



Digitalization for HSE

Leveraging Existing and Emerging Technologies to Improve HSE Performance

Dec, 2020



1990



2010



2020



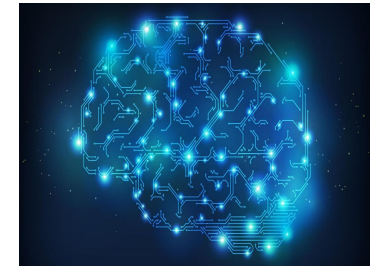
Operations



Change leader



HSE



Digital

LEVERAGING EXISTING AND EMERGING TECHNOLOGIES TO IMPROVE HSE PERFORMANCE

1. What is digitalization for HSE?

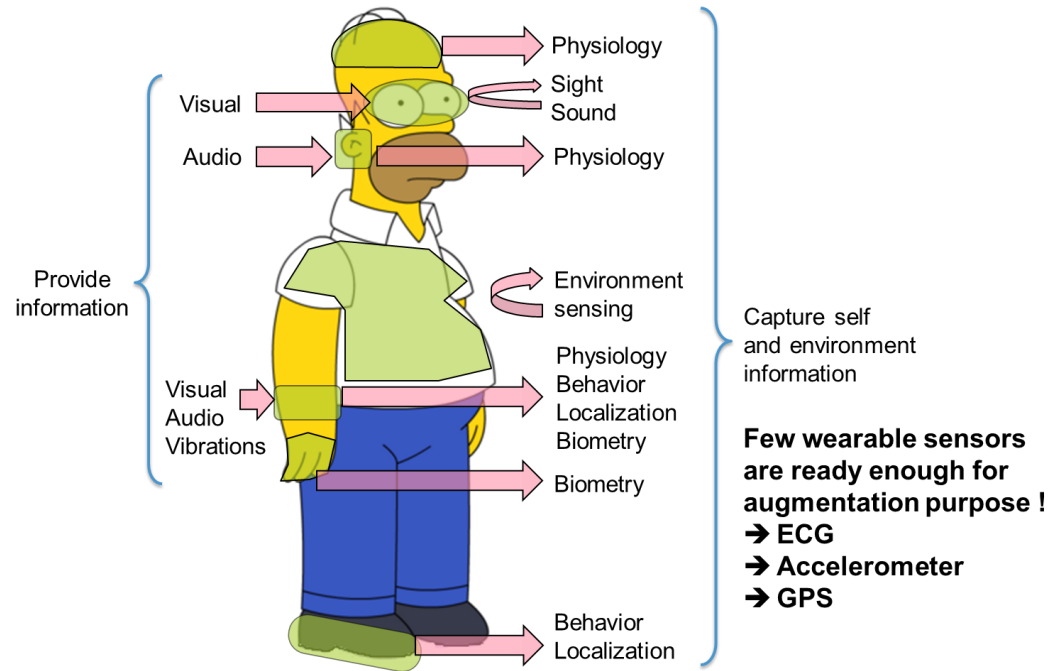
- I. The safe and enhanced operator concept and the digital tools to leverage
- II. Utilizing data intelligence and robotics as key tools for safety improvement

2. Drivers to manage digital for HSE in a large organization

3. Success stories: some examples of Digital applications

4. Engaging the workforce and management in the HSE digital journey for improved results

Safe Operator



Intelligent PPE
Devices & IoT
Advanced vision
Geolocalisation



Protect staff
Save faster
Environnement awareness
Safe environment

Enhanced Operator



Mobility
Augmented reality
Virtual Reality
IoT



Enhance access to info.
Error limitation
Remote assistance
Environment awareness
Skill enhancement

Data analytics



Predictive tools
Task helpers
Hazard & risks studies
Data analytics « heat maps »
Twin plant



