
PerspECCtive

Theme:
Be Ready!

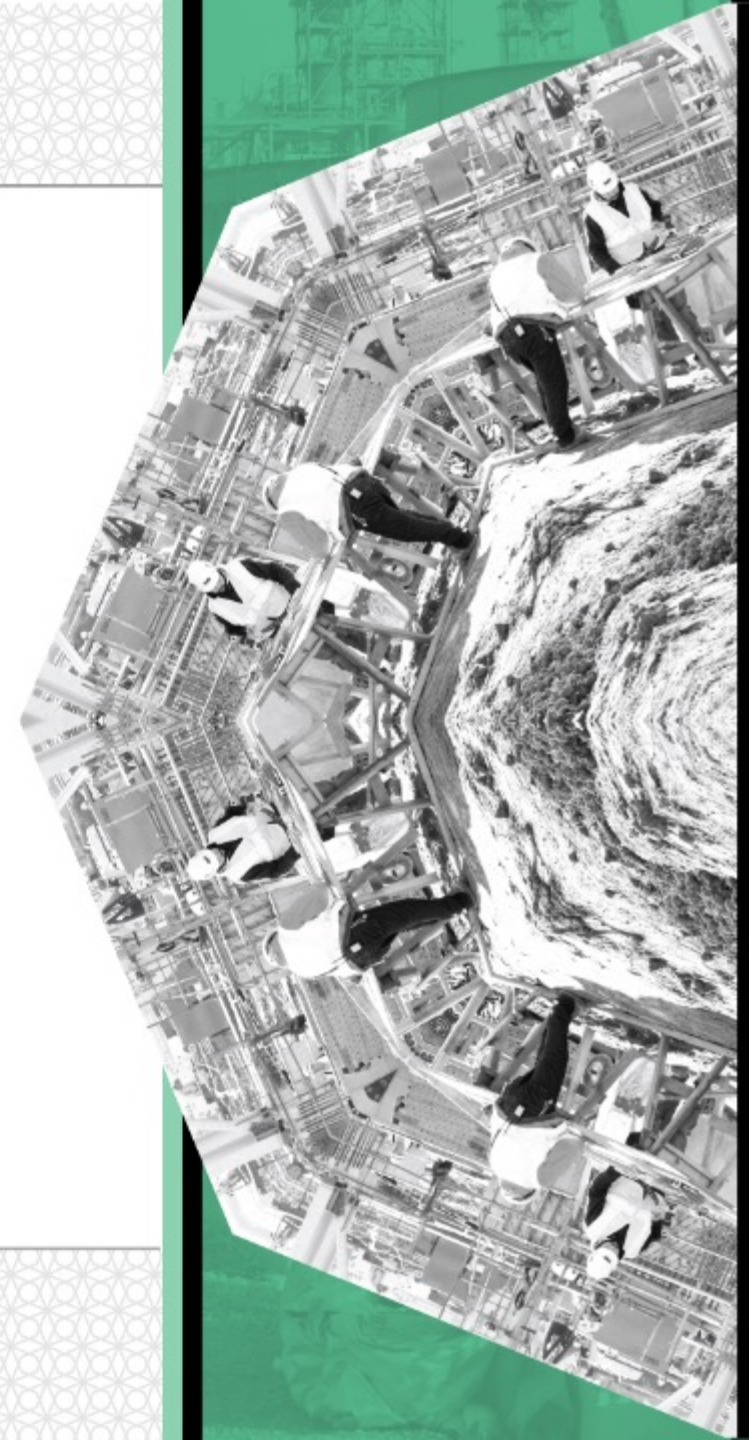
Better Together: Using Data to Get Field Connectivity Right

Modern cloud platforms create an unprecedented opportunity for information availability in the field. The challenge can become how to best structure your approach to using these platforms that ensures the right information is available to support the field worker without overwhelming and isolating them in an information storm

Year:
2023

Date:
**August 30 –
September 1, 2023**

Location:
JW Marriott • Marco Island Florida



Moderator



Cody Austin

Named Account Sales
Executive

Autodesk, Inc.

Speakers



Jeremy Ashford

Vice President
Business Services

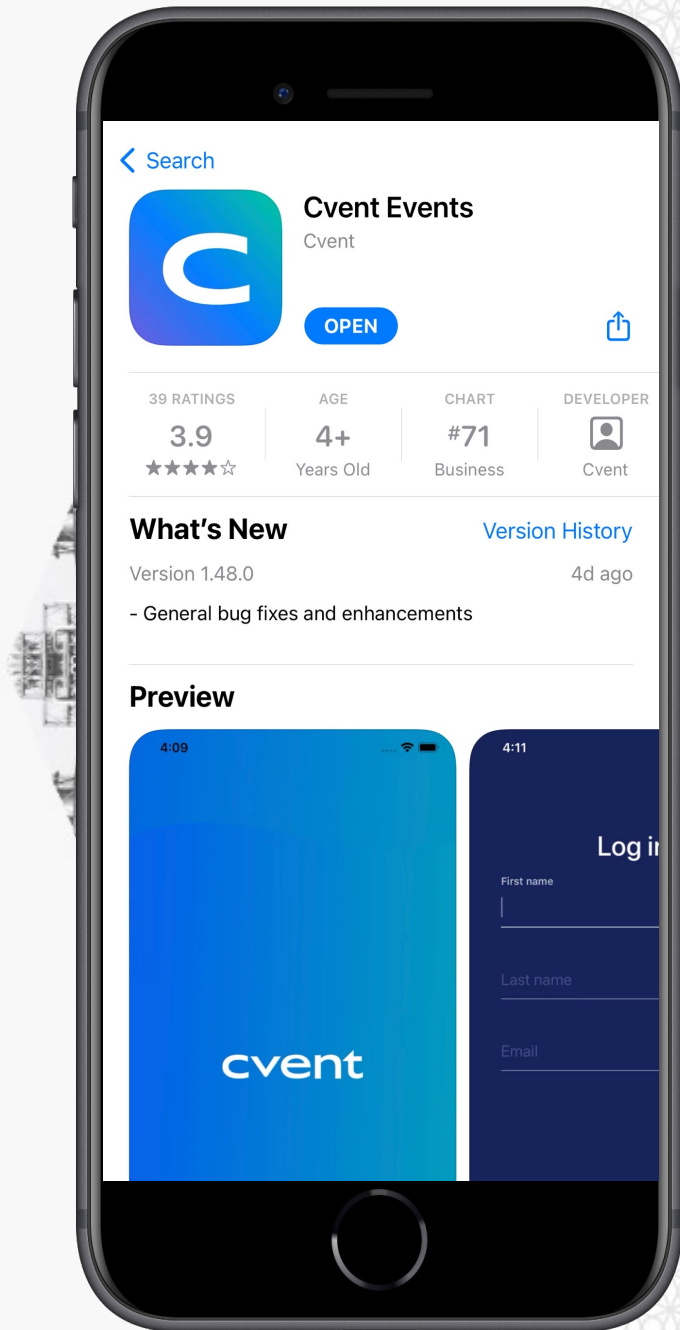
**Primoris Services
Corporation**



Kim Arrant

Vice President, Business
Transformation

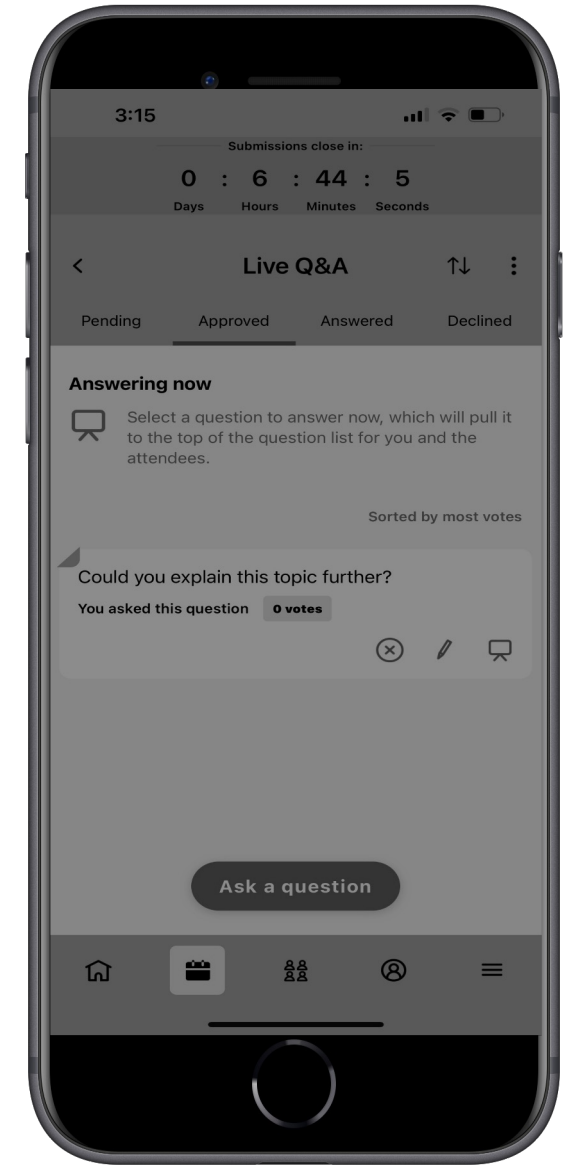
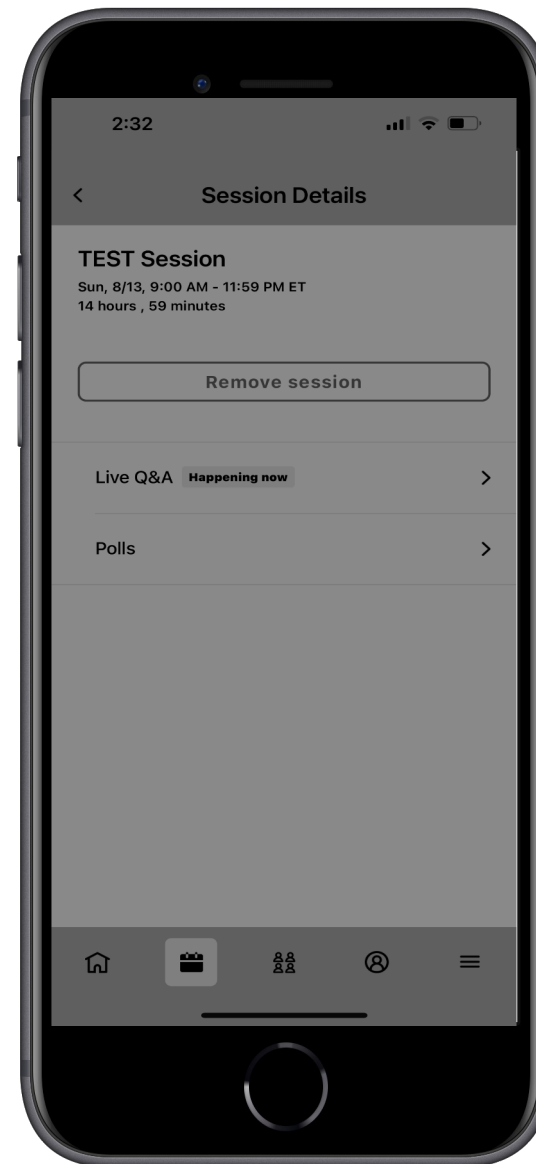
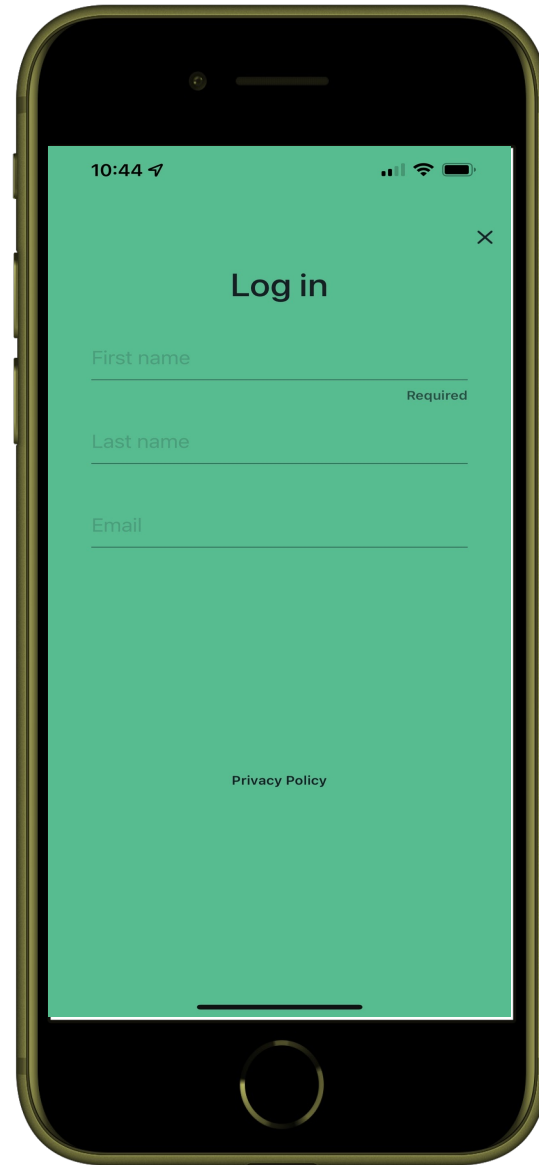
APTIM



Conference App Live Demo

Log In

On the Conference WiFi network, open the (CVENT) app.



