WISCONSIN SAFETY COUNCIL

Data-Driven Safety: Wearable Tech and the Future of EHS Management

Wednesday, April 16, 2025
11:15AM-12:15PM, Africa 80 Room

Tom West, SPHR, SHRM-SCP, COSS
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MākuSafe - The Leader In Workforce Wearables

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#38 Data-Driven Safety: Wearable Tech And The Next Generation Of EHS Management (3)
Tom West, Vice President, Global Practice Leader, MakuSafe Wearable Tech

Workforce wearable smart technology can go beyond biometrics and fitness, tracking usable data that's relevant to employee safety and focused on the environment around an employee and what they're experiencing, rather than tracking the employee themselves. This leading indicator data includes things such as environmental (IH) hazards, slips/trips/falls, strain and exertion risk, ergonomic concerns, and voice reported good-catches, providing a more complete picture of workplace risk and elevating input from the front line worker. With this data, manufacturers, construction, logistics, food production, and industrial organizations globally are gaining real time insights, enabling proactive and preventative hazard remediation to ensure their workers safety. This session will provide an overview of how wearables can work, key considerations in selecting and deploying wearables, and a deep dive into numerous use cases across industries, where deployments of wearable safety tech over time have resulted in data that has contributed to quantifiable reductions in incidents, recordables, claims, and costs, while positively impacting safety culture and enabling process improvement.

Key Takeaways

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SMART. SAFE. MĀKUSAFE.

How do you...

- better understand where risk exists?
- become more proactive & preventative?
- develop participation, engagement, and build culture?
- become more data-driven and strategic?
- relate safety to the C-Suite and Production/Operations?
- make sure you know about things you know happen, but nobody reports?
- ESG? DE&I? TWH?
- optimize your safety management process?
- not waste time and resources, and stay practical?
- use tech to get measurable results fast, without making life more difficult?

Wearable Safety Tech:

Enabling Safety Management 2.0 & HOP

Providing EHS Leading Indicators

Reducing Incidents & Claims

And Improving Safety Culture!

Tech with the right approach, can be human-centric, and enable success!

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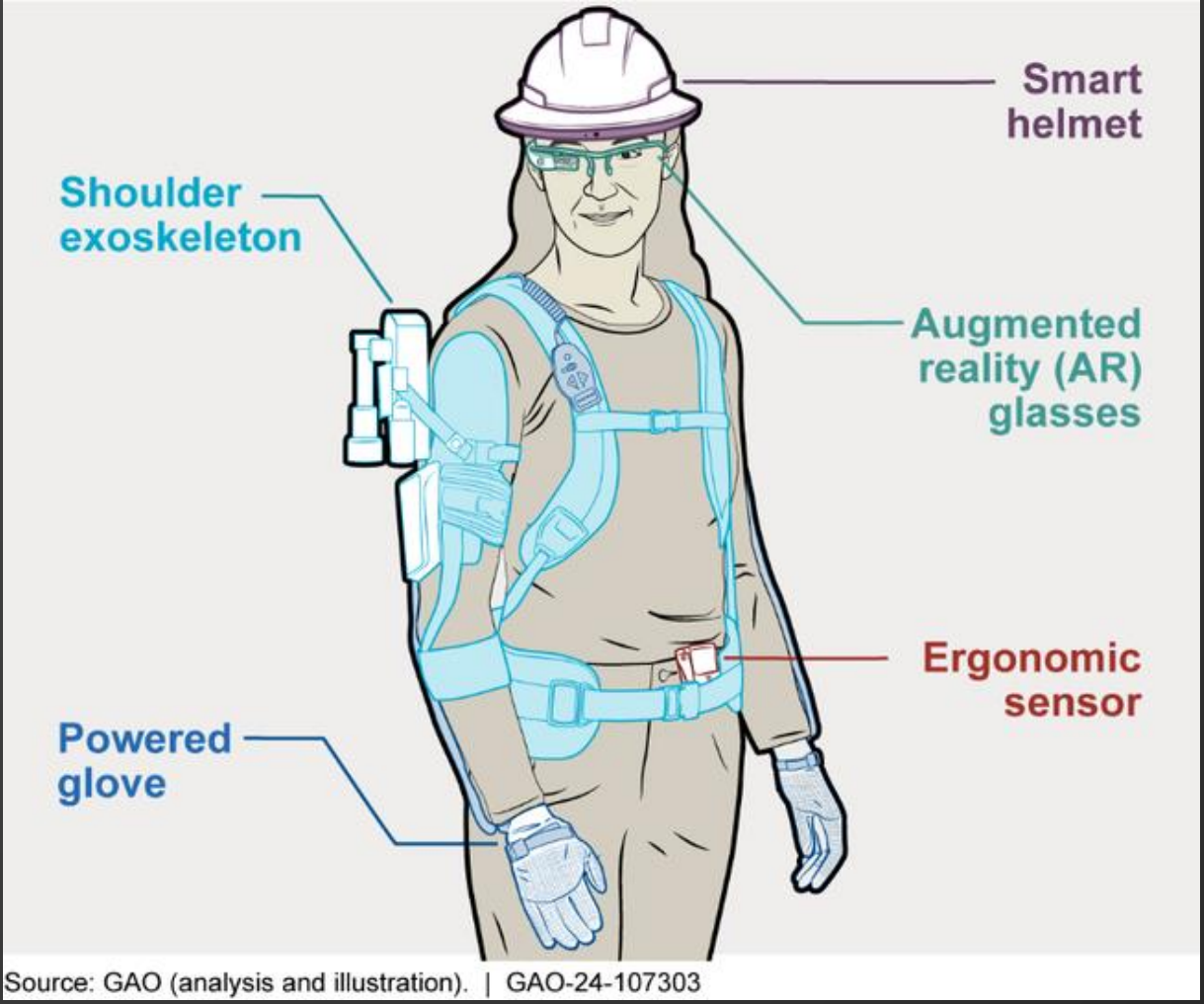
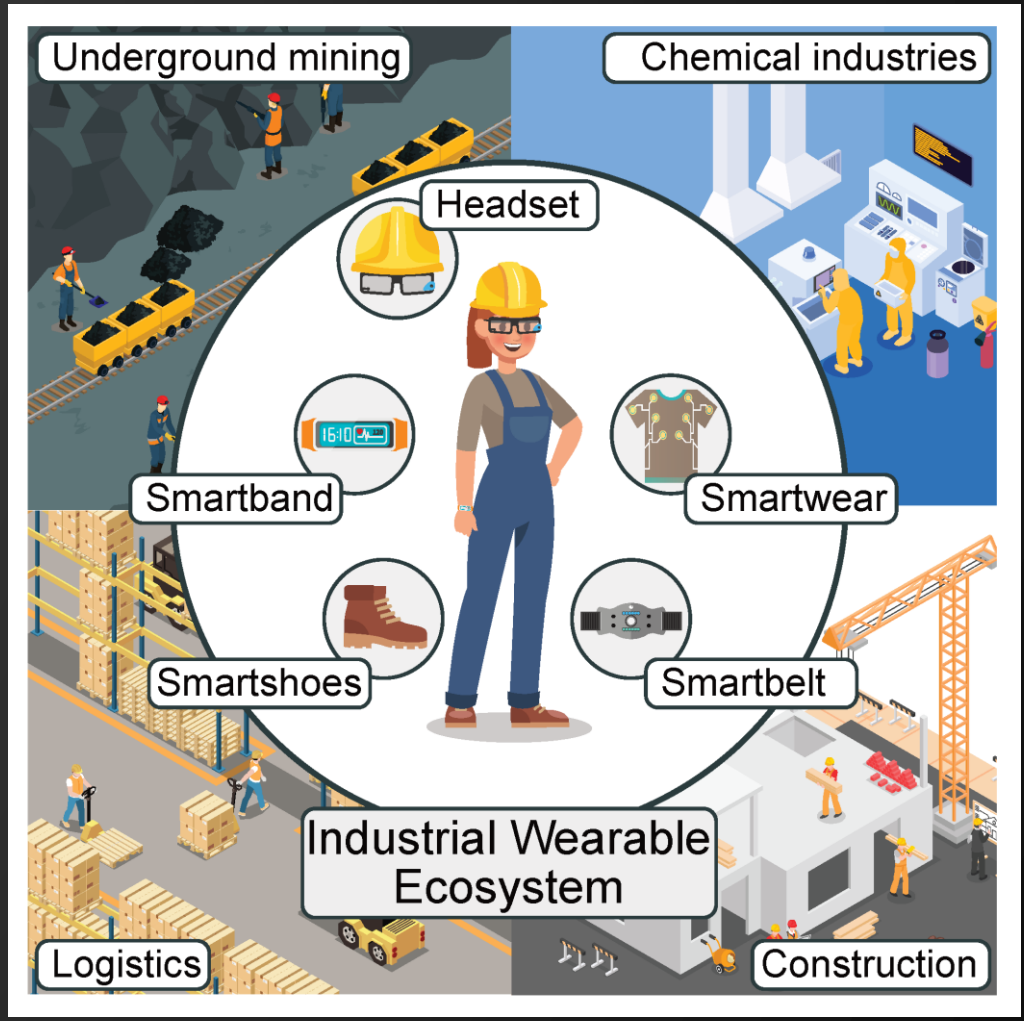


GAO 2024, https://www.gao.gov/products/gao-24-107303



https://www.mdpi.com/1424-8220/21/11/3844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Safety and Wearable Technology: Impact, Applications, and Implementation in Industry

By Gabriel Glynn, Mark Frederick, Tom West
Copyright 2025, 1st Edition
CRC Press

"Technology is available today that automates hazard identification and risk assessment, and provide insights and focus based on EHS leading indicators... However, the most advanced technology is meaningless without the leadership, culture, and systems in place to support it. Innovation in safety starts—and succeeds—with people."

— Tom West

A roadmap to understand, adopt, & use wearable safety tech!

