Innovating social dialogue and collective bargaining toward artificial intelligence in the MET Industries

Abstract

*The study **"Innovating Social Dialogue and Collective Bargaining Toward Artificial Intelligence in the MET Industries"** explores the integration of AI in the metal, engineering, and technology-based (MET) sectors, emphasizing the role of social dialogue and collective bargaining in ensuring ethical, transparent, and worker-centric AI adoption. The research highlights the collaborative efforts of European social partners — Ceemet and IndustriAll Europe — to develop conclusions addressing AI's impact on occupational health and safety (OHS), human resources management (HRM), data protection, and skills development. Key findings reveal that while AI offers benefits such as increased efficiency and automation of repetitive tasks, it also poses risks like job displacement, privacy concerns, and algorithmic bias. The study underscores the necessity of involving workers and trade unions in AI implementation to safeguard rights, autonomy, and well-being. Social partners from non EU countries advocate for a comparable regulatory frameworks as EU members, such as the EU AI Act, to balance productivity gains with fundamental labor rights. The research identifies the need for practices in collective agreements which address digital rights, the right to disconnect, and transparency in AI-based decision-making. Recommendations include establishing a European database on AI applications in the MET sector, conducting critical case*

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studies, and fostering further social dialogue to ensure AI contributes positively to both workers and industry competitiveness. The study concludes that proactive collaboration among social partners is essential for harnessing AI's potential while mitigating its risks.

Keywords: Social Dialogue, Artificial Intelligence, metal industry, occupational health and safety, human resources management, data protection, skills development.

Topics

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Introduction

Ceemet and IndustriAll Europe adopted joint conclusions on artificial intelligence in the MET (metal, engineering and technology-based) industries on the occasion of their social dialogue meeting on competitiveness and employment on 15 March 2023. The aim of the joint conclusions is to provide guidance for the social partners in the European MET industries on how to approach AI in the workplace. And, more recently, the European Parliament approved a resolution on 17 December 2025 with recommendations to the Commission on digitalisation, artificial intelligence and algorithmic management in the workplace (2025/2080(INL)) [1]. This resolution mentions that "any new technology must be deployed and used with the overarching goal of serving people and should be driven by the "ethics-by-default" and "precautionary" principles as well as a human-centric approach, managed by the people building on the provisions on human oversight provided for in Article 14 of the Artificial Intelligence Act and Article 22 of the General Data Protection Regulation" (p. 7 §T1).

This was the basis for the EU project iMET that integrated partners at European level, the Ceemet and the IndustriALL Europe (associated partners), the employer organisations from Croatia, Poland, Spain, Serbia and Latvia and trade union federations from Croatia, France, Austria, Spain, Portugal, Poland, Romania and Serbia.

For the project were developed four manuals elaborated by Nuno Boavida, from Nova University of Lisbon (Portugal), and discussed with all iMET Project partners, particularly the social partners. In the introduction to those manuals, Boavida mentions that the

[1] Cf. https://www.europarl.europa.eu/doceo/document/TA-10-2025-0337_EN.html#title2

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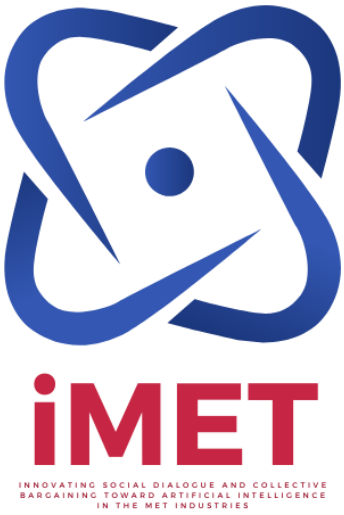

“manuals are therefore the product of sustained, multi-level social dialogue rather than a one-off academic or technical exercise. They are intended to support practical cooperation between employers and workers’ representatives in shaping the introduction, governance and use of artificial intelligence in the workplace. By systematising shared concerns, negotiated safeguards and emerging practices, the manuals seek to ensure that technological change contributes to common objectives, namely the protection of rights and well-being, the reinforcement of trust and transparency and the improvement of organisational and economic performance within the European metal industries”.

One of the manuals is on the effective integration of Artificial Intelligence (AI) into Occupational Health and Safety (OHS) practices (Manual 1). The other on experiences on Human Resources Management (HRM) through the implementation of AI in companies (Manual 2). A third one was focused on Data protection (Manual 3). The final one was on the impact of AI on the skills development in the MET sector (Manual 4).

All social partners agree that there is a necessity of designing AI systems that keep humans in control in human resources field. This means the involvement of workers in AI development to ensure transparency and address potential risks effectively at it’s already planned by the EU in Directive 2002/14/EC on information and consultation of workers. Employers’ representatives in this sector (MET) should establish clear lines of responsibility and accountability in AI functionalities, to protect data privacy by granting workers control over their personal data and to support the right to disconnect to maintain a healthy work-life balance.

Social partners’ representatives are identified as pivotal actors in the process of enhancing social dialogue, ensuring that technological advancements benefit workers without compromising their rights, autonomy and well-being, and improves companies’ productivity. The employers’ representatives’ position is that “delaying AI adoption furthermore reduces productivity in light of growing global competition and, ultimately,

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the capacity to offer high-paid and quality jobs across sectors, and risks fragmenting the European Digital Single Market" [2].

In this publication we intend to refer some of the best examples of collective bargaining negotiations and agreements about AI and agreed innovative tendencies [3]. As was referred in the project proposal, „iMET action is acknowledging the needs of final beneficiaries - workers, who need to be able to understand critically the impact that AI has on their work, and how it will transform their own roles. It will help reap the benefits of AI, while at the same time protect workers and quality employment. Meaningful social dialogue will lead to enhanced trust in the technology, greater efficiency and a maximum level of occupational safety and health. In line with the constituent elements of Industry 5.0, which aim at building forward, better AI should always be sustainable, from a technological, social and environmental perspective". This publication can be considered as an instrument for such process.

The effective integration of AI into OHS practices [4]

In the above-mentioned resolution from the European Parliament, one of the recommendations (Nº 7 on OHS) explicitly says that "employers [should] integrate, in

[2] Cf. https://ceemet.org/position-papers/joint-statement-on-the-european-parliaments-inl-on-ai-at-work/

[3] Some partner organizations — Ceemet, AECIM, the Serbian Association of Employers (Poslodavci), and the Croatian Employers' Association (HUP) — do not agree with certain statements included in this document. These statements therefore represent the views of the contributing authors and not necessarily those of the entire consortium.

