Smart Workplaces: AI, Robotics and Impact on Occupational Safety

Dublin – 31st October 2024
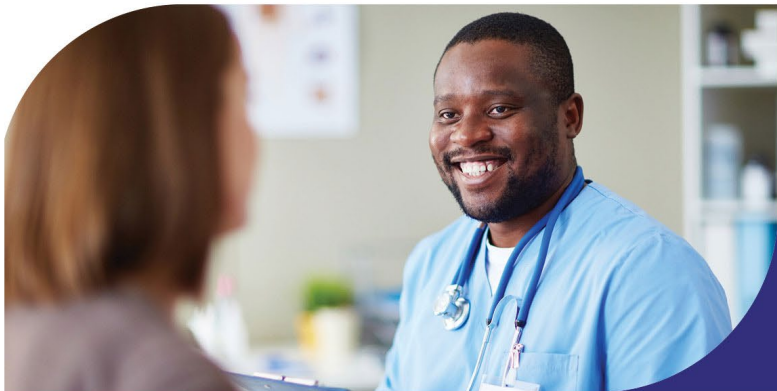
HSA

An tÚdarás Sláinte agus Sábháilteachta
Health and Safety Authority

Slido Questionnaire

Which of the following did you use this morning?

Slido Questionnaire

Do you expect that the adoption of AI in the workplace will have a positive or negative impact on workers' safety?

Definition

An AI system is a machine-based system that, for explicit or implicit objectives, infers from the input it receives, how to generate outputs such as predictions, content, recommendations, or decisions that can influence physical or virtual environments.

Different AI systems vary in their levels of autonomy and adaptiveness after deployment.

OECD 2024

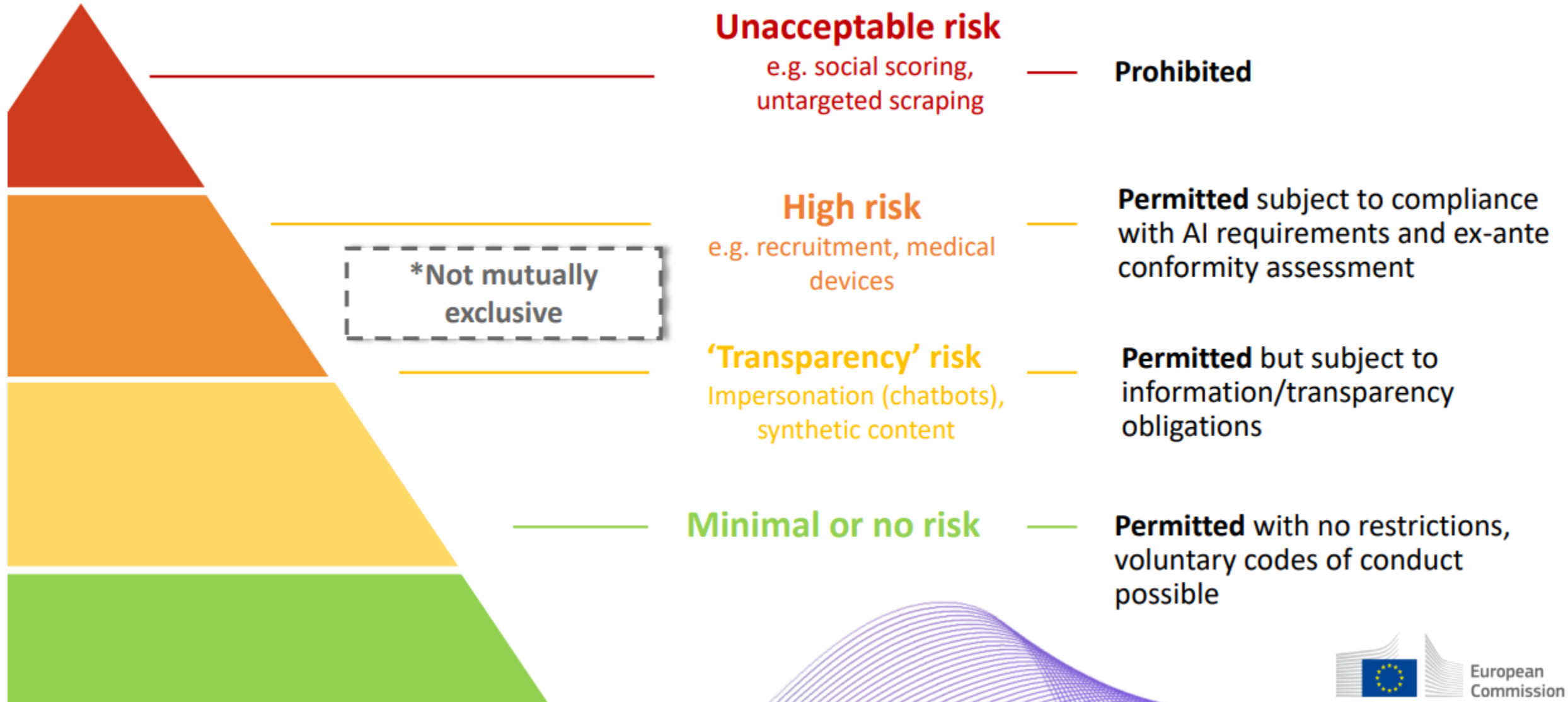# EU Guardrails – Harmonised Rules on AI

Designed to provide a high level of protection to people's health, safety, and fundamental rights and to promote the adoption of human-centric, trustworthy AI.

➤ Entered into force 2nd August 2024,

➤ Provisions apply over 36-month period,

➤ Risk-based approach.

EU AI ACT

https://digital-strategy.ec.europa.eu/en/policies/regulatory-framework-ai

Classification of Risk

Unacceptable risk
e.g. social scoring, untargeted scraping — **Prohibited**

High risk
e.g. recruitment, medical devices — **Permitted** subject to compliance with AI requirements and ex-ante conformity assessment

*Not mutually exclusive

'Transparency' risk
Impersonation (chatbots), synthetic content — **Permitted** but subject to information/transparency obligations

Minimal or no risk — **Permitted** with no restrictions, voluntary codes of conduct possible

European Commission

Prohibited AI Practices for Unacceptable Risk

a) **Subliminal techniques** likely to cause that person, or another, significant harm,

b) **Exploiting vulnerabilities** due to age, disability or social or economic situation,

c) **Social scoring** leading to *disproportionate* detrimental or unfavourable treatment,

d) **Profiling individuals** for prediction of criminal activity,

e) **Untargeted scraping** of facial images,

f) **Inferring emotions** in work or education,

g) **Biometric categorisation** of race, religion, sexual orientation…,

h) Real-time remote **biometric identification** for law enforcement purposes.

High-risk AI Systems

Two categories:

1. Use of AI in conjunction with 12 product types covered by certain EU safety legislation ('Market Surveillance'),

2. Eight specific uses of AI.

Transparency Obligations

1. **Providers of AI systems intended to interact directly with natural persons,**

2. **Providers of AI systems, generating synthetic audio, image, video, or text content,**

3. **Deployers of emotion recognition system or a biometric categorisation system,**

4. **Deployers of AI system that generates or manipulates image, audio or video content constituting a deep fake.**

'deployer' means a natural or legal person, public authority, agency or other body using an AI system under its authority except where the AI system is used in the course of a personal non-professional activity;

'provider' means a natural or legal person, public authority, agency or other body that develops an AI system or a general-purpose AI model or that has an AI system or a general-purpose AI model developed and places it on the market or puts the AI system into service under its own name or trademark, whether for payment or free of charge;

Hi-risk Product Categories covered by Act

	Product Category	EU Harmonised Legislation
1	Machinery	Directive 2006/42/EC
2	Toys	Directive 2009/48/EC
3	Watercraft	Directive 2013/53/EC
4	Lifts	Directive 2014/33/EU
5	Equipment for use in explosive atmospheres	Directive 2014/34/EU
6	Radio equipment	Directive 2014/53/EU
7	Pressure equipment	Directive 2014/68/EU
8	Cableway installations	Regulation (EU) 2016/424
9	Personal protective equipment	Regulation (EU) 2016/425
10	Appliances burning gaseous fuel	Regulation (EU) 4016/426
11	Medical devices	Regulation (EU) 2017/745
12	*In vitro* diagnostic medical devices	Regulation (EU) 2017/746

High-risk Uses

1. **Biometric identification or categorisation, emotion recognition,**
2. **AI used as safety components in management and operation of critical digital infrastructures, road traffic, supply of water, gas and electricity,**
3. **Educational and vocational training,**
4. **Employment, worker management and access to self-employment,**
5. **Access to essential public and private services and benefits (e.g. healthcare, life & health insurance, creditworthiness),**
6. **Law Enforcement,**
7. **Migration, asylum & border control management,**
8. **Administration of Justice and Democracy.**

Application of Act

Most provisions apply from August 2026. However,

➢ **The prohibitions on uses with unacceptable risk apply from February 2025.**

➢ **The provisions on General Purpose AI apply from August 2025.**

➢ **The provisions on product-linked High-risk AI systems apply from August 2027.**

Obligations

➤ **The AI Act provides for two distinct dimensions of regulation of AI systems:**

    1. **Certification of AI systems' conformance with standards, and**

    2. **Supervision of systems by Market Surveillance Authorities.**

➤ **High-Risk Use Case systems must be registered in EU Database.**

➤ **The key responsibilities will lie with,**
- **Providers,**
- **Deployers.**

➤ **However, there are also responsibilities for,**
- **Distributors,**
- **Importers,**
- **Authorised representatives.**

Obligations of deployers of high-risk AI systems

...Before putting into service or using a high-risk AI system at the workplace, deployers who are employers shall inform workers' representatives and the affected workers that they will be subject to the use of the high-risk AI system...

Article 26(7)

Right to lodge a complaint with a market surveillance authority

...any natural or legal person having grounds to consider that there has been an infringement of the provisions of this Regulation may submit complaints to the relevant market surveillance authority...

