



Physical-Digital Convergence Through Augmented Reality

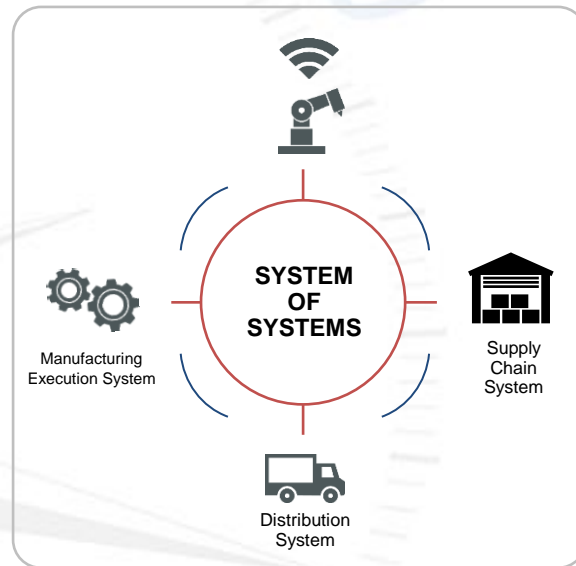
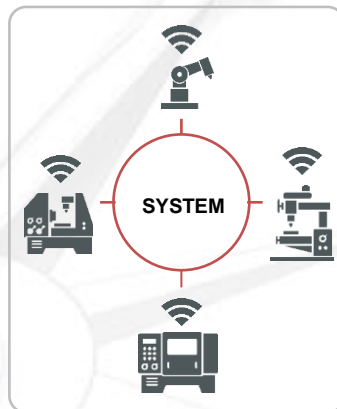
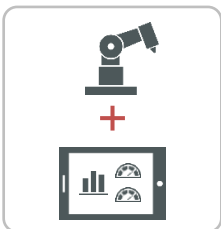
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IoT & AR Field Engineering Manager - South Europe

18 June 2019

Organizzato da





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DATA GROWTH* (ZETTABYTES)



