Jan 17th, 12:00 AM

People Analytics and the Promise of the Good Life—A Critical Transformative Perspective

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People Analytics and the Promise of the Good Life—A Critical Transformative Perspective

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Abstract. Technologies such as people analytics software pose a potential threat towards the (information) privacy of employees and can reinforce existing social injustice. Therefore, it is crucial to design, develop, and deploy the systems with the well-being of employees in mind and to educate users about the harmful impact these tools can have on their personal and professional lives. Yet, the underlying assumptions of these tools are oftentimes hardly questioned. Especially in light of the ongoing public debate on remote work, with politicians discussing a new 'right to work from home', people analytics could become a key technology to facilitate more flexible work, and thereby shaping the future workplace. We establish a critical transformative perspective to outline and evaluate the potential benefits and risks of people analytics for remote workers. Subsequently, we provide a set of transformative actions for practice and IS research.

Keywords: People Analytics, Critical Research, Remote Wortk, Ethical AI

1 Introduction

With employees worldwide having ambiguous thoughts about a possible return to their *life-as-it-was-before-COVID-19* business routines, employers will be the ones ultimately in charge of deciding whether or not to stay remote [1–3]. Many employees are articulating their desire to stay at home—at least for a few days a week [1]. Meanwhile, a growing number of employers have begun to appreciate the benefits remote work holds for their businesses, such as spending less money on properties or rent [4]. Companies like Twitter or the Washington Post announced that they will allow employees to work remotely even after the end of the pandemic [5]. Against this backdrop, politicians in Germany are currently discussing 'a right to work from home', whilst in the UK the already existing law might even become more elaborated [6, 7]. With numerous employees currently working from their homes but not necessarily working remotely in a jurisdictional sense, remote work in the context of this paper also includes employees doing mobile work from within their homes or any other place that is not an office space.

However, this trend towards more remote work goes hand in hand with a number of second-order effects [2]. Increasing amounts of data generated by employees (e.g., Zoom calls or Microsoft Teams chats) are leveraged to build data representations of them and analyzed to improve employee decisions. The new data generated during COVID-19 will very likely shape organizational practices and policies in the years to come [2]. Methods and tools for analyzing this data (automatically) are frequently subsumed by the umbrella term people analytics (PA). PA is defined as the use of descriptive and predictive analytics to generate 'actionable insights' into an organization's workforce and thereby optimize decision-making, performance and employee experience [8].

On the one hand, PA plays a crucial role in enabling the supervision and management of dispersed teams. Shaken by the threat of the COVID-19 pandemic, many companies jumped to new tools and systems that allowed them to lead (and control) teams at a distance [9, 10]. On the other hand, employees too looked for quick ways to adapt to the new situation and improve their self-organization. In this context, PA was frequently portrayed as a quick fix for both employees and employers during the ongoing COVID-19 pandemic situation. PA promises to enable team leaders and employers to get insights into the productivity of their teams, even over long distances, and thus allegedly helping them perform their tasks as supervisors [9, 11]. However, beyond the organizational enabling character, the COVID-19 pandemic has given rise to PA tools that are considered as sheer surveillance software or 'bossware,' raising both labor law-related and ethical questions [12]. Some of these tools (e.g., Hubstaff, InterGuard) even go as far as recording and analyzing keystrokes and mouse movements, taking regular screenshots, or accessing camera and microphone [12, 13]. The tools are also able to perpetuate social injustice such as discrimination of marginalized groups [14].

Though reliable numbers on the exact adoption rate are rare, the incorporation of PA features into widespread applications like Microsoft 365 indicates their growing relevance. The majority of PA tools are coming from and are designed for the US-American market (e.g., Microsoft Workplace Analytics, Workday, Officevibe). Regulation for German companies, for instance, operating within the scope of the General Data Protection Regulation (GDPR) [15] and the Works Council Constitution Act [16] restricts some PA functionalities such as performance monitoring. Nevertheless, the trend towards using PA applications also continues growing in Germany [17]. Yet, the vast amount of PA-related literature takes a global or US-American perspective [2, 14, 18]. Literature focusing on the diverse implications for European markets such as Germany is scarce. In particular, the context of PA in remote work scenarios urgently requires scholarly attention. Against this backdrop, by re-evaluating PA in light of the disruptive changes in the workplace brought about by the COVID-19 pandemic, we see a need for a better understanding of PA's risks and benefits. Falling back on the work of Giermindl et al. [14], there exist major risks for employees in the context of remote work. Despite the perils, PA has the potential to catalyze new forms of work, especially by its capability to enable remote (self)leadership. However, there is a research gap regarding both the risks and the ethical aspects of PA, especially in the context of remote work [12, 14, 19].

