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Algorithmic Management and Employee Autonomy in Platform-Mediated Work

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Abstract

The fast implementation of digital tools and artificial intelligence has changed the way in which employees are managed and controlled in the workplace. As a result, the concept of algorithmic management has emerged in platform-mediated workplaces. Although algorithmic management helps with more efficient task assignments, monitoring, and decision making, it raises some issues related to employees' autonomy, transparency, and workplace control. This paper explores the connection between algorithmic management and employee autonomy by analyzing the effects of algorithmic fairness, trust, and human-centric management. The study is based on Job Demands-Resources Theory and Self-Determination Theory to provide explanations about technology-related control and its effects on the behaviour of employees. It has been found that the impact of algorithmic management on the employee's algorithmic fairness and trust is significant ($\beta = 0.72$, $p < 0.001$). Consequently, these factors affect employees' autonomy in a positive manner ($\beta = 0.68$, $p < 0.001$). Also, employees' autonomy is associated with job satisfaction ($\beta = 0.61$, $p < 0.001$) and work engagement ($\beta = 0.65$, $p < 0.001$). Therefore, an effective way to ensure that algorithms are accepted by employees while keeping workplace autonomy intact is making them transparent and understandable. In this research, the need for HRM practices that integrate both technology efficiency and the empowerment of employees has been emphasized.

Keywords: Algorithmic Management, Employee Autonomy, Platform-Mediated Work, Digital HRM, Algorithmic Fairness, Organizational Behaviour.

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Introduction

The fast development of information technologies has greatly changed the nature of work, organization, and worker management systems. Classical management systems of workplaces, which heavily relied on the human management system, are being replaced by those which are based on technology, data analytics, artificial intelligence, and algorithmic decision making. Among the new management technologies, algorithmic management has become especially popular as companies started to rely more and more on digital technologies to distribute work, monitor the performance, assess outcomes, and optimize the work of their employees. This tendency becomes especially prominent in the case of platform-mediated work (Kuhn & Maleki, 2017).

There are many industries where such kind of work has become popular – among the most common industries, one may note the transportation sector, food delivery, freelancing, online marketplaces, and professional digital services. Digital platforms allow employees to easily find a job, coordinate work with clients, etc. At the same time, there are some new ways of management control introduced in the context of platform-mediated work where algorithms play an influential role in work distribution, performance evaluation, scheduling, and incentives distribution (Tucker, 2020). In contrast to conventional management that relies on direct supervision, algorithmic management is based on automated and data-driven procedures, thus establishing a novel interaction between technology, organizations, and their employees.

While algorithmic management enhances efficiency and allows managing the dispersed workforce, it also raises some questions regarding the freedom of decision making and employees' autonomy. Employee autonomy is defined as the freedom of the individual to choose his/her approach to the job, timing of the work, and decision making, and plays a crucial role in motivation, satisfaction, and organizational commitment. The excessive use of algorithmic management could generate the feeling of surveillance, lack of independence, and lack of participation in decisions related to the workplace. Thus, the balance between algorithmic efficiency and autonomy of employees became the field for scientific research in the area of organizational behavior and human resource management.

Algorithmic management is a tool that can be useful and challenging for HRM at the same time. When developed transparently, such systems can help to conduct fair performance evaluation, personalize work allocation, and manage the workforce effectively. Lack of transparency, absence of human interaction, and automation could negatively affect the relationship of the employees and HRM specialists (McDonnell et al., 2021). As the organization integrates more and more artificial intelligence and digital platform technologies into their activities, HRM specialists need to develop the approaches to combine technology and human-centered management together.

Despite the studies of digital labour platforms, automation, and algorithmic control, there has been minimal consideration of the behavioural impact of algorithmic management with respect to its impact on employee autonomy in work environments where work is mediated through such platforms (Jarrahi et al., 2021). It is important to explore the impact that automated forms of control have on employees so as to ensure productivity without compromising their autonomy and well-being.