Risk cartography
Help for risk analysis
Support for decision
Reinforce knowledge

Robotics



Drones for crisis
Antipol
Robots/drones for fire
Surveillance Drones

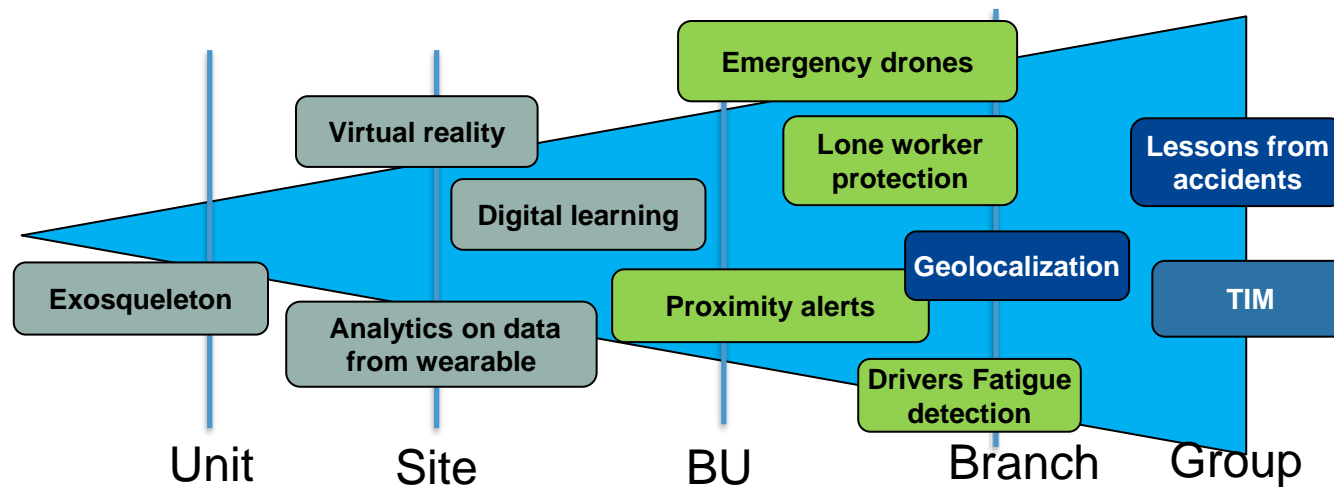


Limit/reduce human exposure
React faster
Help for decision

HOW TO MANAGE DIGITAL HSE IN A LARGE ORGANISATION

Drivers

- a) Value
- b) cost of development
- c) coordination resources
- c) integration effort from IT and supporting function
- d) Scaling effort



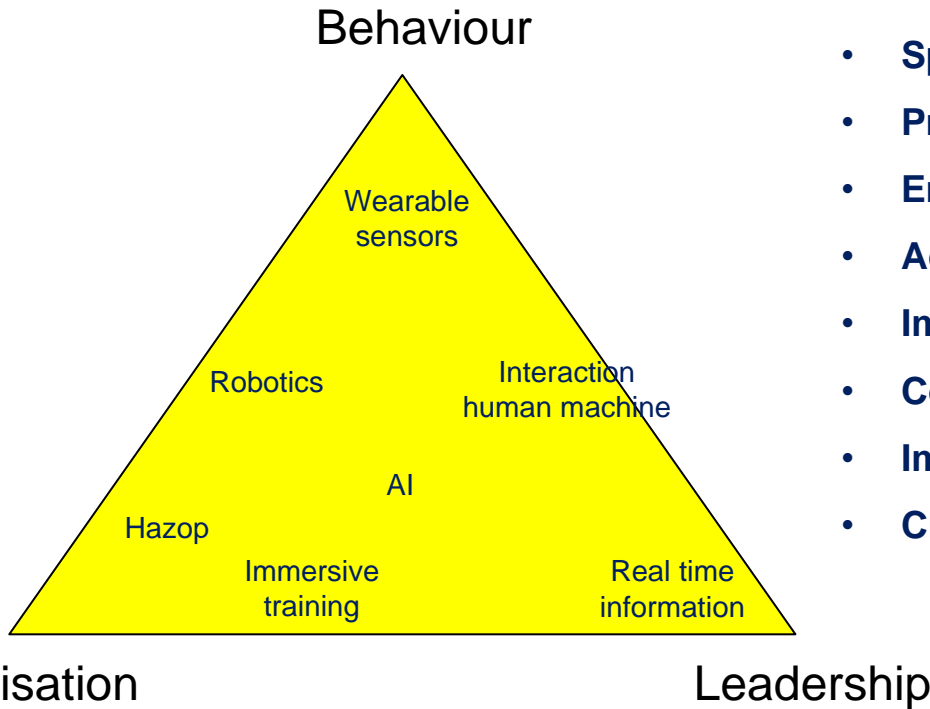
some examples of digital projects for HSE

