidence with the BANI framework, it offers a novel perspective on algorithmic management as both a source of fragility and a potential driver of organizational resilience.

**Keywords:** algorithmic management; BANI framework; human-centric leadership; human-in-the-loop; organizational resilience.

**Category of the paper:** scientific research.

## 1. Introduction

The accelerating integration of artificial intelligence and machine learning into organizational life has ushered in an era in which algorithms actively shape managerial practices, decision-making, and communication flows (Murire, 2024; Song et al., 2025; Raina et al., 2026). As firms pursue greater efficiency, responsiveness, and strategic precision, algorithmic systems are increasingly viewed as essential instruments for optimizing processes and amplifying competitive advantage. They enable refined data analytics, streamline workflows, and support decisions at unprecedented speed and scale. Yet this algorithm-driven transformation is accompanied by profound tensions. While algorithmic management promises operational excellence, it simultaneously raises concerns regarding human agency, transparency, and the erosion of relational aspects of leadership. The deployment of opaque or overly rigid systems can undermine trust, complicate communication, and reduce the capacity of organizations to account for emotional, contextual, or intuitive dimensions of human work.

Against the backdrop of a world marked by brittleness, anxiety, nonlinearity, and incomprehensibility (BANI) (Cascio, 2020; Grabmeier, 2020), these tensions become even more pronounced. Algorithmic tools, despite their analytical power, may reinforce fragility by creating overly deterministic structures that fail under unforeseen conditions. They may heighten anxiety among employees who feel surveilled or displaced by automated decision processes, and they often struggle to navigate nonlinear dynamics or ambiguous patterns that defy simple prediction.

This article examines the paradox of algorithmic management within the BANI context, focusing on the delicate balance between organizational efficiency and human-centric leadership. It explores how algorithms can simultaneously enhance performance and destabilize interpersonal dynamics, and how leaders can navigate these contradictions to foster resilient, empathetic, and adaptive workplaces. This study formulates a set of research questions and hypotheses. These are designed to examine specific configurations and design features of algorithmic management, as well as their implications for employee experience, organizational resilience, and the emergence of human-centric leadership.

RQ1: How do different configurations of algorithmic management (level of algorithmic autonomy, rigidity, transparency) contribute to BANI-related vulnerabilities such as brittleness, worker anxiety, and incomprehensibility?

H1: Higher levels of algorithmic autonomy, opacity, and rigidity are positively associated with employee anxiety, reduced autonomy, and increased organizational brittleness.

RQ2: Which design features of algorithmic management systems (e.g., transparency, explainability, meaningful oversight) most effectively mitigate BANI-related vulnerabilities such as incomprehensibility, anxiety, and nonlinearity in workplace decision-making?

- H2: Workplaces that implement transparency-by-design, explainable AI, and strong human-oversight mechanisms show significantly higher employee trust, perceived fairness, and adaptive capacity than workplaces relying on opaque, fully automated AM.
- RQ3: How does the implementation of responsible algorithmic management practices influence the development of adaptive and human-centric leadership behaviours in BANI-affected organizations?
- H3: Responsible algorithmic management positively moderates the relationship between algorithmic efficiency and leadership effectiveness, enabling leaders to balance data-driven decision-making with empathy and relational coordination.

## 2. Literature review

Research on algorithmic management (AM) has expanded rapidly in recent years, offering increasingly detailed insights into how AI-driven managerial systems reshape work, decision-making, and organizational life. Foundational contributions define AM as the delegation of managerial tasks, such as monitoring, scheduling, evaluation, coordination, and even discipline—to algorithmic systems capable of operating with varying degrees of autonomy, opacity, and rigidity. This body of scholarship shows that algorithmic systems do not simply automate discrete tasks but introduce a qualitatively new mode of managerial control based on prediction, data-intensive processing, and continuous surveillance, which can transform the structure and social fabric of organizations (Möhlmann et al., 2021; Meijerink et al., 2021; Benlian et al., 2022; Parent-Rocheleau et al., 2022). Conceptual analyses also demonstrate that algorithmic systems do not merely execute managerial functions but actively shape meaning-making within organizations by embedding assumptions about efficiency, risk, and performance. These systems influence how work is structured, how decisions are framed, and how managerial authority is enacted, thereby affecting both managerial practice and employee agency. Scholarship highlights that algorithms, as socio-technical actors, configure communication flows, encode particular logics of control, and redefine what counts as relevant or legitimate information in organizational contexts (Gulbrandsen, Just, 2024; Hassan, 2024). Collectively, these works establish the theoretical foundation for understanding algorithmic management as a distinctive managerial paradigm rather than simply a technological tool.

