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FM – With the End in Mind

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Learning Objectives

- Better understand the path to full lifecycle management
- Learn when to start the process, and what data is needed
- Learn how to get the owner and project team looped into the process
- Learn how to use the integrated BIM 360 platform and content

Description

During a typical “BIM” project, we often focus on the design and coordination process with the simple goal of constructing a complex building. But what then? After construction there is still commissioning, warranty, and ultimately the operational phase of a building. Seems like a waste to take all that content and just archive it on a server, right? RIGHT?! What if we had a longer term vision, and could leverage this highly coordinated content looong after the last punch list is completed? Seems easy enough, but is it? In this session we will discuss how to prepare a project team and facility managers to leverage the models, construction documents, photos, and asset data from BIM360 Docs/Field, long after construction, for use in Facility Management via BIM360 Ops. We will discuss what asset information needs to be setup early, how it is connected, and how to make the transition from construction to FM, while also supporting commissioning and warranty phases. If you have ever wondered how you could take BIM further, and truly maximize its value, this class is for you! The goal of this class is to help you better understand the path to full lifecycle management, integrated systems with BIM360, when to start, and how to get the owner and project team looped into the process, early!

Class summary

In this session we will discuss how to prepare a project team and facility managers to leverage the models, construction documents, photos, and asset data from BIM360 Docs/Field, long after construction, for use in Facility Management via BIM360 Ops.

Speakers

Andy Leek: VP Technology & Innovation

I am responsible for strategic planning, enterprise implementations, and innovation. My tenure at PARIC has been focused on developing a proactive strategy to integrate cloud-based tools and processes that enable extended project teams to be more collaborative and efficient. The convergence of AEC technology and a variety of industry experience has enabled me to lead a proactive VDC team with a focus on design, controls, big data, and field innovations. By developing several collaborative partnerships with various technology providers to influence the development of new tools and processes I have enabled integrated preconstruction activities, including model-based QTO and cloud-based estimating, scheduling, along with reality capture tools such as aerial scanning and 360 time-lapse photos, to improve project/data management and information sharing. My highly integrated approach to technology has enabled PARIC to grow our use of technology rapidly, with confidence and accuracy.

Travis Byerley: VDC + FM Coordinator

I am responsible for managing BIM coordination meetings, and assisting with the development and implementation of BIM processes. I earned my Bachelors of Science in Architectural Technology from Ranken Technical College in St. Louis, MO. Before joining PARIC, I spent 10 years designing mechanical and plumbing systems in the mechanical and industrial industry.

Sample Asset Management Questions to Ask Your Owner

These sample questions can help identify critical items to understand the needs of your client better.

- **Asset Management Goals**

1. Why are you looking for an asset management solution? What are your goals?
2. Do you currently have a system to track asset data?
3. How do you manage your preventive maintenance?
4. What issues do you have with your existing process?
5. How do you manage work orders today?

- **Portfolio Information**

1. How many buildings do you manage?
2. Are the buildings located on a single campus or dispersed?
3. Do you have a floor naming standard?
4. Do you have a room number and room name standard?
5. Do you have department categories to define different types of departments?
6. Do you have a data source that currently has this information available to download in a spreadsheet?
7. Do you have updated AutoCAD or Revit drawings that accurately represent your facility?
8. Do you want the 3D Revit geometry tied to your building assets?
9. Will you keep a Revit model up-to-date after construction is complete? What is your process to do this?
10. What is your current process to keep your building drawings and PDF's up to date with all building changes?
11. Are you interested in documenting construction using photometric scanning? Do you want pictures of what is behind a wall or above a ceiling?
12. What reports do you need?

Sample Asset Management Questions to Ask Your Owner cont'd

- **Asset and Maintenance Information**

1. What is your current process for managing equipment information?
2. Do you track assets?
3. Do you have a list of assets that you would like to have maintained?
4. Do you have an asset-naming or numbering standard?
5. Do you have barcodes or QR codes on your assets?
6. What is your current work order ticketing process?
7. How do you manage and track preventive maintenance?
8. Do you have a data source with preventive maintenance checklists or protocols that can export to a spreadsheet?
9. Will you use the manufacturer's recommended maintenance procedure or the facilities best practice procedures?
10. Do you have full-time facility technicians?
11. How does your technician(s) access work order and asset data information on the go?
12. Do your technicians enter their notes at the end of the shift? How much time do they spend entering data in the office?
13. What percent of your maintenance is performed by outside vendors?
14. Where are your building, asset, and preventive maintenance records stored today?
15. How do you group work orders for reporting? (For example, HVAC or electrical)
16. What reports do you need?

