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Field Force of the Future

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Today Speakers

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Agenda

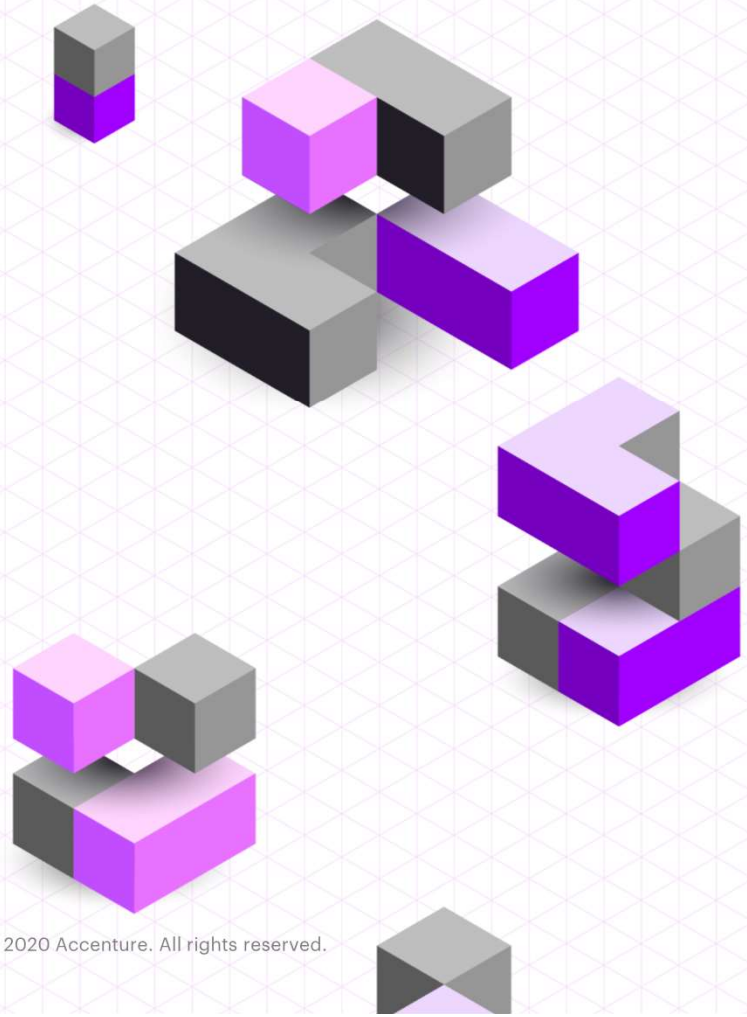
01
Context
(5 min)

02
What's next in field?
(5 min)

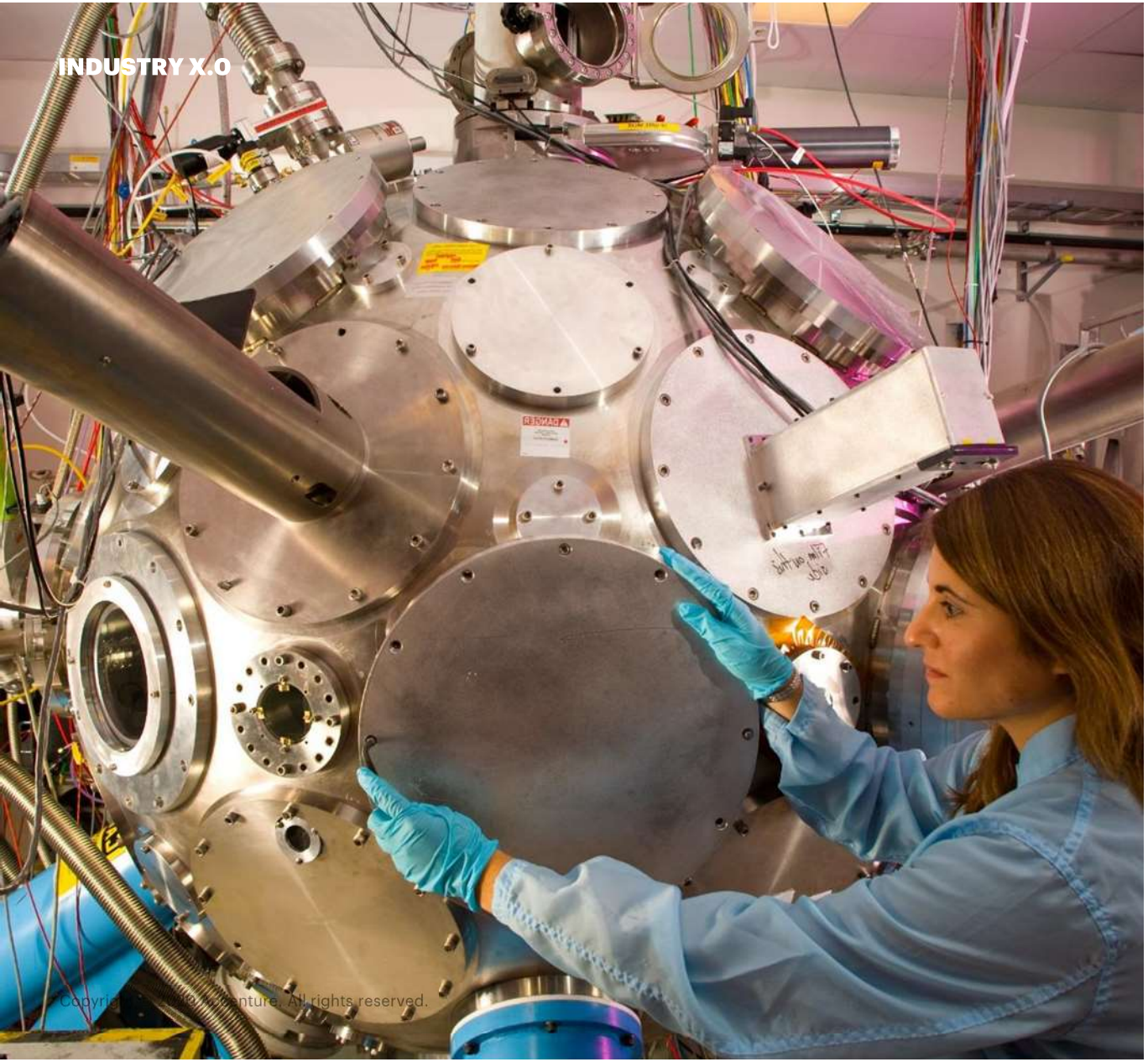
03
Client Story
(5 min)

