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Algorithmic management: insight and workplace implications

In algorithmic management (AM), employers use algorithms and automated processes to perform their management tasks. The Netherlands Labour Authority conducted a survey on the influence of AM at Dutch companies. The aim is to gain insight into how AM is applied and how it affects managers and employees. The results provide initial insight and an indication of the nature of AM's impact on the workplace.

What is algorithmic management?

Algorithmic management (AM) refers to employers use of algorithms and automated processes to perform management tasks and make decisions. It can include technologies such as artificial intelligence (AI) and data analytics deployed to optimise and automate various management aspects. Examples include tasks such as planning, resource allocation, performance appraisal and feedback to employees. AM enables organisations to make faster decisions based on big data and streamline operational processes.

The growth of algorithmic management in the workplace

Although AM is often associated with platform work, such as meal delivery via platforms, it is increasingly applied in the traditional workplace. A publication by the Personal Data Authority¹ shows a sharp rise in the use of AM in traditional work environments. Currently, 40% of large companies use AI systems for management tasks. More than 75% of Dutch companies are expected to use AI in the workplace within five years. This means that the automation of labour management is increasingly becoming the norm.

Research into algorithmic management

The research focuses on how AM is deployed in Dutch companies and its impact on managers and employees. The Labour Authority is thus setting out to gain an understanding of the extent of AM use and its impact on working conditions. The Labour Authority has commissioned literature reviews by TNO² and made exploratory visits to companies that use AM. The results provide initial insight and an indication of the impact of AM on companies' working environments.

Key results

From the literature review

The literature review shows that AM can have positive effects on reducing workloads and improving how we measure health and wellbeing. Despite that, studies show that such positive applications are less common than hoped. The use of AM can also negatively impact employees, causing decreased autonomy, psychological pressure, and longer working hours.

¹ Report on AI & Algorithm Risks Netherlands (RAN) -autumn 2023 Personal Data Authority, p. 26.

[Rapportage AI & Algorithm Risks Netherlands \(RAN\) - Autumn 2023 | Autoriteit Persoonsgegevens](#)

² The entire TNO report is entitled explorations on risks and opportunities for workers due to AM and can be found online: [Algorithmic Management \(tno.nl\)](#).

Goals and applications of algorithmic management

The literature review shows that AM can be used for various purposes within an organisation. The three study goals are:

1. Instruction given to employees.
2. Evaluation of tasks performed.
3. Discipline: the use of AM for rewards and/or punishments.

Risks presented by algorithmic management

Despite the potential benefits, such as tasks that can be done faster and improvements in health and wellbeing, AM poses several risks for workers. TNO's literature review suggests that AM systems can have the following adverse effects:

- **Declining autonomy.** Workers have less control over their work as algorithms determine what should be done and how and when.
- **Longer working hours.** Employees are constantly monitored, and the pressure to perform can cause them to work longer and harder.
- **Discrimination.** For example, if the data on which the algorithm is trained reinforces inequality and injustice, certain groups of workers may be disadvantaged in promotion opportunities.
- **Work stress and psychological pressure.** Constant monitoring and (non-transparent) performance appraisals can cause employees increased stress.
- **Bodily injury.** Psychological pressure can cause workers to exceed their limits, which could lead to physical complaints or accidents.
- **Declining wellbeing.** AM can lead to a work culture where employees have little control over their tasks, which limits their sense of fulfilment and learning opportunities.

Different degrees of algorithmic management

There are various degrees of AM, ranging from support technology to full automation. These gradations, as outlined in research by Wood (2021)³, help us better understand how companies apply AM:

- **No AM.** All management tasks are performed by people.
- **Support AM.** Technology is used as support; the final decision lies with the managers.
- **Partial AM.** Certain tasks are fully automated, while people perform the remaining management tasks.
- **Conditional AM.** Management tasks are largely performed by algorithms; managers can intervene when necessary.
- **A high degree of AM.** Management tasks are performed almost entirely by algorithms, with minimal human intervention.
- **Full AM.** All management tasks are performed by algorithms without any possibility of human intervention.

The company visits show that most visited companies currently use partial or conditional AM, in which technology plays a major role but human managers can still intervene when needed.

³ Wood, A.J. (2021). *Algorithmic Management: Consequences for Work Organisation and Working Conditions*. Seville: European Commission, JRC124874.

From the exploratory company visits

During the company visits, it became clear that there are significant differences in how companies apply AM. The main findings are as follows:

- **The use of AM.** The forms of AM companies use vary widely, from light support technology to fully automated systems. Lighter forms of AM were found, such as systems that assign tasks or optimise orders.
- **Efficiency and productivity.** Both managers and employees cited increased efficiency and productivity as key benefits of AM. For managers, this meant they could better manage and monitor their employees. Employees mainly saw benefits in better instructions and cost savings.
- **Assessment and evaluation.** AM systems were used in many companies to collect data on employee performance. This data was then used to evaluate workers. In some cases, rankings on productivity were shared with employees, but some companies stopped doing so because it adversely affected employee motivation.
- **Direct disciplining** by AM systems was not observed during the company visits; so far, ultimate responsibility remains with human managers.

