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The magazine for civil & structural engineers

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**H O L O
B U I L D E R**

A FARO® Technologies Company

Harness the Power of a Visual Twin
with 360-Degree Reality Capture
Technology

December 13, 2022

Introduction



Kipp Ivey

Senior Business Development Manager
FARO Technologies



Kipp Ivey (nice title but who am I)

- *Field of Study Mechanical Engineering migrated to Computer Science*
- *Graduated Journey Local 7 Sheet Metal Workers International*
- *Former Manager and part Owner*
- *Moved to the tech side of Construction in 2000*
- *Worked for Quickpen International*
- *Trimble*
- *FARO*
- *Involved in the BIM process since before BIM was an acronym*
- *Worked in the world of reality capture since 2009*



During our time together

- What is Visual Twin ?
- How does it differ from the Digital Twin process?
- Why would I use it in lieu of a Digital Twin process?
- How can a Cloud based Visual Twin Platform benefit you in your day to day ?



To get to the meat of the topic Lets discuss Digital Twin first.

I define it as :

A digital representation of an intended or actual real-world physical Structure and/or Space that serves as a digital source of truth for such purposes,

1. Simulation and analysis
2. Integration and comparison
3. Testing, monitoring of various services
4. Monitoring of existing conditions

To be a Digital Twin, the intended result must be accurate, be able to be appended, edited and allow for simulation and analytics both physically and through other IoT information providing additional metadata throughout the lifecycle.

This is my evolved definition, but the original DT definition was put forth by Dr. Michael Grieves and he continues to drive its evolution.

Why Digital Twin

- *The global digital twin market size was valued at USD 3.1 billion in 2020 and is projected to reach USD 48.2 billion by 2026.*
-MarketsandMarkets
- *As a result of COVID-19, 31% of all respondents use digital twins to improve employee or customer safety, such as the use of remote asset monitoring to reduce the frequency of in-person monitoring.*
-Gartner

Why separate

- As an Industry (AEC, Reality Capture), we have lumped everything into the Digital Twin umbrella
- BIM Model or Design
- LiDAR 3D Scan
- SLAM or Mobile Scan
- Aerial Photogrammetry Collection
- 360 Photo Documentation

I conclude, all of these are part of the process but do not meet the intended definition or result



Why Visual Twin

- We feel the Umbrella needs to be further defined
- WE continue to SEE where we fit within the Digital Twin Process

