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The magazine for civil & structural engineers

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The Pace of Possible: Be Part of the Solution To Improved Efficiency With Digital Twin Technology

November 22, 2022

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Introduction

Sam Migliore
Senior Director, Global Developer Success, iTwin Platform
Bentley Systems, Inc.

Sheena Gaynes
Director, Business Development, iTwin Platform
Bentley Systems, Inc.

Roop Saini
Software Developer II, iTwin Platform
Bentley Systems, Inc.

Penny Swords
VP Business Development, Mining Data Solutions
Seequent

Agenda

- How engineering firms are currently **developing solutions** that make every day easier.
- How **using a PaaS** can extend what you are already doing with your chosen SaaS solutions.
- Which requirements are there for engineers or technical teams to **get started**.
- Why **digital twin ecosystems** matter. No one vendor/firm can do this on their own.

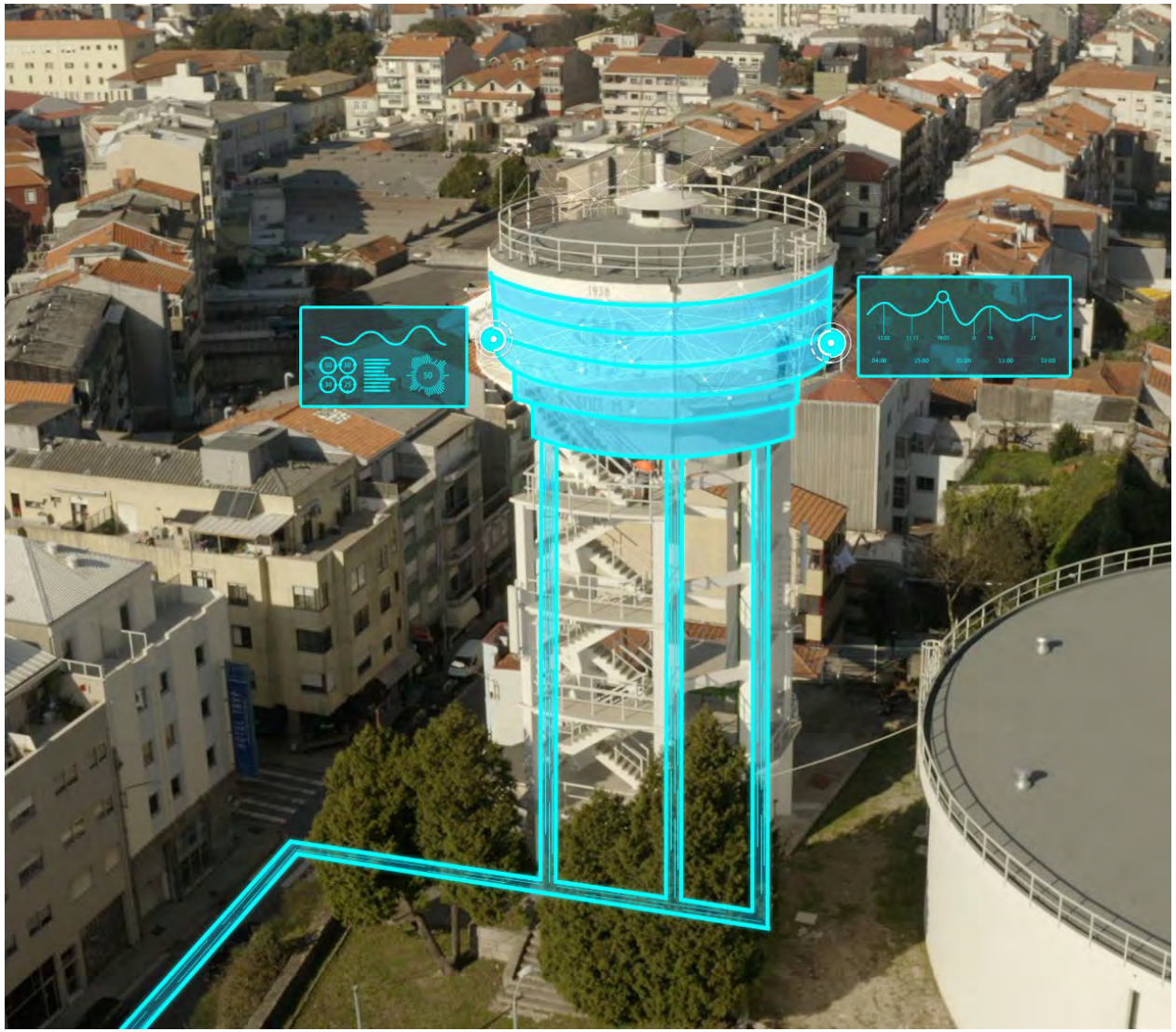
Poll Question:

Where are you on your digital transformation journey in regards to Digital Twins.

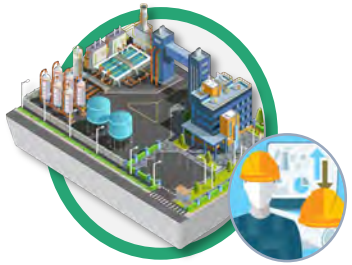
1. Have sophisticated digital twins
2. Have pieces of data or assets in digital visualization
3. Have started working on a digital twin project
4. Am really still trying to figure our BIM

Section 1

How engineering firms are currently **developing solutions** that make every day easier.