QUESTIONNAIRE 1

What lever could digital strongly influence HSE performance on?
(you can select 5 answers maximum)

- Individual behaviour of personal on the field
- Understanding the event and cause analysis
- Plant design
- Asset integrity and reduction of process events
- Quality of reporting
- Fatigue prevention
- Compliance (MSDS, environmental emissions..)
- Prediction of hazards and risks and reduce severe events
- Improved learning on events
- Enhance skills & competences
- Improved communication between staff
- Health of our employees
- Improved management systems
- Others

POTENTIAL BENEFITS FOR SAFETY

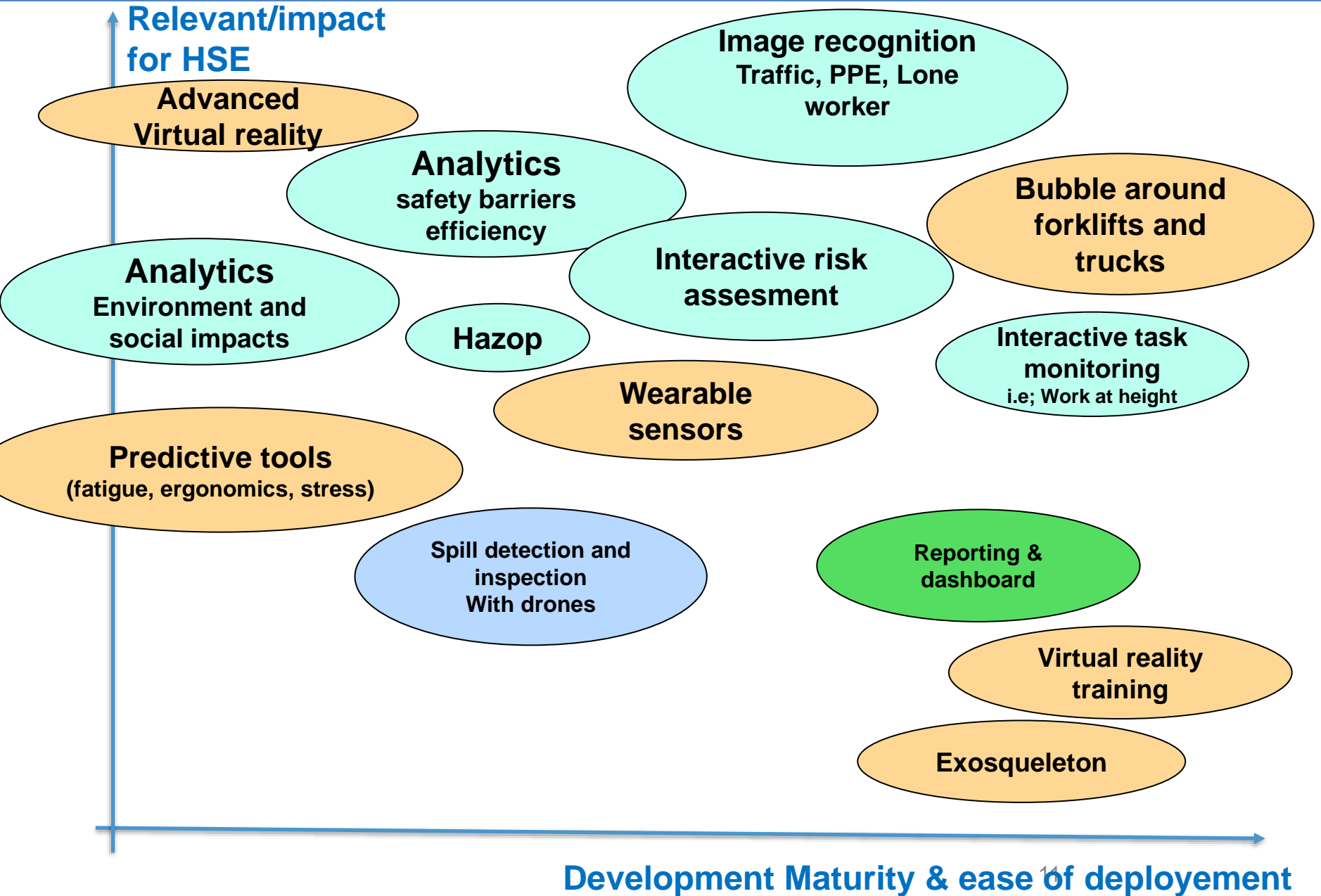


- More near misses and anomalies reporting
- Actual heat maps
- Specific risk profiles
- Prediction of hazardous situations
- Enable the work force to change work methods
- Adaptive HSE planning
