International Journal of Intelligent Computing and Technology
ISSN: 2457-0249 (Online)
Website: https://www.ijict.com Jan (2022) - Vol.6, Iss.1 Pages:20-31

# GIG WORKER'S MOTIVATION AND ALGORITHMIC WORK MANAGEMENT: VIEWING THE PRISM THROUGH SELF DETERMINATION THEORY

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**Article History- Received: March 2022; Published: June 2022**

## Abstract

Thanks to developments in AI, algorithmic management is fast expanding across sectors and drastically altering the nature of labour. Researchers in the social sciences have been captivated by the concept of algorithmic management ever since the first articles appeared in 2015. The quick growth of the phenomena is one factor, but the significant questions it raises about the impact of management on employee engagement, productivity, and satisfaction all contribute to the excitement. Using the framework of self-determination theory, we conduct a literature study to discover the known impacts of algorithmic management on employee motivation. We found that algorithmic management has a detrimental influence on worker need for fulfilment and motivation, but that the impact may be mitigated by certain elements of algorithmic management systems and management techniques. In order to better develop algorithmic management and understand how businesses utilise it, future studies should draw on the motivating insights gained from self-determination theory.

***Keywords: Gig work, Digital HRM, Algorithmic Work management, Self Determination Theory***

## 1. INTRODUCTION

In a very short amount of time, many of the latest innovations in information technology—especially those related to artificial intelligence—have been implemented in a wide range of settings, including the workplace . The pace of technological growth has been unparalleled, and it is changing the nature of human labour in fundamental ways. This time period has been labelled the "fourth industrial revolution." With these expanded options, we can now build and implement algorithmic systems that really operate in the business world. For instance, they enable the growing automation of physical and/or cognitive tasks that were previously performed by humans (Wang & Siau, 2019), and they may help executives, managers, and employees with both big-picture strategic decisions and day-to-day operational decisions. In addition, algorithmic technologies are integrated into business processes to automate activities formerly performed by managers. The focus of this research is on the former kind of AM so that it may be compared and contrasted with human decision-making. On the other hand, AM may refer to either fully autonomous algorithmic decision making based on data or human decision making with the aid of algorithmic technology.

It was in the context of the emerging gig economy that AM first made its mark. AM in the form of "platformic management" is another name for the growing "gig economy" (Duggan et al., 2020),

where companies use online marketplaces to recruit contract workers for temporary projects. However, AM is not restricted to this application and may be used in any industry where an algorithmic system inside an organisation can be trusted with a managerial duty. Despite this, studies on AM's impact on the workforce are behind schedule. Recent investigations that analysed a large body of research indicated that AM does affect employees' attitudes, emotions, and actions through altering the environment in which they do their jobs. Down this piece, we hone in on the ways in which AM might motivate employees and provide strategies for optimising AM's impact on both worker action (such as work techniques, performance) and worker outcomes (such as future contracts, income allocation). So far, there hasn't been a lot of study looking at how AM affects productivity in the workplace.. A research done in the setting of the gig economy found no statistically significant difference in the intrinsic motivation of workers whether they were managed by algorithms or by humans. But there is still a lot to learn about how technology might influence workplace motivation.

To fully grasp the effects of applying AM in an organisation, it is crucial to undertake a study of the motivating repercussions of employing AM. It has ramifications for individual performance and well-being and may guide how to build and apply algorithms to maximise job motivation.

## 2.ALGORITHMIC MANAGEMENT

The definition of an algorithm is "a computing formula that autonomously makes judgments based on statistical models or decision rules," and it may self-correct with the accumulation of additional data over time without human involvement . Algorithmic management refers to the practise of relying on computer programmes to carry out some or all of the tasks traditionally

associated with managing a human labour force .In AM, employees are managed based on information gathered from them and other users (such as customers), such as response times, decision-making patterns, and levels of customer satisfaction .Beyond the gig economy, AM is quickly becoming commonplace in many kinds of workplaces. For instance, algorithms may be used to determine truck drivers' routes and time objectives and retail stores' timetables. Although AM is seldom recognised as a "manager" of employees, algorithms derived from watching employees' actions are often utilised to influence their actions. The inherent opaqueness of this process, along with the constantly self-updating nature of algorithmic systems through the acquisition and analysis of new data, makes the nature of this style of management unpredictable. In addition, it has been asserted that AM will have a major impact on how work is organised and, by extension, on how employees are motivated.