Article 85

Fundamental Rights Impact Assessment

➢ **For High-Risk Use-Cases,**

➢ **Deployers that are public bodies, or private operators providing public services,**

➢**Assessment must include a description of,**

- ▪ **The deployers' processes and the intention of use of the AI system,**

- ▪ **Intended period of use,**

- ▪ **Categories of persons likely to be affected by the AI use,**

- ▪ **Specific risks of harm,**

- ▪ **Human oversight measures,**

- ▪ **Measures to be taken if risks materialise.**

To summarise

➢ **The EU AI Act is a significant advance in ensuring that AI is used in a safe and ethical manner in workplaces across the EU.**

➢ **By addressing the potential harms from use of AI and protecting workers' rights, the Act will help create a safer and fairer working environment for EU workers.**

Thank you.

Questions?

Slido Questionnaire

Which statement best describes the use of AI in your organisation?

An Employer's Perspective on the impact of Digitalisation, AI and Robotics on OSH

Dr. Michael Gillen, Head of OSH Member Services, Ibec

October 2024

Ibec

Areas to consider, from an OSH perspective

- Digitalisation

  - Software as a service (SaaS)

- AI

  - (artificial or augmented?)

- Robotics

  - They're here already!

Digitalisation: why SaaS?

- Cloud-based software designed to manage compliance, risks, and operational safety & health in the workplace

- No need for on-premise infrastructure

- Automatic updates and maintenance

- Accessible from any device with internet connectivity

- Mobile APP supported

- Scalable architecture as a managed service

- Reduces need for IT knowledge or support

The Evolving Landscape of OSH SaaS

- Key drivers

  - Regulatory compliance, workplace safety and risk

- Return on investment

  - 25-35% reduction in incidents < 2 years

- Mobile solutions

  - 65% use mobile apps for field inspections, incident reporting and audits

Ibec

AI – artificial or augmented?

- Key benefits
  - Real-Time data for informed decision making
  - Tracking trends and identifying risks
  - Compliance tracking and auditing
  - Predictive analytics
  - Enhanced stakeholder reporting
  - Continuous Improvement through data-driven feedback
- [Worker management through AI](#)
- [AI and education – a teacher-centred approach to safety and health](#)

Worker management through AI

- A human-centred, transparent, approach that is based on participation and consultation
- Platform work
  - 39% Taxi driver
  - 24% Food delivery
  - 19% Home services
  - 7% Professional services
  - 6% Freelancers
  - 3% Domestic work
  - 2% Micro tasking

Advanced robotics
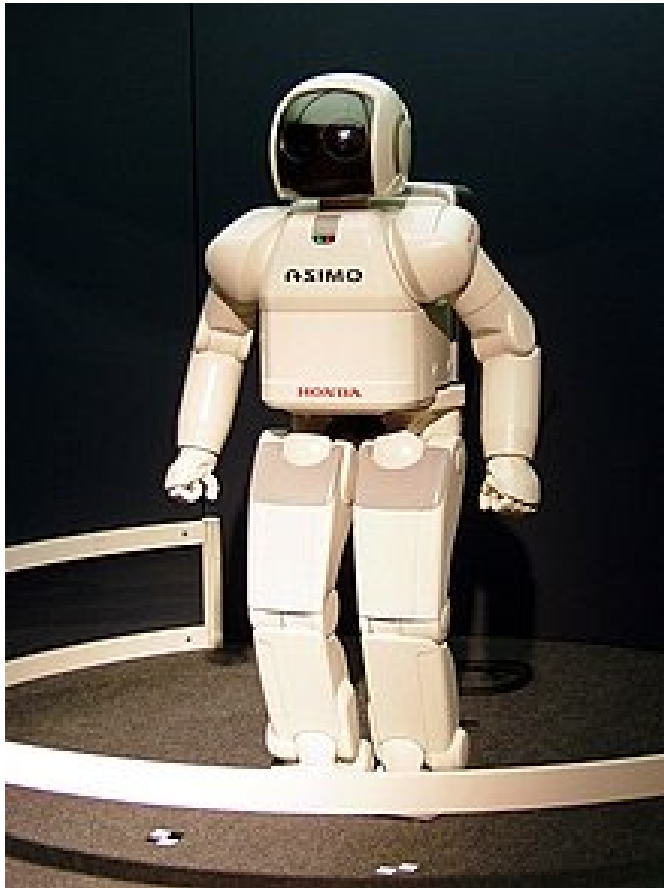
Advanced robotics

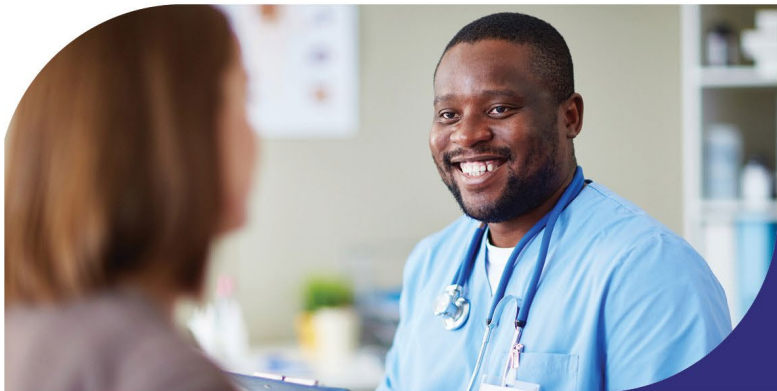**OSH in the digital age – final thoughts**

• Most hazards will still remain

• Risks will still need to be assessed

• We still need adequate controls

• Communication & Consultation are more important than ever before

• A human centric approach is key

OVERVIEW

Introduction to AI's Expanding role and review of research notably from Oxford Internet Institute.

Key challenges:

- Integration

- Reliance

- Transparency & Ethics

Case Studies

Recommendations for addressing challenges for the future of work.

WHAT IS AI?

'An AI system is a machine-based system that, for explicit or implicit objectives, infers, from the input it receives, how to generate outputs such as predictions, content, recommendations, or decisions that can influence physical or virtual environments. Different AI systems vary in their levels of autonomy and adaptiveness after deployment' – OECD 2023

AI'S EXPANDING ROLE IN WORKPLACES

High AI investment – AI funding reached 9 billion dollars and rising.

Expansion beyond tech – AI now impacts sectors like healthcare, retail and manufacturing transforming traditional workflows.

Purpose of evaluation – Analyse real-world impacts on organisational dynamics and worker experience.

MAIN CHALLENGES OF AI IN THE WORKPLACE

INTEGRATION

Issues adapting AI to diverse unpredictable work environments.

RELIANCE

Over –dependence on AI for tasks that may require nuanced human judgement.

TRANSPARENCY

Lack of clarity regarding AI's operational decisions and human involvement behind the scenes.

INTEGRATION CHALLENGES

DATA & PROCESS GAP

AI often requires specific data formats and consistently high-quality inputs that real-world environments lack.

MEDICAL AI IN CLINICS

Example of medical AI test in clinics for diagnosis of diabetic retinopathy
Problem: System's lab-tested accuracy (90%) dropped in fast-paced clinic settings. Nurses faced constant rejections due to poor lighting and image quality, leading to frustration.

INFRASTRUCTURE READINESS

Companies frequently face budgetary and infrastructure constraints that slow or complicate AI deployment

ANALYSIS

Demonstrates the disconnect between controlled testing environments and real-world conditions. Workers were expected to rely on AI for faster diagnostics, but the system hindered their work in practice

RELIANCE CHALLENGES

AI'S BINARY LIMITATION

BIAS RISKS

CASE STUDY AI HR SYSTYEM

NEED FOR HUMAN REVIEW

TRANSPARENCY CHALLENGES

AI AS A SURVEILLANCE & DISCIPLINARY TOOL

AI FOR WORKPLACE MONITORING

PRIVACY CONCERNS

CASE STUDY – AI FOR DETECTING WORKPLACE HARRASSMENT

Analysis: While security is essential, relying on AI for nuanced social judgment may create a surveillance culture, prompting employees to find ways to evade monitoring rather than foster trust

AI CREATING NEW/ADDITIONAL WORK STREAMS

AI INDIRECT WORKLOAD INCREASE

BLURRING PROFESSIONAL/ PERSONAL LINES

CASE STUDY – CONTENT MODERATOR

DATA EXTRACTION & WORKER AUTONOMY

| 1 | Data as Capital |

| 2 | Privacy rules |

| 3 | Case Study – Companies use of Spatial Analytics |

BRIDGING THE AI GAP IN WORKPLACES

- **Transparency**:

- **Clear Communication**: Be open about AI's capabilities and limitations, as well as the human roles supporting it.

- **Consumer Awareness**: Educate consumers about the human labour involved in AI

- **Integration**:

- **Workforce Training**: Upskill employees to better use and understand AI.

- **Flexible System Design**: AI systems should adapt to specific workplace contexts

- **Reliance**:

- **Balanced Use**: Incorporate human oversight to maintain nuanced, ethical decisions.

- **Ethical Supply Chains**: Recognise and support fair labour practices for offshore workers supporting AI.

CONCLUSION

KEY MESSAGES:

Enhanced AI Workplace Symbiosis – AI should complement not replace human roles.

Transparent, Ethical AI use – Clear communication and ethical supply chain practices will build user and worker trust.

Reinforce the value of a balanced strategic approach to AI in workplaces.

