BLD323321

Does BIM Based Facility management Work for Small Projects? - Part 1

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HITT Contracting

Learning Objectives

- Learn how to evaluate items to track for facility management.
- Narrow down the options for facility management solution types
- Learn about the effort and cost of implementing an FM solution on a small project
- Gain a checklist of metrics to determine value and ROI

Description

FM or 6D has been discussed as a huge benefit to owners, but very few owners take advantage of this because it typically requires significant forethought and investment prior to construction. We wanted to see we can implement this after construction. We will dive into a case study of a small 8,600SF Net Zero structure, and looks at several approaches to BIM based facility management. The study will also discuss what elements were deemed worthwhile tracking vs. nice to have. How much effort went into creating a usable solution and what business models exist to support this. We will look at a self-generated approach using (OPS), a consultant based solution (ecodomus) and a vendor based solution (syyclops). Based on the scale and type of project we will discuss the merits of each solution and potential fits within the construction sectors. We will have some value metrics and projected value over the lifespan of the building.

Speaker(s)

David brings 20 years of experience in architecture and construction to inform forward-thinking industry solutions. In his role, David is responsible for developing the vision and strategy for the implementation of virtual construction at HITT, including streamlining processes and coordinating design compatibility issues via the use of industry specific technology tools. He collaborates with project teams to identify and resolve workflow issues and conflicts, coordinate BIM based shop drawings, create visualizations for proactive planning, and communicate project objectives. David is the driving force behind HITT's virtual construction initiatives and is a registered architect and a DBIA design-build professional.

Project baseline and approach

What if we didn't plan for BIM based Facility Management… And how would it be applicable in three different systems.

Based on the scale of the project we made some hypotheses regarding the effort that would result in a usable Building Information Model. Additionally we extrapolated that our building type and scale would allow us to test different features within each proposed solution.

Outline

1. Design required BIM LOD 400 but no structured FM data
2. Construction utilized Reality Capture and BIM for 3D coordination
3. Proposed Facility Management Research project
4. Adopt existing BIM to FM solutions
5. Setup and Implement selected FM systems for 1 year
6. Evaluate

Evaluation

Making the Case for 6D

Since 80% to 90% of the building cost is incurred after Design and Construction is complete, being more efficient on how you manage your building and resources can save significant cost. HITT typically does not own the buildings we build, but we do in this case.

Evaluating Solutions

Most owners that leverage robust FM systems are responsible for multiple building or even campuses and utilize solutions like Archibus and Maximo. These solutions seemed like overkill for a small project and for most of our TI, and single building based clients. So more accessible approaches needed to be considered.

Initiation of system

Once the proposed solutions have been reviewed in the HITT R&D request process we reached out to the providers to understand what data will be needed to implement Facility Management at the CO|LAB

Introduction to CO|LAB

Co|Lab is a space dedicated to bringing ideas to life and building change within our industry.

- Building Construction Type IV – Heavy Timber
- Gross Square feet – 8,600SF
- Net Zero, LEED Platinum, and Petal Certification
- Main Spaces: Lobby, 4 Multi-Function work bays – 2 story high, Large Conference Room, Multiple open space work locations, Roof Top balcony

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R&D Project Concept

What is your R&D project idea?

Our objective is to test three distinctly different Facility Management solutions that utilize

- BIM DIY Approach - BIM 360 OPS
- Integrator Approach - Ecodomus
- Vendor Approach - SYYCLOPES,Inc.

Hypothesis:

- We anticipate that the scale of the project COLAB will allow relatively easy adoption of unstructured data
- Facility Management team will choose to leverage the solution that is easiest to use.

Business Purpose

- Address client needs to maintain and reduce downtime in facility
- Positioning for HITT as a preferred GC
- Inform strategic direction by exploring process, stakeholders required, and total effort entailed in offering this service.
- ROI for Facility Management that constitutes 80% of the total project cost, even a modest improvement will result in offsetting the cost of this R&D project. This improvement percentage is expected to increase over the years of a building's occupancy as maintenance requests increase

Qualifying Success

Engage with facility maintenance staff to use the selected platforms and give input on the comparative benefits of each system.