2.1 Work Motivation

We examine the possible impact of AM on Gig workers motivation within the framework of SDT. The SDT proposes a nuanced perspective of motivation that goes beyond the simple dichotomy between intrinsic (i.e., self-generated) and extrinsic (i.e., externally-generated) motivation. The instrumental reasons underpinning extrinsic motivation may be categorised as either external (representing behaviour done to get rewards from others), introjected (reflecting behaviour done to achieve self-esteem or avoid shame), or identified (reflecting behaviour done owing to personal ideals). Internalized motivation (with intrinsic motivation being the most internalised) has been shown in studies of work motivation to have favourable effects on employee behaviour and well-being. Therefore, "autonomous" (i.e., intrinsic and observable) types of motivation are preferred over "managed" (i.e., externally imposed) ones (i.e., external and introjected). Individuals are more likely to be intrinsically driven when their needs for competence, autonomy, and relatedness are addressed, as proposed by SDT.

In fact, studies show that people are more likely to develop intrinsic motivation when they have a high quality of relationships with others at work, a strong sense of volition and the ability to make their own decisions, and a feeling that they are learning and mastering activities (i.e., a sense of competence) (i.e., relatedness). Therefore, there is much to gain for businesses that prioritise meeting these demands in the workplace. Although it has been shown that job design and effective leadership favourably affect employees' need satisfaction and autonomous motivation in the workplace, researchers have only a rudimentary understanding of how the introduction of AM could alter these practises. As such, we take into account these factors and speculate on how AM will affect motivation in the office.

2.2 The Effects of AM on Work Motivation

Algorithmic management can carry out six managerial tasks, as previously recognised by other academics: 1) Keeping an eye on things, 2) Determining Duties and Objectives, 3) Managing Performance, 4) Managing Time, 5) Managing Pay, and 6) Firing Employees. This allows us to further investigate the possible effects on employee motivation at work. We then go on to explain how AM will likely affect employees' motivation and performance via other, more systemic changes.

2.3 Monitoring

Algorithmic worker monitoring refers to the use of a computer system to track employees in real time and compile data on their activities, habits, and output . In practise since, current systems are able to execute algorithmic management duties such as monitoring a wider variety of staff actions, processing and transferring data autonomously to other algorithmic systems (like customer interfaces), and so on (e.g., performance management;). In this way, algorithms can keep tabs on a plethora of new data at both the individual and population levels simultaneously. In order to keep tabs on their employees, many businesses are turning to high-tech methods, such as software or sensors and cameras placed in corporate cars, mobile devices, and personal computers. Ironically, the rise of these practises coincides with the rise of virual work at certain organisations in response to the COVID-19 pandemic.

There is a danger that behaviour tracking and quantification in the workplace may diminish workers' autonomy. Field studies demonstrate that performance monitoring raises stress levels and may lead to health issues perhaps because of a reduction in emotions of autonomy. Employee monitoring may have mixed effects on productivity, with some studies showing an improvement in performance and others showing a reduction (Aiello & Kolb, 1995), particularly with more complicated activities. Moreover, monitoring often promotes the "working-for-data" phenomenon or "datafication" of work (Gal et in which employees place a disproportionate amount of emphasis on the aspects of their jobs that are being measured and tracked, rather than on other tasks that may be more important to them personally. Although we are not aware of any studies that have directly explored this, we speculate that the widespread use of monitoring via AM may further impair relatedness by limiting informal moments at work, such as "water cooler talks."

On the other hand, there are applications of monitoring that might encourage a sense of agency. To begin, it has been shown that the usage of performance monitoring systems is associated with lower stress levels when paired with greater levels of discretion and independence in the workplace Second, the information gleaned through monitoring may be utilised to provide constructive criticism to workers, resulting in even better performance in the long run.

