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Democracy at Work through Transparent and Inclusive Algorithmic Management

STOCK-TAKING REPORTS

Emerging Organizational Architecture of Algorithmic Management and the Institutional Context of Weak Collective Voice

Hungary

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Content

Glossary 3

Introduction 4

Section I – Research and data sources in relation to the use of algorithms, artificial intelligence and algorithmic management 7

1.1 Overview of state-of-the-art works in Hungary 8

Section II – Main policy issues and challenges in relation to the use of algorithms and algorithmic management by companies: views from Social Partners and the government 11

2.1 Social dialogue in Hungary after the collapse of the state-socialist political-economic regime: Fast erosion of the Hungarian Labour Relations System 11

2.2 Hungarian labour relations partners' attitudes towards AI/AM: exploration and early phase of exploitation 13

Section III – The governance of algorithmic management; the role of collective bargaining 14

3.1 Government AI Strategy Development: Training/Competence Development of Workforce with the Exclusion of IRS Actors 14

References 16

Annex No. 1 Hungarian labour law regulation (excerpts) 18

Annex No. 2 Interview guidelines and preliminary structure of the case study 19

Annex No. 3 The list of persons interviewed 21

Glossary

Algorithmic Management' (AM)

'Artificial Intelligence' (AI)

'Company Executive Official' (CEO)

'Collective Bargaining' (CB)

'DHL Supply Chain' (DHL SC)

'Deutsche Post DHL' (DP DHL)

'Human Resource Management' (HRM)

'Hungarian Forint' (HUF)

'Hungarian Industrial Relations System' (HIRS)

'Internet of Things' (IoT)

'National Federation of Works Councils' (MOSZ in Hungarian)

'Operations Management System' (OMS)

'Project Planning System' (PPS)

'Sector-level Skills Councils' (SSC)

'Work Labor Management' (WLM)

'Works Council' (WC)

Introduction

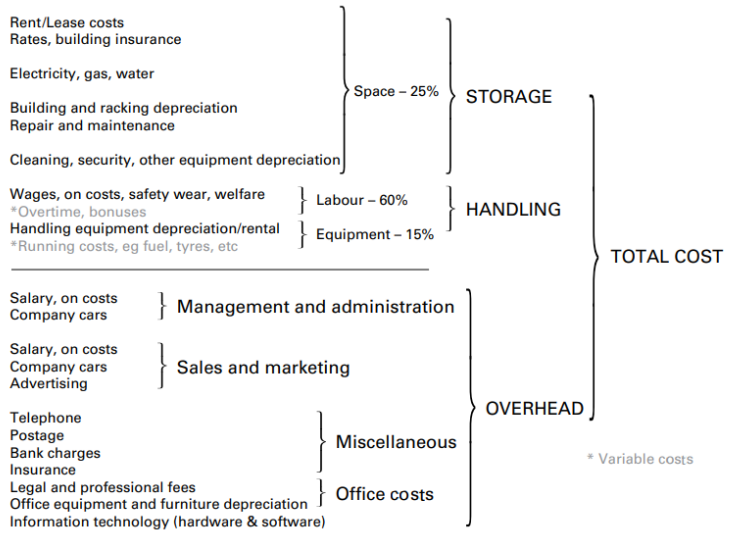
A. The cases to be investigated in Hungary

To provide the general context for the extension and use of algorithms, artificial intelligence mechanisms and algorithmic management **in the companies investigated in Hungary**, our inquiry conducted interviews and developed case studies of two firms: **DHL Supply Chain and Data Expert.** (A list of the interviewed persons is available in Annex no. 2.)

DHL Supply Chain (DHL SC) is part of the Deutsche Post DHL Group. DHL was originally founded in San Francisco USA (1969), and through several acquisitions and corporate development in the field of logistics, the Deutsche Post became the major shareholder of DHL by 2002 and rebranded the firm to Deutsche Post DHL (DP DHL) in 2009. By today DP DHL has over 200,000 workers. DHL SC is a sub-unit of DP DHL, and it focuses on warehousing and value-added logistics services. DHL SC exists in 55 countries worldwide and operates 1,400 warehouses and offices on 11,470,000 square meters and has 146,000 workers. DHL SC has been established in Hungary in 1997, by 2022 they have 666 employees and 2020 their net revenue was about 10 million EUR.

Warehousing services is a labour-intensive business in logistics, according to the Warehousing handbook (Richards, 2014). The normal cost distribution of a warehouse is the following:

Figure 1: *Simple Warehouse cost tree*



Source: *Richards, G. (2014). Warehouse management: a complete guide to improving efficiency and minimizing costs in the modern warehouse*

The largest part of warehousing cost is related to labour. Depending on the country and the profile of the warehouse, labour varies between 50 and 80% of the total cost. In general, warehousing services is a relatively low margin business in logistics, as the value-added of storing is not comparable to transportation. Therefore,

management of labour is critical in warehousing, and if a company can do it well, it gains a clear competitive advantage on the market.

During 2015-2016 DHL SC went through a crisis in Latin-America; one of their largest customers was not satisfied with cost and services and wanted to terminate the contract with them. The main reason of underperformance stemmed from the fact that the company had made several acquisitions in the past without integrating the new businesses properly into their main organization. DHL SC had to "turn the ship around" to avoid losing large customers and began to focus on massive standardization across the globe and implementing lean principles that were focusing on eliminating process waste from a customer perspective. Part of the standardization process was to implement the so-called Operations Management System (OMS), which among many other features included a resource planning and performance monitoring and management module called Work Labour Management (WLM). The aim of the system is to monitor the workers' performance in real time and to provide insights to their leaders. In Hungary the law allows companies to pay part of the salary based on individual performance, and DHL SC is using this possibility to motivate workers for higher performance.

