ALTURA

Start with Haystack

An Owners Guide to Interoperability

Matt Schwartz, P.E.

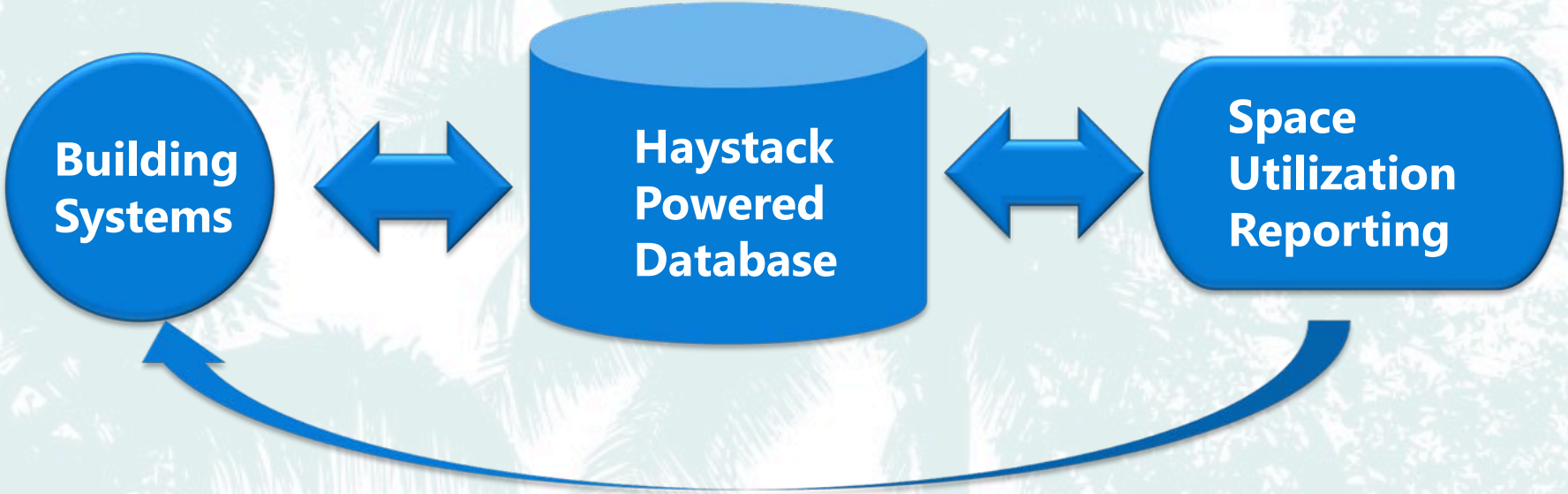
Agenda

- Haystack Refresh
- Haystack in action
- Haystack in action
- Haystack in action
- Haystack in action
- Haystack in action
- Q&A

Haystack
Quick Refresh

Raw Asset Data

Portable, Scalable Utilization Reports Ex 1



Occupancy Data, meet Haystack

Occupancy Status – Occupied/Unoccupied

Occupancy Status – Occupied/Unoccupied

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Tag Based Computation

Occupancy Report | Data Visualization

Select | Select | 7-May-2019 | 8AM | 5PM | Percentage

Occupancy Data	Total Space Count	Back Of House	Conf	Lab	Office
Space Count	47	3	2	10	32
Average Occupancy	55%	39%	77%	59%	42%
Peak Occupancy	74%	67%	100%	90%	54%
Peak Occupancy Time	2PM	2PM	11AM	5PM	2PM
Lowest Occupancy	22%	33%	27%	15%	15%
Lowest Occupancy Time	8AM	8AM	8AM	8AM	8AM