* IDC's Digital Universe study, 2014

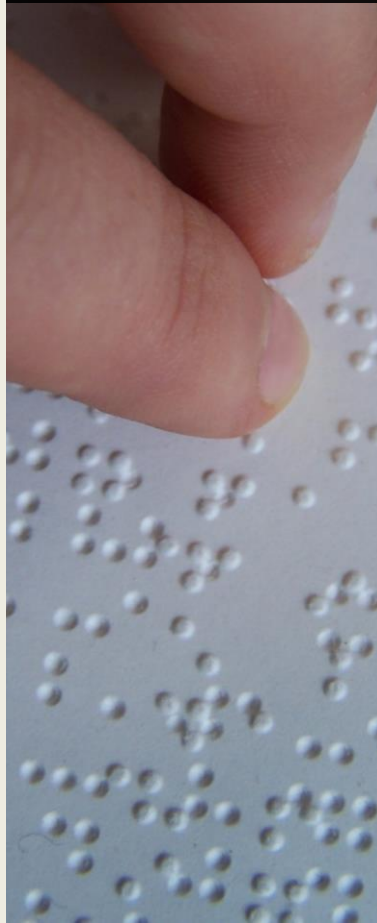
TASTE



SMELL



TOUCH



HEAR

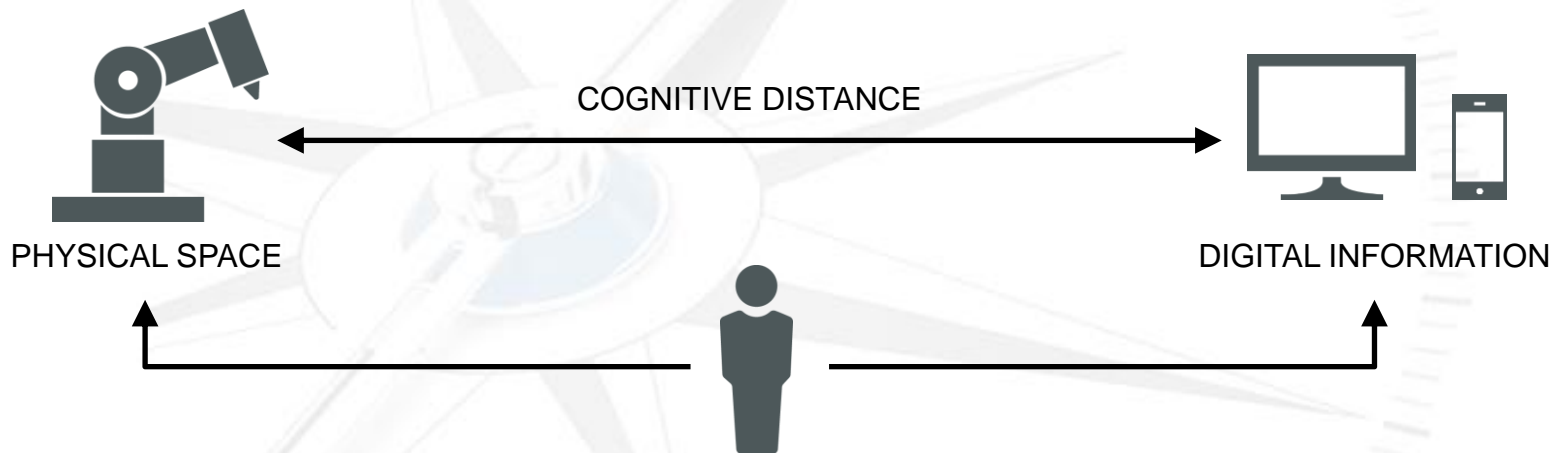


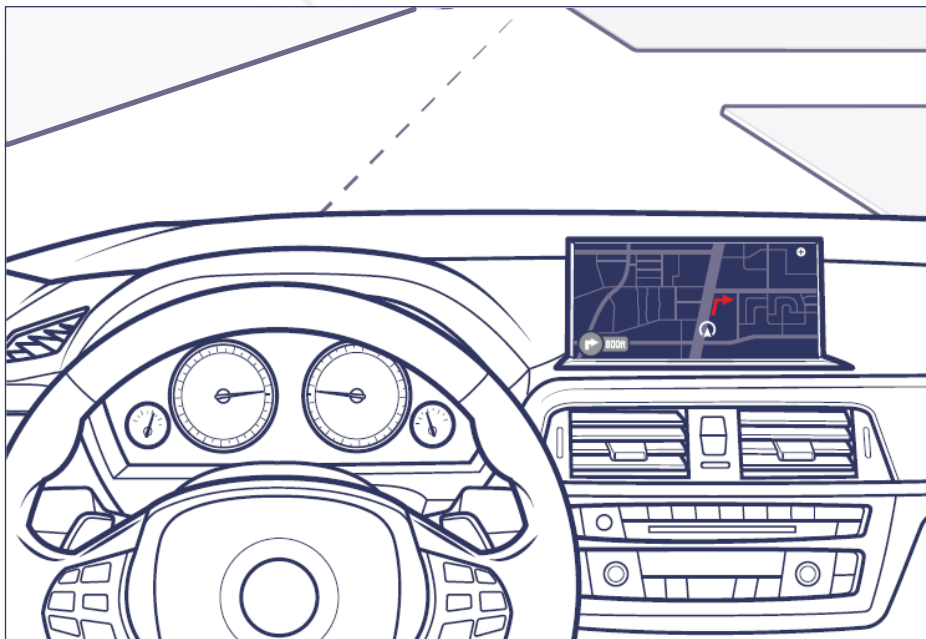
SEE



The effort required to transpose DIGITAL INFORMATION to the PHYSICAL SPACE creates cognitive load, reducing the cognitive resources available for other tasks.