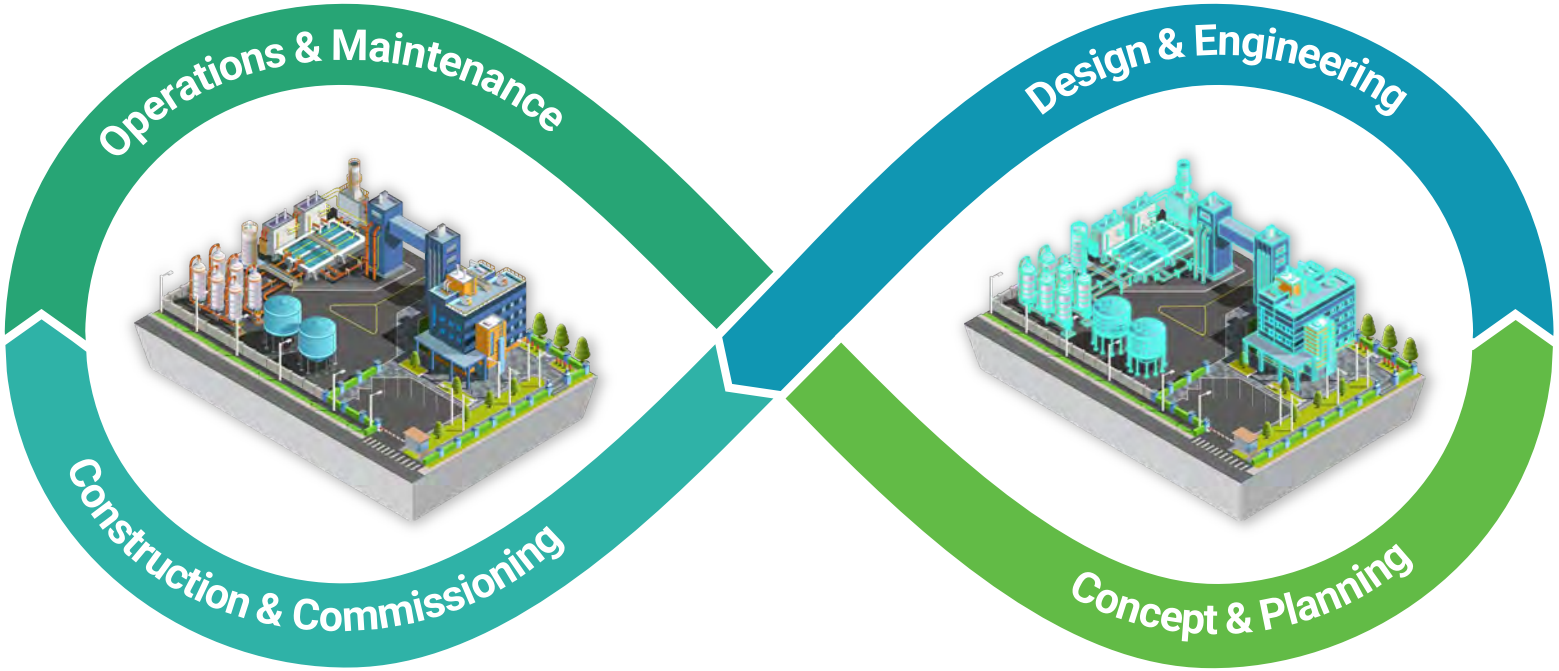


Digital Twin Lifecycle



- HSSE training
- Operator training
- Remote inspection
- Leak detection
- Corrosion detection
- Maintenance planning
- Shutdowns
- Verify before execution

- 4D construction modeling
- Simulate logistics
- Track progress / status



- Stakeholder engagement
- Planning and visualization
- Design collaboration

- Site survey
- Reality capture
- Optioneering

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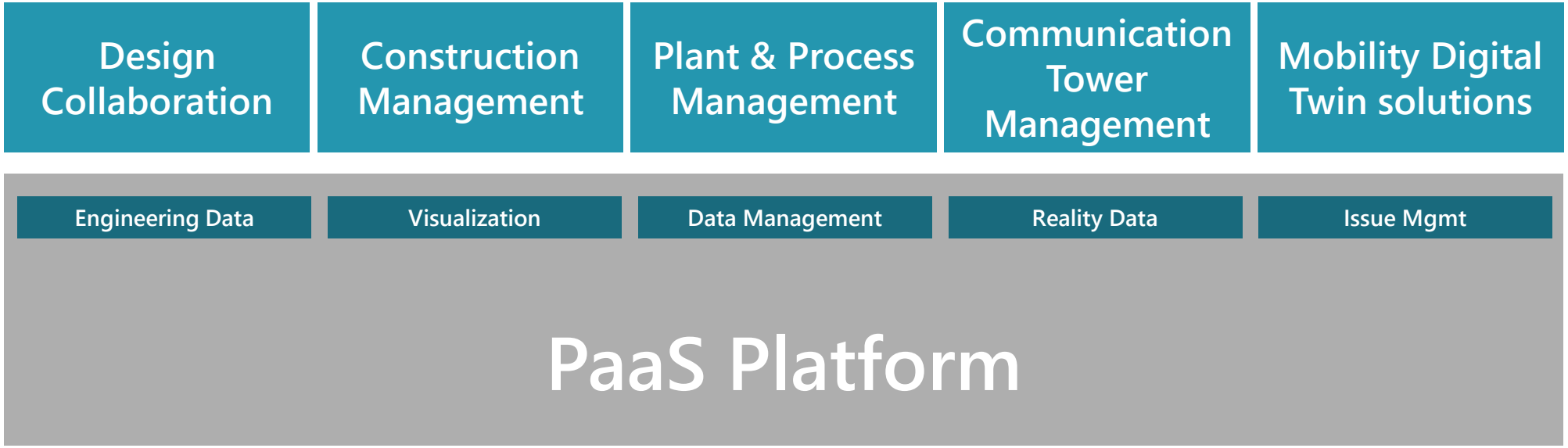
Cloud Services built on an Open Platform