The second case study is focuses on DataExpert Ltd., a company that introduced a self-developed application, the so-called Project Planning System (PPS) that provides full transparency across the company regarding the employees' productivity, occupation and the real-time contribution of the employees and the departments to the business and financial results. The tool is considered as an alteration of Algorithmic Management (AM) that has the following attributes:

- "Prolific data collection and surveillance of workers through technology;
- Real-time responsiveness to data that informs management decisions;
- Automated or semi-automated decision-making;
- Transfer of performance evaluations to rating systems or other metrics; and
- The use of "nudges" and penalties to indirectly incentivize worker' behaviour." (Mateescu & Nguyen 2019:3)

DataExpert Ltd. is a Hungarian private company owned by two entrepreneurs who established the organization in 2007. Initially the scope of the business was on providing online survey programming, data cleaning and data processing service for market research agencies that have outsourced these stages of a market research project. The organization has been exponentially growing in the first 10 years and they have achieved a head count of 60, currently. The peak in terms of the size was 80 full-time employees right before the pandemic and the revenue has been gradually increasing in the 15 years of the DataExpert Ltd.'s history. The client base of the company became highly diversified; in the first 8 years one large customer provided the business stability, while now the two departments serve all together 200 customers.

The business model is quite unique, with operations being primarily project based, meaning that the conditions of the collaboration – including the price, deadlines and the deliverables – are negotiated with the clients project by project, and in most of the cases without a contractual guarantee for an expected amount of revenue or project number within a certain period of time. However, more intense cooperation is incentivized by a rebate scheme.

The pace of the growth and the dynamism of the business model indicated the need of a system that helps to track the on-going activities and the state of the financial balance within the business to enable the management to intervene instantly, if needed. The PPS was introduced in 2011 when the team size was 10.

Back then the system was designed to support the human resource management by planning and booking the activities by projects, reporting the progress to the customers and the management, and tracking the overall financial results.

As the company have been progressing and improving its maturity the PPS had to be developed to fulfil the requirements of the business. Productivity, resource utilization, real time occupation, and the link between these measures and the revenue were the priorities in the first years, since the client base was relatively small, the applied methods were rather standard, and the range of the applied technologies were narrow. During that period, one main customer generated the vast majority of the revenue.

The expertise and the service portfolio were emerging rapidly, and with the introduction of higher added-valued activities, such as data visualization and data modelling services, opportunities emerged to engage a significantly wider range of customers. The tracking of the projects and the retrospective data analysis was no longer sufficient, with the individual productivity and efficiency, as well as the real-time financial results and cash-flow tracking becoming the most important information for the management. Instead of reactive intervention in instances of insufficient delivery, the proactive, immediate actions were supported by the system.

Currently, the PPS provides information on individual, departmental and company level that:

- makes the performance indicators and project efficiency transparent for the employees real-time available;
- supports the team leaders in resource allocation, skill management and performance reviews;
- ensures that the management is up-to-date about resource efficiency, the account performance and sales, and the actual status of the cash-flow; and
- alerts the business development if an account or a target market needs more attention.

The operation of the system, as well as its further development do require the appropriate input of employees, and from the beginning the reporting has been relying on their data inputs. Via the system, the overall results and the business targets of the company are accessible for all the employees, and by the application of the system the transparency of the performance is part of the company culture.

Considering the five characteristics that have been conceptualized by Mateescu & Nguyen (2019), the PPS does represent an algorithmic management solution, since:

- the data feed is regular; the employees book all their hours spent on projects every day;
- the system monitors, tracks and implicitly controls the workers through the technology; by making the productivity, efficiency and profitability transparent for every and each employee. As such, it contributes to the implicit and explicit performance management: the colleagues can delegate tasks for the least occupied ones or the most productive ones; furthermore, the people managers/team leaders can initiate improvement programs based on the observed performance indicators;
- it facilitates the decision making in HRM as well as business development via real-time information about the financial results and employees' occupation;
- performance against productivity targets are automatically evaluated; and
- it indirectly incentivizes the workers through full transparency.

B. Challenges of algorithmic management for industrial relations in Hungary: Weakening of traditional institutions of collective voice and slowly emerging 'grassroot' movements

The social science community and policy makers have paid little attention to the social and economic dimensions of digitisation of work and employment (e.g. platform work) in Hungary. This lack of interest is true for the traditional and online social media as well. In recent years only two EU-funded empirical projects were carried out with the aim of collecting systematic knowledge on the impacts of the AM on the labour process and employment conditions. These sociological studies have begun to map the working and employment conditions of both location and web-based digital labour platforms in the perspective of industrial relations, focusing on the collective representation of workers (Makó, Illéssy and Pap, 2021, Meszmann, 2018).

In addition, it is worth highlighting a recent European project focusing on the legal regulations of the Industry 4.0 from the perspective of the labour law (Kun, Rácz and Szabó, 2021). The key interest of the Hungarian, Italian, German and Polish labour law experts involved with the project is to better understand the changing forms of control represented by AM in comparison with the traditional forms of control (i.e. hierarchical, bureaucratic, Stark, Pais, 2020). This is the only project supported by the National Federation of Works Council (in Hungarian abbreviation: MOSZ). This trade union was founded just before the collapse of the state-socialist political and economic regime and has historical roots in the Works Council movement which was born during the 1956 revolution (Kun, Rácz and Szabó, 2021).