You can't get away from this

360° Reality Capture



Speed

**Low Cost of Hardware
Lightning-Fast Capture
Ease of Collaboration**

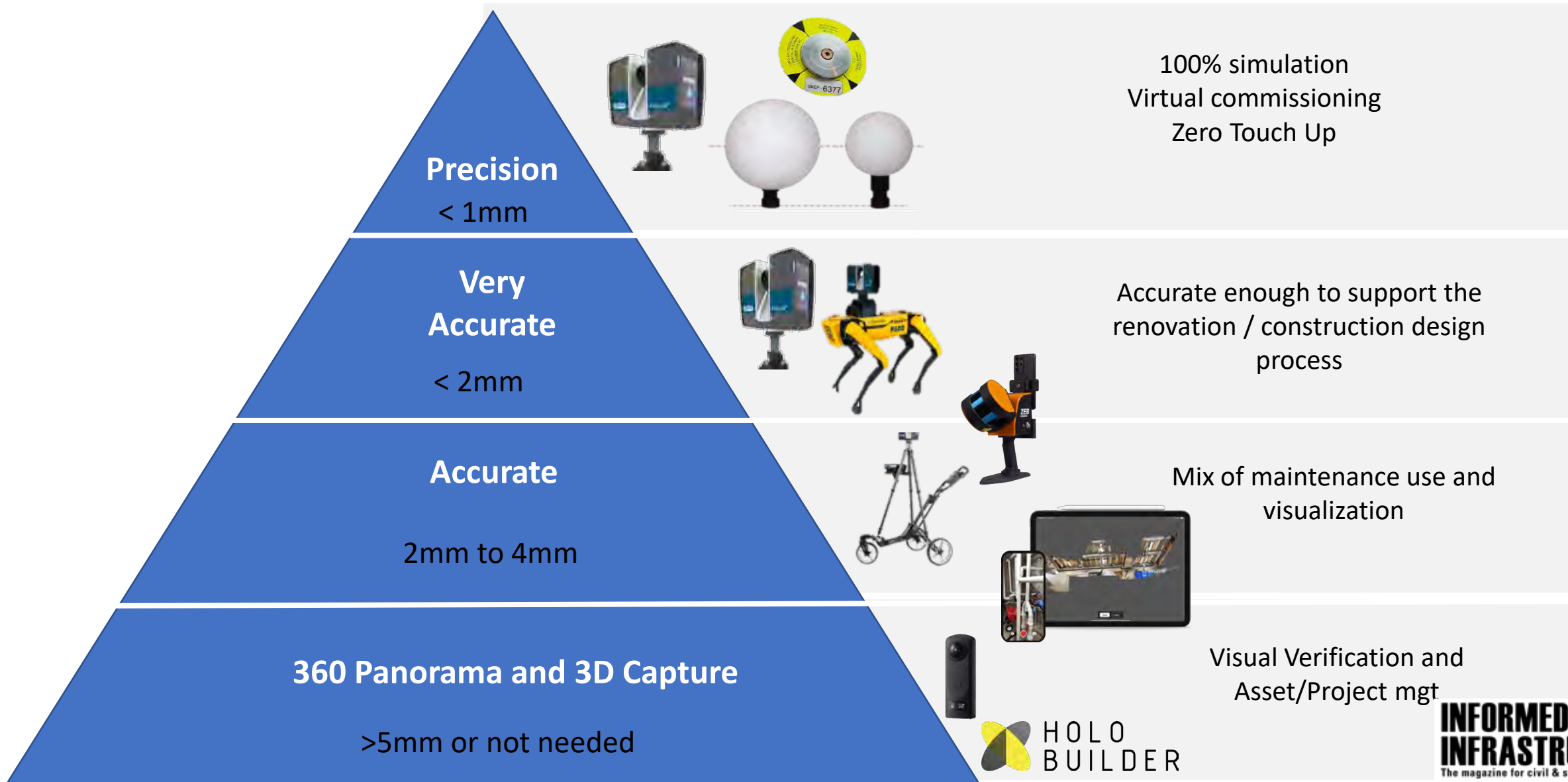
Laser Scanning



High Accuracy

**Point Cloud Analytical Workflows
Engineering Level Data
Scan to BIM**

Realty capture pyramid



Right tool for the right job!