Collaborative employer/employee implementation will foster a productive, ethical and resilient future workplace.
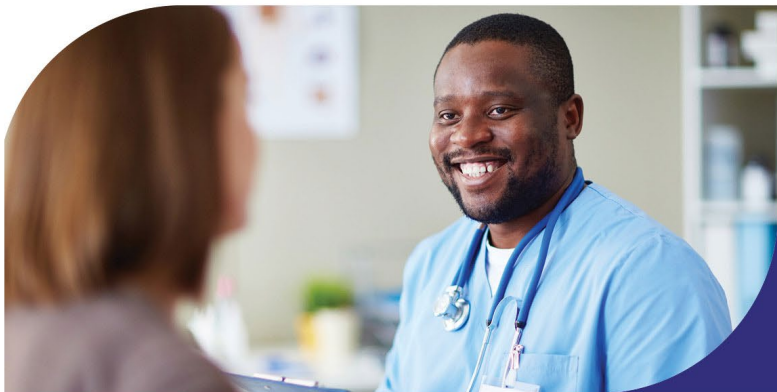
Go raibh maith agaibh

Thank you

T: 0818 289 389

E: contactus@hsa.ie

W: www.hsa.ie

HSA

An tÚdarás Sláinte agus Sábháilteachta
Health and Safety Authority
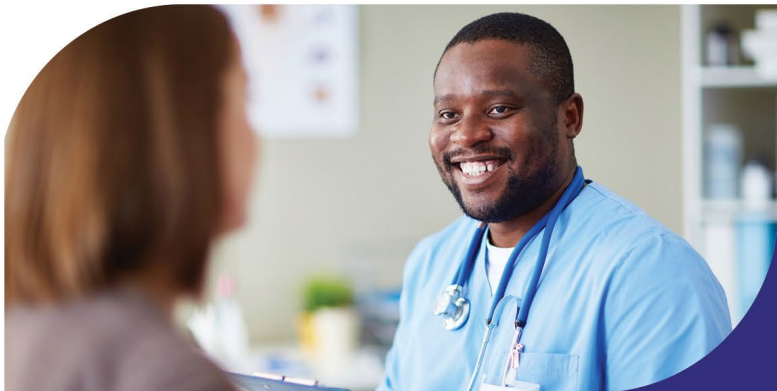
Outline of presentation

- **Query:** Is there a link between increasing digitalisation and psychosocial hazards and fallout for the working population?

  - Human experience -> work -> human behaviour
  - Human experience of work - crucial filters
  - What environments motivate/demotivate?
  - Is digitalisation relevant to the above?
  - Future cautions/solutions for work organisation/SOW

Relevant to 'business case'

- Innovation – digital is developing all the time
- Collaboration – working with others brings more to all
- Leadership – effective leadership, protocols and methods
- Learning – digital involved in assessment, delivery and feedback
- Coaching/mentoring – needed even more in hybrid times
- Resilience – a developing capacity to overcome challenge and thrive

Context of Psychosocial within OSH

"Psychosocial risks and resulting consequences for **mental** and physical health are among the most challenging issues in occupational safety and health.

Besides their detrimental effect on individual health, psychosocial risks can also negatively impact the efficiency of organisations as well as national economies." (EU-OSHA)

From EU-OSHA Guide 2023-2025

- *Digital technologies in the workplace are safe and beneficial for workers as long as **potential** risks are properly assessed and managed.*

- *Technologies can also lead to physical strain and musculoskeletal disorders if used for prolonged periods as well as to **situations of heightened stress, social isolation or poor psychosocial health.***

- *To ensure that a **human-centered** approach to digitalisation in the workplace is implemented.*

Digital impact on work systems - How?

1. Being a **user** of digital platforms and/or software to get job done
2. Being **managed** by digital means while getting job done
3. Receiving **feedback** through AI or digital means for performance appraisal
4. AI directing **L and D** needs
5. **Learning** using digital technology at work

Examples of digitalisation

- Filtering of irrelevant or distressful information
- Engineered at source through software
- Reduced exposure to the whole – segmented, streamlining
- Pre-agreed/risk-assessed and controls algorithm

- Example: Sensitive Content Workers

Digitalisation examples

- Delegating tasks from a human to a machine (so the human presses more buttons)

- Time saving

- Boredom relief

- Examples: Fintech/insurance/banking/accountancy/professional services

Fallout for the method of working

- Quicker work processing. Less human decision making
- Lowered effort:
  - Less uncertainty
  - Less need for expertise
  - Less fear re failure
  - Less competitive environment

- i.e. HR management/financial products/health system/apps

Digitalisation at work – what happens?

- Shifting of traditional roles - sideways/upwards/downwards
- Bringing aspects of 'other' to career view/path. New skills
- Increase or decrease
  - Engagement to the work, task, others, org
  - Commitment – to the employer increased or decreased
  - Psych contract – what is my attachment about?

Digitalisation changes everything

- Reorganisation of social work systems – dynamic unfolding of 'upgrades', increased change and adaptation for tech

- Increase need to learn

- Adapt

- Understand

- Appreciate (agree with)

- Most of us, age-related as well as role and tenure issues

Digitalisation adds pressures

- New, non-human cues or triggers to generate or suppress behaviours
- Active and passive
- Alarms and notifiers
- Reminders
- Covert and overt: red flag and post event surveillance
- Potential Punishments and negative consequences

Context: psychosocial hazards

- Aspects of the work environment which have the potential to lead to psychological injury:
  - We generally collapse psychological injury type issues into the term: **work-related stress**
- Unclear global context: i.e. medical model classification, safety model reporting systems, fragmented across HR, IR, H&S, EL
- Unclear cause-effect relationships, wide individual variance
- Uncertain solutions due to its complexity, uncertainties, nature of work and nature of research
- Caused or made worse by work systems with negative fallout

Psychosocial hazards at work

- Demands of job – task oriented and technical
- Control over doing of the job – socio-technical
- Supportive environment – people and systems – around the worker
- Relationships – low friction, high cooperation
- Role clarity and transparency
- Change management and communication of change

- **WorkpositiveCI – joint tool from HSA and SCA**

  - www.workpositive.ie

Issues arising: engagement, attitude and behaviour

- User – Adaptation Challenge: Steps 1,2,3.
  - Understand behind the issue, (7 forces to influence) prior to event
  - IES – real time talk around and pilot/practice
  - User evaluation and reform, replace, re-do

- Managed – effective vs. efficient. surveillance vs. support, trust

- Feedback – how data gathered, transparency of model, bias, right to query, ability to query, result of queries, delivery mode/medium

- L and D needs identified through algorithm - robust identification system? Fair and just? Transparent? Understood? Socialised?

- Learning delivery through digital – lone, visual, aural, interactive, monitored, what about seeing others, listening, rebutting, sense-making, comms, mistake making and correcting, social discourse

Summary Solutions for preparing for change

- Not all digital is the same - nor are people or jobs
  - Differentiate between relevant characteristics of digital
  - Understand it first
  - Prepare and plan for others it effects
  - Trial and talk about highs and lows
  - Review everything done
  - Acknowledge the socio-digital systems in place and what *new* will mean *psychosocially*

  - **Paramount is that working is a social process**

- Consult to gain an understanding of how the above characteristics impact users' performance
  - introduce timely comms re shift
  - why, how, when
- Listen and learn from employees to appreciate how they view and value their processes
  - reasons for attachment
    - re-frame the ask for digital adaptation
- Formal review of psychological effects on users' behaviour, experience, and affective reactions

Finally

- What is **personally useful** AND **easy to use** will be used.
- Changes in habits – unobtrusive, not delay rewards
  - Friction and Choice Architecture - help **or** impede progress
- Divergent thinking - unfreeze set attitudes
- EAST model
- Trust and transparency: the biggest digital challenges in the human centred working world

Comfort Break

15 minutes
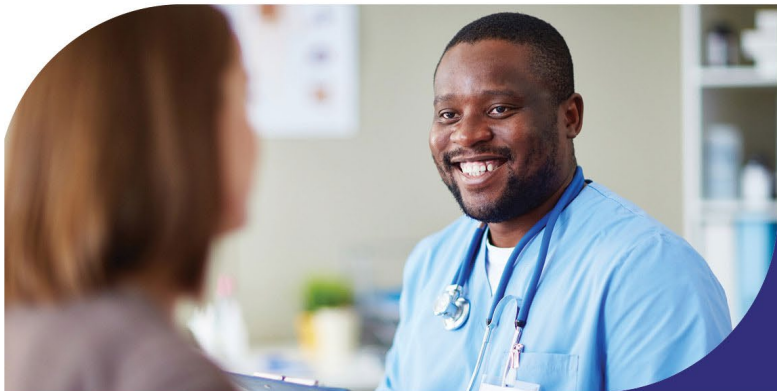
HSA Webinar: Influencing Safety Culture

Save the Date: 26th November, 11:00-12:00

Why attend:

This introductory level webinar, relevant to all sectors, will:

- help you understand safety culture in simple terms,
- give you insights into the role of safety culture in workplace accidents,
- highlight key influences on safety culture, and
- share research findings on workable solutions.

REGISTER HERE

Slido Questionnaire

Which of the following statements best explains your organisation's Digitalisation roadmap?

▶ Building a roadmap for digitalisation of OSH in industrial workplaces

Re-imagining – OSH in manufacturing with AI and robotics!
John Mc Auliffe
October 2024

PILZ
THE SPIRIT OF SAFETY

DIGITALISATION

▶ *"a fundamental, technology-based process"*

— Dragano, N., Lunau, T, 2020

▶ *"is a process of societal transformation that uses ubiquitous digital technologies to connect ever-larger social spaces".*

— *Kääriäinen, J., Kuusisto, O., Pussinen, P., Saarela, M., Saari, L., Hänninen, K*

▶ *"is a broad term used to describe the increasingly widespread adoption and use of digital technologies, with transformative effects on work, employment and society more generally"*

— (Eurofound, 2018a)

▶ ***"Transforming the core using digital tools and discovering and capturing new opportunities offered by digital means"***

— Trittin – Ulbrich, Scherer, Munro, Whelan, 2021

AUTOMATION

" 'the replacement [in full or in part] of labour input by machine input for some types of tasks in production and distribution processes',

Eurofound, 2018a "

DIGITISATION

(of processes)

" 'the use of sensors and rendering devices to translate (parts of) the physical production process into digital information (and vice versa)'.

Eurofound, 2018a "

Why Digitalisation ?

Key Drivers – Operational/Economic

Flexibility

Efficiency

Quality

Future proofing strategic or competitive advantage

Labour Cost

Productivity

Technically Essential

OSH

Capacity

Labour shortages

Why Digitalisation?