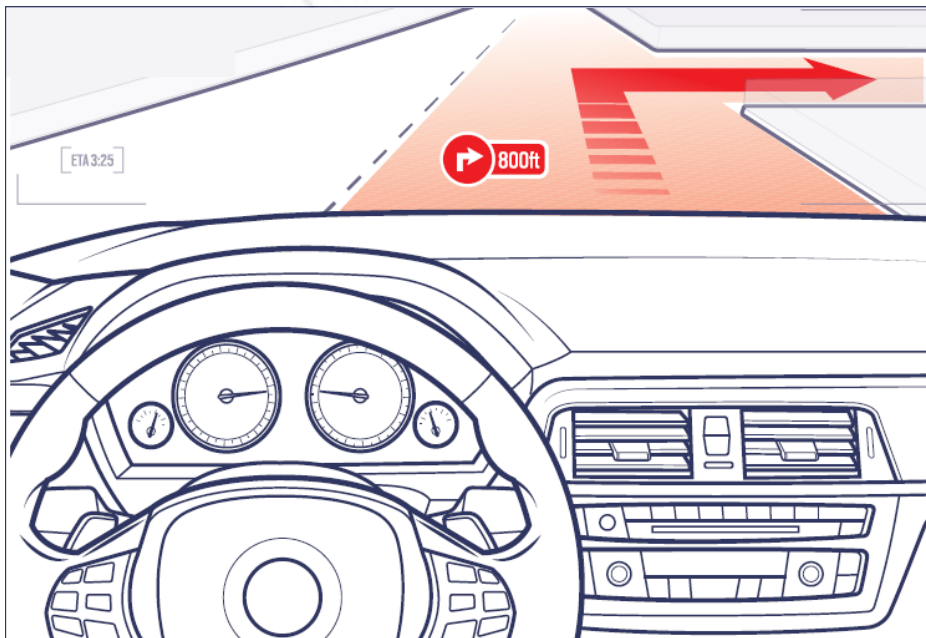
The greater the cognitive distance, the greater the cognitive load.





Separated Physical & Digital Worlds

Mentally understanding GPS images and then transposing them onto the road ahead is demanding and prone to errors.



Converged Worlds

Augmented Reality speeds humans ability to absorb and act on digital information by putting it in context of the physical world.



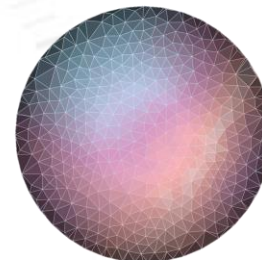
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INDUSTRY 4.0

PHYSICAL WORLD

DIGITAL WORLD



AUGMENTED REALITY

VIRTUAL REALITY

MIXED REALITY SPECTRUM

The race to develop a new digital interface is on and attracting substantial investments from tech titans and upstart investors

The winner of the smart glasses race will ultimately control a technology that transforms how people interface with the physical and digital world