Across empirical contexts, algorithmic management has been shown to profoundly affect job design, employee well-being, and perceptions of fairness. High levels of algorithmic autonomy and opacity often correlate with reduced worker discretion, heightened technostress, emotional strain, and a diminished sense of meaningful work. Continuous monitoring, real-time performance scoring, and automated decision pipelines can amplify employee anxiety, reduce perceived fairness, and restrict opportunities for sense-making, an effect particularly salient in

environments characterized by volatility, ambiguity, and information overload (Kellogg et al., 2020; Zayid et al., 2024; Kinowska, Sienkiewicz, 2023; García-Ruiz, Rocchi, 2025). Studies of gig-work and platform-mediated labor show similar patterns, with rigid algorithmic rules inducing behavioural gaming, dependency, and constrained autonomy (Duggan et al., 2020; Liu, Yin, 2024). The organizational dynamics associated with algorithmic management increasingly reflect the characteristics of the BANI world. Brittleness becomes visible in highly rigid algorithmic systems that struggle to adapt to contextual nuance, creating vulnerabilities whenever unpredictable or rare events occur, which mirrors Cascio's description of fragile structures that appear stable until they suddenly fail under stress (Cascio, 2020). Anxiety intensifies as workers face continuous performance evaluation, automated monitoring, and opaque decision rules, reinforcing the emotional volatility that Grabmeier identifies as central to contemporary organizational environments (Grabmeier, 2020). Nonlinearity emerges from the complex interactions between human judgement, machine-generated recommendations, and organizational processes, where small variations—such as algorithmic recalibrations or changes in worker behaviour—produce disproportionate outcomes, a pattern highlighted in studies examining algorithmic control and job design (Kellogg et al., 2020; Parent-Rocheleau, Parker, 2022). Finally, incomprehensibility results from the increasing opacity of algorithmic decision-making and the difficulty workers and managers face when trying to interpret, contest, or influence automated systems - an issue emphasized in research on transparency, explainability, and human oversight in AI-driven organizational contexts (Shin, 2021; Kritikos, Iphofen, 2024).

Algorithmic management can be understood as a lens through which contemporary organizational dynamics are increasingly interpreted, particularly when analyzed using the BANI framework - brittleness, anxiety, nonlinearity, and incomprehensibility. Conceptually, brittleness reflects the vulnerability of organizations whose processes and decision-making structures rely heavily on algorithmic systems. Rigid task allocation, narrow performance criteria, and inflexible procedural rules reduce adaptive capacity and highlight the fragility of efficiency-driven structures, revealing that apparent stability may mask systemic susceptibility to disruption (Kellogg et al., 2020; Möhlmann et al., 2021; Cameron et al., 2023; Cox, Oosterwijk, 2024). Anxiety emerges as a theoretical construct capturing the persistent uncertainty, perceived unfairness, and emotional strain experienced by workers under continuous algorithmic oversight. The interplay of opaque decision-making, automated performance scoring, and limited autonomy reinforces this tension, positioning anxiety as both an individual and collective response to digitally mediated control environments (Gonzalez Vazquez et al., 2025; Fernández-Macias et al., 2025; Kinowska, Sienkiewicz, 2023; Zayid et al., 2024). The notion of nonlinearity highlights that small changes in human behavior, algorithmic outputs, or organizational parameters can produce disproportionate and often unpredictable consequences. This conceptual lens emphasizes the feedback loops and emergent effects inherent to human-algorithm interactions, providing a framework to understand why

minor adjustments in processes or data inputs can cascade into substantial organizational impacts (Parent-Rochelleau, Parker, 2022; Duggan et al., 2020). Finally, incomprehensibility captures the challenges associated with the opacity of algorithmic systems and the difficulty of interpreting, contesting, or influencing automated decisions. This dimension foregrounds the theoretical need for transparency, explainability, and structured human oversight to maintain meaningful engagement with algorithmically governed work (Shin, 2021; Kritikos, Iphofen, 2024; Papagiannidis et al., 2025). Taken together, these four dimensions offer a synthetic framework for understanding algorithmic management as a complex socio-technical phenomenon. The BANI lens allows scholars and practitioners to conceptualize not only the systemic vulnerabilities, uncertainties, and emergent properties of digitally mediated work, but also the constraints these characteristics impose on leadership, decision-making, and organizational resilience. By integrating these insights, the framework underscores the need for human-centric organizational approaches that balance algorithmic efficiency with interpretive capacity, ethical accountability, and adaptive responsiveness (Cascio, 2020; Grabmeier, 2020).