Key Drivers - Organisational
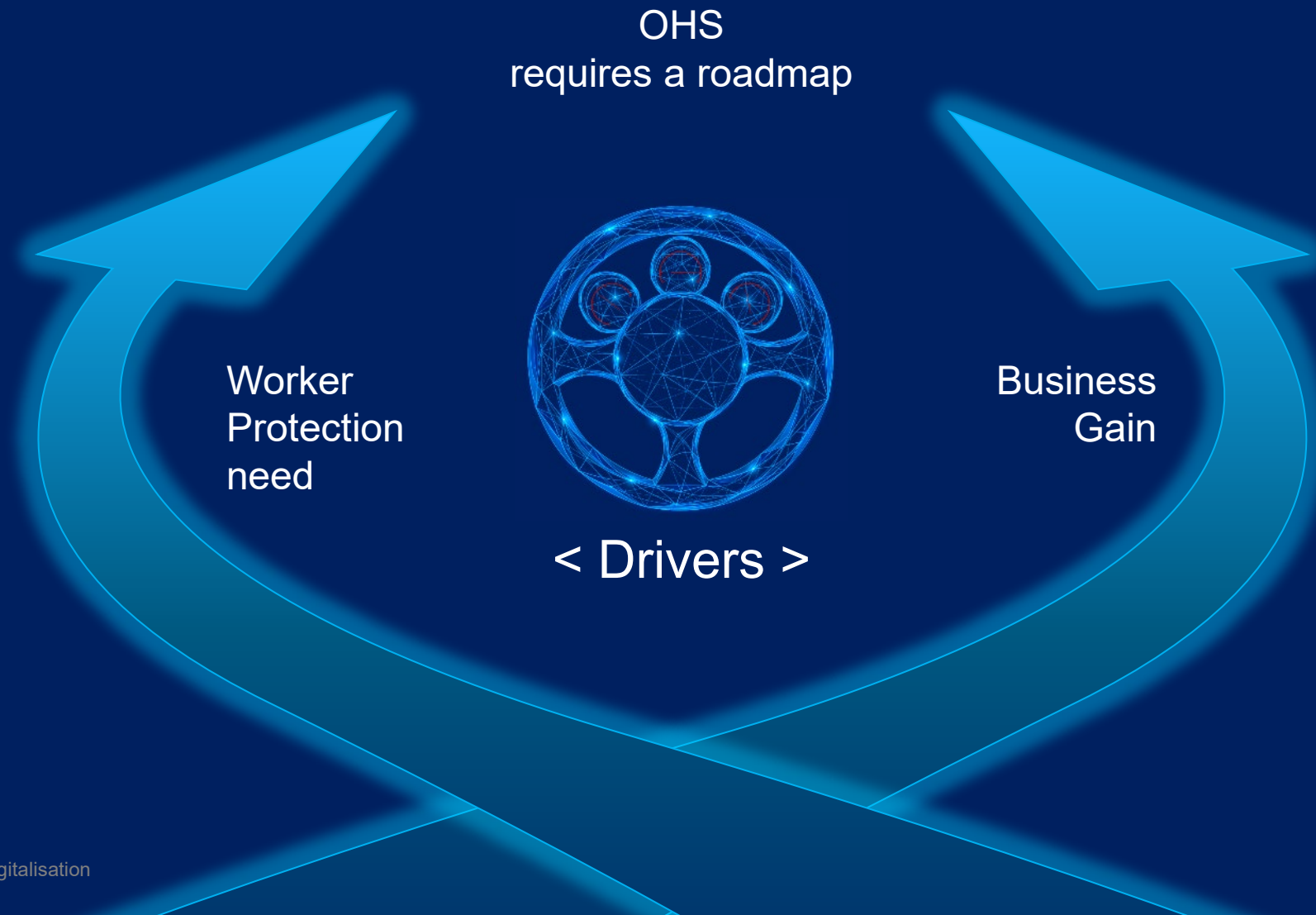
To adopt new technologies as a learning organisation

Increase attraction for employees - be seen as an employer of choice
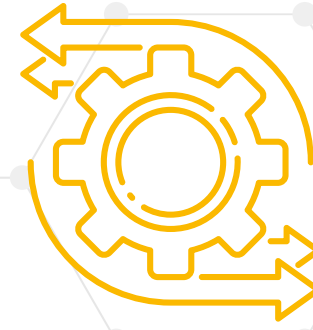
Change unattractive work methods and systems

▶ Digitalisation Drivers

OHS
requires a roadmap

Worker
Protection
need

Business
Gain

< Drivers >

The Business Case

Winning AI and Robotics investment for OSH

Business Activity
Full Lifecycle
Safety Analysis

Safety Activity
Costing

Safety Investment
Analysis

Refertence: The Business Case for Safety: Assessing the Financial Value of Safety Investments
Anthony Veltri, Oregon State University

Assessment of Digitalisation project

Categorisation of a digital system

- ▶ Is the digitalisation Engine
  - — Simple
  - — Complex
  - — Complex and AI based
  - — Evolving
- ▶ Does the application require mechanical processing?
- ▶ Is the task
  - — Physical
  - — Cognitive
  - — Related to: Information or a Person or an Object

- ▶ Is the Task
  - — Routine
  - — Non routine
  - — Codifiable: Repetitive possible to build ML model
- ▶ Is there a high degree of variability?
- ▶ Is Automation present
  - — to assist worker
  - — to substitute worker
- ▶ Are new OHS hazards…
  - — Psychological
  - — Organisational
  - — Physical

= Complexity Rating for Risk Management

Managing the introduction of Digital Technologies

Benefits of worker involvement with other stakeholders

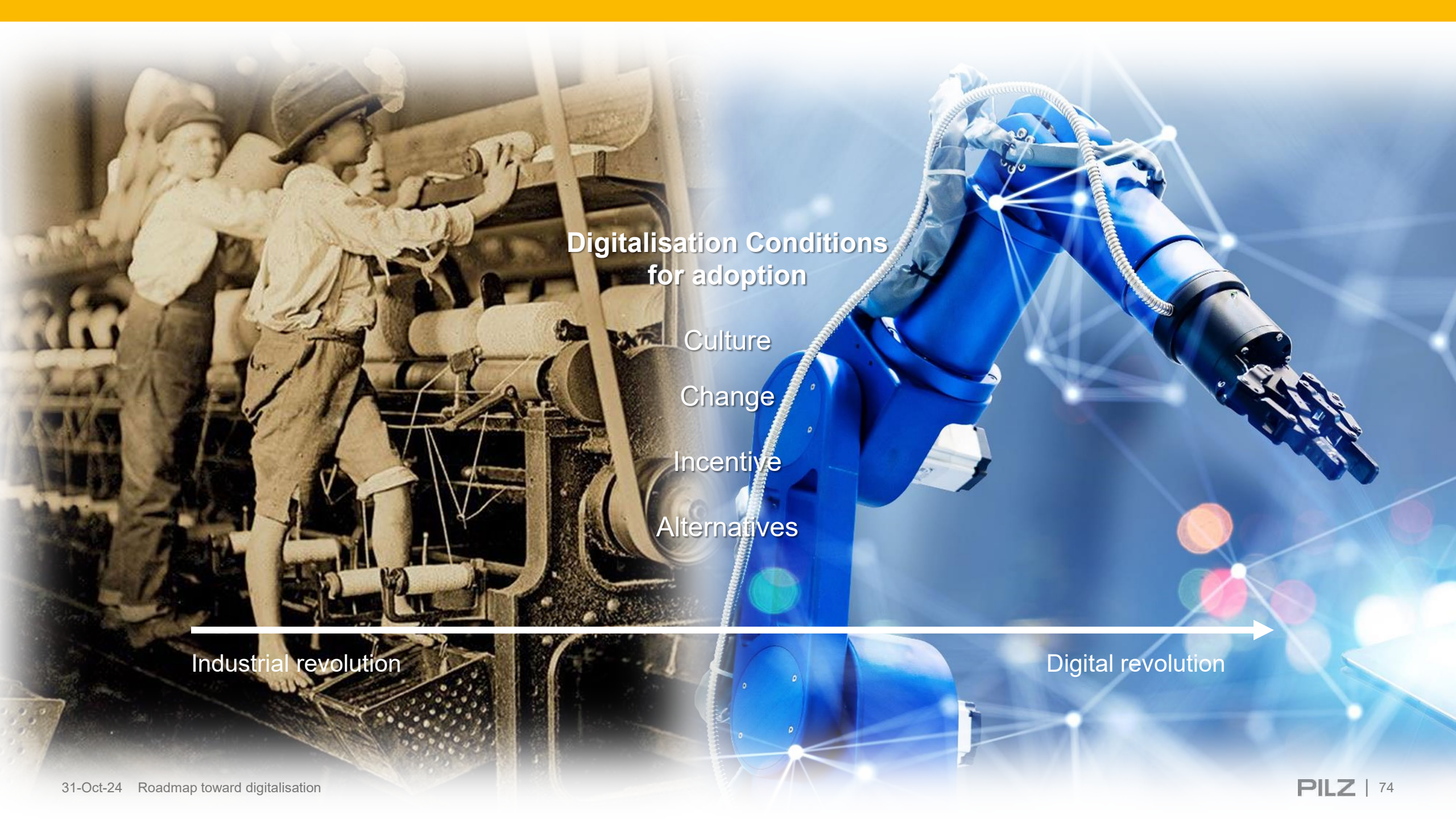| Business vision and digitalisation objectives | Project Concept | Impact Assessment | Project Requirements Specification | Business Case Benefits RoI | Implementation Plan |

Concept to Consensus to Completion

**Digitalisation Conditions
for adoption**

Culture

Change
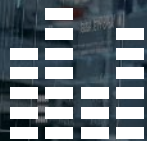
Incentive

Alternatives

Industrial revolution

Digital revolution

Digitalisation and Automation

Hazards that can be eliminated or risk reduced!

