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Accelerating Innovation in Occupational Safety and Health for an Evolved, Generative Approach to Taking Preventive Measures

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Abstract

In this paper, we would like to present the important pillars of the framework for accelerating innovation in taking appropriate preventive measures in occupational safety and health (OSH). Digitization and Artificial Intelligence (AI) can contribute to the harmonious integration of knowledge and innovation in the field.

Implementing the results will improve OSH efficiency, moving from calculative and conformist approaches to more evolved, proactive, and generative approaches.

The paper uses a qualitative method of study, direct observation, and content analysis. It reviews and analyses legislative and strategic documents and best practices, as well as scientific works in the field.

The study's implications are intended to raise focus on improving preventive, continuous, and adequate measures that contribute to consolidating the safety climate and organizational behaviour in companies and protecting the lives and health of workers.

Keywords: safety, OSH, good practices, safety strategy, management

1. INTRODUCTION AND HYPOTHESIS

The rationale and necessity of the OSH field are based on the continuous struggle to decrease the effects of lack of prevention or inadequate or insufficient prevention.

The present paper aims to bring to the forefront the framework for continuous and immediate improvement and adaptation of prevention measures in the field of OSH, through the acceleration of innovation in digitalization or AI (Artificial Intelligence). Thus, it is possible to demonstrate the advantages of new technologies, which bring the OSH system to a proactive or generative-anticipative level in the creation of immediate and appropriate risk measures, to the detriment of a rudimentary conformist, scripted and slow-to-react OSH Management System, less effective in prevention.

In 2021, the European Agency for Safety and Health at Work (EU-OSHA) has published a report (EU-OSHA, 2021) Analysing how AI can create opportunities and challenges for OSH related to monitoring and managing workers and raising legal, regulatory, and ethical issues in the context of OSH.

We have at the center of the discussion the immediate adequacy of the preventive measures according to the risks that have arisen, because this obligation, in the current conditions, cannot be fulfilled in the best conditions due to the following existing deficiencies:

- Poor monitoring of the occurrence of risks due to lack of knowledge of duties or routinisation in reporting or banalisation of importance.
- Long delays in acting.

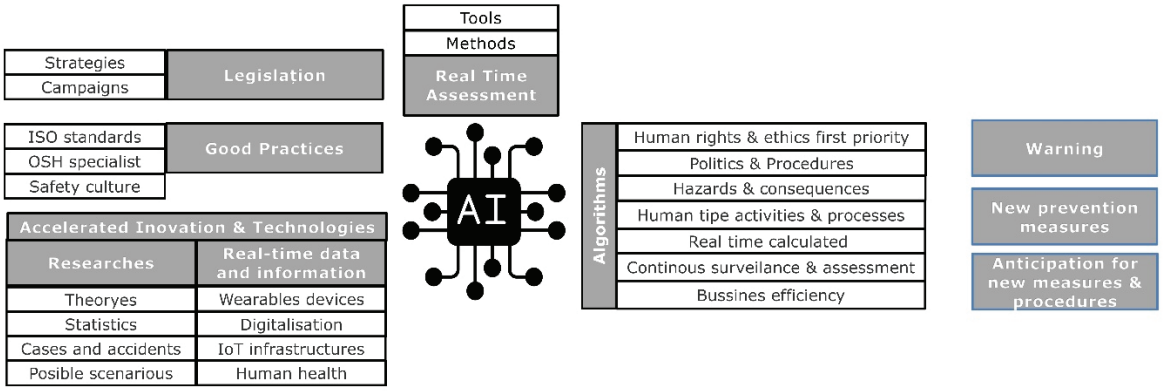
What algorithmic decision-making, technological innovation, digitisation, and AI can do:

- Monitor workers' activities (depends on the level of specific risks) in real-time and flag emerging risks
- Likewise propose prevention measures in real time to all levels involved in OSH (worker, team leader, manager with OSH, General Manager)
- Anticipate possible hazards and risks of injury due to faulty behavior or procedures

This study framework for outlining the approach to improving OSH preventive measures is based on the following directions(Picture 1):

- Legislation and European Council strategies or actions,
- Good practices developed at several levels,
- Technologies, digitalisation, and AI are used for prevention.