PaaS – Platform as a Service

APIs

Open Source

Extensions

PaaS Platform Solutions

Your Digital Twin

Connect

- Design Data
- Reality Data
- Digital Components
- GIS Data

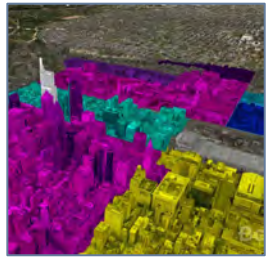
Leverage

- iModel Access
- Issues
- GLTF
- Exports
- Carbon Calculation
- Reporting

Enhance

- Analyze Change
- Validate
- Transform
- Classify

PaaS Solution Example: Workflows



Connect

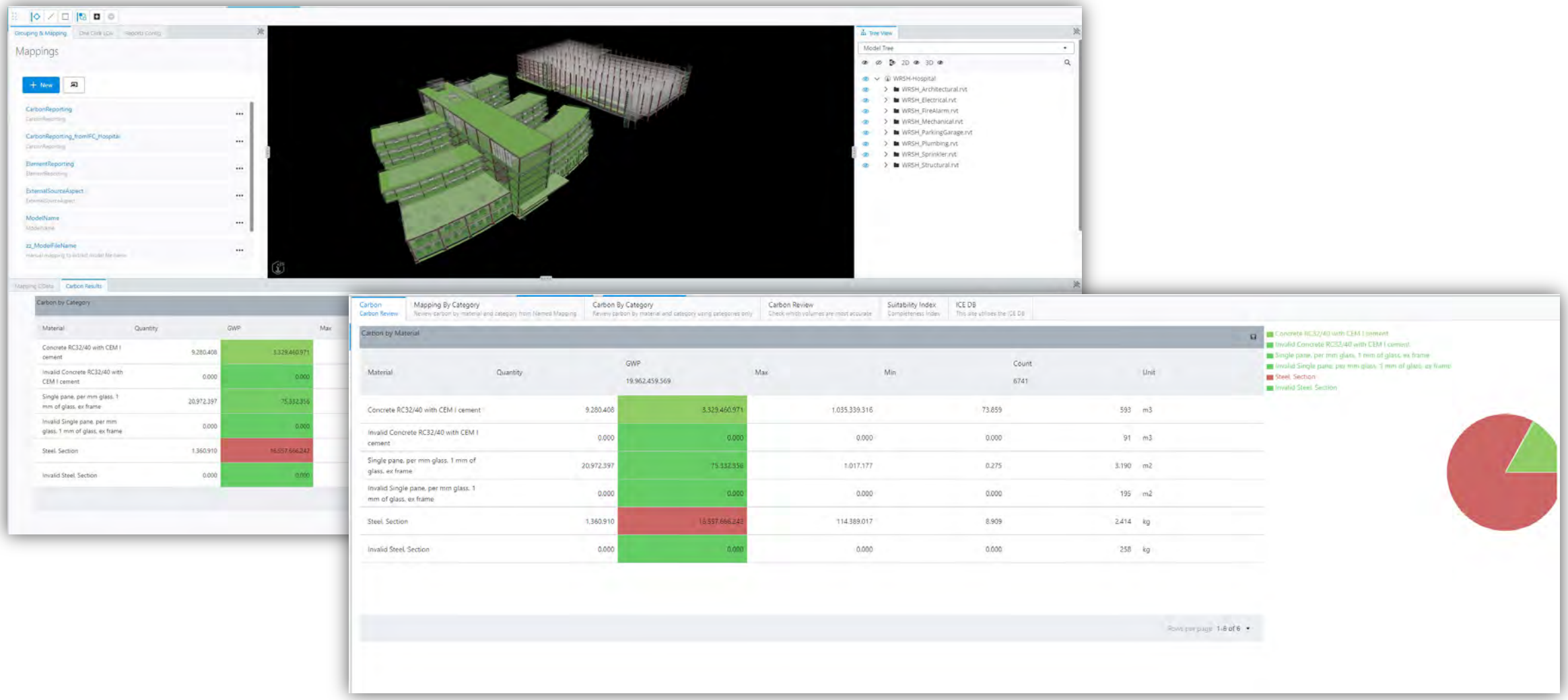
Your Digital Twin

Leverage

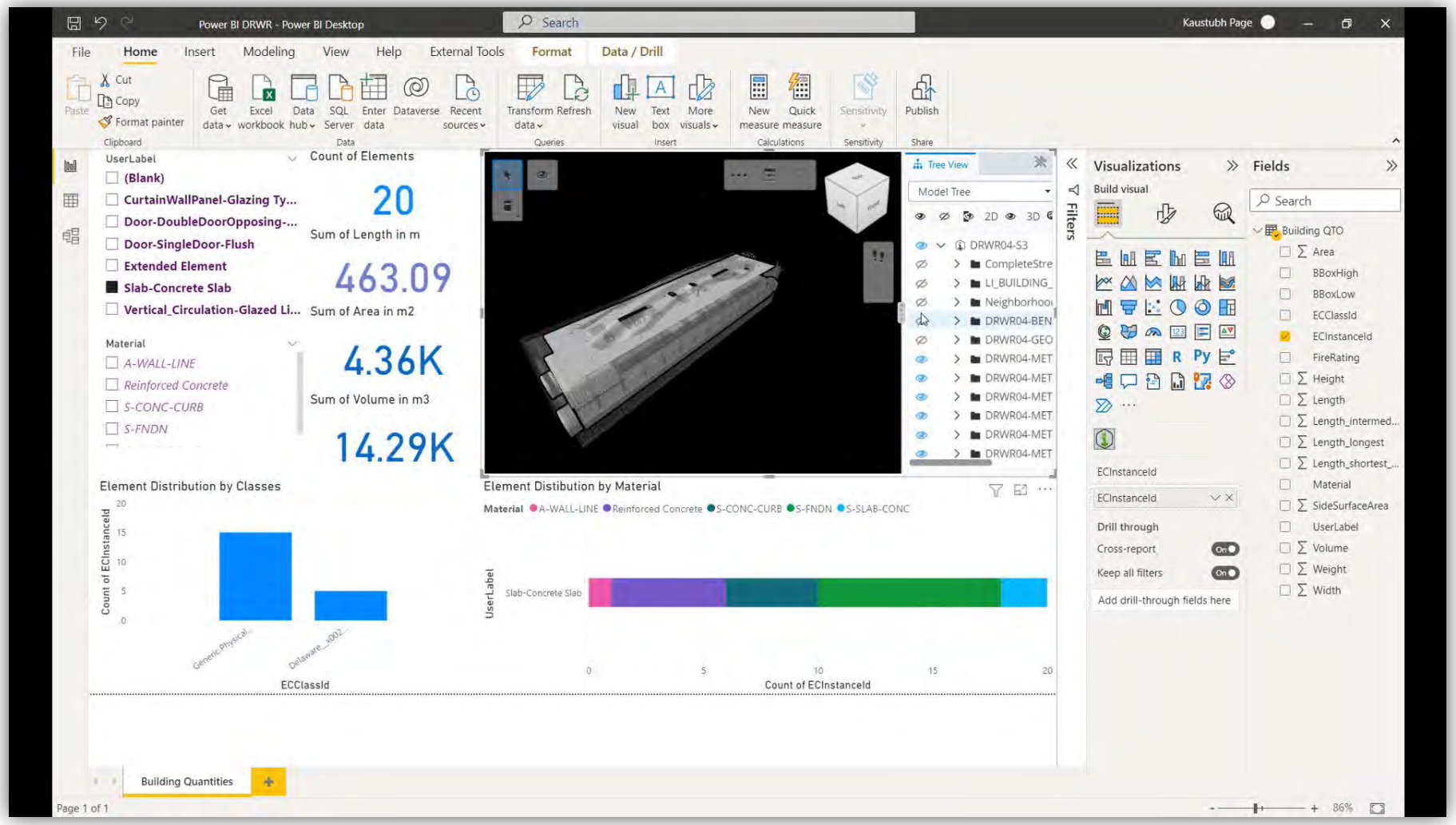
Workflow Solutions

- Carbon Reporting
- Risk Registers
- Project Portals
- VR Review
- Field Data Collection