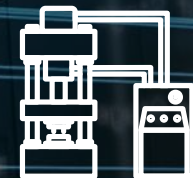Exposure to Hazardous Dusts, Gases, Liquids and Radiation

Exposure to workplace noise

Biological Hazards

Ergonomic – Musculoskeletal Disorder risks

Typical machine hazards

Re-imagining OSH in manufacturing

Impact of Digital Technologies

Smart Glasses

Smart Shirt

Bluetooth Key Tracker

Smart Watch

Smart Gloves

Smart Pants

Smart Shoes

I.O.T

Vision System

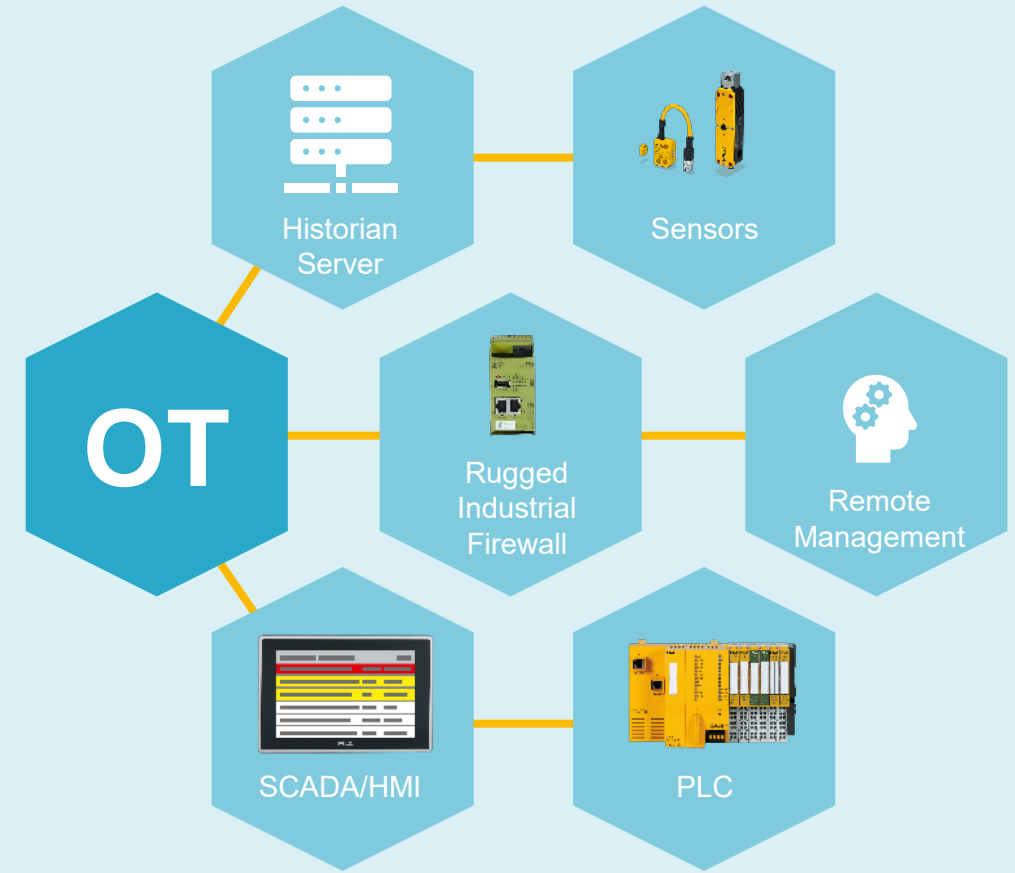Smart Sensors

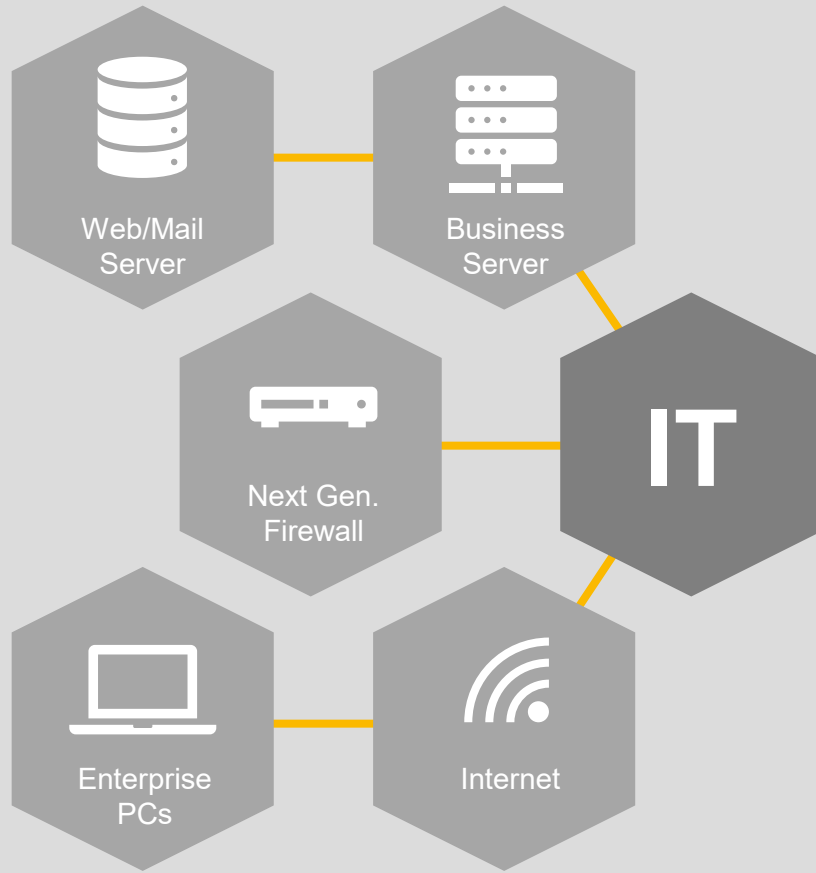Smart radar

Data

Intelligent Safety

Digitalisation and Automation

Digitalisation of Identification and Access Management

Digitalisation and Automation

The cyber security challenge

The solution?

The problem

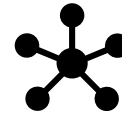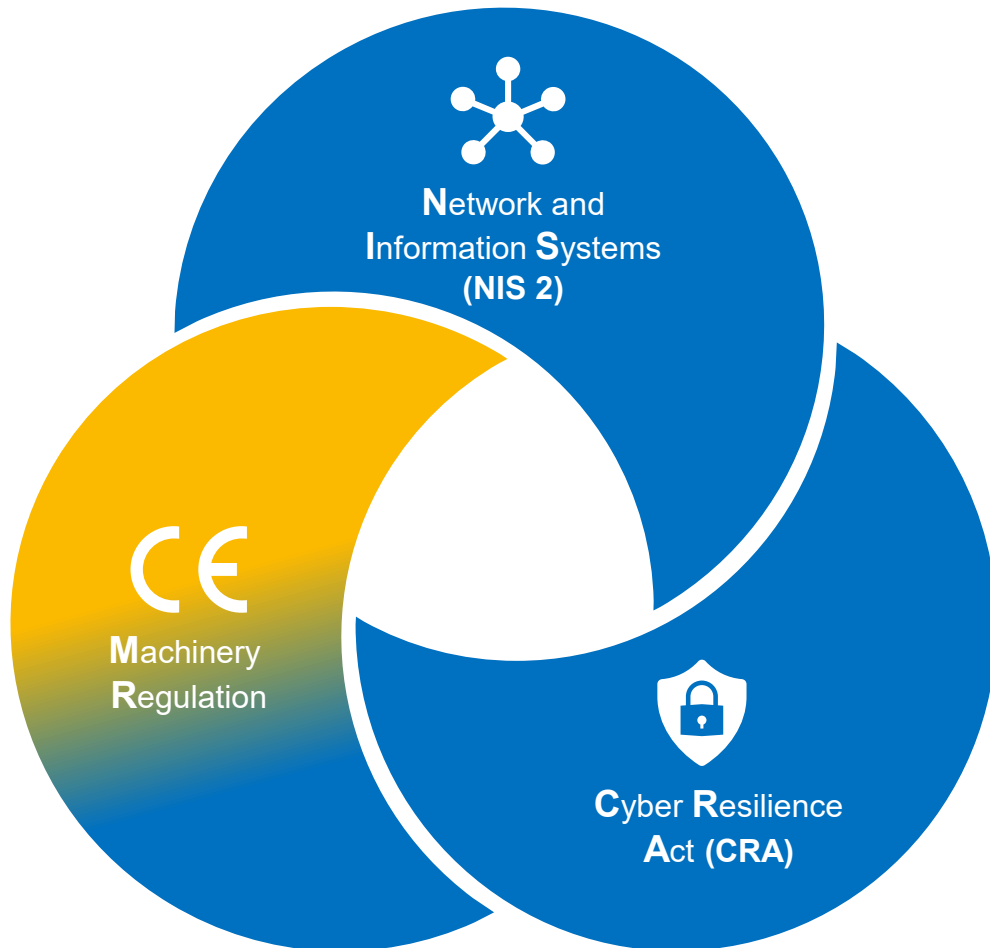# Re-imagining Cask/Barrell Unloading

From Digital to Reality

Re-imagining Cask/Barrell Unloading

The solution implemented

▶ EU regulations and Digitalisation

Machinery Safety and Industrial Security

Network and Information Systems (NIS 2)
(Published in the Official Journal of the European Union on 27th December 2022)
Addresses <u>essential and important entities:</u>
- ▶ Measures to manage cybersecurity risks
- ▶ Compliance with technical and organisational measures
- ▶ Incident reporting obligations

Machinery Regulation

(Publication June 2023 - Validity starts on 20.1.2027)

- ▶ Requirements for machinery:
- ▶ Protection against corruption (with focus on machinery safety functions)

Cyber Resilience Act (CRA)

(First draft from September 2022)

Manufacturer's obligation for products with digital elements:
- ▶ Secure Development Lifecycle Process
- ▶ EU-Type examinations for critical products
- ▶ Report vulnerabilities
- ▶ Security updates

▶ EU regulations and Digitalisation

Machinery Regulation Features

▶ **"AI" is specified as:**

— *… fully or partially evolving behaviour* […]

— *… machine learning* […]

— *… varying levels of autonomy* […]

— Annex III: The risk assessment must include hazards … an evolution of its fully or partially autonomous properties

Software which performs a safety function and which is placed independently on the market is considered a Safety Component

Digitalisation

Leadership in Transformation

"Organizations that use machines merely to displace workers through automation will miss the full potential of AI…Tomorrow's leaders will instead be those that embrace collaborative intelligence, transforming their operations, their industries and – no less important-their workforces."

