

LESS HUMAN BUT MORE EFFECTIVE?

*IT and the organisation of working time**

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Abstract

The advent of information technology has also facilitated the organization of working time. As for now, various electronic monitoring tools and AI algorithms assist in tracking employee performance and planning schedules, making registration of working time easier and enhancing efficient planning. This paper explores the impact of the IT and the AI on working time, advocating for technology to support more human working time policies, for the benefit of both the employers and the employees. It examines EU and Hungarian legal provisions, emphasizing that the organization of working time should prioritise worker needs alongside economic considerations. The paper argues for the humanization of work, with digital tools offering potential to incorporate employee preferences into working time management, thus fostering mutually beneficial solutions.

Keywords: working time register, working time schedules, humanisation of working time, working time directive, algorithmic management

1. Introduction

Regulating the working time is one of the most complicated parts of labour law. Maximum level of daily and weekly working time and minimum rest periods, all possibly calculated as an average during a certain reference period, lead to a complex set of technical rules. Albeit these provisions are not without inner logic, practical

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implementation can be challenging, especially for small and medium-sized enterprises that often lack HR specialists.

Employers have been using information technology to facilitate the organisation of working time since the dawn of computer science. With the explosive development witnessed in the last decades, it results in huge competitive disadvantage if organisations do not introduce IT solutions also for managing the working time.

There are different technologies to collect the necessary data on the employees' temporal performance. Various electronic monitoring tools can be used to accurately track the presence of workers in the workplace (access control systems), their use of computers and the internet (capturing screenshots, logging keystrokes), or their movements in and out of the workplace (GPS technologies embedded in vehicles or in workers' personal smartphones), just to mention a few. These innovative solutions can make fulfilling the obligation to register working time much easier, but such rich data may also help to enhance the efficient planning of future schedules. Moreover, recent advancements in artificial intelligence research have resulted complex algorithms, which accomplish tasks and make decisions by mimicking human capacities to reason, learn, and recognize visual objects, text and speech. Algorithms transform input data into technological outputs, which can take the form of everything,¹ for example the entire organisation of working time.

The aim of this paper is to explore the possible effects of IT and artificial intelligence on working time, especially from the aspect how these technologies can lead to more human working time policies and not only to one-sided gains for the employers. First, the issue of registering working time will be analysed, demonstrating the importance of this seemingly technical obligation for both parties. Then the assessment turns to the more complex issue of working time planning. Both parts will cover the relevant provisions of EU and Hungarian law. The paper argues that there are guiding principles in written law already on both EU and national level, which require employers to organise working time around the worker and not prioritize economic considerations above all.

2. Registering working time

Registering working time seems a merely technical issue; however, it is an essential prerequisite for the practical implementation of working time provisions. A comprehensive, reliable, up to date and easily accessible record of the temporal dimension of the employee's performance is key evidence to check compliance with rules on working time and wages.² Besides, it is also useful if the employer needs to prove that late or absent employees breached their obligations.

¹ Annette BERNHARDT – Reem SULEIMAN – Lisa KRESGE: *Data and Algorithms at Work: The Case for Worker Technology Rights*. Center for Labor Research and Education, University of California, Berkeley, 2021. 4–6. <https://laborcenter.berkeley.edu/data-and-algorithms-at-work/>

² Attila KUN: A munkaidő nyilvántartásának főbb szempontjai. [The main aspects of recording working time.] *Munkaügyi Szemle*, 10. (2005), 49–50.; Péter SÍPKA – Márton Leó ZACCARIA: A tényleges napi

The recording of working time is, therefore, an important administrative obligation for the employer, which can be perfectly fulfilled by using digital solutions. This is nothing new; as such, IT solutions were available some twenty years ago. In order to measure the beginning and end of working time, i.e. to collect the data to be recorded, some kind of hardware is needed, which could be the workers' computer (or other personal device) or an identification terminal or panel. A software processes the collected data and produces the records; this can then form the basis for payroll.³ In place of the old punch-card time clock, employees now log onto a computer or mobile device, swipe a radio frequency identification (RFID) badge, scan a fingerprint, or gaze into an iris recognition device.⁴

While digital tools can make it easier to keep accurate, up-to-date records of working time, they can also pose risks. For example, the credibility of the record can be jeopardised if the employer can modify the data recorded by the employee at any time, especially if the employee is not notified on such amendments. It is, therefore, inappropriate if the system allows for not only the correction of false data, but also its modification in general, without any reasoning. Any automatic mechanisms built into the system may also be a cause for concern. For example, the recording software may automatically deduct breaks from the hours worked, even if the employee was actually unable to take them; or, the system may apply rounding to the detriment of the employee.⁵

It is, therefore, important that the legislation sets out the basic requirements for the recording of working time, meanwhile allowing employers to use the most appropriate technical solution for that aim. Below we turn to such legal requirements as prescribed by EU and Hungarian law.