We summarize our research endeavor articulating the research question: *What transformative actions are required to achieve a PA practice that is in the interest of employees?*

Following Alvesson and Deetz [20], Cecez-Kecmanovic [21], and Myers and Klein [22], we approach this research question by taking a critical research perspective, which consists of three subsequent steps: 1) generating insights, 2) articulating critique, and 3) proposing a transformative redefinition [23]. In the context of Information Systems (IS), critical research evaluates a wide range of social issues regarding the use of information technologies and its consequences, including but not limited to 'freedom, power, social control, and values' [24]. As deploying PA raises concerns towards all of those social issues, applying a critical research approach appears suitable to disentangle and elaborate those concerns. Doing so, we derive a set of transformative actions for the European, especially German, context.

The contribution of the paper is threefold: First, it contributes theoretically by providing a thorough theoretical evaluation of PA in the context of remote work, revealing benefits and risks. Second, it provides a practical contribution by raising awareness regarding the potentially critical use of PA—beyond a scientific perspective. Third, a transformative contribution is provided by identifying a set of actions needed to achieve an employee-centered use of PA. The remainder of this paper is structured as follows. In the next section, we provide the theoretical foundation on critical research and related work investigating PA. We deduce why it is important to discuss the use of PA software in remote work settings critically. It is based on a comprehensive body of literature stemming from IS as well as the social sciences and ethics, which was identified by performing a hermeneutic literature search. We identified relevant literature following the methodological guidelines for hermeneutic literature reviews provided by Boell and Cecez-Kecmanovic [25]. Next, section three describes our findings of analyzing the context of PA in remote work through the lens of critical research. By expounding the concepts, benefits, and risks underlying PA application in the changing context of remote work environments, we provide an informed foundation to adopt a critical perspective [21]. In section four, we derive five transformative actions needed to achieve a PA practice that is in the interest of remote working employees: low-threshold education, diversity, participation & empowerment, transparency, and regulation. We conclude our work with remarks on the limitations and notes on the importance of further research towards both the digital components of remote work as well as on the necessity to develop a novel ethical or critical discourse.

2 Theoretical Foundations and Related Work

2.1 Critical Research

At the heart of critical research are questions of ethics and morality, aiming for emancipation and societal improvements [24]. In the remainder of this paper, the terms 'ethics' and 'morality' are used in a tradition following Kant, using morality as referring to given and accepted norms and ethics subsequently providing a theoretical framework for them [26] . Critical research, based on normative values, therefore, differs from other theory-driven IS approaches. It argues that one certain way of

deploying a technology "[...] is better than another in a moral or ethical sense" [24]. The goal of critical IS researchers is an ongoing questioning of the development and use of information technology that is controlled by an interest group pursuing profit maximization [27]. Although originating from foundations established by classical philosophers such as Aristotle or Plato [28, 29], early modern philosopher Machiavelli [30] as well as enlightenment period philosophers Locke and Hobbes [29], critical research in IS today is closely linked to the work of Foucault [31] and, consequently, to the philosophers of the Frankfurt School (e.g., Adorno, Marcuse, Horkheimer), especially Habermas and Critical Social Theory [27, 31, 32]. A major focus of Foucault's work are power relations, which play a prominent role in the discussion of a right to work from home and the deployment of PA technologies. Critical research in IS reveals how information technology is embedded in organizations, how it contributes to empowerment or oppression of peoples [31] and develops an understanding of the experiences and positions of the people affected by the system [27]. Therefore, its purpose includes, for example, generating knowledge to catalyze change, helping emancipate and giving a voice to marginalized groups and actively shaping IS practice [27]. Highly established methods in critical (IS) research are, but not limited to, case studies, ethnographic field work and conceptual studies [22]. Those methods have in common that their focus is set on understanding the possible negative social impacts of a certain technology. Distinctive about the critical method is especially the mindset of the researchers who deploy the method. Critical researchers are seeking to find evidence to support their already existing beliefs [27, 31, 33, 34]. Reviewing IS critical research literature, Falconer states that it can serve as a tool to bring about valid and vital critique of IS research and guide it towards serving society [35]. Recent IS literature in PA-related contexts employs critical research to investigate algorithmic decision-making and management. Young, Zhou, and Venkatesh, for instance, review literature on emancipation research—a key concept in critical research [36]. They emphasize emancipation research's usefulness for developing adaptive algorithms to compose work teams and assign tasks to its members [36]—a common PA use case. Similarly, they emphasize the literature stream on "IS use for domination of workers through surveillance-enforced punishment systems and other forms of computer-mediated control" [36]. Cecez-Kecmanovic, Marjanovic, and Vidgen investigate harmful social effects of automated algorithmic decision-making through a critical research lens [21].