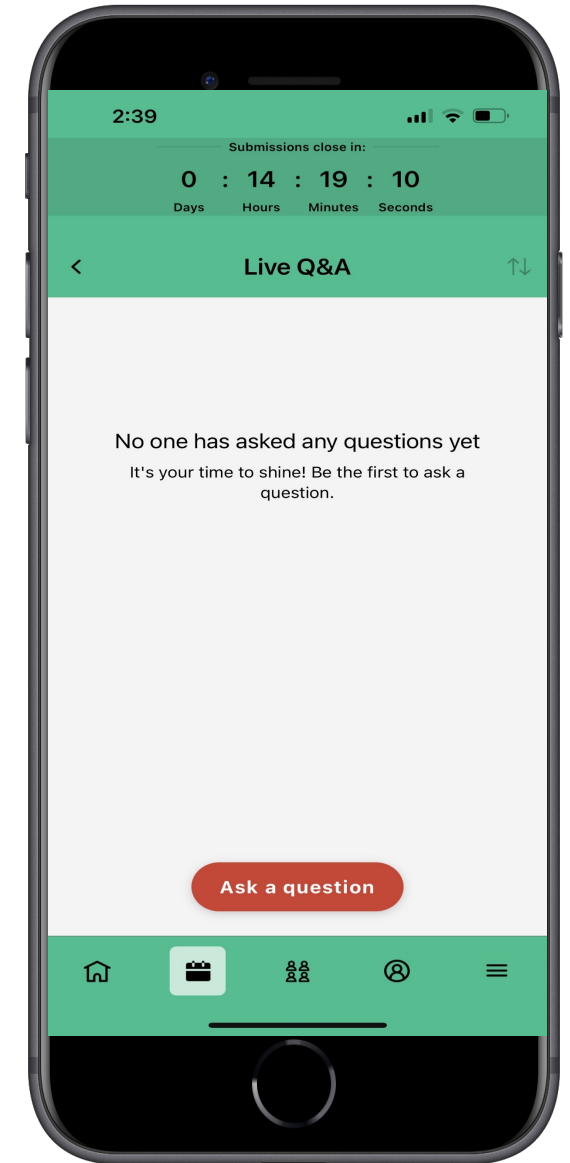
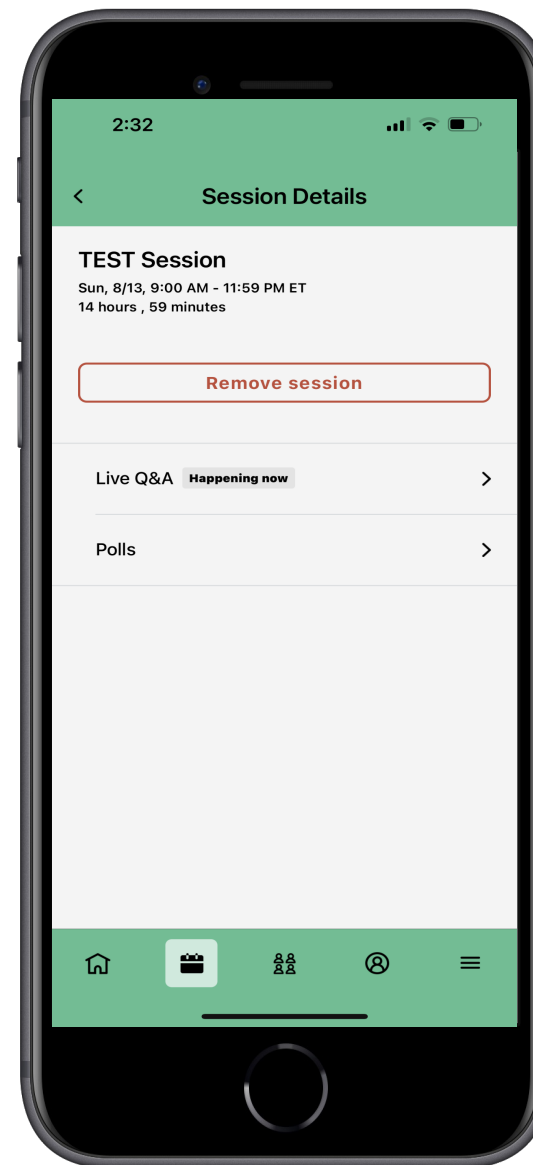
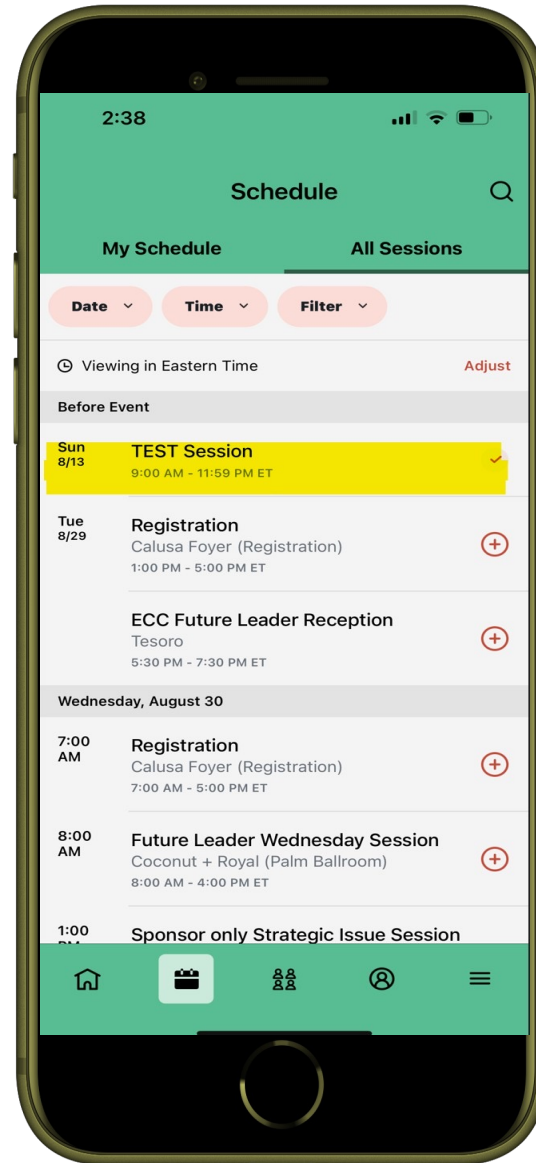
Live Q&A

Once the Conference App (CVENT) is opened:

1 Navigate. Go to the session you are attending.

2 Click for Q&A. “Live Q&A” options for sessions that include them.

3 Type. Type your question in the text box and click “submit”



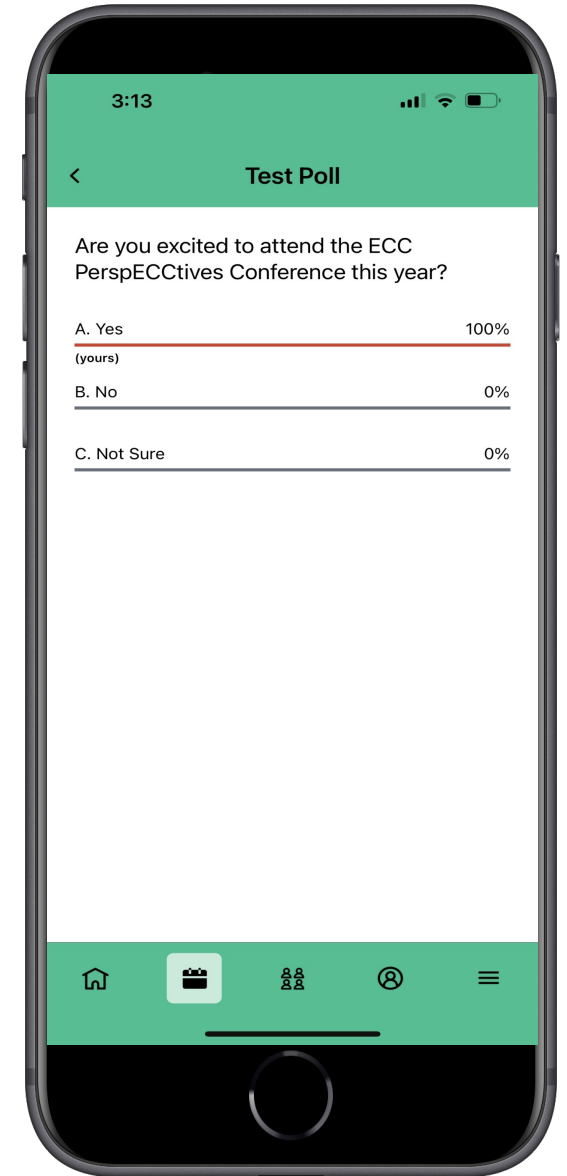
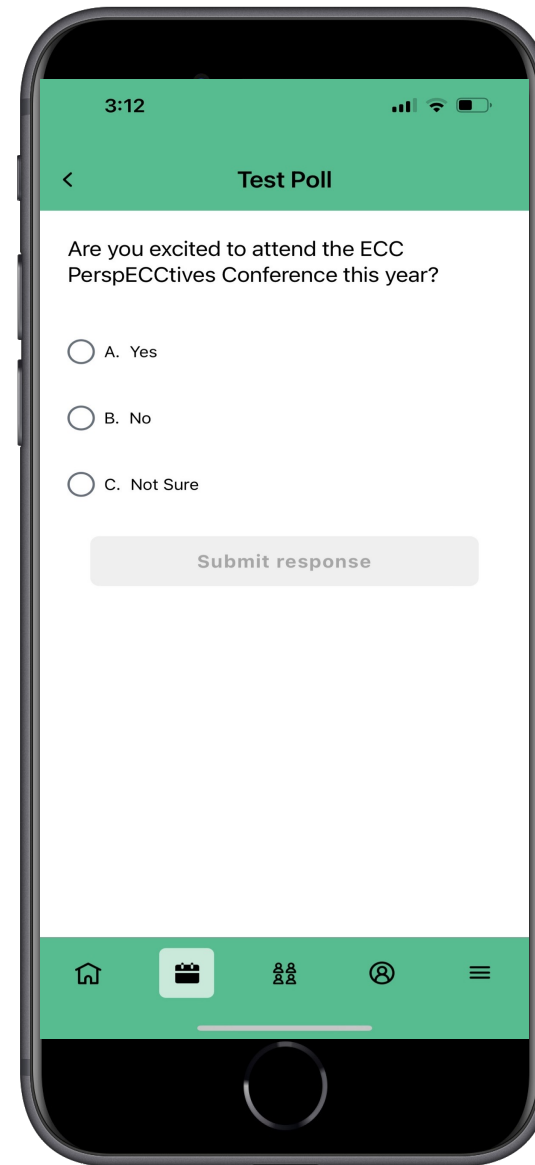
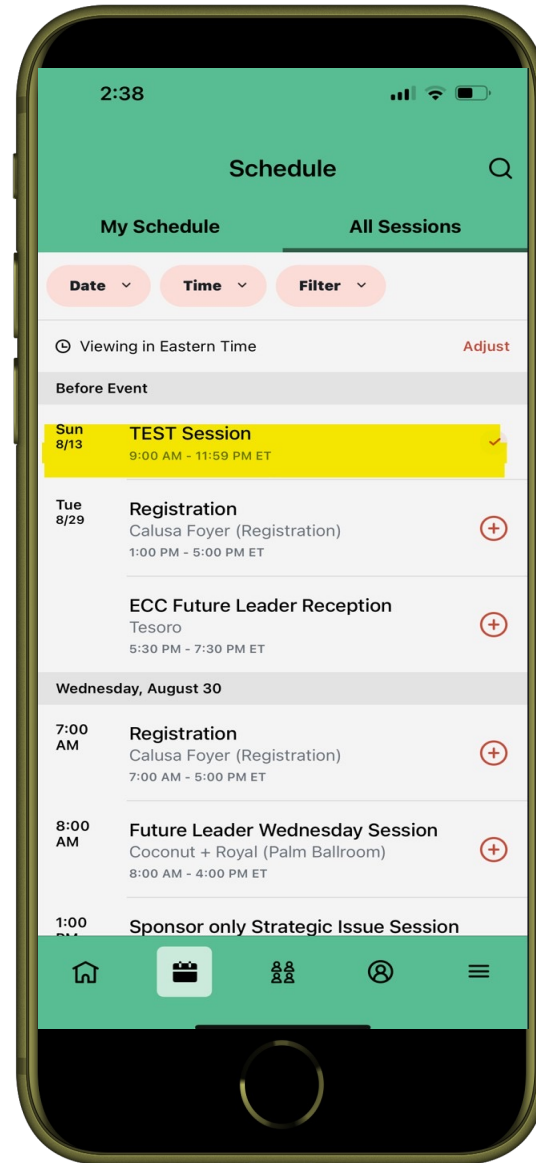
Live Polling

Once the Conference App (CVENT) is opened:

1 Navigate Go to the session you are attending.

2 Click Polls Click “Polls” option which will open up the questions for that session

3 Answer. One question will be available to answer at a time * a moderator or AV tech will open and close questions during the session as needed for sessions with more than one live poll question.



