

[FDC226235](#)

# Bridging Information Silos: Using Forge in an Integrated FM Platform for Owners

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## Learning Objectives

- Industry challenges to position owners make better use of data to manage facilities
- Scalable methodology to specify owner FM requirements
- Data management issues
- Use of Forge in VueOps
- Challenges of Forge in VueOps

## Description

What if projects empowered facility owners with building intelligence that maximizes the value from design and construction, and seamlessly transitioned knowledge to operations and maintenance, to run the facility optimally from the first day? What if we integrated models, drawings, documents, facility performance and analytics data, and delivered such capability as a simple, contextualized user experience? The VueOPS team has consulted on BIM for FM implementations for large-scale healthcare, aviation, bio-pharmaceutical, and public agency owners. We are passionate about these outcomes. This class shares our journey to bridge current and emergent FM requirements for projects and develop an integrated FM platform that uses the Autodesk Forge platform in our quest to integrate information from documents, models, asset management, and building performance and analytics systems to create building knowledge for our customers

## Speakers

Andrew Arnold focuses on product design and management for applications, and consultation to help customers establish appropriate lean construction, BIM, integrated project delivery, and operations and maintenance practices.

Andrew has implemented BIM for facilities management for large-scale healthcare, aviation, bio-pharmaceutical, and public agency owners.

He received his BA in Architecture from U.C. Berkeley, and PhD in construction engineering and management from Stanford University's Center for Integrated Facilities Engineering. His early career in architecture included work on hospitality, health science, and education projects. He also consulted in computerized-aided facilities management CAFM implementations. Following graduate school Andrew designed and managed BIM applications including databases of

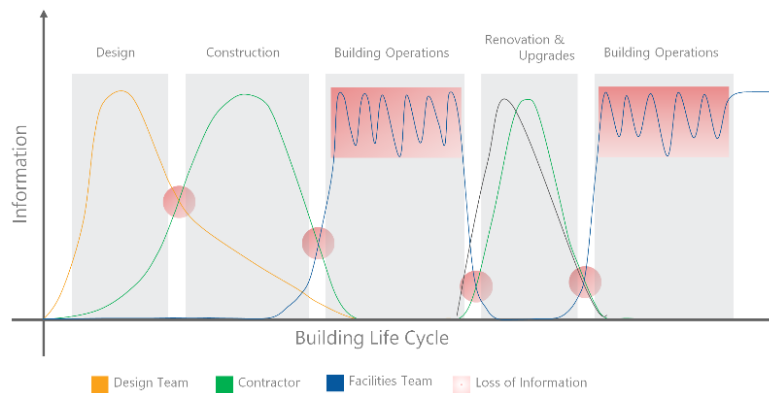
product information, and BIM content management and analysis tools, including quantity takeoff, cost estimating, LEED contribution, and immersive visualization.

Andrew has presented at numerous events, including the Lean Institute, Turkey; International Facility Management Association; Center for Integrated Facility Engineering, Stanford University; McGraw Hill Smart Market Webinar; Autodesk University, Honeywell User Group Conference, Construction Specifications Institute; American Institute of Architects; American Society of Civil Engineers (ASCE); W78 (Working Commission on Information Technology in Construction), TG10 (Task Group on Computer Representation of Design Standards and Building Codes).

Chidambaram Somu (Chidam) is a Virtual Construction Manager for DPR Construction focuses on implementing innovative technologies for construction and building operations applications and new business development for the construction and building operations technology market. His areas of expertise include Building Information modeling BIM, BIM for FM, Reality Capture, data mapping and manipulation for construction/operations intelligence, 4D/5D modeling, and model-based production planning. His past projects include Lucile Packard Children's Hospital, Arizona State University Center for Law and Society, Biomedical Partnership Building, Banner University Medical Center-Phoenix and multiple projects throughout the United States. He received his Master's from Texas A&M University specializing in Construction Management and Business Administration. He serves as a member of several industry advisory boards, is a guest lecturer with ASU, speaker at Autodesk University and has contributed to several publications on construction and building operations technology.

## Industry challenges to positioning owners to make better use of data to manage facilities

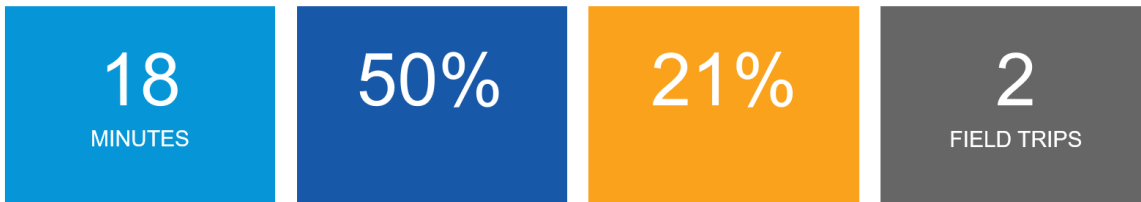
### Project Handover gaps



1. Design & Construction schedules don't include FM milestones/schedules
2. Project closeout becomes low priority
3. Manual data entry into target systems
4. Archival versus Access
  - Electric panel schedules
  - As-builts
  - Product data
  - Life safety information
  - Permits/approvals/certificates
  - Commissioning test data
  - Warranties
5. Lack of standards
  - File names
  - Room names
  - Parts/products
6. Change management
7. Training information not in a shared system or library