Picture 1: AI in OSH adequately prevention measures



2. MOTIVATION OF THE PAPER

The effects of a deficient OSH Management System (OSHMS) can produce negative impacts in financial terms, in terms of keeping workers' lives and health in good condition, and in terms of legal liability. The purpose of discussing the costs of accidents at work and the employer's liability is to provide data that will help **raise awareness** of the need to implement risk prevention measures appropriate to the risks, adequate, immediate, and sufficient to avoid the costs and liabilities effect.

Both cost and liability elements influence the smooth running of companies, which is why this paper comes to the support of employers. Most of them have already realized that prevention comes at a lower cost than the consequences of workplace events, but it also has a double result: the protection of human capital (the company's embedded value), which implicitly leads to profitability, efficiency through the predictability of retaining employees who thus enjoy well-being at work. The benefits resulting from good prevention positively affect all levels of interest, both individuals (workers) and companies, as well as society. This society, situated at the third level of effects, will no longer be burdened with the social costs of reintegration, financial assistance, medical support for recovery, or the resizing of intervention infrastructures.

2.1. Financial terms of keeping workers' lives and health in good condition

Shortcomings in managing preventive measures contribute to substantial loss of human life or material goods. ILO (International Labour Organization) statistics show that in recent years, between 3.9% and 5.4% of the Gross World Product (GWP) has been lost financially due to accidents or mainly occupational diseases - we will refer to them as events. These events resulted in fatalities (from 2.78 to 2.93 million people per year) or disability or temporary incapacity for work (from 374 to 395 million people per year).

2.2. Terms of legal liability

According to article 5(1) of the updated OSH Framework Directive 89/3911/EEC ”the employer shall have a duty to ensure the safety and health of workers in every aspect related to the work” (Council of the European Communities, 2018). As a result of this obligation, the employer is responsible for prevention, which can only be imposed in the course of work. This is a changing paradigm regarding the **presumption of innocence**. Employers **become presumed guilty** when there is a breach of an OSH rule. The nominalisation of the employer enshrines this as a possible liable party in the investigation file. This employer will seek to exonerate himself through documents, procedures, legal obligations complied with, in order not to be unfairly held responsible for the actions of their employees.

In practice, employers are exonerated from liability because the courts are limited, under civil law, in assessing the quality and appropriateness of preventive measures to the **average administrative-managerial, "good housekeeper-like" knowledge of employers and not to their excellence in prevention**.

Excellence in prevention would be shown to be accomplished beyond a reasonable doubt if employers were concerned with or utilised the latest developments and practices in prevention. In the OSH legislation, excellence in prevention is not explicitly required. This has led to the differentiation between companies that accept legislative conformism and others that wish to be proactive or generative,

voluntarily enrolling themselves among the elite companies or institutions that adopt higher standards and best practices, oriented towards excellence and predictability, by using **Quality Standards from the ISO family, which includes ISO 45001 for quality OSH**.(NQA after ISO, 2018)

3. RESEARCH METHODS USED IN THE STUDY

To be able to clearly and accurately present the current state of the contextual state enabling the acceleration of innovation in OSH, we used qualitative methods (Merriam, 2002). Through the critical direct observation method, we aimed to monitor relevant aspects in the field of OSH (legislation, strategies, European actions). Through the method of interpretative analysis, we have followed and compared the substantive content of the implications so that, finally, the study's conclusions can be drawn. In this research, we also use another mixed qualitative method - narrative inquiry and case study. It was conducted based on the perceptions of OSH specialists in Romania, gathered by the authors over time, who themselves specialised in this field, thus making the drafting of hypotheses, analysis, comparisons and conclusions useful and eloquent for this study.

We opted for a **qualitative analysis, predominantly used in the social sciences**, due to the specificity of the field of OSH, which, although it has applicability in the technical and managerial field, is based on the interdisciplinarity of some social sciences (law, sociology, psychology, medicine, human resources, etc.).