Portable, Multi-System, Space Utilization Reports

Occupancy Report | Data Visualization

Select | Select | 7-May-2019 | 8AM | 5PM | Percentage

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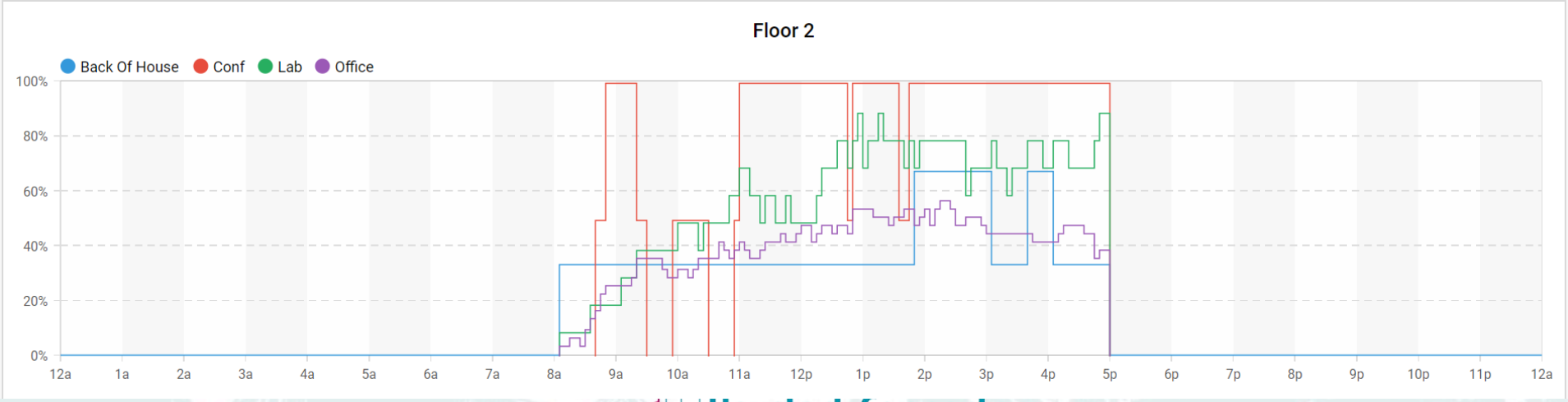
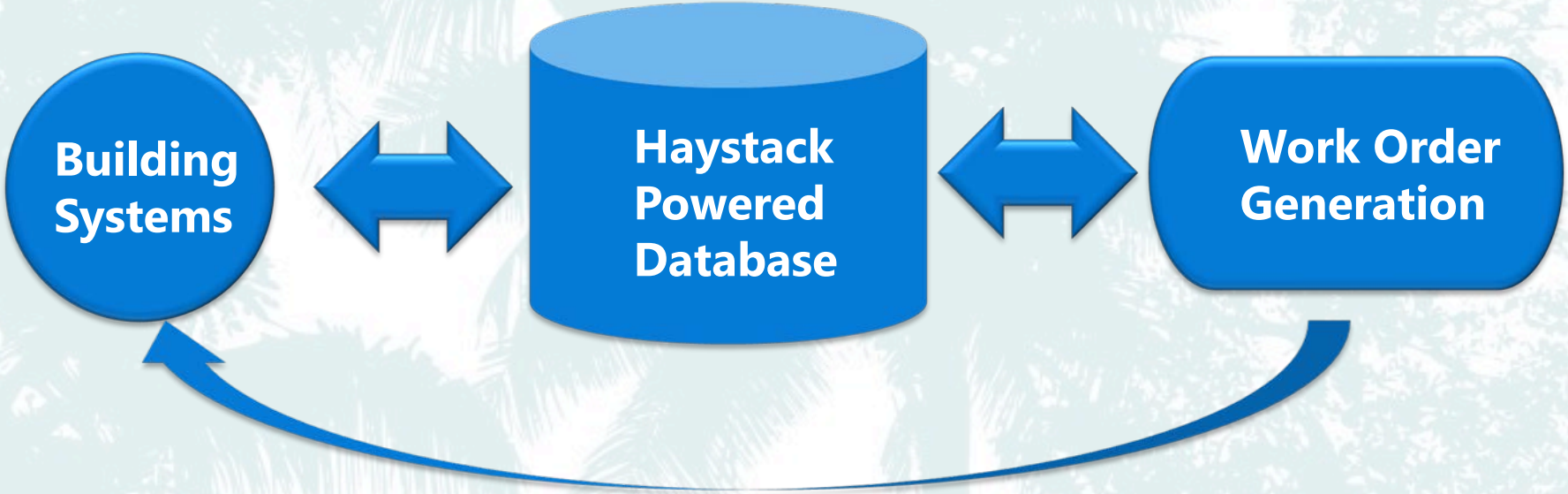