- Improved situational training
- Continuous learning systems
- Improve self awareness
- Change the way we communicate



less injuries

WHAT IS NEXT ?



Development Maturity & ease of deployment

EXAMPLES OF DIGITAL APPLICATIONS

The connected helmet



REMOTE ASSISTANCE

Realwear HMT1-Z1 ATEX head mounted device controlled by voice commands



Works with PPE
Good noise cancellation
Very good command recognition

HPE MyRoom remote assistance solution



No lag
No connectivity issue
Good collaboration features





Understand a situation, produce a report, provide live assistance



Huddle board

- Enhance daily ritual meetings,
- Align goals
- Communicate
- Empower the workforce.

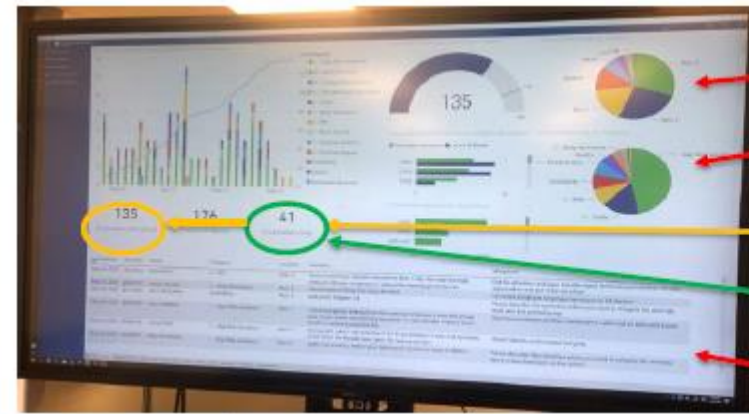
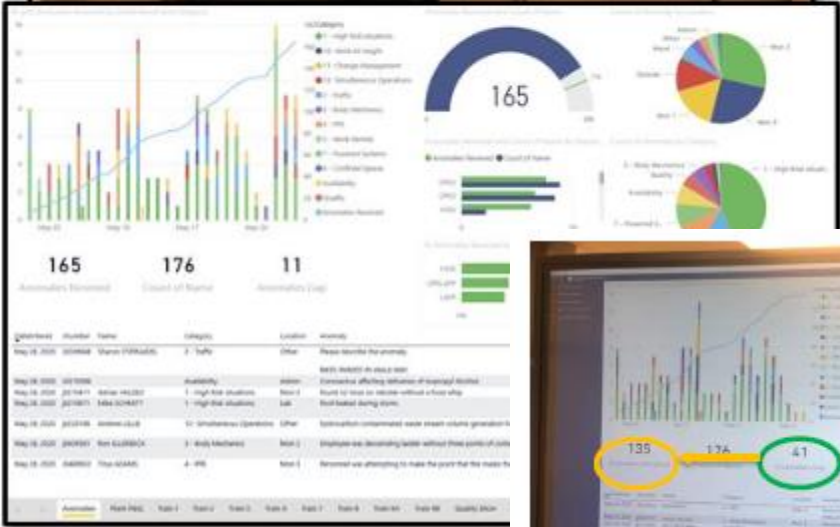
Developed with Power BI, Powerapps, and Microsoft Teams with Planner