04
Connected Construction
(15 min)

01 Context



The field workforce faces an increasingly complex setting, in which they must achieve more with less due a shrinking workforce



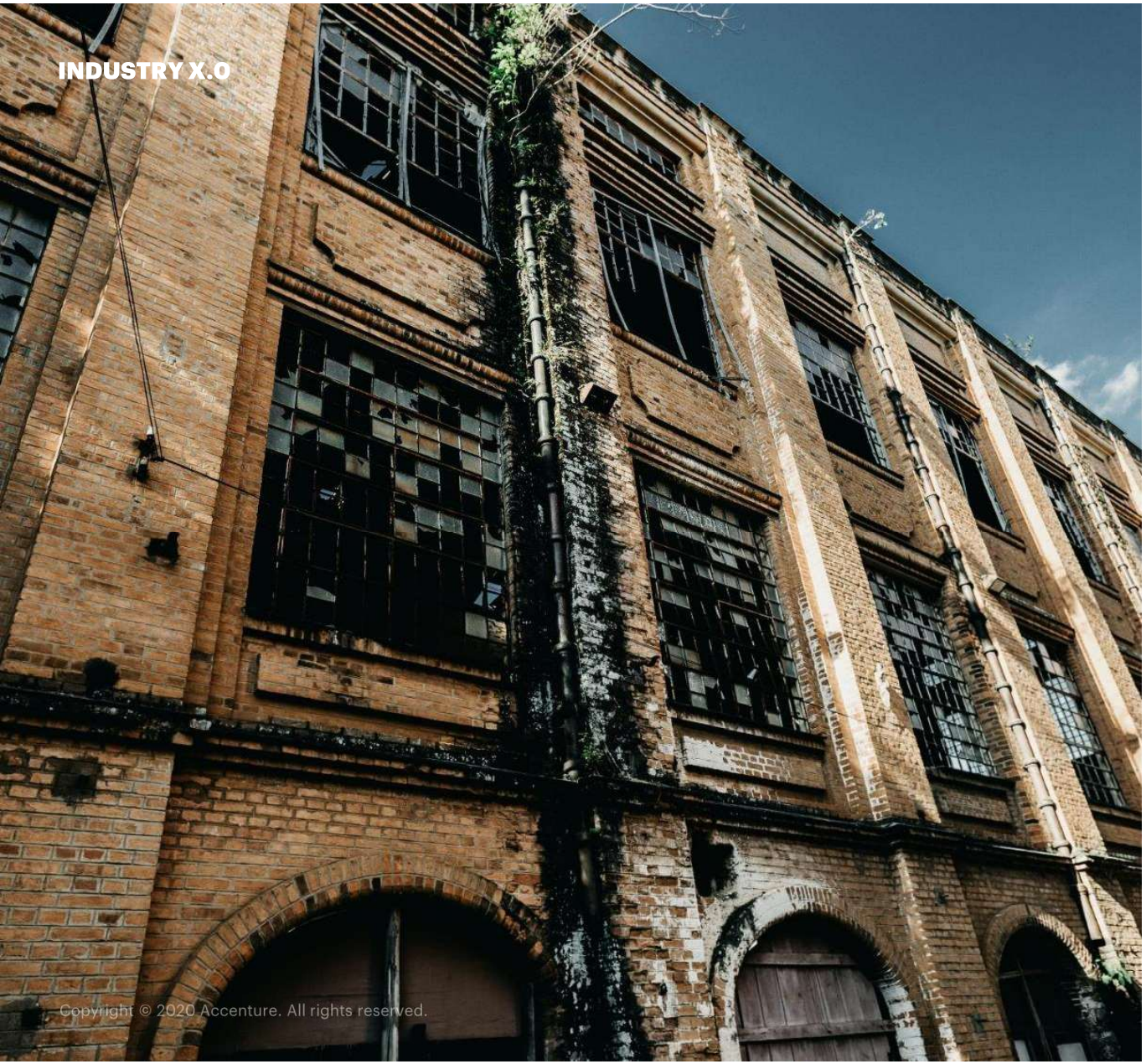
Industrial products, assets and processes are becoming ever more complex

Increasing complexity requires workers to **take on multiple roles** – often with very limited training.