In the case of the traditional and non-traditional media, there is a visible division between the mainstream media, which almost ignores the new topics of work and employment in the fast-growing platform economy. However, some specialised blogs follow systematically the emergence of new forms of work in the platform economy with particular interest on web-based platforms such as Upwork, Fiverr, and Freelancer. In this relation, a 'grassroot' movement of freelancers has emerged. The freelancers' initiatives were systematically analysed through the content analysis of the annually organised 'Freelancer Festivals' (2017-2020). From the point of view of the industrial relations, one of the key lessons is that the overwhelming majority of Upworkers and other freelancers identified themselves as entrepreneur and did not express visible interest for collective representation (Benedek, Makó and Illéssy, 2021).

Earlier research on the possible trade union strategies towards the challenges of digitisation found the following pattern: Hungarian bargaining parties (i.e. both trade unions and employers' organisations) are unable to broaden the scope of bargaining in the weakened legal environment of collective bargaining. However the substantial wage increase in the minimum and average wages in the context of the tight labour market – since 2017 - could create a favourable institutional context to strengthen the bargaining position of Hungarian trade unions. However, 'Time will tell if trade unions will be able to translate the labour market shortages into better and more sustainable system of collective bargaining, which requires organisationally strengthened trade unions at all levels of bargaining.' (Borbély and Neumann, 2019:18).

Section I – Research and data sources in relation to the use of algorithms, artificial intelligence and algorithmic management

This section provides an overview of the state of the art of algorithmic management and the use of algorithms by companies in Hungary, overviewing works from different disciplines on the issue. Here we focus on the impacts of algorithms over workers and working conditions, on the forms of governing and regulating

algorithms, and on the role of collective bargaining and worker representation structures in governing and regulating algorithms.

DHL Supply Chain and DataExpert, were selected and approved by the companies to conduct field work within the INCODING project. In the first company, a newly created trade union has been established in recent years, while in DataExpert, neither trade union or Works Council are operating, and therefore, the issues of collective bargaining are not yet in the focus of the social actors. Therefore, the Hungarian team intends to pay special attention on any emerging initiatives of the individual and collective voice formation. In this relation, we draw on research of the Hungarian platform workers as they are the employees whose working conditions are most affected by the use of AM. Their attitudes toward *collective representation or voice* formation are in an early phase of development. Using the well-known forms of behavioural cycles such as 'Exit', 'Loyalty', (individual and collective) 'Voice' and 'Silence' in the traditional organisational settings (Gleeson, 2016), we may say that the majority of the Hungarian platform workers chooses 'Silence' or 'Individual Voice' instead of 'Collective One'. In other words, they are in a 'wait-and-see' *behavioural position*. Surprisingly enough, when we survey the *perceptions (attitudes)* of platform workers and asked them what they need the most from collective organization, be it a traditional trade union or a 'grassroot' organization, they identified four key areas where they saw a potential room for action:

a) To help organize.

b) To reveal the reality of platform work.

c) To identify and make platform operation ' more visible.

d) To put pressure on the platform company to ensure proper working conditions (vehicles, resting zones, proper handover and drop off points, realistic demands relative to timing, improvement of the algorithm) (Makó, Illéssy and Pap, 2021:123).

1.1 Overview of state-of-the-art works in Hungary

The literature of AM is limited in Hungary. Using the search word combinations of algorithmic management, digital performance management, performance management and the Hungarian versions of these reveals a handful of relevant papers. Moreover, finding those that are published in international journals or highly cited is even more difficult.[1] The scarcity of papers that address AM in a Hungarian context is contradicting the fact that Hungary is in the first quantile of countries in the Eurasian region in terms of digital skills. According to Sands et al. (2021), Hungary is ranking #18 overall out of 72 countries in the Eurasian region. The overall ranking is a combination of three digital skills: Business, in which Hungary is #49, Technology (Software Engineering), where Hungary is #4, and Data Science which Hungary ranks #18.

[1] In their paper, Nagy et al. (2018) used Porter's value chain model to analyze Hungarian firms' practices of using Internet of Things (IoT) in their business. Related to the Human Resource Management element of the value chain model, they found out that the most important topics are data protection, performance related payments, disappearing and emerging areas of work, inadequate quality and shortage of workforce, and the trainings potential development. Kosztyán and Szalkai (2018) demonstrates the usage of a matrix-based approach that optimize the time-quality-cost trade-off problems in project management. Gáspár and Thalmeiner (2020) examine the KPI-tree model that is using big data analytics and data from industry 4.0 sources to explore anticipated performance of the organization, and future deviation from the objectives. Szász et al. (2021) surveyed 705 manufacturing plants from 22 countries and provided evidence that implementing industry 4.0 positively impacts performance, cost, quality, delivery and flexibility.