According to a theory circulated in the scientific world, we do not have a science of OSH, although there is a significant scientific interest in prevention, we have just the OSH applicative domain. OSH applies models and theories without the success of their unitary coagulation. A large part of these paradigms and theories come from the social area, being approaches of man-machine interactivity, giving rise to socio-technical, organisational, and technological-human systems with complex interferences in accidentogenic casuistry.(Swuste et al., 2019)

The methodology addressed does not aim to develop concrete solutions or best practices because the range of measures is too broad depending on the specific field of economic activity. The study's results aim to open the horizon of knowledge given by the transformations in digitalisation and Artificial Intelligence, which directly impact society. These transformations are ones that the OSH field must also take advantage of in the fight for the prevention against events in workplace.

Following this, we describe the implementation framework by listing relevant provisions and actions supporting the acceleration of innovation at the international and European levels, which bodes well for OSH. We will review legislation and best practices, scientific studies, and technological or digital applications, as well as provide a reference to the current situation in Romania, which shows the trend and the need to take continuous and appropriate action according to the risks.

4. PILLARS OF THE FRAMEWORK FOR ACCELERATING INNOVATION IN OSH PREVENTION MEASURES

Within each description, essential references related to the subject of the work are underlined. It is noticeable that all the elements presented have as a common denominator the concern for prevention at the highest qualitative level and the apparent interest in the development of technologies, digitalization, and AI.

4.1. Legislation and European Council strategies or actions

Updated European framework Directive for OSH 89/391/EEC (Council of the European Communities, 2018)
According to art.6 – "Within the context of his responsibilities, the **employer shall take**

- the **measures necessary** for the safety and health protection of workers, including prevention of occupational risks …
- shall be **alert** to the need to **adjust** these measures to take account of **changing circumstances**
- following general principles of prevention …
  - **evaluating the risks** …
  - **adapting to technical progress** …
  - developing a coherent overall **prevention policy which covers technology** …"

*European OSH strategy (2021-2027) (*EU strategic framework on health and safety at work 2021-2027 Occupational safety and health in a changing world of work*, 2021)*
Key priorities in the vision zero approach are: 1. anticipating and managing change, 2. improving prevention, 3. increasing preparedness, 4. anticipating risks, and 5. developing **OSH practice and policy in areas of digitalisation**.
We find here that point 2.1 sets an objective of "**anticipating and managing change** by modernizing and simplifying OSH rules **through digitization"**; point 2.2 sets an objective of **improving prevention**; point 2.3 "**Increasing preparedness - responding rapidly to threats**"

Romanian National Strategy on AI – 2024-2027
Favorable conditions (Secretariatul General a Guvernului României, 2024):

- Human resource, digital skills and AI skills
- Infrastructure and data management
- Development of AI solutions in RDI centres and business environment
- Funding for AI - Horizon Europe, Digital Europe, Made in Europe.
- Adoption of AI solutions in government, public sector, business and society

EU-OSHA campaigns (2016-2025) for ICT/digitisation in OSH and EU-OSHA campaigns OSH Overview (2020-2023) with 5 key aims:

- **Worker management through AI** (AIWM) - (EU-OSHA, 2022); (Kellogg et al., 2019)
- **Advanced robotics and artificial intelligence** (Laura López Forés, Lucie Lechardoy, Cristiano Codagnone, Lode Godderis, 2024)
- Digital platform work
- **Smart digital systems**
- Remote work

The EU-OSHA Report named Foresight on new and emerging occupational safety and health risks associated with digitalisation by 2025 (Stacey et al., 2018) treats terms like: Built-in OSH, Robotics, autonomy and artificial intelligence, Human interfaces, Big data for better OSH, Smart PPE, Ethics of AI decision-making, with their key issues - surveillance and control, transparency, accountability

EU Commission proposal for AI Act (European Union, 2024)
EU AI Act was developed in the context of the Digital Decade.(Firth-Cozens, 2003). This document has two aspects: (1) promoting confidence, security, transparency and fundamental human rights and (2) **Stimulating excellence in the innovation of digital systems.**

4.2. Good practices

The good practices in OSH are developed at several levels, as described below. OSH organisations or agencies concerned with informing and guiding the approach to risk, with concrete proposals for approach.

