Transition to Operations with Building Ops: The (Eye) in BIM

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BIM Application Specialist

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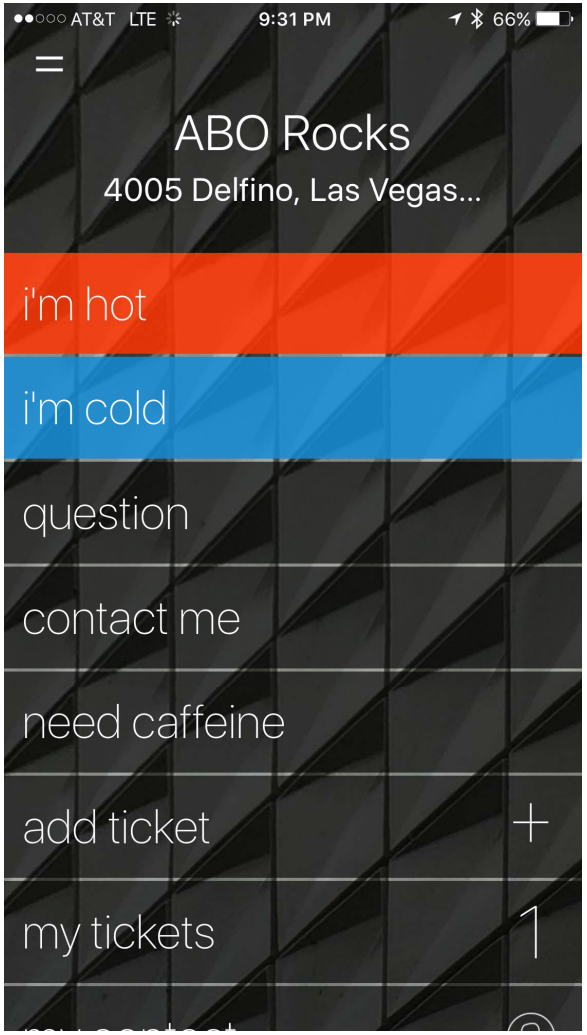
Class summary

With Building Ops software, we can truly focus on the “I” in BIM. Building Ops software brings a business value that enables the owner to reduce cost, ensure equipment continuity, and future proof investments by streamlining the owner-driven BIM process. Manual data collection has been a difficult task, wasting precious time, effort, and capital. Improving this workflow by using validated data directly from BIM will give your staff access to asset information, history, maintenance manuals, and the 3D model from before the first day of operation.

Key learning objectives

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

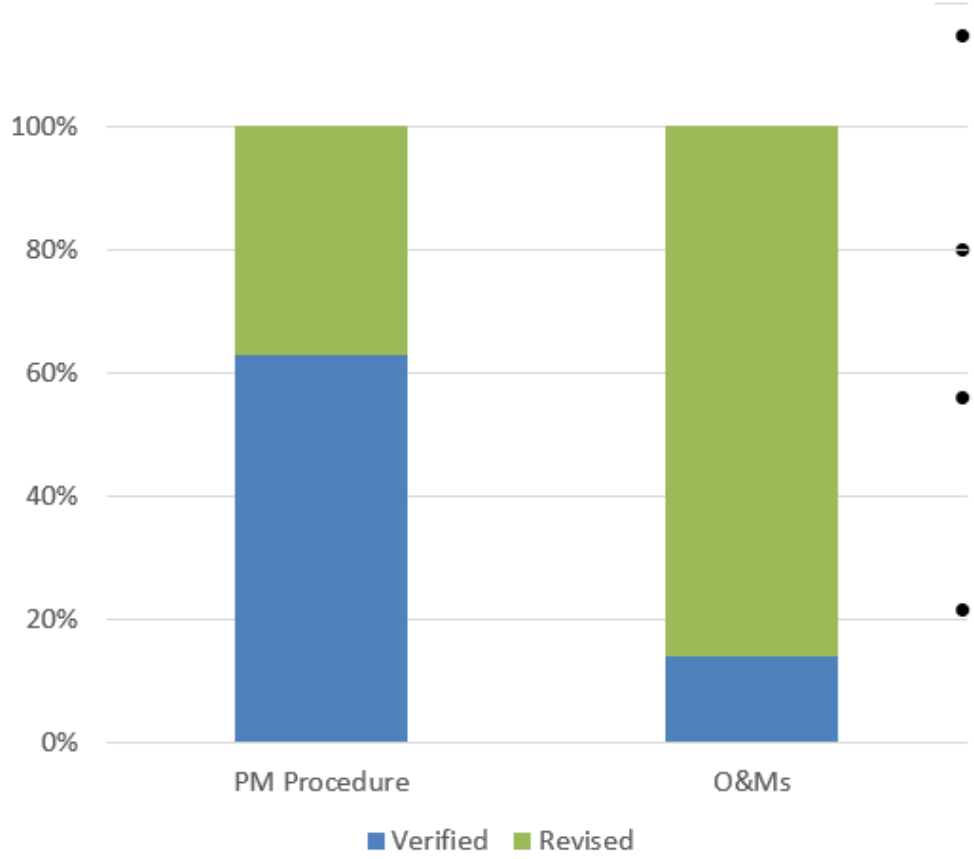
- Track maintenance data before taking ownership
- Learn how to increase accuracy of CMMS data at turnover
- Learn how to reduce data-entry man-hours
- Discover how training manuals and video tutorials can be tied to assets



About Bernhard TME

- Headquartered in Little Rock
- 187 Employees in 14 Locations (8 Offices)
- Certified Healthcare Facility Managers on staff
- Dedicated to Customer Advocacy Philosophy
- Extensive CMMS Experience
- Health System Experience
- Driven to Provide Sustainable Performance

Analytics



- Completed review of all assets for all equipment in CMMS program.
- Located, uploaded and linked O&M'S in file.
- Reviewed and compared O&M's vs. MFG requirements.
- Revised and created new PM procedures for compliance.

Data From Healthcare Facility Manager

Focused on The Joint Commission Data

200,000 SQUARE FOOT BUILDING

1,000 ASSETS
— into CMMS —

Approximately 120 minutes
per asset for data acquisition and creation in IWMS

2000 hours
@ **$45** per FTE Hour

$90,000 spent
obtaining and populating data

Approximately 10,000
lines of data

AVERAGE OF 1 YEAR
to complete

Using Integrated Data

200,000 SQUARE FOOT BUILDING

1,000 ASSETS
— into CMMS —

OWNER-DRIVEN
BIMx Data Plan

Commissioning
DATA USED

Data Acquisition
from BIM software

0 hours
@ **$45** per FTE Hour

$40,000 spent
obtaining and populating data

Approximately 10,000
lines of data

4 DATA IN IWMS
at Substantial Completion

Transition to Operations

4 Questions

1. How often do often do you deliver/receive the actual FM data needed for the building PM program?

2. How many hours did it take your team to assemble the FM data from your last building project?

3. Did you use BIM Data?

4. How did you assemble and deliver the Operations and Maintenance manuals?

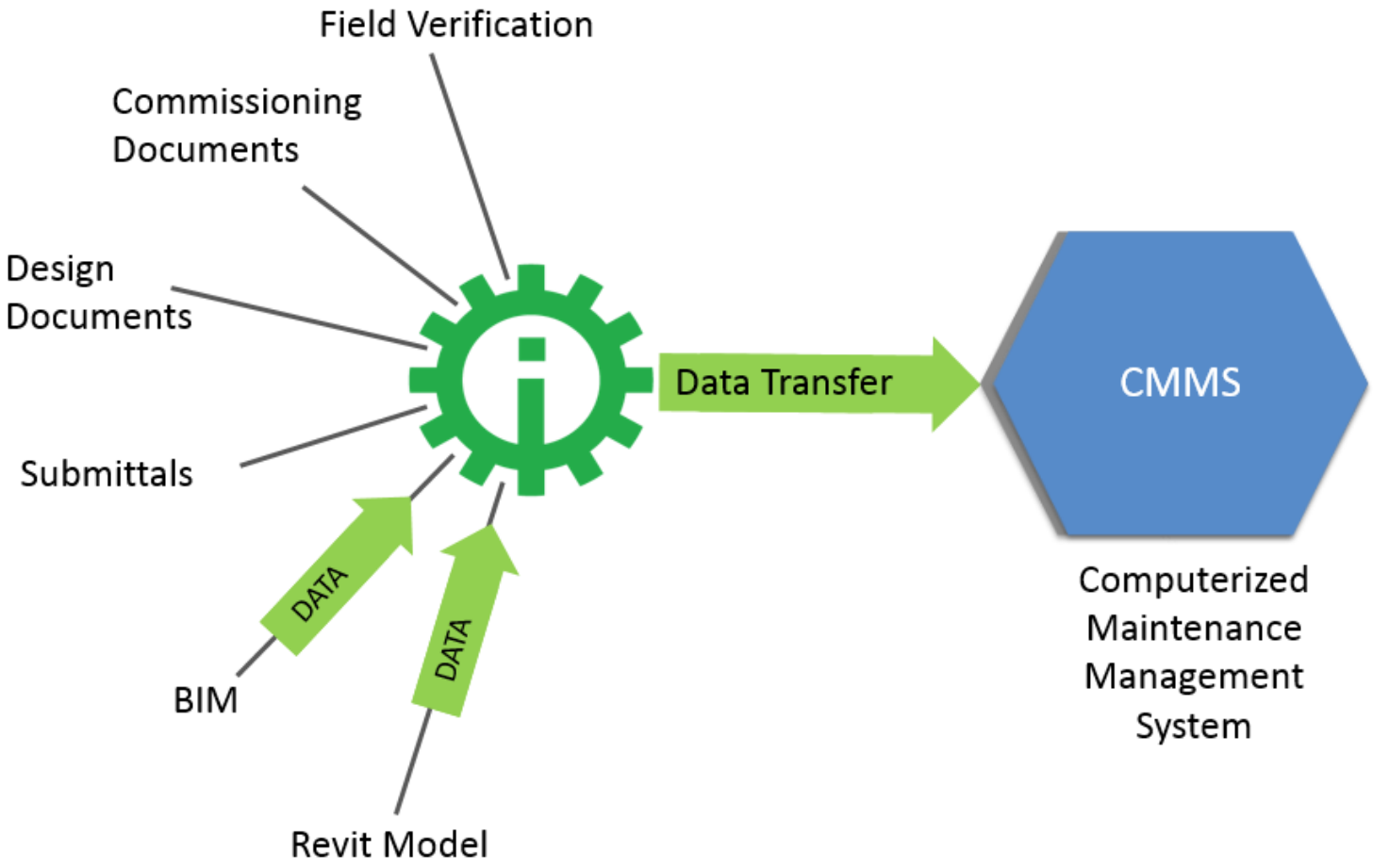
Common Issues

- Owners don’t use the paper deliverables.
- Large PDF’s are challenging to handle.
- Asset data is inaccurate or incomplete.
- As-Builts are inaccurate or incomplete.
- Time consuming efforts by sub contractors at data handoff.
- Managing the maintenance documentation prior to occupancy