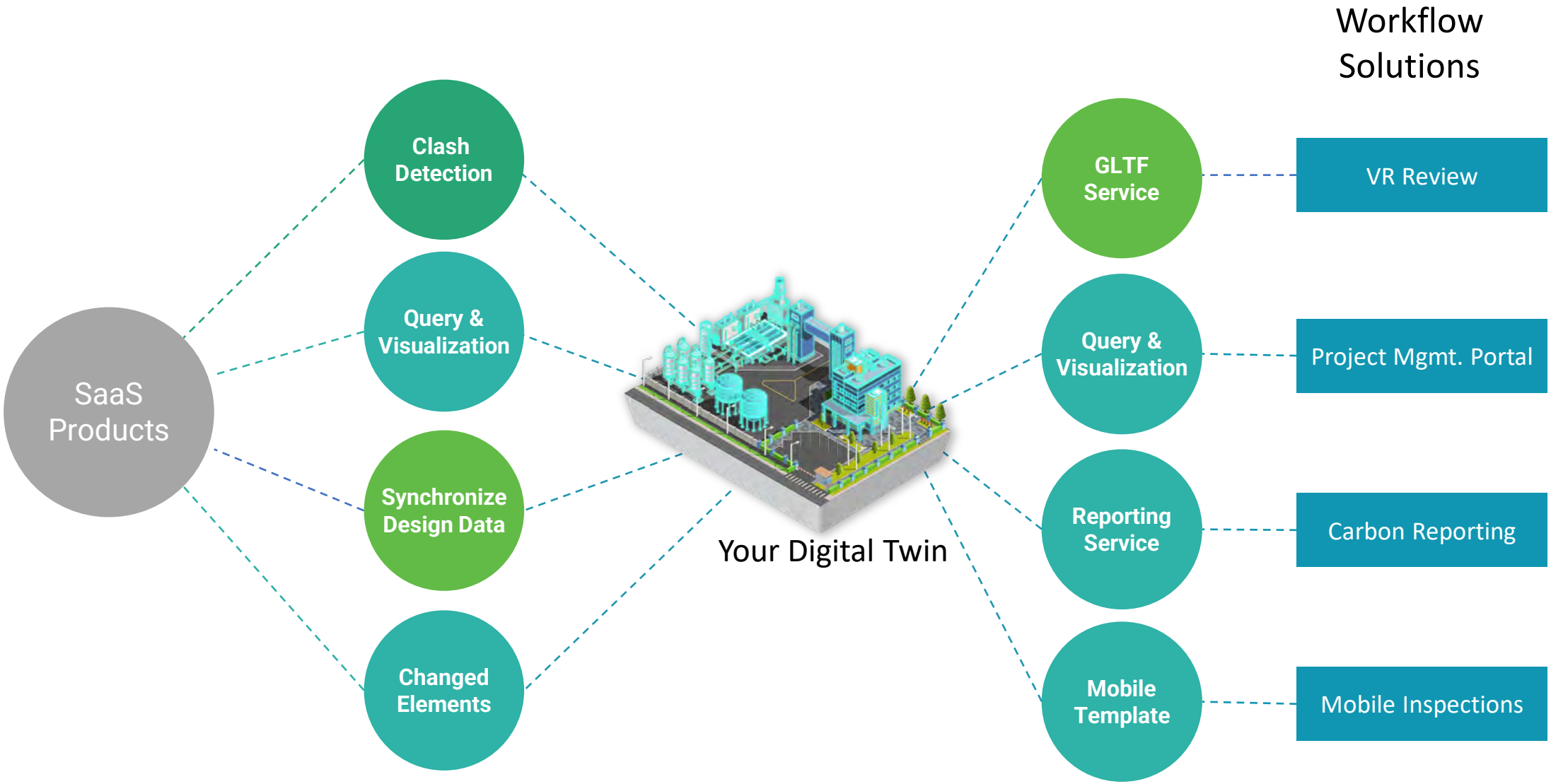
PaaS Solution Example: Carbon Reporting



PaaS Solution Example: Reporting (PowerBI)



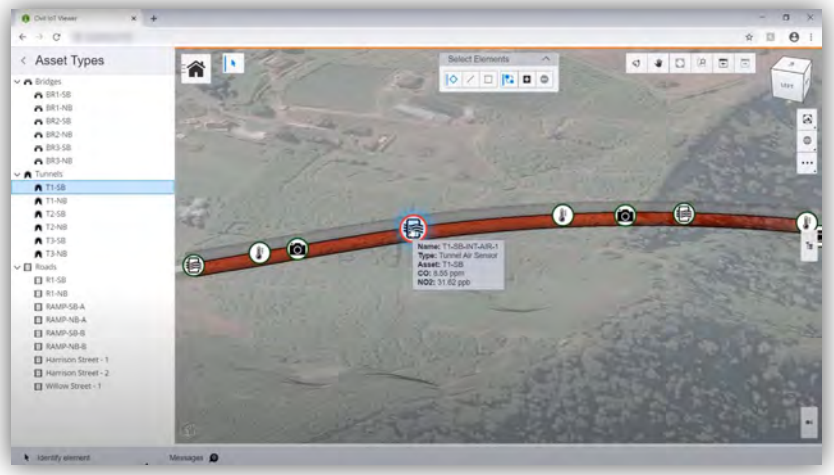
SaaS Product and Platforms



Driving into New Markets

Your Digital Twin

- IoT Sensor Service
- Query & Visualization
- Enterprise Data
- Reality Data



Poll Question:

What are the key advantages to PaaS.

1. Work from a Single View of Truth
2. Visualize, Simulate, and Monitor
3. Improve Decisions and Data Insights
4. All of the above

Section 2

Using a PaaS to extend what you are already doing with your chosen SaaS Solution

Poll Question:

What is the most important skills to have when getting stared developing digital twin solutions.

1. Idea and passion to make a process easier
2. Computer science degree
3. Engineering practitioner expertise
4. Ability to access external funding

Section 3

What requirements are there for engineers or technical teams to get started?