It is on this basis that this study explores the impact of algorithmic management on employee autonomy in platform-mediated work environments. This study intends to make an effort towards enriching the literature in the field of organizational behavior and HRM by looking into the influence of algorithmic management on employees' experiences and behaviors. Furthermore, it demonstrates the need for an ethical and transparent way of working to deploy algorithmic systems at the modern workplace.

Research Objectives

- To study the effects of algorithmic management processes on autonomy of employees in platform-based work settings.
- To evaluate how monitoring, assessment and decision making through algorithms impact employee experiences at the workplace.
- To suggest HRM strategies to strike a balance between algorithm efficiency and employee autonomy.
- This paper is organized as follows: Section 2 provides the review of relevant literature on digital work and algorithmic control. Section 3 provides a theoretical framework. Section 4 describes the research methodology. Section 5 outlines results and their HRM implications. Section 6 concludes the research.

Literature Review

Digital transformation has impacted the modern workplace by introducing technology-based methods of worker management and coordination of activities. Platform-mediated work involves the use of digital tools for allocation of tasks and their performance and monitoring and evaluation. While algorithmic management increases efficiency and decision making, it creates issues around worker autonomy, transparency and workplace control (Jarrahi et al., 2020). The following discussion is a review of research done on platform work, algorithmic management, and worker autonomy from the perspective of organizational behaviour and HRM.

Platform-mediated Work and Digital Employment Transformation

Platform-mediated work facilitates interaction between workers, organizations and customers using digital platforms to create flexible working environments and facilitate service coordination. Such platforms have been utilized extensively in various industries including transportation, delivery, freelance work and other online services. Unlike conventional workplaces, platform work utilizes digital technology in workforce management (Shanahan & Smith, 2021).

While offering flexibility, platform-based work also brings about changes to the established relationship between employees and their organizations (Sun & Chen, 2021). Employees rely on platform policies, ratings, and automated systems to determine the availability of tasks and performance appraisal. Thus, studying the experience of employees in digitally regulated workplaces has become a relevant HRM topic.

Algorithmic Management in Modern Workplaces

Algorithmic management applies artificial intelligence and data to carry out managerial functions such as task assignment, monitoring, evaluation, and giving feedback. This process enables organizations to boost their productivity, consistency, and coordination of workers (Pastuh & Geppert, 2020).

Nevertheless, the use of algorithm-based regulation might bring some problems connected to transparency, fairness, and trust of employees. Lack of knowledge regarding algorithmic processes will limit employee compliance and create the impression of loss of control. So, efficient algorithmic management should be conducted ethically (Newlands, 2021).

Employee Autonomy and Algorithmic Control

Employee autonomy is defined as freedom and control that individuals have over their work-related decision-making and actions. It is vital in motivating, satisfying, inspiring, and engaging people. Digital technologies can facilitate and constrain employees' autonomy in digital workplaces (Schüßler et al., 2021).

Although digital tools allow people to be more flexible in choosing what tasks to perform and when, automation of their monitoring and assessment may diminish employees' sense of autonomy. Transparency, explainability, and human involvement are essential for making sure that technologies enable rather than restrict employee autonomy.

Research Gap

Previous research has mostly concentrated on the technological and operational dimensions of algorithmic management while neglecting its behavioural effects on employee autonomy. The role of transparency and fairness in the acceptance of algorithmic tools by employees needs to be further investigated. This research gap is filled by considering how algorithmic management influences employee autonomy and consequences of workplace processes with emphasis on human-oriented HRM.

Theoretical Framework

It is possible to describe the relationship between algorithmic management and employee autonomy by using organizational behavior theories that will help us to understand how organizational structures impact employees' perception and behavior. The research will be based on the Job Demands–Resources (JD-R) Theory and the Self-Determination Theory (SDT).

