UP SKILL

Assisted Reality for the Connected Worker

Jay Kim
Chief Strategy Officer

Upskill's Mission: Transform "hands on" work

Founded

2010

Locations

- Washington DC, USA (HQ)
- Austin, TX

World Class Investors

NEA, Boeing HorizonX, GE Ventures, salesforce ventures

Global Customers & Recognition

Boeing, Coca-Cola, GE, Schneider Electric, Georgia-Pacific, Rio Tinto, Delta, Johnson & Johnson, Jabil, United States Postal Service, NOV, Belron, Trumpf, Applied Materials, Bureau Veritas

World Economic Forum, GLOMO Awards – The Global Mobile Awards, Gartner 2014 Cool Vendor, Inc. Best Workplaces 2017, IDC – Analyze the Future

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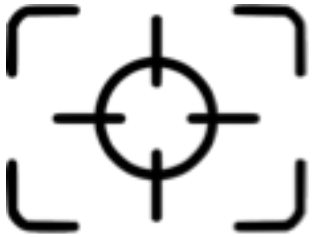
Augmented Reality (“AR”) is an operational reality

30%+ ⬆

Efficiency

Timely

QA

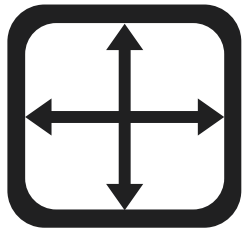


Digital

Compliance

Real-time

Safety



Remote-enabled

Utilization

AR is making a profound impact on some of the world’s leading organizations

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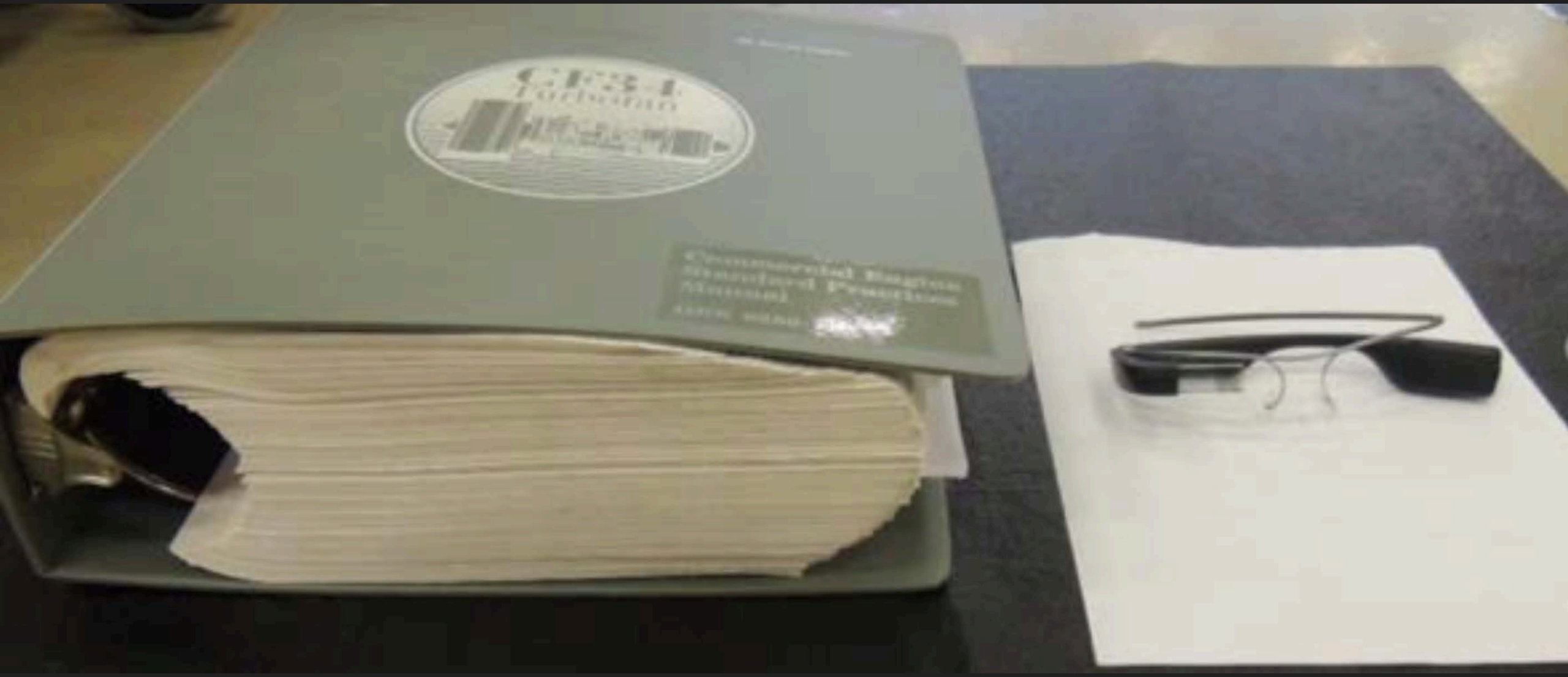
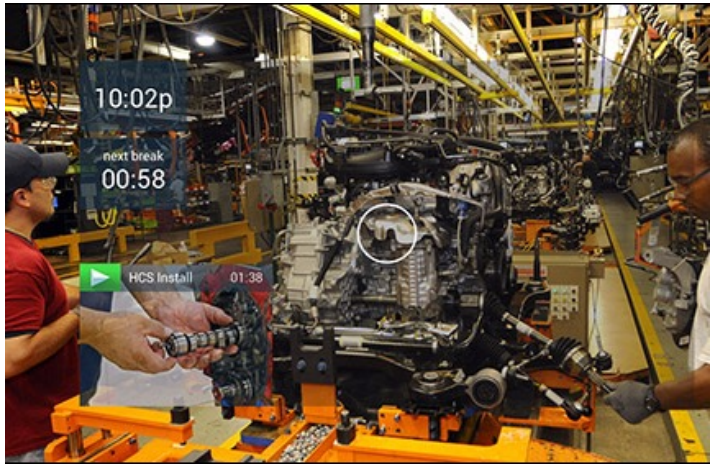