Daugherty, P.R.& Wilson, H.J., 2018. Human+Machine: Reimagining Work in the Age of AI. Harvard Business Press.

▶ Conclusions

Digitalisation using Robotics and AI

Adoption underway with increasing speed

Regulations and Standards requires to ensure Safety, trustworthy, AI throughout the entire governance and engineering lifecycle - MR and AI act first steps

Methods of risk management and risk assessment to be evolved

Roadmap for OSH digitalisation aligned with Business and digitalisation critical

Learn by doing – pilot projects

…continuing your digitalisation journey

Machinery Regulation Information

Find your local Pilz contact

Pilz Ireland
Business & Technology Park,
Model Farm Road, Cork, T12 AW80

Tel.: +353 21 4346535

▸ Machinery Safety, Industrial Security and Automation
▸ Expert know-how on norms and standards
▸ Product solutions, Trainings and Services

B1 ROBOTICS

Robotic cask unloading system to reduce
risk of musculoskeletal injuries

October 2024

Irish Distillers
Pernod Ricard

HEALTH & SAFETY
WHAT IT MEANS IN IRISH DISTILLERS

Taking Care of Each Other
Always Think Safety First

At Irish Distillers we.....

Always Think Safety First

Fully adhere to the Safety Rules at all locations

Stop and call out unsafe behaviours

Report and learn from hazards, near misses & accidents

Always look out for each other

Irish Distillers
Pernod Ricard

WHO WE ARE

We are producers of some of the world's most well-known and successful Irish whiskeys and one of Ireland's leading suppliers of spirits and wines.

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IRISH DISTILLERS: A BRIEF HISTORY

After decades of industry decline, three families came together to form Irish Distillers in 1966, before joining the Pernod Ricard family in 1988. Then the Jameson global growth story truly began.

1700-1800s

John Jameson & Son founded in Dublin.

John Power & Son founded in Dublin in 1791.

Midleton Distillery founded in 1825.

1900-1960s

From the Irish War of Independence to a crippling era of prohibition in the US, Irish whiskey was on the brink of extinction after decades of decline.

1966

Irish Distillers formed in 1966 with the merger between the last three remaining Irish distilleries: Jameson, Powers & Cork.

WHISKEY'S "BIG 3" PLAN A MERGER

Powers, Jamesons and C.D.C. as new sales force?

1988

As Irish whiskey exports struggle, Irish Distillers becomes a takeover target. Pernod Ricard acquires Irish Distillers. The Irish whiskey renaissance begins in earnest, with Jameson prioritised as a key accelerator brand.

1990s

Jameson growth story begins - Jameson reaches 1 million case milestone in 1996. Launch of the Jameson International Graduate Programme in 1991. Jameson Brand Homes open in Midleton & Bow St.
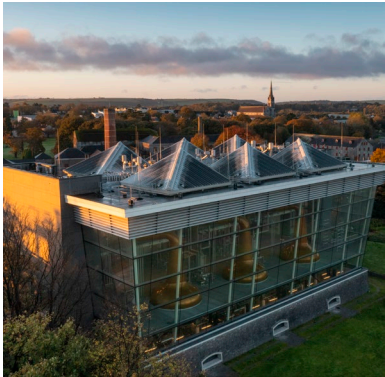
2000s

Double digit growth for Jameson. Expansion of Midleton Distillery and Fox & Geese bottling plant. 5 million cases of Jameson sold in 2015. Jameson surpasses 10 million cases in 2022.

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COMPANY OVERVIEW

Jameson is the world's **#1** Irish whiskey

800+ employees

6 sites

7 brand families

10m million cases of Jameson sold in Financial Year 2022

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OUR PORTFOLIO OF LEADING IRISH WHISKEY BRANDS

The world's most awarded & bestselling Irish Whiskey

The definitive expression of Single Pot Still Irish whiskey

THE
Luxury Irish whiskey

The Cult Classic Irish whiskey brand, influenced by wine casks for a colourful taste

The quintessential Irish whiskey since 1791

THE Single Malt from Ireland

At the Creative Vanguard of the Irish whiskey revolution

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THE IRISH WHISKEY CATEGORY

140%
volume growth
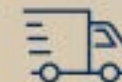between 2010-2020[1]

48+
operational distilleries on the
Island of Ireland (compared
to just 4 in 2010)

sales of
Irish whiskey reached
15 **million**
cases in 2022[2]

Republic of Ireland export
value exceeded
€875 **million**
in 2023[3]

95%
of Irish whiskey
is exported[4]

10,000+
people employed
within the drinks
sector

€1.55 **billion**
invested in the industry
between 2010-2020[1]

1 Irish Whiskey 2010-2020   3 IWSR Global Database   Bord Bia Exports Performance & Prospects report 2023-2024   4 Irish Whiskey Global Report 2022   Drinks Ireland Pride of Place Report

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INTRODUCTION

In partnership with PILZ, Irish Distillers has developed a world class tailor-made safety solution for handling cask unloading at our Midleton facility.

It is the first of its kind and currently the only system of its type worldwide.

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B1 BARRELS

ARE AMERICAN BARRELS USED IN MIDLETON FOR WHISKEY MATURATION

AMERICAN BARREL

- Quercus Alba (White Oak)
- 200 Litres

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PROJECT OVERVIEW

- The team at Midleton Distillery identified our barrel unloading operation as a high-risk activity.

- The single largest driving factor of the B1 Robotics Project was to improve the safety of the process.

- Our goal was to eliminate potential accidents and near misses associated with a manual operation:
  - *Lower Back Injuries*
  - *Back Strain*
  - *Crush injuries.*
  - *Dusty environment in a confined space*

- This required a radical upgrade of our existing dated equipment.

EXPLORING AUTOMATION SOLUTIONS

- Midleton Distillery partnered with Pilz in 2017 to explore automation options.

- A multi-disciplined project team was established to ensure the optimum result:
  - *Health and Safety,*
  - *Engineering*
  - *Operations*
  - *Pilz*

- The primary objective was to automate the unloading of 40-foot containers filled with empty barrels.

- The project team worked together from concept through design, commissioning and operational stages.

HEALTH AND SAFETY CHALLENGES ASSOCIATED WITH UNLOADING BARRELS

Delivered in **40-foot** containers

206 barrels per container

Barrels are stacked **3** high

Each barrel weighs up to **60kg**

During transport, the **barrels** can become dislodged and unstable

Manually unloaded by **two operators**

Up to **1,000** containers per annum = 206,000 barrels

BOX COMPLETE – DOCKED

UNLOADING CASKS

3

2

1

Look both ways

CAUTION! Look both ways

STOP

STOP

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VARIOUS MEASURES HAD BEEN PREVIOUSLY INTRODUCED TO MITIGATE THE RISKS
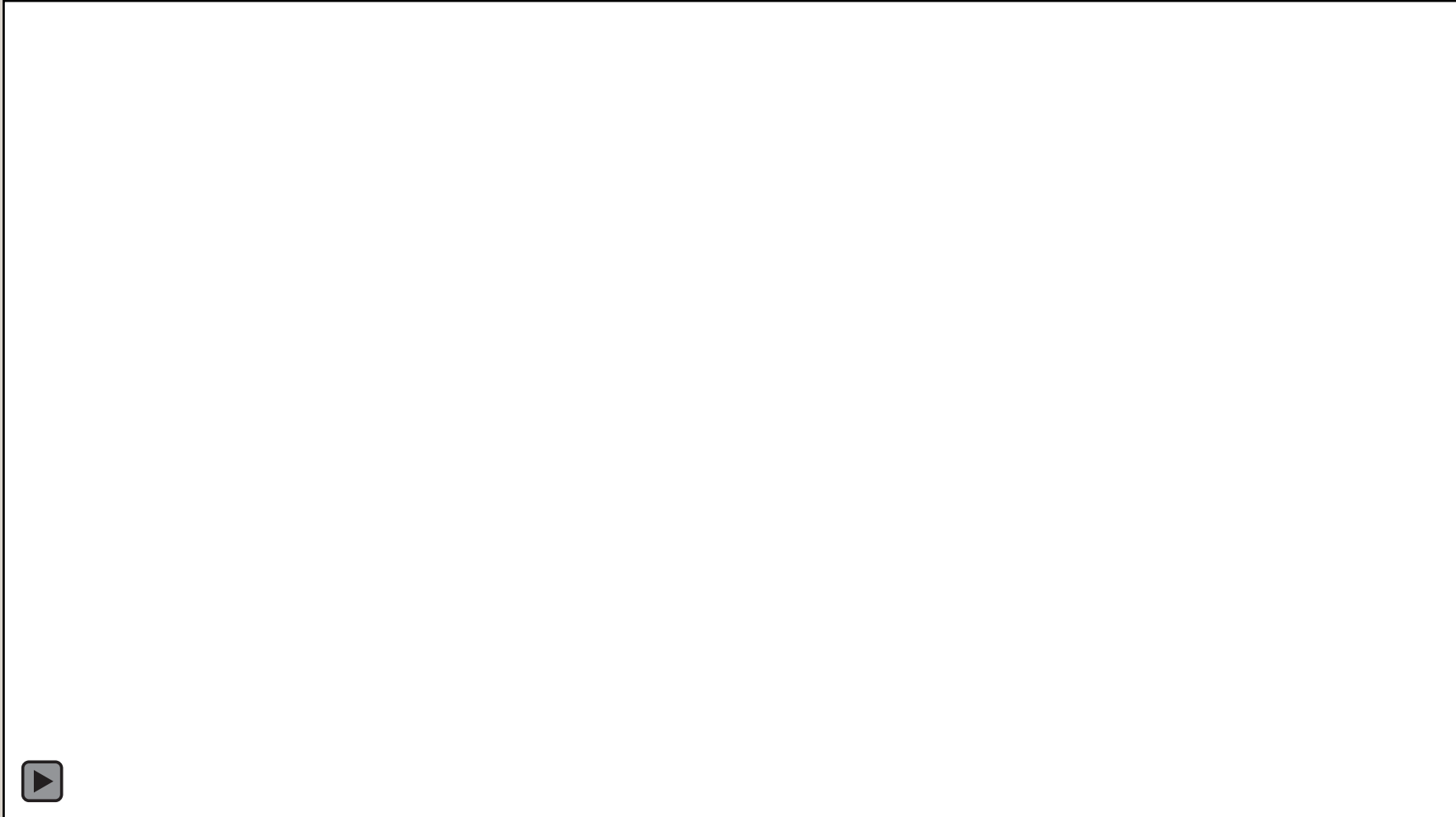
Rotation of operational teams