Major Owner Concerns

- Manual data entry by Facility Personnel is time consuming
- Facility Personnel have many other tasks during a building transition
- O&M manuals provided during construction are often inaccurate and incomplete.
- O&M manuals are often not available in time to have CMMS in place at building opening

Data Collection and Transfer



Equipment Asset Information Sample

Master Med Gas Alarm	Jockey Pump	Electrical Distribution Panel CH-PRL3A
Grease Trap	Medical Air Compressor	Electrical Distribution Panel CH-PRL2A
Medical Air Dryer	Lab Air Dryer	Electrical Distribution Panel CH-PRL1A
Medical Air Dryer	Single Duct Terminal Unit T-DESV	Fire Door 45 Minute
Control Air Compressor	Single Duct Terminal Unit S-LGE	Fire Door 90 Minute
	Single Duct Terminal Unit S-LGS	Fire Door 20 Minute
Heating Hot Water Pump	City Water Booster Pump	Pneumatic Tube System Diverter
Air Handling Unit H-Airpak	Backflow Preventer Watts LF	Pneumatic Tube System Station
Chilled Water Pump	Backflow Preventer Wilkin 350A	Medical Gas Zone Valve Box
120-208 Volt Electrical Breaker Panel CH-PRL1A	Circulating Pump	Fan Coil Unit E-H20
480/Pri.120/208 Sec. Electrical Transformer, CH-V48	Medical Gas Area Alarm	Fan Coil Unit E-HPE
Variable Frequency Drive D-FC102	120-208 Volt Electrical Breaker Panel E-CH-PRL1A	Fan Coil Unit E-H30
Air Compressor	120-208 Volt Electrical Breaker Panel E-PG-IDP	Fan Coil Unit L-MM
277-480 Volt Electrical Breaker Panel CH-PRL2A	277-480 Volt Electrical Breaker Panel E-CH-PRL2A	Air Handling Unit H-Acousti
Campus Elevator	Eye Wash Station	Hazardous Exhaust Fan G-085
Fire Damper R20G	Automatic Transfer Switch	Hazardous Exhaust Fan G-15
Fire Damper R60	Domestic Water Filter ETS-SX	Hazardous Exhaust Fan G-8
Fire and Smoke Damper FSD60	Domestic Water Filter ETS- ECP	Hazardous Exhaust Fan G-16
Fire and Smoke Damper FSDR25	Fire Standpipe Compressor	Exhaust Fan G-18
Domestic Water Heater	Main Electrical Switch Gear Panel	Exhaust Fan G-099
Medical Vacuum Pump	Electrical Capacitor Bank	Exhaust Fan G-CUBE
Water Softener	Electrical Distribution Panel CH-PRL4	Exhaust Fan G-MSX
Fire Pump		

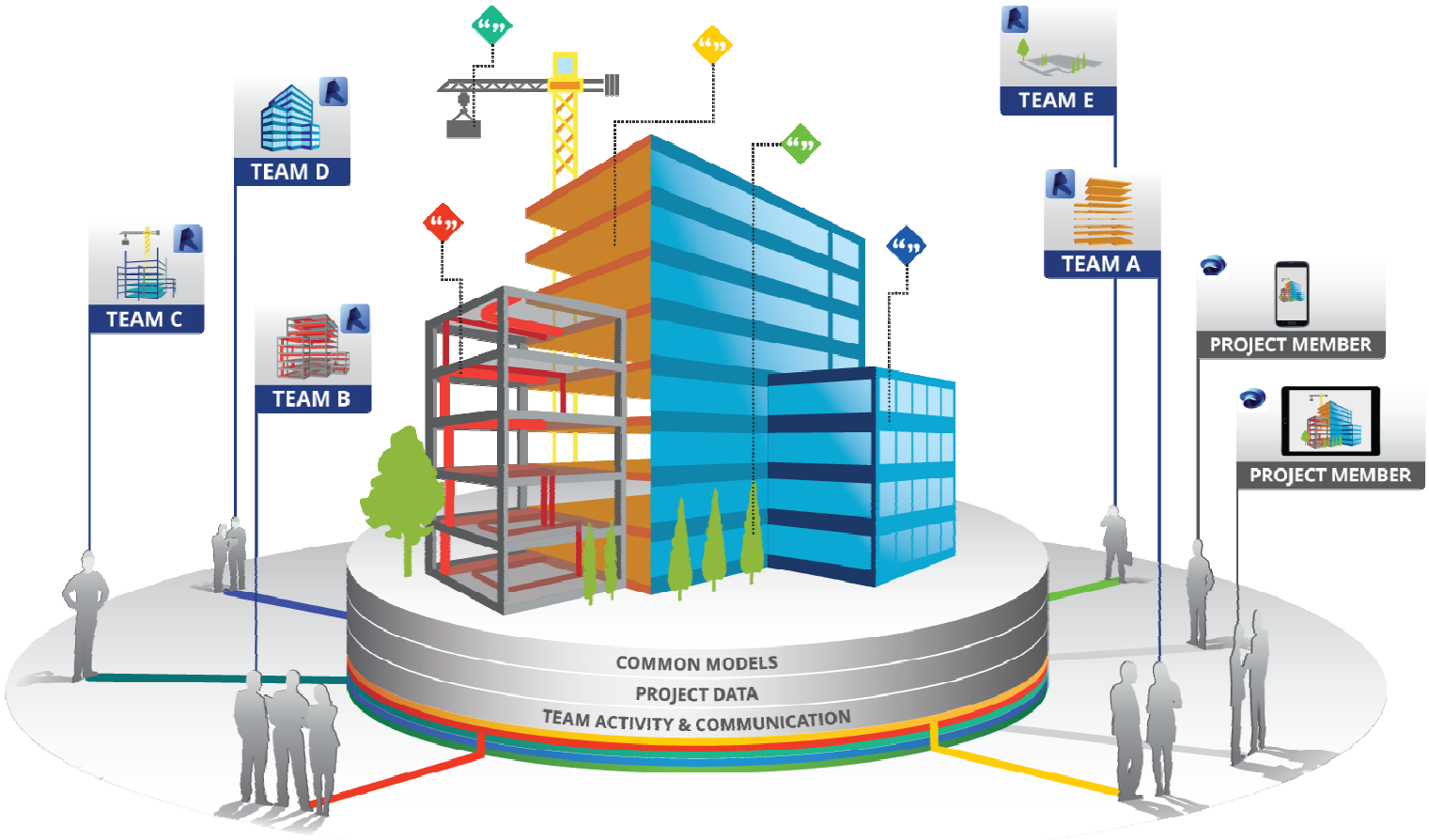
Data Turnover

The goal is to provide the facility management team with complete and verified data

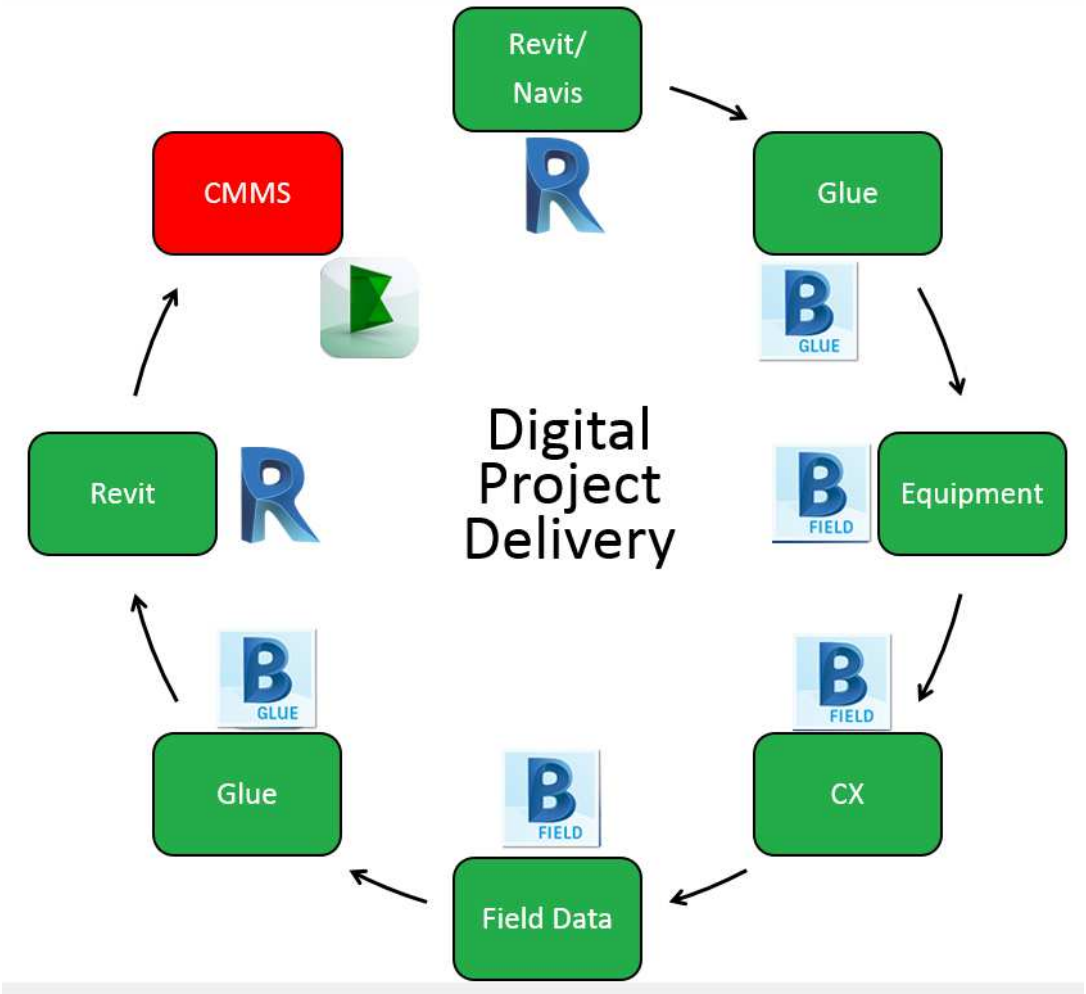
before

the first day of operation.