- Reflect on the platform's user interface: how intuitive or easy to use is it?
- Track and compare the time taken to perform tasks
- How is the process for performing preventative maintenance? Automated?
- Outside of preventative maintenance, what maintenance issues came to light through the platforms? Did anything surface that would otherwise have gone undiagnosed?
- How easy and accurate is it to track assets compared to typical processes?
- How easy is it to track work performed? How intuitive is the historical data?
- Reflect on the platform's flexibility for various project types (building size, building type, etc.): How can we scale this information to our diverse sectors?
- Due to the multiuse nature of the CO|LAB we anticipate being able to apply lessons learned to many project types.

- Due to the lack of a baseline on the Co|Lab we will rely on the experience of the senior staff and available industry standards for comparative data.
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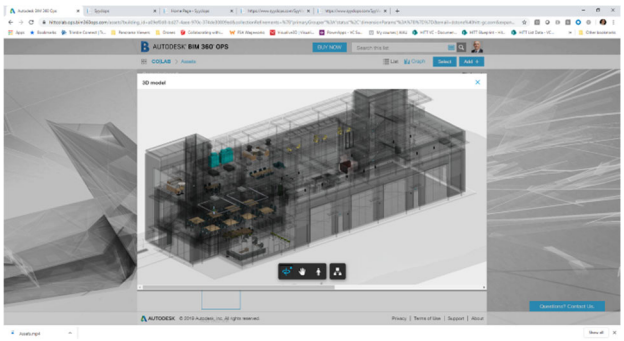
Facility Management Systems Comparison

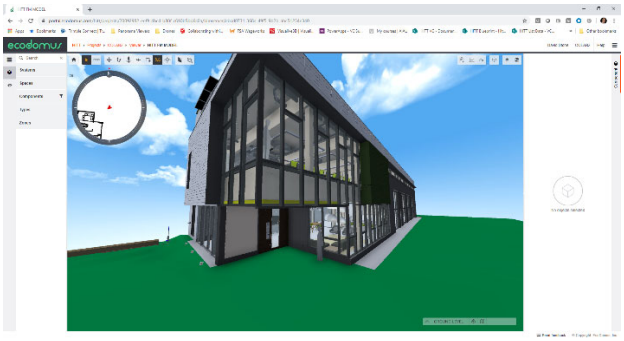
BIM 360 OPS

- Smart phone focus
- Ease of use
- Task oriented



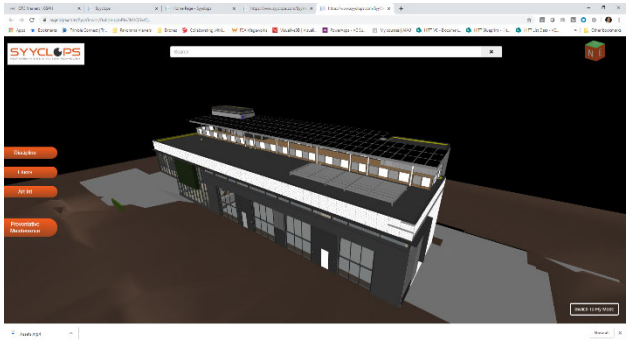
ECODOMUS – THE LIFECYCLE COMPANY

- Integration with BAS
- Robust 3D and
- Robust 2D navigation

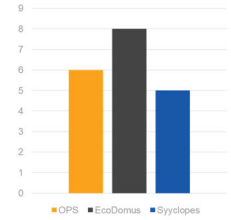


SYYCLOPES INC.

- Total cost of ownership
- Purchasing and automated RFP’s
- 3D navigation
- AFDD – (Automatic fault Detection & Diagnostics) for analyzing live equipment data for diagnosis
- Heat Map for problem areas



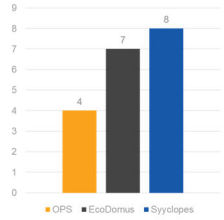
Navigation 2D/3D



ECODOMUS

2D can be used to navigate to 3D location by level, making navigation more intuitive

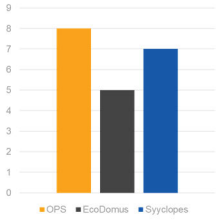
Cost of Ownership



SYCLOPPS, INC.