- European OSH Agency - **Guidelines for employers** (European Commission, 2016),
- International Labour Organisation (ILO) Guideline (ILO, 2009), art.3.10.2.2 "… hazard identification and **risk assessment should be carried out before any modification** or introduction of new work methods, materials, processes or machinery."
- European Commission - Guideline for risk assessment (European Comission, 1996) art. 12.1 – 12.3" **Risk assessment should not be a once**-and-for-all activity. The assessment needs to be **reviewed and revised, as necessary** …can be improved; it needs to be updated and revised …measures currently in place are insufficient or no longer adequate … it will be prudent to **review risk assessments at regular intervals**, depending on the nature of the risks"
- ETUC (European Trade Union Confederation) (ETUC – The European Trade Union Confederation, 2020) - According to article 155 of the UE Treaty, social partners agree, promote and implement "**tools and measures, where necessary** at national, sectoral and/or enterprise levels, in accordance with the procedures and practices specific to management and labour in the Member States and in the countries of the European Economic Area", **agreement for Digitalisation** are an exemple. One of the important provisions is "The **control of humans over machines** and artificial intelligence should be guaranteed in the workplace and should underpin the use of robotics and **artificial intelligence applications whilst respecting and complying with safety and security controls.**"
- ISSA The International Social Security Association
  This international association, which campaigns for the social security of workers, has since 2016 created a Guide for prevention, from which we present some relevant chapters for the immediate adequacy of the necessary measures against emerging risks (Issa, 2016):
  - Guideline 22. **Early detection and intervention**
  - Guideline 28. **Assessment of occupational accidents and diseases**
  - Guideline 29. **Risk assessment**
  - Guideline 32. **Research and development in prevention**
  - Guideline 39. **Establishing a prevention culture**

ISO 45001 quality standard for OSH
The OSH quality standard—ISO 45001—contributes to the **proactive improvement of performance management**, thus becoming an optimal tool for prevention. However, **it is insufficient** if it is not complemented by good knowledge and compliance with legal issues, adequate risk assessment, and good organisational safety culture at all hierarchical levels (Darabont et al., 2017).

The standard states in 9.1 that "The organization shall establish, implement and maintain a process(es) for **monitoring, measurement, analysis and performance evaluation**.", and in point 9.3 lit. e. it is stated that the need for a **continuous review of management policies** should include "**adequacy of resources** for maintaining an effective OH&S management system" so that the **system is continuously updated, adequate and effective**.(International Standard Organisation, 2018) sanctionable

Here, we discover the fundamental difference between legal and best practice provisions. If legal acts lay down sanctionable responsibilities in non-fulfilment cases, good practices require ways to **prevent non-fulfilment through continuous monitoring, updating, and auditing.**

OSH specialist - internal, external or OSH authority inspectors
Although there is a continuous concern about the specialization of OSH staff, international organizations (ISSA/ENSHPO—International Social Security Association / International Network of Safety and Health Practitioner Organizations) still **rely on the voluntary work of specialists** in professional development, networking, participation in conferences, and experience exchange to continuously gain better experiences in the field of OSH (Hale, 2019)This voluntary attitude in career specialisation significantly reduces performance orientation and alignment with best practices. OSH specialists often choose just to conform to the law and routine, unadapted to new challenges and emerging risks.. This **voluntary attitude in career specialisation significantly reduces performance** orientation and alignment with best practices. OSH specialists often choose just to c**onform to the law and routine, unadapted to new challenges and emerging risks**.

In the Netherlands, for example, community perception shows a positive appreciation of the value of OSH professionals. They have a vast professional association membership community of around 3000 members, of which 55% are certified. Some of the members come from academia, and others sign up to abide by a code of ethics in the profession.(Swuste et al., 2019)

In the case of labour inspectors, good practices also come from their professional experience, training and knowledge disseminated within the state control apparatus. ”Labor Inspection is the most important authority of the state for **designing, stimulating and contributing to the development of a culture of prevention.**” (Simionescu & Urechiatu-Burian, 2019). Labour inspectors are appointed by the authorities to ”**methodologically control, coordinate and guide the application of the provisions** on health and safety at work” (Romanian Labor Inspection Law no. 108/1999, art. 6, paragraph (2), point B). This obligation, based on the experience, very good knowledge of the legislation and good practices that they have validated during their work, is mainly realised through two types of methods:

- Thematic inspections - unannounced or upon request, on-site, with checks and drawing up of measures for compliance with the legal provisions, or sanctioning in case of flagrant, dangerous or repeated misconduct
- Guidance, recommendations, interpretations of OSH normative acts, even setting certain limitations that the law explicitly allows on a case-by-case basis, which can be realised through campaigns, conferences or even by participating as a guest consultant at OSH Committee meetings.