Successful Digital Twins

- Clearly defined value proposition, pains and gains, and market research based on your use case
- Desire to build an MVP (minimum viable product) or Practice
- Dedicated software developers; in-house or outsourced
- Familiarity building solutions on a platform-as-a-service

Accessible Accreditation Programs

- Training and accreditation programs are accessible to developers who want to build digital twin apps for infrastructure
- iTwin Developer Accreditation – Associate Level
- Learn the basic principles and components of the iTwin Platform
  - Data federation and synchronization
  - Visualization
  - Writing queries
  - UI customization
- Approximately 4 hours to complete; no cost

Partner Enablement

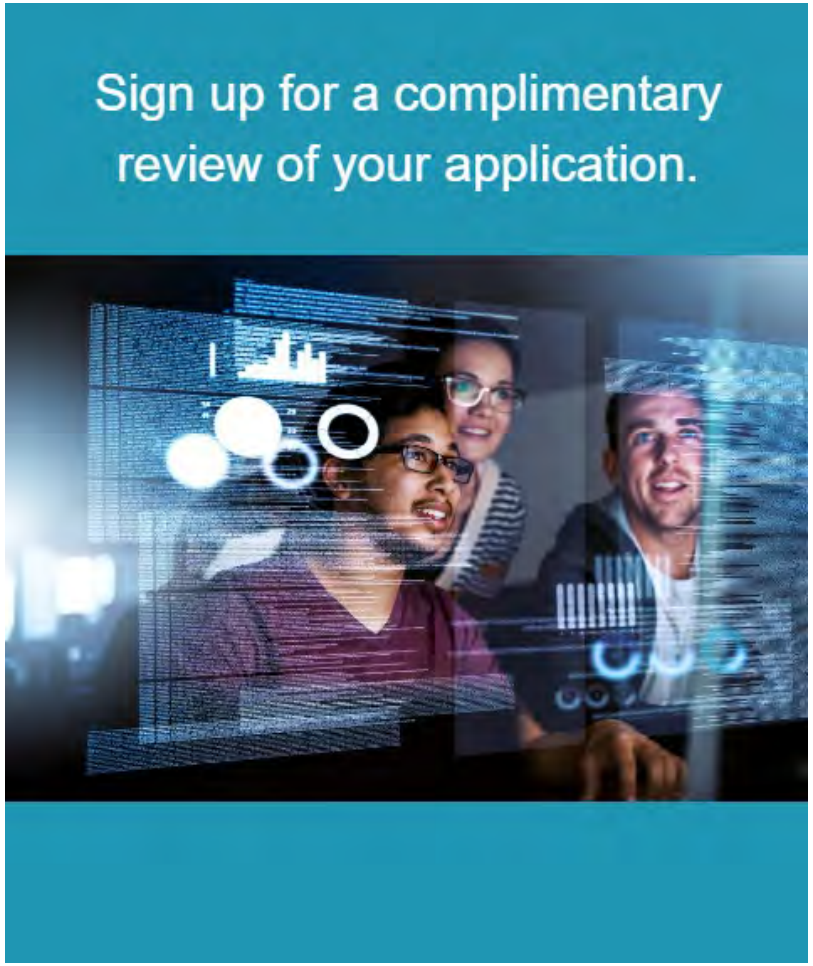
benefits	standard level	premier level
iTwin Partner Logo	◆	◆
iTwin Platform Directory	◆	◆
Dedicated iTwin Partner Manager		◆
Envisioning Workshop		◆
Hackathon		◆
Marketing Resources and Support		◆
Bentley Event Participation		◆

Applications For The Built Infrastructure

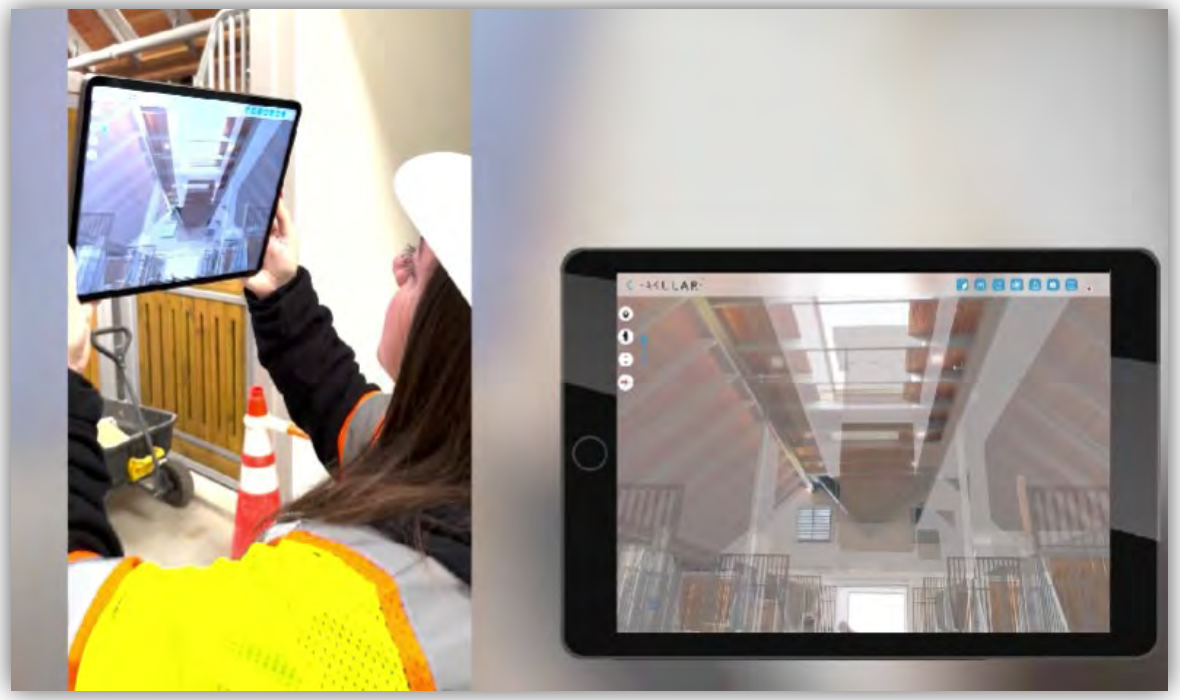
- Offered for applications built on the iTwin platform
- Growing community of iTwin developers and increase your applications exposure within the market
- Benefits:
  - Powered by iTwin badge
  - Quote from a Bentley Systems executive for promotional press release
  - Announcement of product accreditation via Bentley Systems social media