AR Platform for the Business Lifecycle



Build **Move** **Service**

skylight

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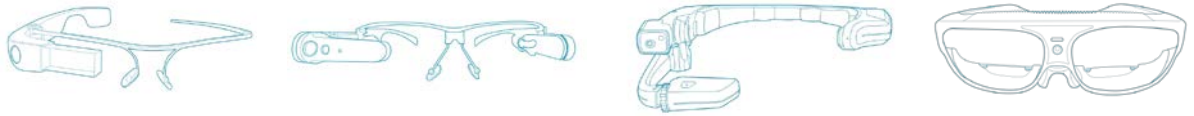
The Skylight Platform

Smart Devices



Skylight Applications

Example Applications

Assembly Instructions	Remote Assistance	Picking & Kitting	QA & Checklists	Process Documentation	…

Skylight Platform

Skylight Platform

Client	Services	Web	Live	Application Builder	Connect	SDK

Enterprise Systems

ERP	PLM	WMS	MES	FSM	...

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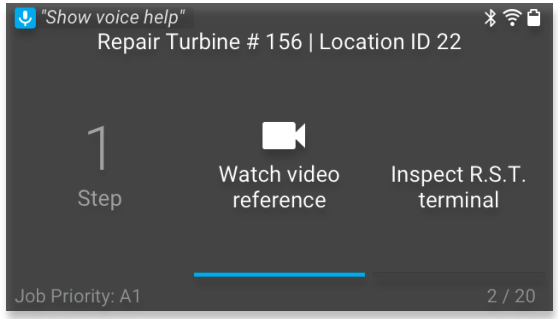
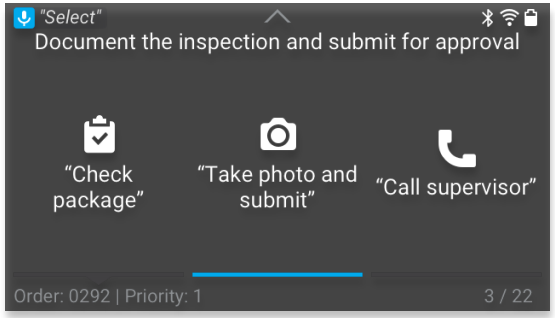
One Platform. Many Applications.