2.1. Working time recording in EU law

Interestingly, the working time directive⁶ (hereinafter: WTD) does not explicitly oblige employers to record working time; however, the Court of Justice of the European Union (hereinafter: Court) derived it from the aim of the directive (protection of workers' health and safety) and the Member States' general obligation to take the "measures necessary" for the proper implementation of the directive.⁷ As the Court pointed out in the CCOO case, in the absence of a working time register, it is not possible to determine objectively and reliably either the number of hours worked by the worker and when

munkaidő mérésére alkalmas nyilvántartási rendszer fenntartásának munkáltatói kötelezettsége. [The employer's obligation to maintain a record system for measuring actual daily working time.] *Munkajog*, 4. (2019), 42.

³ KUN op. cit. 52.

⁴ Elizabeth TIPPETT – Charlotte S. ALEXANDERT – Zev J. EIGEN: When Timekeeping Software Undermines Compliance. *Yale Journal of Law and Technology*, 1. (2017), 3.

⁵ TIPPETT – ALEXANDERT – EIGEN op. cit. 28–34., 30., 34., 37.

⁶ Directive 2003/88/EC of the European Parliament and of the Council of 4 November 2003 concerning certain aspects of the organisation of working time.

⁷ WTD Art. 1(1) and 3–9.

that work was done, or the number of hours worked beyond normal working hours, as overtime. Consequently, Member States must require employers to set up an objective, reliable and accessible system able to measure the duration of time worked each day by each worker.⁸

The Court acknowledged that in disputes concerning working time, a worker may rely on other sources of evidence. In order to provide indications of a breach of working time rights and thus bring about a reversal of the burden of proof, these sources can be witness statements, the production of emails or the consultation of mobile telephones or computers *inter alia*. However, unlike a system that measures time worked each day, such sources of evidence do not allow for the objective, reliable establishing of the number of hours the worker worked each day and each week. In particular, witness evidence in itself cannot be regarded as an effective source of evidence capable of guaranteeing actual compliance with the rights at issue since workers are liable to prove reluctant to give evidence against their employer. It is owing to a fear of measures possibly taken by the latter, which might affect the employment relationship to their detriment.⁹

Nevertheless, it is for the Member States to determine the specific arrangements for implementing such a system of registering working time, in particular the form that it must take, having regard, as necessary, to the particular characteristics of each sector of activity concerned, or the specific characteristics of certain undertakings concerning, *inter alia*, their size.¹⁰ Thus, the relevant data might be kept on paper, in a computer-based system, or by use of electronic access cards, which shall ensure the effective implementation of the WTD.¹¹

While the CCOO case made it clear that a reliable working time account is essential, it also added that its technical implementation could take various forms. The possible technical difficulties of registering working time can be easily overcome with digital devices.¹² In the era of complex algorithms operating many main functions of the employer (like selection of candidates, performance evaluation, monitoring etc.), it seems reasonable to expect that work time recording is not a challenge for software developers. Moreover, as the CJEU pointed out, recital 4 of WTD states that the effective protection of the safety and health of workers should not be subordinated to

⁸ C-55/18. Federación de Servicios de Comisiones Obreras (CCOO) v Deutsche Bank SAE [ECLI:EU:C:2019:402] 48., 60.

⁹ C-55/18. para. 53–55.

¹⁰ C-55/18. para. 63.

¹¹ Vito S. LECCESE: Monitoring working time and Working Time Directive 2003/88/EC: A purposive approach. *European Labour Law Journal*, 1. (2023), 24.