Team Approach



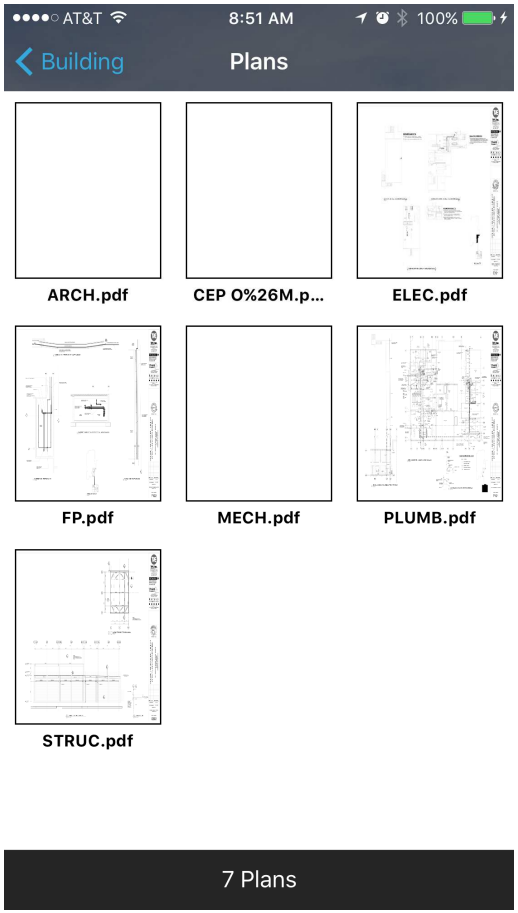
Digital Project Delivery



Inclusive Facility Management

Need Analysis Approach

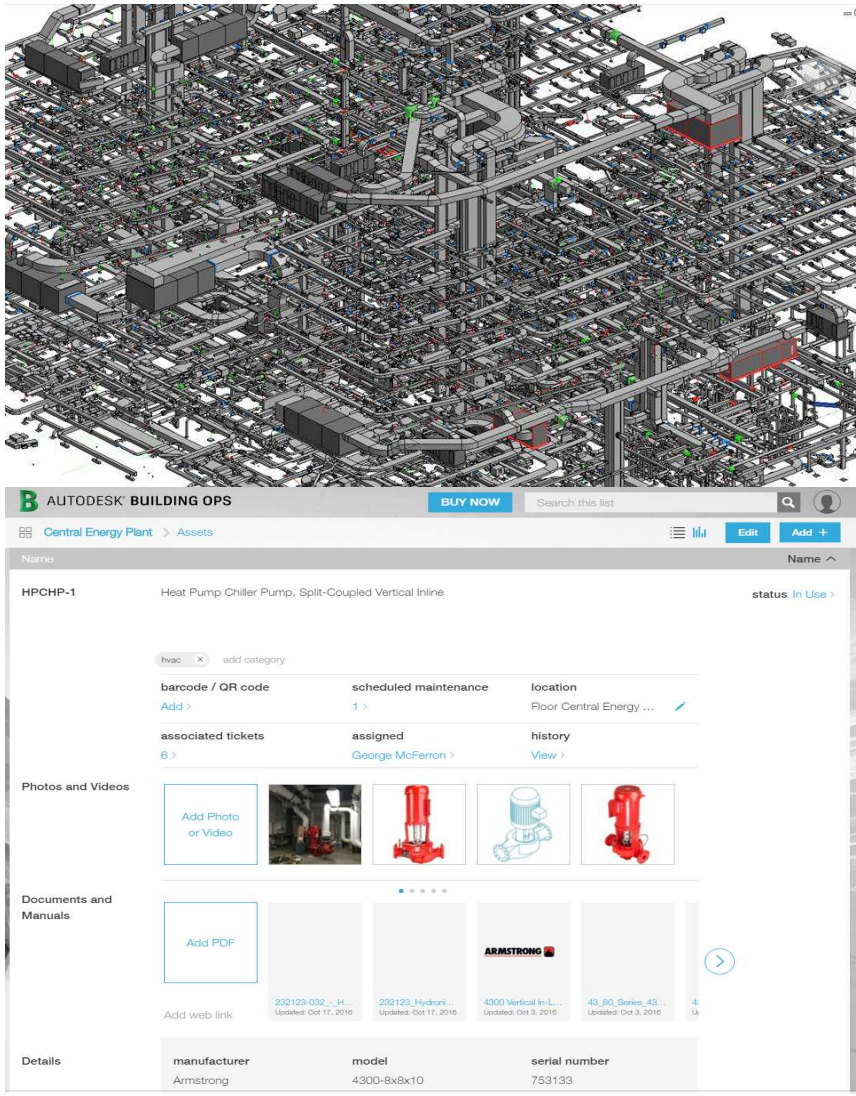
- Conduct a needs analysis to Recommend best approach to address transition to operation needs.
- Review inventory of CMMS asset data for accuracy.
- Retrieve and locate data to fill gaps and transfer data into CMMS.
- Return to client a fully populated compliant CMMS.



Technology

Utilize Technology to electronically transfer data into CMMS

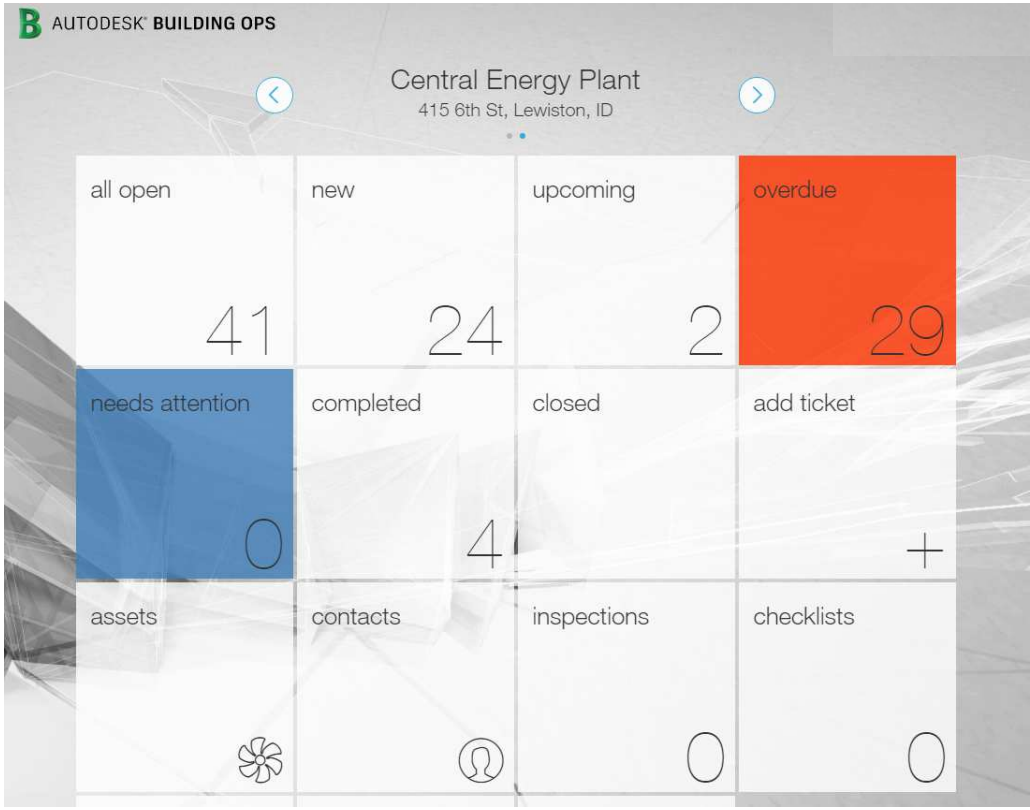
- Information Models with detailed facility operations and maintenance data.
- Computerized Software utilized to capture facility operations and maintenance data.
- COBie (Construction Operations Building Information Exchange) - data exchange format for building operations and maintenance data.
- Digital Project Delivery Package