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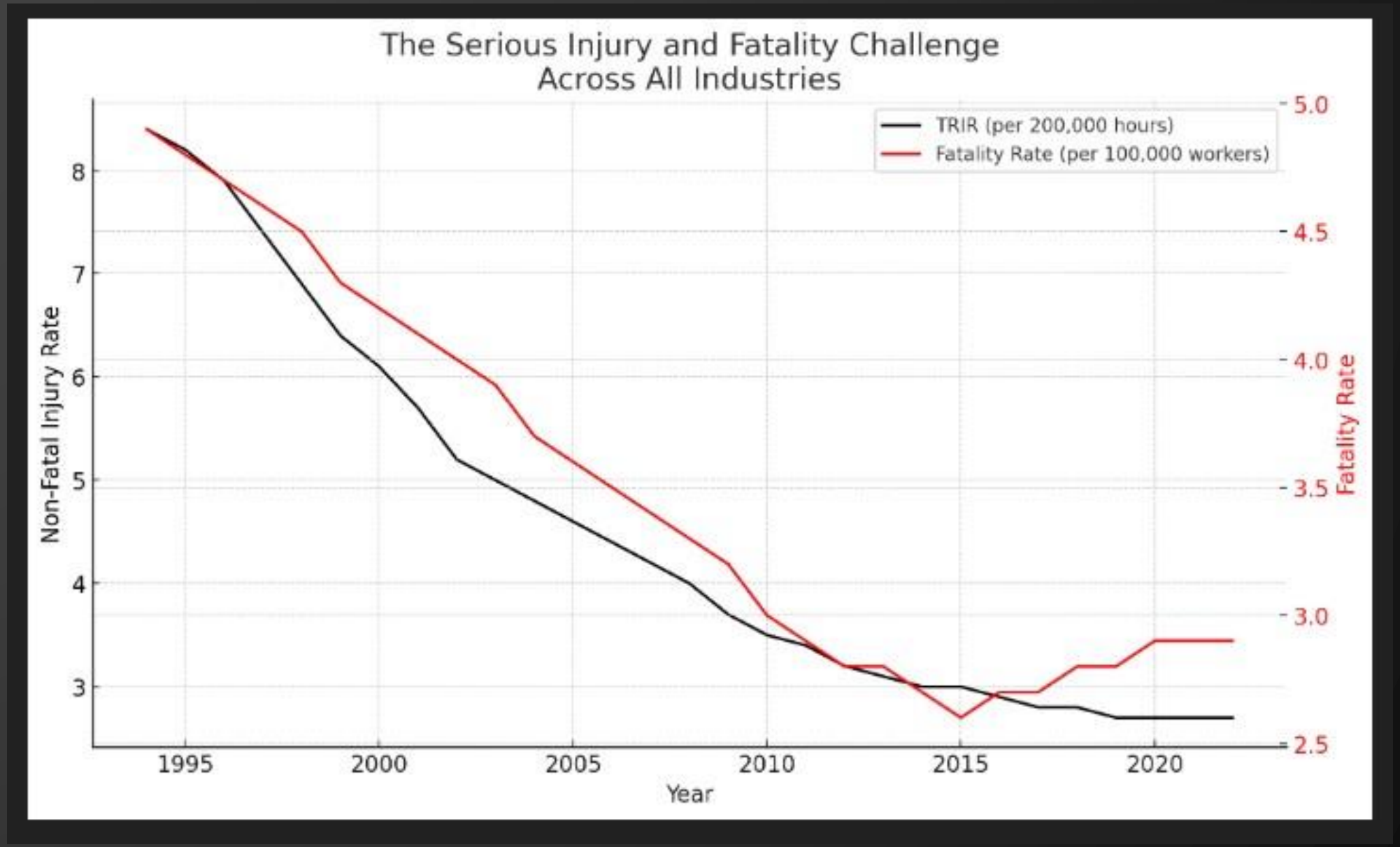
The Serious Injury and Fatality Challenge
Across All Industries
TRIR (per 200,000 hours)
Fatality Rate (per 100,000 workers)
Non-Fatal Injury Rate
Fatality Rate
Year
8
7
6
5
4
3
5.0
4.5
4.0
3.5
3.0
2.5
1995
2000
2005
2010
2015
2020

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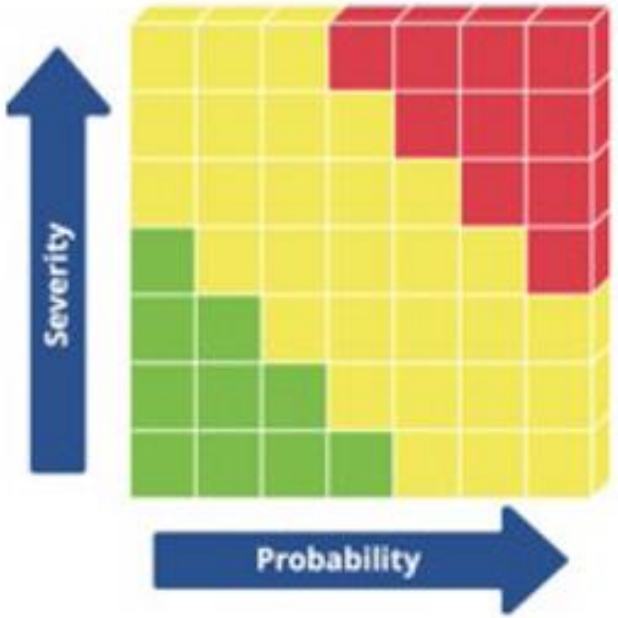
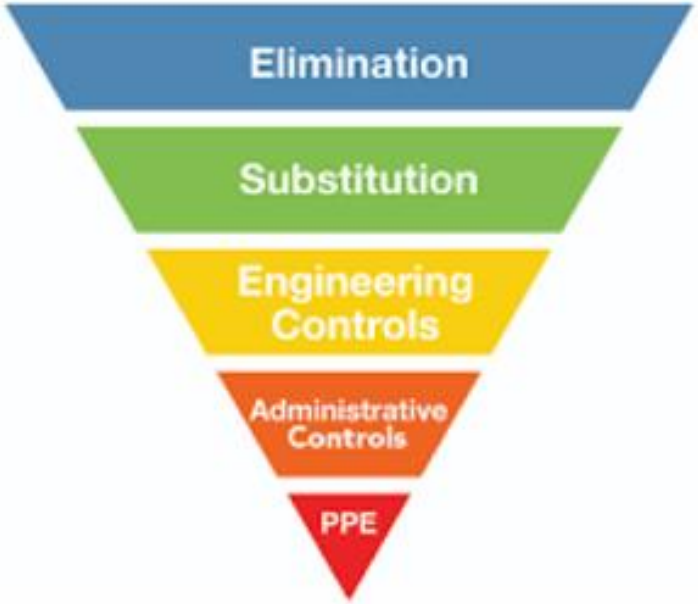
Identify Hazards

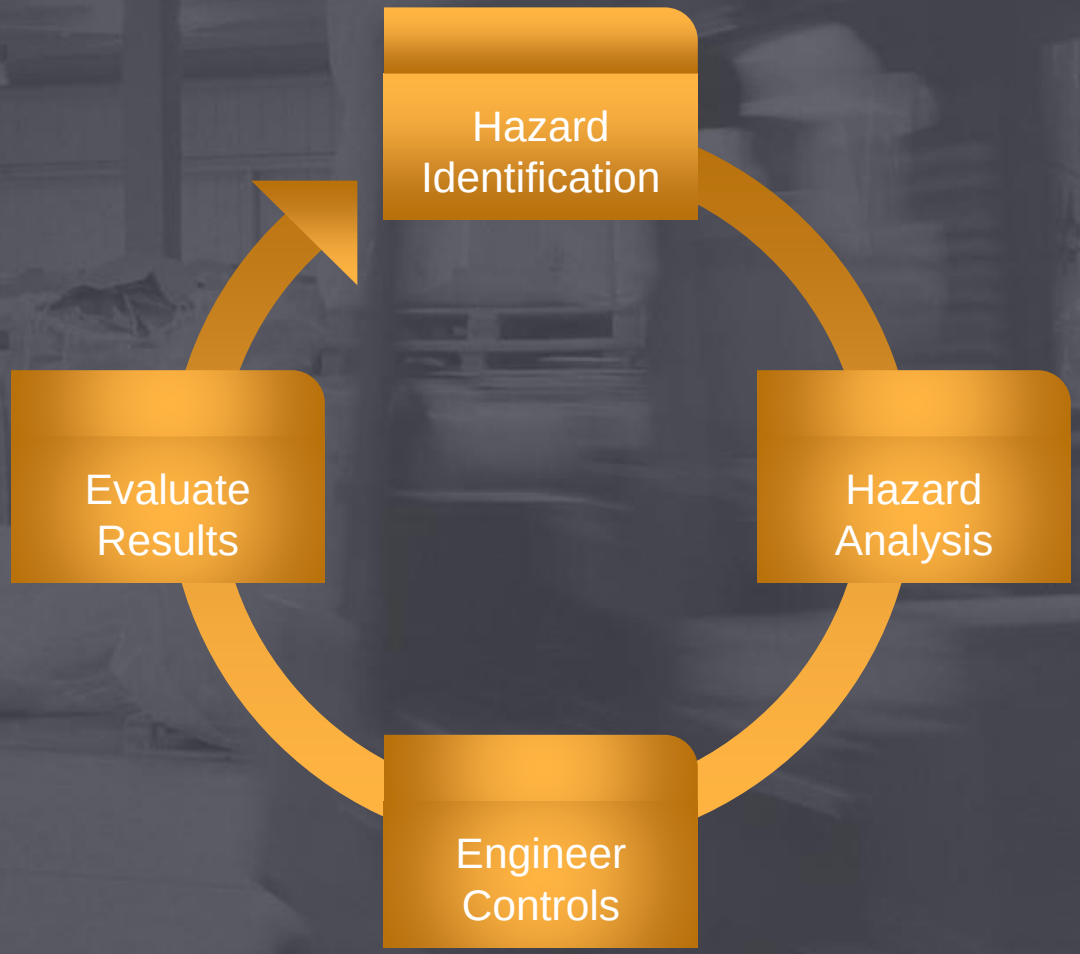


Assess the Risk



Control the Hazard

Safety Management Process



People, Culture, Engagement, Mindset
Learning, Humble Curiosity, Positive Recognition

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T.R.U.E. Leading Indicators of Hazards & Risk

T – Timely
R – Relevant
U – Unique & Useful
E – Easy & Economical

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Liberty Mutual. INSURANCE

The 2024 Liberty Mutual Workplace Safety Index ranks the top causes of serious workplace injuries by their direct cost to U.S. businesses.