To summarize, even though critical research has deep historical roots, it is evident that it is still applied to approach contemporary issues. Therefore, it appears relevant and necessary to deploy critical research to point out possibly harmful PA practices in remote work environments. As Cecez-Kecmanovic and colleagues put it, "[c]reating knowledge as a catalyst for change" [21] is vital, so users of technologies such as PA can make informed decisions and, ultimately, "IS researchers are uniquely positioned to inform these decisions—the making of these futures—through research and commentary" [37].

2.2 People Analytics

The trend towards data-driven people management has dominated the field of human resources (HR) for many years [38]. PA tools use employees' behavioral data and combine it with external data to improve, for instance, managerial decision-making and performance [19]. While these management approaches were previously prevalent in the gig economy, often termed algorithmic management, they have recently extended to the realm of traditional organizations [39]. During the COVID-19 pandemic, the debate around PA tool usage gained momentum, as it supports supervising and managing employees even at a distance. Furthermore, while collaborating digitally, employees generate increasing amounts of behavioral data, ready to be analyzed by PA tools [2]. PA tools increasingly incorporate features leveraging sophisticated statistical models (frequently referred to as machine learning or artificial intelligence). The term artificial intelligence (AI) refers to a set of technologies that adaptively interpret large amounts of data to solve complex problems, identify patterns or make predictions, thereby performing human-like cognitive tasks [40].At its core, PA is a continuation of a long history of management tradition that places increasing value on quantifying, measuring, and ranking performance [41]. However, treating employees as quantified data rather than cultural beings contrasts humanistic approaches to management [42]. By automatically analyzing various metrics (e.g., time spent on particular tasks, frequency of communication with specific colleagues, CV content), PA is used in a wide range of HR practices, such as hiring decisions, performance management, and retention [39]. Current studies on PA come primarily from the management discipline—especially human resources—but the field of computer science is also increasingly concerned with it. As the research on PA is currently primarily conceptual, and the few empirical studies frequently illustrate anecdotal evidence [14, 43], Tursunbayeva et al. [12] emphasize the need for primary PA research. The current state of literature shows a clear optimistic, business- and technocentric tendency hailing it for its data-driven objectiveness and efficiency [44]. It is evident that studies investigating the downsides and unintended consequences of PA still remain rare [12, 14, 19]. This comes as a surprise, considering the major challenges of using data science in HR processes due to their complexity, ethical and legal concerns, and their high-risk social implications [14, 45]. While formal research on ethical considerations remains rare, some grey literature points out ethical issues towards HR practitioners [12]. In their scoping review, Tursunbayeva and colleagues [8] pointed out that the majority of publications on PA and ethics are not empirical studies but rather discussion papers, technical descriptions, or blog posts, often written by industry sources.

Compared to literature on people analytics, research on remote work contexts has a long history and is widely established. In particular, organizational and management studies, computer science, communication, but also industrial and organizational psychology have discussed this topic [46]. Most studies on remote work are in the management disciplines of human resource management and management of technology and deal with personnel and technological issues [47]. Existing research elaborately discusses the opportunities and risks of remote work for both employees and employers [46–48], portraying remote work as a highly ambivalent topic [49, 50]. While some researchers emphasize the autonomy and flexibility it grants employees [51], a dominant theme in literature is surveillance and control [52, 53]. Especially the

metaphor of Foucault's panoptic control is widely used for remote work in organizational and management studies [54]. In regard to technology, current research on remote work is primarily concerned with visibility and communication technology [52, 55, 56], while research on automated data analytics remains underrepresented. Meanwhile, the COVID-19 pandemic, perceived as "the ultimate work-from-home experiment" [48], thereby propelling a new paradigm of work that differs significantly from the hierarchical top-down approach of traditional management [37, 50]. In summary, researchers call for in-depth research on the risks of PA [14], which critically evaluates the assumed affordances of PA [42], as well as on PA's ethical aspects [12, 19]. Furthermore, this topic requires further investigation in light of recently increased remote work [2]. Our research endeavour seeks to fill of this existing research gap.