Integration of Data

Information Needed

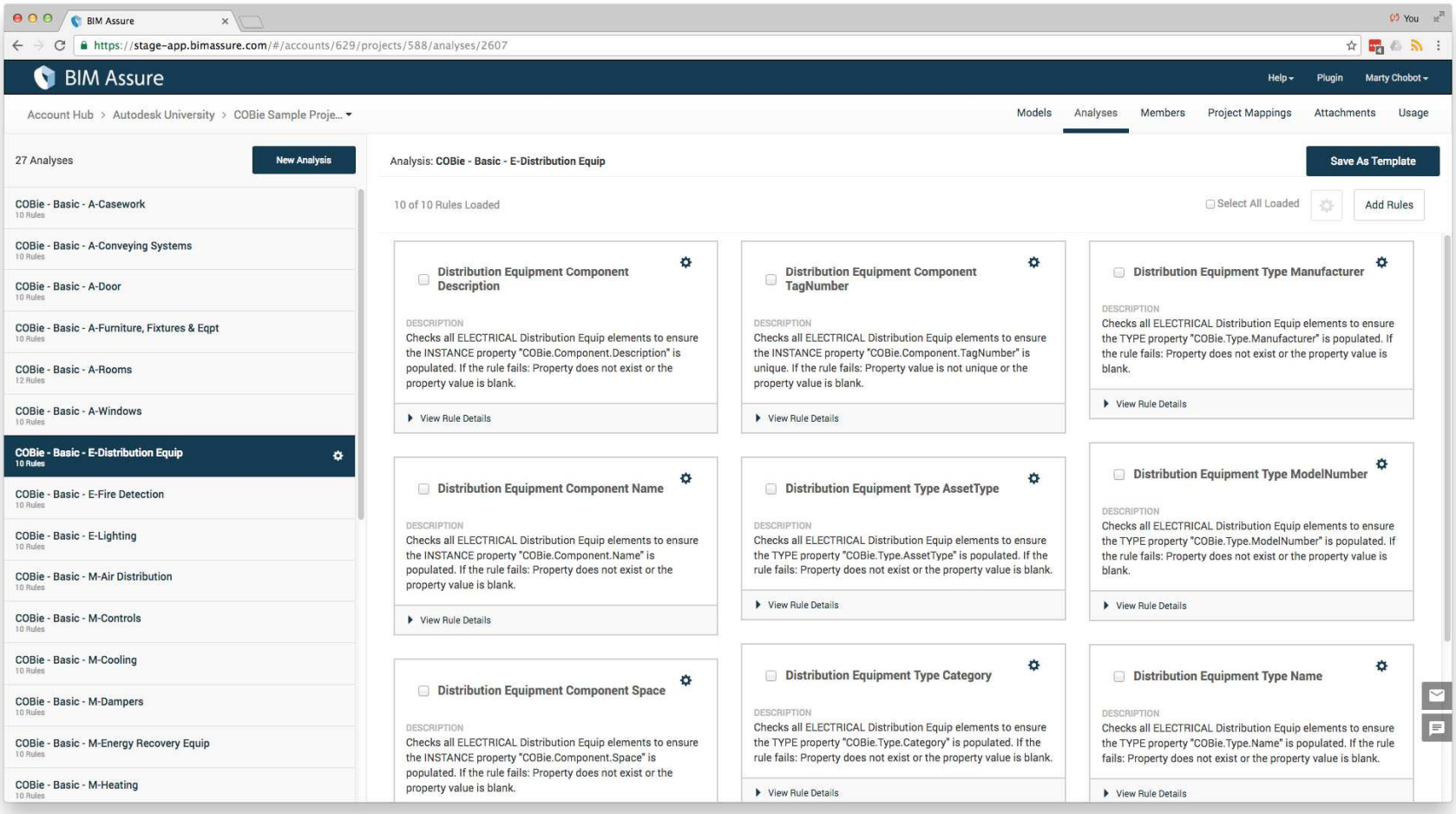
- List of Assets tracked in CMMS
- Equipment type Designations
- Asset ID Nomenclature
- Asset ID Numbering System
- Attributes for Individual Assets
- Room Naming Nomenclature
- Level Designations
- Building Designations
- O&M linking and Storage location
- PM examples



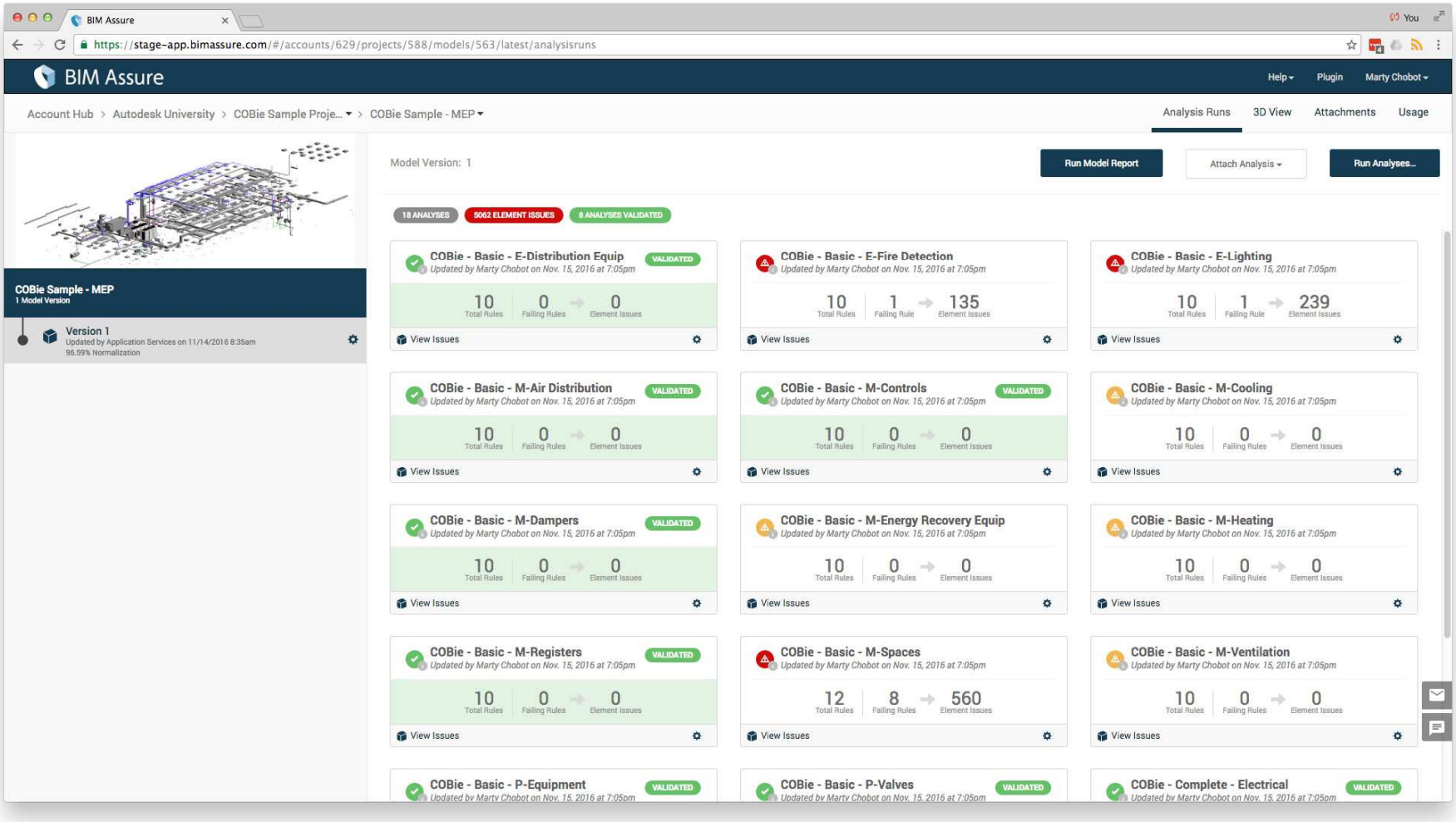
Data Process

Collect	QC/Review	Populate Gap	Analysis	Deliverables
Retrieve Equipment data , preventive maintenance procedures & O&M'S from various sources	Equipment data, preventive maintenance procedures & O&M's	Equipment data, preventive maintenance procedures and O&M's into CMMS compatible document	Equipment data, PM procedures vs MFG O&M's create/revise PM's.	Equipment data, PM procedures, O&M's with links to procedures for each equipment type. CMMS compatible document.