- **Occupants and Tenants**

1. How do your occupants report issues today?
2. What if your occupants could report issues directly in the ticketing system?
3. Do you want single-sign-on for your occupants and staff?
4. Do you have a tenant management system that you want to integrate with a facilities ticketing system?

Sample Asset Check List

AIR COMPRESSOR
AIR COMPRESSOR, INSTRUMENT
AIR COMPRESSOR, MEDICAL
AIR COMPRESSOR, SHOP
AIR COOLED VRF HEAT RECOVERY
CONDENSING UNIT
AIR CURTAIN
AIR HANDLING UNIT
AIR HANDLING UNIT, PACKAGED
AIR/DIRT SEPARATOR
AUDIO VIDEO CARTS
AUTOMATIC DOOR OPENER
AUTOMATIC TRANSFER SWITCH
BACKFLOW PREVENTER
BACKFLOW PREVENTER, DOMESTIC WATER
BACKFLOW PREVENTER, LANDSCAPING
BASIN SWEEPER PUMP
BLOWER COIL UNIT
BOILER
BULK OXYGEN TANK FARM
CARBON MONOXIDE MONITOR
CARD READER
CCTV
CHEMICAL TREATMENT PUMP
CHILLED WATER PUMP
CHILLER
CONDENSER WATER PUMP
COOLING TOWER
DEW POINT MONITOR
DI WATER SYSTEM
DIESEL FUEL TANK
DIGITAL DISPLAYS
DOMESTIC HOT WATER PUMP
DUAL DUCT VAV BOX
DUCTLESS MINI-SPLIT SYSTEM
ELECTRIC BASEBOARD HEATER
ELECTRICAL BREAKER PANEL (EMERGENCY) 120-
208 VOLT
ELECTRICAL BREAKER PANEL (EMERGENCY) 277-
480 VOLT
ELECTRICAL BREAKER PANEL (NORMAL) 120-208
VOLT
ELECTRICAL BREAKER PANEL (NORMAL) 277-480
VOLT
ELEVATOR
ELEVATOR CONTROLLER
Emergency Blue Lights
EMERGENCY DISCONNECT SWITCH
EMERGENCY GENERATOR
EMERGENCY LIGHTING
EMERGENCY SMOKE EXHAUST FAN
ENERGY RECOVERY UNIT
ENERGY RECOVERY VENTILATOR
EXHAUST AIR TERMINAL UNIT
EXHAUST FAN
EXIT SIGN
EXPANSION TANK
EYE WASH STATION
FAN COIL UNIT
FIN TUBE RADIATOR
FIRE ALARM ANNOUNATOR PANEL
FIRE ALARM CONTROL PANEL
FIRE DAMPER
FIRE DOOR
FIRE DOORS
FIRE EXTINGUISHER
FIRE PROTECTION BACKFLOW PREVENTER
FIRE PROTECTION JOCKEY PUMP
FIRE PROTECTION VALVE