3 Critical Transformative Assessment

As the deployment of people analytics technologies in remote work contexts increases, it appears all the more urgent to thoroughly evaluate their benefits and risks in a critical manner. In the following section, we will therefore discuss the implications of PA for employees, both in traditional office-based settings and working from home. The literature was derived by using a hermeneutic approach for conducting literature searches [25], which is more in line with the philosophical roots of the critical research approach as opposed to the systematic literature review [21, 57]. The deployed hermeneutic approach is centered on engaging with literature and discourse on PA as a technical system as well as algorithmic biases and remote work. In line with the critical research goal to gain insight [23], we will explicitly address moral and ethical challenges. As this assessment will enable us to offer critique and subsequently derive specific transformative actions, this stage is a "critical transformative assessment".

3.1 Benefits of PA

Advertising promises and discourse around PA have led to high expectations of the capabilities of these systems [58]. Especially the abrupt switch to remote work caused by the COVID-19 pandemic has made PA seem like a quick fix to some employers to ensure business continuity and regain control over their workforce. For employees, however, PA systems are highly ambivalent. On the one hand, they can enable surveillance and monitoring. On the other hand, the monitoring can also be used for predicting burn-out risks by analyzing emails [59] or evaluating stress levels by analyzing mouse movement data [60]. The benefits could be particularly helpful for employees working from home, as their signals of overwork are often overheard [55].

More generally, PA aims to improve the quality of decisions by using objective metrics across all employees [61]. This may be particularly relevant for remote workers who compete with onsite workers for promotions and rewards while suffering disadvantages of less physical visibility [62]. Similarly, women and members of other marginalized groups could benefit from objective ratings.

When advertised to remote workers, the potential of PA to offer individualized and personalized feedback to individual employees is often emphasized. The need to self-organize is often cited as a major challenge of remote work, where much of the

responsibility is transferred from employer to employee [49]. The principal value proposition of PA is thus to improve the performance of individuals and the company. However, the potential of efficiency gains not only applies to employees. HR and line managers also benefit from PA systems that take over some of their traditional tasks, like selecting or evaluating the performance of employees. Meanwhile, the systems are capable of processing much larger amounts of data than human managers ever could.

In light of these benefits, PA technologies may become a key enabling factor of remote work, thereby promising "the good life" of flexible and autonomous work at the expense of sharing vast amounts of data with the employer.

3.2 Risks of PA

To realize the potential benefits of PA for remote workers, a thorough evaluation of risks and ethical challenges is crucial. In practice, however, many organizations are already using or actively planning to use PA, thereby exposing their workforce to various risks, ranging from privacy and autonomy to well-being [18]. Compared to middle and front-line managers, top managers are often overly optimistic about PA usage [39]. In this context, underlying assumptions of PA too often remain unquestioned and can lead to unintended consequences. Regarding management, employing PA assumes that 1) managing people is a rational process, 2) more data leads to better decisions, 3) more efficient and consistent people decisions (through algorithms) are desirable [42]. Three further assumptions that are more related to the technology are that 1) algorithmic decisions are superior and more reliable than human decisions, 2) analyzing historical data can predict human behavior, 3) human workers can be optimized just like machines[14]. Deriving from these underlying assumptions, Giermindl et al. [14] identify specific PA's perils, which we discuss next in the context of remote work.

Myths of control. Quantifying and measuring human behavior can lead to an illusion of control in a world that is, in fact, unmanageable [41]. Or, as Power [41] puts it, an attempt to "produc[e] quantity from quality for invented accuracy." This datafication of humans can lead to severe ontological harm [21]. Ontological harm becomes prevalent when a certain group is represented in a certain way within the data used to train the underlying algorithm of a PA system. The decisions made by the system then continue to determine the possibilities of *becoming* for the individual. This already causes a notable and much discussed discrimination of groups, for example in the context of crime-predicting software in the USA [63–65]. These risks can be exacerbated, particularly in fully remote work environments, where personal contact between employees and managers is absent.