Are you excited to attend the ECC PerspeECtives conference this year?

- A. Yes
- B. No
- C. Not Sure

Agenda

- | | |
|--------|---|
| 10 Min | Cody Austin, Autodesk
Welcome, Problem Statement and Forum Overview |
| 15 Min | Jeremy Ashford, Primoris Services Corporation
Primoris' journey to create a more connected environment for the field worker and the resulting improvement in communication |
| 15 Min | Kim Arrant, APTIM
Aptim's results from their program to create a connected field worker for the purposes of enhancing information exchange and the effective use of data |
| 15 Min | ALL - Panel Discussion |
| 10 Min | ALL - Open QA |
| 5 Min | Cody Austin, Closing Thoughts |





Cody Austin, Autodesk

Welcome, Problem Statement and Forum Overview



Founded
1982



Headquarters
San Francisco, CA



Employees (2022)
12,600+ worldwide



NASDAQ

ADSK

Market Capitalization
~42 Billion

In FY23

6.74M

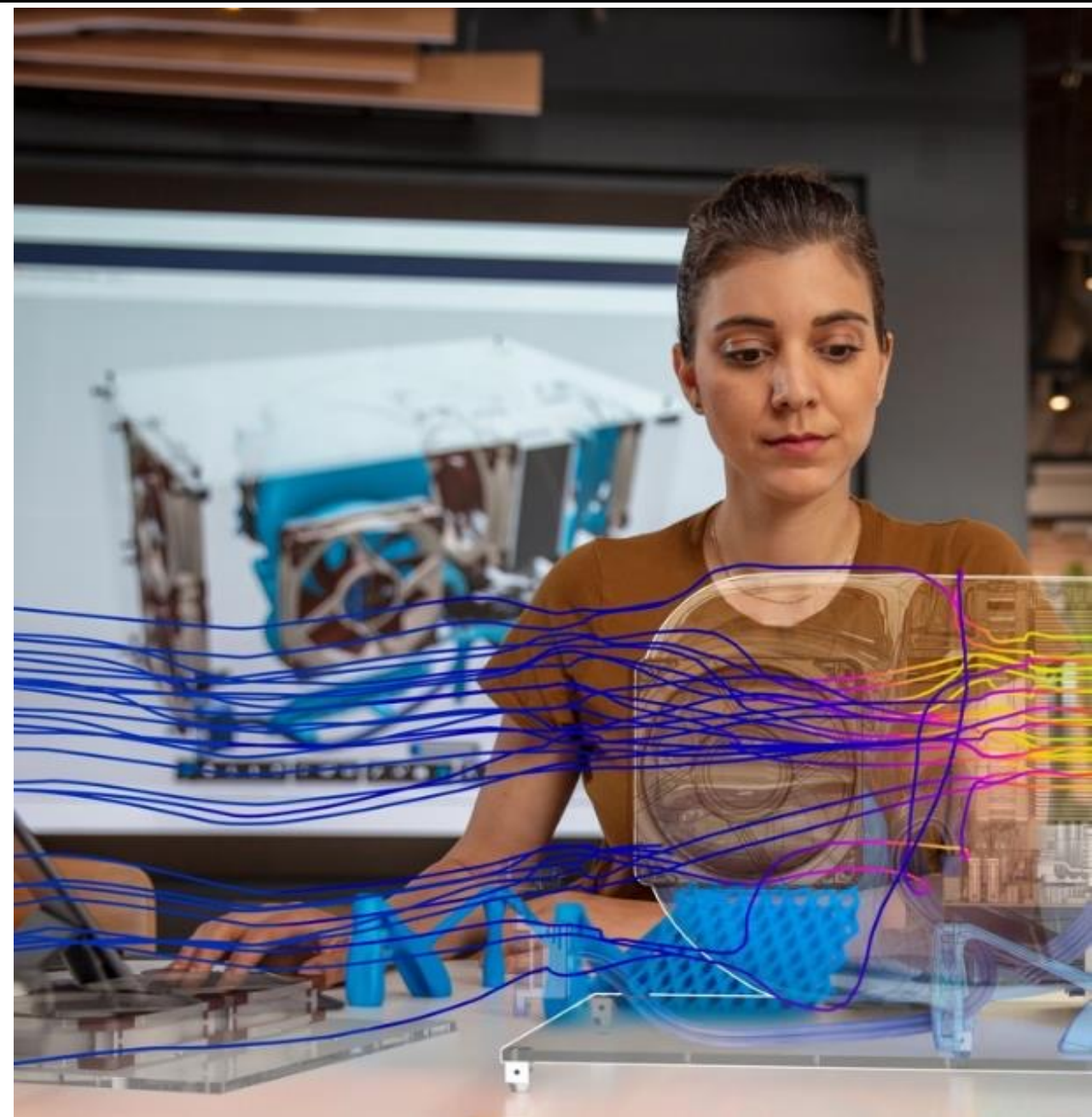
Total subscribers
(up 11% year on year)

\$5.01B

Total revenue
(up 14% year on year)

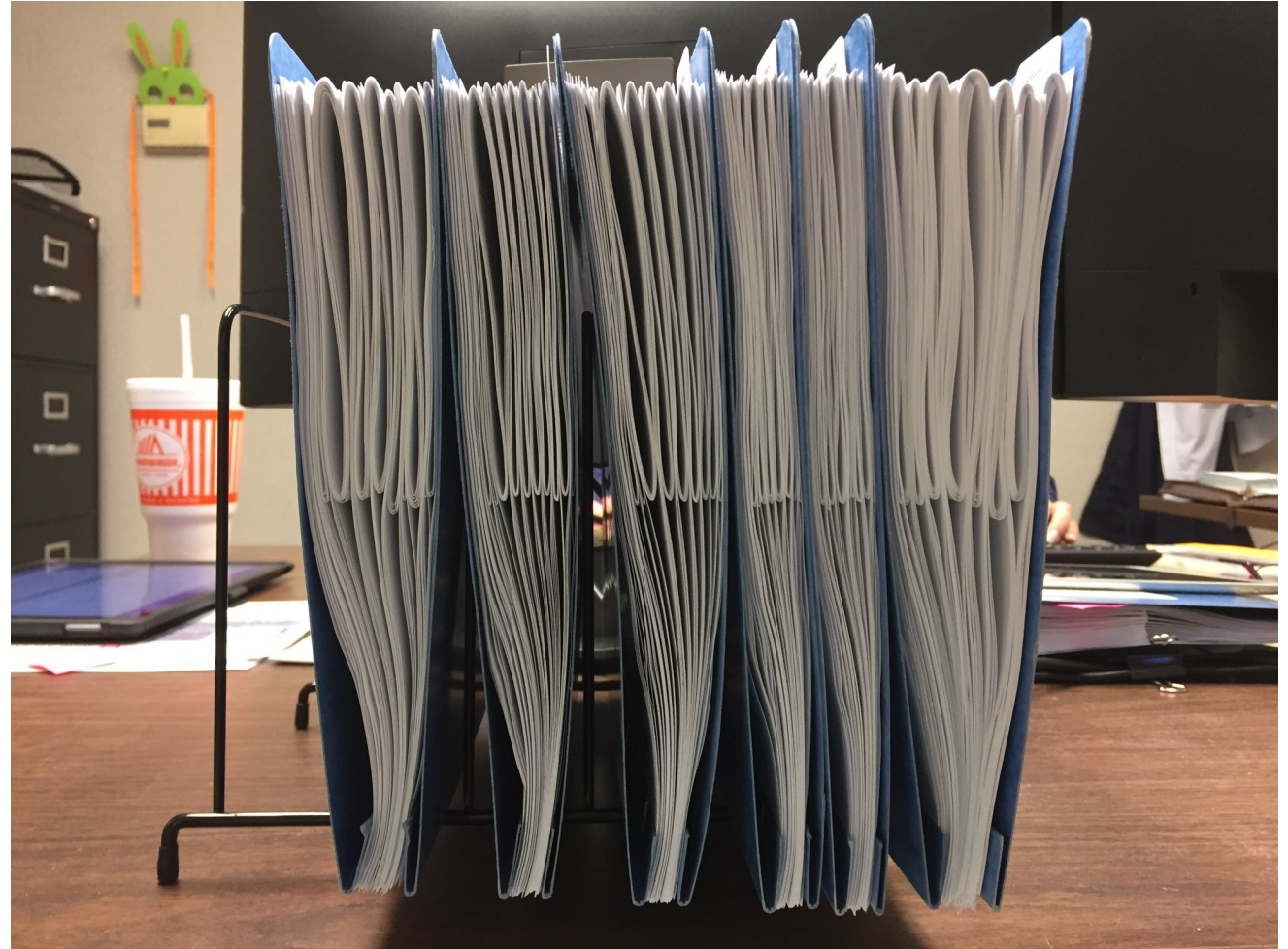
\$1.2B

R&D investment
(24% of net revenue)



Problem Statement

- Modern Engineering processes are highly digitized and managed using information-centric platforms
- However, most of the output from these processes remains paper documents transmitted to the field for execution leading to risk in the area of data currency – Am I working on the correct version?
- Additionally, many processes in the field remain paper-based creating additional risk and limiting the opportunity to use the information available in the field for insight



What is your New Possible?

Making Data Accessible in the Field



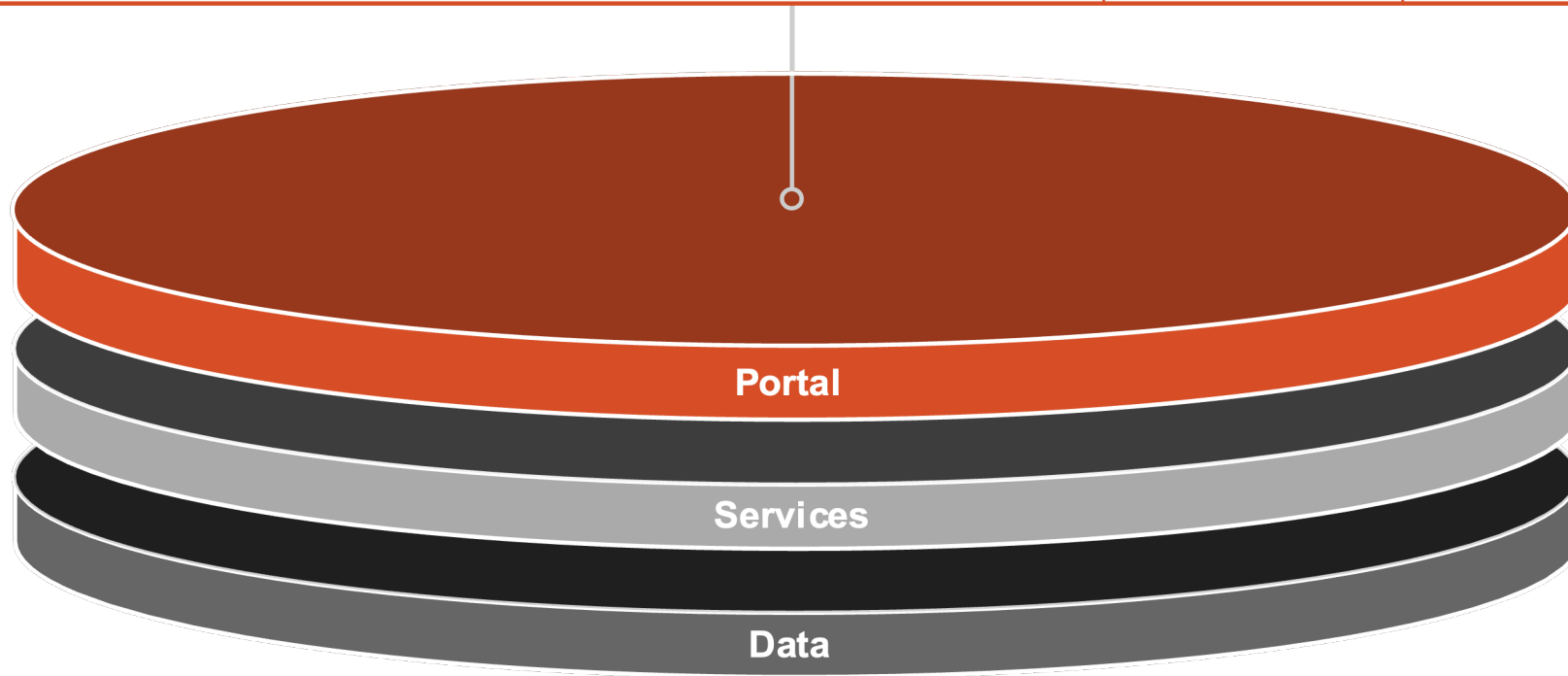
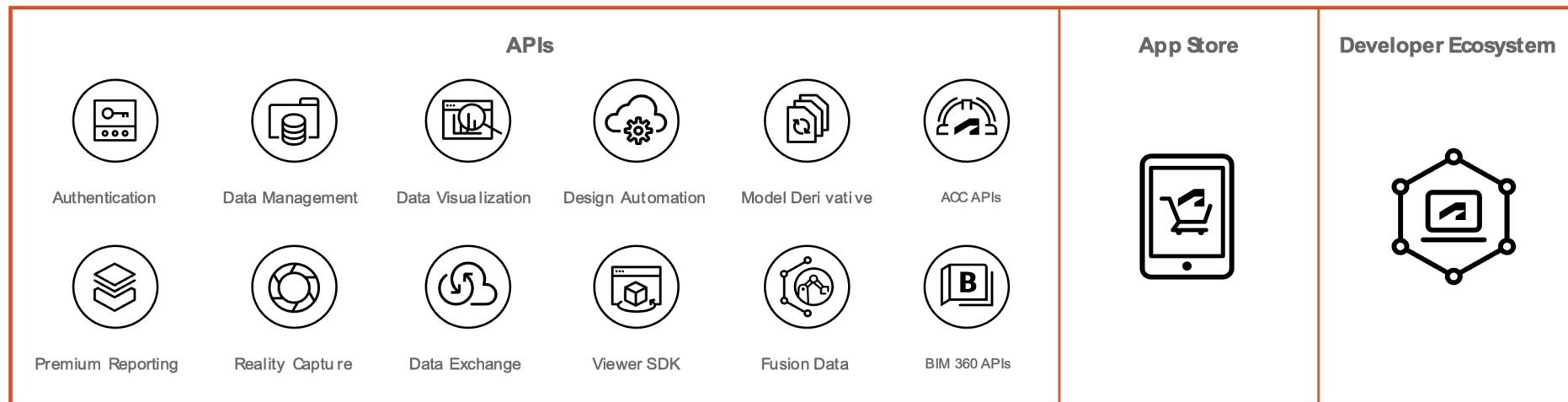
Digitize