Task Guidance



Guide workers step-by-step through tasks enriched with media

Checklist

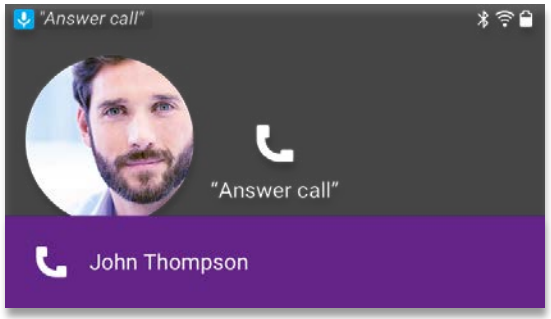


Simplify documentation, compliance, and inventory management

Knowledge Capture & Process Documentation

Capture the collective expertise of your workforce and make it available on-demand

Instant Live Help



Connect workers with offsite experts that can see and hear like they are onsite

Connected Tools/Sensors

Visualize data from connected tools and sensors & take necessary action

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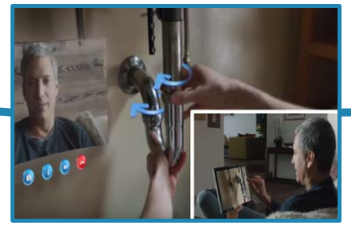
SKILL

Hands-Free AR Adoption Path with Skylight

Assisted Reality (today)

- Works on all smart glasses
- Non-immersive contextually relevant data interactions
  - Text, symbols, videos, diagrams, and pictures
- Leverages pre-existing data from enterprise back-end systems
- **Most scalable AR solution today**



Mixed Reality (near-term)

- Requires stereoscopic devices (e.g. Microsoft HoloLens)
- Immersive digital content aligned to physical world surfaces
- Limited utility without 3D data and object characterizations
- **Scalable today with caveats**

Registered & Immersive AR

- Requires fully immersive smart glasses (wide FOV)
- Dynamic, in-depth, visually enriching content overlaid on objects
- Requires accurate mapping and tracking of objects
- Requires AR-specific content
- Not scalable today

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Demonstration

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Project Juggernaut - Wire Harness Assembly

Business Need

- First-time Quality: Critical, sophisticated, and manual processes cause errors
- Productivity: Excessive cognitive load and wasted motion decrease efficiency
- Training: Difficulty capturing and distributing expert knowledge

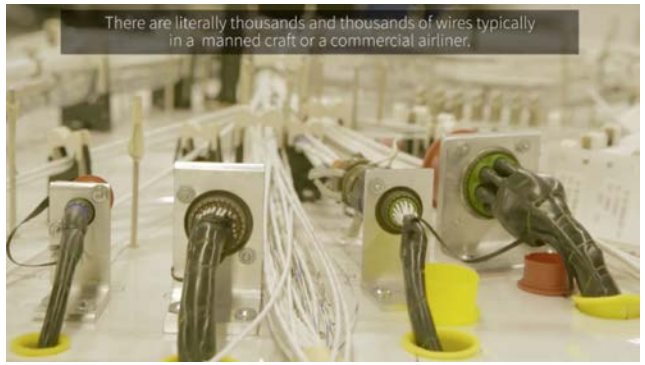
171
miles of wiring in a Boeing 747

5,612
Airplanes in backlog

42 » 57
monthly 737 production rate increase, 2017-2019

Error prone -> high rework

Suboptimal Productivity



Training challenges

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Assisted Reality Solution

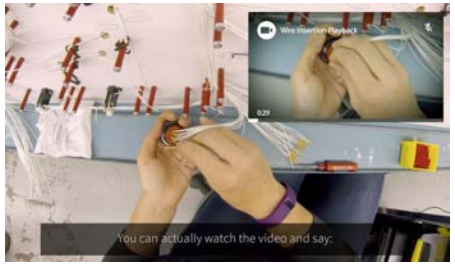
Smart Glasses

Smart glasses uniquely deliver hands-free and heads-up access to work instructions, expertise, and other actionable information to the industrial workforce

skylight

Up-to-date instructions via real-time connection to the Boeing parts/PLM database