Job Demands–Resources Theory

According to JD-R Theory, the outcomes of employees depend on the job demands versus resources balance. In terms of platform-mediated work, algorithmic control, automation and performance monitoring can be viewed as job demands and become sources of pressure and lack of control for employees. At the same time, digital platforms provide

certain resources such as flexibility, improved coordination and accessibility. Employee autonomy becomes one of those resources.

Self-Determination Theory

SDT highlights self-determination, competence, and relatedness as key determinants for motivating employees. Over-reliance on algorithmic control is likely to decrease employees' autonomy while use of transparent and supportive algorithms increases employees' competence. Hence, organizations ought to develop algorithmic systems that strike a balance between automation and employee empowerment.

Conceptual Framework

In view of the above-discussed literature review and theoretical underpinning, this study proposes a conceptual framework that depicts the relationship between algorithmic management and employee autonomy and workplace outcomes.

As illustrated in fig. 1 below, algorithmic management is the main determinant affecting employee autonomy through processes such as algorithmic monitoring, automated decision-making, and performance evaluations. Algorithmic fairness and transparency are some of the influencing factors that determine employee acceptance and trust. Finally, employee autonomy determines workplace outcomes such as job satisfaction and engagement.

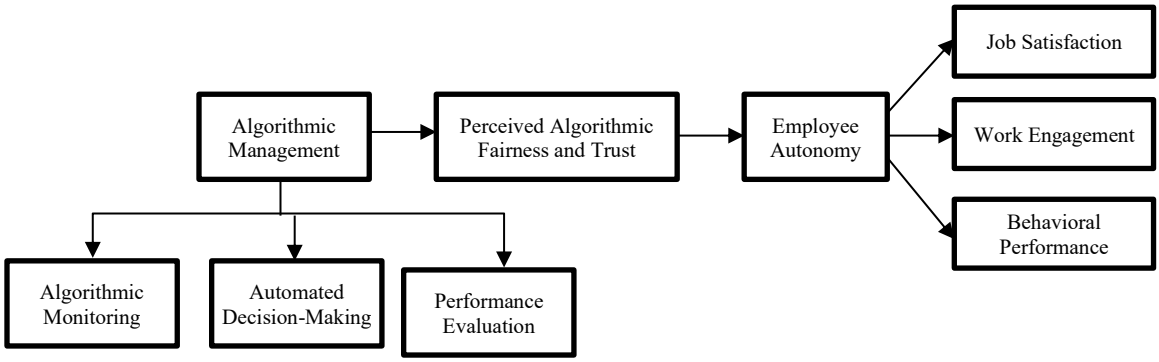


Fig. 1: Conceptual Framework of Algorithmic Management and Employee Autonomy in Platform-Mediated Work

Research Methodology

The current study uses structured research methodology to understand the impact of algorithmic management on employee autonomy in the platform-mediated work environment. Such research design is useful in studying how the process of technology-driven management affects employees' perceptions and behavior. The theoretical framework used in this study encompasses important variables such as algorithmic management, perception of fairness, autonomy of employees, and organizational outcome.

Research Design

The present research is quantitative in nature as it seeks to examine the effect of algorithmic management practices on employee autonomy. It is worth noting that the survey research design would be appropriate because it will help to understand the employees' views about automated monitoring, algorithmic decision making, control at work, and autonomy. The model is derived from existing organizational behavior and HRM theories such as the Job Demands-Resources Theory and the Self-Determination Theory.

Data Collection and Participants

Data can be obtained from workers employed in work environments that use platforms as the medium of work. These may include digital service platforms, freelance platforms, delivery services, and many others which leverage technology for their work process. The data is obtained through the use of a structured questionnaire regarding algorithmic management, transparency, autonomy, and workplace outcomes.

Measurement of Variables

In the research, there will be four key constructs under consideration which are algorithmic management, perceived algorithmic fairness, employee autonomy, and employee outcomes. The algorithmic management will be measured

through the use of measures such as automated monitoring, task allocation, and performance evaluation. The employee autonomy will be measured based on the degree of decision-making freedom, flexibility of the work and control of work activity. The perceived algorithmic fairness will measure the transparency, consistency and trust of the algorithm-based decision making. On the other hand, the employee outcomes will measure job satisfaction, work engagement and behavioral performance.