360° Reality Capture



Speed

**Low Cost of Hardware
Lightning-Fast Capture
Ease of Collaboration**

Laser Scanning



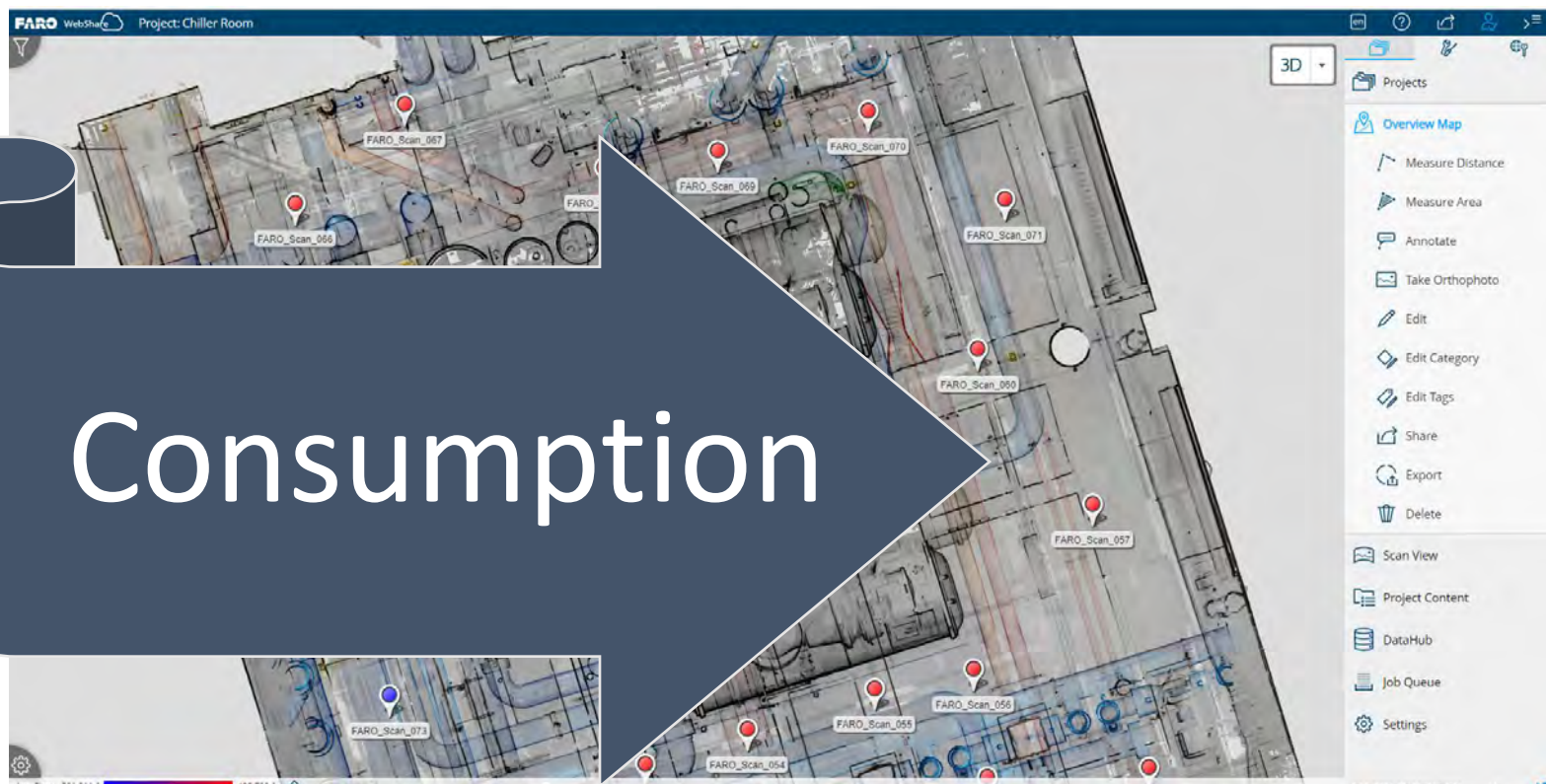
High Accuracy

**Point cloud Analytical Workflows
Engineering level Data
Scan to BIM**

Capture process

Collection

Consumption

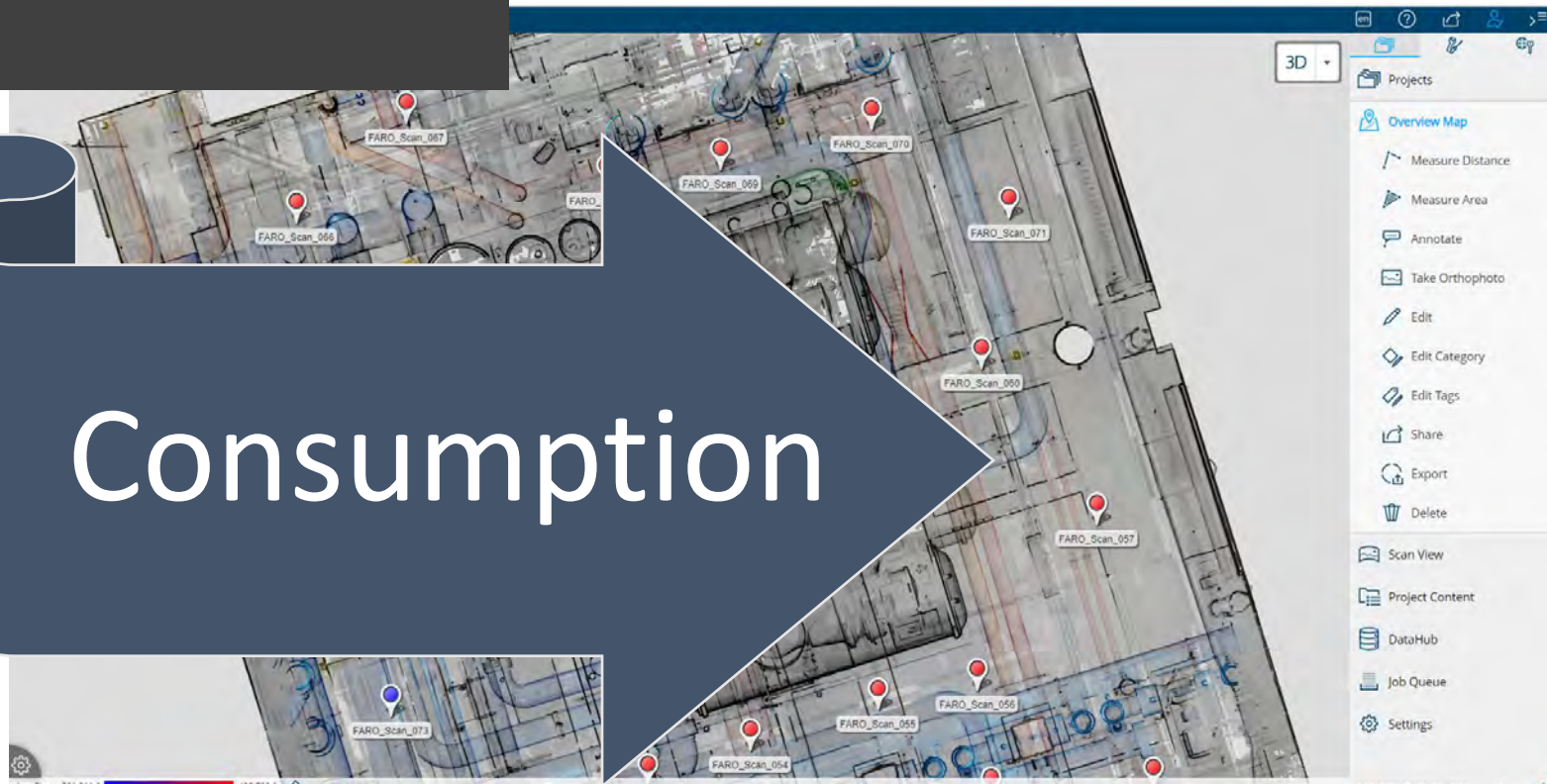


Capture process