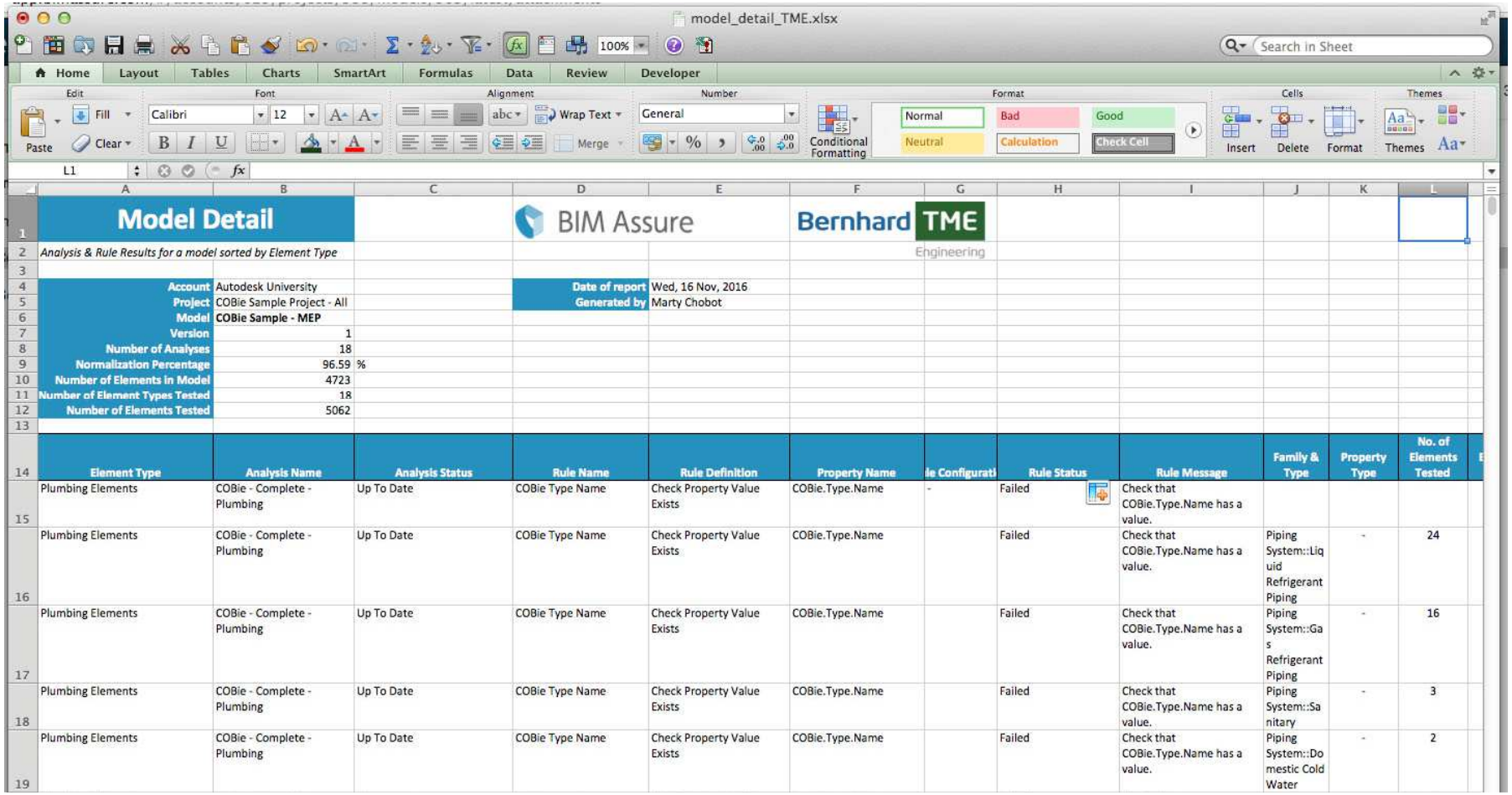
Data Rules


BIM Assure
https://stage-app.bimassure.com/#/accounts/629/projects/588/analyses/2607
BIM Assure
Help
Plugin
Marty Chobot
Account Hub > Autodesk University > COBie Sample Proje...
Models
Analyses
Members
Project Mappings
Attachments
Usage
27 Analyses
New Analysis
COBie - Basic - A-Casework
10 Rules
COBie - Basic - A-Conveying Systems
10 Rules
COBie - Basic - A-Door
10 Rules
COBie - Basic - A-Furniture, Fixtures & Eqpt
10 Rules
COBie - Basic - A-Rooms
12 Rules
COBie - Basic - A-Windows
10 Rules
COBie - Basic - E-Distribution Equip
10 Rules
COBie - Basic - E-Fire Detection
10 Rules
COBie - Basic - E-Lighting
10 Rules
COBie - Basic - M-Air Distribution
10 Rules
COBie - Basic - M-Controls
10 Rules
COBie - Basic - M-Cooling
10 Rules
COBie - Basic - M-Dampers
10 Rules
COBie - Basic - M-Energy Recovery Equip
10 Rules
COBie - Basic - M-Heating
10 Rules
Analysis: COBie - Basic - E-Distribution Equip
Save As Template
10 of 10 Rules Loaded
Select All Loaded
Add Rules
Distribution Equipment Component Description
DESCRIPTION
Checks all ELECTRICAL Distribution Equip elements to ensure the INSTANCE property "COBie.Component.Description" is populated. If the rule fails: Property does not exist or the property value is blank.
View Rule Details
Distribution Equipment Component TagNumber
DESCRIPTION
Checks all ELECTRICAL Distribution Equip elements to ensure the INSTANCE property "COBie.Component.TagNumber" is unique. If the rule fails: Property value is not unique or the property value is blank.
View Rule Details
Distribution Equipment Type Manufacturer
DESCRIPTION
Checks all ELECTRICAL Distribution Equip elements to ensure the TYPE property "COBie.Type.Manufacturer" is populated. If the rule fails: Property does not exist or the property value is blank.
View Rule Details
Distribution Equipment Component Name
DESCRIPTION
Checks all ELECTRICAL Distribution Equip elements to ensure the INSTANCE property "COBie.Component.Name" is populated. If the rule fails: Property does not exist or the property value is blank.
View Rule Details
Distribution Equipment Type AssetType
DESCRIPTION
Checks all ELECTRICAL Distribution Equip elements to ensure the TYPE property "COBie.Type.AssetType" is populated. If the rule fails: Property does not exist or the property value is blank.
View Rule Details
Distribution Equipment Type ModelNumber
DESCRIPTION
Checks all ELECTRICAL Distribution Equip elements to ensure the TYPE property "COBie.Type.ModelNumber" is populated. If the rule fails: Property does not exist or the property value is blank.
View Rule Details
Distribution Equipment Component Space
DESCRIPTION
Checks all ELECTRICAL Distribution Equip elements to ensure the INSTANCE property "COBie.Component.Space" is populated. If the rule fails: Property does not exist or the property value is blank.
Distribution Equipment Type Category
DESCRIPTION
Checks all ELECTRICAL Distribution Equip elements to ensure the TYPE property "COBie.Type.Category" is populated. If the rule fails: Property does not exist or the property value is blank.
View Rule Details
Distribution Equipment Type Name
DESCRIPTION
Checks all ELECTRICAL Distribution Equip elements to ensure the TYPE property "COBie.Type.Name" is populated. If the rule fails: Property does not exist or the property value is blank.
View Rule Details