Speech input delivers hands-free and distraction-free interactions



Video and audio connections to resolve issues on the fly and capture tribal knowledge

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Boeing Wire Harness Assembly Video Link

(Click to play – directs to YouTube)

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Adoption Growth and Business Metrics

Pilot to Production to Expansion

400
targeted technicians at Mesa, AZ pilot location

2,500 + 1,000s
Boeing employees in wire harness assembly
more employees at subcontractors

40,000+
Through enterprise-wide deployment and use case expansion

Driving key metrics in productivity

25%
reduction in production time

3% → 0%
reduction in error rates

"Wearables is what we'd call a step-function change. Rather than seconds or minutes, gives us an opportunity to cut the build time by 25%."

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Overcoming Implementation Challenges

Challenges

Increased IT overhead and security risk without device management

Concern about locking into a single device and technology

Database access and on-premise installation requires IT security audit

Solution

skylight & vmware airwatch

Worked with VMware AirWatch to extend its EMM platform to smart glasses and Skylight

Skylight platform enables zero-effort device switching and futureproofing

Skylight core server audited with the initial rollout & subsequent applications leverage existing core services

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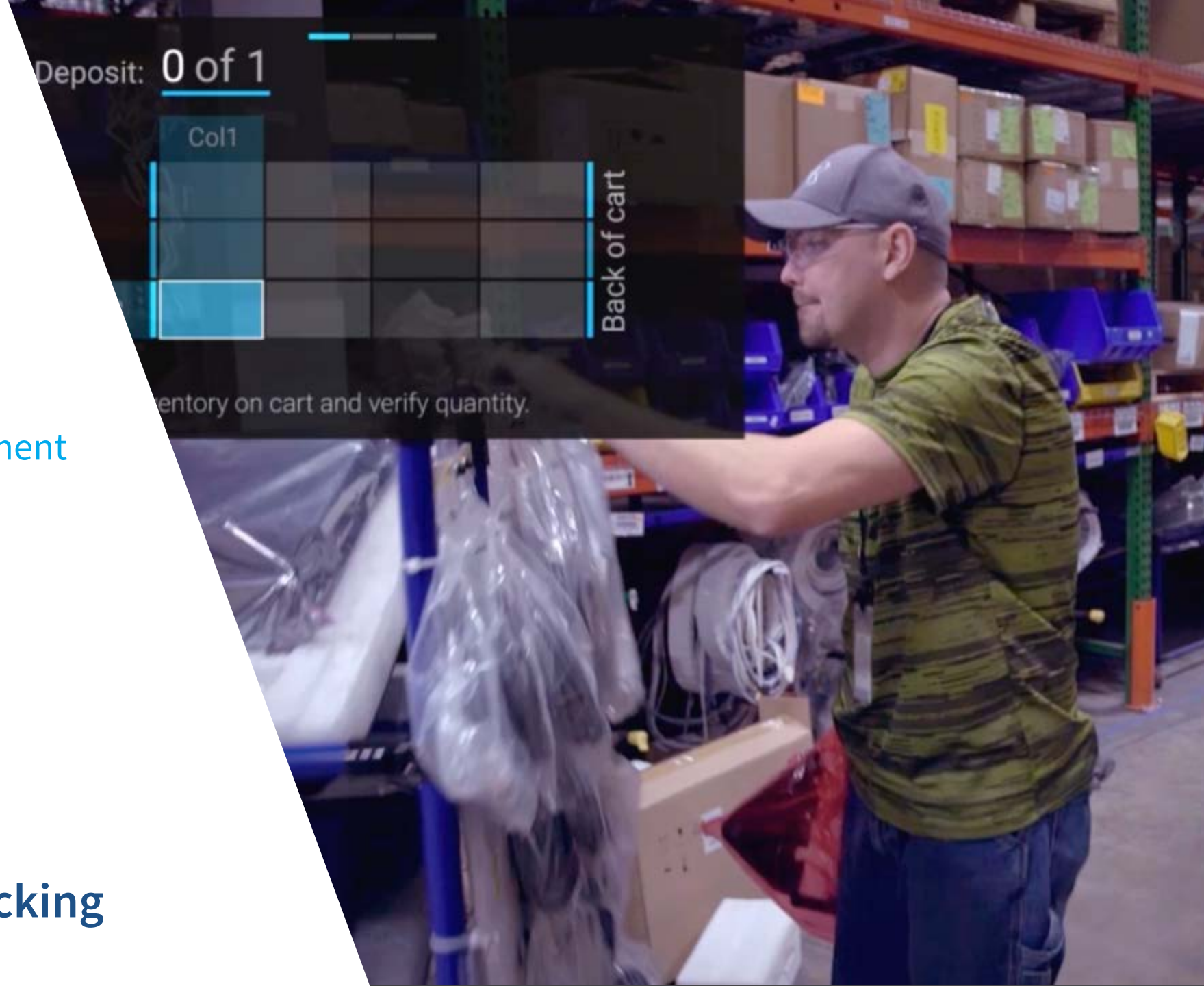
GE Healthcare