As an Industry we tend to Hyper-focus on SPEED
of Collection

Collection

Consumption



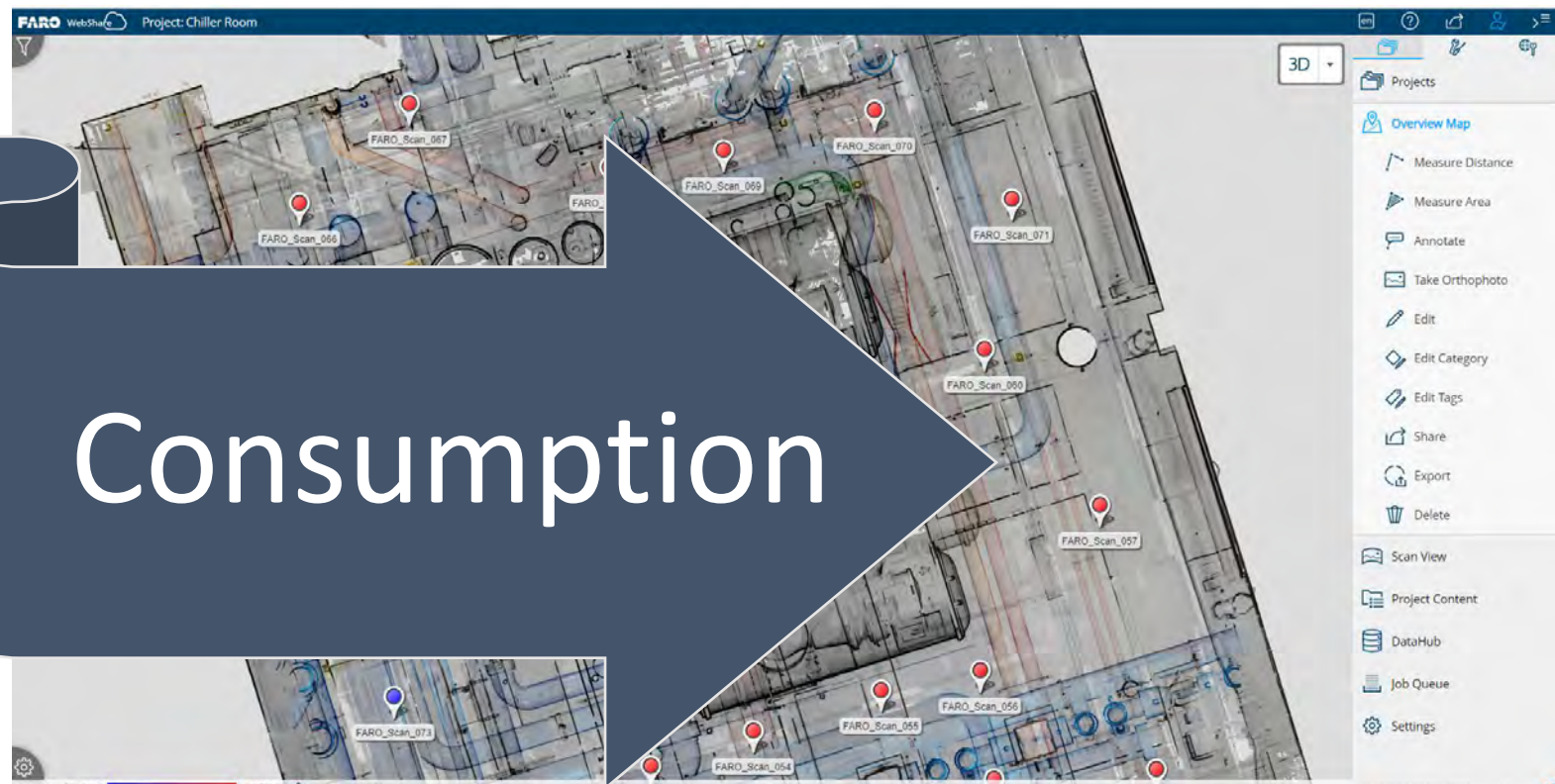
Capture process



Collection



Consumption



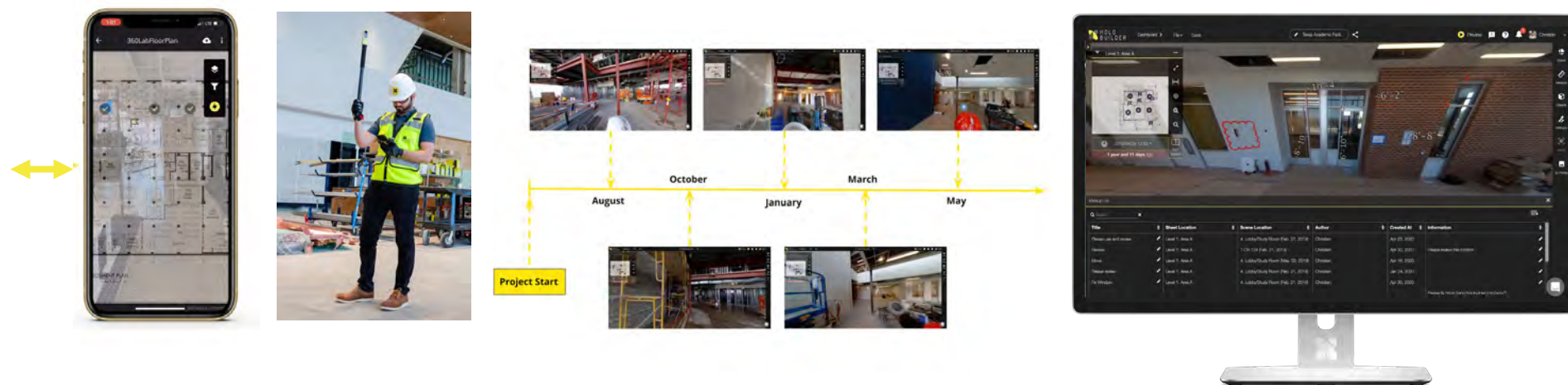
The TIME to Consumption or getting to a tangible, Useable result is where the ROI is.

Visual Twin Process

User in the field captures the site using an off-the-shelf 360° camera & the HoloBuilder app for example

Fast capture in the field...

... Immediate consumption !



Capture

- Off-the-shelf cameras
- Fast, easy, and intuitive to learn

Auto-Organize

- Auto-Pinned to floor plans
- High-resolution visual record

Inspect

- Inspect and validate jobsite - **remotely**
- For payments, dispute resolution. Photos don't lie.