Haystack enabled API relationship Ex 2



How analytics become action

Sites ▾ | Projects ▾ | Open ▴▾ | Any Status ▴▾ | Owner ▾ | Issue Summary Report

Select Issue ▶ | New | Edit | Dup | Trash

Selected	Issue ID	Issue Name	Site	Related Equip
ⓘ	39	CX-M005 ExhSys-EF6 Static pressure (EF-6)	Mead	Mead EF-6
ⓘ	40	Firestone AHU-2 Bldg Static Spark Request	Firestone	Firestone AHU-2
ⓘ	41	CX-F007 VAV-376 Clarify occupancy detection status and c...	Firestone	Firestone VAV-37
ⓘ	42	CX-F008 AHU-2 CD Branch duct static pressure present whe...	Firestone	Firestone AHU-2
ⓘ	43	INT-002 Sup Temp Sensor Fail Spark	Firestone	Firestone HWSys
ⓘ	44	CX-F011 VAV_187 Unoccupied Heating Setpoint 23F	Firestone	Firestone VAV-18
ⓘ	45	Firestone AHU-2 OSA Damper Stuck Open Spark	Firestone	Firestone AHU-2
ⓘ	46	Firestone AHU-2 HD	Firestone	Firestone AHU-2
ⓘ	47	CX-F005 VAV-275 Occupancy Detection Always Enabled (VA...	Firestone	Firestone VAV-27
ⓘ	48	CX-F012 AHU-2 HD Cold Startups	Firestone	Firestone AHU-2
ⓘ	49	CX-M002 Mead AHU-C1 CHW Valve Cycling (AHU-1)	Mead	Mead AHU-1
ⓘ	50	CX-F017 HW System supply temp sensor failure (HWSys)	Firestone	Firestone HWSys
ⓘ	51	CX-F002 AHU-2 Filter Pressure Drop	Firestone	Firestone AHU-2
ⓘ	52	Firestone AHU-2 Sparks Correction Reqest	Firestone	Firestone AHU-2
ⓘ	53	CX-F003 AHU-2 Cold Deck Static Pressure Reset Cycling (...	Firestone	Firestone AHU-2
ⓘ	54	CX-F010 AHU-2 Bldg Static Pressure Sensor Inaccurate	Firestone	Firestone AHU-2
ⓘ	55	Firestone AHU-2 Schedule - Occupied on Weekend Days?	Firestone	Firestone AHU-2
ⓘ ▶	56	CX-F016 AHU-2 Economizer Enable	Firestone	Firestone AHU-2
ⓘ	57	Test App Link	Firestone	
ⓘ	58	CX-F018 AHU-2 OSA Damper Min Position (AHU-2 CD)	Firestone	Firestone AHU-2
ⓘ	59	AHU-2 Firestone Return Fan Control	Firestone	Firestone AHU-2

Open | Reply | Reassign | Close

#56: CX-F016 AHU-2 Economizer Enable

OPEN and assigned to **Jared Lee**

- **Site:** Firestone
- **Equip:** Firestone AHU-2
- **Details:** Link (Trends from 2017-02-08)

Issue Description: ISSUE: Economizer Enable OSA Temp Setpoint is set to 65degF. Per Design should be 80degF. Missing signficant economizer oppurtunity otherwise. Also, per design, Economizer should enable/disable off of both return temp OR osa temp conditions.

REQUEST: Update economizer enable osa temp setpoint. Verify return temp condition is included in economizer osa enable/disable

Issue Comments:

■ *(Feb-08-2017 4:30pm)* **su**:

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REQUEST: Update economizer enable osa temp setpoint. Verify return temp condition is included in economizer osa enable/disable

And a work order is born

FIRESTN18093685

Created By On 03/15/2018 02:08 PM
Last Edited by On 03/15/2018 02:08 PM

Identifies when the chw valve position cmd [ruleOnPosition] is open [config_Polarity] to a position tolerance of 2 [tune_PositionTol] while commanded the opposite. This is idenitified when the delta between the entering temperate mixed air temp [ruleOnSen