Additional PPE

A layer of plywood on the bottom row (for operators to walk on)

Increased manual handling training

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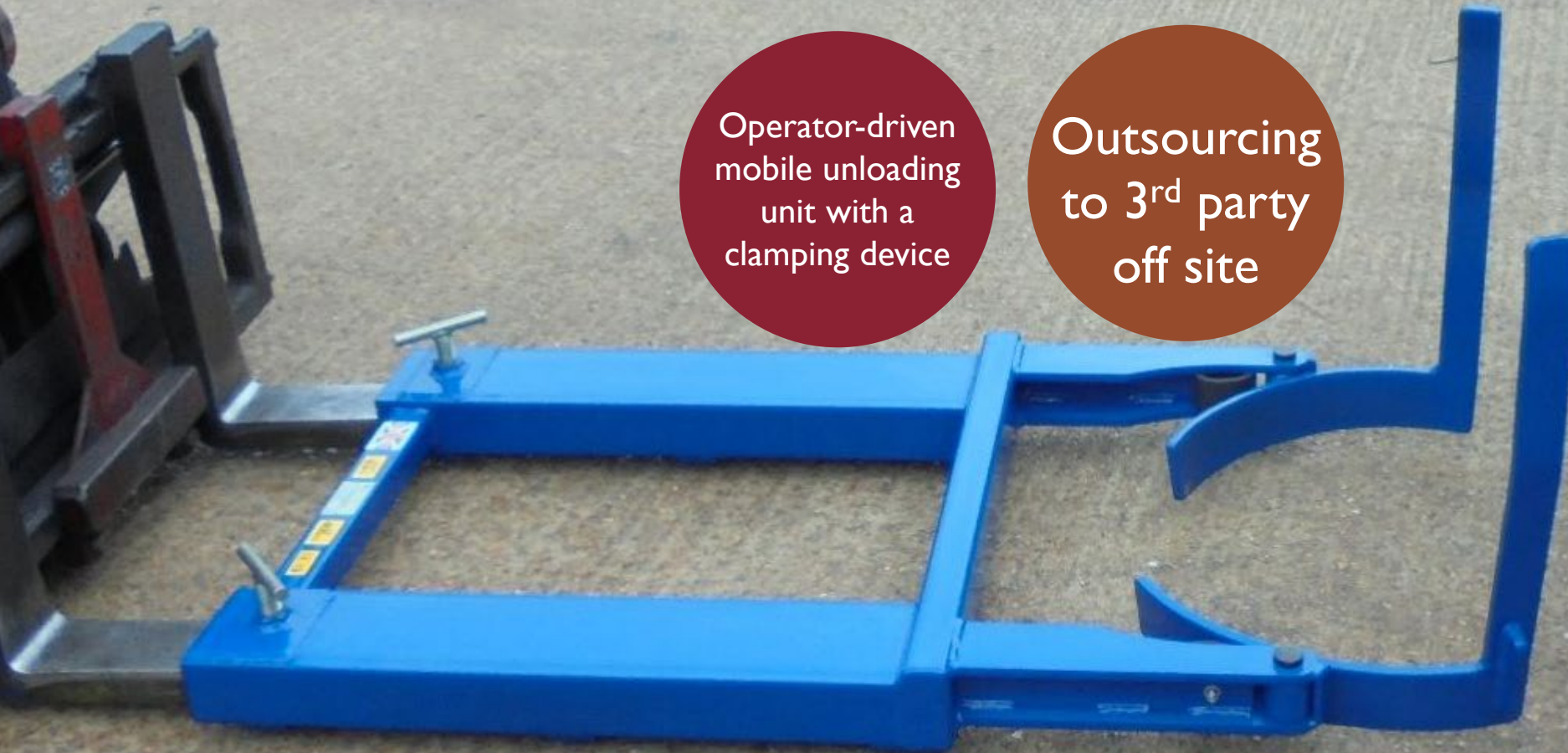Pernod Ricard

ORIGINAL MANUAL PROCESS

OTHER OPTIONS EXPLORED

Reducing barrel layers to one

Semi-automated fork truck (AGV) concept involving clamping devices

Operator-driven mobile unloading unit with a clamping device

Outsourcing to 3rd party off site

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CHALLENGES TO AUTOMATION

- Could not rely on barrels being neatly stacked in each container.

- All barrels are slightly different in shape and size and loads can be packed into containers in different patterns.

- Maintain the operational output of 650 to 800 casks per shift.

- Unload full containers stacked 3 rows high.

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AUTOMATED SYSTEM SOLUTION

- Was achieved through the deployment of a bespoke autonomous **Automated Mobile Robot** (AMR) guided by a **vision system** with the **AI** to traverse through a container and row by row select which barrel to safely grip and unload from the container.

- The system at its heart is a mobile 6-Axis Robot mounted on an **Autonomous Guided Vehicle** (AGV).

- CE compliance was core throughout out the design process.

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SYSTEM COMPONENTS

- **Vehicle restraint and docking system** ensures secure positioning of containers.

- **Automated Guided Vehicle (AGV).**

- **Robot Arm**: 250 kg payload robot arm mounted on the AGV featuring 360-degree flexibility and bespoke end of arm tooling (patent pending) for handling barrels.

- **Vision System** which is capable of safely and accurately identifying the cask profile and location.

- **Telescopic Conveyor System** extends to follow the robot into the container and transport barrels onto the conveyor.

- **Process Control and Safety Control Systems**: CE *Marked*

- **New loading bay** equipped with automatic doors and dock levellers

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VISION SYSTEM

Is capable of safely and accurately identifying the cask profile and location

B1 ROBOT IN OPERATION

ENHANCED SAFETY SOLUTION – TRAPPED KEY INTERLOCK

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ENHANCED SAFETY SOLUTION – LIGHT CURTAINS

ENHANCED SAFETY SOLUTION – GUARDING & ACCESS

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ENHANCED SAFETY SOLUTION – TRAILER RESTRAINTS

RESULTS ACHIEVED/ SUCCESS FACTORS

The B1 robotics system was successfully installed and commissioned, going live in January 2024.

So far we have achieved:

- Significant risk reduction

- Container Capacity - unchanged

- Cask size variability: The system can effectively manage variations in cask sizes

- Minimal manual intervention

- Operators oversee the process from a safe zone

- Compliance with safety standards: CE and Pernod-Ricard safety standards
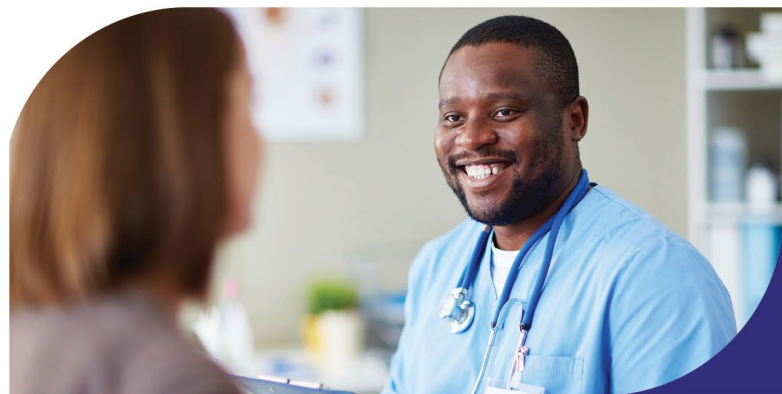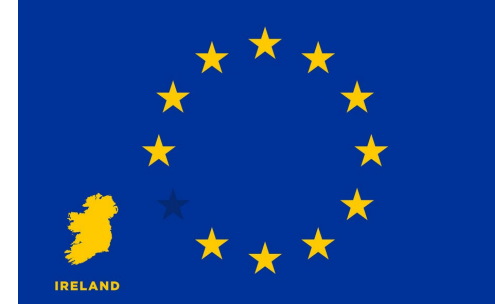
THANK YOU

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AI/Robotics and the new Machinery Regulations (EU) 2023/1230

Alan Costelloe – MSc, CEng, EurIng.

Presentation Outline

- Overview of the current Machinery Directive 2006/42/EC

- EU approach re risks from emerging technologies and reasoning for the new Regulations.

- Review the sections of the new regs which will have an impact on Manufacturers and other Economic Operators.

- Discussion on changes and how they will benefit the users, the environment and EU economy.

- Implementation dates.

- Q & A.

SCOPE of MACHINERY

Machinery Directive 2006/42/EC and the Machinery Regulation 2023/123

- The Directive defines machinery as an assembly of components, at least one of which moves, joined together for a specific application, the drive system being powered by energy other than human or animal effort.

- Chains, ropes and webbing designed for lifting purposes as part of lifting machinery.

- Lifting accessories;

- Safety components;

- Power take-off drives;

- Interchangeable equipment that is added by the user to other machines to change their function.

- Exceptions.

Requirements of the Machinery Regulations

- The Directive as with the new Machinery Regulations outlines **essential health and safety requirements** that machinery must meet. These include factors like design and construction, safety, and ergonomic considerations.

- Risk Assessment: - identify and reduce any potential hazard associated with the machine.

- Technical Documentation:

- Instructions and Information: - use, maintenance & residual risks.

- Conformity Assessment: - high risk and 3rd Party assessment.