Self-fulfilling prophecies. Jarrahi et al. [39] describe the tendency to blindly follow recommendations of PA "cognitive complacency" (as compared to algorithm aversion). This is fueled by high workloads and time constraints [39]. During the COVID-19 pandemic, many organizations had to make the switch to remote work quickly and abruptly, which also required a quick fix to manage their remote workforce, thereby potentially not approaching algorithmic decisions with an appropriate critical attitude.

Path dependencies. Reducing employees and their individual behavior to numbers, especially while analyzing historical data, can restrain diversity [12]. Processes are path dependent when the order of how events are happening is affecting the way further

events are going to happen [66]. In the PA context, this could for example mean that a company that always hired preferably a certain group of people might even hire less diverse people with the support of a PA system. PA tools threaten to inherit and operationalize biases and inequalities pre-existing in the organization [12]. Being exposed to these risks creates a "bias burden" [67] for employees.

Reduced transparency and responsibility. Employing PA systems, especially those that include black-box machine learning features, are difficult to understand by employees, their representatives, and even employers that buy them. If how the systems arrive at their decision is not transparent, it also reduces the potential to track responsibility for decisions. This also places a mental burden on employees, who have to make a substantial effort to understand how the systems work [67]. In remote work environments, employees receive less support by, for instance, work representatives to identify and take action against these issues.

Reduced autonomy and human reasoning. Gal and Stein [19] adopted a virtue ethics approach based on Aristotelian views on ethics. They argue that the use of PA "can create a vicious cycle of ethical challenges," namely algorithmic opacity, datafication, and nudging. Thereby, they "limit people's ability to cultivate their virtue and flourish." The systems shape the behavior of employees and managers, for instance, through nudges, thereby inhibiting their autonomy [12]. These nudges are especially relevant in the context of self-organization features frequently advertised in the context of remote work.

The risks are further intensified by the declining influence of trade unions [12] and the fact that the decision on what is ethical and acceptable is often left to HR or IS practitioners, or even vendors of the systems, rather than experts specialized in behavior and ethics [68]. Therefore, aside from data skills, algorithmic competencies also need to include critical thinking, that is, equipping employees to question and challenge the decisions of PA systems [39]. Compliance with ethical guidelines is a key success factor for PA projects, further emphasizing the topic's relevance for employers [12].

4 Transformative Actions

In this section, we derive five key questions (KQ) to address the formerly identified risks emanating from the use of PA. These key questions address both the deployment of PA in the remote work context and in the regular office-based setting and are derived with existing EU regulations, especially German law, in mind. Our five key questions lead to a set of transformative actions (TA) that will help to shape an inclusive, non-discriminatory, and employee-centric PA usage. Beyond, each transformative action is a specific call for action for IS research. However, they should not be considered final answers for the key questions; they rather constitute indications for how the IS community should or might respond to the increasing use of PA. Some of the KQ and the TA are closely intertwined and reciprocal. Depending on the perspective, multiple approaches to answer the key questions are conceivable. Harm, for instance, in the form of discriminatory actions, may be tackled from a mere technological angle (e.g., by establishing more accurate algorithms) [21]. Within other ontological approaches, the technological components and the possibilities to solve algorithmic harm by fixing the data are seen as mitigations to the problem–they do not constitute the problem in itself

[21, 69]. Algorithmic harm can reflect societal problems, as it mirrors problems such as gender inequality and discrimination based on income, education, or religious beliefs [70, 71]. Our proposed transformative actions aim at both those broader social issues and the technological execution of algorithmic harm. We elaborate the KQ and TA in the following, by putting them in "a wider cultural, economic and political context [23]."

KQ1 How can employees use PA in a beneficial manner?

TA1 Low-threshold Education A highly assertive TA is to educate people so they can assess the potential risks and benefits of a certain technology, in this case PA. This is currently not happening and the state of the available literature makes it a difficult task for employees to understand the full scope of automated personnel management. Recent studies show that public knowledge regarding AI and AI-based technologies is limited [72]. In Germany, companies are obliged to gain the workers' permission before collecting and analysing their data [56]. If employees do not understand what they (dis)agree to, this law falls short on reaching its full potential. However, education does not necessarily have to take the form of written texts. IS researchers in particular can support the process by creating low-threshold methods to support users ability to assess potentials. The discipline can draw on established methods and many years of experience, including the development of badges or dashboards. The development of chatbots to support workers with a low affinity towards technology, especially in the context of remote working, can also be driven by the IS community. Further, IS research could participate in the development of transparent design of applications that collect personal data and detecting design mechanisms of PA tools that are specifically trying to build trust in situations that demand skepticism of the user.