2.4 Task Assignment and Scheduling

Algorithmic monitoring gathers a wide variety of data that helps systems conduct algorithmic job assignment effectively. In order to adapt in real time to shifts in the work environment and consumer needs, firms may take advantage of the high responsiveness of these systems and re-allocate the activities of their employees. Among the many reported uses of such systems is the automated sorting and transmission of priority files to social workers. They are also used in hotels to alert maintenance personnel of the order in which rooms should be cleaned based on visitor check-in and check-out times. The most well-known instance of this is in the so-called "gig economy," where algorithms are often used to distribute "tasks" to the "workers" who are the best matches for them, either in terms of ratings or location.

Typically, computer scientists who aren't specialists in excellent work design (defined as "the content and arrangement of work tasks, activities, connections, and responsibilities are the ones

who create algorithms in the first place. Since AMs don't provide much in the way of reinforcement for the need for competence, it shouldn't come as a surprise that job assignment through AM tends to make work easier and less compelling. Work that consists of many, simple tasks is often dull because it is monotonous, lacks mental challenge, and is less likely to put an employee's full set of skills and expertise to use. Due to the limitations of this form of contract employment, many creative professionals supplement their income by taking on "genuine" creative projects outside of the gig economy.

Uncertainty may impair a person's sense of independence by reducing his or her capacity to direct one's own life and career. The individual's performance may even suffer as a result, which would be disastrous for any attempt at success. For instance, hotel housekeepers might be assigned to many floors at once rather of focusing on a single one. This is an inefficient use of their time and energy (Reyes, 2018). Workers in the "gig economy," who often have little control over their own schedules or locations, may find some relief in the flexibility offered by AM.

Other research, however, show that this autonomy is often an illusion, since tasks are assigned depending on demand, which is highest at various times of the day and week and changes greatly across platforms. Due to the need of being always connected or alert should the app give a signal providing employment, many gig workers no longer distinguish between work time and personal time.

2.5 Performance Management

Algorithmic performance management systems are used to assess employees in real-time, rank or compare them, and offer feedback based on a wide range of quantitative and particular data acquired mostly via monitoring devices. As an example, UPS's algorithmic performance management system correlates information about individual drivers' acceleration, braking, and cornering patterns with other real-time factors like weather and traffic. These metrics are utilised as benchmarks against which the company's drivers are measured on a daily basis.

In contrast, Gallerand and Reid (1984) found that individuals learn and feel more competent when they get regular, "objective" feedback, which is exactly what AM can give for its employees (Stark & Pais, 2020). There is a broad range of usefulness in the input supplied. Some of the input given by AM may help with the work being done. During contacts, the algorithmic management system reportedly "guides" certain customer support representatives to seem more human by prompting them to talk more slowly, among other things. With a maximum delay of two seconds AM offers options for the positive rearrangement of work for workers in the railway sector in the event of tiny disturbances (such as train delays, cancellations, or diversions, or the absence of a worker).

Workers often note the opaqueness of the AM's decision criteria when just comparison feedback (e.g., ranks) is provided. In addition, as algorithms are always being updated, the feedback received might shift quickly, thus undermining any sense of confidence in one's abilities or expertise. One distinct feature of algorithmic performance assessment compared to

more conventional performance evaluation methods is that it does not rely on subjective judgments about the quality of work.

AM-derived metrics are constantly revised in response to fresh information. Employee behaviour and the fulfilment of psychological needs are affected. Algorithms are always being updated with new information, adding to the datafication of work and increasing the need of paying attention to what "pays off" for one's career. This not only raises the possibility of experiencing a decline in autonomy but also has the potential to undermine confidence in one's abilities.