Data Analysis Approach

The gathered data can be analyzed using various statistical tools to assess the relationships among the postulated constructs. Reliability analysis will be conducted to analyze the measurement consistency whereas validity analysis will be conducted to ascertain that the chosen measures represent the variables under investigation. Correlation and regression analysis can be conducted to test the effect of algorithmic management on employee autonomy and associated behavior outcomes. Methodology serves as a systematic framework for determining how companies can adopt algorithms into their management systems without compromising the freedom, autonomy, and engagement of employees within digital workplaces.

Results and Discussion

This part focuses on the connection between algorithmic management and employee autonomy in the context of work that is mediated by a platform. This analysis is based on the point of view of organizational behavior and HRM in order to analyze the effects of digital management systems on employees.

Table 1: Relationship Between Algorithmic Management and Employee Outcomes

Relationship	Path Coefficient (β)	p-value	Result
Algorithmic Management → Algorithmic Fairness and Trust	0.72	<0.001	Supported
Algorithmic Fairness and Trust → Employee Autonomy	0.68	<0.001	Supported
Employee Autonomy → Job Satisfaction	0.61	<0.001	Supported
Employee Autonomy → Work Engagement	0.65	<0.001	Supported
Employee Autonomy → Behavioural Performance	0.57	<0.001	Supported

Table 1 demonstrates the effect of algorithmic management and fairness on employee autonomy and organizational outcomes. The findings show that algorithmic management systems that operate fairly and openly foster autonomy, satisfaction, and engagement.

Influence of Algorithmic Management on Employee Autonomy

Algorithmic management has completely transformed organizational approaches to coordinating and supervising employees' work. Through automation of monitoring, task allocation, and performance evaluation procedures, organizations have an opportunity to ensure their efficiency and consistency in managing employees. Still, this process affects the perception of autonomy since it affects the ability of employees to perform their tasks independently and make decisions.

When such algorithmic systems grant workers flexibility, relevant and timely information, and feedback, they have the potential to boost autonomy. However, when monitoring is too high and decisions are made automatically, workers may perceive that their autonomy is reduced and that there is more surveillance in the workplace. Thus, the effect of algorithmic management on autonomy is dependent on how these algorithmic systems are used in organizations.

Role of Algorithmic Fairness and Transparency

Fairness and transparency affect employee trust and acceptance of algorithmic management systems. Providing detailed explanation of data used, evaluation criteria, and decision-making process could help to boost employee confidence in digital systems. Lack of transparency may lead to concerns about biased evaluations, inaccuracies, and low participation. Therefore, organizations should introduce fair algorithms with human oversight.

Implications for Organizational Behaviour and HRM

Algorithms in management should complement rather than substitute for the principles of human-centered management. For HR specialists to succeed in their roles, there is a need to reconcile algorithmic decision-making with empowerment through transparency, participation, and judgment by humans.

Conclusion

The use of digital platforms and artificial intelligence has led to a transformation of workforce management through algorithmic management practices. In this research, the effect of algorithmic management on the autonomy of employees was assessed in platform-based working environment. It was found out that there is a strong correlation between algorithmic management and the well-being of the employee with the factors such as algorithmic fairness and trust having a positive effect on the autonomy of employees ($\beta = 0.68$, $p < 0.001$) while autonomy of employees improves the job satisfaction ($\beta = 0.61$, $p < 0.001$) and work engagement ($\beta = 0.65$, $p < 0.001$). It is shown from the findings that algorithmic systems can help in increasing efficiency and making decisions when used transparently and fairly. For HRM, there is a need for organizations to consider human-centered digital management practices. Possible avenues for future research may include examining algorithmic management in various industry sectors and cultures to ascertain its effects on employees in the long term.

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