More stringent health and safety requirements coupled with more taxing machinery or riskier settings further add to this complexity.

Mounting cost pressures and scarce labor supply force the industrial workforce to achieve even more with less

Increasing labor costs across geographies including Asia, are putting additional pressure on businesses to drive efficiencies or risk to be left behind the competition.



While the need for, and complexity of industrial work keeps growing, young people are abandoning this line of work

Current generations coming into the workforce are drawn heavily towards other industries, such as technology or services. This leads to an **aging industrial workforce** facing steadily growing demand.

The pressure just got intensified by a global event

COVID-19 has disrupted standard procedures and added operational risks

01 **Unplanned downtime**

Essential staff can be **sick or self-quarantined**, leaving the site at risk and missing essential competencies

02 **Productivity loss from collaboration restrictions**

Reduced site staff limits the ability for non-essential staff to support and problem solve for efficient plant operation

03 **Asset reliability**

Reduced staffing and turnaround delays put pressure on the workforce to keep plant running. This further exposes the site to the risk of safety and security incidents

04 **Fatigue**

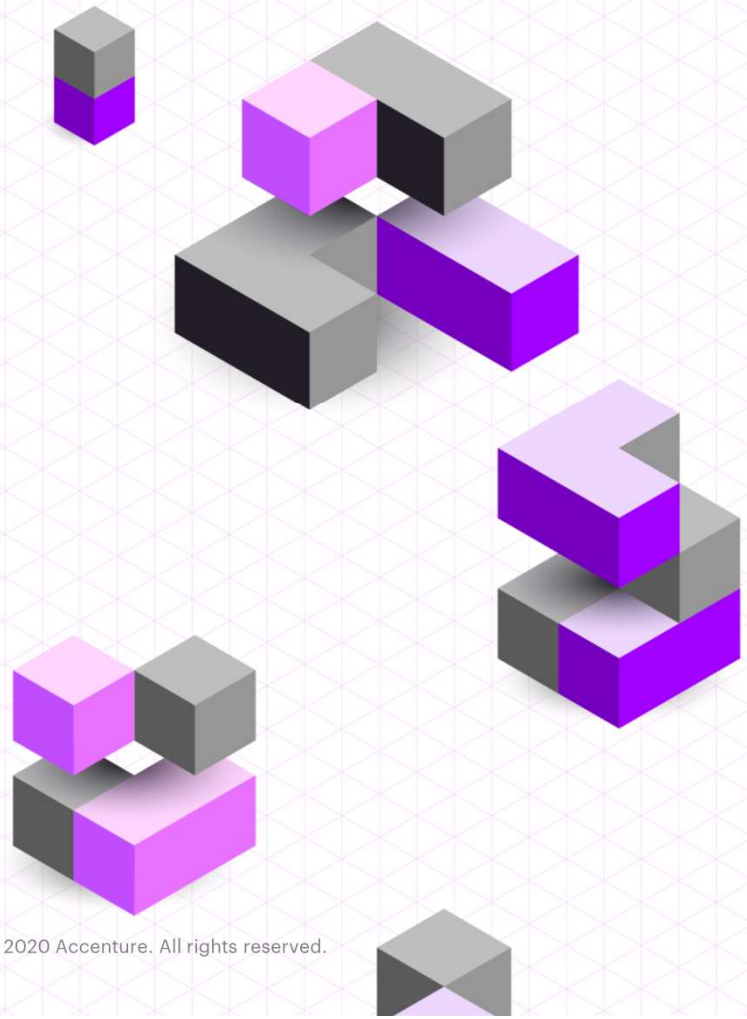
Reduced site staffing, may add to **worker fatigue** due to increased stress levels with new and additional worker routine responsibilities

05 **Ways of working changes**

Leaders will have to change the way they do business and workers will need to **adjust work practices and schedules** to follow hygiene, remote working and/or physical distancing requirements

06 **Travel restrictions**

Critical skilled resources may not be available due to **imposed travel restrictions** in different countries



Enabling the industrial workforce for better decisions through

- connectivity
- collaboration
- visibility
- analytics

will equip them well for these challenges

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Targeting field safety & efficiency

CLIENT SYSTEMS INTEGRATION

STATIC PROCEDURES

- Static Procedures
- Paper Based
- CAD Models
- Media Repository

CONNECTED PRODUCTS DATA

- Transactional
- Sensors
- Asset

PLATFORM

- QR / Barcode / OCR
- AR and Image Recognition
- Signature and Feedback
- Convert Content
- Track
- Analyze
- Create
- Support

SMART DEVICES

- Handhelds
- Laptops
- Watches & Wearables
- (AR/MR) Glasses

Cost of field devices is decreasing

Cost of cloud-computing is decreasing, while maturity and on-site availability of solutions is increasing.