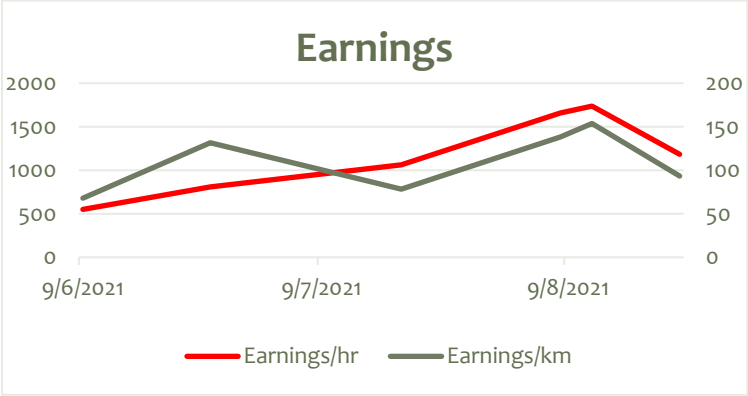
Moniz et al. (2022) studied the platform economies of four European countries': Hungary, Spain, Portugal and Germany. In the Hungarian context, there were three companies using AM:. Upwork, the largest global online labour market provider; Wolt the global food delivery company; and Bolt the global mobility and food delivery company, which out-competed Uber in Hungary. In case of Upwork, AM is used for performance management as well as finding or matching talents with tasks (Pap, J., & Makó, Cs., 2021).

Wolt has been established in Helsinki, Finland in 2014 by six entrepreneurs. According to interviews with the CEO and Co-Founder Mikki Kuusi,their motivation stems from their Uber experience, and they thought that there was a great chance that everything that people do offline will go online in the near future due to the penetration of smartphones. Their focus became last-mile logistics, e.g. delivering goods from stores to home ordered online, which has proven to be a strong market One of the founders' family had a pizzeria, so they decided to start with food deliveries, launching their first delivery in 2015. Fast forward by 2021, the Wolt platform was present in 23 countries worldwide and provided platform work for tens of thousands of food couriers. At the end of 2021, Wolt wasacquired by a US company called DOORDASH for seven billion EUR.

Wolt has established its Hungarian operation in 2018. By the end of 2021 there were about 4,000 restaurants and 5,000 platform workers using the platform. They also opened new verticals such as grocery and pharma deliveries, with the COVID-19 pandemic boosting Wolt and other online delivery platforms.

Wolt is using AM for their entire operation, including task allocation, performance monitoring, job optimization, and performance evaluation (Pap, J., & Makó, Cs., 2021). Bolt is also using AM for their entire operation, including taxi and food delivery services as well, in terms of task allocation, performance monitoring, optimization, performance evaluation (Pap, J., & Makó, Cs., 2021). These AMs can reward and punish platform workers, based on their past performance. In case of Bolt and Wolt, the AM has an extremely important impact on earnings of the workers. AM is used to manage prices for location-based services, and in surge times and surge areas when demand is high, it can provide additional fees on top of normal delivery prices for the platform workers to motivate them to work and manage the available workload. For instance, in case of heavy rain or cold when people are less likely to go out for dinner, Wolt's AM adds an additional HUF 100 per delivery to engage workers despite of the bad weather conditions. Based on action research conducted during the CrowdWork21 research project, we have gathered original empirical data from food delivery services. The action research consisted of six different working days spent in a food delivery company over a two month period over 100 km distance by bicycle. The research took place normally on weekdays during the summer, in evening hours. Details are visible on Figure 2.

Figure 2: *Action research project in CrowdWork21*



Source: *Pap, J., & Makó, Cs., 2021. The authors' original empirical data.*

There is a learning curve for both the worker and the algorithm. During this learning curve, the income per hour doubled, while the income per km grew by 50%. The speed has also grown from the first day at 8 km/h to the last day at 12,7 km/h.

At Wolt AM is used primarily for task allocation, determining which courier gets a certain task using pre-set knowledge elements set by city logistics experts, with the AM using machine learning deciding on task allocation. During the research project it became clear that in the view of the workers, there were some issues with it and that the reliability of the AM is limited , while the management perceived the AM very positively, concluding there were "only" some issues. During the action research it became obvious that there are substantial differences relative to how much a courier needs to work, and how much money he or she can make. In addition, there is a learning curve for both the courier and the algorithm to develop higher performance. The AM is also doing constant performance monitoring, giving signals to the courier about the deadline of the deliveries and pickups. The AM is not only monitors performance, but also manages it. Besides availability and speed of the courier, it considers the rating of the customers as well, providing opportunities for the couriers to add their own input.

In this fast evolving arena, Ződi (2022) has also begun to examine the impacts of the machine-made decisions on the person's legal position in the Hungarian context

Over the course of our research project, we conducted interviews with couriers, managers, and engaged in action research of the platform as a client and platform worker. From our interviews it was observed that there is no collective representation of the workers, and, despite of the best intentions of the Hungarian management, the workers are exploited, and left in many cases. Interestingly, by the end of our research project, two grassroots movements initiated by couriers emerged. Both have been registered – only in 2021 - as a trade union in Hungary, each have attracted hundreds of members, and these groups have begun to address very practical problems of the couriers. However, until present the newly created trade unions' activities are lacking the visibility.

Section II – Main policy issues and challenges in relation to the use of algorithms and algorithmic management by companies: views from Social Partners and the government

The aim of this section is to discuss the main views of social partners and the government in relation to the use of algorithms and artificial intelligence mechanisms at the workplace level. This section specifically reflects on the following issues:

- Which are the most important challenges posed by the extension of algorithms and artificial intelligence mechanisms according to trade unions, employer organizations and the government?
- What proposals have been put forward by trade unions, employer organizations and the government to regulate and govern these issues?

To understand the approach of the social actors towards toward AI/AM, it is necessary to briefly outline the main features of the Hungarian Labour Relations System and the positions of the key actors: trade unions, employers' associations and the government.