“huddle” being a sports term for gathering together with teammates to make a plan before executing



Safety @Huddle board

Near misses and safety observation tracking



- Distribution by area
- Distribution by category
- Count per day
- Gap to hit month end target
- Last several anomalies entered

Virtual reality training



QUESTIONNAIRE 2

Have you ever attended a session of « working at height » virtual reality training ?

If yes, do you feel ...

(you can tick several options)

- You are more conscious of risk of working at height
- The fall experience remains forever in you minds
- You have decided to deploy this training for all your workforce
- It is was a lot of fun
- No, I never attended

VR TRAINING CONTENT

고소작업 추락 high place work _ fall		적재 작업 협착 loading work _ narrowness	
운송작업 전복 transportation work _ rollover		고소작업 낙하물 high place work _ falling object	
밀폐작업 전복 confined work _ rollover		전동기구작업 감전 electric machine work _ electric shock	
도로작업 전복 road work _ rollover		용접작업 화재 welding work _ fire	

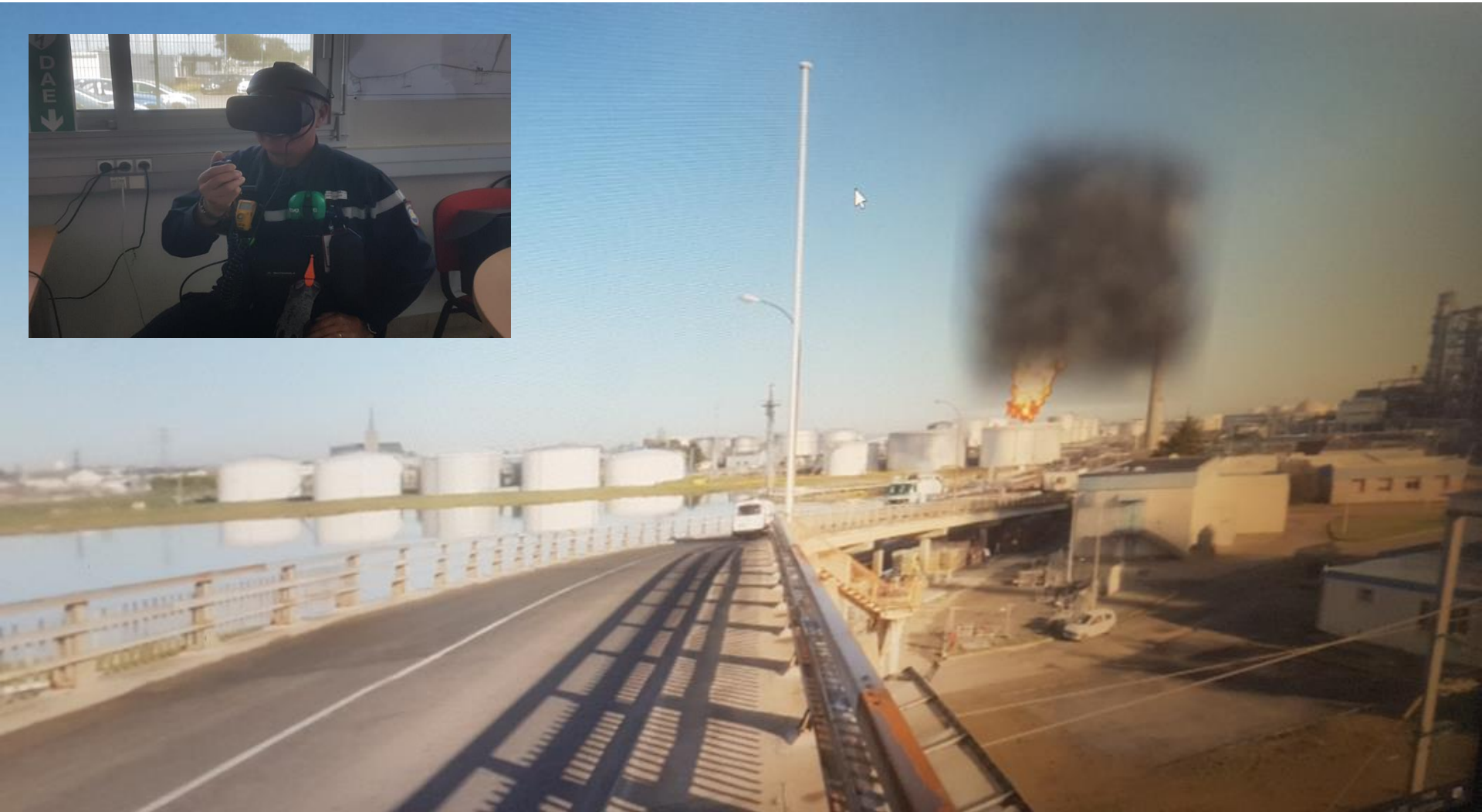
8 accident experiences in industrial sites