TARGET

- Reduce people on site
- Increase automation
- Access to a remote highly specialized team
- Real-time quality checks and acceptance
- Streamline and enforce way of working

However, there are five critical obstacles that hamper the adoption of the digital industrial workforce

Employees & Unions

Obstacles

Big Brother

Description

Industrial **workers lack trust** and often believe technology will be used against them.

Connectivity Approach

Obstacles

Technology Choice Paralysis

Description

Many companies **delay progress based on the multiple technology options** and pace of change.

Middle Management Buy-in

Obstacles

Middle Management Buy-in

Description

Worker management often are the **most reluctant to support** this change.

Safety

Obstacles

Devices Distractions

Description

Leadership concerned around **risks due to distraction** while using devices (e.g. phones and tablets).

Data Integration

Obstacles

Integrated Source of Truth

Description

Many companies have **dirty data and multiple sources of "truth".**

But there are some strategies to put in place to navigate these roadblocks

Employees & Unions

Connectivity Approach

Middle Management Buy-in

Safety

Data Integration

Obstacles

Employees & Unions	Connectivity Approach	Middle Management Buy-in	Safety	Data Integration
Big Brother	Technology Selection	Middle Management Buy-in	Devices Distractions	Integrated Source of Truth

Description / Mitigations

Employees & Unions	Connectivity Approach	Middle Management Buy-in	Safety	Data Integration
Industrial **workers lack trust** and often believe technology will be used against them.	Many companies **delay progress based on the multiple technology options** and pace of change.	Worker management often are the **most reluctant to support** this change.	Leadership concerned around **risks due to distraction** while using devices (e.g. phones and tablets).	Many companies have **dirty data and multiple sources of "truth".**
Transparent communication with Unions and Workers is critical to support adoption. Leadership generates trust **using technology agnostically for improvements** (e.g. enhanced worker safety and process support), and **never for individual penal actions**	Companies that **focus on use case value proposition** and then select current best fit are accelerating results.	**Executive passion and support** are critical to the accelerated success of digital workforce solutions. They must stay involved, celebrate small wins and continue to support and push change	Companies must **reset policies and safety mindset continuously** like any other technology on site. A safety mindset throughout there life is important.	Take an **agile approach to get solutions** moving with current data and fix as needed along the way. Real time visibility of integrated data will out weigh issues with data quality.

02

What's next in field?

Endless possibilities

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What's the field force of the future?

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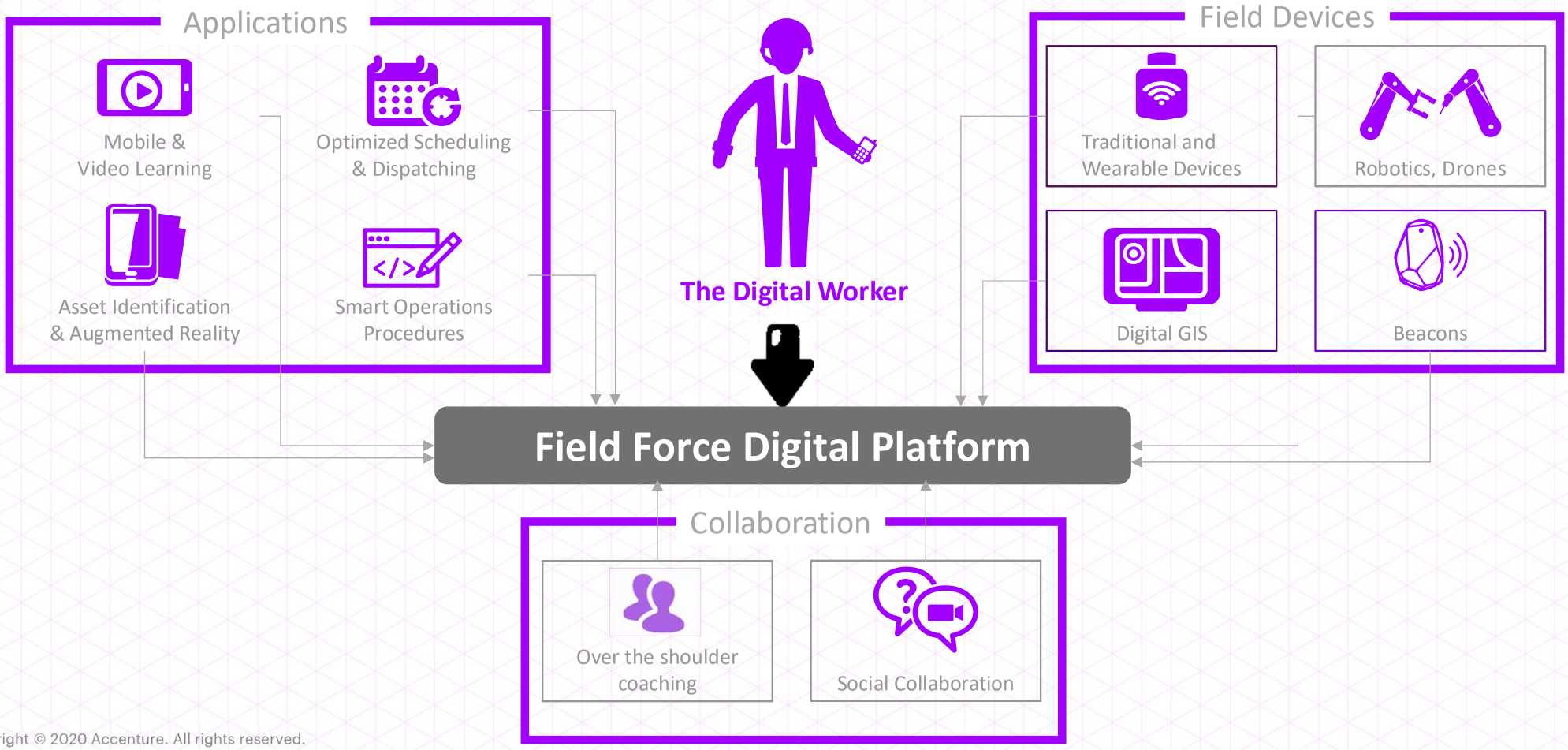
Connected field force: a digital ecosystem