2.6 Compensation

"The term "algorithmic compensation management" is used to describe the computerised systems that are responsible for doling out bonuses and other forms of financial compensation to employees based on observable metrics like the number of completed tasks, individual performance, customer satisfaction, and so on. At the food delivery service DoorDash, for instance, drivers with a high acceptance rate are the only ones who get incentives (given during peak hours). Furthermore, the algorithmic system on several platforms adjusts pay rates in real time in response to demand, encouraging employees to "hunt" profitable hours and, as a result, work lengthy, antisocial, and irregular hours. Compensation-for-performance has been associated with a decline in autonomy, so it's no surprise that connecting performance feedback to pay might have a chilling effect on intrinsic drive.

2.7 Job Termination

We can observe that algorithmic job termination is the last function of algorithmic management. These systems, which are based on algorithmic performance management systems, may terminate employees and notify them of the choice to do so without ever engaging a human manager in the process. Although this feature is most often associated with the various gig economy platforms, where it is known as "worker deactivation", it has also been seen in warehouses. Most of the time, these judgments are based on opaque and ever-changing algorithms that provide employees no opportunity to defend their "poor performance." Thus, their independence and confidence are hampered.

## 3. SYSTEMIC EFFECTS OF AM ON MOTIVATION

These systemic effects were studied in a recent study that contrasted "guiding algorithmic control," in which AM is used to provide individualised feedback to help workers improve their performance, with "gatekeeping algorithmic control," in which AM is used to determine task assignment, compensation, and termination. The former was correlated with lower levels of worker autonomy, justice, and privacy, whereas the latter was correlated with higher levels of these three factors (Wiener et al., in press). In addition to the aforementioned functions of AM, studies have also been conducted on the more systemic organisational consequences on employees. These include dehumanisation, job design, dissatisfaction and anxiety, justice and trust views, competitiveness, and technology adoption.

3.1 Work design

It is critical for businesses implementing AM to think about how it could affect employee motivation by altering their job design, since research has shown that excellent work design has a substantial impact on workers' intrinsic motivation and need fulfilment. Research on gig workers is beginning to show that this kind of employment does have an effect on employees' intrinsic motivation. However, these impacts of AM are complicated by other aspects of gig labour, such as the fact that gig workers are seldom seen as employees and are expected to take on a large share of responsibility on their own (e.g., vehicle maintenance, weather risks; Timko & van Melik, 2021). A high-demand, low-control work environment may result from the implementation of AM, in which workers' freedom of action is curtailed without their duties being eliminated.

Work engagement has been the subject of research; it is a concept that has a strong resemblance to intrinsic motivation in the workplace. Malik et al. (2020) interviewed managers, AI project team leaders, and other staff at a global IT firm in India to compile qualitative data. Their findings suggest that AM that tailors HRM policies to the unique needs of each organisation might increase employee enthusiasm for their jobs.

According to a survey of Amazon Mechanical Turk employees in the gig economy, understanding the significance of their labour was difficult for them. Based on their research, the authors concluded that the most motivated employees satisfied all three psychological needs: they felt competent in their jobs, that their work was meaningful, and that they had strong relationships with both their coworkers and the people who had requested their services.

3.2 Frustration and Anxiety

Workplace dissatisfaction and anxiety around 9 a.m. have been connected to the unfavourable astrological sign of the phoenix. Several issues have been identified in the literature, including: an inability to completely disconnect; a sense of needing to maintain a high level of productivity; worries about money and losing one's job. Most of the negative effects of AM on quality of life may be traced back to diminished perceptions of one's own agency and ability.

3.3 True Trust and Fairness

As a result of AM, workers may lose faith in the fairness of their workplace and the reliability of their superiors and managers. Employees may feel less confident in their abilities if they learn that these systems are being implemented because of the algorithmic monitoring function (Moore & Hayes, 2018). The notions of fairness and justice have also been altered as a result of using AM as the norm. This is significant since it has been shown that procedural fairness is a strong predictor of need fulfilment, and therefore motivation. Workers may feel wronged if they believe that algorithmic management makes decisions based on less reliable data than human decision-makers do, or if they believe that algorithmic management ignores important qualitative or contextual information. Another study revealed no change in the views of procedural justice regarding judgments made by people versus "smart" systems, while still emphasising the necessity of procedural justice regardless of the decision-maker,

demonstrating the incongruity of research results. Another research (Wang et al., 2020) demonstrated that employees' perceptions of how fair an algorithmic system is are based on the outcome of the choice it made for them. In addition, the sense of procedural fairness improves when an algorithmic system executes simpler tasks, whereas employing management improves it when the activity is seen as particularly complicated and needs so-called human abilities (such as compassion or inventiveness) (Nagtegaal, 2021).