Idea for a Solution

- Have an idea for an application that you want to discuss with likeminded individuals in the digital twin space?
- Submit your idea and our Developer Success team will be in touch to provide you with guidance.
- We also offer free sample code, tutorials, and videos to help engineering firms start their digital twin journey.



Use Case



Use Cases – Shawmut (GC) & National Mall

courtesy of:

AKULAR

Magic Leap

ALPHA CORPORATION

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Poll Question:

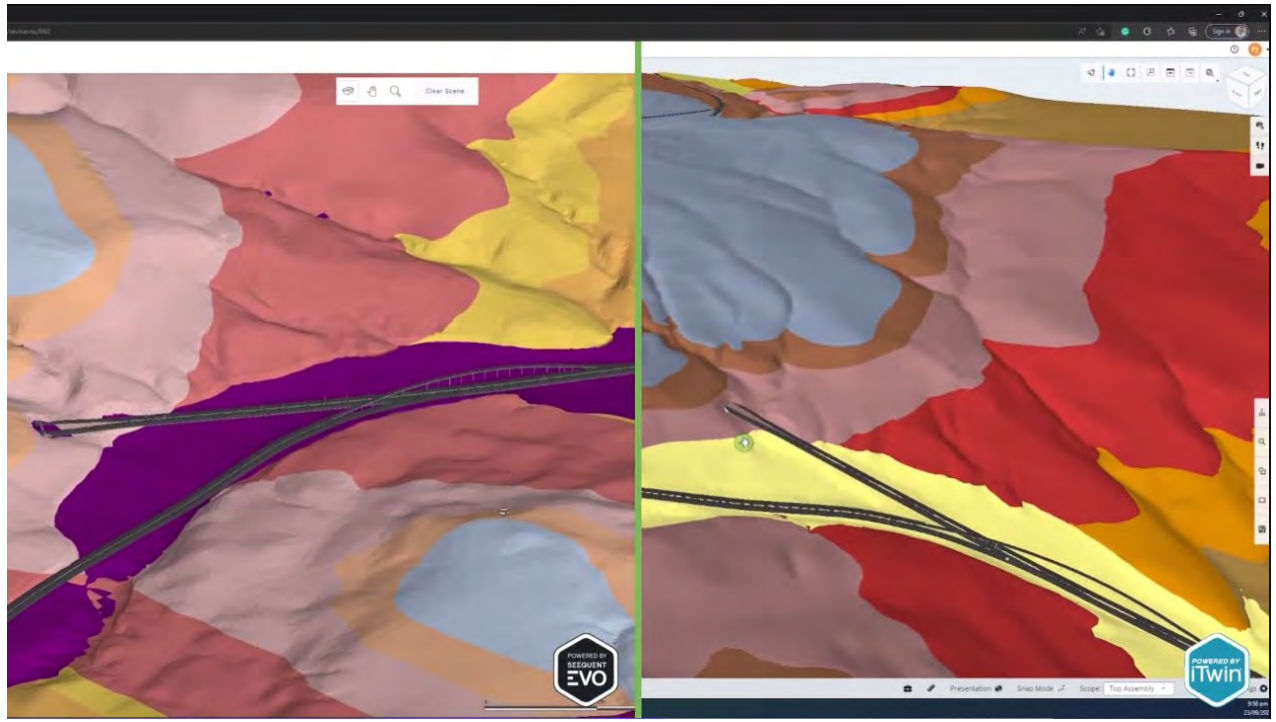
Which area is of **most** interest to make your life easier?

1. IoT – Internet of Things (such as sensors)
2. GIS – Geographical Information Systems
3. BIM – Building Information Modeling
4. AI/ML – Artificial Intelligence / Machine Learning
5. AR/VR – Augmented Reality / Virtual Reality
6. Reality Data

Section 4

Why digital twin ecosystems matter.

No one vendor / firm can do this on their own.



Having the big picture

Bentley and Seequent are working together to enable you to get the most out of the digital twin ecosystem.

Through integrated solutions, subsurface and built environment data are brought together seamlessly, at all stages of your project; from planning, to design and engineering, to construction and commission, operations and maintenance.