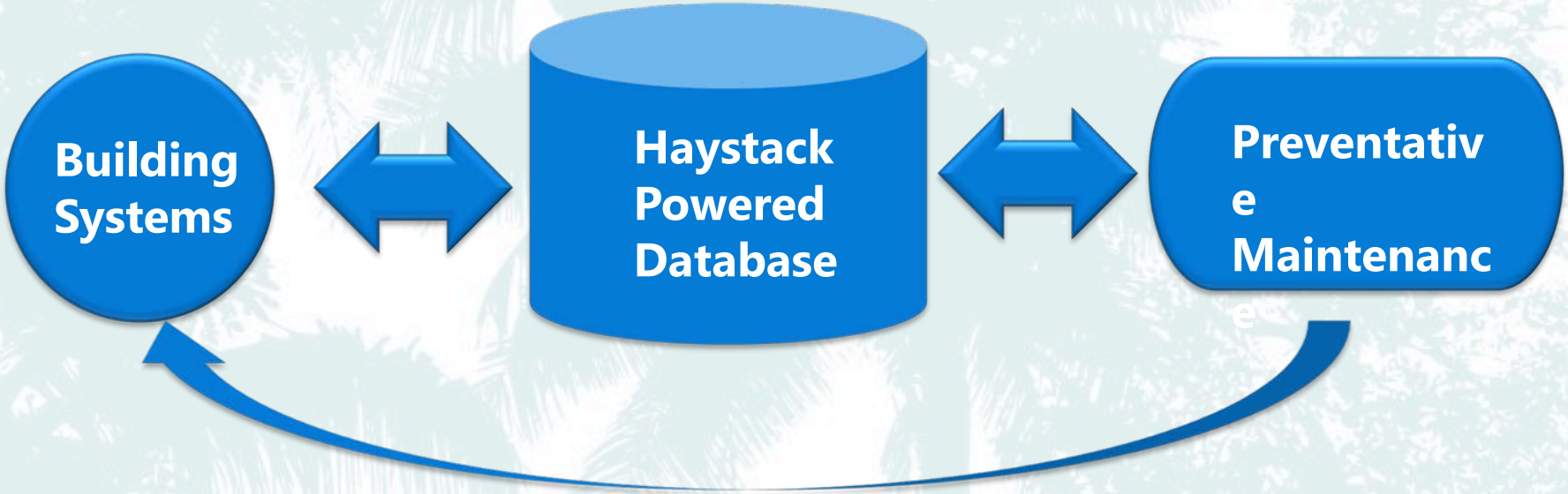
Status	OPEN
Project	
Desired Date	
Budget	

Organization	
Requestor	
Contact	
Contact Phone	
Contact Email	

Region	010
	PASADENA
Facility	011
	CAMPUS
Property	050
	FIRESTONE LAB

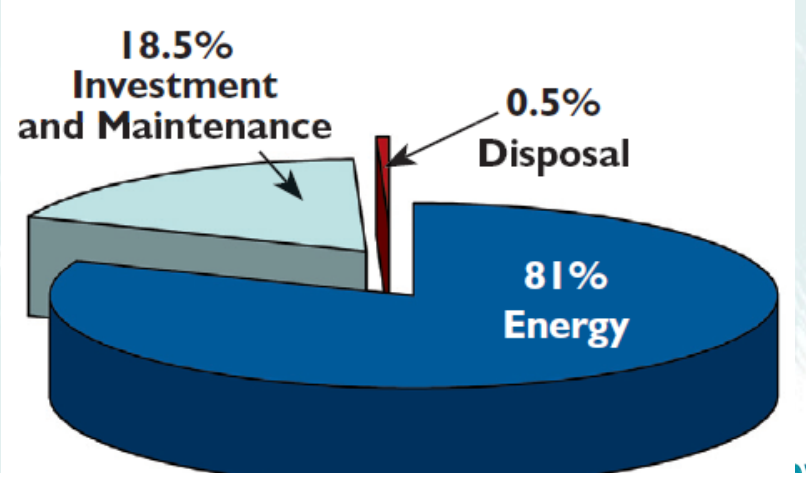
Problem Code	SPARK-M0005
	AHU ECONOMIZER DISABLE FAIL
Type	PLANNED
	PLANNED MAINTENANCE
Category	PREDICTIVE
	SAME AS PREVENTIVE MAINTENANCE BUT WITH NO
Job Priority	