Cross-national analyses of algorithmic management reveal substantial variation in how these systems are implemented across sectors, organizational models, and national contexts. Empirical studies in Europe show extensive deployment in logistics, healthcare, professional services, and public administration, while also indicating uneven exposure among workers depending on occupation, skill level, and regulatory environment. These analyses describe the emergence of hybrid workplaces in which algorithmic decision support operates alongside human oversight, as well as fully platformised environments where automated systems dominate task allocation, evaluation, and workflow coordination. Importantly, research demonstrates that algorithmic stressors such as pervasive digital monitoring, performance scoring, and lack of transparency are distributed unequally, with semi-skilled, low-skilled, and frontline occupations facing disproportionately high levels of anxiety, unpredictability, and perceived incomprehensibility (Gonzalez Vazquez et al., 2025; Cox, Oosterwijk, 2024; Rani et al., OECD, 2025; Keegan, Meijerink, 2025).

In parallel, a growing body of scholarship proposes frameworks for responsible algorithmic management aimed at mitigating these risks through transparency, explainability, auditability, and meaningful human oversight. Research shows that transparency-by-design solutions, explainable AI interfaces, and structured human-in-the-loop systems can reduce perceived unfairness, strengthen trust, and improve adaptation under uncertainty. Ethical and governance frameworks increasingly emphasise worker participation in system design, authenticity and control in algorithmic interactions, and institutional safeguards that maintain human agency in digitally mediated work settings. Empirical findings indicate that organizations implementing such safeguards—particularly through communicative clarity, participatory mechanisms, and oversight protocols—experience fewer negative psychological outcomes and greater resilience in decision-making under volatile conditions (Shin, 2021; Kritikos, Iphofen, 2024;

Papagiannidis et al., 2025; Rivera et al., 2025; European Parliament, 2025; Meijerink et al., 2021; Cui et al., 2024; OECD, 2025).

Finally, broader theoretical and normative contributions stress that algorithmic systems reshape not only managerial routines but also the moral and experiential dimensions of work. Analyses grounded in organizational ethics and social philosophy argue that excessive reliance on algorithmic metrics can weaken relational aspects of work, reduce opportunities for judgment, and undermine the cultivation of meaningful professional agency. These concerns highlight the need for leadership approaches that preserve human interpretation, contextual sensitivity, and shared sense-making in environments increasingly shaped by automated decision systems. Together, this literature shows that algorithmic management generates a fundamental paradox: while promising efficiency, precision, and control, it simultaneously risks producing the brittleness, anxiety, nonlinearity, and incomprehensibility that characterize the BANI world (García-Ruiz, Rocchi, 2025).

Building on the reviewed scholarship, it becomes evident that algorithmic management operates in diverse configurations across European workplaces, differing in their levels of autonomy, opacity, and behavioural rigidity. Existing conceptual and empirical studies illuminate how these systems may generate brittleness, anxiety and incomprehensibility, while simultaneously showing that responsible governance mechanisms - such as transparency, human oversight and participatory design - can mitigate these effects and support more human-centric leadership. Yet despite these advances, important questions remain regarding the scale and distribution of algorithmic management practices across occupations, sectors and national contexts, as well as their interaction with workers' experiences of the BANI conditions. These gaps create a clear need for comprehensive, comparative evidence capable of linking the theoretical vulnerabilities discussed in the literature with their observable manifestations in real-world workplaces. The subsequent Results section addresses this need by drawing on recent large-scale European analyses, including the AIM-WORK survey and OECD data, to quantify the prevalence and patterns of algorithmic management and to provide an empirical foundation for the research questions guiding this study (Gonzalez Vazquez et al., 2025; OECD, 2025).