The experiences, attitudes, and competencies of each worker, team leader or general manager, in generally safety culture and organisational behaviour

A new best practice resource is found in each and every participant in the OSH management system. Here, we are talking about the **experience of each individual** worker and the efficiency, **commitment, dedication and leadership of managers** on whatever hierarchical ladder they are on.

In addition to experience, monitorable in years of seniority in their own work, we are also talking about the **knowledge, skills and safety behaviour** of the employees and the employer, all contributing to the establishment of **company-specific good practices**, due to the managerial specificity of the OSH of the participative - consultative type. Participation in the suitability of prevention measures according to the risks is an obligation to be fulfilled by employer and employee representatives. They must participate both in the **process of assessing risks and proposing measures** and in the **process of approving and implementing** appropriate measures. Consequently, worker participation is an important key to the success of the risk prevention management system in creating safer and healthier workplaces.(Hassard et al., 2012)

When we talk about safety culture or organisational behaviour, we must consider workers' attitudes (more than skills), determined by their psycho-social perceptions (along with their knowledge), which are directly influenced by complex factors, both from the external environment as well as from the company's internal environment. Here we can list as influences of the safety culture, those coming from the culture/habits of prevention in the area, group, family, friends, level of education, the practice of certain hobbies, perceptions conveyed by vectors of opinion remaining in the public consciousness, or multimedia. Organisational behaviour also creates a climate of safety, which can be achieved through the proactive and dedicated involvement of management in prevention, through training, through proactive, constructive, and optimistic attitudes of the members of the organisation, and through stimulating, rewarding, and reinforcing participation in the organisational system.(Gaureanu, 2021)

4.3. Technologies, Digitalization, Artificial Intelligence (AI) and Internet of Things (IoT)

In the construction of this pillar to support the acceleration of innovation in OSH, many components of new technologies contribute, becoming the so-called key enabling technologies (KETs), sensors and technologies that fall into the IoT category (J. Howard et al., 2022), technologies that provide proactive and personalized opportunities for worker protection, such as:

- Wearable devices or sensors for monitoring postural ergonomics in real time for use in OSH (Petz et al., 2021) (Pistolesi et al., 2024) or even in sport (Huang et al., 2025),
- Smart glasses for various remote data retrievals useful for OSH analysis (Patel et al., 2022)
- Smartwatches to recognize activity types (Altheimer & Schneider, 2024)
- Equipment or PPE that also transmits data about the location, health or fatigue of workers and more (Rasouli et al., 2024), (Wang et al., 2024)
- Sensors to help employers measure and improve worker productivity (Patel et al., 2022);

5. DISCUSSION AND CASE STUDY

Talking about technology, we can look back in time and see that in the vehicles treated, there are only approaches to prevent the risks developed by technologies, and for this reason, there are concerns for better identification and assessment of those risks, with appropriate information and training. At that time, the emphasis was on the quality of the “Safety System” (Friend & Kohn, 2007). From a managerial

perspective, this section covers techniques for implementing steps in risk assessment and risk analysis through a program plan (PP) with different methods and approaches. Some assessment methods still exist and are still used today, but even then, it was anticipated that there would be a need for a proactive approach to assessment (p.213). There are concerns about their effectiveness in reducing occupational risks in the workplace (Hasle & Zwetsloot, 2011).

As time has passed and technologies have advanced, this concern for improving the OSH management system (OSHSM) has led to analysing the human capabilities needed for a proactive approach to dealing with risks. This is how the psychometric approach to these capabilities emerged, which "is grounded in basic cognitive psychology, and it represents one major approach to understand why perceptions of risk can deviate from objectively measured risks." (Leoni, 2010).