[4] Based on the information provided on Boavida, N. (2025), *Manual 1 - Social Dialogue on Artificial Intelligence in the Metal Industries: Occupational Health and Safety*, iMET project.

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cooperation with workers' representatives, the evaluation of the risks of algorithmic management systems into their safety and health systems, as regards possible risks of work-related accidents, psychosocial and ergonomic risks as well as undue pressure put on workers. Employers should use algorithmic management systems in a manner that respects workers' wellbeing and does not put at risk their safety or their physical and mental health. They should take mitigating actions where appropriate" (p. 17). However, Ceemet (with other business associations) "reject the legislative annex [where this recommendation is], which would push for new prescriptive measures that go beyond what is necessary or helpful at a time when implementation and enforcement of existing regulations should be our priority" [5]. Thus, these types of measures still need further social dialogue.

In the iMET project all social partners agree that a primary objective is to ensure that AI enhances worker well-being and maintains a safe work environment. While AI offers substantial benefits - such as increased efficiency and the automation of repetitive tasks, which can improve safety and allow workers to engage in more creative endeavours - it also presents significant risks. These risks include potential job displacement, loss of autonomy, privacy concerns, and inherent biases that may lead to unfair labour practices. AI-based Worker Management systems, in particular, can introduce ethical dilemmas and occupational hazards, such as elevated stress levels and diminished control over work processes.

Reinhold et al. (2022) indicated that the different task content of occupations reflects past investment into automation technologies.

Rolf (2024) mapped some of the practices made possible by AI-enabled systems that are increasingly affecting the world of work. This author discusses how these systems affect both blue- and white-collar occupations, regardless of the employment status of the workers affected by them. His work highlighted the risks these systems pose to

[5] https://ceemet.org/position-papers/joint-statement-on-the-european-parliaments-inl-on-ai-at-work/

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working conditions and labour rights, including discrimination, severe invasions of privacy, union-busting and occupational health and safety hazards.

EU-OSHA (Christenko et al., 2022) outlines three primary objectives for Artificial Intelligence-based Worker Management (AIWM):

a) Enhancing the efficiency and/or productivity of workers: This scope encompasses functions such as task and shift allocation, as well as providing direction or guidance in the execution of various tasks.
b) Enhancing the decision-making process: Within this scope, functions include tracking employee performance, conducting evaluations, facilitating promotions, and even employing predictive models to anticipate worker decisions, such as leaving their current job.
c) Enhancing workers' health, safety and wellbeing: This involves functions such as the identification, prevention and management of risky behaviours that may pose threats to workers' health and safety.

According to the European level employers' association Ceemet, there are examples demonstrating that AIWM can contribute positively to OSH when implemented thoughtfully. One, from Switzerland, is about the company Georg Fischer - specialized in piping systems, automotive and industrial components as well as precision machining - provides service technicians with an AI mobile application that offers real-time information on fault diagnostics and repairs, making field service operations safer and more efficient.

Comparative results show that the implications of AIWM adoption are highly dependent on the level of worker involvement and the managerial strategies employed. As well, differences in the size of the companies and their positions in the global value chain may significantly influence the choice of management model adopted (Pesole et al., 2024).

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The 2020 framework agreement between the ETUC and European employers' organisations on algorithmic management [6], the social partners should respect the principles of the human in control in HR field, the prevention of harm and the need for a risk assessment, transparency and fairness, i.e. avoiding unfair bias and discrimination (Voos and Bertossa 2022). The problem of AI in HRM is also closely linked to the workers' rights to be informed on what data analysis is taking place and what algorithmic inferences and profiles are created.

In terms of potential benefits, unions believe that AI can primarily improve job quality. Possible mechanisms include reducing stress, fatigue and safety risks through better work organization and task optimisation. For instance, AI can support or substitute repetitive or physically and mentally strenuous tasks, allowing workers to focus on more engaging and safer activities. Moreover, AI offers opportunities to reduce discrimination in the workplace and to better monitor the well-being and security of workers (Cazes, 2021).

Experiences on Human Resources Management [7]

The integration of AI into HRM presents challenges due to potential biases in input data, which can lead to flawed recommendations and discriminatory outcomes. Risks include overlooking employee interests, increased surveillance, intensified work pace,

[6] See ETUC, & European employer organizations. (2020). *European Social Partners Framework Agreement on Digitalisation*. https://www.etuc.org/en/document/eu-social-partners-agreement-digitalisation and https://ceemet.org/wp-content/uploads/2023/12/iall-ceemet_ai_paper_en-1.pdf

[7] Based on the information provided on Boavida, N. (2025), *Manual 2 - Social Dialogue on Artificial Intelligence in the Metal Industries: Human Resources Management*, iMET project.

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knowledge imbalances between workers and managers and decisions made without adequate human oversight, if AI is misused.

Managers, trade unions and/or workers representatives should respect the information and consultation rights stemming from the EU directives for AI introduction, from understanding existing technologies and participating in purchasing decisions to overseeing implementation and establishing monitoring mechanisms. Worker information is vital to ensure their experiences and knowledge technology outputs. It is also essential to protect workers' rights by implementing and respecting EU regulatory framework such as the AI Act. The prioritisation of social dialogue and collective bargaining ensures that AI contributes positively to productivity and quality of life without compromising fundamental human and labour rights.

The rapid introduction of artificial intelligence (AI) and advanced technologies into the workplace has induced anxiety and stress among workers and employers, exacerbating feelings of precariousness in an ever-evolving work environment. But they bring also new challenges to improve productivity and company competitivity. These tensions become a HRM target and it means also that early and transparent communication between employers, managers, trade unions and employees is essential.

European trade unions and employers' associations have successfully negotiated comprehensive framework guidance with the conclusions of the document that outline procedures for digitally restructuring workplaces, mitigating potential negative impacts on workers and fostering a more equitable transition [8]. The European-level social partners in the MET industries, namely the Council of European Employers of the Metal, Engineering and Technology-Based Industries (Ceemet) and IndustriAll Europe, have

[8] https://ceemet.org/wp-content/uploads/2023/12/iall-ceemet_ai_paper_en-1.pdf

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collaborated to develop joint conclusions on AI's impact in the workplace, particularly concerning human resource management [9].

Despite these European-level efforts, reports of social partner agreements related to AI introduction in the metal industries remain limited. The complexity and novelty of regulating AI at EU level, along with its varied impact across sectors and companies, call for approaches that combine protective and participatory standards.

For example, the displacement of middle-skilled jobs due to AI raises concerns about widening gender disparities and skill gaps within the workforce. Thus, the access to training and development programs can mitigate the adverse effects on specific groups, particularly women and less-skilled workers who might be disproportionately affected.