¹² INTERNATIONAL LABOUR ORGANISATION: *Ensuring decent working time for the future. General Survey concerning working-time instruments*. International Labour Office, Geneva, 2018. 298.; Elena SHEVCHENKO – Angelika EFREMOVA – Nataliya OSHOVSKAYA – Aleksey VOLOSHIN – Anna FINOGENOVA: Improving Methods of Accounting for Working Time in the Context of Digitalization. *SHS Web of Conferences* 93, 03011, (2021), 3–4. <https://doi.org/10.1051/shsconf/20219303011>

purely economic considerations, consequently, the costs associated with working time registers are secondary issues here.¹³

Accurate accounting of working time should not be hampered even in flexible schedules where working time is more difficult to measure as it is not performed during an uninterrupted period and/or in a particular place. Considering the fast development of surveillance techniques in the world of work, one might be concerned not about the technical difficulties working time recording could mean to employers, but rather about the incredible amount of control over their workers that these techniques give them. Any device used to keep account of working time shall not gather more data than necessary and shall by no means monitor the employees' activities too closely or intrude into private life.¹⁴ It is worth noting that in the Court's practice a record of working time is included within the concept of 'personal data'; one that indicates in relation to each worker the times when working hours begin and end, as well as the corresponding breaks and intervals.¹⁵

From a practical point of view, one of the most important issues raised by the CCOO case is whether the obligation to keep working time records has an impact on the rules of proof in working time disputes. For example, if an employee claims back pay for extraordinary working time, does the burden of proof shift to the employer who fails to keep adequate records of working time and, consequently, does the employer have to prove that the circumstances alleged by the employee do not exist? The answer to this question is in the negative. The WTD does not provide for rules of proof and remuneration for work since its legal basis is the protection of workers' health and safety at work.¹⁶ In a legal procedure for back pay, it is for the Member State to determine the rules of proof, although it must surely be assessed to some extent against the employer if working time has not been properly recorded.¹⁷ However, in occupational health and safety disputes, the subject matter is directly related to the WTD, so in such cases it does not seem excessive to expect the burden of proof to be reversed.¹⁸

It is worth noting that the European Parliament's proposed directive on the right to disconnect incorporates the merits of the CCOO decision. It calls Member States to ensure that employers set up an objective, reliable and accessible system enabling the

¹³ C-55/18. para. 66–67.

¹⁴ Marta GLOWACKA: A little less autonomy? The future of working time flexibility and its limits. *European Labour Law Journal* 12, 2. (2021), 121. <http://dx.doi.org/10.1177/2031952520922246>; Tammy KATSABIAN: It's the End of Working Time as We Know It – New Challenges to the Concept of Working Time in the Digital Reality. *McGill Law Journal* 65, 3. (2020), 32.

¹⁵ C-342/12. Worten – Equipamentos para o Lar SA v Autoridade para as Condições de Trabalho (ACT) [ECLI:EU:C:2013:355].

¹⁶ Treaty establishing the European Community Art. 137(2).

¹⁷ SIPKA – ZACCARIA op. cit. 45.

¹⁸ Szilvia HALMOS: Fordul-e a bizonyítási teher rendkívüli munkaidős perekben az EUB C-55/18. CCOO-döntését követően. [Is the burden of proof reversed in extraordinary working time cases following the CJEU's C-55/18 CCOO decision.] In: Ádám AUER et. al. (ed.): *Ünnepi tanulmányok Kiss György 70. születésnapjára*. [Studies for the 70th birthday of György Kiss.] Budapest, Wolters Kluwer, 2023. 206–210.

duration of time worked each day by each worker to be measured. This shall be done in accordance with workers' right to privacy and to the protection of their personal data. Workers shall have the possibility to request and obtain the record of their working times.¹⁹ Interestingly, the proposed directive would apply to all workers who use digital tools for work purposes, thus its scope is broader than that of the WTD. Consequently, if adopted, the new directive would introduce the obligation to keep working time records for more workers.²⁰

To sum up, the Court has established a clear obligation under EU law for all employers to keep records of employees' working time. However, each Member State is free to decide on the form of record-keeping, and the employer is free to choose the most appropriate solution within the framework of national law. Digital solutions can play an important role in fulfilling the obligation to record working time.