Goals and applications in the workplace

During the exploratory company visits, it was noted that companies use AM mainly to increase efficiency and boost productivity. Managers see the benefits of better control and allocating tasks more effectively. On the other hand, workers particularly appreciate the reduced physical strain and the safety of their work, e.g., by AM reducing the risk of collisions.

Rankings

An online retailer and a distribution centre of an online shop used AM for rankings. They stopped doing so because the workers who scored high on it actually slowed down. Employees OPINIONS ON rankings DIFFER FROM EACHOTHER. Whereas one employee is undaunted by it and works at his or her own pace, another is more motivated to score as high as possible.

Employee autonomy

At a logistics company, AM determined the order of floors, but the employee was allowed to determine the route on the floor itself. At a supermarket distribution centre, workers are told via AM which products to pick. They then CAN decide THEMSELVES how to place it in the roller container.

Effects of algorithmic management on managers and employees

Interviews with managers showed that they were predominantly positive about the effects of AM on their own work. They appreciated the higher productivity of employees and felt that their own work became easier as employees' behaviour could be better managed. However, some noted less personal contact with employees and less visibility into what was happening on the work floor.

Employees were moderately positive about the use of AM. While they appreciated the lower physical strain and increased safety, they also mentioned downsides such as a higher workload, less social contact and reduced empathy from managers. Managers often do not pay enough attention to the negative effects of AM on employees.

Efficiency

At a supermarket distribution centre, AM reduces the number of roll containers needed by 10%. This reduction means lower carbon emissions as fewer trucks are needed for transport.

Collision hazard

At a department store, AM lowers the number of trolleys and forklifts on the WORK floor, thus reducing the risk of collision hazards. At a supermarket distribution centre, AM ensures more efficient routes and less congestion.

Employee engagement in algorithmic management

Interestingly, employees are usually not involved in designing or implementing AM systems. They are often not informed until the system has already been purchased and implemented or changes have already been made. Only in one company employees were extensively informed and involved in the implementation. Managers' influence on AM systems is also limited. While they do not always have control over the use of AM, they can set aside from the algorithm's assessments and make human decisions where necessary.

Managers' judgement

A manager still has some ability to set aside the AM's judgment. This could be the case when assessing an employee. The manager's judgement is still taken into account.

Employee engagement

Only at a supermarket distribution centre employees did receive extensive information about the deployment of the AM through meetings, working groups, pilots, etc. In addition, the Works Council was closely involved in the choice of software. Employees were kept extensively informed about changes in the system, and they could provide feedback. Forklift drivers said that they felt like robots, and adjustments were made to the system in response so that they still had some control over their operations.

Finally: legislation, the importance of risk assessment and monitoring development AM

Legislation

AM and AI (*artificial intelligence*) legislation is constantly evolving. For example, the AI Regulation, which regulates the development and use of AM based on AI,⁴ the EU Platform Directive, the Machinery Directive, and other laws such as the GDPR⁵. The Working Conditions Act⁶ and the Works Councils Act (WOR⁷) also apply. The Labour Authority is already able to study the impact of AI deployment on healthy, safe or fair work.

⁴ For more information, see [AI Regulation | Personal Data Authority](#).

⁵ In Dutch: AVG.

⁶ In Dutch: Arbeidsomstandighedenwet.

⁷ In Dutch: *Wet op de Ondernemingsraden (WOR)*

The importance of risk assessment

AM has the potential to make management processes more efficient and increase productivity, but some risks call for attention. It is crucial that companies strike a balance between technological advances and human empathy, especially when it comes to working conditions and psychosocial strain.

It is important that when introducing new technology, such as when implementing AM and making subsequent changes, companies adapt the company risk assessment accordingly. Industries should also address the risks of new technology in their health and safety catalogues on branch level. The psychosocial risks that AM can entail, such as work stress, must also be considered, e.g., those caused by work intensification or uncertainty about their performance when an algorithm is involved. It is important to involve employees (the works council in larger companies) from the beginning of AM implementation.

Monitoring longer-term AM developments

To monitor AM developments also in the longer term, the Labour Authority, together with TNO, is joining an international study on AM. That study is entitled 'algorithmic management at work- challenges, opportunities and strategies for safety, health and wellbeing'.⁸ This is intended to lead to intervention options to reduce negative aspects of AM and enhance or stimulate its positive aspects.

⁸ The English abbreviation is ALGOSH. One part of this programme is AMOSH, launched in 2023, on the effects of AM on workers in the warehouse and transport sector in Sweden. The research team is conducting qualitative research on how AM affects employees' work environment and their wellbeing in Sweden and other countries. The Swedish Labour Authority is also involved in this study.