

April 17th Webinar - Q&A with Audience

Implementation of Fault Detection and Diagnostics software at Scarborough Civic Centre

- Q: Is the use of economizer being considered to achieve the targets?**
A: Yes, economizer performance was reviewed and faults were set up to ensure AHU economizers are working correctly.
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- Q: Can you please speak to how corrective actions are taken from the moment a fault is identified? How are the faults communicated? How frequently?**
A: Faults are made visible in “near real-time” with frequency determined by the user. Typical Corrective actions can be communicated via the built-in dashboards, reporting tools are available in standard or custom formats. They can also be emailed to maintenance staff if required. Additionally, skyspark has in-built functionality to track the lifecycle of any fault which works as a computerized maintenance management system.
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- Q: How is the software integrated with BAS? BACnet integration? And how does it fetch historical data from BAS? Accessing BAS database?**
A: Standard BACnet IP connector is used to connect to BACnet systems, Through proper authentication and IP controller end-point address we can connect to BACNet system. BACnet connector comes with skyspark as out-of-the-box feature.
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- Q: Do the tags need to be applied for each point manually initially?**
A: Data tagging can be done manually and through AXON scripting, For each unique equipment tagging is normally done manually for higher accuracy, and then at a large scale it can be replicated through advance scripting or by using some of the skyspark’s replication functionality where possible.
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- Q: How does the software tackle the challenge of data noise while detecting the faults?**
A: The challenge of data noise can be tackled during database integration; we can implement some data-cleaning algorithms/functions as a pre-processing. Also, while rule implementation we can have conditions programmed within the Rule code to avoid such situations as well. The fine-tuning rule is a continuous process to improve rule algorithms to address such data notice challenges.
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- Q: Can you integrate more than one site/building to the software and have combined reports for all sites?**
A: Yes, you can consolidate multiple sites and buildings. Software is capable of generating customized site-level and portfolio-level dashboards/reports.
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- Q: How are cost sections estimated based on this spark? Is this based on cost deviating from the original BAS schedule?**
A: Cost savings are based on deviations from the schedules, underperformance, etc. Virtual meters are used to document the increases once a fault is triggered.
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- Q: Is there technical information available on how the energy, cost is determined? Curious to know if we can use this for M&V for energy performance contracts, etc..**
A: Energy costs can be calculated as virtual meters where physical meters aren’t installed. For example, knowing the VFD operation on a fan, energy consumed based on load can be calculated.
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- Q: How were the equipment usage costs determined?**
A: Equipment usage cost is calculated in real time by load and runtime. For example, the Cost for OA air with an open damper is dependent on what energy is consumed by the coil to heat/cool the additional air that is coming in, With temperature sensors (On supply duct and Outdoor air) combined with AHU airflow we can determine the BTU/m3 usage by coil, and additionally we can consider the efficiency of heating/cooling equipment combined with Utility cost in order to calculate the resulting cost.
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- Q: For the savings result at this facility, how was it segregated between outcome of Skyspark implementation and other possible external factors? For example, occupancy change from the residents, different weather conditions compared to the baseline etc.**
A: For the savings result at this facility, how was it segregated between outcome of Skyspark implementation and other possible external factors? For example, occupancy change from the residents, different weather conditions compared to the baseline etc. For each fault we can see the estimated potential savings before implementing the Corrective Measures, Once the Corrective Measure is in effect we can monitor the actual savings on the building level meter or equipment level virtual meter. In case of the major difference between expected and actual savings both the expected cost savings and actual cost saving analysis is required to determine the exact source of savings. Analysis can be done through user-friendly dashboards or some custom KPI/RULE that can be programmed to calculate the avoided energy use through any CM implementation.
1. Occupancy change can be easily compared at the equipment data points dashboard with a fault or Runtime KPI if the actual savings are higher/lower than expected savings. And through all correlated data points presented in an easy-to-analyze dashboard, we can track down where the savings are coming from.
 2. The baseline is calculated using a real-time weather station in skyspark, so basically rather than relying on a static baseline we are using a dynamic baseline that changes with weather conditions.
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- Q: How do you layer SkySpark into the Capital Project? As a requirement to the commissioning provider?**
A: This is something we are still trying to figure out as well, but we are thinking of setting it up as a separate contract – similar to the approach you would use when hiring a 3rd party commissioning agent. In the future, we will explore rolling it into the engineering consultant’s scope of work. In that case, the engineering consultant would then go out and hire the analytics integrator.
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- Q: Question for City of Toronto: Prior to implementation, any challenges or obstacles from IT department? Example: concerns with data from an internal network to external, is the FDD server external vendor-hosted or is an internal server utilized? If internal I imagine some challenges with access for your implementation contractor.**
A: Our data analytics specifications called for the system to be capable of both cloud and on-premises hosting, specifically to give us flexibility both now and in the future. At present, our analytics and BAS servers are located on the City’s corporate network (i.e., internal). Contractors access both servers through a secure remote access token provided by our IT division.
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- Q: Have you been able to set up email notifications for critical sparks? Not via email digest.**
A: For this particular project email notification was not set up, but apart from email digest Skyspark is capable of sending immediate fault alert upon occurrence of critical spark.
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- Q: What types of electricity/gas meters were used (outputs, connection types, third party EMS)? I would like to install meters without negatively impacting future ability for FDD. Thanks.**
A: Generally speaking, meters can be connected directly or indirectly to skyspark using either open protocol such as Modbus, BACnet, pulse outputs. Depending on the type of meters – gateway devices may be required. If existing meter platforms exist and the information exists in a stand-alone cloud platform skyspark can use open APIs to pull data from the meter platform.
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- Q: How do you ensure that the cost savings are calculated accurately when the gas and electricity rates change?**
A: For each individual fault level and building energy meter level tariff rates can be easily updated manually to reflect the accurate savings, additionally for building meter level we can implement extension like tariff builder which automatically utilizes tariff data from RateAcuity™ Database, and that can be automatically updated with defined periodic schedule.
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- Q: Is there a rule of thumb for cost/point or facility size?**
A: For typical 2000 data points we can consider \$35-50k as a rule of thumb cost.