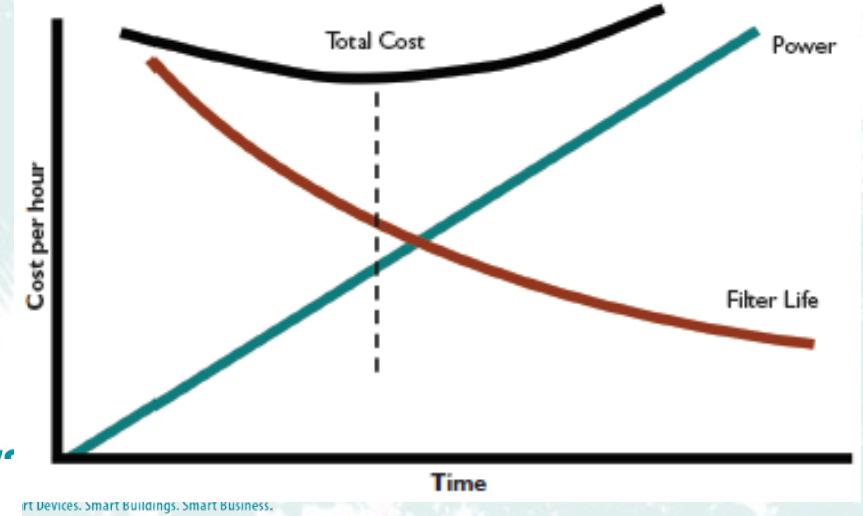
Haystack enabled API relationship Ex 3



Optimal Filter Maintenance

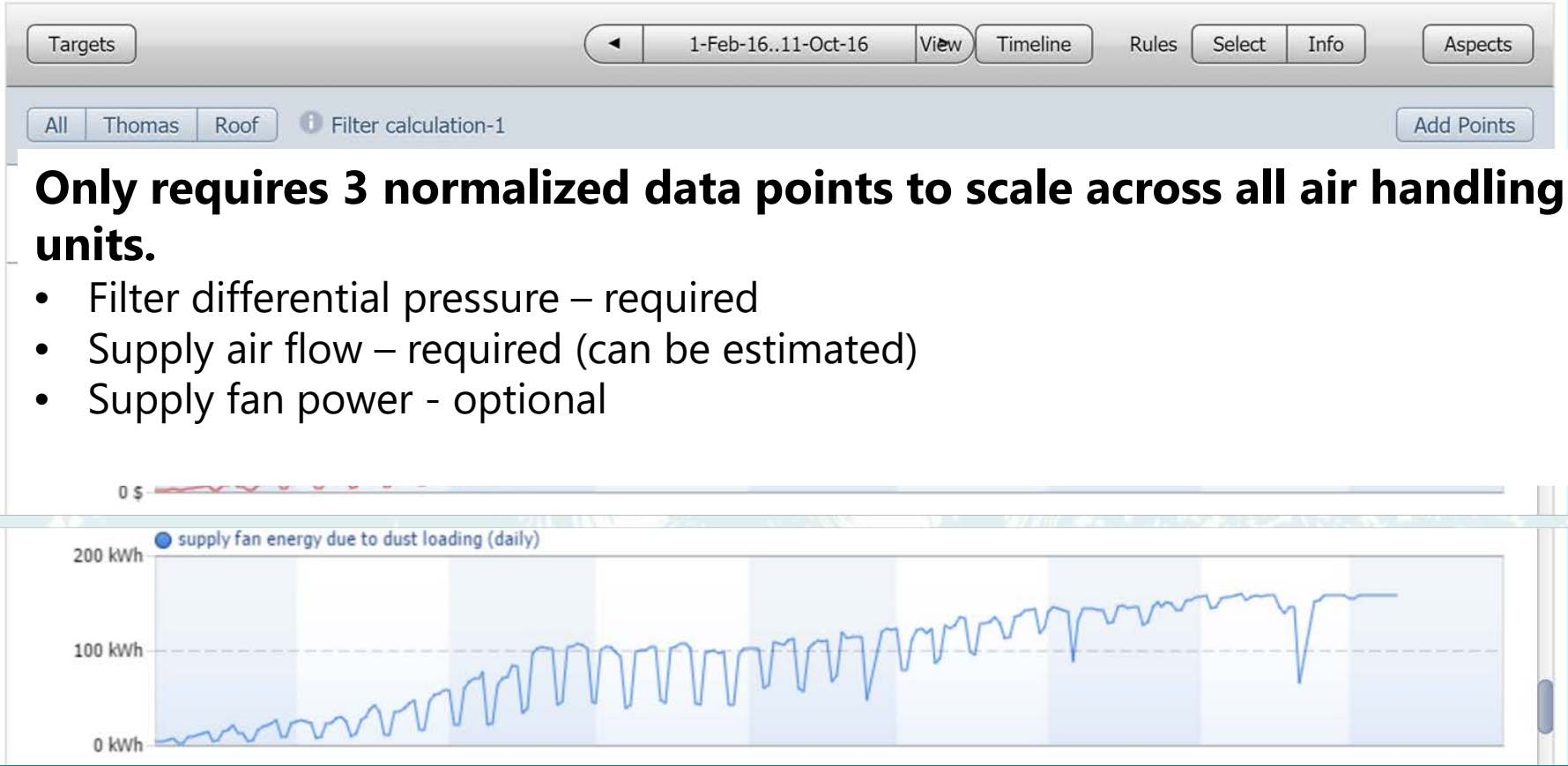
- The replacement of AHU filters is classic case of a labor and material-cost intensive PM. And with significant energy cost implications!!
- Determine the optimal time to change air filter based on minimizing total cost of ownership.