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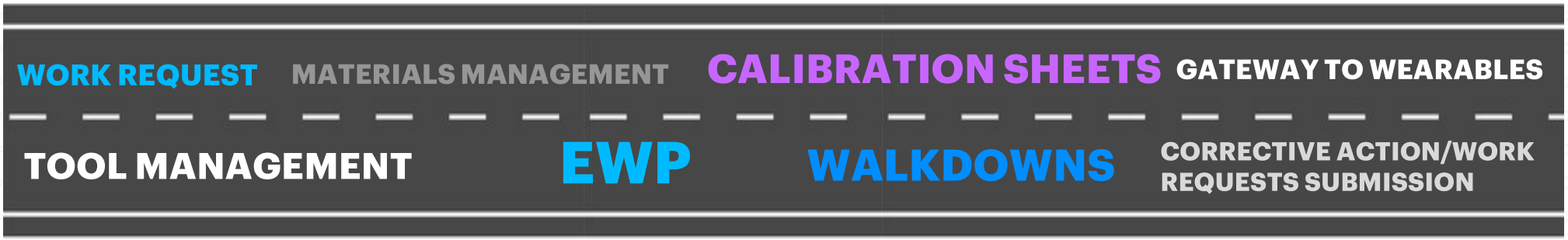
Mobile platform and applications

As Clients invest in their mobility platform and digital footprint, end-users can access all data needs in their hand.



A Platform of Possibilities

Mobile Platform

Deployed tablets leveraging mobile application provide the platform for all other digital advancements such as sensors and wearables

Wearable Connectivity

As wearable apps are developed, investment in mobile applications are extended into wearable simply utilizing Bluetooth technology.

Notifications

Keep workers informed of changing plant conditions.

Human Error Avoidance

With data lookup, entry, and capture readily available, the worker is powered by real-time or near real-time data to assist them in their work execution.

Issue Reporting

Immediately report issues found during site inspection, walkdown or even in route to a job location.

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Smart field procedures

Activities performed in field are guided by procedures, instructions and checklists, generally known as Paper-Based Procedures (PBPs). The use of technology have evolved paper processes to new ways of working (Smart Procedures).

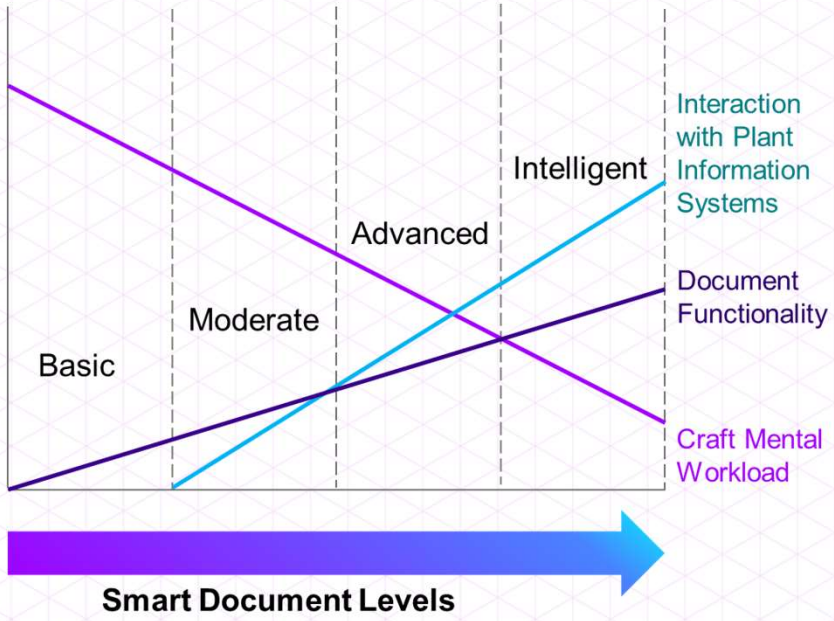
How smart you need the document?