2.1 Social dialogue in Hungary after the collapse of the state-socialist political-economic regime: Fast erosion of the Hungarian Labour Relations System[2]

The Hungarian trade unions suffered substantial membership loss within a few years during the political and economic restructuring process and especially under the impact of the so-called mass privatisation during the early 1990s. In the state-socialist political and economic system, union membership was almost compulsory, but overall trade union density has now fallen to around less than ten per cent (Neumann, 2018). In 2000, the collective bargaining (C.A.) coverage rate was 47%; it has dropped by 2020 to 30%. The bargaining system is currently decentralized and uncoordinated, with limited impact on working conditions and confined principally to single-employer agreements in the private sector and public companies. Most collective agreements are signed in large or medium-sized companies. The coverage rate is the highest among state- and municipality-owned companies. Collective agreements are extremely low among SMEs[3], while the coverage rate is the highest in the group of the state- and municipality owned enterprises: 36.7% of workforce covered by single-employer's agreement. As concerning the competitive sector, 21.8% of the workforce is covered by single employer's C.A., while 10.5% by multi-employer C.A.[4]

Sector level agreements in Hungary used to be and still are quite rare. Sector-level negotiation is inhibited by the absence of employers' organizations prepared to negotiate. Although industry-level business associations exist, in most cases their role is limited to lobbying.

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[2] This section on the post-socialist development of Hungarian social dialogue is based on Borbély, Sz., Makó, Cs. and Illéssy, M. 2020: 25-26.
[3] The SME segment of the Hungarian economy is the largest employer with 1.8 million workforce.
[4] http://www.mkir.gov.hu/index.php. For total number of employees (at employers with at least five employees, without public works, July/2017): HCSO, https://www.ksh.hu/docs/hun/xstadat/xstadat_evkozi/e_qli033.html, https://www.ksh.hu/docs/hun/xstadat/xstadat_evkozi/e_qli034.html,

Using the Eurofound developed indicators of the industrial democracy related governance (Sanz, Weltz, Caprile and Contreras, 2020), the EU-28 countries classified into six clusters. The following table summarizes the countries by governance clusters.

Table 1: *Clusters of industrial democracy*

Clusters	**Countries**
Corporatist-framed governance	Austria, Belgium, Luxemburg and the Netherlands
Voluntary associated governance	**Germany, Denmark**, Finland and Sweden
State framed governance	**Spain,** France, Portugal, Slovenia (and Greece from 2008-2012)
Statutory company-based governance	Croatia, **Hungary**, Slovakia
Voluntary company-based governance	Bulgaria, Cyprus, Czech Republic, Ireland, Latvia, Lithuania, Malta, Romania (and Greece for 2013-2017)
Market-oriented governance	Estonia, Poland, UK

Note: *Dimensions of industrial democracy governance: a) associational governance, b) representation and participation rights, c) social dialogue at company level, d) trade union strength and government intervention in industrial relations, in: Sanz, Weltz, Caprile and Contreras, 2020:10*

The clusters have the complete set of both normative (e.g. collective bargaining coverage) and contextual (e.g. degree of centralization of collective bargaining) indicators. According to the quantitative analysis of the trends between 2013 and 2017, "cluster 1 and cluster 2 score above 70 points, for above the EU-28 average; cluster 3 scores close to the European mean, whilst cluster 3, 4 and 5 scores well below the EU28 average." (Op.cit. 2020:12). The key features of the governance clusters (Sanz, Weltz, Caprile and Contreras, 2020:14-15) covering the INCODING consortium members are as follows:

Cluster 2- This country group is characterised by the strong tradition of regulation based on coordinated and centralized bargaining practice plus high collective bargaining coverage rate. The centralized bargaining system "…evolved, particularly in Sweden and Denmark, towards a two-tier system of centralised-decentralized collective bargaining where national and sector level framework agreements are supplemented by company agreements covering topics such as vocational training, work organization, company-level social security and employability/workability." (Op.cit.:14)
Custer 3- Countries in this cluster have both the strongest intervention in the collective bargaining and the weakest trade union densities. "A defining feature of this cluster is the low performance in social dialogue at company level, a phenomenon, which is particularly evident in Italy, Portugal and Spain …" (Opc.cit.: 15)
Cluster 4- Countries in this cluster have contradictory patterns of industrial relations system. On the one hand, they are characterised by the extremely low union density, are decentralized and uncoordinated collective bargaining. On the other hand, in some Central European countries (e.g. Hungary, Slovakia) employee's participation institutions were introduced following the collapse of the state-socialist political and economic systems. For example, the Hungarian Works Councils (WC) – which are the cloned version of the German Works Councils – have extensive consultation and information rights working conditions, work organisation, training, and technological changes (Prugberger and Nádas, 2016; Gróf, Kisgyörgy and Vámos, 2008).[5]

[5] See the list of issues on the consultation and information rights of the WC in the Annex No. 1

The institution of works councils was implemented by the New Labour Law in 1992. Interest representation by the trade union and employee's participation via WCs afford a dual character of the Hungarian Industrial Relations System (HIRS). The result of the dual nature of the HIRS is the emerging "micro-corporatism" based on closes cooperation between management and labour in the individual firm (Crouch, Streeck, 2006).