3.4 Competition

There is some evidence that AM may foster an atmosphere of rivalry in the workplace, leading to less emotions of camaraderie among employees. Many platforms in the gig economy keep workers competing with one another for tasks, deliveries, and trips by controlling the supply (the number of workers connected) and the demand (the number of jobs available). This is done so that workers are compelled to keep up a certain level of productivity (Gerber & Hess, 2015). Furthermore, the individual outcomes of algorithmic performance management systems may produce rankings that may be placed where employees can see them, so promoting some rivalry among employees and

reducing collaboration and helpful actions. In addition, some businesses may tie compensation plans directly to the rankings achieved by algorithmic algorithms, therefore increasing intraoffice rivalry.

3.5 Adopting New Technologies

Acceptance of AM tends to vary from context to context or from person to person, and the literature indicates resistance behaviours on the part of employees designed to negate or evade AM. According to research by Lehdonvirta (2018), gig workers typically create their own routines, tools, and groups in order to function within the parameters set by algorithms. Curchod et al. (2019) used the phrase "working around the algorithm" to characterise this behaviour. Some Uber drivers, for instance, have figured out how to avoid the app's algorithmic trip requests, such as those for the company's controversial carpooling service, UberPOOL. Similarly, workers at Sweden's Social Insurance Agency, which introduced. They found a vulnerability in the system's algorithmic distribution of priority files and used it to their advantage, assigning all the files to the whole team over a long period of time. That way, we could keep working in groups and maintain command over how urgent individual files were. This last case study shows how far some employees will go to ensure their basic needs are met on the job.

When working under an algorithmic management system, employees must frequently make educated guesses about the system's operation and modify their behaviour and skills accordingly or consult online forums to learn from coworkers with more experience in this area.

3.6 Capabilities of an Algorithmic Control System

Schorpf et al. (2017) state that the elements of a system have the greatest impact on the actions and judgments of those involved. Indeed, research suggests that the effects of an algorithmic

system may be affected by factors such as the openness of its procedures, the dependability of its algorithms, the fairness of its algorithms, and the degree to which humans are able to influence the algorithmic system.

3.7 Transparency

Numerous investigations; (Scheiber, 2017) showed Employees' collaboration and productivity are both enhanced when a system can give explanations and specifics about the jobs, enabling workers to make sense of these choices. We hypothesise that as a result, staff members feel more confident and in charge of their job. Indeed, SDT research demonstrates that justifying requests and choices has a substantial impact on demand fulfilment, autonomous motivation, task evaluation, and performance. On the other hand, opaque AM is a hindrance, capacity to grow, which in turn affects employees' confidence in their abilities (Rahman, 2021). A lack of transparency in AM's decision-making processes might have a chilling effect on competition, erode employees' sense of community and belonging, and lead them to believe they've been treated unfairly. However, some study showed that openness did not boost workers' perception of fairness, perhaps because many employees doubt the validity of the data used to train algorithmic decision-making systems (i.e., algorithmic bias). Transparency alone won't solve this problem, but it just could shed some light on it.

3.8 Reliability

The effect of algorithmic management may also be affected by how trustworthy users regard certain aspects of the system to be. Certainly, employees may get frustrated due to system and equipment failures, which may then rise to perceptions of incompetence Evans and Kitchin's (2018) ethnographic research demonstrates that equipment failure and improper system operation are prevalent. When this occurs, the algorithmic system becomes ineffective and causes disruptions in operations. The authors state that incorrect information or system incompatibility are two possible causes of such problems inside an organisation. In turn, this lends credence to the claim that inefficient algorithmic systems may increase the workload of human workers.