Social partners can effectively deal with the uncertainties of AI by fostering collaborative approaches and developing comprehensive agreements. As AI continues to evolve and permeate various sectors, a commitment to participatory and protective standards is essential. This commitment will safeguard employment quality and equity, ensuring that technological progress contributes to a fair and sustainable future of work for all stakeholders.

Data Protection and AI in the Metal Industries [10]

[9] See Ceemet and IndustriAll Europe. (2023, February 15). *MET Social Partners reach joint conclusions on artificial intelligence*. https://news.industriall-europe.eu/Article/876

[10] Based on the information provided on Boavida, N. (2025), *Manual 3 - Social Dialogue on Artificial Intelligence in the Metal Industries: Data protection*, iMET project

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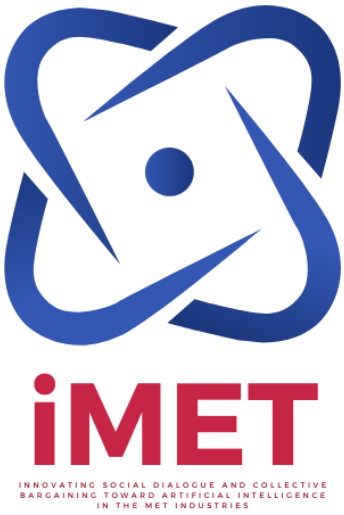

Installing safe and fair AI is important and beneficial to employers, managers and other workers' representatives. European social partners have initiated programs to address digital monitoring's impact on worker privacy. Legislation in countries like Sweden, Germany, Poland and the UK is evolving to facilitate collective discussions on AI adoption.

Collective agreements play a crucial role in managing data rights and algorithmic decision-making, as recognized in Article 88 of the EU-General Data Protection Regulation. European MET industry partners have adopted guidelines stressing lawful and transparent data use. Collective bargaining is identified as an effective tool to implement safeguards against algorithmic management risks, limit surveillance, and improve transparency.

The use of LLMs in the workplace raises significant concerns regarding data protection and privacy. LLMs process large volumes of text and other data related to labour, which enables to automatically evaluate employee performance over time and to provide personalized functions such as recommending meetings and training sessions.

As Chagny and Blanc (2024) mentions, „only via negotiation in companies will it be possible to initiate discussions on all the important issues related to the implementation of these systems: acceptability, transparency, explainability, appropriation, bias, robustness and organisational risks. Raising awareness of data processing and developing a 'data' culture is, in this regard, essential" (p. 202).

Artificial Algorithmic Management Systems (AAMS), comprises software systems used by managers to hire, train, manage, evaluate and reward or discipline workers. Some software companies have evolved to deliver a suite of enterprise-wide services and customer relationship management (CRM) platforms, including human resource management (HRM), marketing and people analytics. The integration of OpenAI's GPT technology with traditional CRM functions, facilitated AI-driven access to employee emails, calendars, key performance indicators (KPIs) and workflow data (Rolf, 2024).

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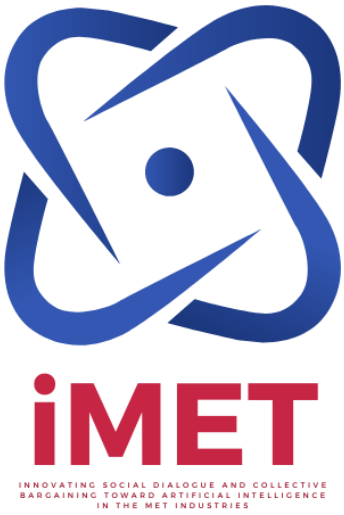

The possibility to extensive producing metrics for employee supervising presents several risks. Employers are granted access to real-time activity logs, allowing them to observe individual employee activities in detail. Some software allows the ranking of employees based on metrics such as 'average productive hours per day', 'tasks completed per hour' and the total 'number of tasks completed'. This can be understood as potential for excessive and unethical surveillance by management, as well as significant security risks related to unauthorized access to employees' personal data. However, these practices are strictly prohibited by the GDPR, and authorized software is subject to various strict rules depending on its classification under the AI Act. This is also the case for other AAMS applications which could closely monitor workers' performance through metrics gathered from handheld and wearable devices, tracking time usage, movements and other variables. This enabled to evaluate individual employee performance, including hours spent on specific tasks, an algorithmically calculated performance scores. The capacity to monitor and compare performance at such a detailed level could amplify managerial control over the workforce and create tensions that have negative effects on productivity. It raises also significant concerns regarding worker autonomy, privacy, and the potential for excessive pressure, in case of misuse of the AAMS.

Extensive data collection informs management decision-making not only concerning disciplinary actions but also during the recruitment phase of candidates, potentially perpetuating biases and inequities. In Germany, works councils must assess the introduction or application of AI and may involve an expert in this assessment. In Poland, a bill was introduced in Parliament to incorporate the right to information about algorithms into the Act on Trade Unions.

Ceemet and industriAll Europe, when adopted their joint conclusions on artificial intelligence in the MET industries in 2023, provided guidance for the social partners in the European MET industries on how to approach AI in the workplace about data and data protection. These partners agreed that as AI is data-intensive, questions on how this data is being treated and how it can be protected are important. As a principle, the


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partners underlined that the data usage should happen lawfully, fairly and transparently – in line with principles of General Data Protection Regulation (GDPR).

The collective agreements can also provide criteria to improve the transparency of AI-based decision-making processes to enhance understanding of how their outcomes are reached (Stefano and Taes, 2023). A problem that has been found in several occasions is that workers may encounter limits on their requests to access their personal data and, consequently, to verify the data processing features of algorithmic management. These issues can be tackled with improved social dialogue.

The impact of AI on skills development [11]

The Cedefop's digital transition policy scenario shows that "fast deployment of automation and AI could result in a 5% employment reduction by 2035 compared to the baseline projection, which incorporates the European Green Deal and assumes current digitalisation trends will continue in the future" (Cedefop, 2025: 8). The same report tells us also that „a non-trivial share of low-, medium- and highly skilled employment in advanced economies could be negatively affected. The limited empirical evidence of a negative net AI employment effect makes it difficult to quantify job destruction and to draw definite conclusions. It is obvious that data used to assess the impact of the AI revolution can only capture the early outcomes of the complex adjustment and market reallocation processes typical of breakthrough technological innovations" (CEDEFOP, 2025: 8).