2.2 Hungarian labour relations partners' attitudes towards AI/AM: exploration and early phase of exploitation

The core experience learned from the field work conducted among Hungarian trade union confederations leaders, labour relations experts and evidence learned from the relevant limited empirical research is the following: there is a growing concern and uneasy situation on how to cope the best with the challenges of interest representation in the fast growing digital economy in general and fast diffusion of the AI/AM. This is mainly due to the lack of adequate financial, human and knowledge sources. Until now, Hungarian trade unions have not succeeded in systematically collecting empirical experiences on the working, employment conditions shaped by AI/AM. Trade unions have been unable to fill this knowledge gap with the systematic use of the lessons learned from empirical research in Hungary and in other Central and Eastern European (CEE) countries. The main source of this weakness is the lack of dialogue between policy makers and the researchers. The only exception of the briefly outlined pattern is the activity of National Federation of Workers Councils (in Hungarian abbreviation: MOSZ), which has been recently hosted an EU project entitled 'Smarter Inclusive Relation to Address New Technological Challenges in the World of Work (iRel). However, the final results of this project carried out in four European countries (Hungary, Germany, Italy and Poland). (Kun, Rácz and Szabó, 2021).

In an optimistic perspective, the extensive use of AI/AM in the workplaces may challenge the existing practice of the trade unions and force them to discover and employ new forms of recruiting and advocating for the prospective members.

For example, *online forums* are slowly emerging as important tools to articulate the collective voice of the workers. These 'community spaces' are supported by IT infrastructures and '*external' forums,* such as Facebook groups or blogs informing on the new social economic implications of new forms of work and employment. These forums may challenge and offer alternatives to the existing (offline) institutions of collective voice. The traditional organisational tools in recruiting new members seem to be rather ineffective. There is a need to identify the workers' needs through recruiting methods that are consistent with the new digitally shaped working practices. For example, in addition to inventing new forms of recruiting techniques there is a need to focus more on the *strategy of advocacy* in contrast to the more traditional forms of organising strategies. This means that trade unions counselling and advising services could function as an organisational or collective learning process for both trade union staff and their new future 'clients' (various categories of the platform workers or even grassroots movement), while also creating mutual trust and engagement between trade unions and workers affected by AI/AM. Once *mutual trust and engagement* is created, it will be much easier to develop a shared vision and mutually reinforcing activities between workers and union organizers. (Borbély, Makó and Illéssy, 2020.)

Section III – The governance of algorithmic management; the role of collective bargaining

This last section aims to provide an overview of developments in relation to the regulation and governance of artificial intelligence and algorithms at work. First, it provides an overview of statutory regulations at national level in relation to this issue. Second, we will discuss to what extent there are some developments in collective bargaining when it comes to AI and AM. Third, we will also discuss developments in the two sectors where our case studies are being analysed.

3.1 Government AI Strategy Development: Training/Competence Development of Workforce with the Exclusion of IRS Actors

The most influential concept of digitisation of production is called Industry 4.0 which was born in 2011 in Germany (Buhr, 2017). Some years later the Hungarian government initiated a development project that focused on the development of small and medium sized companies (Industry 4.0 Sample Factories project[6]). Soon, the 'Industry 4.0 National Technology Platform Association' carried out a questionnaire-based survey on the main challenges of implementing digital technologies in the SMS sector. According to the results, the main inhibitors of applying these technologies were the lack of skilled workforce (23%) and digital illiteracy (17%)[7]. However, it is worth noting that even though employees' representatives should be important social partners in the design of in-house company trainings, they were totally left out from this survey (Kun, Rácz and Szabó, 2021: 2), which is an indicator of how weak the social dialogue in Hungary is.

The 'Hungarian Artificial Intelligence Coalition' (2018)[8] was founded with 74 Hungarian and international companies, universities, research institutes and various government institutions. As of early 2022 the coalition had 342 members, although representation from trade unions and employers is missing negligible. Similarly, in the recent comprehensive government strategy, called 'Hungary's Artificial Intelligence Strategy 2020-2030' (2020)[9] the role of social actors is missing. The strategy identifies two key social requirements related to the diffusion of AI: the development of the human capabilities (i.e. education, competence development)[10] and a general preparation of the population (i.e. the goal is to demystify the AI/AM, explaining what is possible and not possible with AI and how it shapes our everyday life and work.) Besides these two key social requirements, the document also indicates the following goals: improving the social awareness of one million Hungarian citizen until the end of 2021 and offer a basic course for 100, 000 of them (Hungary's Artificial Intelligence Strategy 2020-2030:30). In order to diminish the unfavourable impact of the AI, the document formulates – in a rather abstract way – the need of increasing transparency and creating models to increase the visibility of

[6] https://www.ipar4.hu/hu/page/ipar-4-0-kkv-knak
[7] https://www.i40platform.hu/sites/default/files/2021-04/Flyer_3.0_ENG.pdf
[8] https://digitalisjoletprogram.hu/en/content/artificial-intelligence-coalition
[9] Hungary's Artificial Intelligence Strategy 2020-2030.
https://digitalisjoletprogram.hu/files/2f/32/2f32f239878a4559b6541e46277d6e88.pdf
[10] The goal of this free online course is to demystify AI for everyone interested in learning what AI is, what is possible (and not possible) with AI, and how it affects our lives – with no complicated math or programming required. By completing the course, the learner can earn a LinkedIn certificate. People in Finland can also earn 2 ECTS credits through the Open University. After taking the course, learners will be able to: (1) Understand some of the major implications of AI, (2) Think critically about AI news and claims, (3) Define and discuss what AI is., and (4) Explain the methods that make AI possible. (The course has been available since May 14, 2018), **https://course.elementsofai.com**

decision making mechanisms in order to ease the interpretation of the decisions (Op.cit.:14). In relation to the regulation of the AI, the government strategy insists exclusively on the need for the fast and efficient simulation/adaptation of the EU legal regulation into the Hungarian practice (Op.cit.:18). Apart from this rather general postulate, no significant roles for trade unions or other social partners were assigned. For example, Sector level Skills Councils (SSCs) were established in 2018 to improve vocational education and training on AI. Companies are the dominating members in these SSC: although the number of memberships in one Skills Councils varies between eight and 24 depending on the size of the sector '… only one person's participation from the trade unions' side is rather negligible…[and so] trade unions' influence on SSCs' work cannot be significant.' (Kun, Rácz and Szabó, 2021:14)