KQ2 How can AI-practitioners mitigate social injustice?

TA2 Diversity In general, the lack of research on inclusive and non-discriminating PA is striking. We attribute this circumstance to the overall lack of attention towards this topic beyond the scientific domain and the still-existing stereotypes within (information) technology-related fields. Statistical models within PA systems are regularly trained using publicly available or historical corporate data. This data is often inherently biased, with some groups and characteristics being overrepresented and other groups being virtually non-existent. Thereby, PA systems can inherently reflect and amplify existing historical inequalities [70]. Incorporating more diverse teams of programmers increases the chances that those historical inequalities will be detected before an algorithm is deployed to make decisions that affect human lives. "[...] [a]pproximating diversity and inclusion concepts within an algorithmic system can create outputs that are informed by the social context in which they occur" [70]. Consequentially, three major technological solutions should be considered and developed further by (IS) researchers: de-biasing [73, 74], algorithmic auditing [70, 75] and an enhanced process of data collection [76].

KQ3 How can we support the establishment of an employee-centred use of PA?

TA3 Participation & Empowerment In Germany, a recently established law actually makes the involvement of the workers' council mandatory in all matters concerning the digitalization of work as well as regulations about remote work in a company [16]. The fact that these councils are now forming even at large technology companies such as Google is an important step towards more participation on the PA developing side.

On the downside, there are frequent reports of large companies preventing and even punishing the process of establishing Empowerment means establishing a culture in which employees dare and have the courage to express their honest opinions freely. Thereby, empowerment constitutes a necessary basis for sustainable participation. Combining both empowerment and participation is imperative for companies to be able to develop a consensus on the use of PA. To foster empowerment even in dispersed teams, digital means of communication can be utilized. IS research should focus - especially now, in the light of the current disruption happening to the traditional workplace - on digital empowerment. There is already a stream of research focused on digital collaboration tools or enterprise social software (ESS). This should be complemented by studies focusing on the social implications of PA and the intertwinement of PA and ESS. For example, how does it affect employees when they feel like they are constantly visible, even just by means of data-representation? Does the use of PA invade their privacy on a different level when they are at home vs at the office?

KQ4 How can a regulatory practice be enabled by means of technology?

TA4 Transparency It is paramount that employees are able to understand what data is being collected from them and how it is being used. In addition, when PA is deployed, decision-makers must also be clear and aware of how these tools work. In this context, transparency also means being able to comprehend these critical areas in an open-source manner. "It is also acknowledged that PA is an emerging innovation with as-yet-unknown consequences, and organizations need to envision and mitigate potential risks as PA projects are happening. This need might be termed "anticipatory ethics" [13]. Transparency is also needed to enable both internal and external algorithmic audits, and a necessary antecedent for an appropriate regulation. Transparency, though, can also be achieved by clarifying the technical process or explaining the events that lead to a final decision. IS research could react to the current intransparency by developing checklists or guidelines that are accessible for employees.

KQ5 How can an employee-friendly use of PA be ensured?

TA5 Regulation. The European Commission recently proposed a regulation of AI. According to this proposal, AI applications are subject to strict regulation, so they do not pose risks towards the " [...] safety, livelihoods and rights of people." [77] The new legislation considered AI-technology used in the context of "employment, workers management or access to self-employment [...]", as high-risk applications. Those proposed rules are not yet in action, could one day become implemented in all member states of the European Union. At present, however, the states have to rely on existing laws. Nevertheless, the General Data Protection Regulation (GDPR) already serves as a strong regulation tool. Regulation is probably the most challenging TA, as it has as a prerequisite that both transparency (TA4) and education (TA1) have been implemented. Until a consensus on legislation at the EU level is reached, companies themselves have a responsibility to develop their own ethical guidelines both independently and participatory with the involvement of workers' councils and unions (TA3). Research is necessary to evaluate PA systems and ensure that regulations are made in the best interest of the employees, but also do not prevent technological progress. IS research with a longstanding experience in evaluating business systems and the human – machine – interaction should take up the topic of PA on a larger scale, as research on the matter still remains scarce.