The WSI Top Ten: results across all industries

In 2021 (2024 WSI), U.S. industries spent $58.07 billion on the direct costs of worker injuries, and 82.5 percent of that cost ($47.9 billion) was for the top 10 causes of disabling injuries and illnesses. The 10 most costly causes of workplace injuries and illnesses are as follows:

The top 10 most costly causes of injury and their direct costs to U.S. businesses

Cause	Cost (billions)	Percentage
Overexertion involving outside sources	$12.49	21.5%
Falls on same level	$9.99	17.2%
Falls to lower level	$5.68	9.8%
Struck by object or equipment	$5.55	9.6%
Other exertions or bodily reactions	$3.68	6.3%
Roadway incidents involving motorized land vehicles	$2.76	4.8%
Slip or trip without fall	$2.34	4.0%
Caught in or compressed by equipment or objects	$2.05	3.5%
Struck against object or equipment	$1.84	3.2%
Repetitive motions involving microtasks	$1.54	2.7%

Top 5 alone nearly $31B
Those that likely had movement/motion leading indicators = 75.13%

LiMu WSI 2024 USA - https://business.libertymutual.com/insights/2024-workplace-safety-index/

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*** My personal re-interpretation of results! ***

“All employees, at all levels, have clear safety and health goals and responsibilities.”

🔴 71.6% of respondents not able to strongly agree that everyone has clear safety and health goals.

“Workers in my organization feel comfortable voicing opinions, problems and concerns about safety and health.”

🔴 66.8% of respondents did not strongly agree that workers feel comfortable raising safety concerns.

“How engaged is executive leadership in your organization’s safety and health mission, goals, and practices?”

🔴 67.7% of respondents not able to say leadership is very engaged in safety efforts.

“How engaged are workers in your organization’s safety and health mission, goals, and practices?”

🔴 81.8% of respondents cannot say workers are very engaged in safety efforts.

NSC 2025 Survey - https://www.safetyandhealthmagazine.com/articles/26558-2025-state-of-safety?

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*** **My personal re-interpretation of results!** ***

“What are the 10 biggest challenges the OSH field needs to address in next 5-10 years?”

90.1% Safety culture
80.2% Worker complacency
68.8% Worker engagement in safety & health
57.9% Safety Leadership

“Which technologies are you using to improve worker safety and health?”

Only ~0.9% of respondents reported using any of the listed technologies to improve worker safety and health — reinforcing that technology adoption in this area is still extremely low.

NSC 2025 Survey - https://www.safetyandhealthmagazine.com/articles/26558-2025-state-of-safety?

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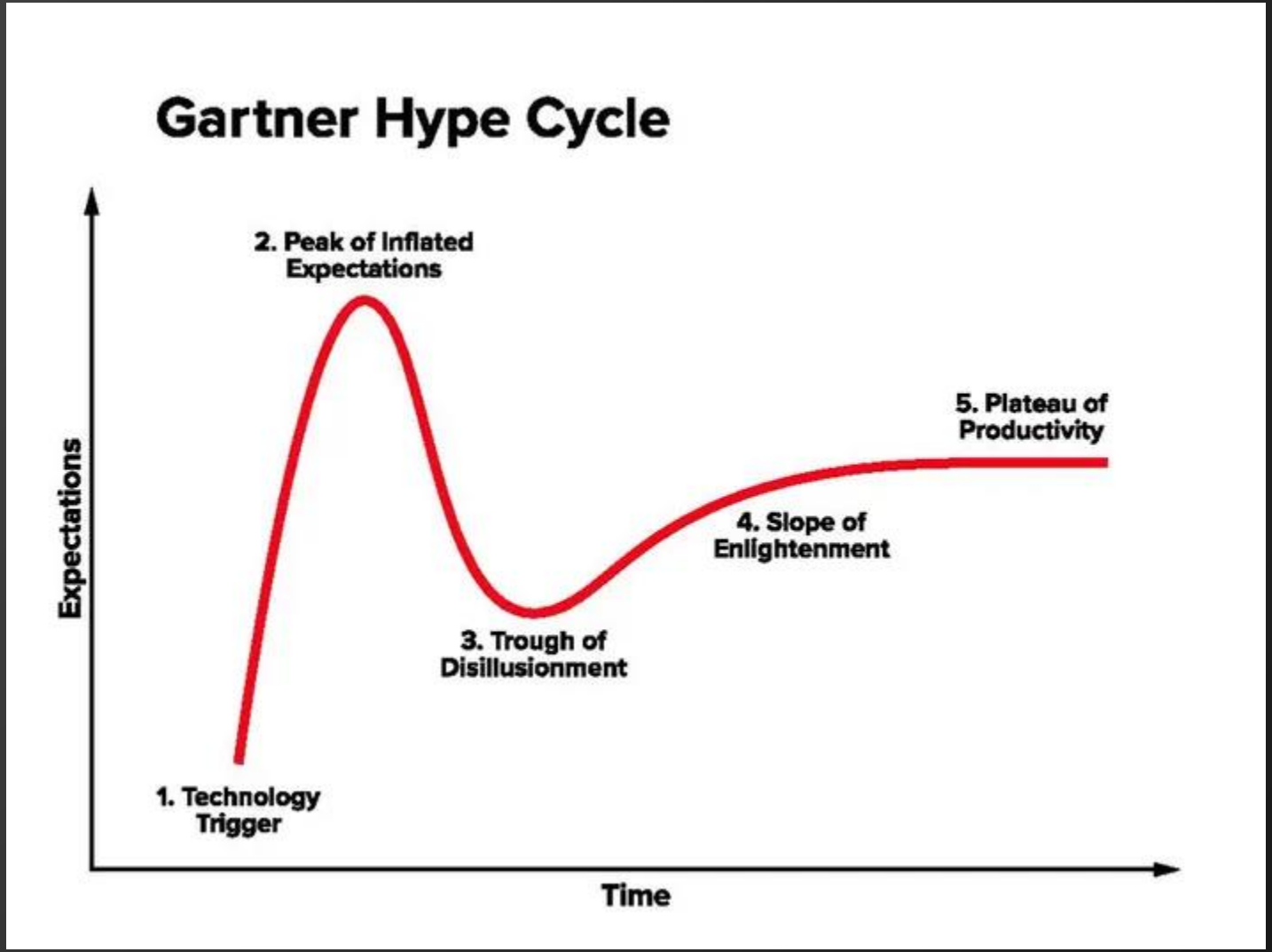
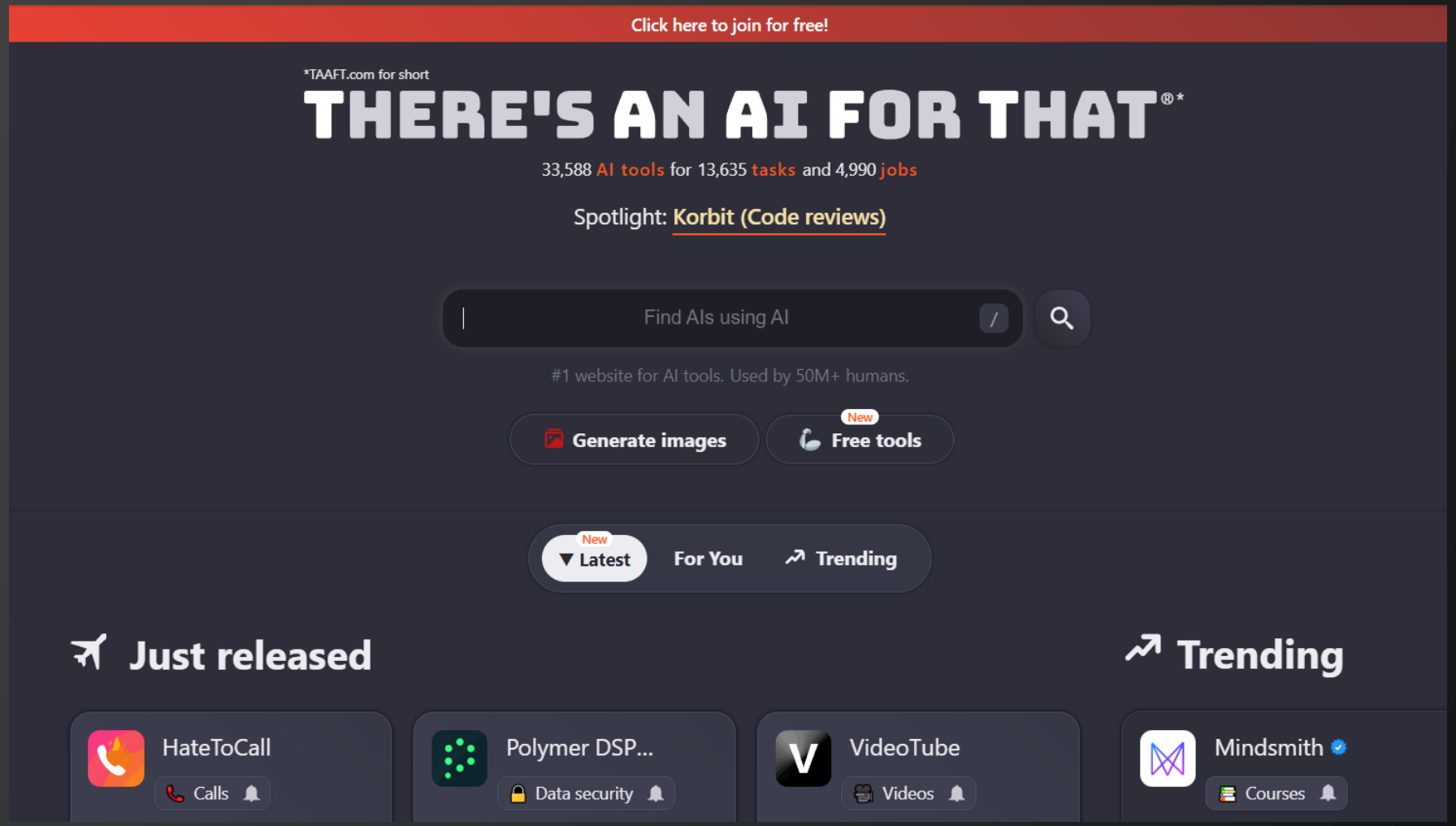
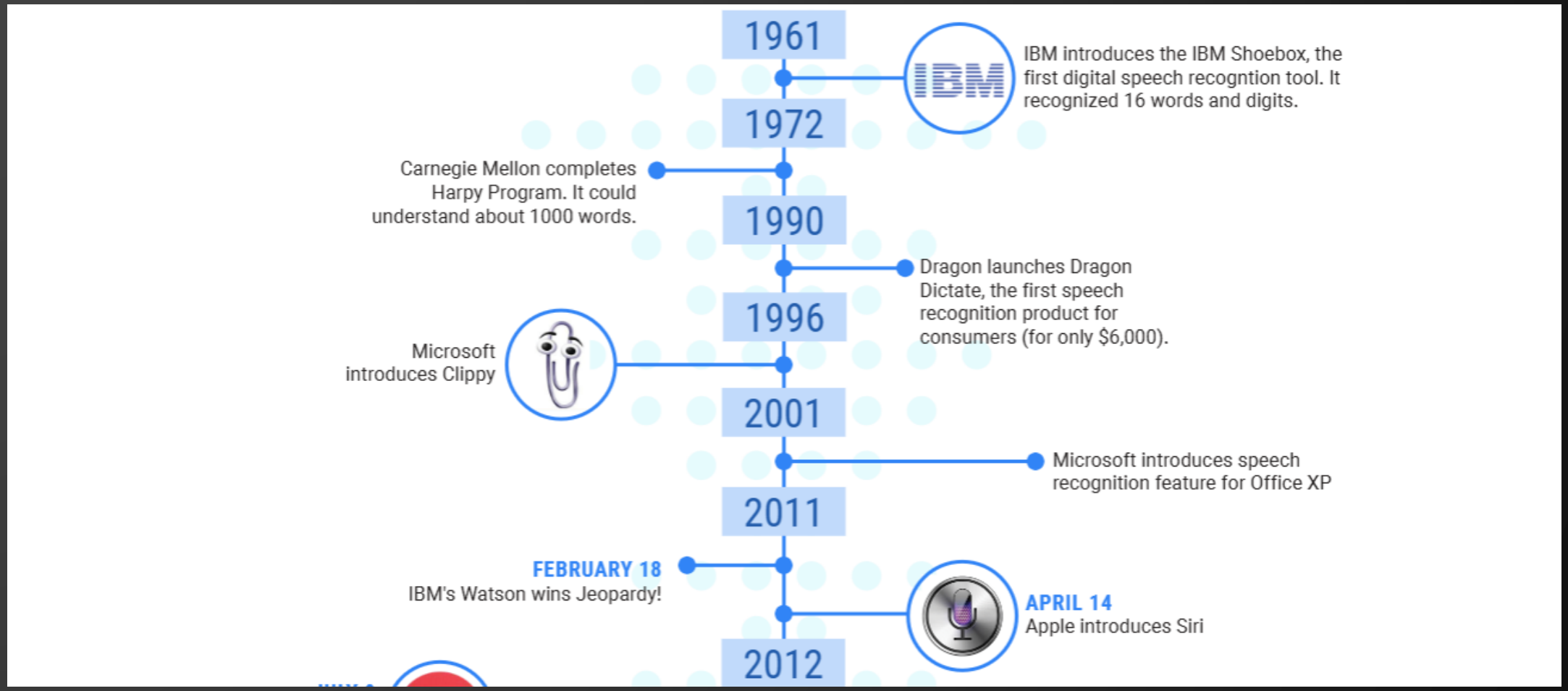