Sample Asset Check List cont'd

DOMESTIC WATER FILTER
DOMESTIC WATER HEATER
DOMESTIC WATER ISOLATION VALVE
DOMESTIC WATER VALVE
FIRE PUMP
FIRE PUMP CONTROLLER
FIRE SPRINKLER CONTROL VALVES
FIRE SUPPRESSION
FIRE/SMOKE DAMPER
FUEL OIL POLISHER
FUEL OIL PUMP
GENERATOR
GREASE INTERCEPTOR
HAZARDOUS EXHAUST FAN
HEAT PUMP CHILLER
HEAT PUMP CHILLER CONDENSER PUMP
HEAT PUMP CHILLER EVAPORATOR PUMP
HEATED EQUIPMENT
HEATING COIL PUMP
HEATING WATER PUMP
HELIPAD LIGHTING
HELIPAD WINDSOCK
HVAC WATER ISOLATION VALVE
ICE MAKER
JET FUEL TANKS
KITCHEN HOODS
LANDSCAPING IRRIGATION SYSTEM
LAUNDRY CHUTE
LIGHTING CONTROL PANELS
LINE ISOLATION MONITORS
LOUVERS
MAIN ELECTRICAL BREAKER EMERGENCY
MAIN ELECTRICAL SWITCHGEAR PANEL
MAIN WATER ISOLATION VALVE
MAKEUP AIR UNIT
MEDICAL GAS AREA ALARM
MEDICAL GAS MANIFOLD
MEDICAL GAS MASTER ALARM
MEDICAL GAS ZONE VALVE BOXES
MEDICAL VACUUM PUMP
MISCELLANEOUS KITCHEN EQUIPMENT
PNEUMATIC TUBE SYSTEM
PROJECTORS
PUMPS
REFRIGERATED EQUIPMENT
Roofing
SECURITY CAMERA
SECURITY ENTRANCE KIOSK
Solar Panel Invertors
Solar Panels
TOWER WATER PUMP
TRANSFORMERS
VARIABLE FREQUENCY DRIVE
VARIABLE REFRIGERANT VOLUME FAN COIL UNIT
VAV TERMINAL UNIT
WATER HEATERS
WATER SOFTENER

Sample Maintenance Check List

Checklist Name	Category	Checklist Line Item
AHU Monthly PM	HVAC	Inspect general condition of unit
AHU Monthly PM	HVAC	Clean debris from unit
AHU Monthly PM	HVAC	Check unit for unusual noise or vibration
AHU Monthly PM	HVAC	Replace Filters
AHU Monthly PM	HVAC	Check each fan wheel / cone for alignment - possible: binding noise or wheel rubbing against cone.
AHU Monthly PM	HVAC	Ensure unit is controlling at correct set point.
AHU Monthly PM	HVAC	Ensure unit is running in Auto Mode.
AHU Quarterly PM	HVAC	Check structural elements for loose or worn parts including spring isolators.
AHU Quarterly PM	HVAC	Check condition of flexible duct connectors.
AHU Quarterly PM	HVAC	Check condition of fan bearings and lubricate where necessary.
AHU Quarterly PM	HVAC	Check condition of motor bearings and lubricate where necessary.
AHU Quarterly PM	HVAC	Check for excessive noise or vibration.
AHU Quarterly PM	HVAC	Check fan wheels for dirt and buildup.
AHU Quarterly PM	HVAC	Check coils for dirt and buildup.
AHU Quarterly PM	HVAC	Check for loose or broken wiring devices.
AHU Quarterly PM	HVAC	Ensure biocide treatment is visible in condensate pan.
AHU Quarterly PM	HVAC	Ensure drain lines are clear and flowing freely.
AHU Quarterly PM	HVAC	Check lighting, replace bulbs as needed.
AHU Quarterly PM	HVAC	Check backdraft damper operation. (if applicable)
AHU Quarterly PM	HVAC	Check that all linkages are operating smoothly for backdraft dampers. (if applicable)
AHU Quarterly PM	HVAC	Check that all backdraft damper blade seals are in good condition.
AHU Quarterly PM	HVAC	Clean backdraft damper rod bushings. (if applicable)
AHU Quarterly PM	HVAC	Clean external casing of AHU.
AHU Quarterly PM	HVAC	If any damage to paint is found, remove any corrosion and repaint the surface.
AHU Quarterly PM	HVAC	Check the condition of the gaskets around access doors.
AHU Quarterly PM	HVAC	Clean the inside of the AHU with a disinfectant.
AHU Quarterly PM	HVAC	Visually inspect motor making sure vent openings are clear.
AHU Quarterly PM	HVAC	Check filters for restriction using magnehelic replace as needed.
AHU Quarterly PM	HVAC	Lubricate backdraft dampers where appropriate, if so equipped.
AHU Quarterly PM	HVAC	Ensure unit is controlling at correct set point.
AHU Quarterly PM	HVAC	Temperature and pressure gauges installed and functioning
AHU Quarterly PM	HVAC	Check for leaks in coils and at control valves.
AHU Quarterly PM	HVAC	Ensure unit is running in Auto Mode.