Integrate



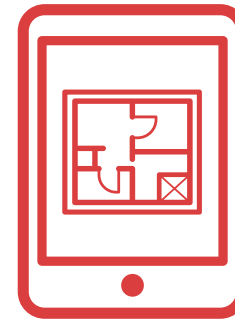
Optimize



Two High Value Use Cases



**Common Data
Environment**



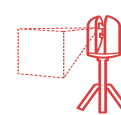
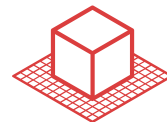
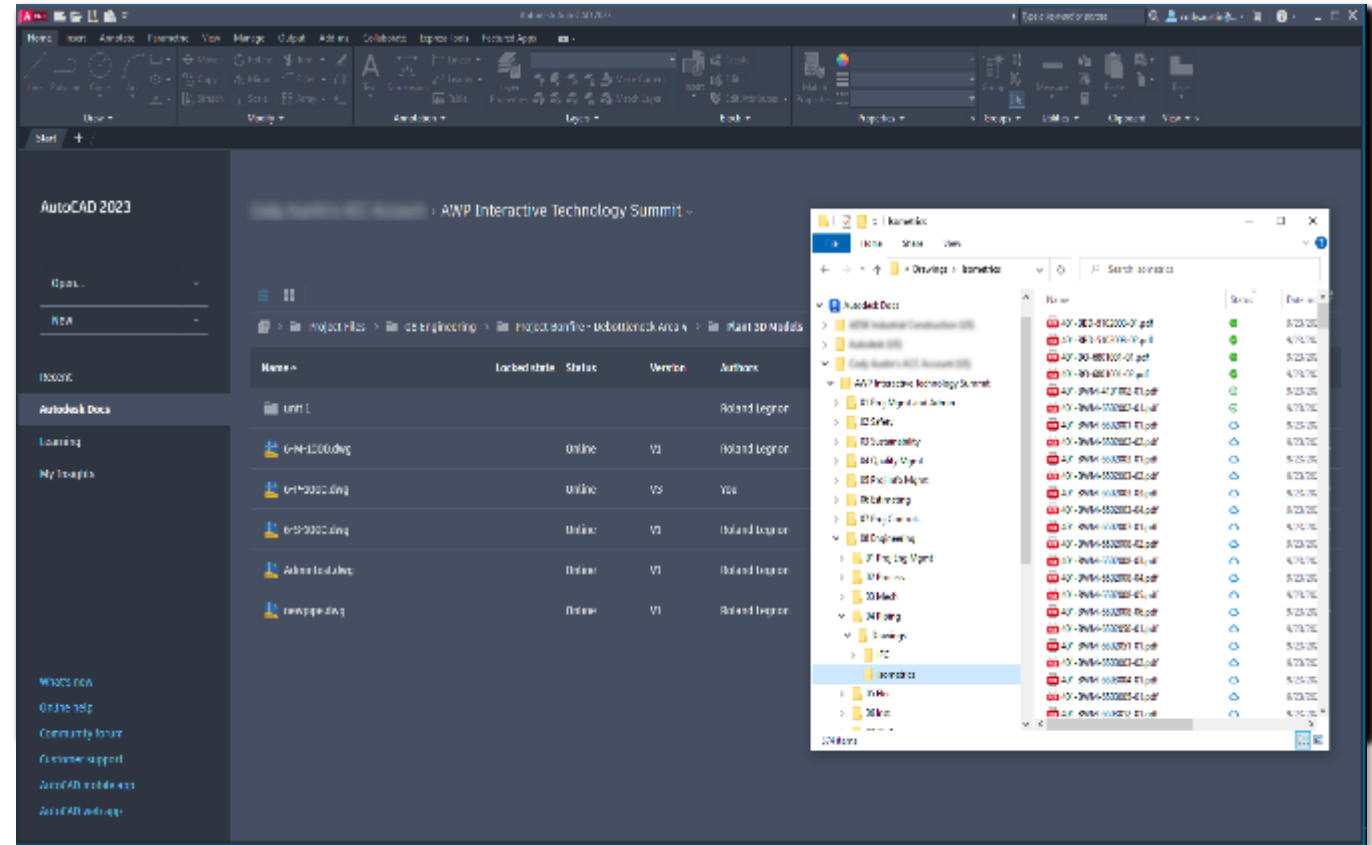
**Connecting the
Field**

Common Data Environment

Organize and share files confidently
Reliably track and securely deliver files to stakeholders.

Work flexibly on a cloud-based platform
Empower multidisciplinary teams to access centralized information anytime, anywhere.

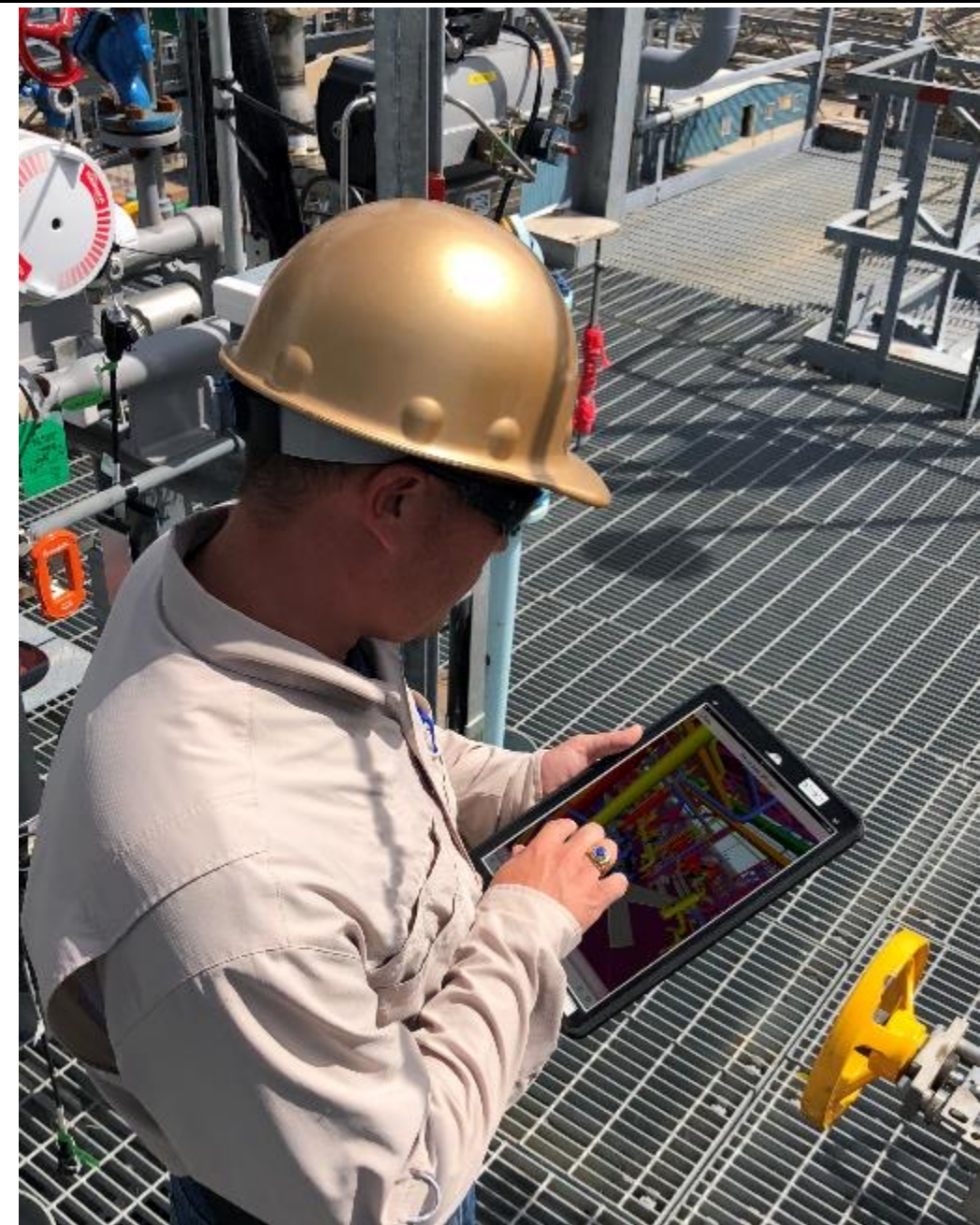
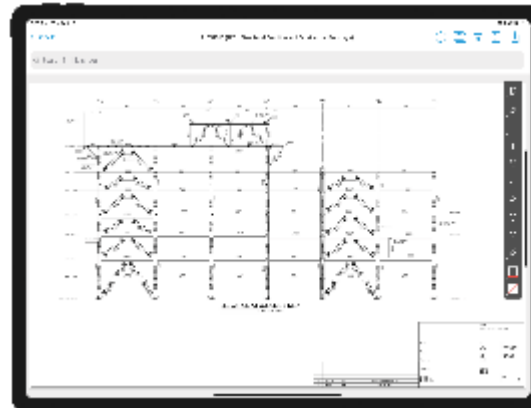
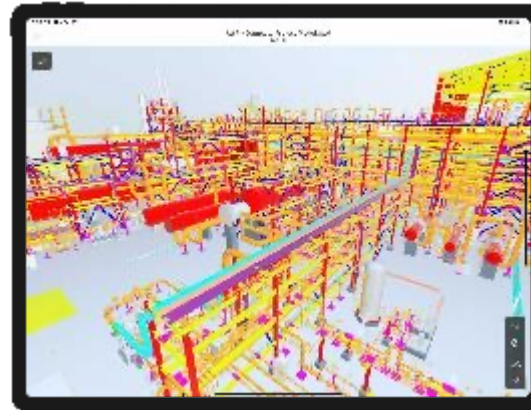
Boost your team's agility
Stay ahead of changing project conditions and issues.