## We turn over documents, not knowledge

### Cost of information search



Average search time for documents

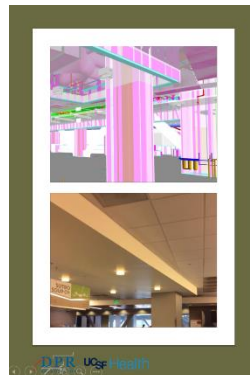
Time spent looking for information

Productivity losses due to document challenges

Average field trips made to collect required information to fix issues

### BIM FM uses

- Find asset by location
- Identify assets
- Maintenance access
- Incidence response
- Incident Location
- Trace to control device for containment
- Understand impacted areas
- Occupant comfort
- Facility licensing/accreditation by JHA
- Life-safety
- Wayfinding



### Right Information, Right Time

Fall 2016

11:15 PM Sunday Night

#### Incident

Liquid line break flood down through 7-story vertical fire-rated chase, emanating in Café, threatening Food Services operations for Monday morning

### Data quality

- Information the building owner needs
- Standards for building assets and asset properties
- Validation for data values
- Field verification
- Change management

### Breaking Silos

- Design and Construction data
- Space management
- Maintenance management
- Building management
- Building performance analytics

### Better Outcomes

- Commitment to technologies and processes that help building owners make better use of data through applications that enable project teams deliver an integrated facility

database.

The database and applications help owners achieve better facilities operation and management outcomes

- Holistic view of addressing the FM data development problem, in terms of upfront specification of owner requirements, changes in project delivery processes to develop the information the owner seeks and change management post project turnover.

## Scalable methodology to specify owner FM requirements

- Enterprise FM data standards
- Enable data development at point of authorship
- Incremental, agile collection, verification processes
- Project/organization outreach to education/training
- Change management process engineering and implementation for facility life-cycle

## Data management issues

Commitment to development of a facility database that includes assets and asset classifications, systems, spaces/locations, and (in future) people/organizations that occupy buildings.

### VueOps Data Platform

The VueOps data platform is organized around Clients (customer business entities), Facilities (buildings), Levels, Zones, Rooms, Assets, Service Request tickets, Contractors who perform warranty work, and document collections. The system extracts locations, systems and assets from BIM and/or AutoCAD.

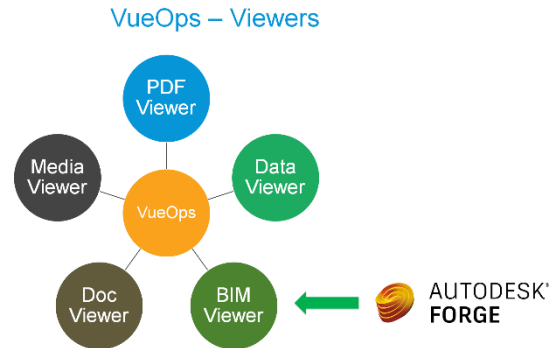
The design is consistent with our holistic and scalable approach to solving FM data development problems. When a modeler authors CAD/BIM content according to VueOps best practices, our system constructs the asset, classification, system, and location relationships which are necessary to support FM workflows.

## VueOps

VueOps is a SaaS browser application, designed responsively to work in desktop and mobile form factors. It provides a portal for project turnover document search and a ticketing system for managing construction warranty events. It has viewers for various file types, for example documents, images, video, CAD and BIM. The BIM Viewer, which is based on Autodesk Forge, integrates the presentation of model geometry, asset and system data, documents, and data from partner systems.

## Use of Forge in VueOps

The BIM viewer enables building managers to easily navigate, filter, and slice a BIM by location breakdown structure, i.e., levels, spaces/rooms to view building assets (geometry that represents installed products and systems), product data, and documents, and asset data supplied by partner systems, e.g., work orders from CMMS or building performance/comfort data from analytics platforms.



## Challenges of using Forge in VueOps

### Big model processing

- Problems when processing large models
- Time to upload the files for processing
- Error messages
- Solved – “forceget” in Header

### Meta-data download

- Big JSON files – 100MB model can produce 500MB JSON file
- JSON download issues

## Forge enhancement requests

### Load multiple models into a scene (in progress)

- Currently merging files from different in Navisworks and pushing to Forge
- Capabilities to merge and process files in Forge

### Direct meta-data query (in progress)

- API to query data directly

### SDK for mobile viewer (Requested)

- Numerous issues rendering big models in Forge Viewer on Mobile