References

Alkhatib, A. (2021). To live in their utopia: Why algorithmic systems create absurd outcomes. In: *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems* (New York, NY, USA, 2021), CHI 2021. https://doi.org/10.1145/3411764.3445740

Alkhabit, A. and Bernstein, M. (2019) Street-level Algorithms: A Theory and Gaps Between Policy and Decisions. In: *CHI - Conference on Human Factors in Computing Systems*. CHI 2019. https://doi.org/10.1145/3290605.3300760

Benedek, G., Makó, C. and Illéssy, M. (2021). *A Grassroots Initiative to Build a Digital Community, (The Annual Freelancing Festivals: 2017 - 2020)*. Centre for Social Sciences. (Manucript)

Borbély, Sz., Makó, C, Illéssy, M., & Nostrabadi, S. (2020) *Trade Union Strategies towards Platform Workers: Exploration Instead of Action. The Case of Hungarian Trade Unions. Working Paper.* Centre for Social Sciences,

Borbély, S., and Neumann, L. (2019) Neglected by the State: the Hungarian Experience, In: Müller, T., Vandaelle, K., & Waddington, J. (eds.) (pp. 297 – 314) *Collective Bargaining in Europe: Towards and Endgame Vol. 4*. European Trade Union Institute.

Buhr, D. (2017) *Social Innovation Policy for Industry 4.0*. Friedrich Ebert Foundation.

Gleeson, E. (2016) *Re-conceptualizing Hirschman's Exit, Voice & Loyalty model for contemporary organizational contexts*. The University of Notre Dame, Australia.

Crouch, C., and Streeck, W. (Eds.) (2006) *The Diversity of Democracy: Corporatism, Social Order and Conflicts.* Edward Elgar Publishing.

Gróf, G., Kisgyörgy, S. and Vámos, I. (2008) *A dolgozói részvétel és az üzemi tanácsok munkájának megszervezése, (Employees' Participation and How to Organise the Activities of Works Councils)*. Friedrich Ebert Foundation.

Johnston, H., and Land-Kazlauskas, C. (2019) *Organising on demand: Representation, Voice, and Collective Bargaining in the Gig Economy, Conditions of Work and Employment Services, No. 94.* International Labour Organization.

Kun, A., Rácz, I. and Szabó, I. (2021) *Industry 4.0 and Industrial Relations, National Report on Hungary. Smarter Industrial Relations to address new technological challenges in the world to work.* National Federation of Workers Councils (MOSZ in Hungarian Abbreviation) and Károli Gáspár University of the Reformed Church.

Mateescu, A. & Nguyen, A. (2019, February 1.) *Explainer: Algorithmic Management in the Workplace*. Data&Society. Available on: https://datasociety.net/wp-content/uploads/2019/02/DS_Algorithmic_Management_Explainer.pdf

Makó, Cs., Illéssy, M. and Pap, J. (2021a). *Dominance of Individual Voice Instead of Collective Interest Representation. The Case of Platform Workers in Hungary. National Report – Hungarian Fieldwork Experiences*. Centre for Social Sciences.

Makó, Cs., Illéssy, M. and Pap, J. (2021b) *Work Related Learning as a Core Lever Shaping Voice Options, Hungarian Platform Workers Views on Interest Representation*. Centre for Social Sciences.

Meszmann, T. (2018) *Industrial Relations and Social Dialogue in the Age of Collaborative Economy CELSI Research Report, no. 27*. Central European Labour Studies Institute.

Moniz, A.B., Bouvida, N., Makó, Cs., Krings, B. J. and Sanz de Miguel, P (2022) *Digital Labour Platform: Representing Workers in Europe.* HUMUS Publishing Company – CICS NOVA

Nacsa, B., and Neumann, L. (2013). Hungary: The reduction of social democracy and employment. In: Lerais, Frédéric F. et. al. (eds): *Social democracy under the strain of crisis. An essay of international comparison*. (pp. 94–108). Institut de Recherches Économiques et Sociales.

Neumann, L. (2018) A munka jövője: a szakszervezetek jövője? (Future of Work is the Future of Trade Unions?) ***Magyar Tudomány*** (Hungarian Science), (1), pp. 77 - 89.

Prugberger, T., and Nádas, G. (2016). *Európai és magyar összehasonlító kollektív munkajog, (European and Hungarian comparative collective labour law)*. Wolters Kluwer.