Gartner Hype Cycle
2. Peak of Inflated Expectations
5. Plateau of Productivity
4. Slope of Enlightenment
3. Trough of Disillusionment
1. Technology Trigger
Expectations
Time


Click here to join for free!
*TAAFT.com for short
THERE'S AN AI FOR THAT®*
33,588 AI tools for 13,635 tasks and 4,990 jobs
Spotlight: Korbit (Code reviews)
Find AIs using AI
/
#1 website for AI tools. Used by 50M+ humans.
Generate images
New
Free tools
New
Latest
For You
Trending
Just released
Trending
HateToCall
Calls
Polymer DSP...
Data security
VideoTube
Videos
Mindsmith
Courses



Voicebot.ai infographic

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New Thinking, Tools, and Approaches to Safety Management

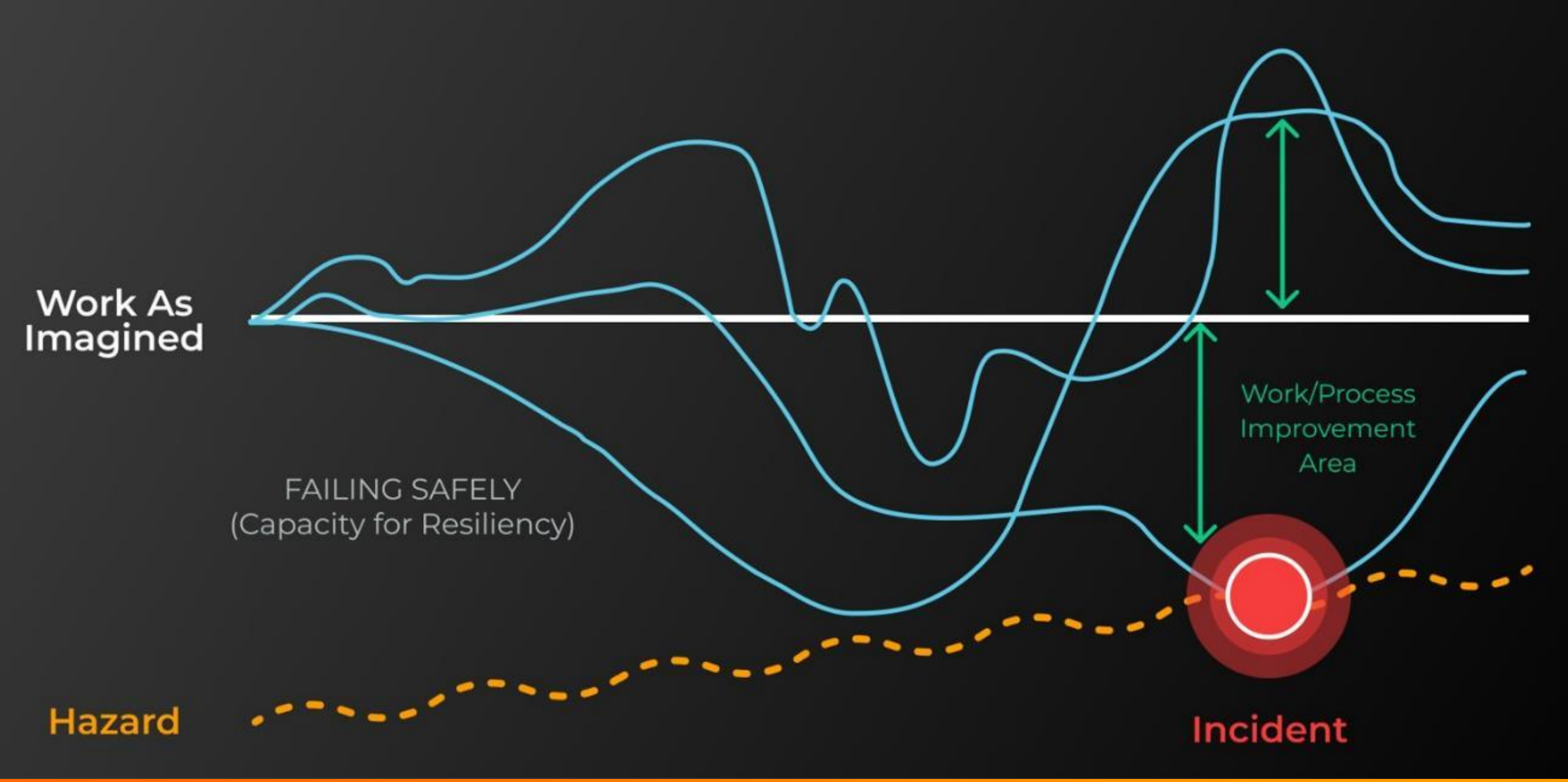
It’s time to evolve.

Human and Organizational Performance (HOP) is a science-based approach to looking at mistakes so we can address them more effectively. It builds an understanding of how humans perform and how we can build systems that are more error tolerant.

Human and organizational performance (HOP)
is a risk focused OPERATING PHILOSOPHY
which recognizes that to ERROR is human
and that an organization's
PROCESSES AND SYSTEMS greatly influence
employee actions and choices,
and consequently, their likelihood of success.

Key Principles of HOP:

1. People are fallible, and even the best make mistakes
2. Workers are masters at adaptive problem solving



Work As Imagined vs. Work in Reality – Conklin/Edwards/Fisher

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Key Principles of HOP:

1. People are fallible, and even the best make mistakes
2. Workers are masters at adaptive problem solving
3. Context drives worker actions and behaviors
4. Leadership’s response to failure matters
5. Blame Fixes Nothing
6. Improvement happens through learning

Safety? The absence of errors in outcomes, or presence of capacity and resilience in systems to ensure things go well?