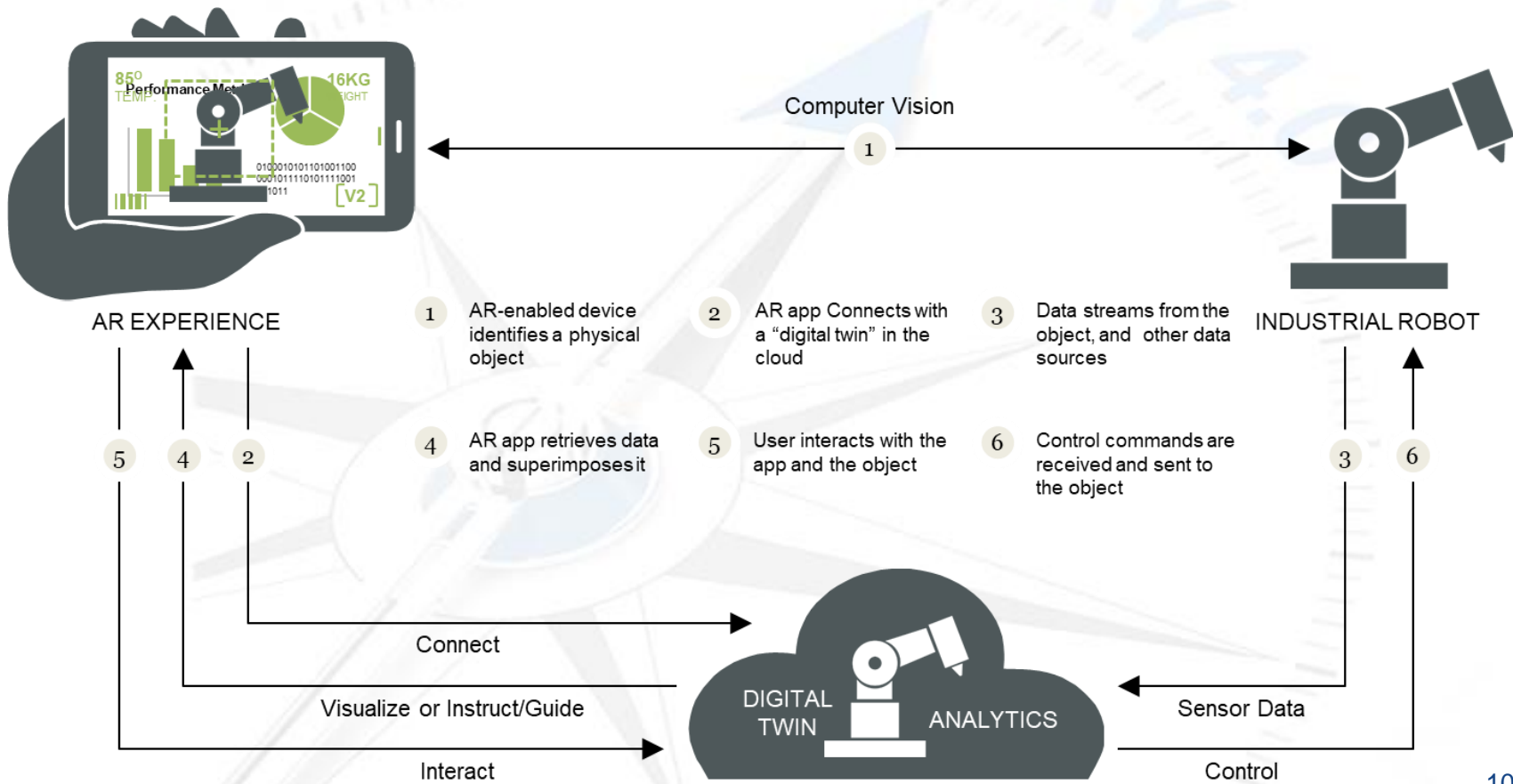
ODG R-7



**Microsoft
HoloLens**



**Google Glass
Enterprise**





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VISUALIZE

Enhance the user's **view** the physical world with the overlay of **real-world hypothetical digital information**

INSTRUCT

Train or guide users on how to perform a task through the overlay of **digital instructions or real-time expert guidance**

INTERACT

Manipulate digital graphics or extend a product through an **AR interface**

SIMULATE

VR adds a fourth capability that will allow users to **transcend distance, time, and scale**



Worker Skill Gap

31% turnover rate¹

10 million jobs unfilled²

Ongoing skills upgrading

PRODUCTIVITY



Complex Products & Workspaces

Service/maintenance challenge, configurations

Information access & content creation

EFFICIENCY & EFFECTIVENESS



Increased Customer Demands

Expectations of immediacy

Fiercely competitive & shifting marketplace

DIFFERENTIATION

Capgemini

Operational benefits of $\geq 10\%$ are realized by 76% of companies with large-scale AR in areas such as **productivity, efficiency, safety**



IDC

Manufacturing benefits:

- ✓ Increased efficiency (70%)
- ✓ Decreased training time (60%)
- ✓ Improved accuracy (42%)

Services benefits:

- ✓ Improved knowledge transfer (66%)
- ✓ Employees more efficient (60%)
- ✓ Effectiveness / first-time-fix-rates (50%)

ABERDEEN
GROUP

Companies who use AR see year-over-year business growth:
29% gross margin lift, 17% revenue lift, 14% customer retention lift



PRODUCTIVITY

Onboard more quickly,
facilitate agility, increase
instruction comprehension.



