Start with Haystack
An Owners Guide to Interoperability
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Agenda

• Haystack Refresh
• Haystack in action
• Haystack in action
• Haystack in action
• Haystack in action
• Q&A
Portable, Scalable Utilization Reports Ex 1

Building Systems

HaystackPowered
Database

Space
Utilization
Reporting
Occupancy Data, meet Haystack

- Thermostat 2 – OccPresent – Active/Inactive
- Thermostat 1 - OccStatus – On/Off
- Lighting Occupancy Sensor – Status – Occ/Unoc
- Security Motion Sensor – MotionDet – on/off
- Occupancy Status – Occupied/Unoccupied
## Tag Based Computation

### Occupancy Report

<table>
<thead>
<tr>
<th>Occupancy Data</th>
<th>Total Space Count</th>
<th>Back Of House</th>
<th>Conf</th>
<th>Lab</th>
<th>Office</th>
</tr>
</thead>
<tbody>
<tr>
<td>Space Count</td>
<td>47</td>
<td>3</td>
<td>2</td>
<td>10</td>
<td>32</td>
</tr>
<tr>
<td>Average Occupancy</td>
<td>55%</td>
<td>39%</td>
<td>77%</td>
<td>59%</td>
<td>42%</td>
</tr>
<tr>
<td>Peak Occupancy</td>
<td>74%</td>
<td>67%</td>
<td>100%</td>
<td>90%</td>
<td>54%</td>
</tr>
<tr>
<td>Peak Occupancy Time</td>
<td>2PM</td>
<td>2PM</td>
<td>11AM</td>
<td>5PM</td>
<td>2PM</td>
</tr>
<tr>
<td>Lowest Occupancy</td>
<td>22%</td>
<td>33%</td>
<td>27%</td>
<td>15%</td>
<td>15%</td>
</tr>
<tr>
<td>Lowest Occupancy Time</td>
<td>8AM</td>
<td>8AM</td>
<td>8AM</td>
<td>8AM</td>
<td>8AM</td>
</tr>
</tbody>
</table>
Haystack enabled API relationship Ex 2
How analytics become action
And a work order is born
Haystack enabled API relationship Ex 3

Building Systems

Haystack Powered Database

Preventative Maintenance
Optimal Filter Maintenance

- The replacement of AHU filters is a 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.

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
Building Systems

Haystack enabled API relationship Ex 4

Haystack Powered Database

Innovative Architecture
What can you do with 25,000 Haystack tagged data points?
And a work order is born
Haystack enabled API relationship Ex 5
Large Scale System Comparisons
“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