Data Analysis



Data Validation



model_detail_TME.xlsx

Model Detail

BIM Assure

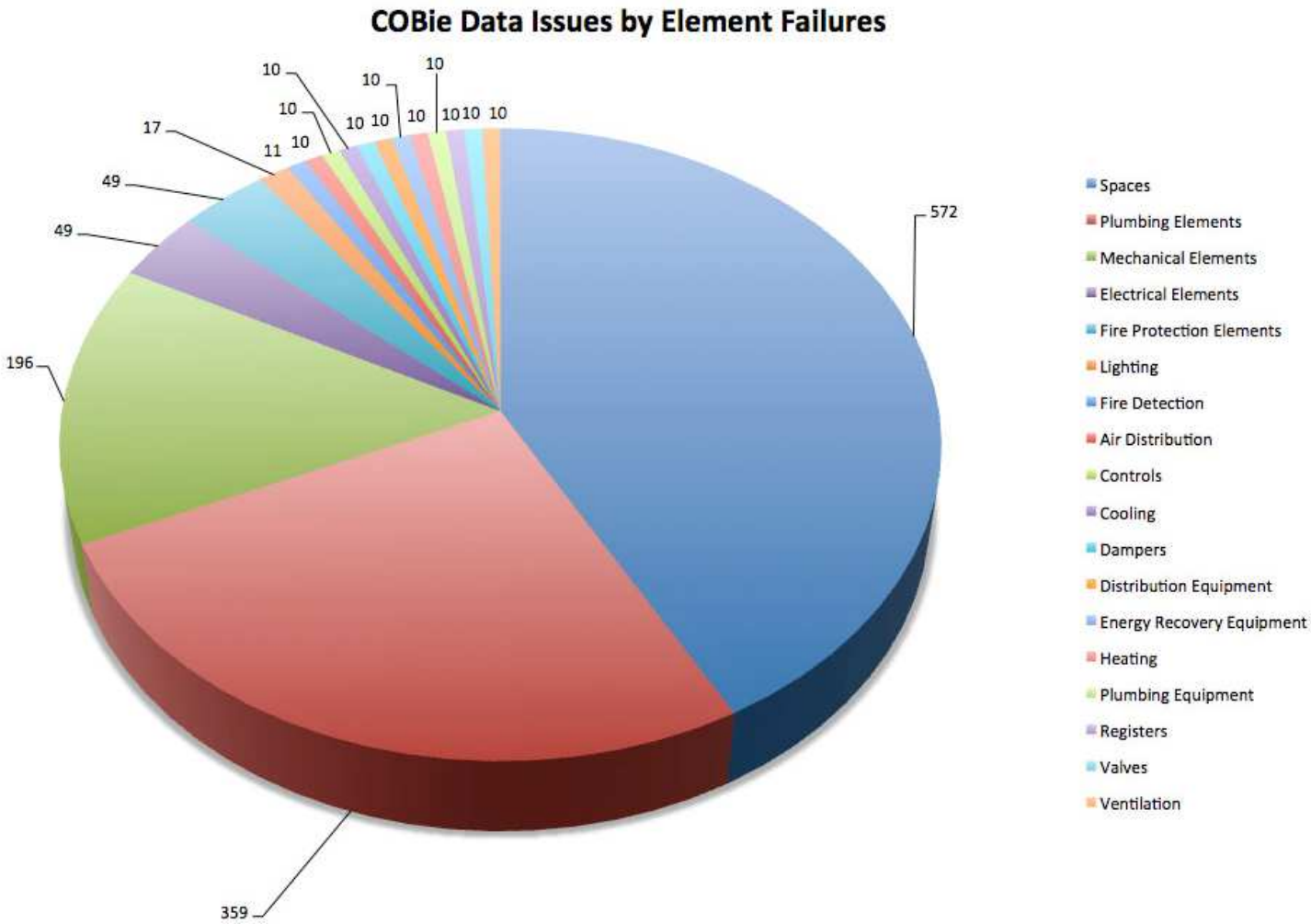
Bernhard TME Engineering

Analysis & Rule Results for a model sorted by Element Type

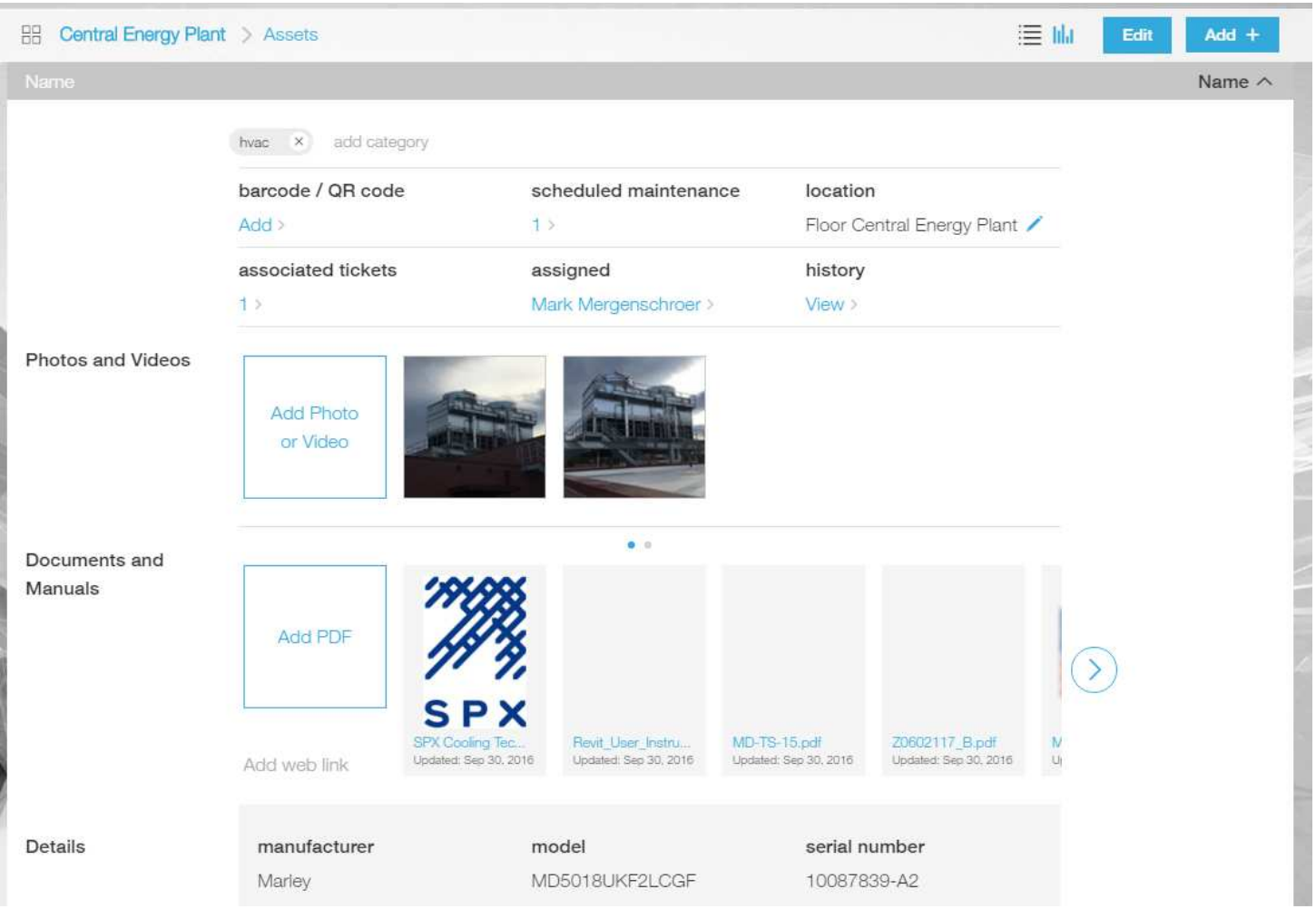
Account	Autodesk University	Date of report	Wed, 16 Nov, 2016
Project	COBie Sample Project - All	Generated by	Marty Chobot
Model	COBie Sample - MEP		
Version	1		
Number of Analyses	18		
Normalization Percentage	96.59 %		
Number of Elements in Model	4723		
Number of Element Types Tested	18		
Number of Elements Tested	5062		

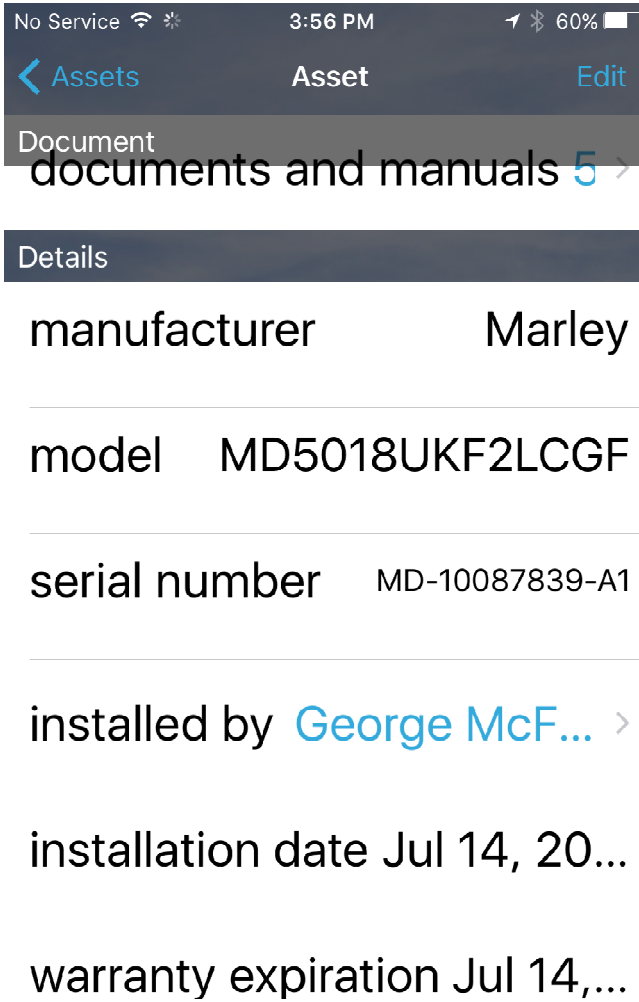
Element Type	Analysis Name	Analysis Status	Rule Name	Rule Definition	Property Name	ie Configurati	Rule Status	Rule Message	Family & Type	Property Type	No. of Elements Tested
Plumbing Elements	COBie - Complete - Plumbing	Up To Date	COBie Type Name	Check Property Value Exists	COBie.Type.Name	-	Failed	Check that COBie.Type.Name has a value.			
Plumbing Elements	COBie - Complete - Plumbing	Up To Date	COBie Type Name	Check Property Value Exists	COBie.Type.Name		Failed	Check that COBie.Type.Name has a value.	Piping System::Liquid Refrigerant Piping	-	24
Plumbing Elements	COBie - Complete - Plumbing	Up To Date	COBie Type Name	Check Property Value Exists	COBie.Type.Name		Failed	Check that COBie.Type.Name has a value.	Piping System::Gas Refrigerant Piping	-	16
Plumbing Elements	COBie - Complete - Plumbing	Up To Date	COBie Type Name	Check Property Value Exists	COBie.Type.Name		Failed	Check that COBie.Type.Name has a value.	Piping System::Sanitary	-	3
Plumbing Elements	COBie - Complete - Plumbing	Up To Date	COBie Type Name	Check Property Value Exists	COBie.Type.Name		Failed	Check that COBie.Type.Name has a value.	Piping System::Domestic Cold Water	-	2