Connecting the Field

Improve Decision Making and Productivity

- Access project documents, drawings and 3D models on tablets and phones
- Eliminate the time wasted walking back to the construction trailer
- Keep field supervisors in the field with their crew making them safer and more productive





Jeremy Ashford, Primoris Services Corporation

Primoris' journey to create a more connected environment for the field worker and the resulting improvement in communication

Primoris at a Glance



**Established
in 1960**



**Headquartered
in Dallas, TX**



**Publicly traded on
NYSE (PRIM)**



**12,700+
employees**

- **A premier specialty contracting and engineering company with operations in the U.S. and Canada**
- **Extensive company-owned fleet and equipment**
- **Full Engineer-Procure-Construct (EPC) capabilities**
- **Strong self-perform construction capabilities**

The Primoris Journey

Background

- Traditional Beginning
 - 25 years ago
 - All paper-based processes
 - This was before computers were popular
 - “No way we will ever use a computer”
- Enter the Computer
 - The computer became our repository for information
 - Checklists
 - Timecards
 - Schedules
 - Other project information
 - **But.....these were all paper forms that were then entered into a computer**





The Primoris Journey

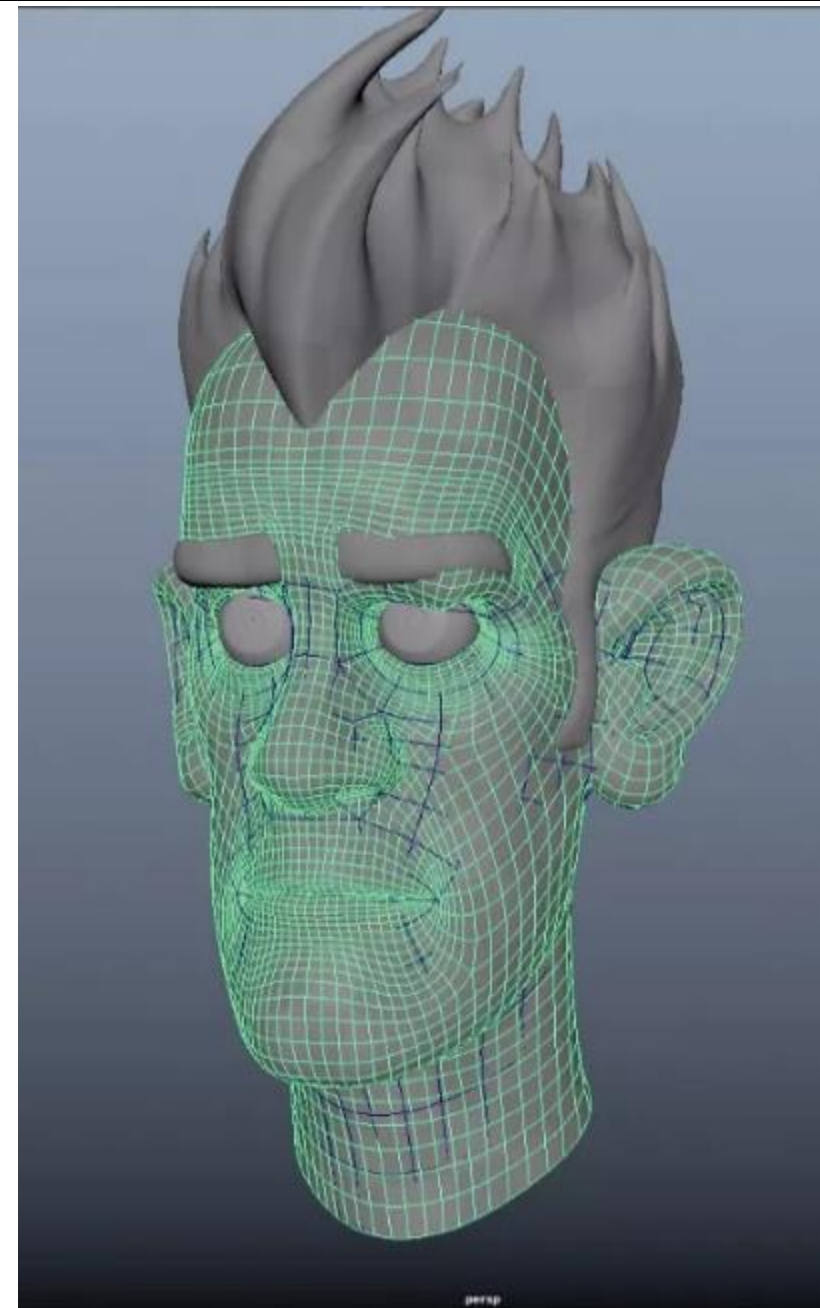
The Need for a Better Way

- Identifying the need for change
 - Was not just about being digital
 - Connecting disparate systems
 - Checklists, Timecards, Punch Lists, Document Control
 - Nothing talked to each other
- Still paper in the Field
 - Foreman checks the cubby every day for changes
- Project closeout
 - Spent weeks scanning and indexing
- **Passion – How do we minimize the touch points**

The Primoris Journey

An interesting beginning

- Existing relationship with Autodesk
 - Knew Autodesk as AutoCAD and Navisworks
 - Did not understand the company's breadth
- Had a recordable incident on a project
 - Needed a way to simulate / document the incident
 - Found out that through our agreement with Autodesk we had access to Maya, a tool used for Movies
 - Successfully used Maya in documenting the incident
- This made us look at Autodesk differently
 - Broad toolset, many markets
- Found the Autodesk Construction Cloud





Enter the Cloud

Starting simply with the Cloud Platform

- Looked first at Document control
 - Still using shared folders
- **Step 1 – All field-related documentation to the Cloud**
 - Field documentation was transitioned first
 - Fairly seamless transition, minimal interruption
 - **But, we are an EPC, really needs to start at the RFP**
- **Step 2 – Transition other functions for documents**
 - Started using the Cloud for Engineering, Business Development and other forms of documentation
 - Brings everyone together, using the correct document

Expanding the use of the Cloud

Benefits extended to Construction Execution

● Step 3 – Construction Execution

- Using the platform for construction execution was a natural extension
 - Issues, RFI's, Markups, Version Control, etc.
- Impact on Field Teams
 - Access to near real-time information
 - Design information, IFC documents
 - Inspections
 - Information back from the field also
- Example Metrics

Before The Cloud	With The Cloud
1200 Folders	Single Common Cloud
30,000 Documents	Similar numbers of documents
12,000 were duplicated	No duplication
- Has nearly eliminated version issues
 - Example – estimating from the wrong version of a document

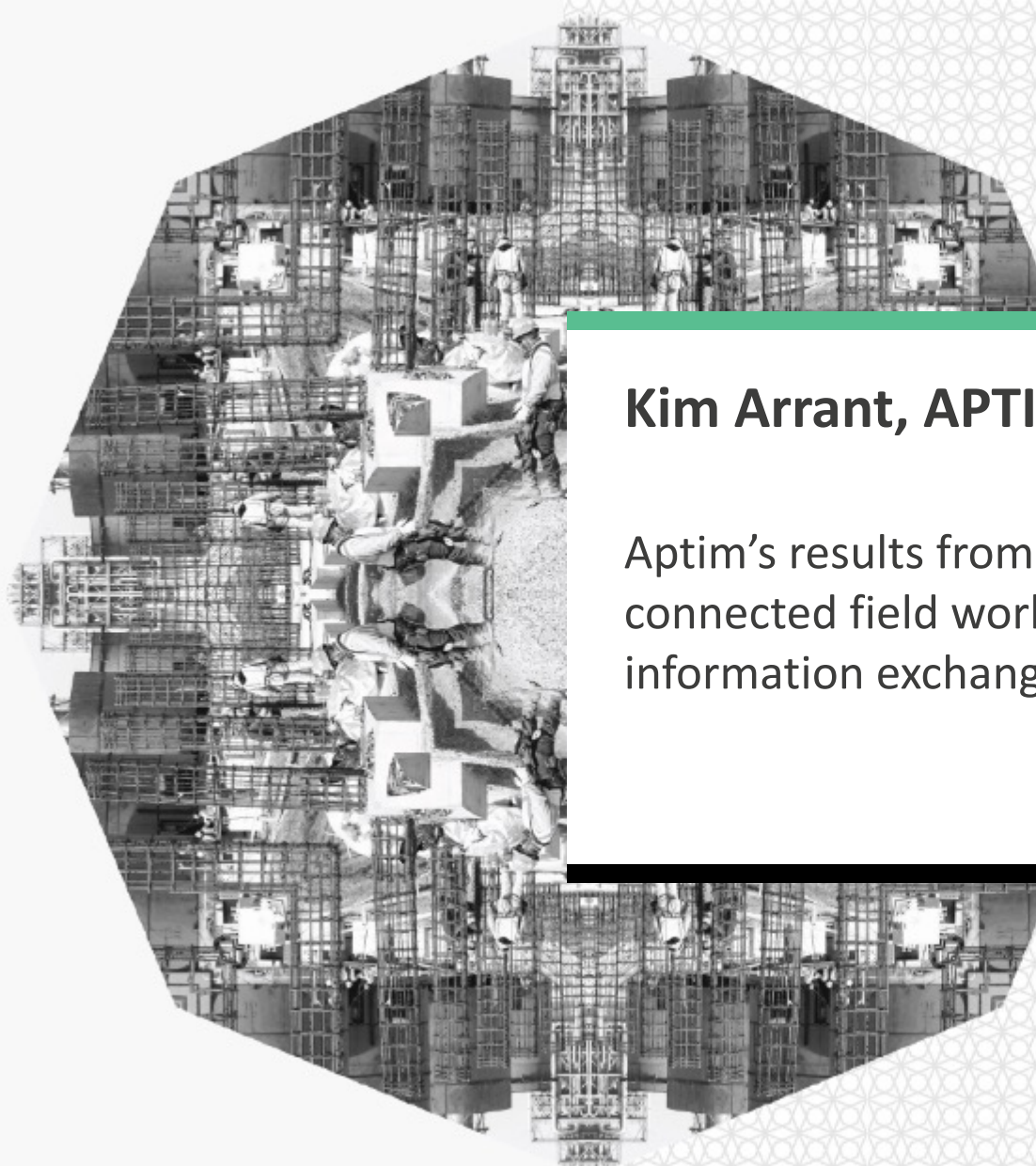




Impact and Benefits

What are we seeing in this early stage

- Predictable Project Completion
 - Previously the last 5% took 20% of the time
 - Lacked data and information to progress
 - Now project information is readily available
 - Progress is tracked in real time until signed off
- Real-Time Turnover
 - Project information collected in a single location
 - **“The client just has it as a part of the process”**
- Consideration – Visibility
 - The client now sees the information and can more easily hold you accountable
 - **Makes us better!**



Kim Arrant, APTIM

Aptim's results from their program to create a connected field worker for the purposes of enhancing information exchange and the effective use of data

APTIM Overview

- APTIM specializes in
 - Critical Infrastructure
 - Technical and Data Solutions
 - Environmental
 - Program Management
 - Resiliency
 - Sustainability and Energy Solutions
- Markets
 - Government
 - Commercial
 - Industrial
 - Energy

APTIM. Expect the Extraordinary.



APTIM's Technology Journey



Digital
Foreman

Construction
Toolkit

Service Line
Toolkits

The Digital foreman



Objectives:

Push: Keep the Crews in the field, at the workplace, informed and successfully completing tasks

- Stats - Industry published statistic – implementation of mobile data collection can increase productivity (time on tools) as much as 35%. Can we realize that?

Pull: Transparency of data and real time comms and issue resolution. Reduce administrative level of effort and increase effectiveness.