[11] Based on the information provided on Boavida, N. (2025), *Manual 4 - Social Dialogue on Artificial Intelligence in the Metal Industries: Skills*, iMET project

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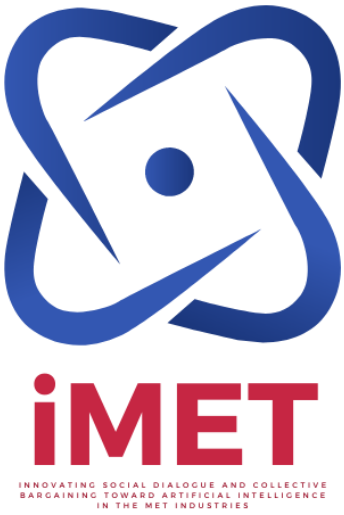

It seems that educational attainment within the MET sector workforce is relatively concentrated, with over two-thirds (70% in 2021) holding qualifications at International Standard Classification of Education (ISCED) levels 3 and 4, equivalent to completion of upper secondary education. This qualification profile is projected to remain stable through 2035. This means that there is a high skilled level among MET sector workforces. At the same time, AI is also being widely applied in larger companies in the sector, as well as at SMEs.

This means that significant changes may occur. Technological developments in the manufacturing sector, particularly within the metal manufacturing subsector, are anticipated to drive significant changes in the skills required of metal workers. For this reason, it is important that social dialogue is focused in the sector also to qualification and training issues.

Some collective agreements in this sector and in Europe can be considered as a tool to identify critical skill gaps and guide investments in workforce qualifications. The high costs associated with technological investments in the MET industries (robotics, automation and machine learning, augmented reality), coupled with practical difficulties in automating complex tasks — especially those involving the deployment of robots and new tools — pose substantial challenges. It was detected a need for strategic approaches that focus on enhancing worker skills and facilitating adaptation to technological changes, without significant workforce displacement.

As AI rapidly develops, it introduces new challenges and opportunities by expanding the range of tasks that could be automated beyond routine, non-cognitive activities, thereby necessitating the acquisition of new skills. While the current impact of AI on the labour market is minimal due to limited widespread adoption, the rapid progress in AI capabilities implies that its effects will require careful monitoring soon (OECD, 2024).

In fact, while AI technologies have the potential to complement and augment tasks, thereby improving job quality and efficiency, they also present significant ethical and practical challenges. Addressing these challenges requires a collaborative effort

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between employers, employees, trade unions, and policymakers to develop guidelines that promote the ethical integration of AI in the workplace. Through proactive engagement and negotiation, stakeholders can harness the benefits of AI while mitigating its risks, fostering a labour market that is both innovative and equitable.

When implemented thoughtfully, with clear consideration of associated risks, AI has the potential to enhance workplace experiences by fostering skill development, increasing job autonomy, improving work quality, reducing monotonous tasks and presenting more engaging, creative challenges for workers (Rolf, 2024). To realize these benefits, management must adhere to key guidelines that prioritize ethical, transparent, and equitable deployment of AI systems.

Good practices of agreements

In some countries, existing collective agreements predominantly make general references to the use of AI technologies. However, Brunnerová et al. (2024) identified several agreements in Italy, Germany, Norway and Spain that provide more detailed provisions. These agreements serve as exemplars of specific rules and arrangements concerning the right to disconnect, digital upskilling tools for workers in the workplace, information sharing and business control.

During the collective bargaining process, trade unions emphasize workers' possibilities to challenge decisions made through automated decision-making and the opportunity to receive advice from external data experts. Additionally, there is a strong desire among trade unions to ensure the implementation of the right to information and consultation on the use and evaluation of AI tools.

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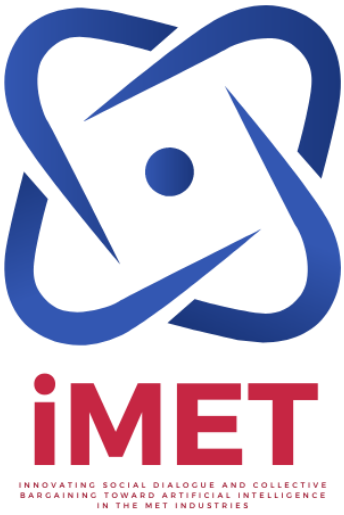

But, above all, the European-level social partners of metal industries, Ceemet and industriAll Europe, adopted their joint conclusions on artificial intelligence on the occasion of their social dialogue meeting on competitiveness and employment on 15 March 2023. These partners agree that social dialogue is best placed to address all employment-related aspects of technology, including inequality, skills, the nature of work, work organisation and the prevention of discrimination (MET Social Partners reach joint conclusions on artificial intelligence, https://news.industriall-europe.eu/Article/876)

Social partners positions views and recommendations

On the problem framing and normative orientation about the impact of AI on jobs. Employers' organisations seem to predominantly frame AI as a competitiveness and an implementation-capacity challenge. The Fact Sheet nº 1 of the recent AI@Work Project, coordinated by Ceemet, and the involvement of the European Employer's Institute [12] mentions that "AI represents a huge opportunity for companies. However, there are many areas in the workplace where regulatory requirements need to be met to realise this opportunity. These regulations result in costs for compliance that pose challenges. To ensure compliance, companies can build up the necessary expertise themselves or seek advice from legal or IT service providers" (p. 6).

The AI detected risks are treated usually as a governance variable rather than the primary organising principle. Some examples from the iMET Project were clear on that. Starting with the national employers' associations, the Croatian association (HUP) foregrounds opportunity, framing AI as having "significant potential to improve occupational health and safety through predictive risk analyses, automated detection of

[12] www.eei-institute.eu/publications/project/ai-work/

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hazardous situations, and reducing workers' exposure to dangerous tasks" (Croatia employers HUP, p1 ¶1). The same paragraph also places the decisive emphasis on "organisational readiness, high-quality data, and training for supervisors," arguing that "technological capabilities of AI often exceed companies' operational readiness" (Croatia employers HUP, p1 ¶1). This orientation positions risk as largely manageable through managerial capacity and organisational preparedness.

Latvia employers (RUB) similarly articulates opportunity in operational terms (for example, "forecast machine failures," "flag sparks, gas leaks," and "wearables and posture-analysis AI" to reduce musculoskeletal risks) while simultaneously warning that "reliance on AI can create new safety risks — system errors, data bias, or sensor malfunctions" and that "over-automation can also reduce human vigilance and skill retention" (Latvia employers RUB, p1 ¶1). The normative centre of gravity remains pragmatic: benefits and risks are both treated as engineering-and-governance problems.