Focus on tracking utilities and expected life of assets

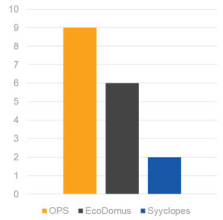
Learning curve



BIM 360 OPS

End user is not required to understand any model navigation or focus on tasks

Mobile Friendly



BIM 360 OPS

This solution has many is focused on mobile first approach

Budgeting

COST OF SOFTWARE

FM Solution	License Cost	Hosting Cost	Implementation Integration
BIM 360 OPS	$125/Month	N/A	
EcoDomus	$125/Month	N/A	$5,000
Syclopps Inc.	N/A	$300/Month	

TIME FOR SETUP

Project Manager – 100 hours (5 Months) R&D proposal, Communication meetings, and setting up OPS Facility Manager – 40 Hours (3 months) Input for assets and PMs, Communication meetings, and Onboarding

Building Engineer – 40 Hours (3 months) Input for assets and PM's, Communication meetings, and Onboarding

INITIATION OF SYSTEM

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Stake Holders Priorities

OWNER - HITT

Cost management Space utilization Efficiency

FACILITY MANAGER

Ease of use Work tickets Space planning

BUILDING ENGINEER

Access to Information – Visual 3D and Documentation Actionable Issues and resolution Preventative Maintenance workflow

Data Collected / Needed

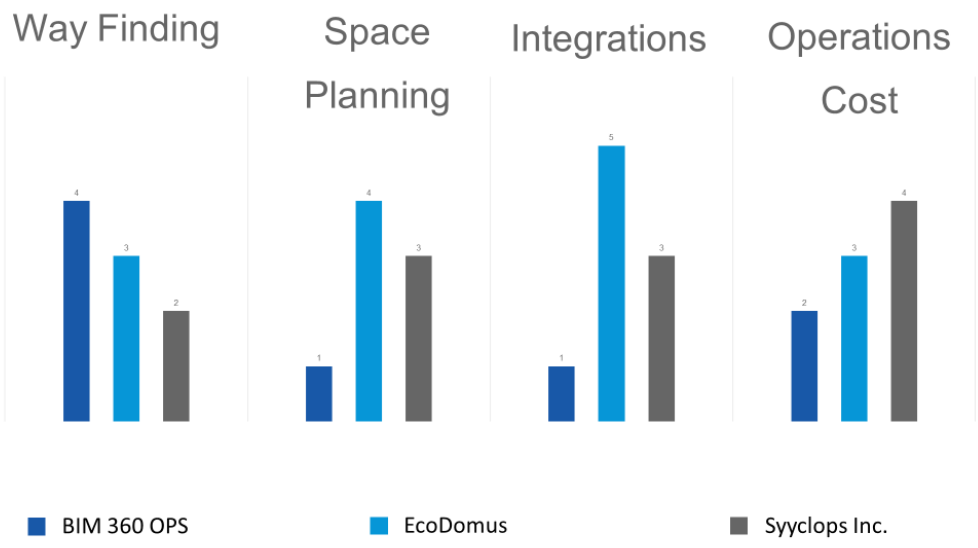
CLOSEOUT DOCUMENT
- PDF Drawings and BIM
- Owners Manuals
- Submittals/ Specifications

SETTING UP BIM FOR FM
- Cleaning up the model
- Updating for as-built including FFE
- Importing to FM solution

PREVENTATIVE MAINTENANCE + TICKETS
- Preventative Maintenance Schedule
- Tickets
- Checklists

Added value for each solution

The following reflect initial understanding of each software capabilities beyond basic functionality



Cost of Implementing FM

Design + Construction	Cost / SF	FM Cost	Ratio
$7,800,000	$1,000	$30,000	LESS THAN 0.5%
Net area = 8,600SF	$300/SF	Includes:	1.2%
	$200/sf	• FM Software	1.7%
	$100/sf	• Manhours	3.5%
		Not including BAS	Based on sim. size

Items targeted for FM

MEP/FP
- HVAC - Quarterly
- Plumbing / Fixtures – Annually
- Sprinkler / Backflow – Quarterly + Annual
- Fire Alarm panel – Annual + Quarterly tests
- In-Floor Heat - Annually
- Big Ass Fans – Semi-Annually

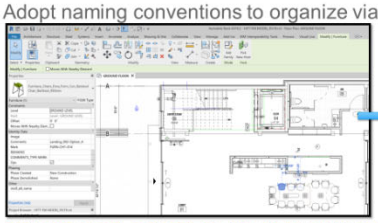
FACILITY MANAGER
- Furniture
- Green Wall – Monthly + (Spring/Fall major)
- Events
- Landscaping
- Cleaning