- Declaration of Conformity – Manufacturer or Authorised Rep.

- CE Marking:

- Demonstrating compliance with the requirements can be done through application of European harmonised standards, or another solution that demonstrates a similar level of safety. (800+)

EU - Emerging Technologies

- The Machinery Directive 2006/42 EC, published in 2006 and in force since 2009.

- Evaluation was carried out in 2018 –

- A Public Consultation process was initiated in 2019.*

- An Impact Assessment study on the revision of the Directive was published in August 2020.

- Concerns re AI, software, safety controls & automated machinery…

- In April 2021, the Commission put forward a proposal for a new Machinery Regulation, as part of a wider EU '**AI package**'…

*Academic/research institutions• Business associations: associations of producers. Manufacturers, importers and distributors of machinery (or parts)•Consumer organisations (professionals/workers using machinery, private users of machinery)•Environmental organisations• EU citizens• Machinery safety consultants• Non-EU citizens• Non-governmental organisations (NGO)•Notified bodies• Public authorities)•Standardisation organisations• Trade unions • Other

EU - Proposal 2021

The Commission proposal on machinery products addresses a number of problems identified in the current EU framework:

- Insufficient coverage of new risks stemming from the new digital technologies (such as AI, the Internet of Things (IoT) and Robots, Collaborative Robots.

- Insufficient coverage for 'high risk machines'.

- Costs due to the required paper-based documentation.

- Inconsistencies with other pieces of product-safety legislation; and divergences in interpretation across MS due to transposition. (hence the choice of a Regulation instead of a Directive).

The Machinery Regulation introduces relevant changes:

- Legal status: as a Regulation,

- The Machinery Regulation follows the principles of the New Legislative Framework, which aligns with the new Market Surveillance Regulations (EU) 2019/1020.

- Duties on Economic Operators such as Manufacturers (Art 10), Importers (Art 13) and Distributors (Art 15).

- Manufacturers will continue to ensure that machinery products fully respect the essential health and safety requirements. (Annex III)

- The general principle for the conformity assessment of the machinery remains **self-compliance.**

Changes cont.

- Machinery Products (High Risk) Annex 1 Part A, must undergo validation through notified bodies (external accredited centres).

- Machinery Products (High Risk) indicated in Annex 1 Part B, similar to the old Annex IV category where Notified Bodies may be used.

- **Substantial modification** is introduced into the Regulation text - where there is a change of the significant hazards.

- **Partly completed machinery** will need to comply before they are incorporated in the whole machinery.

- **Common specifications:** additional power of the Commission to provide

  a means to comply with the essential health and safety requirements (Art 20)

Annex III Essential Health and Safety Requirements

Manufacturers of mobile machinery will need to:

- Provide a filtered cab for machines with ride-on driver, when the main use of the machine is the application of hazardous substances e.g. self-propelled sprayers.

- Provide an audible and visual warning when the seat belt is not fastened on machines presenting a risk of overturning and crushing.

- If the risk is significant it shall not be possible for the machinery to move.

- Take into account the possibility of contact with overhead power lines, initially controls to prevent contact, if cannot be avoided, controls to protect the operator. (3.5.4)

Autonomous Vehicles

- The rules introduce new safety requirements for autonomous machines, human-machine collaboration and, for the first time, the safe use of Artificial Intelligence systems in machinery

- Where Supervisory functions are used, they shall only allow actions to stop and to start the machine remotely or related product or move it to a safe position and a safe state to avoid causing other hazards.

Machines fitted with self-evolving logic or behaviour.

- The Risk Assessment will need to take into account the behaviour of the machine after it is placed on the market. This measure targets in particular the movement space and the tasks it will perform.

- Machine learning: systems containing self-evolving behaviour containing machine learning approaches' are now in Annex 1 (Part A) –

- The upcoming AI Regulation, when published, will consider these systems as high-risk Artificial Intelligence and may impose additional requirements.

- **Cybersecurity**:-

  - Account will need to be taken to protect against external influences to ensure the control systems cannot be compromised and result in a dangerous behaviour of the machine. (Annex III)

  - The manufacturer is required to identify key data or software, also the versions of the software installed, which must be adequately protected against accidental or intentional corruption.

  - On remote controls, a communication or a connection failure must not lead to a dangerous situation.

  - The upcoming publication of the Cyber-Resilience Act should cover this in detail.

Annex I Part A 'high-risk' machinery with obligatory Notified Body assessment

- Removable mechanical transmission devices including their guards (PTO drives and Guards).

- Guards for removable mechanical transmission devices.

- Vehicle servicing lifts

- Portable cartridge-operated fixing and other impact machinery

- Safety components with fully or partially self-evolving behaviour using machine learning approaches **ensuring safety functions**.

- Machinery that has embedded systems with fully or partially self-evolving behaviour using machine learning approaches **ensuring safety functions** that **have not been placed independently on the market**, in respect only of those systems.

Note – EU Commission can modify with delegated Acts

Entry into Force

(Art 54)

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Health and Safety Authority

- This Regulation shall **enter into force** on the 19th July 2023, however specific articles take effect as follows:

- **Manufacturers and Economic Operators** – Application date is 14 January 2027 - MD will be repealed.

- A number of Articles shall apply from the following dates:

- Reporting obligations for member States (July 2024)

- Safeguard Procedures EU / Member States (upon entry into force).

- Specific requirements for Notifying Authorities (Member States) and also some

  additions to Notified Body requirements. - Articles 26 - 42 from 14 Jan 2024.

Challenges ahead

- Harmonised Standards – 800 + to be amended to reflect the changes to the numbering and updating the new requirements.

- Guidance – new Machinery Regulation Guidance will be developed.

- Artificial Intelligence Act – will apply to all AI systems linked to machinery.

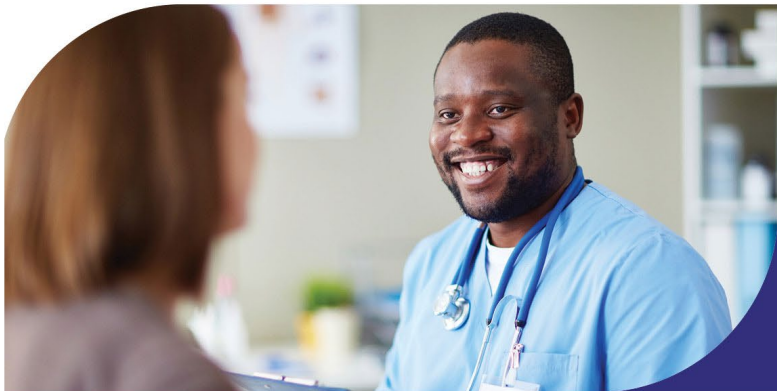- Cyber Resilience Act should apply to all machinery in scope.
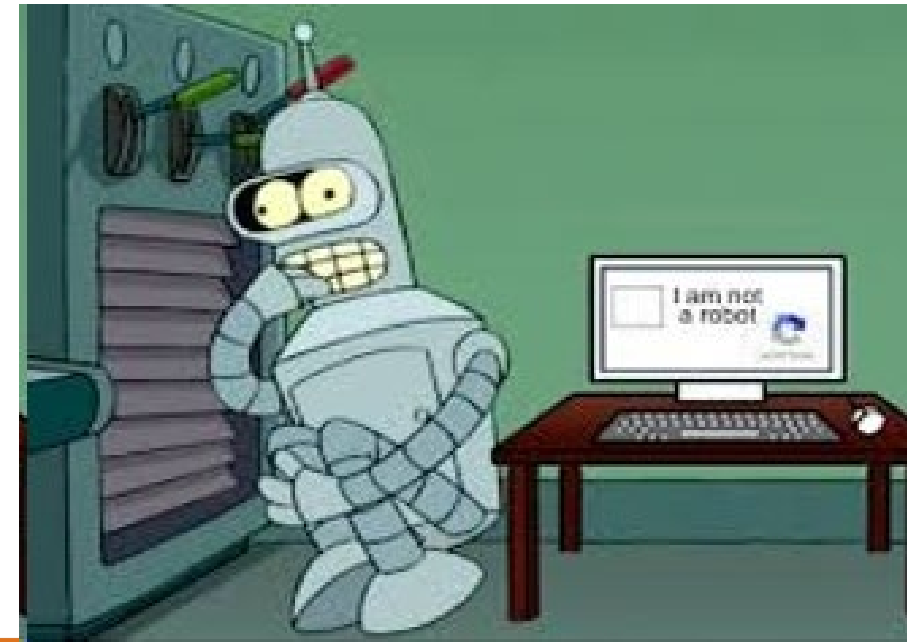
Conclusion

- Brings the Regulation of Machinery up to date with current machinery and manufacturing practices.

- It takes account of risks linked to new technologies while fostering innovation and enhancing the Circular and Green economy.

- Establish clear and proportionate rules, which will be uniformly applied across the EU, increasing legal certainty for Manufacturers and other Economic Operators.

- Clarifies issues related to scope, definitions, essential requirements and conformity assessment procedures.

- **Establish more effective market surveillance**. The new rules align the safeguards against non-compliant machinery products to those used in the wider EU legislation on products.

- Link to the text of Machinery Regulations: https://eur-lex.europa.eu/eli/reg/2023/1230/oj

- Additional EU information: https://osha.europa.eu/en/safety-and-health-legislation/european-directives

Panel Discussion and Q&A

Upcoming Events

- **Smart Workplaces: AI, Robotics and Impact on Occupational Safety**
  - **Dates:**
    - Limerick, 23rd October, 9:30-13:00
    - Galway, 24th October, 9:30-13:00
    - Dublin, 31st October, 9:30-13:00
- **HSA Webinar: Ergonomics in the Irish Workplace: Risk Assessment to Manage Risk Exposure**
  - **Date:** 6th November, 11:00-12:00
- **Safety Representatives National Conference**
  - **Date:** 12th November, 9:30-16:30
- **HSA Webinar: Influencing Safety Culture**
  - **Date:** 26th November, 11:00-12:00
- **View all our events:** www.hsa.ie/!45J7C9

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VIEW EVENTS