Talking about the pillars of the development of prevention through new technologies, we see that good practices stemming from perceptions influenced by the safety culture are based on the perception of risks by most people in a more personal way (Sjöberg, 2000). Difficulties in understanding probabilistic processes, biased media coverage, and misleading personal experiences can lead to wrong perceptions of risks or even complete risk denial. (Slovic et al., 1982)

Between the two situations, the necessity of the proactive safety system improvement and the reality of decision-making by an OSH specialist or manager, there are, as we have seen, deviant perceptions. The human manager, knowing the limits in his cognitive dimensions in risk assessment, can direct this decision-making to the AI by transmitting all the necessary information and creating logarithms to cover his imperfections of knowledge and analysis.

The process is a gradual and empirical one, with practical methods for analysing and predicting risks in Large Language Models (LLMs) starting to be launched in a regulating general-purpose AI (GPAI) system (Novelli et al., 2024). These developments take into account an existing model based on the identification and combination of risk factors, and we adopt the framework developed by the Intergovernmental Panel on Climate Change (IPCC) detailed by (Simpson et al., 2021).

A similar framework is given by the definition of Algorithmic Management described by (Stacey et al., 2018), which contains:

- "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;
- the use of "nudges" and penalties to indirectly incentivize worker behaviours"

The management strategy for implementing new technologies will have to consider both aspects, perhaps contradictory at first sight but which can only be considered together, being in a continuous mutual influence: workers' condition control and productivity. (Krzywdzinski et al., 2022; Vidal, 2020)

5.1. Case study – adequate measure process regarding new risk discovered in Romania

The European Survey of Enterprises on New and Emerging Risks (ESENER) contains a chapter on monitoring the periodicity of risk assessments.(A. Howard et al., 2019)

The questions asked to the OSH specialists (45,420) in the European area concerned the following issues from Table 1

Table 1: Result of risk assessment survey in EU by ESENER 2019

No	Question	Average EU	RO
1	Does your establishment carry out workplace risk assessments regularly?	76,6% yes	94,1% yes
2	In what year was the last workplace risk assessment carried out?	35,3% last year	46,7% last year
Reasons why workplace risk assessments are not carried out regularly			
3	The dangers and risks are already known?	84% yes	81,6% yes
4	There are no major problems?	80,3%yes	71,7% yes
5	The procedure is too onerous	20,9% yes	84,2% yes
6	The necessary expertise is lacking	31% yes	22,7% yes
Emerging risks and their management – Digital technologies at work			
7	Are wearable devices, such as smart watches, data glasses, or other (embedded) sensors, used in your workplace?	4,8% yes	8,9%yes
8	Have the possible impacts of the use of such technologies on the health and safety of employees been discussed in your workplace?	24,5% yes	42,7%yes

In our view, the term periodic/regularly (from question 1 of Table 1) is rather vague for some risks, irrelevant for OSH quality assessment, and practically unacceptable regarding workers' lives. Risk assessment—which underpins modern prevention—cannot be approached in vague terms because the expected outcome of risk assessment, which directly influences workers, must be continuously established and adopted. Workers need workplace safety at every moment of the job, not periodically when a risk assessment is decided. ESENER 2024, as in 2019, only considers regular risk assessments, not any reference to continuous monitoring or duration of its implementation.

To these reasons investigated by the EU-OSHA, for the case of Romania, we could add the following causes that lead to the depreciation of the efficiency of risk assessment:

- **Routinisation** of the specialists in carrying out the updates, arriving only at an update of the deadlines for preventive actions from one year to another. Most risk assessors limit themselves to these formal update practices (changing in title just the year of evaluation) without real on-the-field evaluation.
- **Not knowing or losing the significance of reporting** the introduction of new machinery, procedures, and processes containing new, unassessed risks, and only after a specialized check can action be taken.
- If the assessment procedure is expensive for Romania, four times more expensive than the EU average (question 5 in Table 1), it is also tedious and time-consuming. **The duration** does not refer to how long the assessment procedure takes but how long it takes from identifying a risk to implementing a proposed measure. This is due to bureaucracy and financial considerations.
- **Bureaucracy** - means that if the employer does not take immediate decisions on appropriate preventive action, the legal rules provide procedures for convening "whenever necessary" the OSH Committee – OSHC, at least 5 days later (legal deadline for convocation), or at the ordinary quarterly meeting. At the meeting, with the agenda already announced, appropriate action is discussed and voted upon.
- **The possibly high costs of implementing** new preventive measures lead the employer to **delay indefinitely**, at his own risk and responsibility, decisions on the adequacy of measures