Data Reports

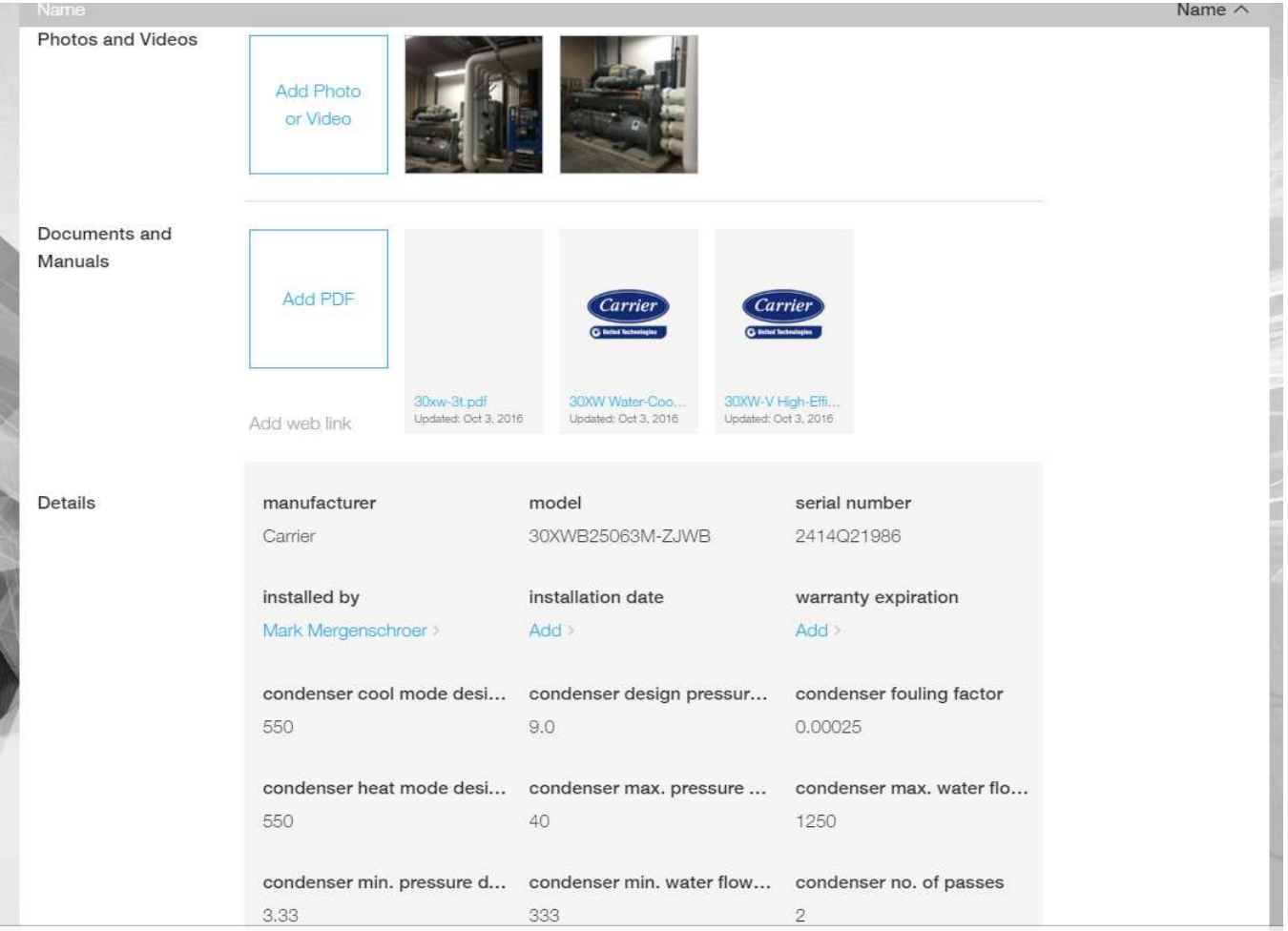


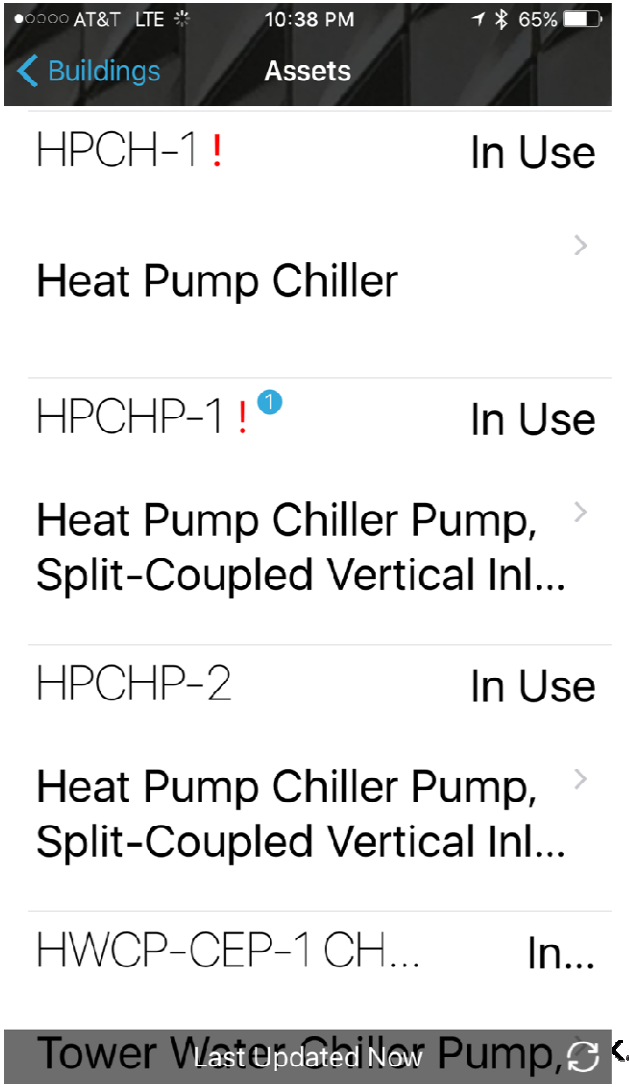
Building Ops Web/App



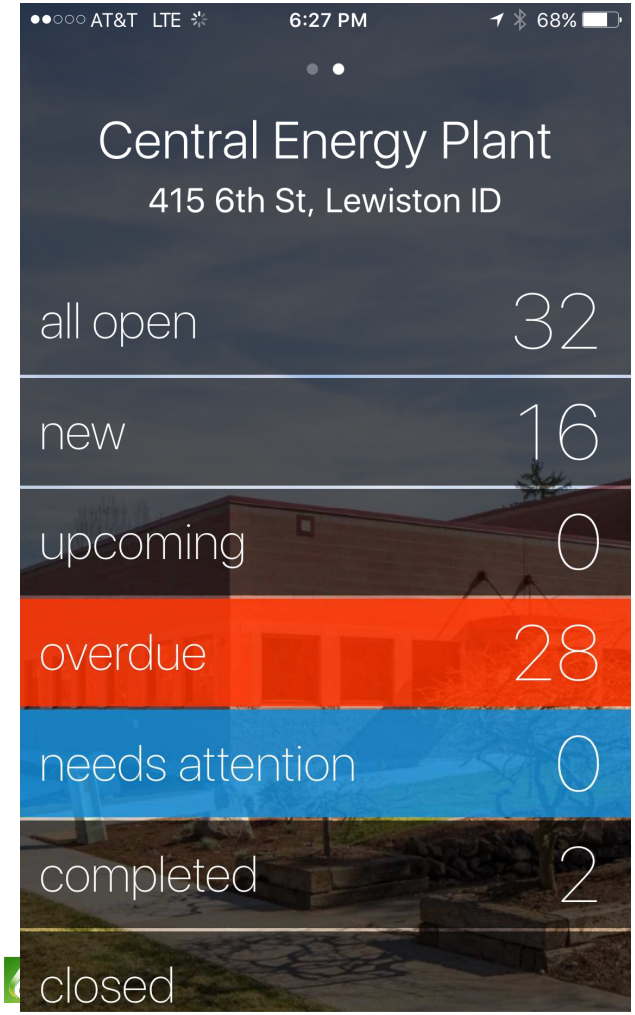


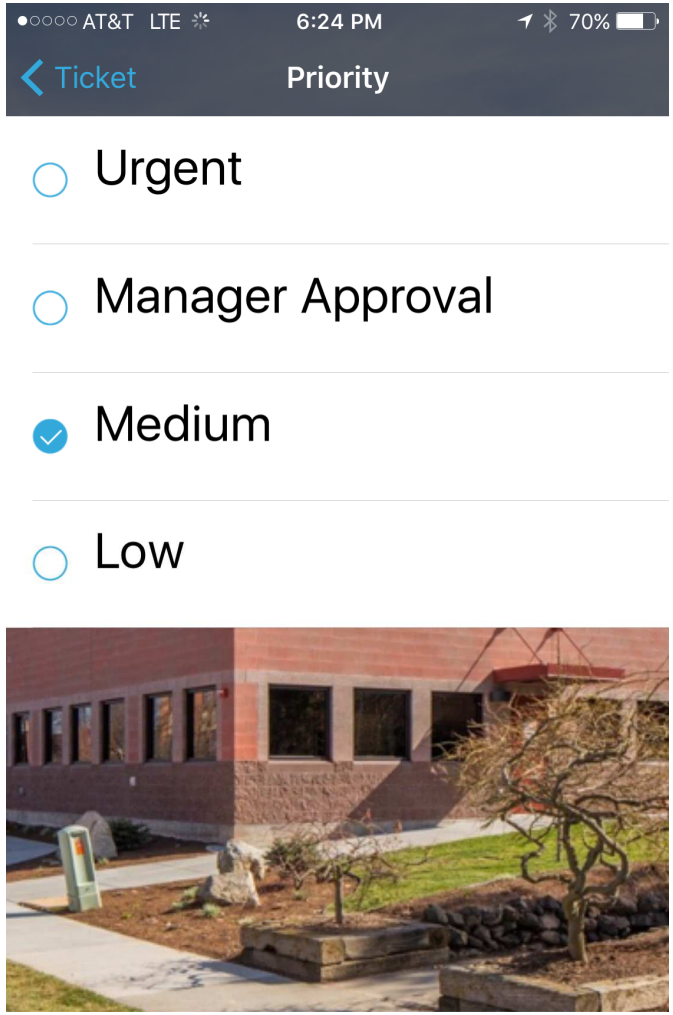
Building Ops Web/App

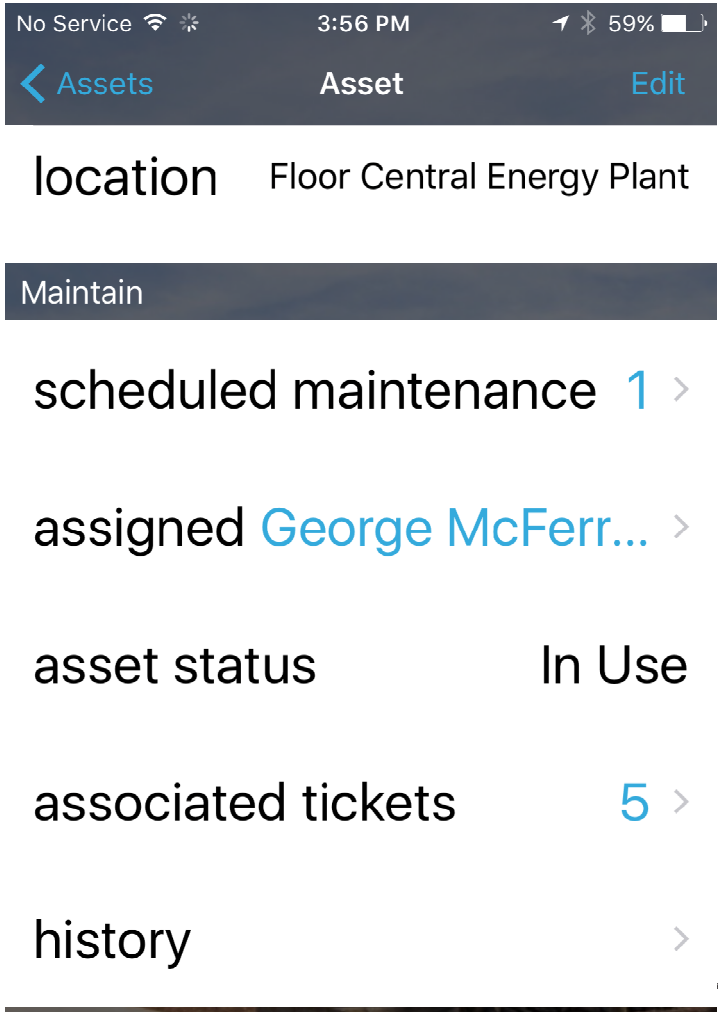




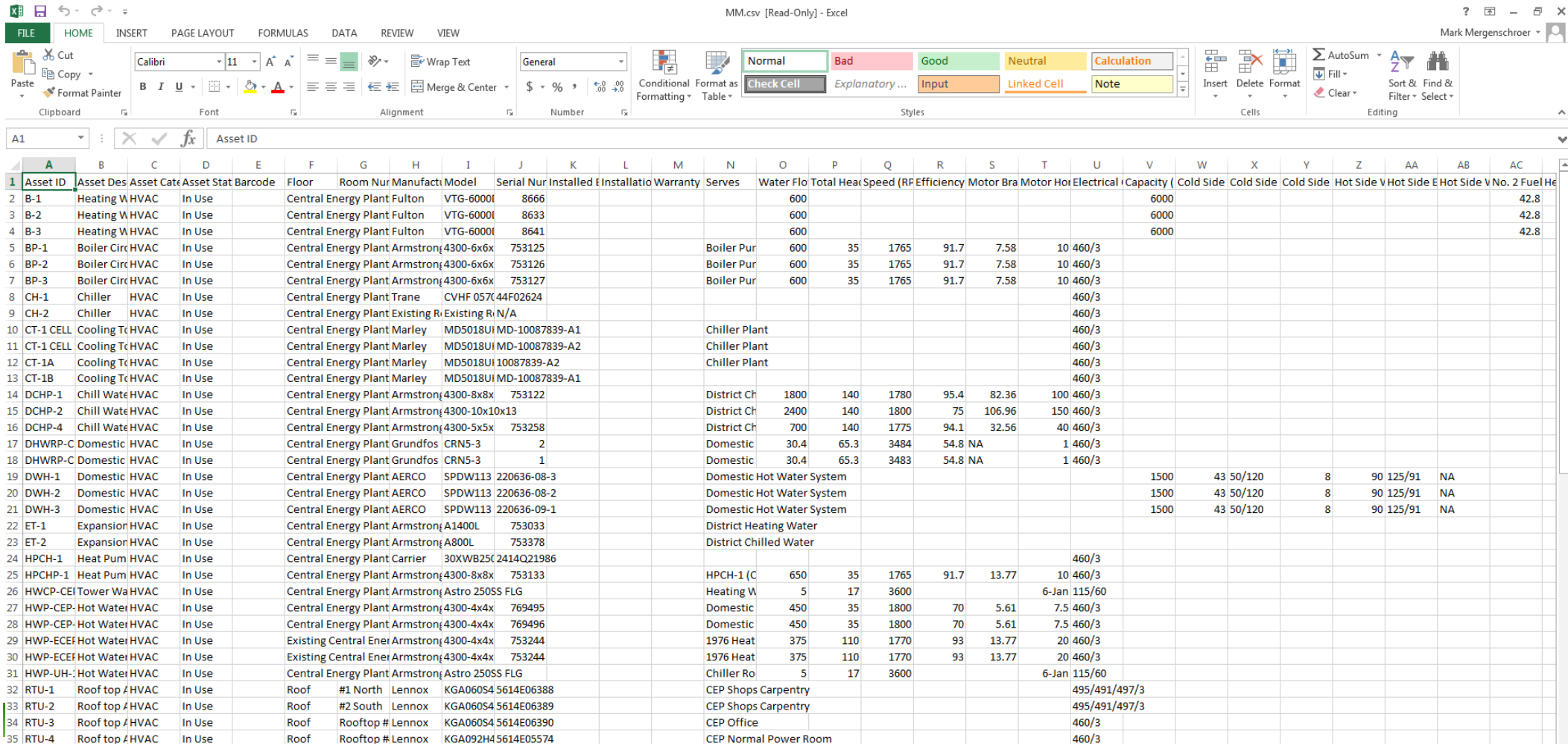
Building Ops App







Building Ops Data Upload

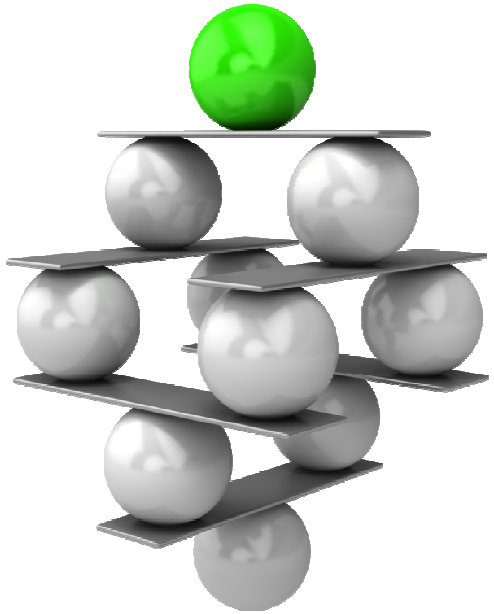


Asset ID	Asset Des	Asset Cate	Asset Stat	Barcode	Floor	Room Nur	Manufacti	Model	Serial Nur	Installed E	Installatio	Warranty	Serves	Water Flo	Total Hea	Speed (RF	Efficiency	Motor Bra	Motor Hor	Electrical (	Capacity (	Cold Side	Cold Side	Cold Side	Hot Side V	Hot Side E	Hot Side V	No. 2 Fuel	He
B-1	Heating W	HVAC	In Use		Central Energy Plant		Fulton	VTG-6000I	8666					600							6000							42.8	
B-2	Heating W	HVAC	In Use		Central Energy Plant		Fulton	VTG-6000I	8633					600							6000							42.8	
B-3	Heating W	HVAC	In Use		Central Energy Plant		Fulton	VTG-6000I	8641					600							6000							42.8	
BP-1	Boiler Circ	HVAC	In Use		Central Energy Plant		Armstrong	4300-6x6x	753125				Boiler Pur	600	35	1765	91.7	7.58	10	460/3									
BP-2	Boiler Circ	HVAC	In Use		Central Energy Plant		Armstrong	4300-6x6x	753126				Boiler Pur	600	35	1765	91.7	7.58	10	460/3									
BP-3	Boiler Circ	HVAC	In Use		Central Energy Plant		Armstrong	4300-6x6x	753127				Boiler Pur	600	35	1765	91.7	7.58	10	460/3									
CH-1	Chiller	HVAC	In Use		Central Energy Plant		Trane	CVHF 057(	44F02624											460/3									
CH-2	Chiller	HVAC	In Use		Central Energy Plant		Existing R	Existing R	N/A											460/3									
CT-1 CELL	Cooling To	HVAC	In Use		Central Energy Plant		Marley	MD5018UI	MD-10087839-A1				Chiller Plant							460/3									
CT-1 CELL	Cooling To	HVAC	In Use		Central Energy Plant		Marley	MD5018UI	MD-10087839-A2				Chiller Plant							460/3									
CT-1A	Cooling To	HVAC	In Use		Central Energy Plant		Marley	MD5018UI	10087839-A2				Chiller Plant							460/3									
CT-1B	Cooling To	HVAC	In Use		Central Energy Plant		Marley	MD5018UI	MD-10087839-A1											460/3									
DCHP-1	Chill Wate	HVAC	In Use		Central Energy Plant		Armstrong	4300-8x8x	753122				District Ch	1800	140	1780	95.4	82.36	100	460/3									
DCHP-2	Chill Wate	HVAC	In Use		Central Energy Plant		Armstrong	4300-10x10x13					District Ch	2400	140	1800	75	106.96	150	460/3									
DCHP-4	Chill Wate	HVAC	In Use		Central Energy Plant		Armstrong	4300-5x5x	753258				District Ch	700	140	1775	94.1	32.56	40	460/3									
DHWRP-C	Domestic	HVAC	In Use		Central Energy Plant		Grundfos	CRN5-3	2				Domestic	30.4	65.3	3484	54.8	NA	1	460/3									