Sample Maintenance Check List cont'd

AHU Quarterly PM	HVAC	Ensure unit Asset Tag number is correct and appropriately attached.
AHU Quarterly PM	HVAC	Check that interior and exterior of motor is free of dirt, oil, grease, water, etc.
AHU Quarterly PM	HVAC	Use a "Megger" to ensure that the integrity of the winding insulation has been maintained.
AHU Quarterly PM	HVAC	Record Megger readings.
AHU Quarterly PM	HVAC	Check all electrical connectors to be sure that they are tight.
AHU Quarterly PM	HVAC	Ensure hatches, covers, and doors are in place and properly fastened.
AHU Semi-Annual PM	HVAC	Check structural elements for loose or worn parts including any spring isolators.
AHU Semi-Annual PM	HVAC	Check condition of flexible duct connectors if equipped.
AHU Semi-Annual PM	HVAC	Check fan bearing locking collars
AHU Semi-Annual PM	HVAC	Check Supply fan and motor bearing condition and lubricate where necessary.
AHU Semi-Annual PM	HVAC	Check motor bearings for possible binding, noise, or overheating.
AHU Semi-Annual PM	HVAC	Check Motor voltage and current
AHU Semi-Annual PM	HVAC	Check for excessive noise or vibration.
AHU Semi-Annual PM	HVAC	Lubricate motor base adjusting screws.
AHU Semi-Annual PM	HVAC	Check fan wheels for dirt and buildup.
AHU Semi-Annual PM	HVAC	Check coils for dirt and buildup clean as needed.
AHU Semi-Annual PM	HVAC	Check supply fan and exhaust fan wheels for dirt and grease accumulation.
AHU Semi-Annual PM	HVAC	Check for loose or broken wiring devices.
AHU Semi-Annual PM	HVAC	Ensure biocide treatment is visible in condensate pan.
AHU Semi-Annual PM	HVAC	Check drain lines and pans for clogging.
AHU Semi-Annual PM	HVAC	Check lighting, replace bulbs as needed if equipped.
AHU Semi-Annual PM	HVAC	Check backdraft damper operation. (if applicable)
AHU Semi-Annual PM	HVAC	Check filters for dirt and proper air flow.
AHU Semi-Annual PM	HVAC	Replace filters if magnehelic static limit is exceeded.
AHU Semi-Annual PM	HVAC	Lubricate backdraft dampers where appropriate. (if applicable)
AHU Semi-Annual PM	HVAC	Ensure unit is controlling at correct set point.
AHU Semi-Annual PM	HVAC	Ensure unit is running in Auto Mode.
AHU Semi-Annual PM	HVAC	Ensure unit Asset Tag number is correct and appropriately attached.
AHU Annual PM	HVAC	Ensure hatches, covers, and doors are in place and properly fastened.
AHU Annual PM	HVAC	Notify Control Room of unit Shutdown (coordinate with department leader prior to shutdown)
AHU Annual PM	HVAC	Follow proper lock out tag out procedures
AHU Annual PM	HVAC	Ensure unit Asset Tag number is correct and appropriately attached.
AHU Annual PM	HVAC	Clean Fan wheel

Sample Maintenance Check List cont'd

AHU Annual PM	HVAC	Clean Coils
AHU Annual PM	HVAC	Blow out drain lines
AHU Annual PM	HVAC	Lubricate bearings (if applicable)
AHU Annual PM	HVAC	Inspect protective finish
AHU Annual PM	HVAC	Lightly lubricate damper bushings and associated linkage (Ruskin-Back draft damper)
AHU Annual PM	HVAC	Check fan housing condition for corrosion and penetrations.
AHU Annual PM	HVAC	Remove lock out tag out devices
AHU Annual PM	HVAC	Notify Control room of start-up and return unit to auto mode
AHU Annual PM	HVAC	Check for excessive noise or vibration.
AHU Annual PM	HVAC	Record Magnehelic reading



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Thank You