for the new risks. In this case, the realisation of the measures requested and voted on within the OSHC is not sure to be carried out in time unless the representatives of OSH workers or OSH specialists do not request the authorities in the field to intervene and possibly sanction the employer for failure to comply with legal obligations to take preventive measures adequately. However, those involved request the help of the state authorities (in Romania the OSH inspectors from the Territorial Labor Inspectorate) when and if they want; the legislation only provides for the possibility of referral, not as a mandatory obligation (art. 56 of HG 1425/2006 "may carry out the following activities: ... f) inform the authorities ..."). Only in case of creation (attention, not in case of existence) of imminent risk, the failure to take preventive measures leads to criminal liability/offence, punishable by imprisonment from 6 months to 3 years.

The poor prospect of success in taking appropriate new preventive measures due to the above (routinisation, lack of knowledge, time, costs) demotivates both those who would propose measures after specialised analysis and those involved who would benefit from reducing/eliminating risks immediately after they arise.

The emergent appropriateness of continuous risk assessments with taking appropriate action in real-time through AI is low due to the specificity of the risks that require such monitoring. This can also be seen in ESENER 2019 (question 7 in Table 1), which shows us that wearable technologies used in the EU have a rate of 4.8% and in Romania, an auspicious rate of almost double, 8.9%. The same encouraging trend for Romania is also the answer to question 8 in Table 1, which shows a much broader openness to discussions on the impact of technologies in OSH.

6. CONCLUSIONS

As can be seen, even if there is no EU strategy exclusively dedicated to OSH, aspects of innovation, digitisation, or AI are integrated or implicitly contained in legislation, strategies, or initiatives influencing the OSH field. The EU expert reports anticipate, define and explain the impact of technology acceleration and AI's footprint on the future of business in the European space. They complement the European Union's intense concern and full-force commitment to develop, support and promote deployments with AI and new technologies at the forefront.

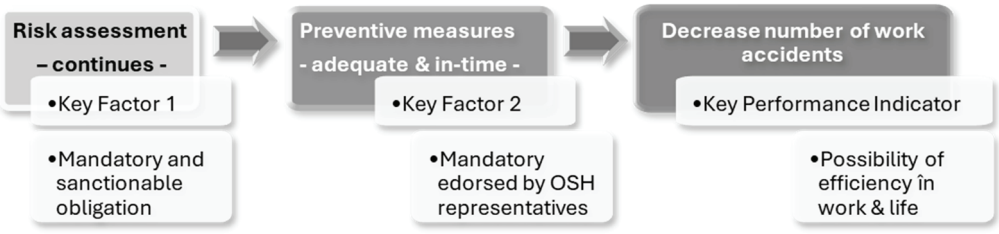
Best practices and theories have evolved and have matured to recommend (with the appropriate precautions) to take advantage of the opportunities offered by digitisation and data analytics and acting through AI.

By putting workers' well-being, safety and health at the forefront, man can transfer semi- or fully automated decision-making (Christenko et al., 2022) to safety systems capable of capturing data and analysing and resolving new and dangerous situations on time. Even if all these decisions are in the early stages, in the hands of human algorithms, with AI advice, there are prospects for AI to take control of the decisions. The decision protocol taken over by AI can be applied, especially where risks are significant and arise unexpectedly in dangerous processes with very short reaction times, especially where robotic infrastructures are used.

Workplace risk assessment, “the cornerstone of the European OSH approach,” has as its ultimate effect, of interest to workers and employers, the most important KPI in OSH—accidents at work. Thus, based

on risk assessment, the measures that exist in the risk prevention plans become key factors (KF) to be implemented optimally to improve the KPI of the lowest possible number of accidents (Picture 2).

Picture 2: KF influences KPI



Shifting to a proactive and even generative, anticipatory and proactive developmental approach to OSH benefits workers' lives, health, and organisations seeking to thrive in an increasingly dynamic and complex environment. Accelerating technological developments thus compel leaders to take such futuristic steps as a commitment to a climate of safe development and a robust future in OSH.

7. ACKNOWLEDGEMENT

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