2.2. Working time registering under Hungarian law

Hungarian labour law explicitly prescribes the obligation to register working time from 1999.²¹ The provision in force states that employers shall keep records of the duration of normal and extraordinary working hours, on-call time and paid annual leave. The records must also provide an up-to-date record of the start and end dates of the normal and extraordinary working hours and of the time spent on-call.²² It follows from this relatively shortly worded rule that the recording of working time is the employer's obligation and must be kept up to date for each employee. This requires particular attention in the case of unequal working time schedules, where the amount of daily or weekly working time and/or the start and end of working time may change daily. In labour litigation, it is the employer who must prove the content of documents generated in the course of its business, including working time records.²³

The form of the register may be decided by the employer. It can be kept on a paper-based document or in a chart posted on the wall of the workplace, or in any electronic form. The employer may also delegate this task to its employees; however, the employer is still liable for inadequate working time recording if the employee fails to comply with this obligation. Therefore, any form will do, provided that it contains the information required by law. The employer should choose the simplest solution which fits best both to the circumstances of its everyday operations and the legal requirements.

¹⁹ European Parliament resolution of 21 January 2021 with recommendations to the Commission on the right to disconnect (2019/2181(INL)), Art. 3(2).

²⁰ LECCSE op. cit. 32.

²¹ For the history of the regulation, see: Attila MÁRIÁS: A munkaidő-nyilvántartás. [The working time record.] In: Lajos PÁL – Zoltán PETROVICS (ed.): *Visegrád 18.0. A XVIII. Magyar Munkajogi Konferencia szerkesztett előadásai*. [Visegrád 18.0. Edited papers of the XVIII Hungarian Labour Law Conference.] Budapest, Wolters Kluwer, 2021. 132–135.

²² Act I of 2012 on the Labour Code (hereinafter: Labour Code), Art. 134.

²³ Act 130 of 2016 on civil litigation procedure Art. 522(1).

Court practice has developed a number of guidelines for the proper recording of working time.²⁴ Thus, the register must be such that a clear conclusion can be drawn as to whether the statutory requirements are complied with, and any changes in the working time schedule must be properly documented. Double record keeping is prohibited.²⁵ The requirement to keep up-to-date registers does not mean that each entry must be entered in the register immediately, but on the same day.²⁶ In the absence of a working time register, the employee might rely on any other evidence, for example witnesses, other documents, data from the electronic access system, or network login data. Based on reliable evidence, the court may establish the number of hours worked by estimation.²⁷ The Supreme Court (Kúria) also highlighted that the law does not explicitly provide for the obligation to keep records of working time at the place of work. However, the employer must record working time in an objective, reliable, up-to-date and verifiable manner, having regard to the regulatory purpose of this obligation.²⁸

Thus, Hungarian labour law, just like EU law, only sets out some of the content and quality requirements of the working time record, but does not prescribe its form. Employers are free to use electronic solutions, which are widely used because of their practicality. It is clear from judicial practice that records kept in electronic form are also suitable for meeting the legal requirements.²⁹

3. Working time planning

The planning of working time schedules is a much more complex task than keeping records of hours worked. First, ensuring compliance with the rather complex rules on working time is a challenge in itself. Second, while manoeuvring through the legal barriers, employers shall seek to find the most appropriate schedules for the operation of their business. For that aim, they must take into account a number of factors, many of which falls outside the employment field.

The most relevant data for working time planning are the following:

- Incoming orders: the primary consideration should be the expected demand for the employer's product or service in the period under consideration. Employers not only need to ensure they have the adequate workforce for peak periods, but

²⁴ For a comprehensive analysis, see MÁRIÁS op. cit. 138.

²⁵ BH2013. 226.

²⁶ BH2020. 52; EBH2016. M.13. Edina TASS: A munkaidő-nyilvántartási kötelezettség a bírói gyakorlatban. [The obligation to record working time in judicial practice.] In: Zoltán BANKÓ – Gyula BERKE – Erika TÁLNÉ MOLNÁR (ed.): *Quid juris? Ünnepi kötet a Munkaügyi Bírák Országos Egyesülete megalakulásának 20. évfordulójára*. [Quid juris? Commemorative volume on the 20th anniversary of the National Association of Labour Judges.] Budapest, Kúria, PTE ÁJK, Munkaügyi Bírák Országos Egyesülete, 2018. 463–464.

²⁷ HALMOS op. cit. 207.