BASIC:
Active field to enter data
Example: Check boxes that users can select

MODERATE:
Document self-populates information
Example: Work order number and description populates when scanned

ADVANCED:
Document can transmit data to other data systems
Example: PM As Found conditions sent to EAM system

INTELLIGENT:
Data mapping that updates fields based on previously entered conditions
Example: Branching of steps based on previous responses, auto-calculate tolerance ranges based on previously entered data



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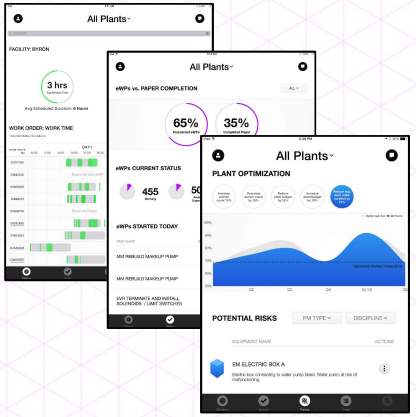
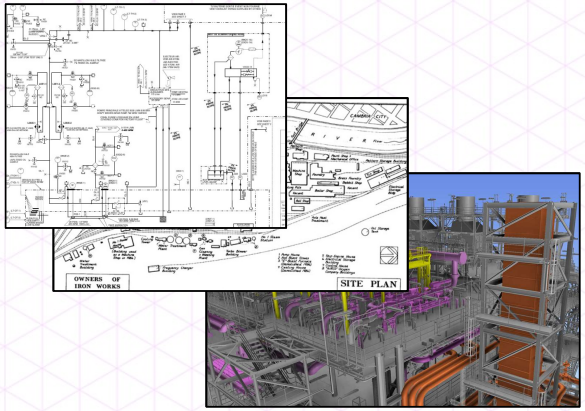
Electronic Work Packages (EWP)

As usage data continues to grow with the execution of electronic work packages, gaining high level of efficiency.

Dashboards and Reporting

Utilizing the collected data during the package generation and execution, providing customers an immediate view of where work progression is within the lifecycle of the package.



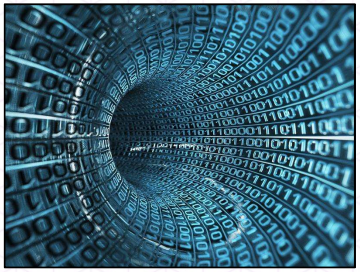


Electronic Library

Provides field professionals instant access to an updated Mobile Document Library (MDL) containing the latest version of all documents that are relevant as they perform their tasks.

Analytics

The large amounts of data are captured can be utilized to target areas for performance improvements, work efficiencies and even human error prevention through analysis.



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Wearables and IoT

Workers could receive updates from critical equipment, alerted of tags located at their job site, alerted of condition elements which could impact their health and safety, notified of the next task in a procedure...the possibilities are endless.

EXAMPLE:

Capture Worker Location
Equip field workers with UWB positioning devices to be able to accurately identify their location

Track Equipment/Machinery
Equip machinery with moving parts with IOT sensors to track their location and positioning

Integrate with Plant Systems
Connect with plant data systems such as radiation maps, temperature maps, etc.

Display
Display user location, equipment positioning, and plant data in user friendly interface to easily identify field workers in high risk situations

Alert Users
Notify field workers and safety personnel when users are at high risk

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Virtual plant imaging

Virtual Plant Imaging can be accomplished through full 3D modeling of a plant or simplified through 360 degree image capturing. Each integration has value added benefits for creating a digital field worker environment.

POTENTIAL USES

FIELD NETWORK SUPPORT

Allow remote users to provide support on equipment through the 360 digital image.

ASSET TRACKING

Provide departments visual tracking of assets across multiple sites.

INSPECTION AND TROUBLESHOOTING

Inspect As-Built equipment through Peer Review or Concurrent Review and provide troubleshooting as needed.

POTENTIAL BENEFITS

Reduce Cost	Reduce planning and preparation time to review sites
	Avoid back and forth on-site
	Minimize time in travel (resources time, virtual meetings…)
	Minimize travel cost (transportation, hotel, carbon emission…)
	Facilitate Safety training & certification
	Avoid rework. Do it right the first time.
Improve Collaboration	Improve clarity / accuracy of discussion
	Reduce time in meeting or focus on understanding complex problems
	Bring what you need, do not forget tools
	Optimize skillset use (Jr travel & capture, Sr focus on analysis)
	Log and find quickly digitized and relevant documents
Improve Safety & Micro-Learning	Less exposure to hazardous, confined spaces
	Less time on the road
	Facilitate micro-learning and safety tips (show & tell)
	Facilitate disaster recovery

Extended Reality

Extended Reality (XR) covers a broad range of technologies for enabling, re-skilling and new skilling the field workforce. XR's ability to bridge physical distance is changing how users connect with people, information and experiences.