Serbia employers (SAE) explicitly frame adoption as a survival imperative: "To preserve their business operations, they must introduce innovations and AI systems, otherwise they will not remain competitive" (Serbia employers SAE, p3 ¶1). It extends the framing to affordability and market structure: "They often lack the necessary financial resources" and "small and medium-sized enterprises fail to transform in time and invest in innovation" (Serbia employers SAE, p3 ¶1). The dominant problem definition is therefore economic viability under structural constraints.

Metal Industry Companies Association in Madrid (AECIM) frames the issue impact of AI on data protection , primarily as a matter of legal architecture and confirmatory compliance design, calling for panels to "focus more on the legislation applied to the emergence of AI and interaction with employees" and for a "much more detailed outline of all the key points of [the] regulation with regard to mandatory requirements and

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penalties for noncompliance" (Metal Industry Companies Association in Madrid (AECIM), p1 ¶1).

On the other side, trade unions predominantly frame AI as a power-, rights-, and work-intensification problem, requiring enforceable safeguards and collective regulation. The French trade union FTM-CGT sets a rights-primacy orientation: "AI cannot be seen as a neutral tool: it carries with it choices of organization, values, and power" (France trade union FTM-CGT, p4 ¶1). It frames the core risk as opacity and control: "imperative of transparency and clear explanations," "no AI-based tools should be deployed," and explicit concern over "surveillance algorithms" and "algorithmic micromanagement—a significant source of stress and malaise" (France trade union FTM-CGT, p1 ¶1).

Serbia trade union (SSMS) frames the problem as simultaneous benefit-risk but anchored in autonomy and governance: AI brings "benefits… and risks, including privacy violations, increased pressure on workers, and non-transparent decisions," and therefore "AI-based worker management systems require strict control to prevent the reduction of worker autonomy and dangerous decisions" (Serbia trade union SSMS, p1 ¶1).

Poland trade union (FZZMiH) makes a distinctive contribution: it frames the central issue as usability and translation into practice, describing the manuals as "very extensive and highly academic, making it difficult for trade union leaders to use," and demanding that "it should be shorter and less theoretical" with more "negotiation and operational tools" (Poland trade union FZZMiH, p1 ¶1). While it also endorses a rights-protective direction ("ensure that AI supports rather than displaces workers, reduces rather than increases the burden of work, and enhances rather than limits workers' creativity and autonomy"), the diagnostic emphasis is strongly implementation-oriented (Poland trade union FZZMiH, p3 ¶1).

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Portuguese trade union (Fiequimetal) frames the issue as inseparable from social dialogue and collective bargaining, emphasising that it "cannot be left out of… Social Dialogue, Collective Negotiation and… Collective Agreements" in contexts of "control and management of production systems" and "measurement of metrics from an endless number of parameters" (Portugal trade union Fiequimetal, p2 ¶1).

On the governance model and decision-rights boundary related to the AI impacts, there were also several recommendations. A central cleavage concerns the "control point" of governance: procurement and strategic adoption (ex-ante) versus deployment constraints and monitoring (ex-post). On this issue, Serbia employers' association SAE, reject union influence over investment and procurement decisions: "trade unions should be involved in every stage… as well as in decisions regarding their procurement… We believe that the employer is the owner of the business and that such decisions should be made independently, as the employer bears the business risk" (Serbia employers SAE, p3 ¶1). Even while accepting consultation, it draws a boundary: "Employers should inform employees… and consult them… but decisions such as investments in new technologies and AI… should remain within the competence of employers" (Serbia employers SAE, p3 ¶1). Parallelly, the Serbian trade union SSMS asserts the opposite governance logic, demanding "Mandatory union involvement in every step of implementation, from procurement to monitoring" (Serbia trade union SSMS, p1 ¶1). It additionally proposes institutionalised co-governance: "Establish permanent oversight mechanisms, such as joint commissions of employers and unions" (Serbia trade union SSMS, p2 ¶1).

The French trade union FTM-CGT similarly demands systematic involvement at design and deployment stages: "systematic involvement of employees and their representatives during the design phase of AI-related HR projects, to avoid unilateral implementation" (France trade union FTM-CGT, p2 ¶1) and later reiterates "systematic involvement of workers' representatives at every stage of deployment" (France trade union FTM-CGT, p4 ¶1).

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Several actors converge on transparency and consultation as baseline governance, even where decision-rights diverge. Croatia employers (HUP) stresses internal governance devices, suggesting "establishing an internal 'AI Charter' that defines the areas in which AI may be used" (Croatia employers HUP, p2 ¶1). This implies a managerial governance instrument, but one which can be made compatible with information/consultation expectations. And the Portuguese trade union (Fiequimetal) specifies information entitlements in operational terms: "Information on which processes… work with AI," "criteria/metrics," and "Clarity… in the decision-making chain" (Portugal trade union Fiequimetal, p1 ¶1). This is a governance demand focused on transparency, traceability, and explainability of employment-relevant decisions.

Metal Industry Companies Association in Madrid (AECIM) proposes functional separation of topics across panels, aiming to locate collective agreements primarily under "panel 2" and risks under "panel 1," which is, in effect, a governance sequencing proposal for training and deliberation: "focus more on the risks… rather than on issues relating to collective agreements" (Metal Industry Companies Association in Madrid (AECIM), p1 ¶1).

On the rights and safeguards package it can be understood that surveillance, micromanagement, and psychosocial risk appear as union-prioritised safeguards, with partial convergence among employers on privacy risk but not always on prohibitions. The French trade union FTM-CGT is the most explicit: "employees must not be the target of surveillance algorithms," and there must be "clear limits on algorithmic micromanagement" (France trade union FTM-CGT, p1 ¶1). It further calls to "explicitly prohibit the use of AI for micromanagement and intrusive employee surveillance" (France trade union FTM-CGT, p2 ¶1). The Serbian trade union SSMS likewise demands prohibition of off-hours surveillance: "Prohibit surveillance that violates privacy, especially monitoring behaviour or activities outside working hours" (Serbia trade union SSMS, p1 ¶1).

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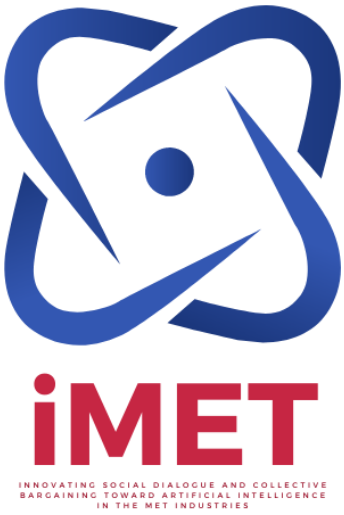

Latvia employers (RUB), while not issuing explicit prohibitions, recognises that "ethical and privacy issues linked to constant monitoring can further affect employee trust and well-being" (Latvia employers RUB, p1 ¶1) and describes surveillance technologies as potentially violating "human dignity," "privacy," "non-discrimination," and even "the rule of law and democracy" (Latvia employers RUB, p3 ¶1). This is analytically important: it indicates employers can articulate a rights-based diagnosis even when preferring flexible instruments (see Pillar 4).