OTHER
- Elevators – Quarterly + Semi-annually
- Roof – Annual inspection + Monthly Clean
- Cameras - Annually
- A/V – Monthly/Quarterly
- Bathrooms
- Appliances – DW, Fridge, Disposal, Coffee maker
- Concrete Floors – Daily, Weekly, Monthly
- Stainless Steel – Bi-Annually + Annually
- Powder Coating - Annually

Revit to BIM 360 OPS - Workflow

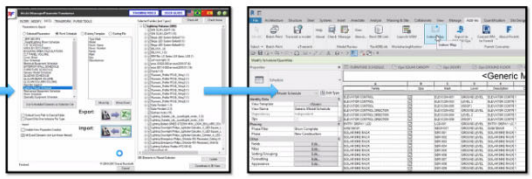
MODEL CLEAN-UP

Adopt naming conventions to organize via schedules



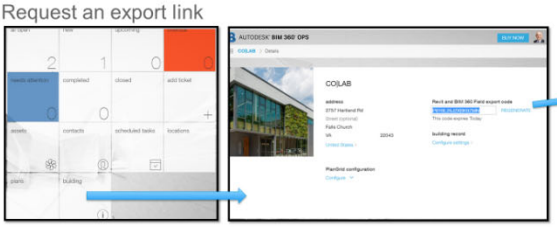
ASSET RENAMING

Bulk assignment of naming convention via excel



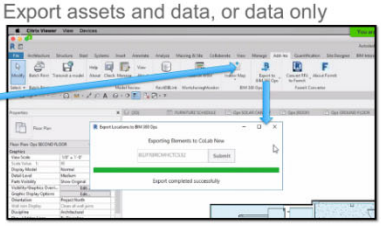
START OPS PORTFOLIO AND BUILDING

Request an export link



EXPORT FROM REVIT TO OPS

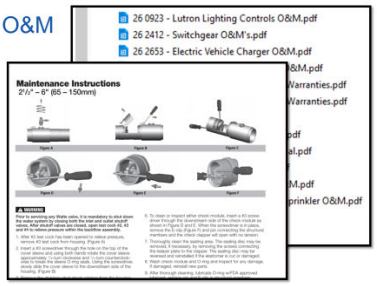
Export assets and data, or data only



Creating a Checklist from O&M's

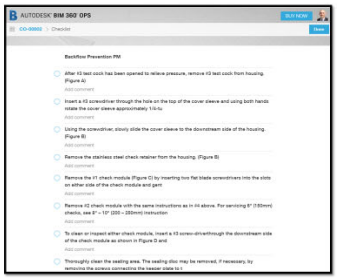
LOCATE PM WITH O&M

- Folder structure
- Separate PM items



CHECKLIST FROM PM

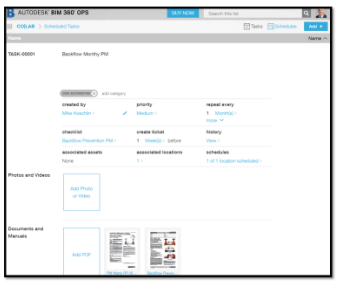
- Portfolio
- Checklist
- Create



UPLOAD O&M'S

- Specific to task

CREATE A PM TASK



Initial Takeaways

DATA COLLECTION
- Owner's manuals – 2-month delay
- Format of O&M's – breakdown to assets
- FFE was not included in closeout document
- BAS system – 5-month delay
- PM's checklists should have been required

STAKEHOLDER INPUT
- Building Engineer and Facility manager had no set template to create a baseline
- Facility Manager never used a facility management system
- Building Owner was not familiar with FM system's

BIM MODEL
- Updating to match As-built
- Model assets do not match O&M's
- Missing FFE elements in the model
- Proper naming conventions and data fields (example: FURN-TBL1-001)

IMPLEMENTATION
- How do you effectively run 3 solutions simultaneously?
- What are the metrics we want to track?

LESSONS LEARNED

Determining how feedable this approach is and what will be the next step.
Biggest challenge moving forward will be: How do we effectively test 3 systems without overloading the team implementing them?

If we could have predetermined all of the objectives outlined in this presentation with the proper resources to manage the deliverables, we would have been able to start implementation of the facility management earlier, but it is not clear if it would have saved money yet.