### **3. Methods**

This study employs a mixed-methods approach, combining a systematic literature review with secondary analysis of large-scale datasets to examine algorithmic management in BANI-affected workplaces. The aim is to investigate how algorithmic design features influence organizational brittleness, employee anxiety, and incomprehensibility, and how responsible practices may mitigate these effects.

The empirical analysis draws on the AIM-WORK survey (De Cuyper et al., 2025; Gonzalez Vazquez et al., 2025), which provides Europe-wide data on digital monitoring, algorithmic management, AI adoption, and platformisation across sectors and occupations, and the OECD report “Algorithmic Management in the Workplace” (OECD, 2025), offering cross-national statistics on adoption, system design, and organizational outcomes including autonomy, transparency, and human-in-the-loop mechanisms.

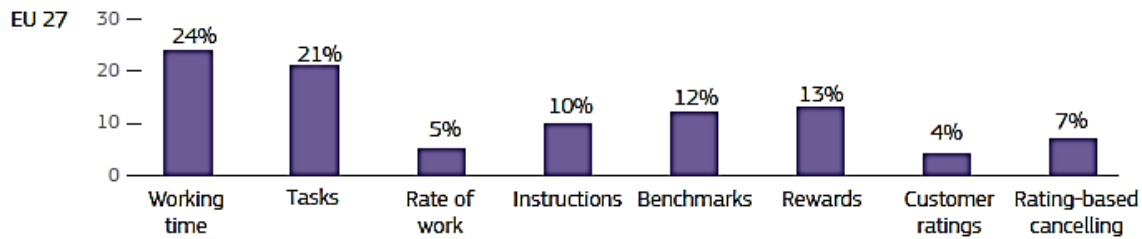
In parallel, a systematic review of publications from 2020-2025 synthesized conceptual and empirical work on algorithmic functions, impacts on employee well-being, and mitigation strategies. Descriptive statistics and cross-tabulations were used to analyze patterns of algorithmic management and associations with BANI-related vulnerabilities, while the literature review provided interpretive context and informed the discussion of potential mechanisms and practical implications. Given the secondary nature of the data, leadership is operationalized indirectly using organizational and work-design indicators available in the EU and OECD datasets—such as autonomy, participatory practices, communication clarity, perceived fairness, and human oversight—which collectively reflect conditions associated with adaptive and human-centric leadership under algorithmic management.

## 4. Results

This section presents empirical findings regarding the prevalence and characteristics of algorithmic management (AM) in European workplaces, focusing on their implications for organizational brittleness, anxiety, and incomprehensibility, as framed by the BANI model. Data from the AIM-WORK survey (De Cuyper et al., 2025; Gonzalez Vazquez et al., 2025) and OECD (2025) form the basis of the discussion, addressing RQ1 and H1 quantitatively, while conceptual insights related to RQ2/H2 and RQ3/H3 are elaborated qualitatively.

### 4.1. Prevalence and Types of Algorithmic Management

Algorithmic management is present in a substantial share of European workplaces, although its prevalence varies considerably across specific practices and national contexts. Figure 1 presents the average prevalence of eight forms of algorithmic management across the EU-27, as reported by workers.



**Figure 1.** Prevalence of Algorithmic Management across EU countries.

Source: Gonzalez Vazquez, I., Fernandez Macias, E., Wright, S., Villani, D., 2025.

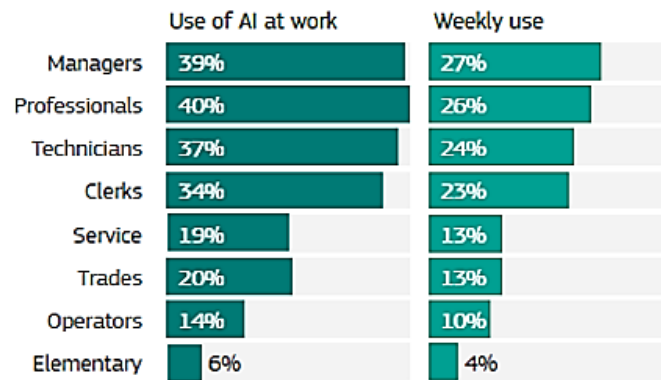
The most widespread form of algorithmic management is the automatic allocation of working time, such as rosters or shifts, affecting approximately 24% of EU workers. This is followed by the automatic allocation of work tasks, reported by around 21% of employees. These two practices represent the dominant modes through which algorithmic systems structure everyday work processes in European organizations. Other forms of algorithmic management are less prevalent. Automated systems of reward, including the assignment of points, prizes, or ratings, affect around 13% of workers, while automated benchmarking practices, such as performance rankings displayed in digital dashboards, are reported by 12%. Approximately 10% of employees receive automated instructions guiding the execution of their work tasks. More intensive and controlling practices are comparatively rare at the EU level. Automatic cancellation of shifts affects about 7% of workers, automatic determination of work speed 5%, and the use of online customer ratings only 4%. Although currently less widespread, these practices represent forms of algorithmic control with potentially strong implications for perceived autonomy, predictability, and emotional strain in the workplace.