²⁸ 1/2022. Uniformity decision.

²⁹ See for example the following decisions of the Supreme Court: EBH2016. M.13.; BH2020. 52.; BH2020. 311.

also should think about how to bridge downtimes when it is harder to assign relevant tasks to the workers.

- Machines' output: if the employer's activities are asset-intensive, the limited capacity of certain tools and equipment must be considered. To improve utilisation, it may be necessary to introduce additional shifts or longer and/or more working days.
- Raw materials: even with huge demands for the product (service) and a high-performance machinery, the raw materials needed for the activity might be scarce or available only during certain times of the year. In some sectors (e.g. food processing) the most important task of working time management is to ensure precisely that raw materials are processed quickly, upon arrival.
- Storage capacity: depending on the nature of the product, the employer's limited storage capacity or the high storage costs could have a serious impact on working time planning. In such cases, the storage possibilities determine the quantity of product that can be produced, which affects the required measure of working time.
- Transport capacity: like storage, the availability and cost of transport may affect the scheduling of working time.
- Available workforce: from the HR side, a key factor in planning working time is the number of employees that can be assigned to the task. In addition to the headcount of employees, the loss of staff due to planned and unforeseen absences should also be monitored. The additional costs of overtime pay shall also be calculated.

While the above list is not exhaustive, it well illustrates the complex nature of working time planning. An optimal working time schedule requires the combined consideration of many relevant factors, which is hardly conceivable without the help of a computer. In the era of algorithmic management there are many services available where this complex planning task is carried out automatically with the help of algorithms. The employer simply defines the relevant factors and uploads the data based on its previous operations, and the software uses this data to design the optimal schedules, which also respect the labour law provisions. Such IT tools can enable the employer to remove unproductive or inactive time from paid working hours and schedule working time solely to those periods when the workforce is needed.³⁰

For example, in the United States many retailers have adopted scheduling optimisation systems. These systems draw on a variety of data to predict customer demand, make decisions about the most efficient workforce schedule, and generate schedules that can adjust in real time as new data becomes available. Some systems use computer vision and algorithms to monitor and measure in-store customer traffic and

³⁰ Agnieszka PIASNA: Algorithms of time: How algorithmic management changes the temporalities of work and prospects for working time reduction. *Cambridge Journal of Economics* 48, 1. (2023), 115. <https://doi.org/10.1093/cje/bead017>

worker activities. The system then estimates sales productivity scores for each worker, and creates schedules based on those scores.³¹

Nevertheless, the development of such IT-tools is rather complicated. If a poorly programmed management system is unable to handle some (otherwise legal) working time schedules or cannot amend the actual schedules quickly, then digitalisation becomes an obstacle to the optimal functioning of the employer.³²

While digitalisation may make it possible for the employer to operate with the optimal working time schedules, it is questionable whether and how the interests of the employee would appear in this system. The algorithm could be able to design a schedule that perfectly fits the employer's interests, yet it may prove to be unacceptable for the employees. For example, according to the suggested schedule, in the hospitality sector, during the summer months, no employee can take any annual leave and as few weekly rest days are scheduled as possible; a retailer concentrates all possible overtime for the advent period; a logistics company schedules all deliveries for the night because shipping costs are higher during the day. These solutions may be legal. Still, beyond legal compliance, the schedule shall not ignore the needs of the human beings who will make the job done. If the workers' aspects are not considered, the scheduling software will dictate everything, from how much sleep the workers and their children can get to what groceries they will be able to buy in the relevant month.³³

Employers shall not "over-optimize" their workforce management, which results in harsh scheduling practices.³⁴ Even if an employer is not specifically committed to providing decent working conditions, it should be aware that undesirable (or unrealistic) schedules could make the recruitment of the necessary personnel nearly impossible, or could lead to high fluctuation levels.

3.1. The labour law requirements to consider workers' preferences

There is a growing body of law in the EU to mitigate the possible harmful effects of automated decision-making; more specifically, the use of artificial intelligence.³⁵ Nonetheless, this paper concentrates only on the labour law provisions calling for the consideration of the human perspective in working time planning.

³¹ BERNHARDT – SULEIMAN – KRESGE op. cit. 9.