Investigations? Only failures, or normal work?

Focus? Containing sources of energy, or engagement participation and learning?

People? The problem to be fixed, or masters adaptive problem solving and therefore the solution to be harnessed?

SHMS? Compliance and bureaucratic accountability upward, or ethical responsibility downward?

What's happening when nothing bad is happening?

Change the work, not the people.

Wearables can be a powerful tool for identifying hazards and risk

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In every work environment there are clues...

...leading indicators & near-misses that we collect automatically, analyze and use...

...to predict & prevent injuries & claims.

- Reduction in Accidents

  Claim Frequency - Down 50%
  Total Claims - Down 50%
  Claims severity - Down 90%
  ROI estimated at over 1000% +

- Increased Transparency & Communication, Culture Building

  Increase in “Good Catches / Near-Misses” & reported observations from front lines.

- Uncover Unknowns

  Harness data and sensor technology to discover insights previously unavailable.

- Simplify EHS Documentation

  Immediately shows EHS value.

- Safety & Health Management System

  Effectiveness, Efficiency & Productivity Impact

Benefits Realized!

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Workers check out and return wearables from kiosks

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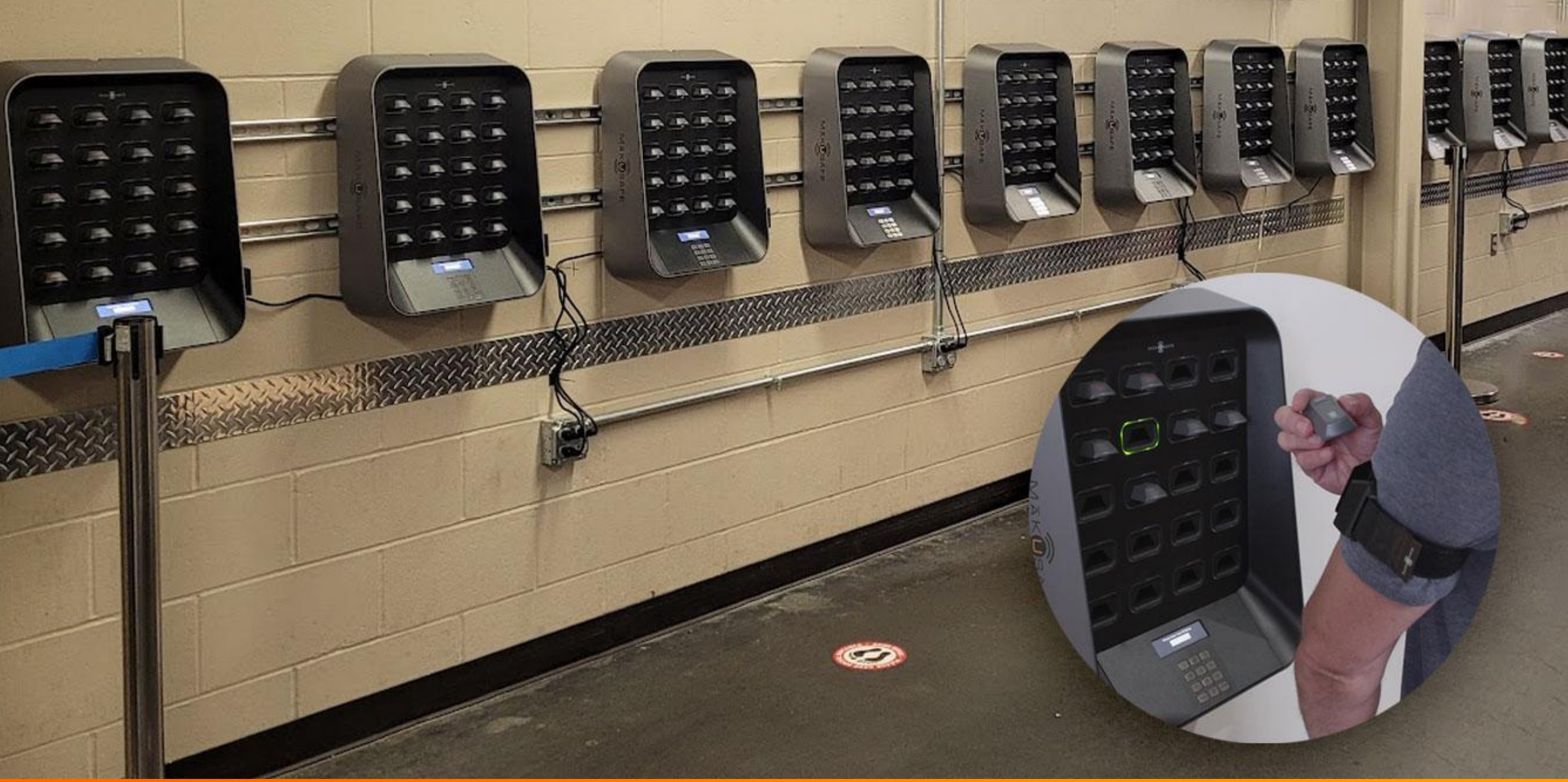

Workers check out and return wearables from kiosks

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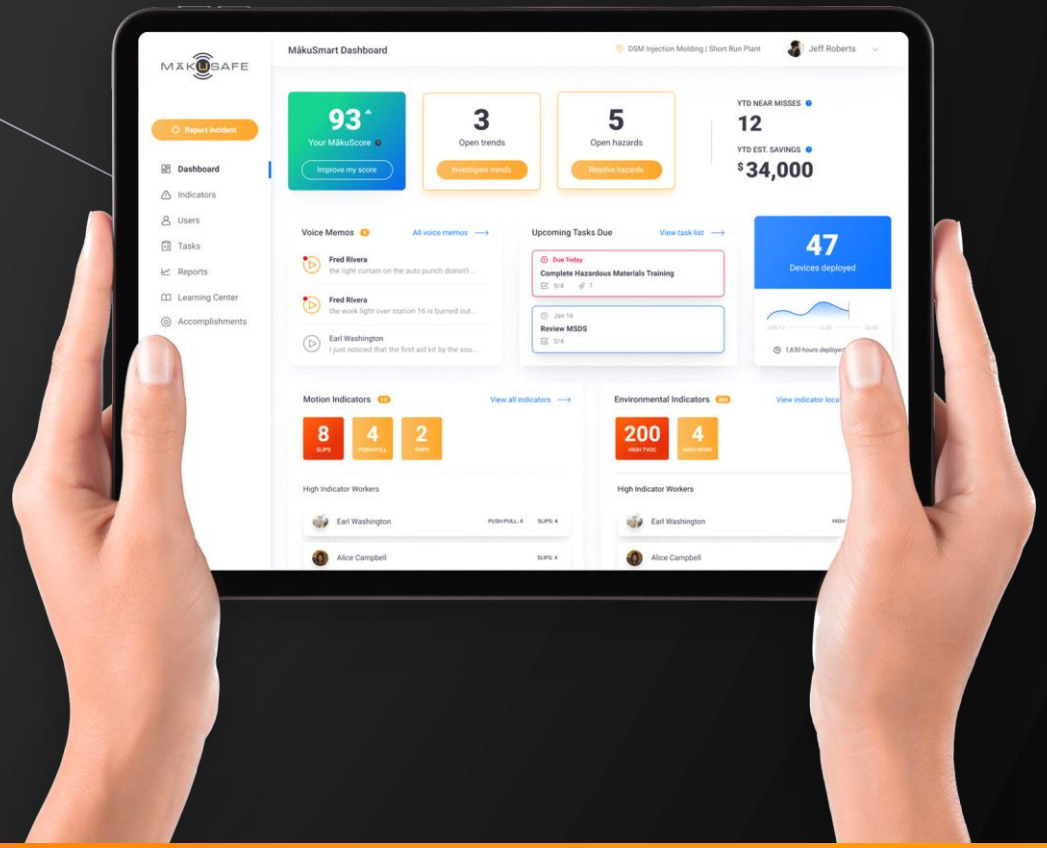
MākuSmart Cloud

MākuSmart Web & Mobile Application

Wearable

Base Station



Connected Safety Ecosystem

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The MākuSafe Ally™ gathers & transmits data in real-time to the MākuSmart Cloud.

Motion Detection

- Slips, Trips, and Falls
- Repetitive Motions
- Worker Physicality
- Forceful Exertion

MyVoice™

- Audio Messaging
- Voice-to-text
- Push-to-talk

Battery

- 22 Hour Battery
- Multiple Shifts

Spatial Awareness

- Location Identification
- Worker-to-worker Proximity
- Access Control & Factory 4.0
- Contact Tracing

Environmental Sensors

- Ambient Light
- Air Quality (TVOC & CO2)
- Noise / Sound Dosage
- Air Pressure
- Humidity
- Temperature