46% Productivity Improvement

Better Accuracy



Case Study: Order Picking

GE Healthcare Picking & Kitting Video Link

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GE Power & Water
Renewable Energy

34% Productivity Improvement

Better Work Utilization

Safer Working Conditions

Case Study: Assembly

GE Renewable Energy Wiring Video Link

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GE Aviation

8-12% Increase in Mechanic Efficiency

Higher Job Satisfaction

Significant Error Reduction, Saving Millions

Case Study: Maintenance & Repair

JABIL

Increase in line availability

Shorter production cycles

Faster delivery of customer orders

Case Study: Process Management

Rapid issue resolution

More effective line changeovers

Minimized Downtime &

Higher Production Throughput

Case Study: Line Maintenance

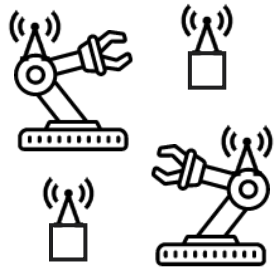
The Cost of Doing Nothing (or Waiting)

Annual Productivity Savings at 15% Improvement			
	Hourly Rate		
Headcount	12,00 €	18,00 €	24,00 €
100	691.200 €	1.036.800 €	1.382.400 €
1.000	6.912.000 €	10.368.000 €	13.824.000 €
10.000	69.120.000 €	103.680.000 €	138.240.000 €
25.000	172.800.000 €	259.200.000 €	345.600.000 €

Assumes 2,0 loaded rate and 1.920 hour work year.

Assisted Reality, IoT, and Cloud Computing

Internet of Things



Information

Assisted Reality

Action

- Productivity
- Quality
- Compliance
- Safety
- Utilization

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Order number: 0292
"Scan bin on delivery"
"Take photo and submit"
"Mark complete"
Document the inspection and submit for approval
"Check package"
"Take photo and submit"
"Call supervisor"
"View photos"
New assignment: Repair Turbine #156
Location ID 22
"Check valve seals"
"Submit for approval"
Warning! Humidity levels exceed maximum tolerance levels.
Video playback: How to inspect pump assembly
00:15
"Training video 1"
"Training video 2"
Repair Turbine # 156 | Location ID 22
Watch video reference
Inspect R.S.T. terminal
165ºF
Step 6 of 15
Torque the nut
51 - 55 (in/lb)
53