Imagine a tunnel project and having to decide which type of Tunnel Boring Machine (TBM) should be used. With the integration of subsurface data, visualization, and increased digitization and automation, modelling and subsurface characterization help not only select the TBM but forecast it's performance.

User Example – Mott MacDonald

Collaborative assessment technique

A single view of all your project data

Unified Visualisation
You will be able to leverage a single view of both subsurface and above ground data to enable faster collaborative analysis

4D Scheduling
Project efficiencies and success through construction sequencing and timeline simulation.

Subsurface Modelling
The integration of 2D and 3D subsurface models enables increased accuracy and less uncertainty for quicker and better project decisions

Block Model
You can analyze large data sets in a simplified representation for faster and efficient data insights, comprehension and management.

Ground Structure Interaction
You will enhance risk mitigation and better understand engineering requirements through the subsurface spatial validation of data

Managed and Secure Data
Your data is secure in the cloud for ease of access and sharing. Your entire team will work from a single source of truth, notified of any changes in real-time.

Digital Twins

Interpretations of the subsurface can now be visualised and incorporated into a digital twin unlocking more powerful project insights

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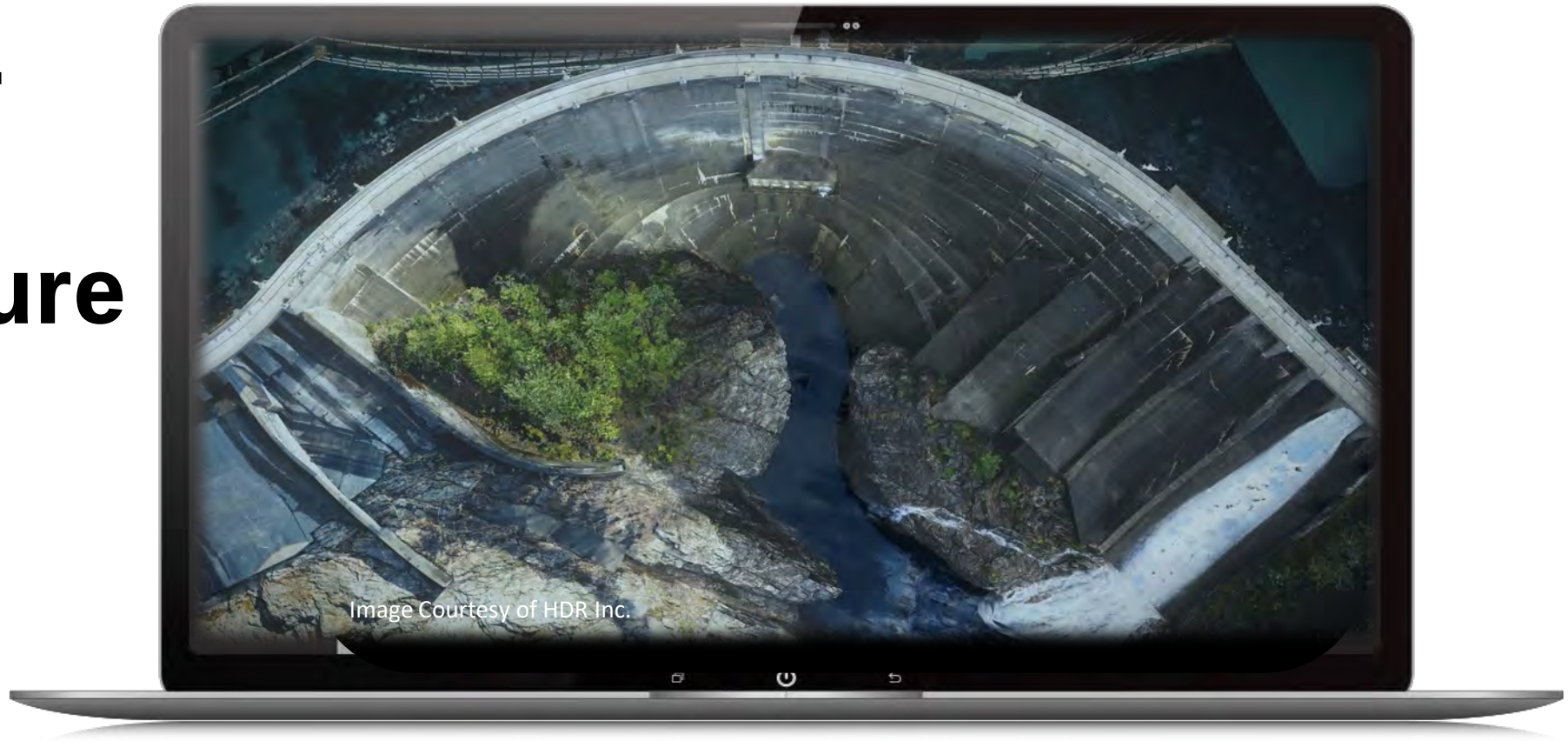
IoT Sensors for Resilient Infrastructure



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Questions and Answers with:

Todd Danielson
Editorial Director
Informed Infrastructure

Sam Migliore
Senior Director, Global Developer Success,
iTwin Platform
Bentley Systems, Inc.

Sheena Gaynes
Director, Business Development,
iTwin Platform
Bentley Systems, Inc.

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