A Sensor-Packed Data-Gathering Ally™

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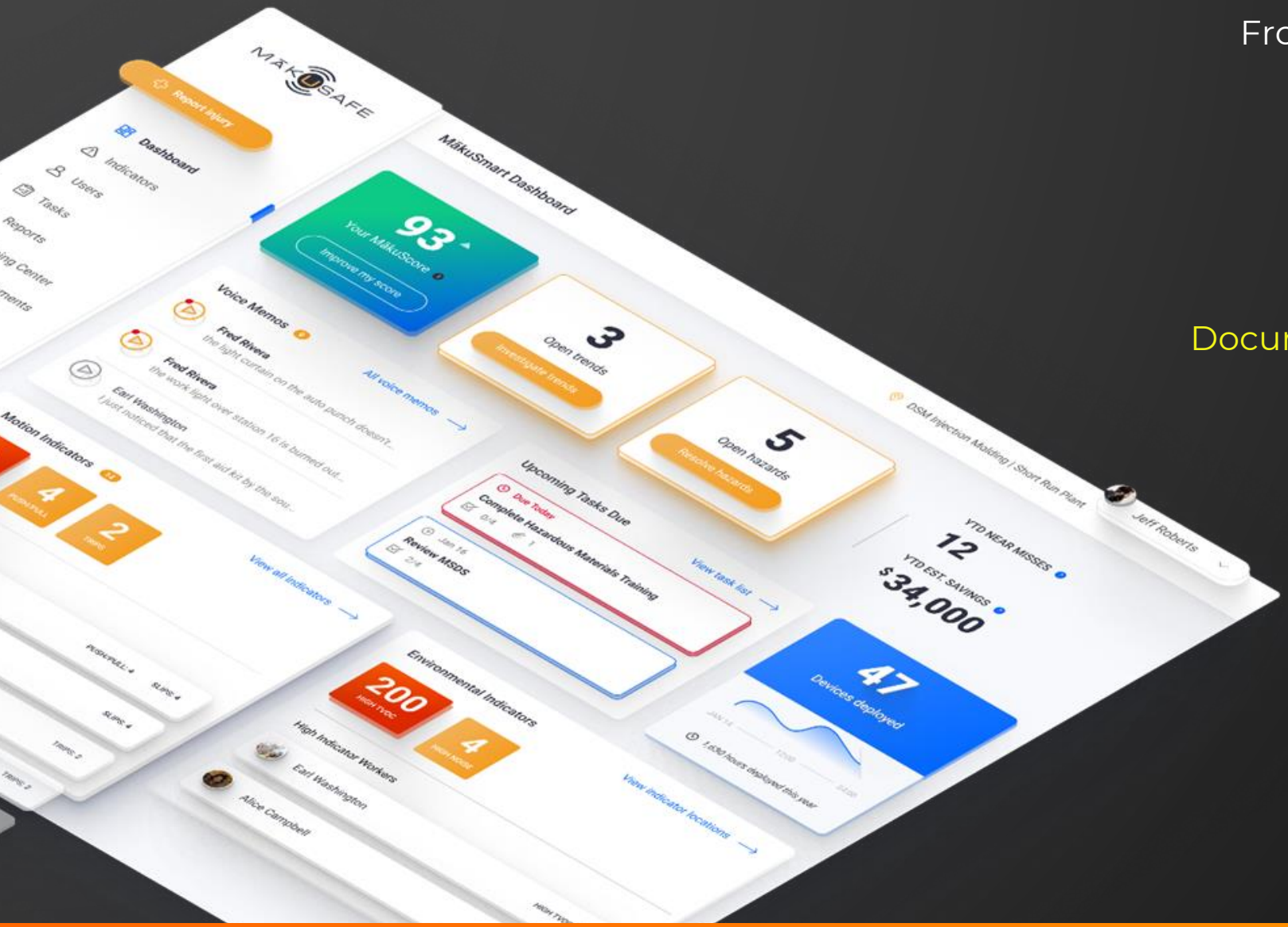
MākuSafe Does Not:

- Collect anything personal (No PII)
- Monitor any biometrics
- Deliver any negative feedback to the worker; haptic, visual, or auditory
- Assume the worker is the problem, or knows what to do to correct it
- Continuously track the individual



Frontline communication via Voice Memos

Real-Time Alerts

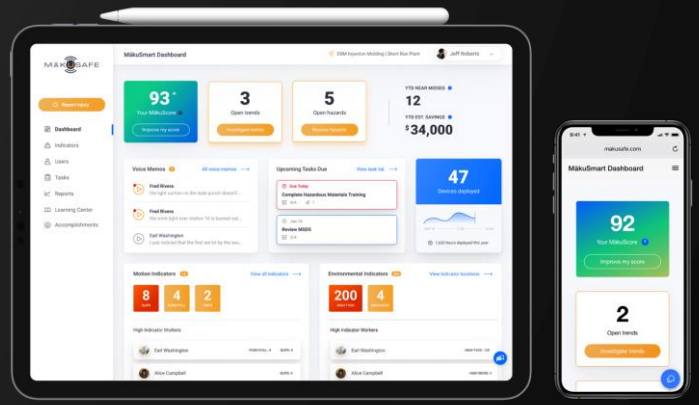
Location Conditions

AI-Driven Trends

AI-Driven Motion & Physicality Analysis

Document Incidents, Injuries, Tasks & Hazards

Reporting & Analytics



Support for Multiple Devices

MākuSmart Cloud Application

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Environmentals - Heat & Noise Exposure, Air Quality, Light Levels

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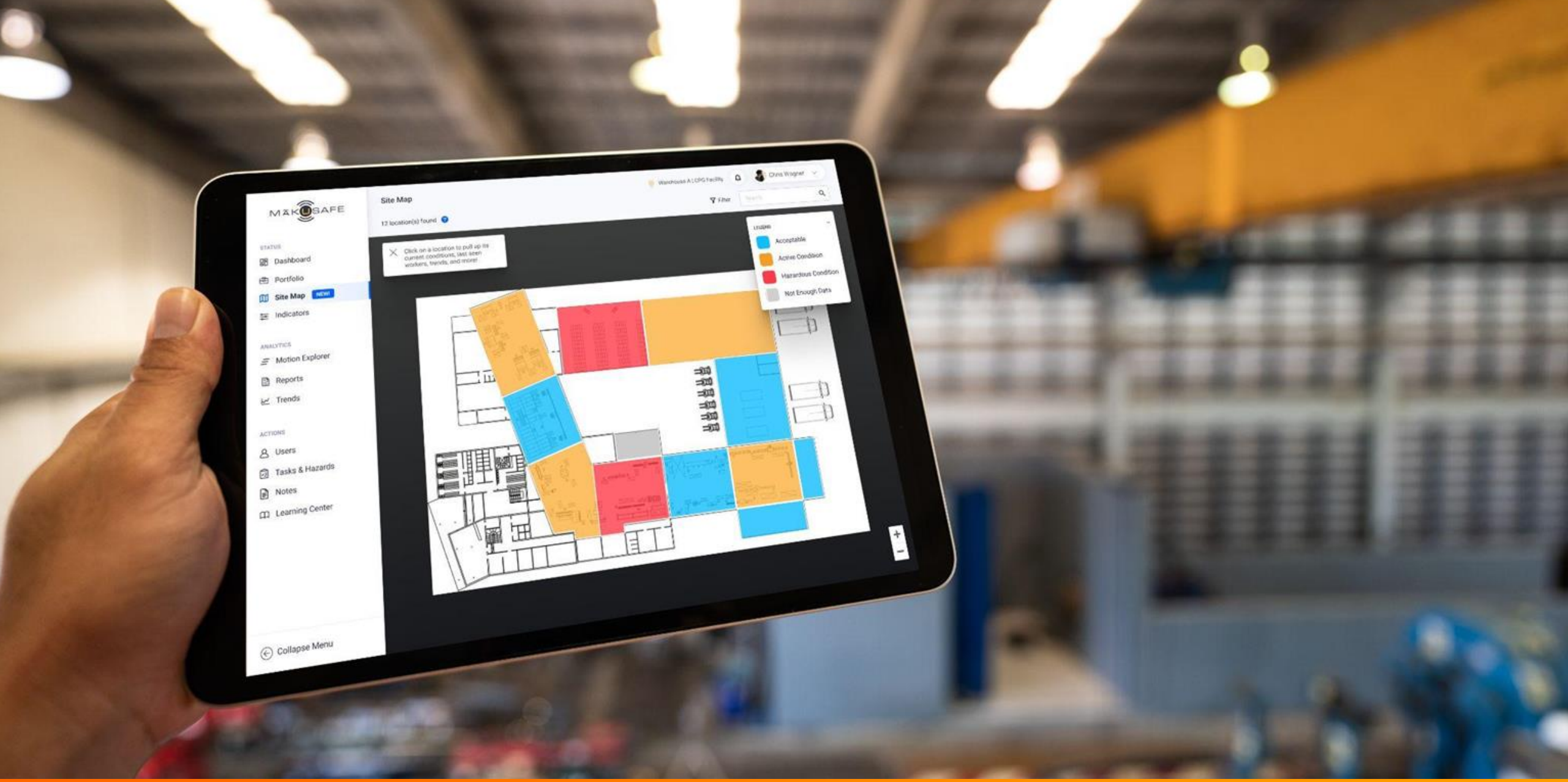