³² Mátyás ZIMMER: Az üzemi munkaidő-szervezés gyakorlati kérdései. [Practical issues in the organisation of working time in the workplace.] In: Lajos PÁL – Zoltán PETROVICS (ed.): *Visegrád 17.0 – A XVII. Magyar Munkajogi Konferencia szerkesztett előadásai*. [Visegrád 17.0. Edited papers of the XVII Hungarian Labour Law Conference.] Budapest, Wolters Kluwer, 2020. 236.

³³ Jodi KANTOR: Working Anything but 9 to 5: Scheduling Technology Leaves Low-Income Parents with Hours of Chaos. *The New York Times*, August 13, 2014, <https://tinyurl.com/2fys7kb7>

³⁴ Carrie GLEASON, Susan J. LAMBERT: "Uncertainty by the Hour." Open Society Foundations' Future of Work Project. Position Paper, 2014. 3., <https://tinyurl.com/fndh9eht>

³⁵ See Article 22 of the GDPR on automated individual decision-making, the proposal for the Artificial Intelligence Act (COM/2021/206 final) and the proposal on improving working conditions in platform work (COM/2021/762 final), especially Chapter III on Algorithmic management.

The principle that the worker is not only the subject of the employer's working time schedules, but his/her preferences shall be taken into account, appears also in the WTD. Under the enigmatic title "Pattern of work", it prescribes that Member States shall take the measures necessary to ensure that an employer who intends to organise work according to a certain pattern, takes account of the general principle of adapting work to the worker, with a view to alleviating monotonous work, and work at a predetermined work-rate, depending on the type of activity, and of safety and health requirements, especially as regards breaks during working time.³⁶

The adapting work to the worker or the "humanisation of work" principle could be among the most important provisions of the WTD. It sets the priority of the human perspective over the economic considerations, regardless of the available technologies. Consequently, working time must be adopted to the worker's needs as a human being with dignity and autonomy, rather than insisting on the subjection of the worker's human needs to the employer's economic interests.³⁷ It is worth mentioning that the same provision was included also in the previous directive, coming into effect in 1996, even if during those years IT was incomparably less developed than today.³⁸ Nonetheless, during these almost four decades having this provision in force, it has never been interpreted by the CJEU yet. In the absence of case-law, it is not exactly clear what this requirement means for the application of the more concrete articles of the directive.³⁹

The Hungarian Labour Code contains a similarly important principle, stating that the employer shall schedule working time considering the requirements of occupational health and safety and the nature of the work.⁴⁰ While the employer may decide on the employees' schedules unilaterally, it shall not only respect the explicit rules of the Labour Code, like on minimum rest periods or maximum level of daily and weekly working time, but also the more general principle of the protection of workers' health and safety. The significance of this is illustrated by the fact that some schedules may be mathematically correct and at the same time, lead to dangerous fatigue for the worker, thus it should be avoided. For example, the Hungarian legislation is very flexible in allowing for a "grouping" of weekly rest days, which can mean long weeks of continuous work with a "rest block" only at the end.⁴¹ Such a schedule, numerically, may comply with the rules on weekly rest days, but it may undermine the overarching objective of the working time rules to protect workers' health and safety. Thus it is unlawful.

³⁶ WTD Article 13.

³⁷ Alan BOGG: Article 31: Fair and Just Working Conditions. In: Steve J. PEERS – Tamara HERVEY – Jeff KENNER and – Angela WARD (ed.): *The EU Charter of Fundamental Rights: a commentary*. Oxford, Hart, 2014. 862.

³⁸ See Council Directive 93/104/EC of 23 November 1993 concerning certain aspects of the organization of working time, Article 13.

³⁹ Karl RIESENHUBER: *European Employment Law: A Systemic Exposition*. Intersentia, 2021. 544.

⁴⁰ Labour Code Art. 97(1).

⁴¹ Labour Code Art. 105(3) and 106(3).

3.2. Technology in support of the human perspective

The most modern technological solutions can also play a pioneering role in ensuring that the preferences of employees are reflected in working time planning as much as possible. When designing working time schedules, employees' needs are not necessarily ignored simply because they are contrary to the economic interests of the employer. In many cases, the employer lacks the required tools, knowledge or human resources to identify workers' priorities, analyse employees' opinions and incorporate them into working time planning. Automation can also help employers and employees to give more emphasis on the human perspective in working time management.