Beyond these aggregate patterns, the data reveal substantial cross-national variation in the prevalence of algorithmic management. Higher levels of exposure are observed in countries such as Spain, Poland, Ireland, and Romania, where multiple forms of algorithmic management exceed the EU average. In contrast, lower prevalence is reported in countries including Greece, Bulgaria, Hungary, and the Netherlands. These differences illustrate the contextual embeddedness of algorithmic management and suggest that the same forms of technology may produce different levels of organizational brittleness and employee anxiety depending on the national and institutional environment.

Overall, these results indicate that algorithmic management in the EU is primarily concentrated in scheduling and task allocation functions, while more intensive forms of automated control remain less common. From the perspective of the BANI framework, widespread allocation of working time and tasks can contribute to brittleness by creating rigid structures, and increase worker anxiety through reduced discretion and predictability. These patterns directly inform RQ1 and support H1, indicating that higher exposure to algorithmic management is associated with potential vulnerabilities in employee well-being and organizational stability.

## 4.2. Adoption of AI Tools by Occupation

Figure 2 presents the use of AI-powered tools at work across eight occupational groups in the EU, based on AIM-WORK survey data. On average, roughly one-third of EU workers (29.9%) reported using an AI tool at least once in the past 12 months. This indicates a substantial uptake of AI in workplace tasks, despite the recent availability of many of these technologies.



**Figure 2.** Adoption of AI Tools at Work by Occupation in the EU.

Source: Gonzalez Vazquez, I., Fernandez Macias, E., Wright, S., Villani, D., 2025.

Usage differs markedly by occupation. White-collar occupations—including managers, professionals, technicians, and clerks—show the highest levels of AI adoption, with more than one-third of workers in each group reporting use. In contrast, adoption is considerably lower among service, trades, and operator roles, affecting fewer than one-fifth of employees. Elementary occupations exhibit the lowest usage, with only 6% of workers reporting any engagement with AI tools. Frequency of use is also notable: approximately 20% of EU workers report using AI tools at least weekly in the course of their main job. Employees use AI tools for multiple purposes, most commonly writing and translation, with an average of three purposes per worker.

These occupation-specific patterns align with broader national-level variation observed in the EU. Countries such as Denmark, Belgium, the Netherlands, Finland, and Austria report AI adoption above or close to 40%, whereas Bulgaria, Romania, and Greece show lower adoption rates, below 20%. Overall, most EU Member States exhibit prevalence levels around or above the EU average, indicating widespread, though uneven, integration of AI tools across occupations and countries.

These disparities in AI adoption have important implications from the perspective of BANI. Lower exposure to AI tools among service, trades, operator, and elementary occupations may contribute to incomprehensibility and heightened anxiety, as employees have less opportunity to engage with or understand the systems shaping their work. Conversely, higher adoption in white-collar roles may reinforce efficiency but also introduce brittleness by centralizing decision-making around algorithmic systems. Thus, these results provide empirical support for RQ1 and H1, highlighting how uneven integration of AI and algorithmic tools contributes to