5 Conclusion and Call for Action

Research on the risks of PA remains scarce, even though a number of authors recognized their occurrence and pointed out the research gap [12, 14, 19]. With the majority of existing research focusing on benefits of PA, our paper extends the current debate by directing scholarly attention at the underrepresented risks for employees. By adopting a critical transformative perspective on the findings from current literature, we were able to assess both the risks and benefits of PA through the lens of critical research. This resulted in the proposal of five Transformative Actions, which can be seen as guidelines to direct scholarly attention towards the matter. Society is no longer at the point where it can discuss whether or not PA will be used at the future workplace, society is already at the stage where we have to make policy decisions so that we might benefit from the application of the tools in the best possible way whilst diminishing the mitigations caused by the systems [14]. Discussions and scholarly debates must be directed towards an inclusive and beneficial PA practice that keeps the employee in mind. Within the TAs, some actions can and should be put into practice immediately. First, research should be directed towards establishing low-threshold educational materials as well as badges or certificates (TA1). This is a minimal effort solution for researchers in the field and would contribute tremendously towards a better PA practice. To enable workers' councils and unions that are already aware of the risks emanating from PA to participate (TA3) in the process of evaluating and lastly purchasing a PA tool for a company, TA1 is indispensable. Participation in the form of surveying their interests and concerns on PA can also be put into practice with low effort. In the current PA practice, employees are not always informed on which data is collected and how this data is processed. Transparency (TA4) in the form of giving employees insights into the mechanisms behind the data collections can and should be readily implemented. Diversity among decision-makers (TA2) in this context can be achieved by hiring more diverse staff. This is a process that should already be in action. Achieving unbiased and more diverse training data by deploying technological solutions such as de-biasing or algorithmic auditing should be supported by research from the IS community.

There are, however, some aspects of the TAs that cannot be implemented without further (IS) research. PA holds risks for the (information) privacy of employees, but we need more research specifically on those risks. We urgently need research on the question of whether PA is threatening the privacy of employees differently when they work from home compared to an office-based setting. Furthermore, the term 'ethical' is increasingly used when discussing PA. There is, however, no universal definition of what is meant by 'ethical.' IS research could benefit from establishing its own ethical theory to describe modern-day social implications of the use of IS.

The paper's theoretical contribution is based mainly on critical insights into the current state of PA. Within our ontological understanding, it is not necessarily the technology that causes harm towards employees. The harmful practice is based on the application of those technologies, mirroring biases that already exist within societies. The derived five transformative actions can help mitigate currently harmful PA

practices and enable an application of the systems in the interest of the employee. We also identified future research challenges that should be addressed within the IS community.

The paper's practical contributions emerge from drawing public awareness towards the risks of PA, enabling a broader understanding of the mechanisms behind the use of PA and deriving five transformative actions. This informs different actors to engage and follow our derived TA. These can be regarded as concrete recommendations for action for both decision-makers and employees. In addition, they are considered a reference for both current legislators for regulating the use of PA as well as for the development of compliance guidelines.

Our findings are subject to several limitations. First, this paper did not work with empirical data but instead took a retrospective to examine the existing literature body. Future research towards the topic is needed, especially interviews and surveys based on, for instance, critical social theory—as long as there is no critical theory that is inherently owned by the IS community [27, 78]. Second, the field of PA research is still relatively new, and future research is necessary. The described gaps of current research in this paper may serve as a helpful starting point.

In general, the idea of using algorithms in personnel management is oftentimes adapted out of a wish for more neutral and unbiased decision making. PA could support many important causes on behalf of workers. For example, PA software can not only record when employees are permanently working too much, this information is also recorded and can benefit the employees. Works councils can also benefit if negative behavior in terms of discrimination or non-compliance with the Working Time Protection Act is recorded by a system. Likewise, PA can help workers work more flexibly by enabling supervising teams even over a distance.

As we currently lack a thorough understanding of the (unintended) consequences of using PA, our proposed set of TA can be considered a guideline towards an employee-centric use of PA. Before this technology is further adopted by European companies, risks emanating from the use of it should be known and mitigated. Only when actions are taken to prevent the misuse of PA that would consequently put the rights of employees at risk, can the technology become an enabler for an inclusive and flexible approach to the future of work.

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