	고소작업 추락 high place work _ fall
	신호수작업 지게차 충돌 signalman's work _ forklift crash
	화기작업 화재 firearm work _ fire
	전기작업 감전 electrical work _ electric shock
	heavy equipment work _ falling object from crane 낙하물

5 training films



VR for crisis training



« TIM » - TOTAL INDUSTRIAL MOBILITY IN-HOUSE APPS



Industrial Mobility for the Field Operators to:

- Enhance Safety
- Reduce costs
- Improve availability
- Modernize way of working
- Increase efficiency

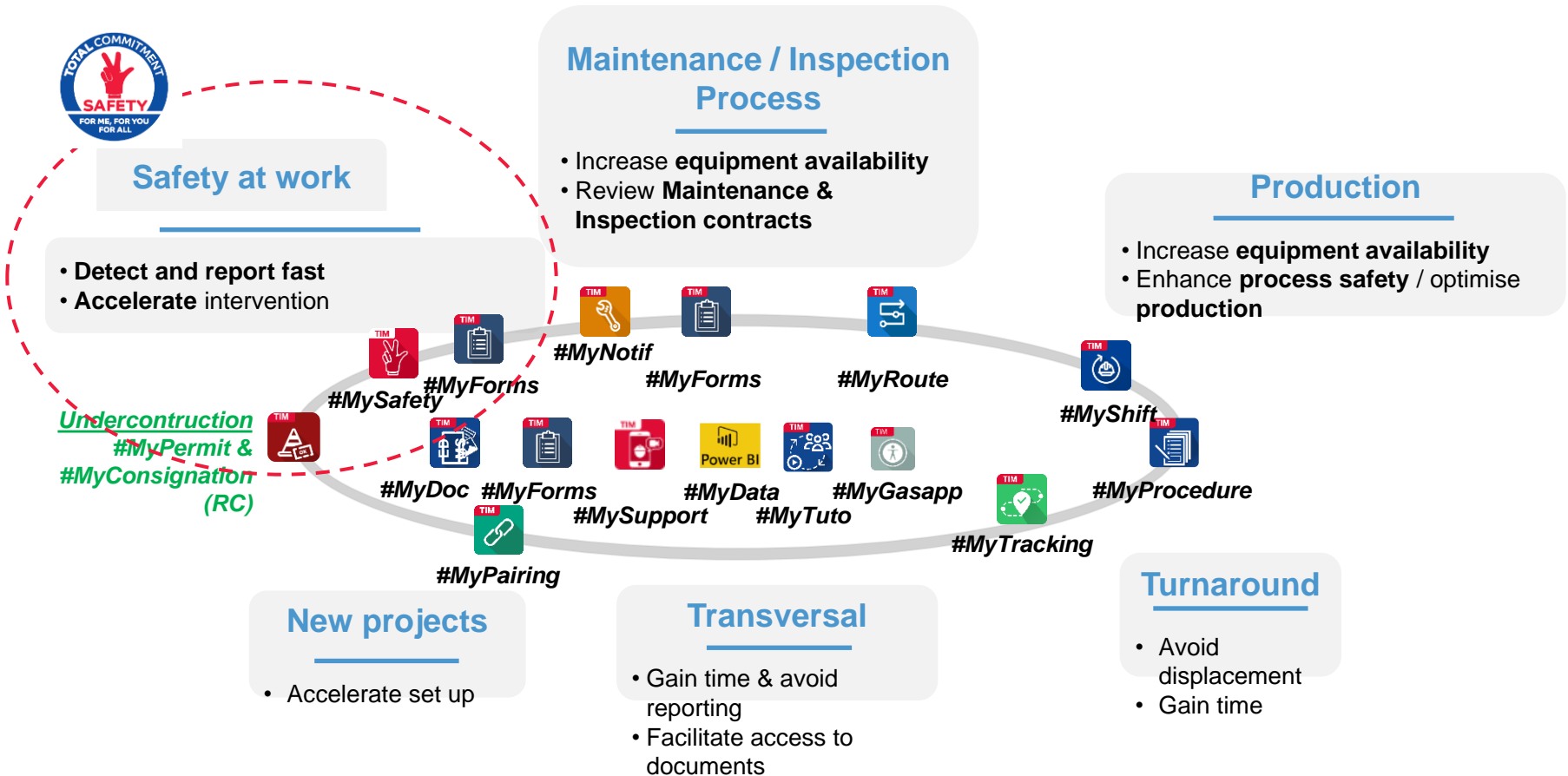
Deployed to > 2000 users in > 50 industrial sites in 15 countries

VIDEO TIM: TIM world

VIDEO TIM: My Forms

TIM: DESIGNED FOR INDUSTRIAL OPERATIONS

TIM PORTFOLIO COUNTS MORE THAN **15 APPLICATIONS** FOCUSED PER DOMAIN / ACTIVITY, OUR OBJECTIVE IS THAT **ONE OPERATOR USES A MAXIMUM OF 4 TO 5 APPLICATIONS**.



My safety : Raise HSE observations. Identify & follow-up corrective actions until closure.

My Form: fill **tailor made forms** Any type of checklist

My permit: **Open and close work permits** in mobility, Map visualization of opened permits

Critical Task Execution



Effort on shooting & editing SpeachMe videos on Critical Tasks by Shifts



Operator Reviewing Task before execution



QUESTIONNAIRE 3

In your opinion , by what % the digital tools have helped to reduce accident rate in 2020

- 0%
- 20%
- 40%
- 60%



DIGITAL STRESS?

Hard to understand

Complexity

Unreliable

Feeling that systems are not reliable

Digital stress

Techno invasion

Fear of private life overtaken by technology

Job insecurity

Fear of failure at new tasks
Fear of being replaceable
Fear of data sharing

Uncertainty

Constantly changing work procedure and software

Techno overload

Change my work behavior to adapt to digital

Conclusion

Digital HSE...have we measured the real benefits?

2020 – creation of **Total Digital Factory**

Business value driven use cases
+ Scalability, User acceptability, Technology & Data

Enabler for Plant 4.0

Start with WHY

Nothing replaces field presence