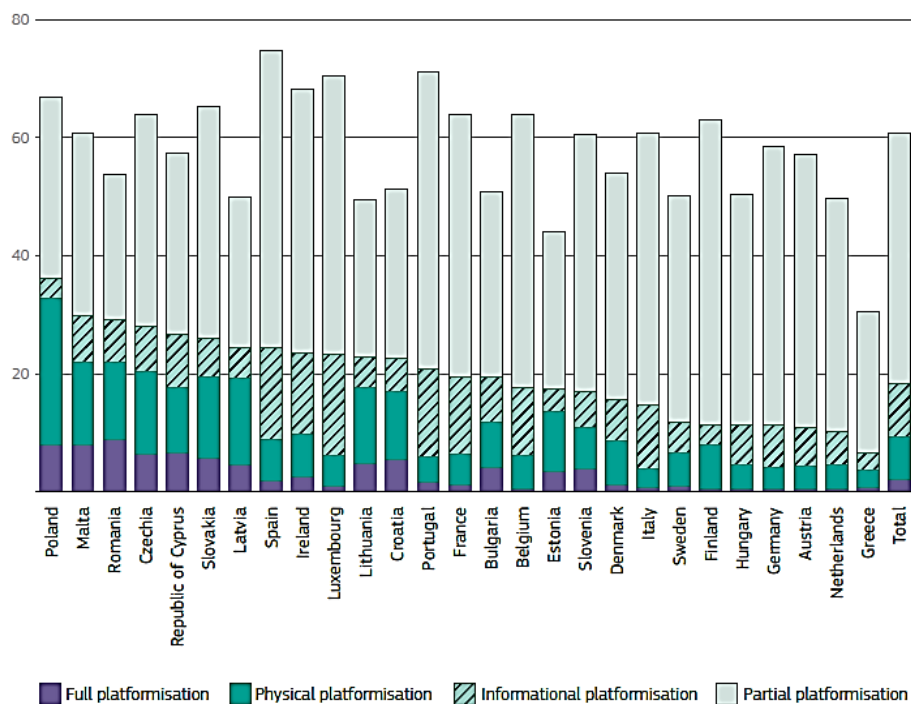
vulnerability patterns identified in the BANI framework. Moreover, they set the stage for examining broader patterns of platformisation, where multiple forms of algorithmic management combine to shape work organization across sectors and countries.

### 4.3. Platformisation Typology

Algorithmic management in European workplaces manifests in diverse configurations, which can be described along a six-level typology. At one end are workers not exposed to digital tools, followed by those who use digital tools but are not subject to algorithmic management or monitoring. The remaining four levels represent increasing exposure to platformisation: partial platformisation, where workers experience some combination of monitoring and algorithmic management; informational platformisation, combining activity monitoring with algorithmic evaluation; physical platformisation, involving physical monitoring alongside algorithmic direction; and full platformisation, in which employees are simultaneously exposed to all forms of monitoring and algorithmic management.

In the EU-27, 6% of workers are not exposed to digital tools, 33% use digital tools without algorithmic management, 42% fall under partial platformisation, 9% experience informational platformisation, 7% are subject to physical platformisation, and 2% are fully platformised.

Figure 3 presents the prevalence of platformisation of work by country, focusing on the four categories representing active exposure to algorithmic management: partial, informational, physical, and full platformisation. Workers without digital tools or using only digital tools without algorithmic management are not shown in the figure.



**Figure 3.** Prevalence of platformisation of work by country.

Source: Gonzalez Vazquez, I., Fernandez Macias, E., Wright, S., Villani, D., 2025.

Platformisation is particularly high in most Central and Eastern European Member States, with many countries showing percentages of workers in full platformisation between 5% and 10%, and in physical platformisation often above 10% (Poland exceeding 20%). In contrast, Continental and Northern European countries generally show low levels of active platformisation. Southern-Western Member States such as Spain, Portugal, France, Belgium, and Ireland display intermediate levels; however, in these countries, the higher overall platformisation is largely due to informational platformisation, which is considered less intrusive, while fully or physically platformised work remains relatively low. Partial platformisation does not follow a clear geographic pattern.

These patterns illustrate the diverse ways algorithmic and digital control is implemented across Europe, with full and physical platformisation being associated with higher stress levels and reduced autonomy. Overall, the prevalence and configuration of platformisation highlight how algorithmic systems contribute to nonlinear work experiences, reinforcing organizational brittleness and incomprehensibility, central to RQ1 and H1.