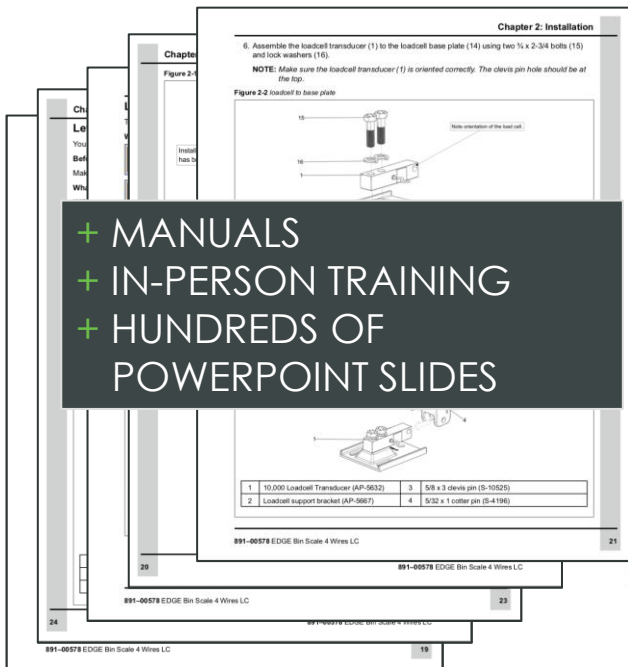
EFFICIENCY & EFFECTIVENESS

Deliver guidance to right
person, right time;
achieve zero-errors.



DIFFERENTIATION

Unlock new business
models, speed time to
market, lift retention



60%
REDUCTION
INSTALLATION TIME





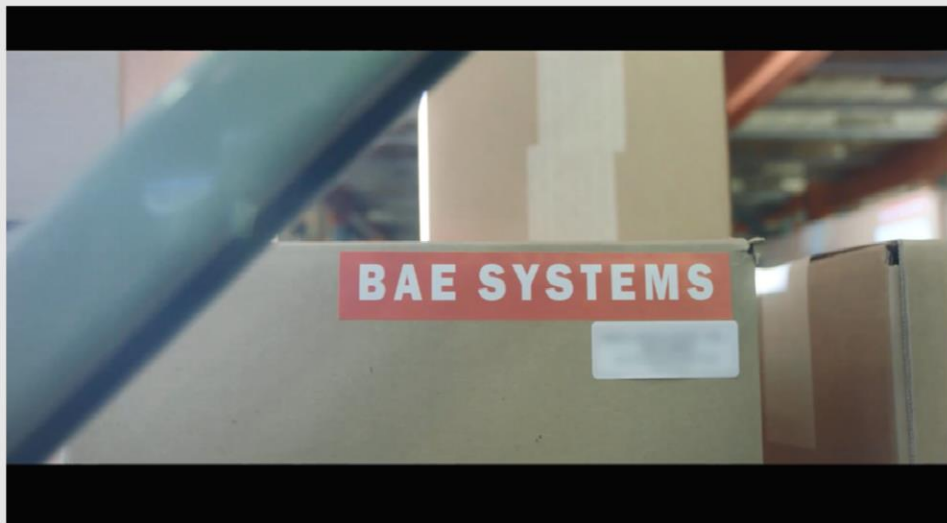
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50%

IMPROVEMENT IN **ASSEMBLY**

BAE SYSTEMS



“We created work instructions that we were able to deliver to the production floor in hours. And at a tenth of the cost.”

Fran Piascik

*Sr Project Manage,
Engineering Innovation*



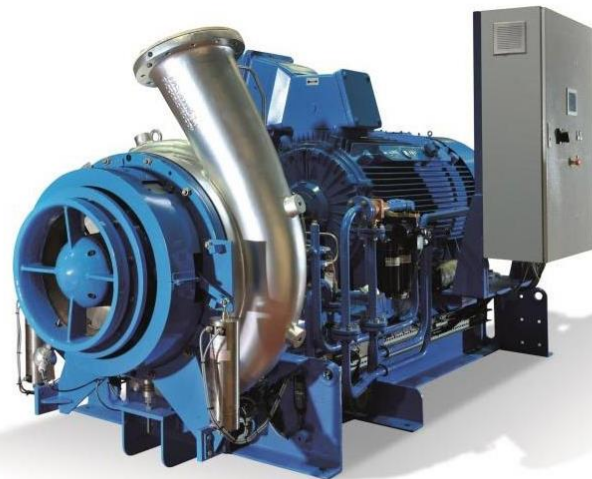
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Challenge: Howden equipment is a critical asset for plant operation - unplanned downtime is disruptive and costly.

Solution: Using Vuforia Studio Howden created immersive MR experiences for Microsoft HoloLens infused with real-time IoT and predictive analytics from Thingworx

Outcome: Customers now have real-time insights into the equipment which enables them to optimize performance and prevent failures and downtime.



Howden





Harvard Business Review

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ARTICLE COLLECTION

A Manager's Guide to Augmented Reality

Why Every Organization Needs an Augmented Reality Strategy
by Michael E. Porter and James E. Heppelmann

How Does Augmented Reality Work?
The key is a digital twin.