Types of Extended Reality

Assisted Reality
Supplementing the real world with easily accessible data

Augmented Reality
Real & digital worlds integrated

Virtual Reality
Computer simulated version of reality, an immersive experience

Real Physical World ← → *Virtual World*

POTENTIAL USES

Remote Video
Connect workers with remote experts that can see and hear via live video calling

Electronic Procedures
On-demand procedures, visual overlay guides, and 3D models

Inspection
Simplify documentation, compliance, and inventory management

Knowledge Capture & Documentation
Capture collective expertise and make it available on demand

Connected Tools & Sensors
Guidance and real-time visualization of data from connected tools and sensors

POTENTIAL BENEFITS

Time Savings
- Reduce travel back and forth on site
- Less individuals needed in field for verification

Safety and Human Performance
- Hands free calling/video
- Collaborate effectively with 'you see what I see' video calling and ability for remote user to send photos/draw on screen
- More eyes on work in the field

Training
- Just in time training (JITT) via headset
- Media content capture for training

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Digital Twin Plant

Using sensor data, operating inputs, historical data and subject matter expertise from machinery components, assets, and systems, a digital twin can be created to run analytics that serve as performance indicators and give the ability to run predictive simulations.

POTENTIAL USES

PERFORMANCE SIMULATION

Utilizing real time performance data and usage data, simulations and analysis can be run for predicting possible failures and indicating maintenance required

PERSONNEL TRAINING

With archived data, simulations can be created mirroring machinery and other plant components for the purpose of training and continued education

INTEGRATED MAINTENANCE SCHEDULING

Data inputs directly to an EAM to schedule preventative and corrective maintenance as necessary based on component performance conditions such as degradation and run time

POTENTIAL BENEFITS

Increased Availability

Reduced Risk

Lower Maintenance Costs

Improved Productivity

Faster Time to Value

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03 Client story

Optmizing site productivity through digital innovations

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Optmizing site productivity through digital innovations

Onsite employees often traveled around the workplace to obtain information such as checklists, operating procedure guidelines and essential communications. BP solutions are **Mobile-enabled field worker** and **Using wearables to improve inspection process**.

CHALLENGE

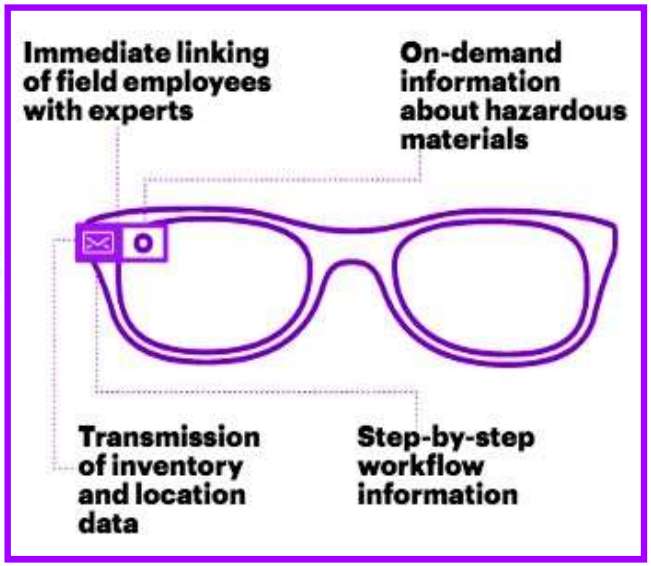
Inadequate audit trails

Too much "pen and paper" activity

A lack of vital information not immediately available during critical situations

The company wanted a **SOLUTION** that could deliver key connected technology benefits.

SOLUTION



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04
Connected Construction

Digital Construction Management

WHAT IF YOU COULD . . .

Know Exactly Where all Assets are, if they are Healthy, if they are Being Utilized and by Whom?

Locate all Materials on Site Instantly and Know if they are Located Correctly and Stored Appropriately?

Perfectly Co-ordinate all Materials, Workers, Equipment and Consumables for Every Task?

Precisely Co-ordinate Critical Personnel who Control Approvals to Proceed with Work?

Automatically Inform Workers they have Entered (or are about to Enter) a Restricted Area?

CONNECTED CONSTRUCTION

WHAT IS A POSSIBLE SOLUTION?