#### **4.4. Cross-national and Sectoral Variations and Conceptual Implications**

Complementary evidence from the OECD (2025) highlights substantial cross-national and sectoral variation in the adoption, design, and governance of algorithmic management systems. Across surveyed countries, firms report differing degrees of reliance on algorithmic tools for task allocation, performance monitoring, and decision support, as well as marked differences in how these systems affect employee autonomy, clarity of responsibility, and managerial satisfaction. These findings underscore the importance of contextual factors—such as institutional frameworks, sectoral characteristics, and organizational maturity—in shaping the outcomes of algorithmic management. Importantly, OECD data reveal that the effects of algorithmic management are closely linked to the presence or absence of governance mechanisms. Organizations that deploy algorithmic systems with limited transparency or minimal human oversight report higher levels of uncertainty regarding accountability, decision logic, and employee reactions. Such configurations are associated with heightened organizational anxiety and incomprehensibility, particularly in environments characterised by rapid change and complex decision-making, reflecting key dimensions of the BANI framework.

Conversely, firms that implement responsible algorithmic management practices—including human-in-the-loop (HITL) arrangements, transparency-by-design, explainability mechanisms, and formal oversight policies—report more positive outcomes. These organizations exhibit higher levels of employee trust, stronger perceptions of procedural fairness, and greater adaptive capacity in responding to unexpected events. From a BANI perspective, these governance features function as stabilising mechanisms: they reduce anxiety by clarifying expectations and decision rationales, mitigate incomprehensibility by making algorithmic processes more interpretable, and enhance resilience by preserving human judgement in non-linear or ambiguous situations. These findings provide empirical support for

RQ2 and H2, demonstrating that specific design features of algorithmic management systems play a critical role in mitigating BANI-related vulnerabilities. They also speak directly to RQ3 and H3, as responsible governance arrangements enable leaders to leverage algorithmic efficiency while maintaining relational coordination, empathy, and contextual sensitivity. Rather than replacing leadership, algorithmic systems governed in this way appear to reconfigure leadership roles toward interpretation, mediation, and sense-making—capabilities that are particularly vital in brittle and anxiety-prone organizational environments (OECD, 2025).

#### **4.5. Interpretative Insights in the Context of BANI**

The empirical evidence points to several patterns consistent with the BANI framework. The high prevalence of algorithmic management and platformization contributes to fragility by creating rigid, centralized decision-making structures. The uneven implementation of AI tools across professions contributes to misunderstandings and perceived inequalities. Scenarios of full and partial platformization illustrate nonlinear work experiences, where employees face varying levels of control and oversight, often difficult to predict. A conceptual analysis of governance mechanisms highlights the importance of transparency, integration of HITL, and oversight in reducing anxiety and misunderstandings and promoting adaptive, human-centered leadership.

The empirical evidence presented in this section reveals several patterns that closely align with the BANI framework and directly address the study's research questions. The widespread adoption of algorithmic management practices, particularly in scheduling and task allocation, contributes to organizational fragility by reinforcing rigid, centralized decision-making structures that are susceptible to disruption. The uneven implementation of AI tools across professions further contributes to misunderstandings and perceived inequalities, as workers experience significantly different levels of exposure, understanding, and control over algorithmic systems.

Patterns of full and partial platformization illustrate a distinct nonlinearity in work experiences, where workers encounter variable and often unpredictable combinations of algorithmic allocation, evaluation, and monitoring. These configurations generate feedback loops and disproportionate impacts on work intensity, autonomy, and supervision that are difficult to predict for both workers and managers. Finally, evidence on governance mechanisms suggests that transparency, human integration, and formal oversight play a crucial role in reducing anxiety and misunderstandings while fostering more adaptive and human-centered leadership practices in algorithmic workplaces.

## 5. Discussion

The results of this study illuminate the dual nature of algorithmic management (AM) in contemporary European workplaces, providing empirical evidence that complements existing conceptual and qualitative research. On one hand, algorithmic systems enable enhanced operational efficiency, predictive power, and workflow optimization, as shown by the prevalence of algorithmic time allocation, AI adoption, and platformization typologies observed in the AIM-WORK survey and OECD data (De Cuyper et al., 2025; Gonzalez Vazquez et al., 2025; OECD, 2025). On the other hand, these same systems generate BANI-related vulnerabilities, including organizational brittleness, heightened employee anxiety, and incomprehensibility of decision processes. The empirical patterns align with the literature, confirming that algorithmic autonomy, opacity, and rigidity are associated with increased fragility and reduced human interpretive capacity (Möhlmann et al., 2021; Parent-Rocheleau, Parker, 2022; Zayid et al., 2024).