Augmented Reality in the Real World
Companies are investing and testing.

One Company's Experience with AR
A conversation with ABB's chief digital officer, Guido Jourret
by Gardiner Morse

The Battle of the Smart Glasses
Money is pouring into development.



HBR AR



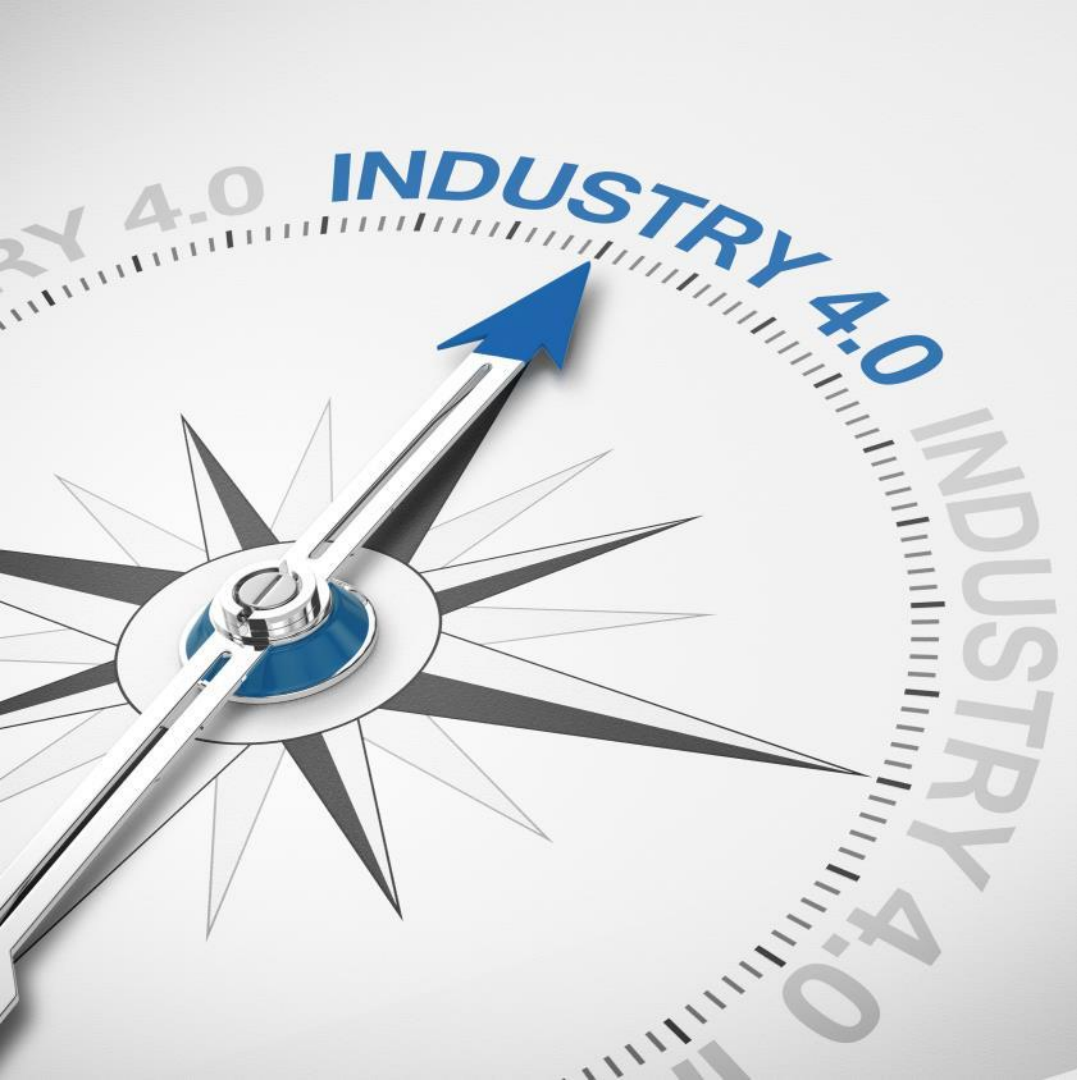
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Thanks!

Questions?

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