Email



Policies & Procedures



Weather



GPS/GIS Tracking



Schedule



Virtual Meetings
Group Chats



Issue, Task
Management



Safety
Inspections,
Reporting



Daily Reports



Location, Timestamp
Camera



RFIs



Drawings, Redlines,
Specs



Quality
Inspections



Time, Progress, Productivity



Work Assignments
Crew Management

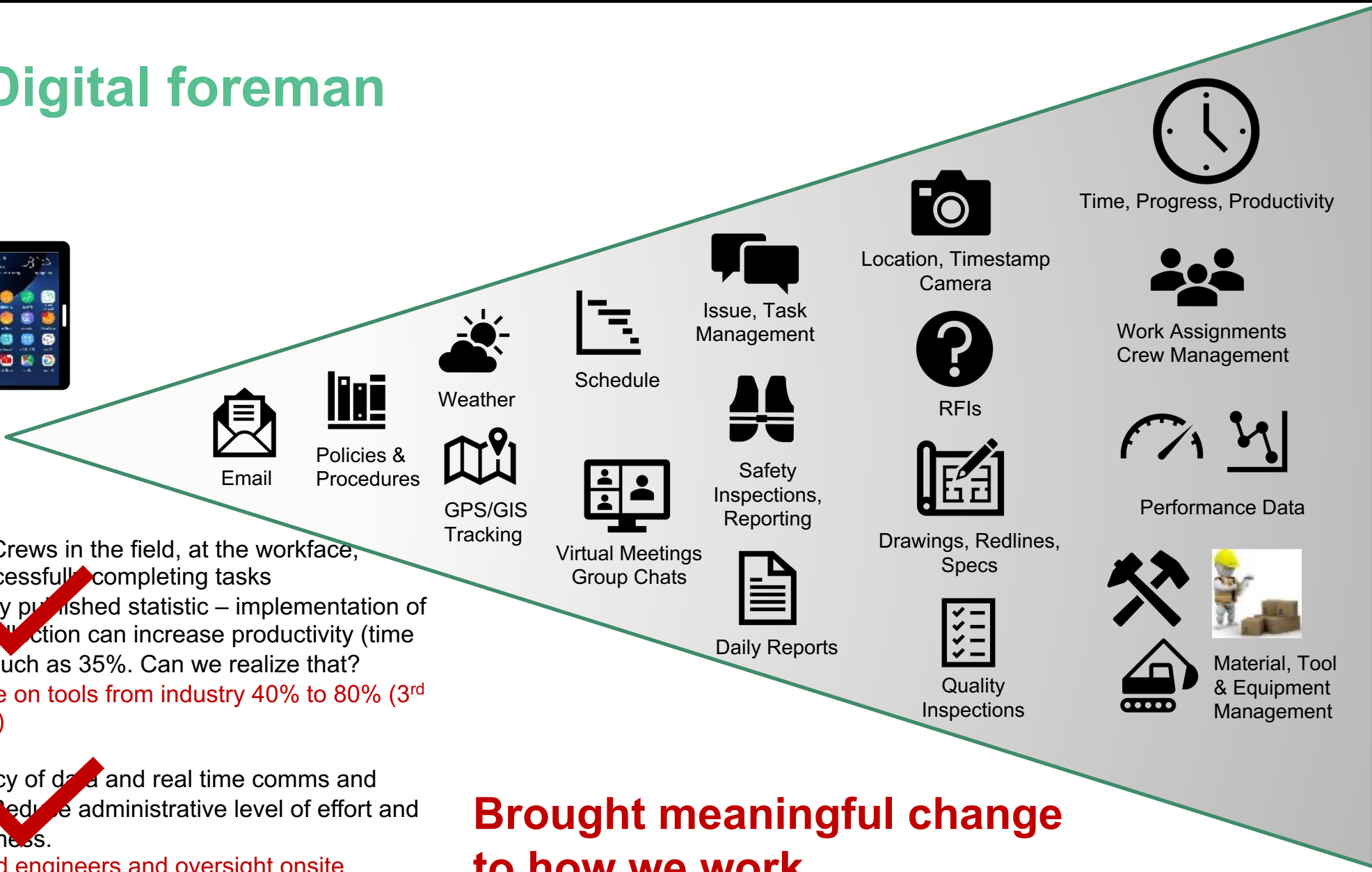


Performance Data



Material, Tool
& Equipment
Management

The Digital foreman



Results:

Push: Keep the Crews in the field, at the workplace, informed and successfully completing tasks

- Stats - Industry published statistic – implementation of mobile data collection can increase productivity (time on tools) as much as 35%. Can we realize that?

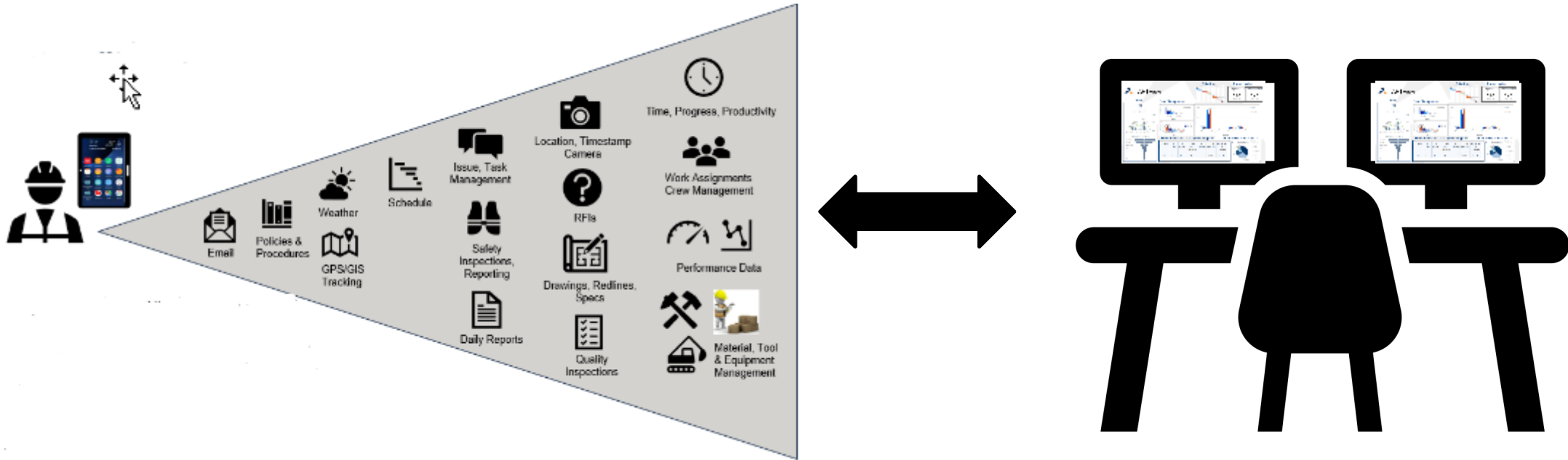
Increased our time on tools from industry 40% to 80% (3rd party assessment)

Pull: Transparency of data and real time comms and issue resolution. Reduce administrative level of effort and increase effectiveness.

Decrease # of field engineers and oversight onsite
Reimagined the role of the General Foreman.

**Brought meaningful change
to how we work.**

Operational Transparency



- Tool Selection - Best In Class Solutions that align with and facilitate “how we work”.
- Renders a Data Rich Environment - Fueled by field focused processes and solutions
 - Collect the data as we work, as it is generated
 - Real Time Decision Making, Issue Resolution
 - Optimizing Accuracy
- Enables Powerful, Integrated Data Analytics and Performance Management

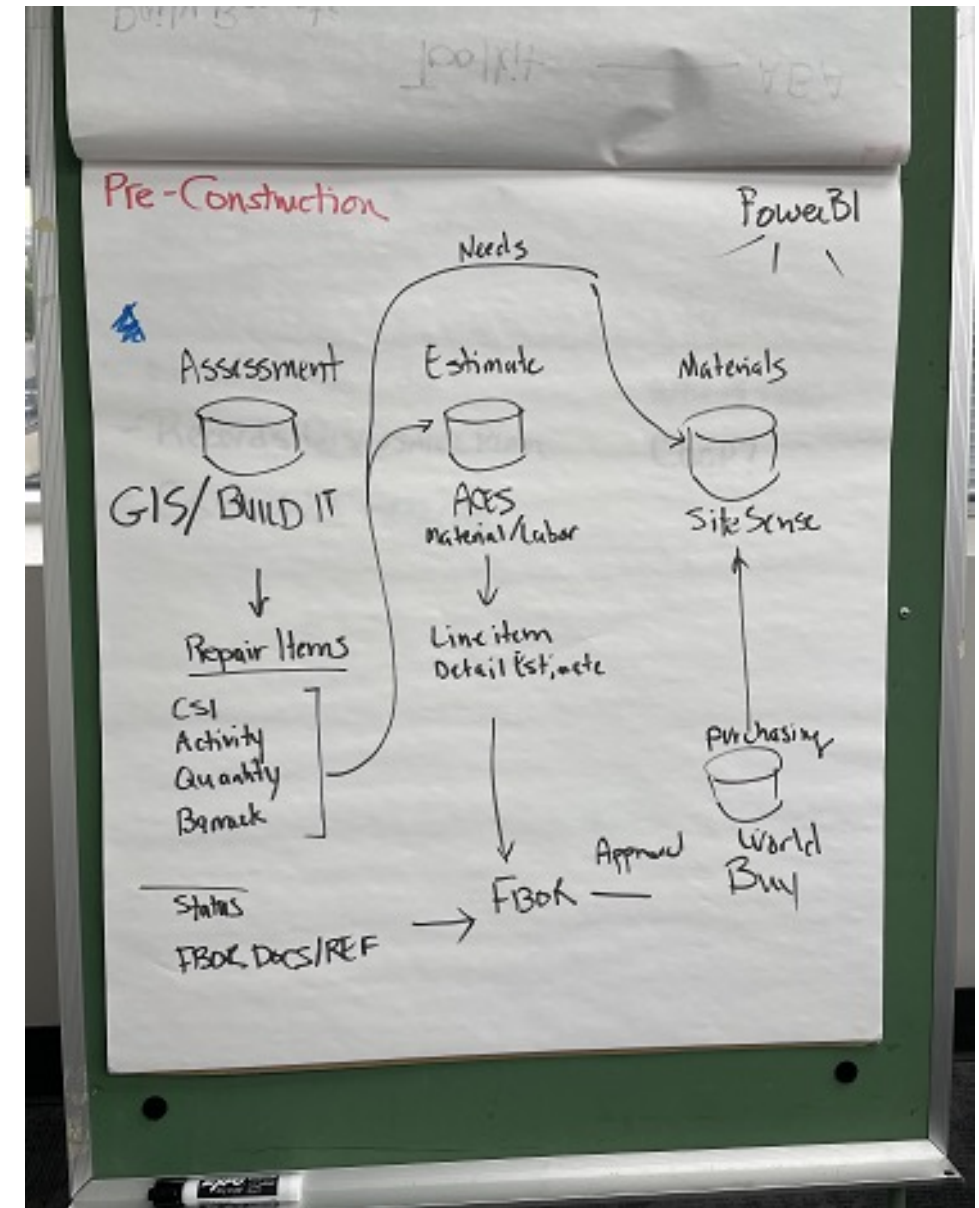
Our Key selection criteria

- ✓ Intuitive and Easy to Use – UI (User Interface)
- ✓ Best in Class Tech and Functionality; opportunity for differentiation
- ✓ Cloud-based, SaaS or PaaS model
- ✓ Open APIs, access to our data
- ✓ Technology Partner
 - ✓ Support
 - ✓ Not just as a support ticket but in thought, implementation and strategic growth and engagement
 - ✓ Visibility and a voice – Product Strategy



Project EXAMPLE

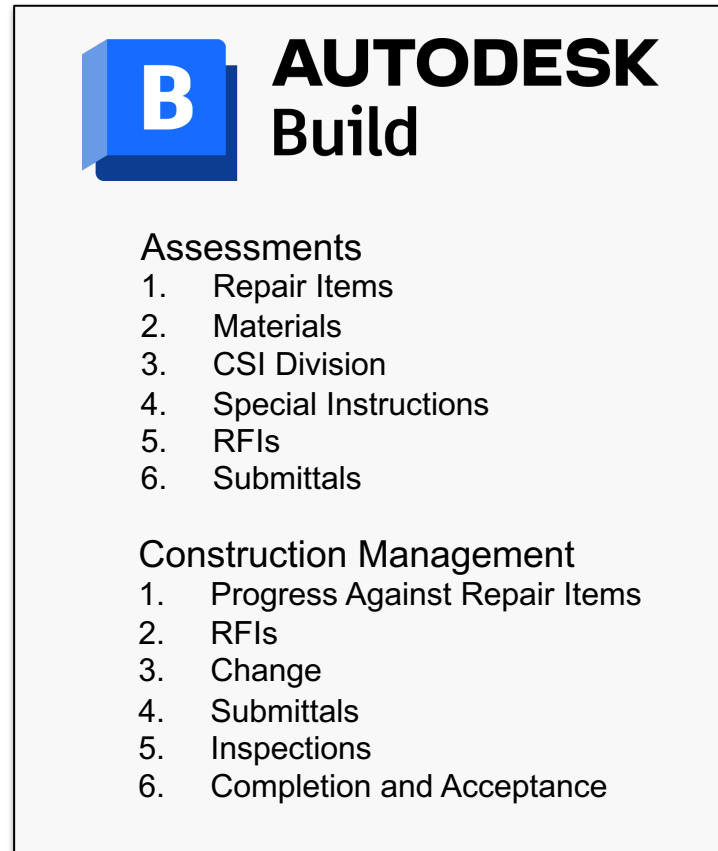
- Scope of Work: 200+ Structures Assessed for Repair < 30 days
- Objective: Establish Scope and Cost of Construction
- Pre-RFP – Project Execution Strategy
 - Talk through your operational approach
 - Align systems and data
 - Renders your Data and Operational Strategy



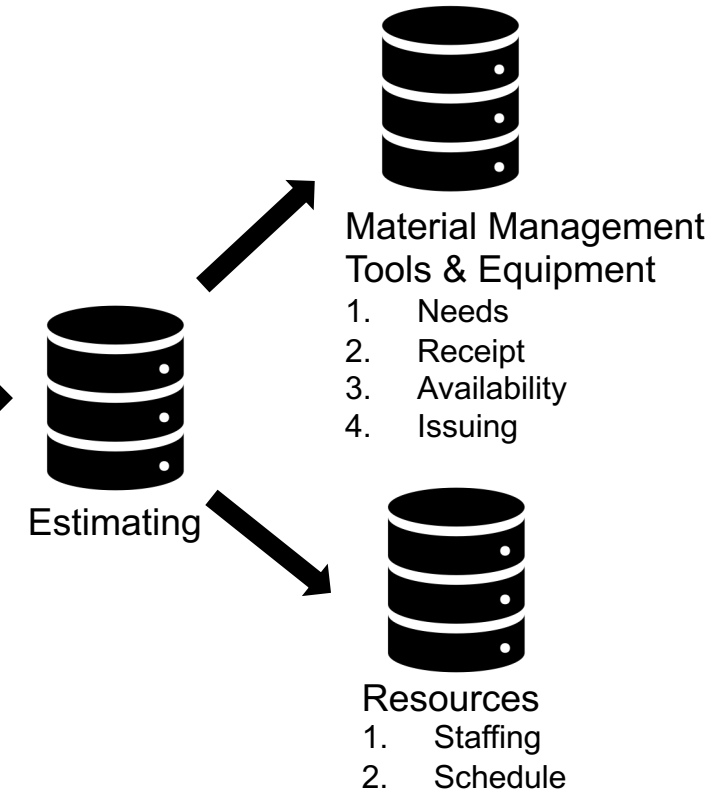
Project EXAMPLE

● Results

- Schedule/Productivity
 - RFP required a **30** day completion.
 - We bid **23** days based on Execution Strategy.
 - We finished in **18** days.
- Awarded the construction scope for repair.