3.9 Fairness

The results of AM might be affected by how fair it is. Most definitions of algorithmic fairness focus on the absence (or reduction) of prejudice and discrimination, the secrecy of data and judgments, and the dependability of both the data utilised and the outcomes. All of these are components of procedural fairness, which research shows has a major impact on feeling fulfilled (Olafsen et al., 2015).

Wang et al. (2020) not only show how reducing bias in a system may increase people's impression of its fairness, but they also claim that injustices are more likely to be detected if the system was built by an external team rather than an internal one. Also, Uhde et al. (2020) state that employees have a higher opinion of an algorithmic scheduling system if they are given an equal amount of vacation days and opportunity to input their preferences. The authors, however, stress that the system should not attempt to settle a scheduling disagreement. They

contend that for the system to be seen as fair, it need only provide little assistance to human judgement when resolving disagreements.

Bokányi and Hannák (2020) propose a job assignment algorithm that helps employees who have experienced pay inequality, demonstrating that even little adjustments to algorithmic systems may have a major impact on their fairness. Concerning the secrecy of information and decisions, research by Chory et al. (2016) found that employees who felt their information was not being kept private had a negative impression of the company and had less confidence in its leadership. Also, the results of previous performance reviews have been implemented employees feel it's unfair when their pay is determined by an algorithm based on factors beyond their control. On the other hand, employees may be unfairly and inefficiently held accountable for the results of every job and customer encounter by algorithmic performance assessment systems that have the last word in the matter.

## 4. IMPLICATIONS FOR THEORY AND PRACTICE

This review of the literature applies a motivational perspective to the expanding area of algorithmic management (AM), with the goal of guiding and informing future AM research and design and promoting the use of AM in a way that does not demotivate workers.

The study concluded that experimental (or vignette) studies and field studies done in a particular environment, based on ethnographic or qualitative data, were the only two kinds of research designs employed so far, with both having significant room for growth in terms of future investigation. While these studies did produce significant insights in a short amount of time, future research might benefit from using quantitative methodologies like worker surveys and quasi-experimental field investigations. Furthermore, the study demonstrates AM's presence across a broad range of organisations and sectors, indicating the fast development and eventual ubiquity of this technology. The majority of current AM studies, however, have been undertaken in the gig economy. Traditional companies with paid staff may have AM present, but they still need to invest in training and education. Managers and/or workers in businesses may not be aware of the existence of algorithms running operational systems, leaving a lot of mystery.

The review's findings have important practical consequences, suggesting that a trustworthy, fair algorithmic management system with transparent decision-making procedures may benefit employees and the business, or at least mitigate some of the negative effects of such a system. It seems beneficial to allow either employees or managers to make final choices on the systems. Indeed, our findings demonstrate that a cooperation between algorithms and humans may help businesses get the quantitative benefits of algorithmic management while surpassing some technical limitations. Organizations that have employees participate in the decision-making process relating Companies that put thought into their AM implementation and design have a better chance of reaping the advantages of AM while keeping or even boosting employee enthusiasm.

## 5.CONCLUSION

Our analysis reveals that many management scholars have been focusing on algorithmic management during the last five years, a period of tremendous expansion for this field. The findings of this review, which set out to identify the motivating impacts of AM on employees, reveal that the effects of AM as it is now utilised are primarily unfavourable because they undermine crucial psychological requirements. This research also demonstrates that elements of algorithmic management systems (such as openness, trustworthiness, fairness of the system, and the extent of human input) and management practises may reduce the effect of algorithmic management (such as management styles, sharing information generated by the technology with workers, worker communities, and organisational culture). Future research should rely on motivating insights from self-determination theory to better build AM and its applications in businesses.

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How to cite this article:
Mano Ashish Tripathi, Dr. Ravindra Tripathi, Uma Shankar Yadav "Gig Worker's Motivation and Algorithmic work management: Viewing the Prism through Self Determination theory", International Journal of Intelligent Computing and Technology (IJICT), Vol.6, Iss.1, pp.20-31, 2022