Visual Twin Process



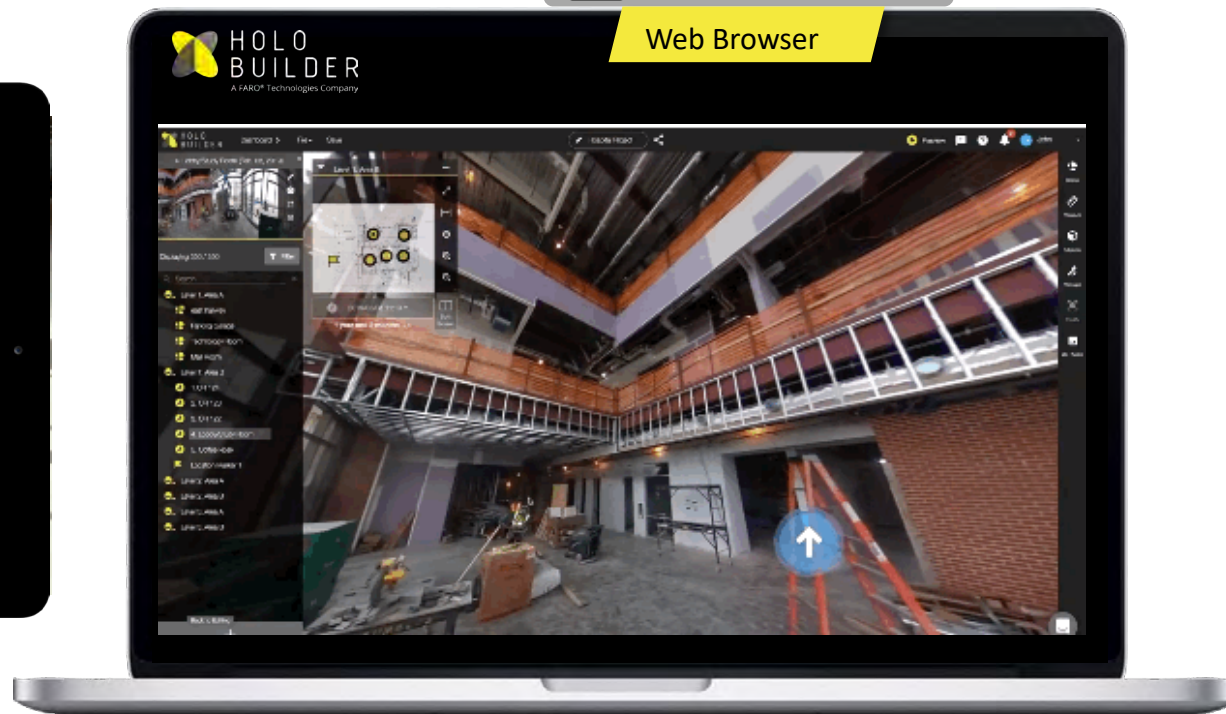
Walk

Mobile Application
iOS, Android



WebEditor™

Web Browser



Visual Twin Platform

- Immediate consumption
- Easily democratize the data
- Allows for growth to allow for downstream analysis
- Allow for import of model-based twin for comparative analysis
- Creates ability to view in virtually real-time
- Augments any existing documentation process
- Should take advantage of existing [segment partners](#) via integration
- Can be taken beyond construction
- Takes 360 photo platform like HoloBuilder to facility, asset, owner, safety and other tangential functions where both 3D and 4D information may be beneficial

Segment partner examples

Microsoft Teams

View your projects in 360° right next to your other documents and collaboration with the HoloBuilder App for Microsoft Teams.

Autodesk Construction Cloud®

Import your files and images from Autodesk Docs and Autodesk Build into your HoloBuilder project.

Procore

Create RFIs & Observations in your HoloBuilder 360° environment and sync them back to Procore.

Box

Connect your Box data storage with HoloBuilder to import floor plans and 360° construction photos.

Autodesk® BIM 360®

Access Docs for file transfer into your HoloBuilder Project. Create and view Field Issues from inside your HoloBuilder project.

PlanGrid

Import your floor plans and construction documentation photos to your HoloBuilder projects.

Dropbox

Connect your Dropbox data storage with HoloBuilder to import floor plans and 360° construction photos.

Autodesk® Revit®

Place HoloBuilder 360° views in Autodesk® Revit® and upload model rendering views and floor plans to your HoloBuilder project.

Bluebeam

Import sheets and photos from Bluebeam into your HoloBuilder 360° site documentation.

Egnyte

Connect your Egnyte data storage with HoloBuilder to import floor plans and 360° construction photos.

Autodesk® Navisworks®

Upload 360° views of your coordination models and compare them side-by-side with your 360° photos.

pCloud

Connect your pCloud data storage with HoloBuilder to import floor plans and 360° construction photos.

Google Drive

Connect your Google Drive data storage with HoloBuilder to import floor plans and 360° construction photos.

Google Maps

Import Google Maps data for site plans. Use GPS to find current location for accurate and easy photo capture.





Visual Twin

“Sometimes to CONSUME IT all
you need is to SEE IT “

~Kipp Ivey

Questions and Answers with:



Kipp Ivey

Senior Business Development Manager
FARO Technologies



Todd Danielson

Editorial Director
Informed Infrastructure

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