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CONNECTED CONSTRUCTION

POTENTIAL BENEFITS

Enhanced HSE Monitoring

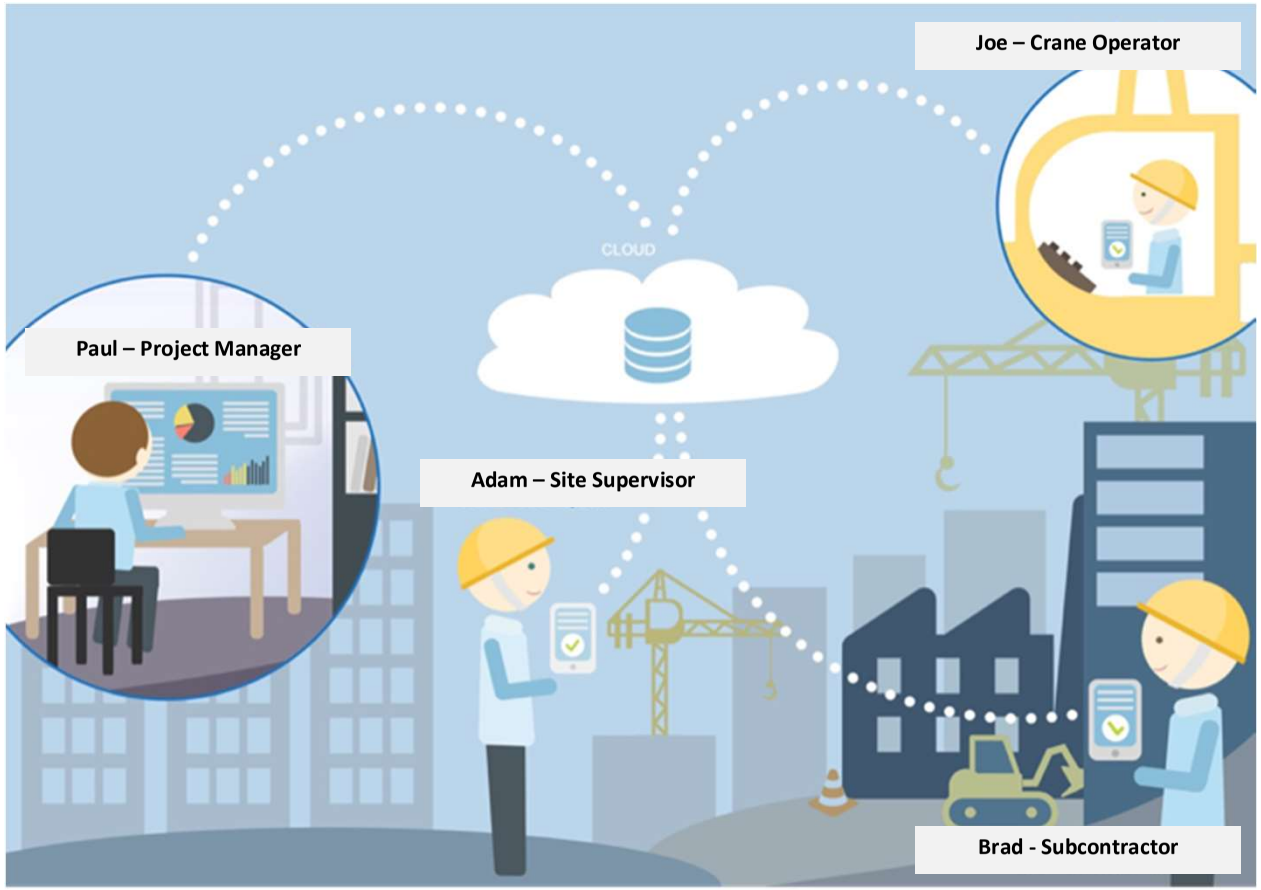
On Site Asset Utilization

On-Time Project Delivery

Reduced Project Cost

Reduced Engineering Support

Lower Procurement In Field



USE CASES: 70+ Use Cases to Select From

WE SELECTED THREE HIGH VALUE USE CASES TO DEMONSTRATE:

1. "REAL-TIME PRODUCTIVITY CHECK"

CONNECTED CONSTRUCTION

USE CASE 1

USE CASE 1:

“REAL-TIME MANHOURS BY AREA IS COMPARED WITH PLANNED TO MONITOR PRODUCTIVITY”

CONNECTED CONSTRUCTION

REAL-TIME PRODUCTIVITY CHECK

USE CASE 1

USE CASES:

2. "CRITICAL PERSONNEL MANAGEMENT"

CONNECTED CONSTRUCTION

USE CASE 2

USE CASE 2:

“CRITICAL PERSONNEL ARE TRACKED TO ENSURE CORRECT LOCATION (e.g. WORK PERMIT) & TIMELY ALERTED IN CASE OF EVENTS”

CONNECTED CONSTRUCTION

CRITICAL PERSONNEL MANAGEMENT

USE CASE 2

USE CASES:

3. "EQUIPMENT HEALTH & TRACKING"

CONNECTED CONSTRUCTION

USE CASE 3

USE CASE 3:

“THE LOCATION AND THE STATUS OF THE EQUIPMENT IS TRACKED TO PROMOTE SEAMLESS, CONTINUOUS UTILIZATION”

CONNECTED CONSTRUCTION

EQUIPMENT HEALTH & TRACKING

USE CASE 3

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THANK YOU!