Autodesk® BIM 360™ Field; University Hospital Case Study

Jesse Kassinger
Project Engineer
Jesse Kassinger

- Project Engineer at Zachry Construction Corporation
  - Building Division
  - Heavy Division

- Government and private projects

- Between $2M and $600M (over a billion)

- Current assignment is the CMMS Manager and Close-Out Manager for the ZVL Joint Venture
  - Vaughn Construction (Houston, TX)
  - Layton Construction (Salt Lake City, UT)

- Joint venture’s Autodesk® BIM 360™ Field account administrator
This case study chronicles the implementation and use of Autodesk BIM 360 Field cloud service on a major capital improvements project. Emphasis is on user groups, use of mobile devices in facilitating project management, BIM, commissioning, facilities maintenance and computerized maintenance management systems (CMMS). Additionally, the class includes some discussion on the challenges that were encountered in using Autodesk BIM 360 Field and the solutions that were developed to overcome those challenges.
Key Learning Objectives

At the end of this class, you will be able to:

- Describe the real-world challenges of Autodesk BIM 360 Field and take away actual solutions and lessons learned.

- Identify similar challenges and address them in the early stages of a project.

- Explain how Autodesk BIM 360 Field interfaces with other Autodesk products and third-party FM applications.

- Describe the resources, planning, and stakeholder participation required for effective FM implementation.
Deployment Timeline

- **Early 2010**
  - First Vela Systems contract signed in May 2010
  - 4 Motion tablets purchased in June 2010
  - Implementation stalled

- **Arrived onsite on October 4, 2010**
  - First real look at using the software

- **Late 2010 thru today**
  - User interface redesign (iPad app)
  - Apple’s iPad2
  - Demonstration and education (with our project information)
  - Second Vela Systems contract signed in May 2011
  - Implementation takes off
  - 658 users
User Groups

- Architect (Photo viewer)
  - Architect of Record and sub-consultants

- Contractor (Project admin, document manager, photo viewer)
  - General Contractor and QAQC staff

- Engineer (Photo viewer, inspector)
  - Engineer of Record and sub-consultants

- Owner (Photo viewer)
  - Owner and owner reps

- Subcontractor
User Groups

- **Architect**
  - Interior, exterior, and FF&E

- **Contractor**
  - Structure, skin, interior, QAQC, CX, site, renovations and BIM

- **Engineer**
  - Structural, mechanical, electrical, plumbing, fire protection and low voltage
User Groups Needs

- Issue Types

- Locations
Mobile Devices

- **October 2010**
  - Personnel using traditional methods for project management
    - Hardcopies, Excel logs, email and cell phones
      - a small number of smartphones
    - 4 tablet PCs that sat in a box in the job trailer.
  - Education, demonstration and training

- **December 2013**
  - Lots of smartphones (in the 100s)
  - 150 iPads (+/-) for all users
Mobile Devices

- Purchase history

Number of GC iPads

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### Contract language

"Building Information Model" or "BIM" means a computable representation of all the physical and functional characteristics of the Project facilities and their related life-cycle information, to serve as a repository of related information, as required by the Building Information Modeling Protocols (Exhibit 10), for use by the Project Team during the design, bidding and construction phases of the Project, and for the Owner to continue to use and maintain throughout the lifecycle of the Project.

(Exhibit 10) As soon as is practicable, but in no event later than thirty (30) days after the execution of the Contract between the Owner and the Construction Manager, all Project Participants shall meet, confer and use their best efforts to agree upon the terms of or modifications to a BIM Execution Plan. When agreed upon, the BIM Execution Plan and any modifications shall become an amendment to this Exhibit.

(BIM ExP) Facility Management - The objective would be to be able to use the Architectural and Consulting Engineers’ models for facility management, with the possibility of use in ongoing operations. The Architectural and Consulting Engineers’ models will be used to represent the actual assembly of the building from construction. **The scope of services and document format has yet to be identified and is not defined in the base contract.** This service use can be provided under separate contractual agreements.
BIM

- Coordination
  - BIM Execution Plan Vol 1 (Design Team)
  - BIM Execution Plan Vol 2 (Contractor)
  - No LOD spec
  - Clash detection process

- Mobile device
  - First BIM engine
    - Slow due to massive model sizes (60 MB – 150 MB)
  - Current BIM engine
    - Much improved for use in the field with our models

- FM/CMMS
  - Was an after thought and started in the middle of the project
  - Became an appendix to Vol 2
QAQC & Commissioning - Issues

- 27 issue templates
- 511 issues
QAQC & Commissioning - Checklist

- 65 QAQC templates
- 190 Cx templates
QAQC & Commissioning - Checklist

Checklist Summary - 17,651

QAQC, 9,359, 53%

CX, 8,292, 47%
QAQC & Commissioning - Checklist

Observations - 730,585
- CX, 462,023, 63%
- QAQC, 268,562, 37%

Issues - 6,959
- CX, 3,534, 51%
- QAQC, 3,425, 49%
FM/CMMS

- Owner expectations/requirements
  - Education (Owner & Contractor)
  - Needs, wants and vision

- BIM requirements & setup
  - Appendix 2 of BIM Execution Plan Vol 2
  - Modeling methods

- Barcoding
  - Standards
  - Opticon – OPN 2002 Bluetooth Pocket Scanner

- Use of specific projects to capture and build data
FM/CMMS

- Barcoding
Use of specific projects to capture and build data
Product Interface

- Autodesk
  - Revit
    - plugin
  - Navisworks
    - plugin
    - Modeling methods
    - Search/selection sets

- 3rd Party FM software
  - Excel
Product Interface

- Navisworks
Product Interface

- 3rd Party FM software
  - Excel
Effective FM Implementation

- **Resources**
  - Owner/end user needs, wants and vision
  - BIM
  - Contractor/subcontractor

- **Planning**
  - Owner/end user needs, wants and vision
  - BIM
  - Contractor/subcontractor

- **Stakeholder participation**
  - Owner/end user needs, wants and vision
  - BIM
  - Contractor/subcontractor
Real World Challenges

- Deployment
- User group needs
- Communication/interpretation
- Contract deliverables (Federated Models)
- Modeling methods (Blocks v. Objects)
- Library management
- Safety integration
- Opposition to change
Real World Challenges
Real World Solutions

- Education, demonstration & training
- Location management
- Issue type management
- Communication/interpretation
  - Issue v. Observation
- Model methods
  - _etag
- Creating “ghost” projects for FM
- Library management
  - Pushpin report
Identifying Similar Challenges

- Ask questions during the RFP process
- Understand how people feel about and use technology
  - Owners, A/E firms and Subs
- Contract requirements versus owner expectations
  - Understanding owner expectations
    - Level of development
  - BIM Execution Plan (Project V. Owner)
  - Contract documents