Rahman, H. A. (2021) The Invisible Cage: Workers' Reactivity to Opaque Algorithmic Evaluations. *Administrative Science Quarterly*, 66(49), 945-988. DOI: 10.1177/00018392211010118

Sanz, P., Weltz, C., Caprile, M. and Contreras, R. R. (2020) Industrial Democracy in Europe: a Quantitative Approach. *Labour & Industry: a Journal of Social and Economic Relations of Work*, 30(2), pp. 101-132. https://doi.org/10.1080/10301763.20201774101

Stark, D., and Pais, I. (2020) Algorithmic Management in the Platform Economy, *Sociologica*, 14 (3), pp. 47-72, https://doi.org/10.6092/issu.1971-8853/12221

Szerb L., Somogyine Komlosi, É., Ács, Z., Lafuente, E., and Song, K. A. (2022) *The Digital Platform Economy Index*. Springer.

Ződi, Z. (2022) Algorithmic Explainability and Legal Reasoning, *The Theory and Practice of Legislation*, 10(1), pp. 67-92. https://doi.org/10.1080/20508840.2022.2033945.

Annex No. 1 Hungarian labour law regulation (excerpts)

Act I of 2012 on the Labor Code[11]

Section 264

(1) Employers shall consult the works council prior to passing a decision in respect of any plans for actions and adopting regulations affecting a large number of employees.
(2) In the application of Subsection (1), employer's actions shall, in particular, mean:

a) proposals for the employer's reorganization, transformation, the conversion of a strategic business unit into an independent organization;
b) introducing production and investment programs, new technologies, or upgrading existing ones;
c) processing and protection of personal data of employees;
d) implementation of technical means for the surveillance of workers;
e) measures for compliance with occupational safety and health requirements, and for the prevention of accidents at work and occupational diseases;
f) the introduction and/or amendment of new work organization methods and performance requirements;
g) plans relating to training and education;
h) appropriation of job assistance related subsidies;
i) drawing up proposals for the rehabilitation of workers with health impairment and persons with reduced ability to work;
j) laying down working arrangements;
k) setting the principles for the remuneration of work;
l) measures for the protection of the environment relating to the employer's operations;
m) measures implemented with a view to enforcing the principle of equal treatment and for the promotion of equal opportunities;
n) coordinating family life and work;
o) other measures specified by employment regulations.

[11] Available atList of issues of consultation and information rights of the Works Councils (WCs) regulated by the par 264, Labour Law, 2021. (available in English: : Act_I_of_2012_on_the_Labor_Code.pdf (1x1forditoiroda.hu) and available in Hungarian: https://www.njt.hu)

Annex No. 2 Interview guidelines and preliminary structure of the case study

I. Top management/Owner Interview Guide – *60 mins timeframe*

1. **Introduction, role, career, short company history**
2. **The importance of the Project Planning System (PPS) in the operation of the company**
    a. History of the development of PPS
    b. The origin of the idea
    c. Milestones influenced the development of PPS
    d. Key stakeholders in system development
    e. The role of the "designer"
3. **The purpose of PPS**
    a. What business activities does the system support?
    b. Decision-making processes and employment relations
    c. PPS and its influence on HR management practices
    d. The PPS on the employees' level
4. **The biggest successes in using PPS - through examples**
5. **The biggest challenges so far in using data from PPS**
6. **System development process cycle**
7. **The main advantages of PPS for the Owners/Top management**
8. **Linking future business challenges with PPS development**

II. Team leader interview guidelines – *60 mins timeframe*

1. **Introduction, position, role in the organization, career at DataExpert**
2. **Practice of using PPS**
    a. The role of PPS through the eyes of team leaders
    b. One day with PPS - examples of how team leaders use the system
    c. The purpose of using PPS at the team leader level

3. **The impact of PPS on the business workflows**
4. **The role of PPS in HR management and employment relations**
    a. Duties and responsibilities of employees when using PPS
5. **Data collection, access management and the utilization of the data**
    a. The biggest challenges in data collection and use
    b. Possible limitations of PPS from the perspective of team leaders
6. **Development cycle of the PPS – involvement of the employees**
7. **The main advantages of PPS**
8. **Potential developments, new uses**

III. Employee interview guide – *60 mins timeframe*

1. **Introduction, position, role in the organization, career at DataExpert**
2. **Practice of using PPS**
    a. The importance of PPS in the eyes of the employee
    b. One day with PPS - examples of how an employee uses the system on a daily basis
    c. Embedded system – the employees' workflows
3. **Benefits of the system through the eyes of employees – examples**
    a. Examples where the employee was helped by the use of PPS / data derived from it
    b. HRM processes and the PPS
4. **Involvement of the employee in the introduction of a new function / view of PPS**
5. **The main advantages of PPS**
6. **Possibilities and suggestions for the development of PPS**

Annex No. 3 The list of persons interviewed

1: Dr. Attila Kun - labour lawyer, AM regulation
Headquarter of the National Confederation of the Works Councils
Interview: 10th January, 2022

2: Mr. Csaba Szabó, consultant, data processing/data analytics
DataExpert Ltd., Debrecen,
Interview: 12th January, 2022

2: Mr. Dezső Karasszon, managing director/owner, data processing/data analytics
DataExpert Ltd., Debrecen,
Interview: 11th February, 2022

4: Mr. Tamás Andrási, operations director, data processing/data analytics
DataExpert Ltd. Debrecen,
Interview: 18th February, 2022

5: Mr. Gábor Bácsi, senior data processing expert, data processing/data analytics
DataExpert Ltd., Debrecen,
Interview: 25th February, 2022

6: Mrs. Zsóka Varga, Works Council President, Deutsche Telekom, Co., Budapest and Vice-President of the European Works Council of Deutsche Telekom,
Interview: 10th January, 2022