On data protection safeguards there was a strong convergence on purpose limitation and control. Trade unions were pressing for categorical limits on model training and extraterritorial risk controls. For example, the French trade union FTM-CGT demands prohibition of data collection without consent: "prohibition of systems that collect employee data without informed and verifiable consent" (France trade union FTM-CGT, p2 ¶1). It also insists that "Collected employee data must never be used to feed AI models designed to evaluate, sanction, or discriminate" (France trade union FTM-CGT, p3 ¶1). In addition, it makes a geographically specific sovereignty claim: "storage within the EU… to reduce the risk of extraterritorial access" and warns against "American cloud services… subject to the U.S. Cloud Act" (France trade union FTM-CGT, p3 ¶1). The Portuguese trade union Fiequimetal anchors safeguards in legality and worker authorisation: "Limitation of information collection in strict compliance with European and national legislation" and "only… with the knowledge and authorization of the workers" (Portugal trade union Fiequimetal, p2 ¶1).

From the side of employers' associations, the Croatian HUP aligns with several of these safeguards but within a compliance-and-governance frame: it recommends "mandatory DPIA before implementation, and prohibiting the use of employee data for model training" (Croatia employers HUP, p2 ¶1), and stresses that the "black-box nature of many AI systems is the greatest barrier to compliance" (Croatia employers HUP, p2 ¶1). This represents an employer-originating safeguards package oriented toward compliance manageability and vendor governance. The Serbian employers SAE places

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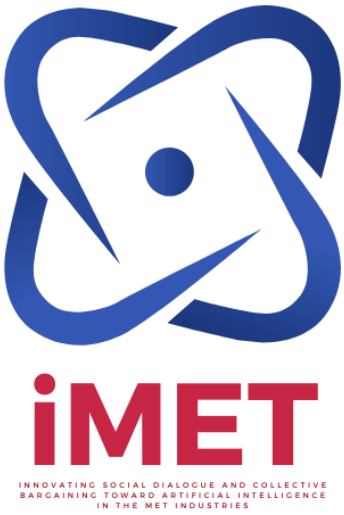

safeguards partly in existing data protection law pending specific AI rules: “until specific regulations on AI are adopted, the legislation on personal data protection should be applied” (Serbia employers SAE, p5 ¶1). This is a legal-instrument position rather than a detailed rights package, but it still constructs a safeguard baseline.

On human decision-making responsibility is strongly asserted by trade unions and partially endorsed by employers through “human oversight” requirements. The French trade union FTM-CGT is categorical: “AI should only be a decision-support tool. Final decisions must remain with human beings” (France trade union FTM-CGT, p2 ¶1) and later emphasises “reaffirmation of human responsibility in all decision-making processes” (France trade union FTM-CGT, p4 ¶1). For the Serbian case, they similarly require “human control over AI decisions affecting tasks and safety, with clear management responsibility” (Serbia trade union SSMS, p1 ¶1). Finally, Croatian employers’ association HUP, emphasises “limitations of automated decision-making and the need for a clear human-oversight mechanism” (Croatia employers HUP, p2 ¶1). Serbia employers (SAE) also insist that “human oversight must be ensured when AI makes decisions” to prevent “violations of workers’ rights and discrimination” (Serbia employers SAE, p3 ¶1). The convergence is meaningful, though the governance boundary dispute remains (Pillar 2).

On accountability and assurance mechanisms, there are independent auditing/certification and impact assessments that emerge as high-consensus assurance mechanisms, albeit justified differently. The French trade union FTM-CGT calls for external assurance: “Algorithms should be certified by independent, public, or academic third parties to reduce bias risks and ensure compliance” (France trade union FTM-CGT, p2 ¶1). It also insists on transparency as a condition of deployment: “In the absence of these two elements, no AI-based tools should be deployed” (France trade union FTM-CGT, p1 ¶1). The Serbian SSMS calls for “risk and mandatory impact assessments” (Serbia trade union SSMS, p1 ¶1) and “independent technical and ethical risk assessments” (Serbia trade union SSMS, p2 ¶1). On the other side, Croatian


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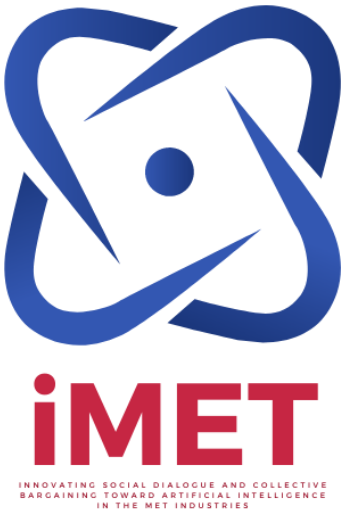

employers' association HUP similarly highlights "guidelines for algorithm audits and transparency towards employees" (Croatia employers HUP, p2 ¶1) and mandates "vendor management and contractual obligations" as a practical compliance pathway (Croatia employers HUP, p2 ¶1).

On liability allocation there is an explicit employers' concern, with unions emphasising remedy/appeal mechanisms. For example, Latvian employers' association RUB states: "Questions remain about who is accountable if an AI system makes an error or causes financial or reputational damage" and that this "uncertainty often slows down the decision-making process" (Latvia employers RUB, p4 ¶1). This is a core accountability variable for employers: without clear liability pathways, adoption is strategically inhibited. The Serbian trade union SSMS emphasises remedies for workers: "Develop clear procedures for appeals and human review of algorithmic decisions" (Serbia trade union SSMS, p1 ¶1) and "Establish mechanisms for challenging automated decisions affecting employment" (Serbia trade union SSMS, p2 ¶1). These are accountability mechanisms focused on individual rights enforcement, rather than organisational liability.