The findings reveal that different configurations of algorithmic management produce varying levels of risk. Workplaces characterized by fully automated task allocation and opaque evaluation systems tend to concentrate stress and anxiety among employees, particularly in sectors and countries where oversight and human involvement are limited. Conversely, workplaces that integrate human-in-the-loop mechanisms, transparency-by-design, and explainable AI features show potential to mitigate these risks, enhancing trust, perceived fairness, and adaptive capacity (Benlian, 2022; Glikson, Woolley, 2021; OECD, 2025). These observations support H2, suggesting that design choices in algorithmic systems are critical in determining whether AM contributes to resilience or exacerbates BANI vulnerabilities.

Sectoral and occupational variations also emerge as significant. Highly skilled and white-collar employees exhibit greater exposure to AI tools and algorithmic evaluation, yet they also benefit more from interpretive and decision-making flexibility, while semi-skilled and elementary occupations face reduced agency and higher vulnerability to anxiety and incomprehensibility (Gonzalez Vazquez et al., 2025; Fernández-Macias et al., 2025; Kinowska et al., 2023). These findings underscore the nonlinearity of algorithmic impacts across hierarchical and educational strata, illustrating how AM can simultaneously empower and constrain employees in ways that are context-dependent.

Importantly, the results suggest that responsible algorithmic management (RAM) practices are central to reconciling efficiency with human-centric leadership. The integration of HITL checkpoints, participatory design, and transparent audit mechanisms enables leaders to leverage algorithmic insights without compromising relational and ethical judgment, supporting adaptive and empathetic decision-making (OECD, 2025; Europarl, 2025; Benlian, 2022; Papagiannidis, 2025). In this sense, algorithmic systems, when coupled with RAM,

can transform potential sources of brittleness and anxiety into instruments of organizational adaptability and resilience.

Several limitations should be acknowledged. The study relies on secondary, cross-sectional datasets (AIM-WORK and OECD), which limits causal inference. Occupational and national differences are only partly captured, as cultural and regulatory contexts may shape the effects of algorithmic management. Leadership and employee well-being are measured indirectly through organizational indicators rather than direct assessments. In addition, some evidence on HITL and transparency practices is case-based, and rapid developments in AI may outpace the existing literature. Despite these limitations, the study provides a solid foundation for analyzing the dual effects of algorithmic management on efficiency and human-centric leadership.

These limitations also point to opportunities for future research. Building on this, studies could track employee experiences, leadership practices, and organizational resilience in workplaces affected by algorithmic management, combining quantitative surveys with qualitative interviews to capture both measurable outcomes (e.g., employee anxiety, autonomy) and contextual insights into leadership behaviors. A possible research project might involve a cross-national panel of organizations implementing varying configurations of HITL, transparency, and algorithmic autonomy, allowing for causal analysis of how responsible algorithmic management shapes adaptive, human-centric leadership. Such research would directly address the gaps highlighted in our review and secondary data analysis, providing stronger empirical foundations for understanding the interplay between algorithmic efficiency and human-centered organizational practices.

## 6. Conclusion

This study demonstrates that algorithmic management embodies a paradox in organizational contexts affected by BANI. While algorithmic management increases operational efficiency and enables rapid, data-driven decision-making, it also carries the potential to generate fragility, employee anxiety, and misunderstanding if systems are too opaque or rigid. Empirical evidence from the AIM-WORK study and OECD analyses confirms these dual effects across professions, sectors, and European countries, supporting the conceptual arguments presented in the literature.

The findings highlight the crucial role of responsible algorithmic management in mitigating these risks. Practices such as transparency in design, explainable AI, HITL integration, participatory design, and adaptive leadership enable organizations to leverage algorithmic efficiency while maintaining human agency, trust, and relational coordination. RAM emerges as a key path to transforming algorithmic systems from potential sources of fragility into tools for resilience and adaptive advantage.

From a theoretical perspective, this research expands our understanding of the BANI paradox in contemporary workplaces by linking algorithmic configurations to specific vulnerabilities and identifying design features that mitigate these effects. In practice, the study provides practical guidance for managers and policymakers, emphasizing the need for algorithmic transparency, meaningful human oversight, and leadership development aligned with empathy, adaptability, and ethical decision-making.

Overall, by integrating algorithmic efficiency with human-centered management, organizations can navigate the challenges of the BANI world, achieving both technological optimization and sustainable employee well-being.

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