Location Services & Environmental Hazards

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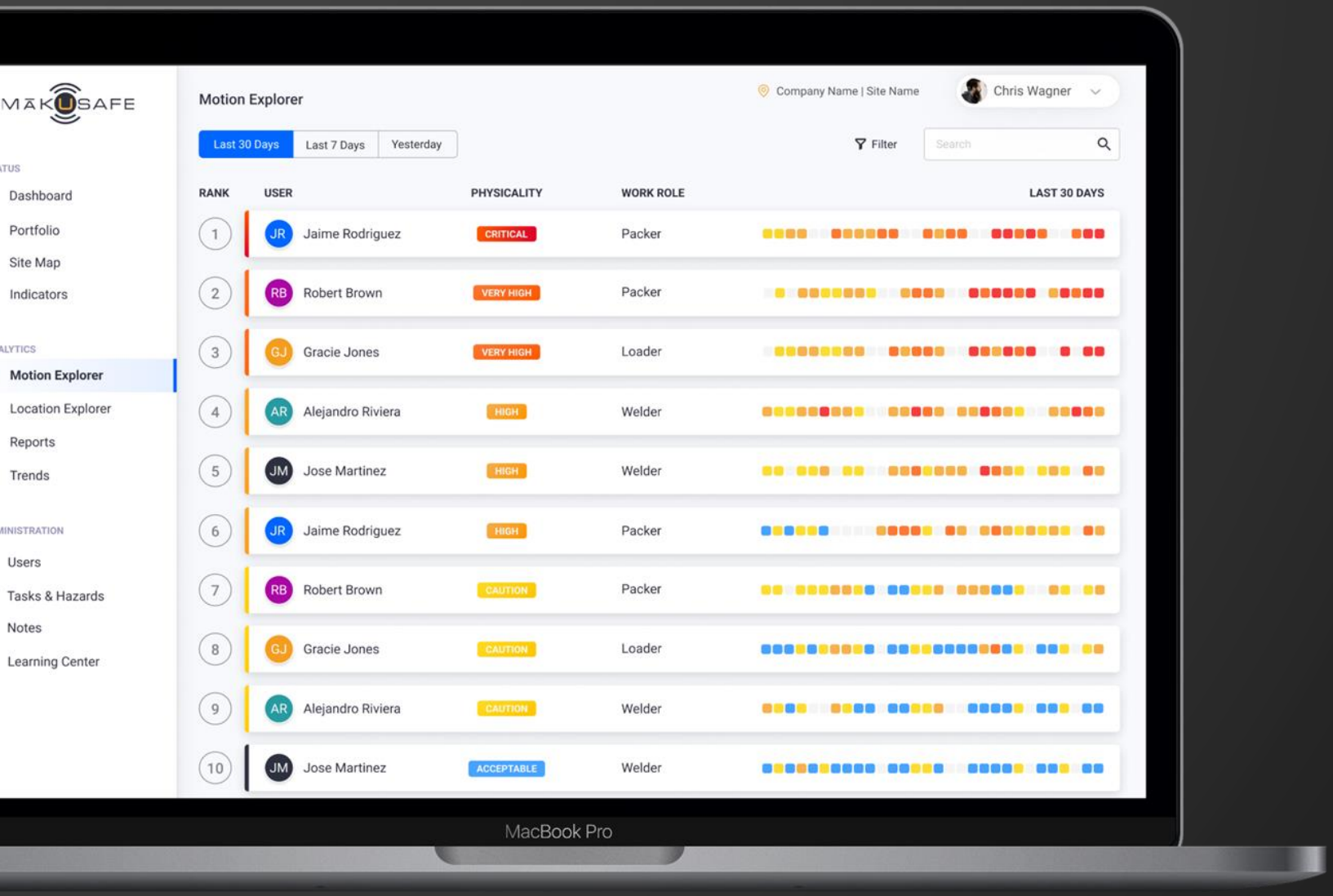
- Client Case Study
- Long standing construction client
- Deploying across numerous large data center projects
- Multi employer job sites
- ESG & Safety management program reporting to customer helps win projects
- Achieved and maintained 0.0% TRIR on sites where MākuSafe is being used
- 31 months



Visualize worker's expended effort and potential impact on them for the day

Motion Explorer

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Motion Explorer & Physicality Ranking

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- Client Case Study done through their insurer
- Trucking & transportation
- Reduced strain & exertion injuries by 56% in year one.
- They realized $450,000 in WC savings per site

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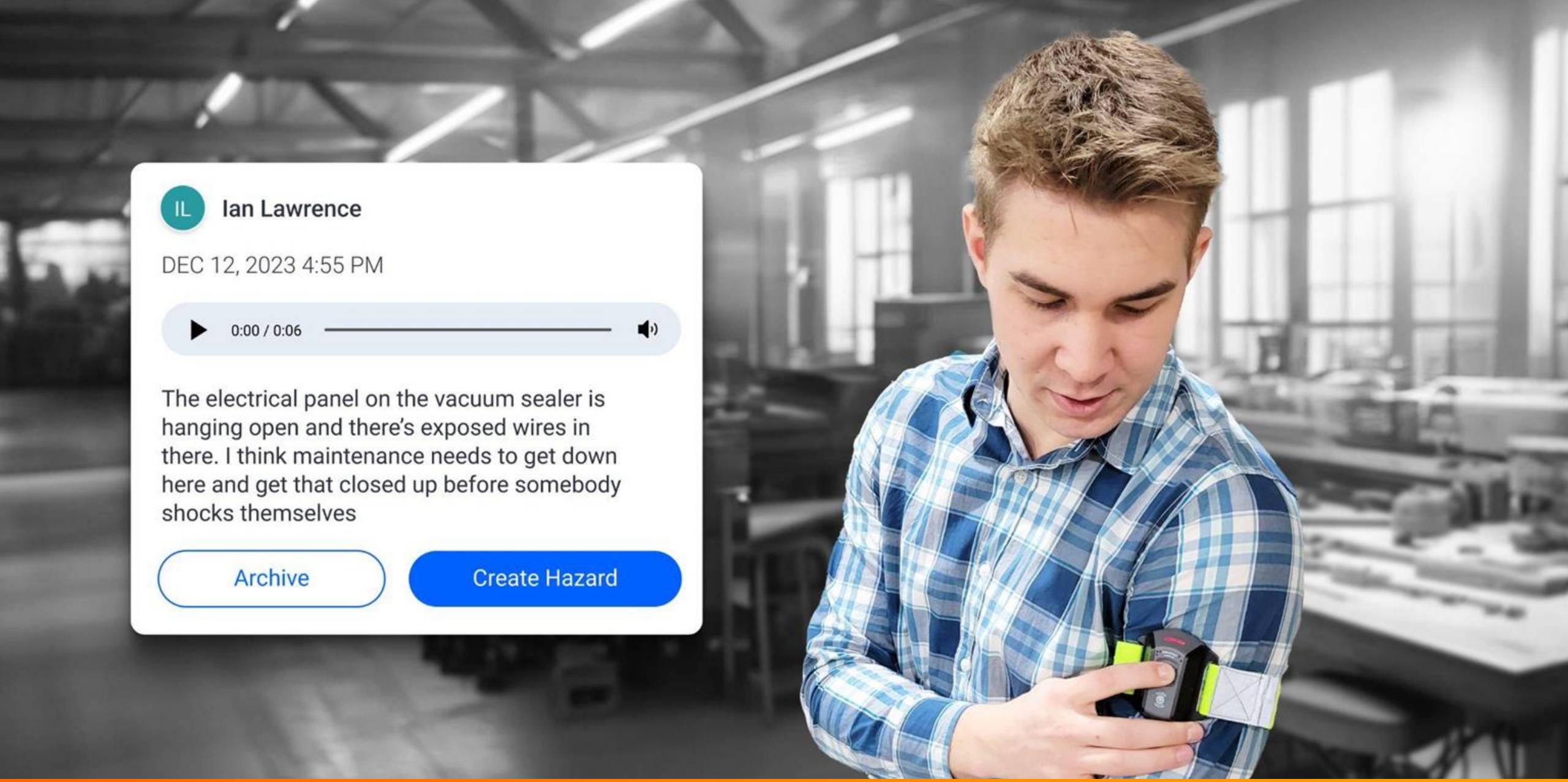

MyVoice™ Messaging

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- Client Case Study done with NSC
- Nationwide Logistics Organization
- Reduced lost time injuries by 74% in year one
- Continuous stream of feedback from the front lines
- Positive cultural impact documented

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- Over 335 “good catches” (or near misses) were reported with 82% mitigated
- Reduced Workers Compensation costs by 60% from 2021–2023
- Fewer hours of lost time, fewer trip hazards, and a cleaner, more efficient work area
- Enhanced employee morale and engagement

LIFE LINE
EMERGENCY VEHICLES

National Council on Compensation Insurance (NCCI) Case Study

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Front Line
Conversations
Build Culture, Engagement, and Mindfulness

Shifting Safety Culture

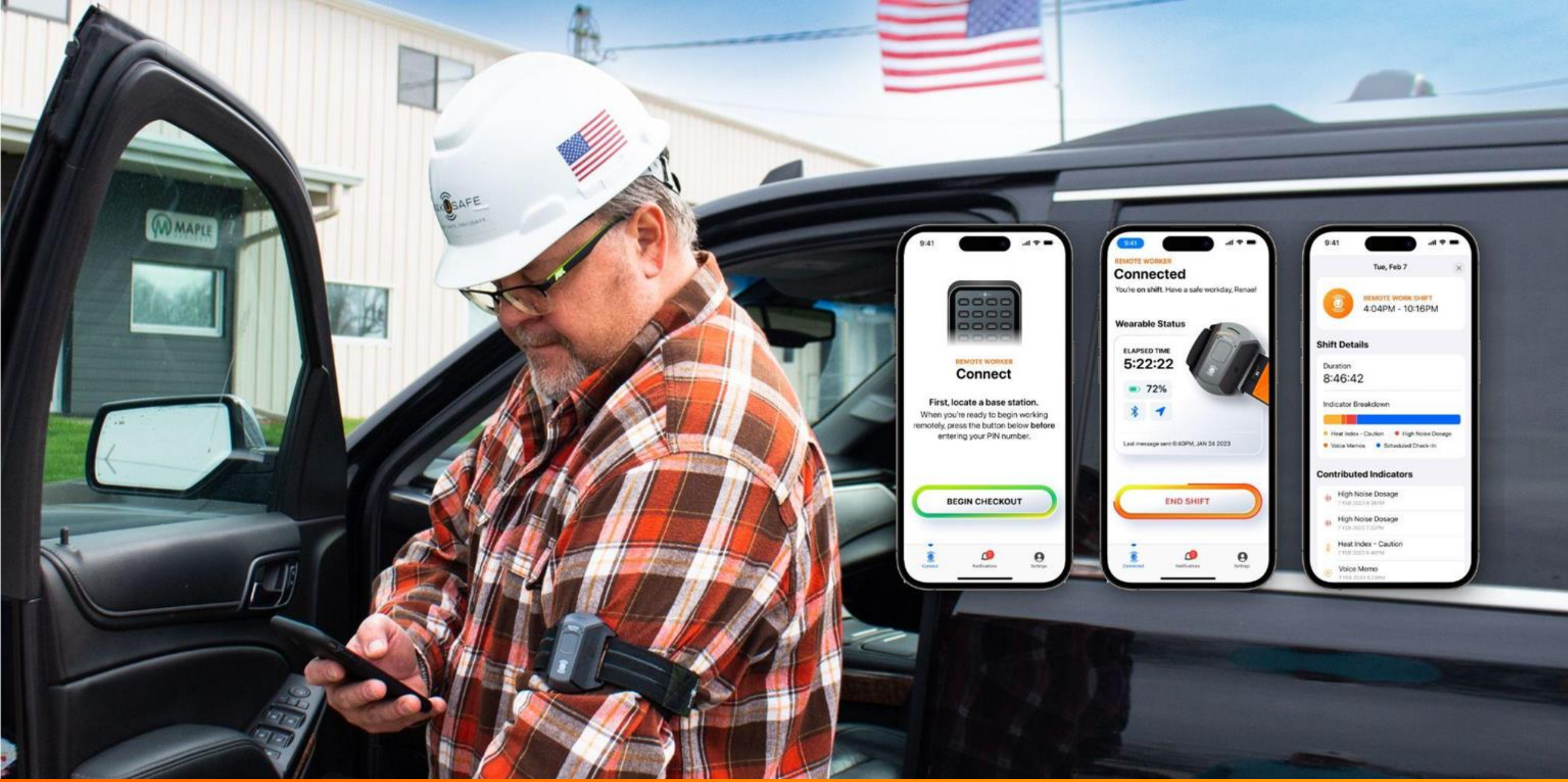
- 0 +

Shifting Safety Culture

\- 0 +

Stronger Cultures + Safety Mindfulness + Worker Engagement =

14X Safer Workplaces with 70% Incident Reduction
Higher Quality & Higher Productivity