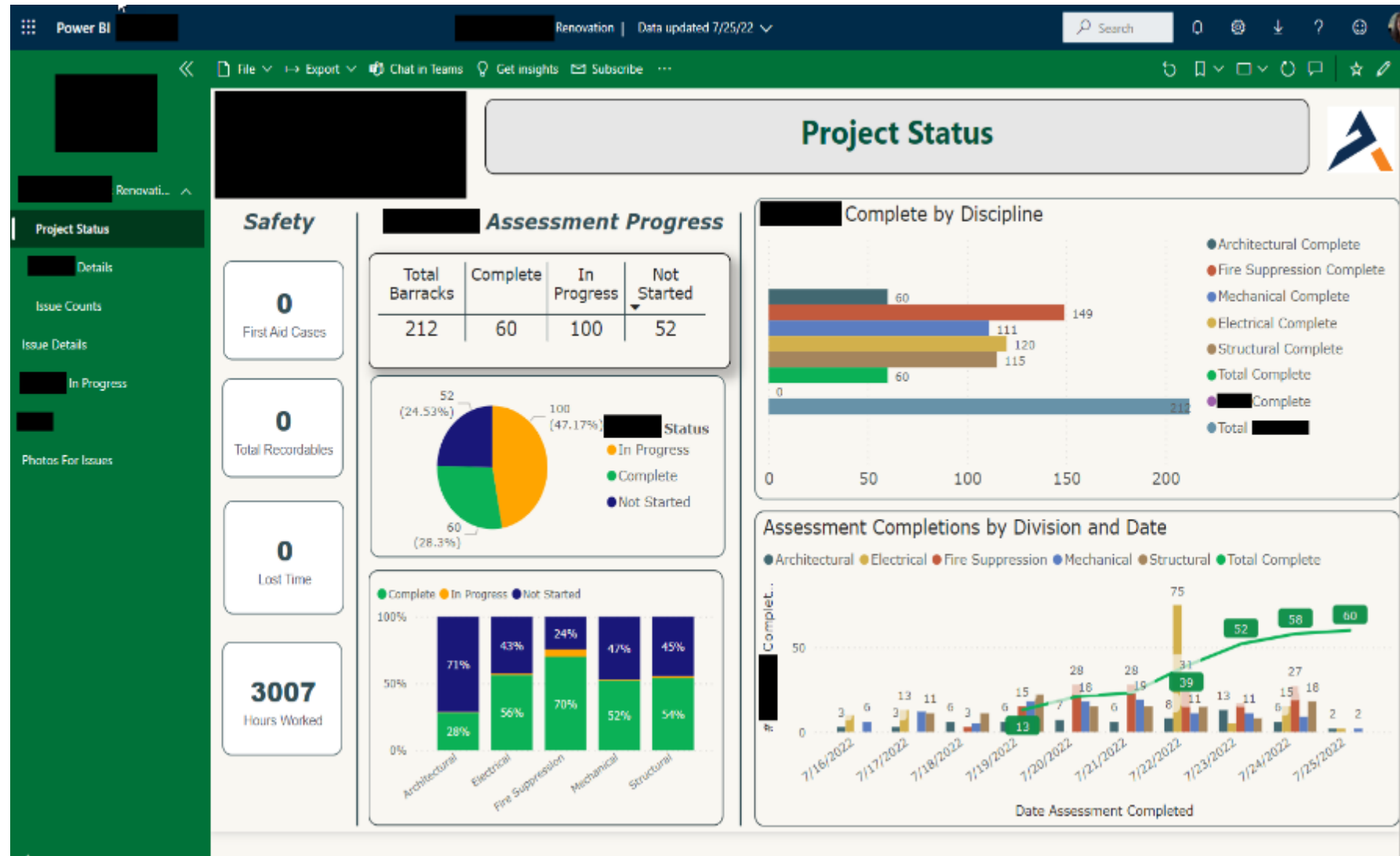
DATA CONNECTOR



Dashboarding: Project EXAMPLE

► What the Data Tells Me:

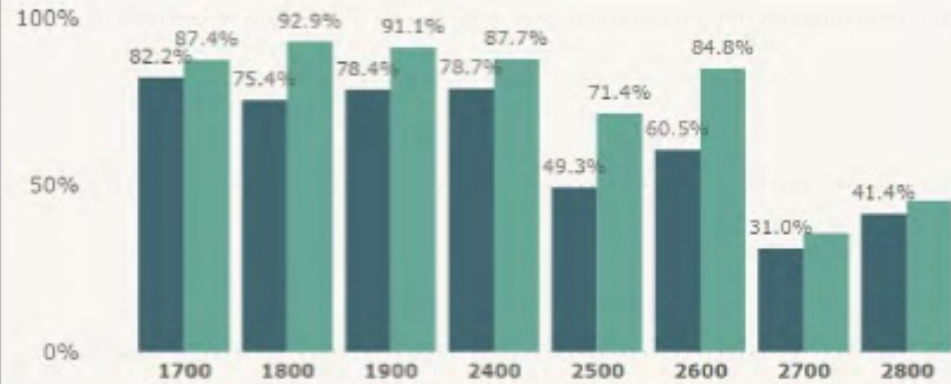
- Progress
- Status
 - By Building
 - By Repair Item
 - By Division
- Completion Rate Curves
- Productivity by Discipline
- Materials Needed
 - By Building
 - By Repair Item
- Rework
- Punchlist Items
- Work Accepted
- Submittal Review/Approval Status
- RFIs
 - By Status – Ball in Court
 - Avg No Days to Closure



Dashboarding: Project EXAMPLE

Barracks % Completed by Block OAW/Non-OAW Issues

OAW ● NO ● YES



Bathroom Critical Path % Complete

● Spray Foam ● Drywall Bathroom ● Shower Floor ● Bathroom Floor ● Bathroom Paint ● Shower Partitions/Trim Out



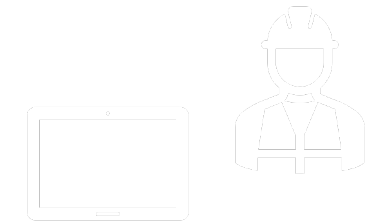
Overall % Completed by Feature

● Spray Foam ● Drywall Bathroom ● Shower Floor ● Bathroom Floor ● Bathroom Paint ● Shower Partitions/Trim Out ● ACT ● Living Area Paint



Feature	% Complete
ACT	98.58%
Barracks Living Area Paint	100.00%
Bathroom Flooring Install	79.10%
Bathroom Paint	93.70%
Drywall Bathroom	97.97%
Epoxy Shower Floor	83.54%
Shower Partitions, Bath Fixtures, Trim Out	77.38%
Spray Foam and Insulation	98.58%
Average	91.11%

Construction & Construction Management



- (Anchor) Drawings, Specifications, Markups, Redlines, RFIs, Submittals, Issue Management, Quality



- Material Management, Equipment & Tool Tracking, Logistics powered by SiteSense



- BIM for Construction, Clash Detection, Work Management powered by NavisWorks and iConstruct



- Reality Capture Solutions: Drones, 3D Scanning, Mobile Mapping powered by SiteScan & NavVis



- Crew Management (Time, Equipment, Quantities, Productivity, T&M) powered by Riskcast



- Design, QC, Inventory powered by Avontus



- Project Management powered by InEight Estimates, Primavera P6 and Autodesk Cost Management



- Project Management and Performance KPIs Reporting and Dashboards powered by PowerBI