A working time planning system using modern technologies, including artificial intelligence, can enhance the human aspect especially by the following:

- collecting workers' feedback. The system can automate the process of gathering and analysing immediate feedback from employees by regular online surveys or by AI-powered chatbots. AI could be useful to correlate feedback with workers' performance levels to understand the impact of scheduling on productivity and employee satisfaction.
- offering alternatives for the workers. The planning system can provide flexible scheduling options, propose alternative shifts or tasks that align better with workers' personal needs and preferences. An AI-managed working time tool can facilitate shift-swapping between employees by identifying suitable matches based on skills and availability. Note that EU law explicitly prescribes for parents the right to request flexible working arrangements for caring purposes. Employers shall consider and respond to such requests within a reasonable period of time, taking into account the needs of both the employer and the worker and include a reasoning in case of refusal.⁴² Digitalised tools can facilitate the management of such requests.
- analysing workers' choices: the system can analyse the data on workers' scheduling choices and preferences to improve future planning. Algorithms can detect patterns in employee choices and identify trends and preferences over time. AI can also predict future preferences and availability.
- measuring efficiency: AI can monitor and measure the efficiency of working time schedules by tracking the most important indicators (as set by the employer, like the costs of one time unit, or the labour costs of one product), and can generate detailed reports to highlight areas for possible improvement.
- enhancing enforcement of working time rules: the application that generates the schedules must be designed to treat the legal provisions as an inescapable framework, and be able to interpret them correctly. This will ensure full compliance with the working time rules. For example, the practical implementation of the separation of working time and rest periods, or in a digital working environment: the right to disconnect, can be greatly enhanced

⁴² Directive (EU) 2019/1158 of the European Parliament and of the Council of 20 June 2019 on work-life balance for parents and carers and repealing Council Directive 2010/18/EU Art. 9.

if the time management system consistently respects mandatory rest periods, controls electronic communication outside working hours, records working time accurately and monitors employee satisfaction.⁴³

Managing these tasks without the help of digital tools can be extremely resource intensive. Technology is not only able to optimise working time management according to the employer's interests; it can also be used to reflect the employees' priorities.

4. Summary

Tasks related to the recording and planning of working time are as old as the modern employment relationship. Therefore, employers have had to take these obligations into account way before IT tools were available to facilitate their fulfilment. However, employers have been able to rely on certain technical help to meet these obligations from the outset. For example, pre-printed timesheets or blocking clocks were the first milestones on the road that, by now has led to AI-driven solutions. In any case, the development is impressive, which not only makes employers' administrative tasks much easier, but leads to much more efficient decision-making and employer control by managing the huge amount of data on working time.

While the benefits of this technological development are clear on the employer's side, it is not self-evident that it would be in the interests of the employees. In my view, labour law regulation should seek to ensure that the results of this technological revolution are not unilateral benefits for employers, but mutually beneficial solutions. Data-driven technologies are, in the end, creatures of their creators and users. In the workplace, employers decide if, when, and how to use electronic monitoring; which performance metrics to use; which management decisions or functions to automate. Data driven technologies can be used also to help workers, make them safer, reduce monotony and improve their work lives.⁴⁴

The study presented a few examples to prove that digitalisation is not necessarily an obstacle in front of the humanisation of working time; on the contrary, it could also be its facilitator. It is fairly beneficial that we are not acting in a legal vacuum in this respect. Since the mid-1990s, EU legislation has laid down the principle that the organisation of working time must take account of the worker him/herself. Although this general rule has not yet been interpreted by the Court, it is possible that it will be invoked in the near future, precisely in cases triggered by digitalisation. Moreover, the basic institutions of working time rules, like the strict divide between working time and rest periods, shall be complied with, irrespective of how digitalised the workplace is. The newly adopted EU measures on the use of AI and algorithmic management can help to avoid abusive practices. However, it is primarily up to employers and workers'

⁴³ EUROFOUND: *Right to disconnect: Exploring company practices*. Publications Office of the European Union, Luxembourg, 2021. 45–46.

⁴⁴ BERNHARDT – SULEIMAN – KRESGE op. cit. 6., 15.

representatives to develop practical solutions that shape the future organisation of working time in a way that is beneficial to both sides.

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