Remote Worker

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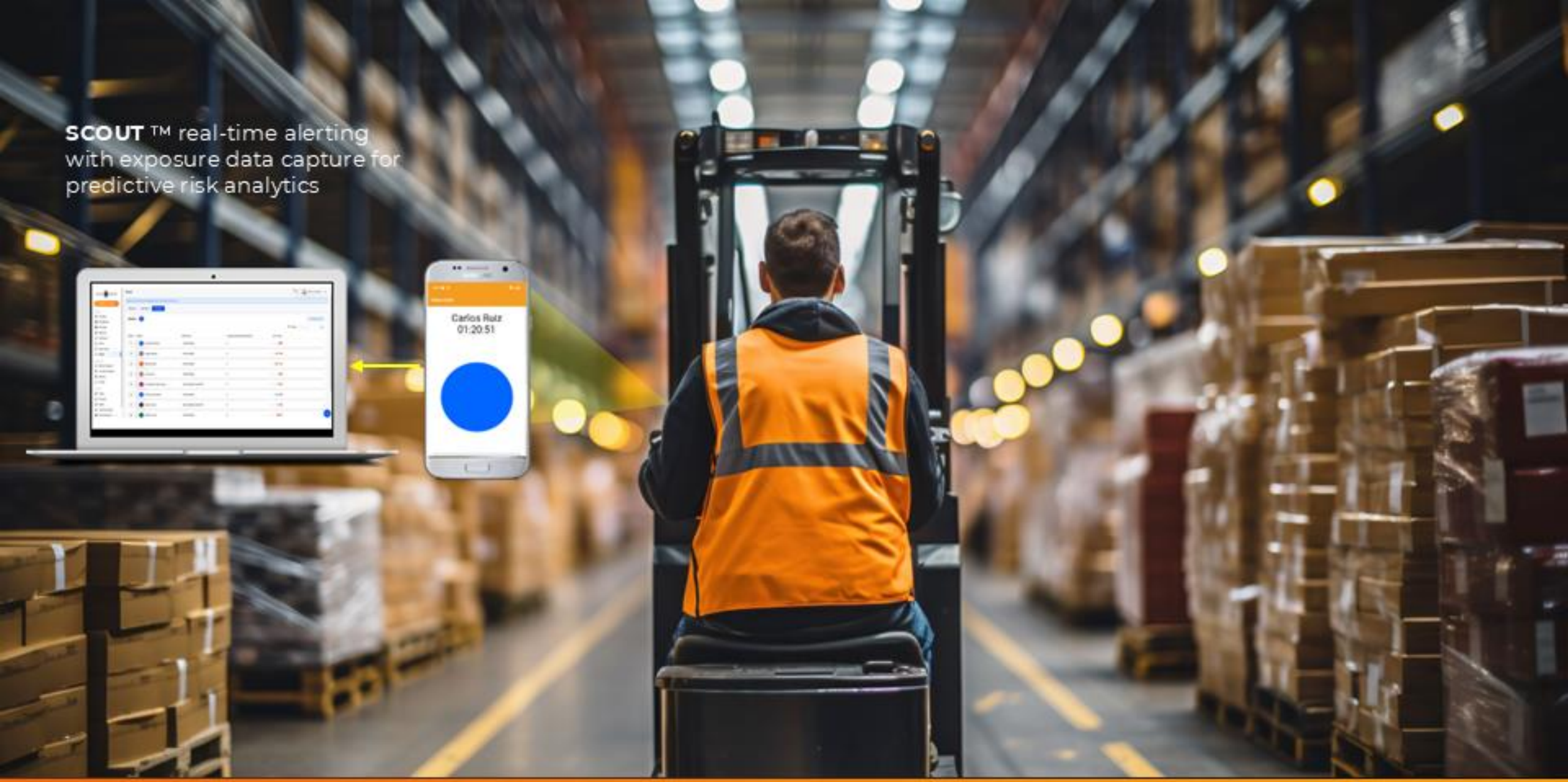
MākuSafe RāngeView
Worker Proximity
Contact Tracing
Connected Workforce



Forklift Safety With SCOUT™

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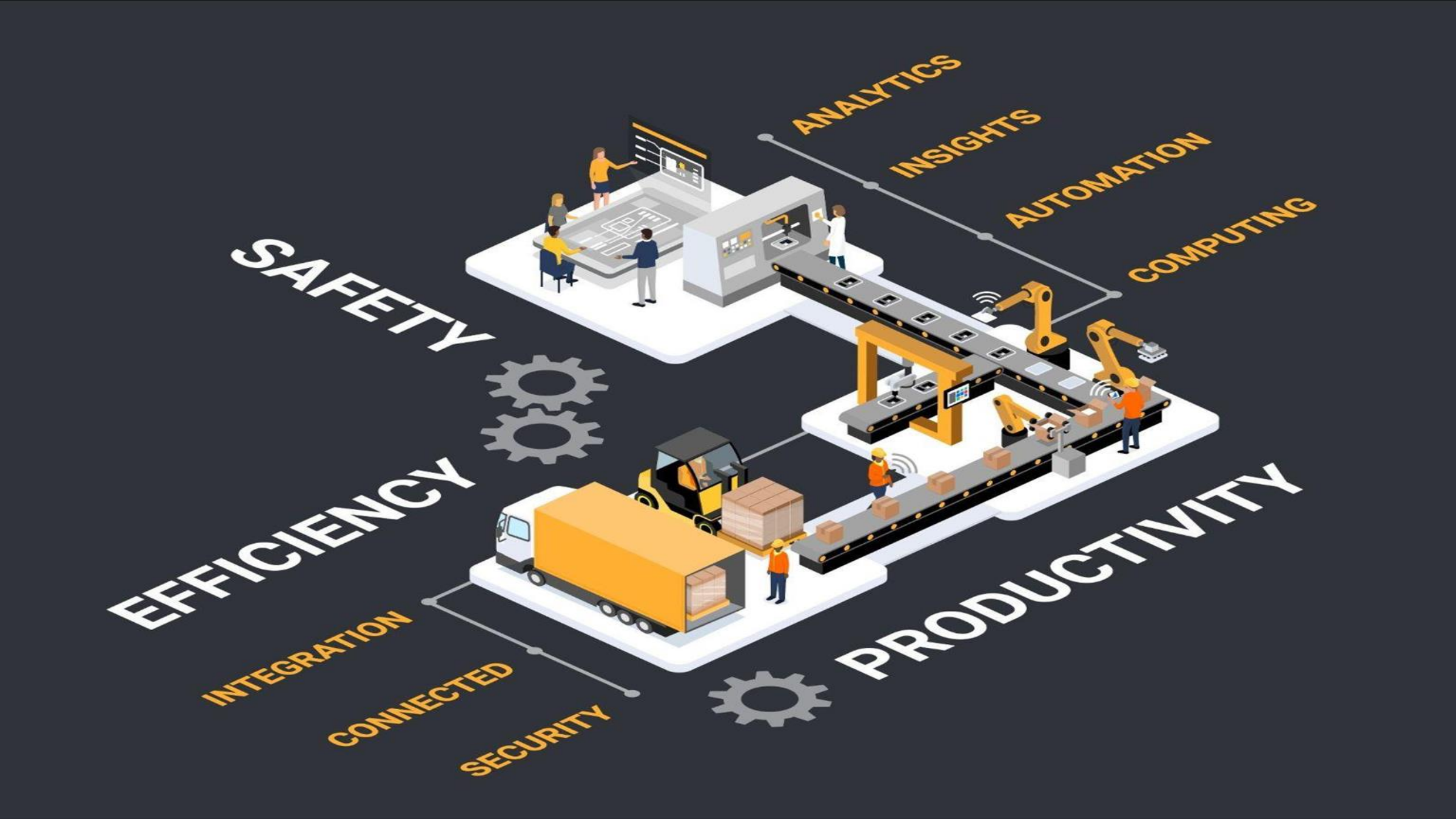
ANALYTICS
INSIGHTS
AUTOMATION
COMPUTING
SAFETY
EFFICIENCY
PRODUCTIVITY
INTEGRATION
CONNECTED
SECURITY


DANGER
BE CAREFUL
WHEN BELT
IS IN MOTION.


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Do you believe that tech / wearables can help you...

- better understand where risk exists?
- become more proactive & preventative?
- develop participation, engagement, and build culture?
- become more strategic?
- relate safety to the C-Suite and Production/Operations?
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- 22 Hour Battery
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QUESTIONS?

A Sensor-Packed Data-Gathering Ally™

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Thank You!

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OVERVIEW FLYER

PRODUCT SUMMARY

MANUFACTURING USE CASES

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