(Arnold 2005- Life cycle cost of air filtration. ASHRAE 2005)

Optimal Filter Maintenance



Only requires 3 normalized data points to scale across all air handling units.

- Filter differential pressure – required
- Supply air flow – required (can be estimated)
- Supply fan power - optional

And a work order, again

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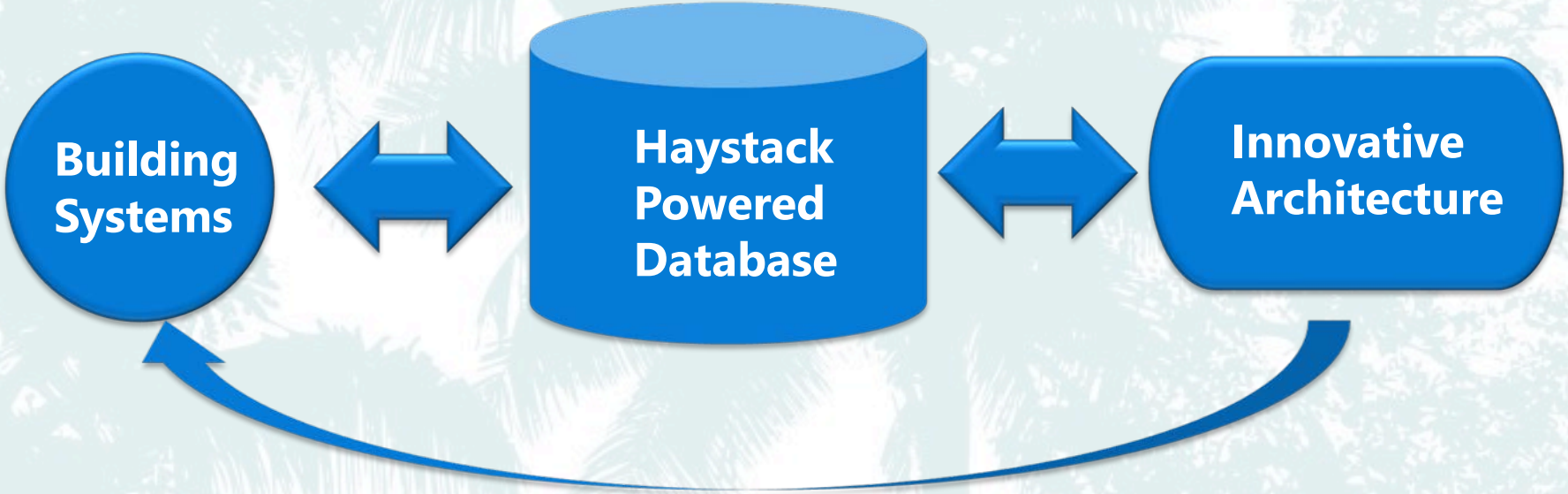
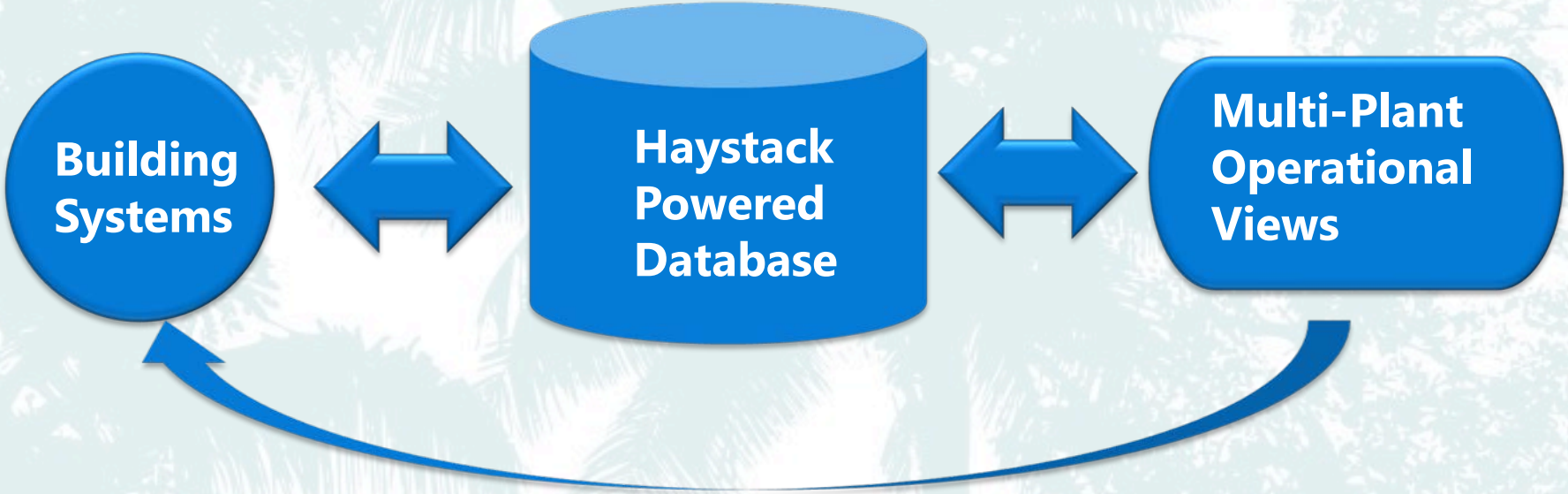
Haystack enabled API relationship Ex 4



What can you do with 25,000 Haystack tagged data points?