The instrument choice for accountability and assurance mechanisms can be the legislation, collective bargaining, or the ethical/self-regulatory frameworks. The Latvian employers RUB explicitly argues that "binding legal rules may indeed not be the most appropriate solution" and proposes "ethical guidelines" (Latvia employers RUB, p3 ¶1). The Metal Industry Companies Association in Madrid (AECIM) takes a contrasting position, demanding a "much more detailed outline... [of] mandatory requirements and penalties" (Spain employers Metal Industry Companies Association in Madrid (AECIM), p1 ¶1), thus privileging hard-law clarity for compliance. On another side, the Serbian trade union SSMS asserts that "Collective bargaining is identified as the most effective mechanism for preventing abuses" (Serbia trade union SSMS, p2 ¶1). In parallel, the Portuguese trade union Fiequimetal similarly insists that AI topics must be included in

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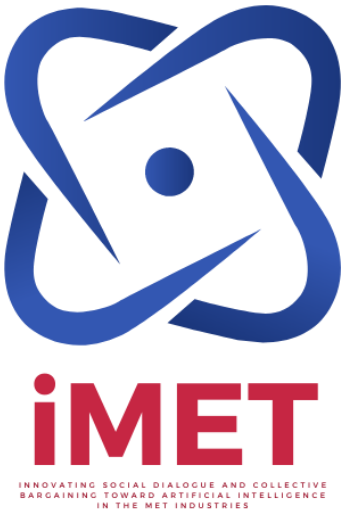

“Social Dialogue, Collective Negotiation and… Collective Agreements” (Portugal trade union Fiequimetal, p2 ¶1).

On the capability-building and inclusion strategy the employer and union positions converge on training as necessary, diverging on funding logic, enforceability, and inclusion guarantees. French trade union FTM-CGT links training to equality and enforceable rights: it warns of “risk of exclusion for low-skilled workers,” requires “employer-guaranteed funding and validated by trade unions,” and demands “automatic right to retrain… with salary maintenance during the training period” (France trade union FTM-CGT, p3 ¶1). It also insists on “critical understanding of AI—not just technical usage” (France trade union FTM-CGT, p3 ¶1). And Portuguese trade union (Fiequimetal) prioritises awareness and role-specific training: “Providing awareness training on AI technologies” and “Training appropriate to the job when it starts to be ‘monitored’ by AI” (Portugal trade union Fiequimetal, p2 ¶1). Finally, Serbian trade union SSMS similarly demands “training and retraining programs focused on digital competencies and generative AI” (Serbia trade union SSMS, p2 ¶1).

Serbia employers (SAE) frames training partly as a shared societal burden: “Investing in new skills requires changes in education system policies and this burden should not fall solely on employers” (Serbia employers SAE, p6 ¶1). The Croatian employer’s association HUP proposes practical models: “developing ‘hybrid competences’” and “practical training models, such as the 80/20 approach in which a smaller group of employees become internal trainers” (Croatia employers HUP, p2 ¶1). Latvian employers (RUB) identify obstacles: “Employee motivation, particularly among older workers, to learn new skills is also a major challenge” (Latvia employers RUB, p4 ¶1) and lists future skill clusters ranging from “analytical thinking” to “cyber security” and “green thinking” (Latvia employers RUB, p3 ¶1).

On the operationalisation and sectoral anchoring, a cross-class convergence emerges: the manuals and workshops require de-duplication, metal-sector specificity, and

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operational tools. The Polish trade union FZZMiH is explicit that the manuals are "very extensive and highly academic" and therefore "difficult for trade union leaders to use," recommending they be "shorter and less theoretical," with expanded "negotiation and operational tools," including "templates, checklists" and "procedures" (Poland trade union FZZMiH, p1 ¶1; p2 ¶1). It also observes that the manuals share "a very similar introduction" and proposes "a single, common introduction" (Poland trade union FZZMiH, p1 ¶1), even asking whether "we really need four different handbooks" (Poland trade union FZZMiH, p2 ¶1). Croatian trade union (SMH-IS) demands also concrete collective bargaining clauses: "supplemented by concrete examples of clauses of collective agreements… found in the PSI collective bargaining hub" (Croatia trade union SMH-IS, p1 ¶1), and a stronger emphasis on the "joint conclusion of European social partners in MET industry" because it is "highly relevant for national affiliates" (Croatia trade union SMH-IS, p2 ¶1).

The Spanish employer's association Metal Industry Companies Association in Madrid (AECIM) mirrors the duplication critique in workshop design terms: " "The draft manuals repeat the topics covered in the different panels… avoid repeating material between panels" (Metal Industry Companies Association in Madrid ((AECIM), p2 ¶1). It also requests sector examples and practical cases: "examples applied to the metal sector as well as the creation of practical cases" (Metal Industry Companies Association in Madrid (AECIM), p2 ¶1). The Croatian employers (HUP) ask for "real-life examples" and "tools for assessing the impact of AI on work processes" (Croatia employers HUP, p2 ¶1). Serbia employers (SAE) similarly seek "practical guidelines" and emphasises that participating companies "expressed their willingness to contribute to the development of practical guidelines for the responsible and sustainable use of AI" (Serbia employers SAE, p8 ¶1).

Operational readiness and organisational change management are recurrent implementation constraints. For example, the Croatian employer's association HUP stresses that "organisational readiness" may lag behind "technological capabilities"

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(Croatia employers HUP, p1 ¶1). Serbian employers (SAE) cite uneven adoption due to "concerns over data security, confidentiality and the potential leakage of sensitive information," and notes that adoption is "gradually and on a limited scale, primarily due to high costs and the need for additional investments" (Serbia employers SAE, p6 ¶1; p7 ¶1). And finally, the Latvian employers (RUB) similarly emphasise "lack of [funding]" as a limiting factor and highlights that accountability uncertainty "discourages smaller companies from adopting AI solutions too quickly" (Latvia employers RUB, p4 ¶1).

The framework reveals three structurally decisive fault-lines and one robust convergence zone. The first fault-line (Pillars 1–2) refers to the **governance "control point"** dispute. Employers, exemplified by Serbia employers (SAE), insist procurement and investment remain managerial because "the employer bears the business risk" (Serbia employers SAE, p3 ¶1), whereas unions, exemplified by Serbia trade union (SSMS), insist on "union involvement… from procurement to monitoring" (Serbia trade union SSMS, p1 ¶1). This is not a minor disagreement; it is a disagreement about where power is located in the lifecycle of AI at work.

The second fault-line (Pillars 3–4) refers that whether **surveillance and micromanagement** should be prohibited or merely governed. France trade union (FTM-CGT) demands that "employees must not be the target of surveillance algorithms" (France trade union FTM-CGT, p1 ¶1), while Latvia employers (RUB) strongly problematises surveillance in rights language but simultaneously argues that "binding legal rules may… not be the most appropriate solution" and that "ethical guidelines or self-regulatory frameworks" may be preferable (Latvia employers RUB, p3 ¶1). The difference is therefore not recognition of risk; it is the preferred enforceability mechanism.