DHWRP-C	Domestic	HVAC	In Use		Central Energy Plant		Grundfos	CRN5-3	1				Domestic	30.4	65.3	3483	54.8	NA	1	460/3									
DWH-1	Domestic	HVAC	In Use		Central Energy Plant		AERCO	SPDW113	220636-08-3				Domestic Hot Water System								1500	43	50/120	8	90	125/91	NA		
DWH-2	Domestic	HVAC	In Use		Central Energy Plant		AERCO	SPDW113	220636-08-2				Domestic Hot Water System								1500	43	50/120	8	90	125/91	NA		
DWH-3	Domestic	HVAC	In Use		Central Energy Plant		AERCO	SPDW113	220636-09-1				Domestic Hot Water System								1500	43	50/120	8	90	125/91	NA		
ET-1	Expansion	HVAC	In Use		Central Energy Plant		Armstrong	A1400L	753033				District Heating Water																
ET-2	Expansion	HVAC	In Use		Central Energy Plant		Armstrong	A800L	753378				District Chilled Water																
HPCH-1	Heat Pum	HVAC	In Use		Central Energy Plant		Carrier	30XWB25(	2414Q21986											460/3									
HPCHP-1	Heat Pum	HVAC	In Use		Central Energy Plant		Armstrong	4300-8x8x	753133				HPCH-1 (C	650	35	1765	91.7	13.77	10	460/3									
HWCP-CEI	Tower Wa	HVAC	In Use		Central Energy Plant		Armstrong	Astro 250SS	FLG				Heating W	5	17	3600			6-Jan	115/60									
HWP-CEP-	Hot Water	HVAC	In Use		Central Energy Plant		Armstrong	4300-4x4x	769495				Domestic	450	35	1800	70	5.61	7.5	460/3									
HWP-CEP-	Hot Water	HVAC	In Use		Central Energy Plant		Armstrong	4300-4x4x	769496				Domestic	450	35	1800	70	5.61	7.5	460/3									
HWP-ECEI	Hot Water	HVAC	In Use		Existing Central Ener		Armstrong	4300-4x4x	753244				1976 Heat	375	110	1770	93	13.77	20	460/3									
HWP-ECEI	Hot Water	HVAC	In Use		Existing Central Ener		Armstrong	4300-4x4x	753244				1976 Heat	375	110	1770	93	13.77	20	460/3									
HWP-UH-:	Hot Water	HVAC	In Use		Central Energy Plant		Armstrong	Astro 250SS	FLG				Chiller Ro	5	17	3600			6-Jan	115/60									
RTU-1	Roof top A	HVAC	In Use		Roof	#1 North	Lennox	KGA060S4	5614E06388				CEP Shops Carpentry							495/491/497/3									
RTU-2	Roof top A	HVAC	In Use		Roof	#2 South	Lennox	KGA060S4	5614E06389				CEP Shops Carpentry							495/491/497/3									
RTU-3	Roof top A	HVAC	In Use		Roof	Rooftop #	Lennox	KGA060S4	5614E06390				CEP Office							460/3									
RTU-4	Roof top A	HVAC	In Use		Roof	Rooftop #	Lennox	KGA092H4	5614E05574				CEP Normal Power Room							460/3									

Next Steps

Recommendations

- Conduct Needs Analysis
- Execution Plan
- Integrate existing processes.
- Develop facility-specific standards for O&M Documentation
- Standardize naming nomenclatures.
- Develop PM schedules.
- Set comprehensive modeling standards



Remember – CS21793 is the class –
Please remember to complete the survey!

Thanks for attending!

A wise Jedi master once said,
"Always in motion
is the future.“