Haystack enabled API relationship Ex 5

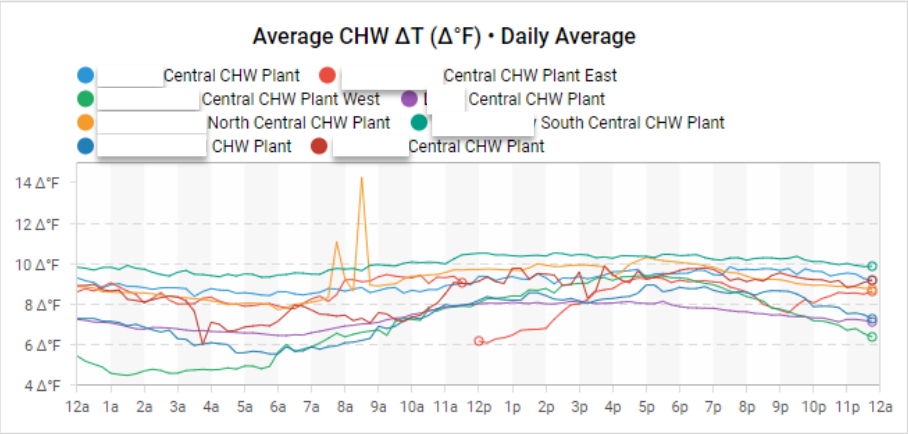


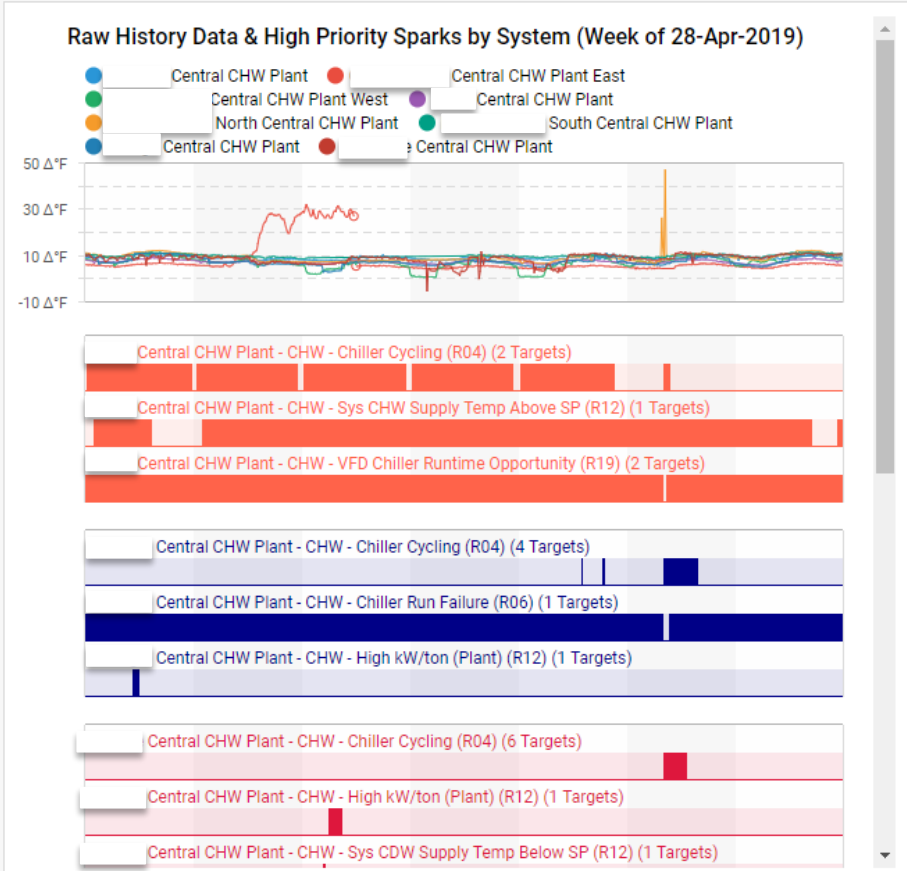
Large Scale System Comparisons

Systems Reporting | CHW Plant Metrics | CHW Plant Snapshot | Airside Metrics | Airside Snapshot | Opportunity Group Report | Portfolio Opportunities | Issue Log | Project List

Week of 28-Apr-2019 | Min / Max Off

KPI	Central CHW Plant	Central CHW Plant East	
Average Plant Delivery Efficiency (kW/ton)	0.655	1.08	1.4
Total Plant Electric Energy (kWh)	326,173	86,030	82,
Total Plant Cooling Energy (tonrefh)	485,227	78,947	85,
Average CHW Supply Temp (°F)	43.4	41.6	42.
Average CHW Return Temp (°F)	52.5	49.9	49.
Average CHW ΔT (Δ°F)	9.13	8.38	7.1
Average CDW Supply Temp (°F)	60.4	74.0	73.
Total Waterside HX Runtime (h)		1.75	0.5
Total HX Parallel Mode Runtime (h)			
Average Outside Air Temp (°F)	71.8	76.9	76.
Average CHW Flow (gal/min)	7,574	2,287	1,7





“Tag in” Project Haystack

- Start with Haystack standards before tech commitments
- People matter and disclaimer: change management not included
- Bring a creative mind to problem solving