The third fault-line (Pillar 5) is about training as a right with **redistribution** guarantees versus training as a **shared adaptation burden** with employee obligations. France trade union (FTM-CGT) proposes "automatic right to retrain… with salary maintenance" and

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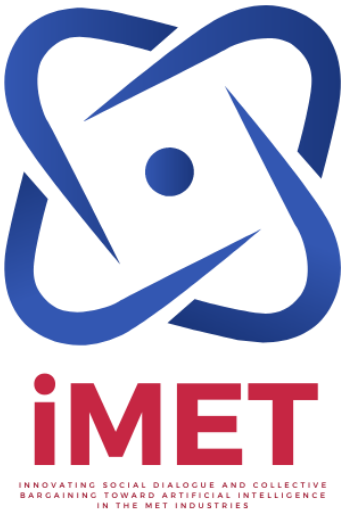

"employer-guaranteed funding" (France trade union FTM-CGT, p3 ¶1). Serbia employers (SAE) counters that the burden "should not fall solely on employers" and that collective agreements should include "employees' obligations to undergo training" (Serbia employers SAE, p6 ¶1).

Finally, the convergence zone (Pillar 6) is about **operationalisation**, specificity, and **de-allowing repetition**. Poland (FZZMiH) calls for "templates, checklists" and less theory (Poland trade union FZZMiH, p2 ¶1). Spain (AECIM) insists on shortening and reducing duplication (Spain employers AECIM, p2 ¶1). Croatia employers (HUP) demand real-world examples and tools (Croatia employers HUP, p1 ¶1; p2 ¶1). This convergence is strategically valuable: it is the low-conflict area where revisions to the manuals and workshop design can produce immediate legitimacy gains across both employers and trade unions.

Outcomes

There is a large number of recent studies on the application of AI on companies. Some EU research projects, as AI@WORK where Ceemet is involved, are collecting information on case studies and on experiments in the sector. But less information has been provided to the main social actors on agreements at company level, or at regional or sector levels. One reason is that there are very few agreements reached by now. The topic is recent, and the social partners are still discussing the examples and the consequences that may need their action.

Recommendations

Within the project, through the work around the manuals, training activities and debates in the consortium meeting, it was clear information is necessary on labour agreements in each country regarding the use of AI in the MET sector. The available information is

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very scarce and eventually can only be found in the national data bases just in national languages. There are no common information infrastructures that provide such information. Ceemet and Industriall Europe could provide information on those labour agreement (at sector level, and at company level), with comments

The information on experiences using AI in companies in the sector is very important to provide knowledge on the processes of modernisation of the industry. The project proposes a European data base on the diverse applications of AI in the MET sector, from CNC machine tools to robotics to augmented reality. Connect this information with those produced by other EU projects on Industry 4.0 and Industry 5.0 but focused on metal engineering and technology industries (MET). There are much EU projects, from Horizon Europe to DG EMP and even national projects with EU support, that have collected information on cases and experiences of AI applications in the sector. There is, nevertheless, no comprehensive collection of such data to be accessed by employers' association or by workers representatives. Such data should be considered as a basis for capacity building to enable further negotiations and sectoral agreements.

Are also needed further critical case studies of companies where more advanced AI was applied. They should provide information on the implications in each area considered in this project: working conditions, human resource management, data protection, and qualifications. It is recommended that future EU studies could focus on this topic.

Finally, there is also a need to support further studies on company agreements in the metal sectors where AI related topics have been introduced. It is needed to know more on Scandinavian, German, French cases or other cases not covered by the iMET project. Those examples could contribute to provide knowledge on positive achievements of social dialogue in the MET sectors.

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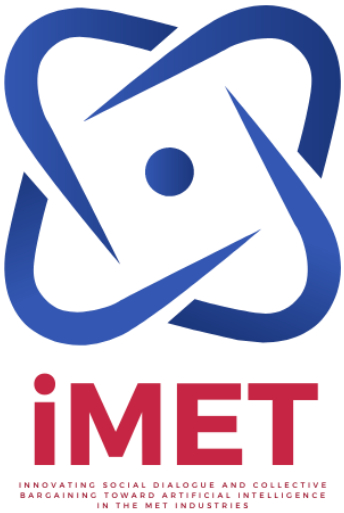

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Annex – social dialogue in MET sectors on AI impacts

Country / Region	Sub-sector / Company(ies)	Date	Topic/theme	Link
Europe	Cross-sector BusinessEurope, SMEunited, CEEP and the ETUC (and the liaison committee EUROCADRES/ CEC)	22/6/ 2022	European Social Partners Autonomous Framework Agreement on Digitalisation	https://www.businesseurope.eu/publications/european-social-partners-framework-agreement-on-digitalisation/
Denmark	The labour platform Hilfr and the trade union 3F	2024	sets requirements for the platform's use of artificial intelligence and algorithmic management.	
Italy	Contratto Collettivo Nazionale Lavoro (CCNL) for the metal sector	5/2/ 2021	includes codetermination as well as the duty to provide, in any case, written reasons in the event that companies do not accept the trade unions' proposals.	In Guaglianone L. (2024) Collective bargaining and AI in Italy, in Ponce del Castillo (ed.) Artificial intelligence, labour and society, ETUI, p. 208
Spain	Cross-sector Charter of Digital Rights	14/7/ 2021	„the development and use of algorithms and any other equivalent procedures in the work environment will require an impact assessment related to data protection. The analysis thereof will include the risks related to the ethical	In Rodríguez Fernández M.L. (2024) Collective bargaining and AI in Spain, in Ponce del Castillo (ed.) Artificial intelligence, labour

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			principles and rights pertaining to artificial intelligence contained in this Charter, and it will particularly include the gender perspective and the prohibition of any discrimination, both direct and indirect"	and society, ETUI, p. 220
France	Schneider Electric, Alstom, Ferco, Renault Group, Axon, Wabtec, OVHCloud, Altsef		company agreement on AI use. Most of agreements are on upskilling workforce	GEPP agreements (Gestion des Emplois et des Parcours Professionnels - jobs and career management agreement). There is a statutory obligation for companies with at least 300 employees to negotiate on this topic. The content of this negotiation is detailed in article L 2242-20 of French Labour code.
Finland			There is no AI/AM specific provisions. However, in both sides the impact of AI/AM has been acknowledged among different negotiating parties for CBAs, and it has been subject to discussion in regular and separate subject specific communication and discussions between the parties.	

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Switwerland (Swissmem)	Swissmem	2028	regulations tend to be drawn up at company level. For the MET sector, the issue will be on the agenda at the next collective bargaining agreement negotiations beginning in 2028.	

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