Service Line Toolkits Dashboard



Emergency
Management &
Disaster Services



Environmental
Consulting



Energy &
Sustainability



Construction &
Construction
Management



Grant and Program
Management



Engineering



DDR



Operations &
Maintenance

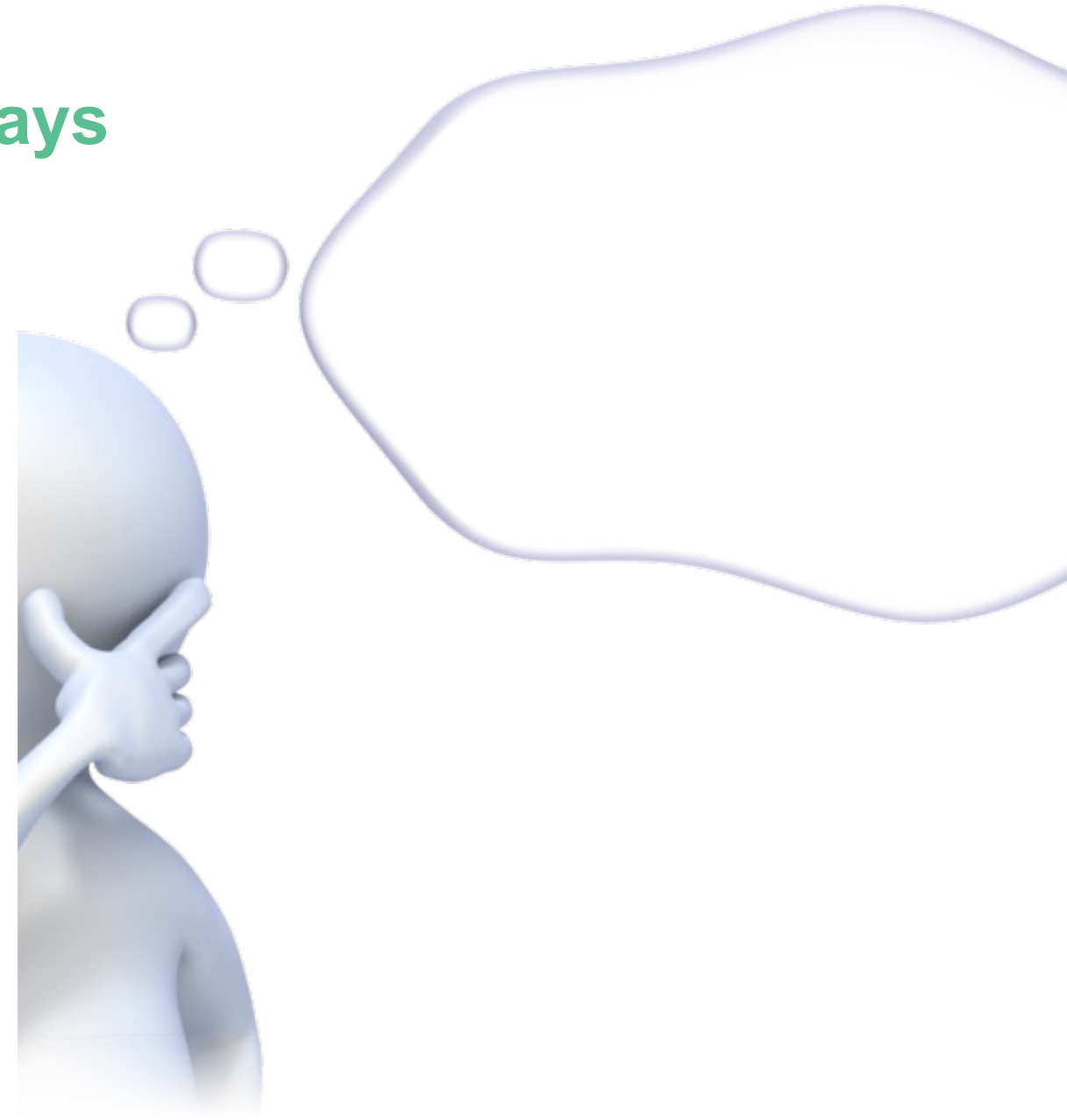
Lessons Learned / Key Take Aways

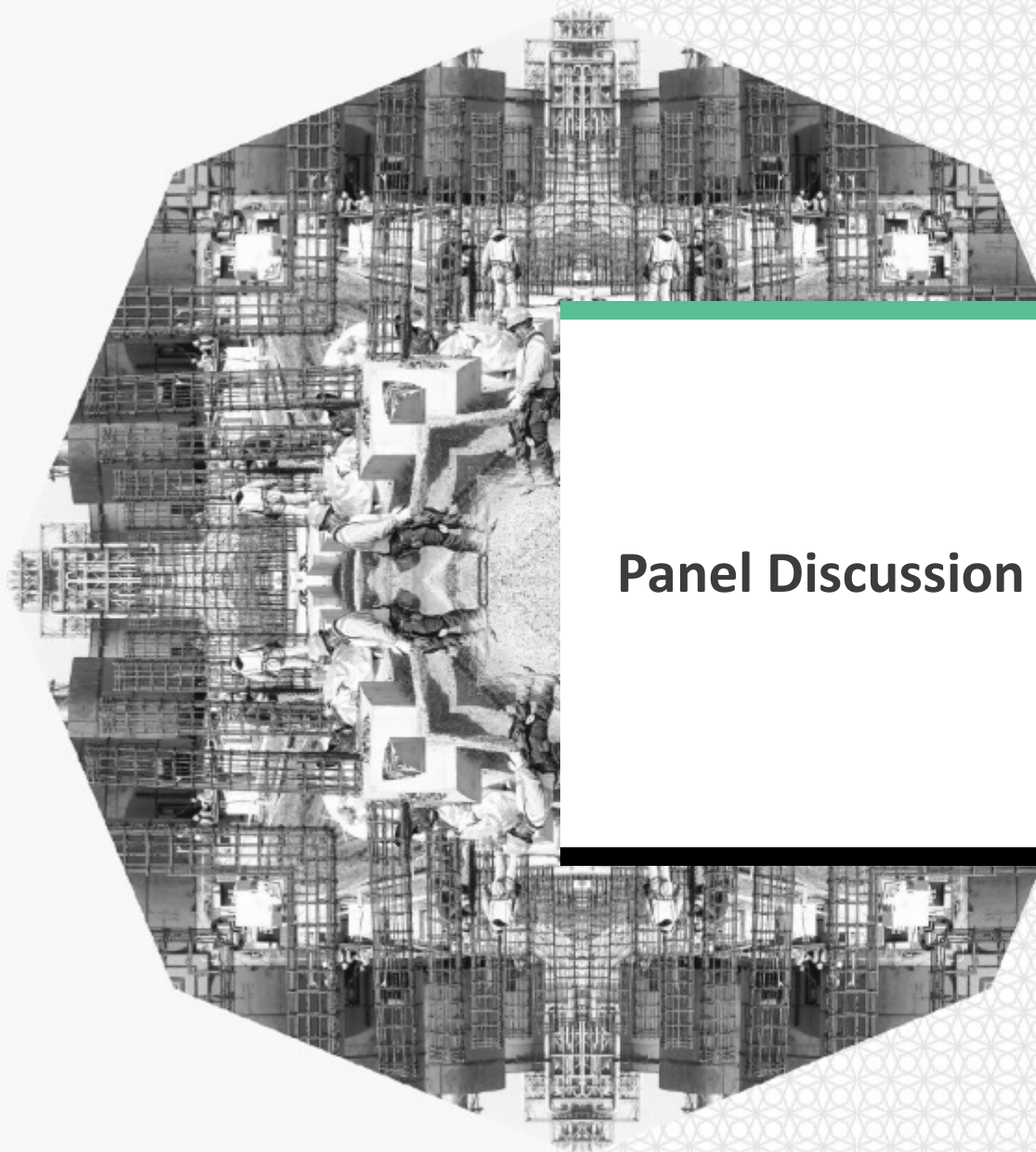
- Address Change Management... Head On
 - Give your stakeholders/end users a voice
 - Ownership and Responsibility
 - Don't underestimate the power of "the frozen middle"
 - Solutions should solve problems
- Plan, Plan, Plan
 - Engage Stakeholders for Planning
 - Develop Your Execution Strategy
 - Key Metrics, KPIs
 - Managed Elements
 - Risk Points
 - THEN Overlay Your Data Needs
 - All before you step foot in the field.



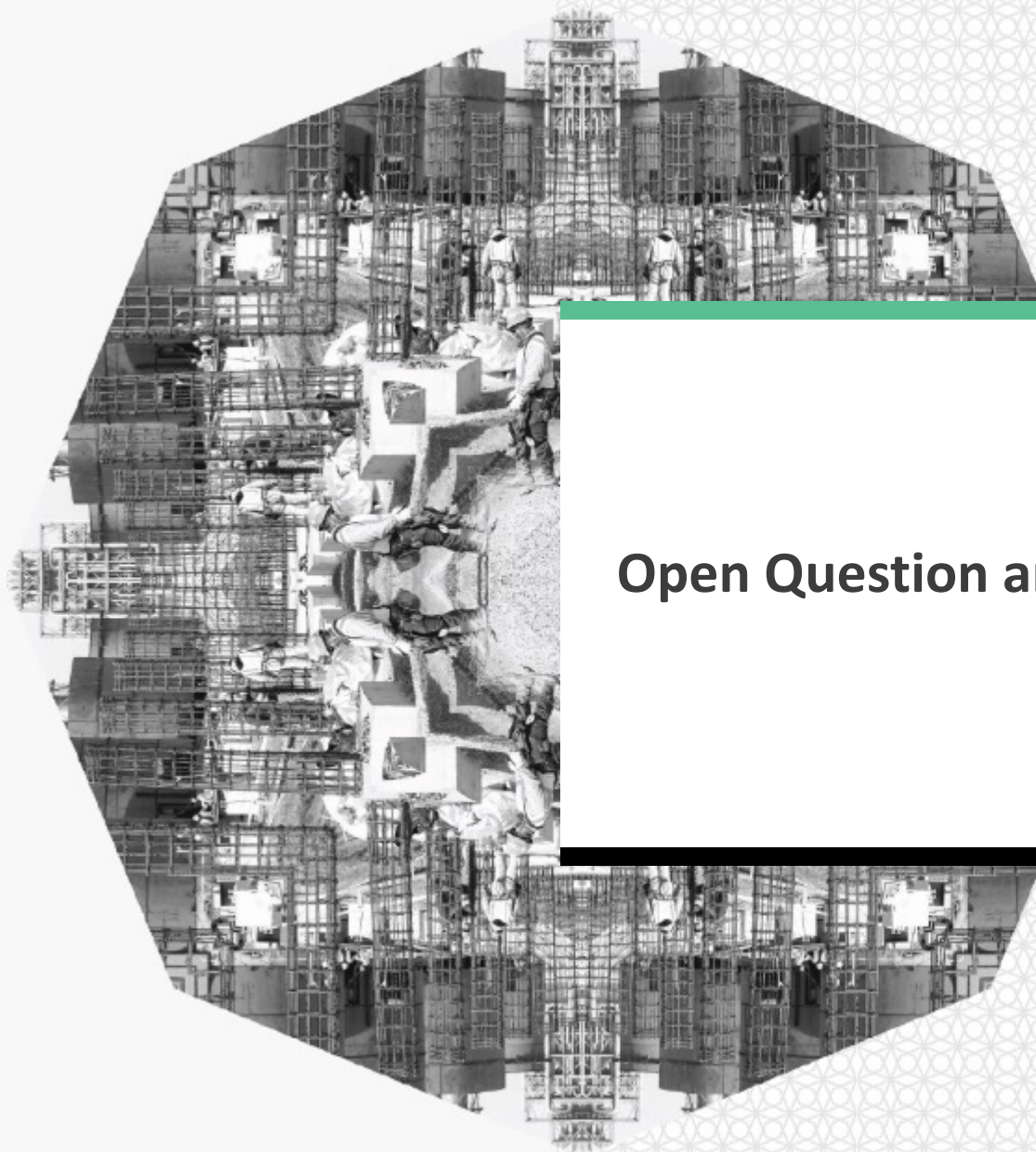
Lessons Learned / Key Take Aways

- If you THINK you might need the data, Include it.
 - Very difficult to add data when you're in progress.
- Ownership is Imperative
 - Roles & Responsibilities
 - Requires Commitment & Accountability
- Systems but be Central to the Process and Workflow
 - No external or secondary data sources
 - PowerBI is ONLY for viewing your data





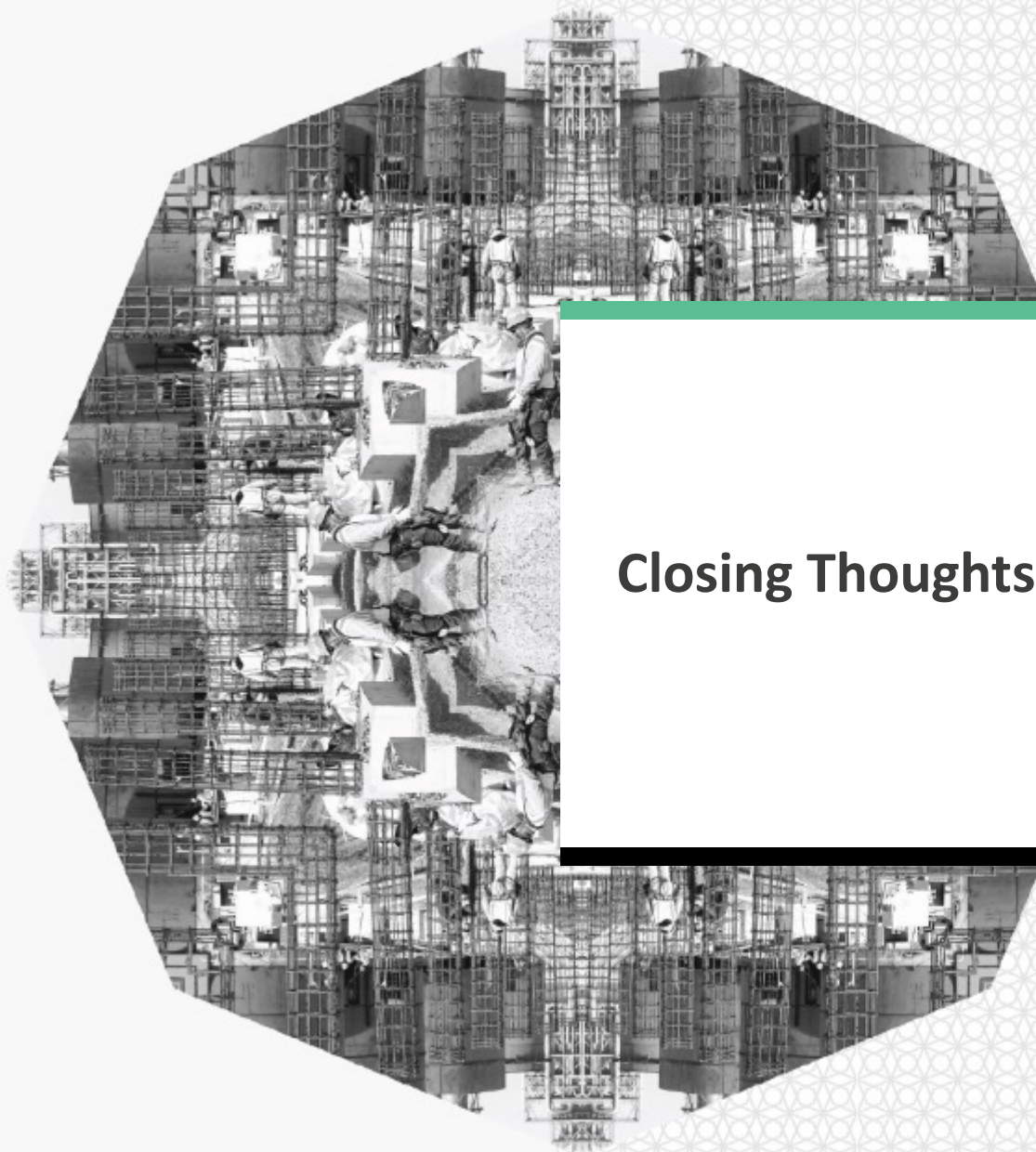
Panel Discussion



Open Question and Answer

Session Logistics

- ECC Slide here about the session Logistics, how to ask questions, etc.



Closing Thoughts

Key Takeaways

- Cloud platforms provide a catalyst to change the information supplied to and received back from the field worker
- Begin with an area of meaningful impact like using a cloud repository to make sure the information in the field is current and lacking duplication
- It is possible to see significant gains in time on tools with accurate and available information in the field
- Available information provides a platform for re-imagining field supervisory roles, making them more available to their teams!
- All of the above points provide an opportunity for increased safety



What is your New Possible?



Thank You!