SkyFoundry Insider

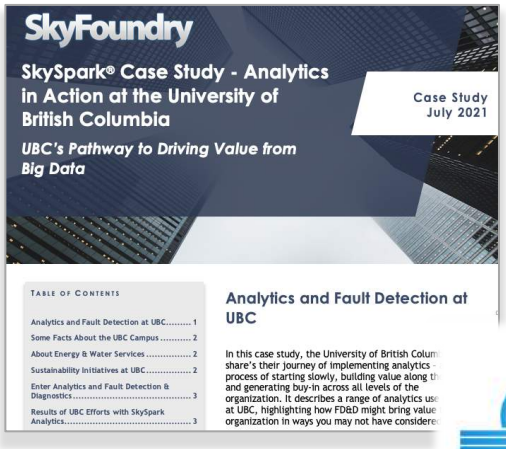
Issue No. 39 Sept 2021

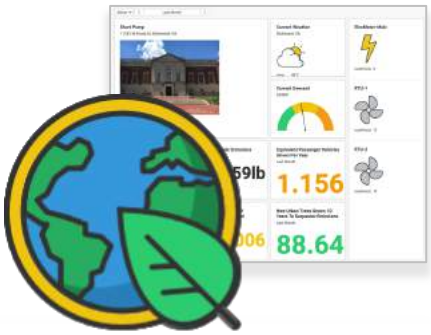
In This Issue

What's New with SkySpark®?

We're Glad You Asked!

It's been a very busy and productive spring and summer here at SkyFoundry. You're going to want to see these important product additions, case studies and announcements.





haxall

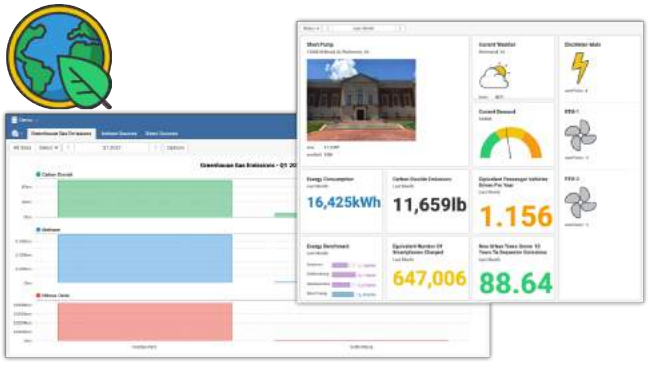
Let's take a look! →

SkySpark's All-New GhG App Makes It Easy to Calculate, Track and Report Greenhouse Gas Performance

Corporate and government interest and support for sustainability and "ESG" related policies (Environmental Social and Governance) is growing across all segments of the CRE industry. ESG issues are increasingly seen by shareholders as an indicator of a company's future success and are now a core component of most annual reports by public companies. Key elements of the "E" portion include energy efficiency initiatives, and Greenhouse Gas Emission tracking and reporting. Adding the capability to calculate, track and report GhG metrics in SkySpark® was a logical extension of our continually growing suite of energy focused applications.

SkySpark's GhG App connects to emission-source data available online from government agencies to simplify the configuration of location-specific emission factors for accurate GhG calculations. Online resources that have been integrated include the US Environmental Protection Agency Emissions & Generation Resource Integrated Database (eGrid) which is searchable via zip code or individual states/territories, and the US EPA Emission Factors Hub for Natural Gas and Propane. If a source for a specific location or fuel type is not available via an online resource, an emission source and conversion factors can be defined manually. Once an emission source is created, it easy to associate it with the consumption data, such as an electric meter or gas meter.

The App presents GhG performance in a wide range of engineering and "societal" metrics that are more understandable to the lay person (cars removed from the road, trees planted, etc.). Some examples that of GhG equivalent values included out of the box include:

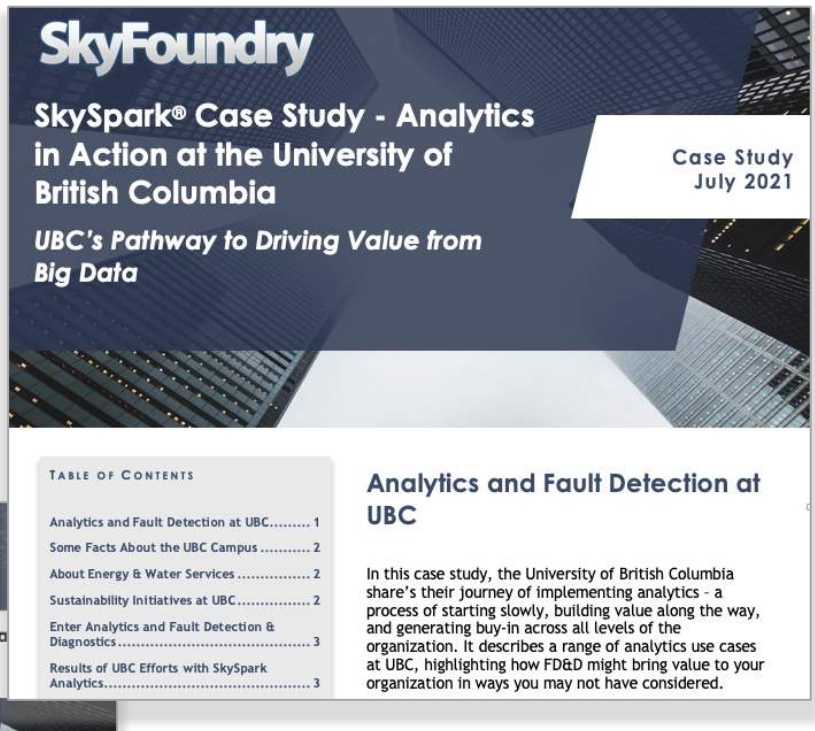


- Passenger Vehicles Driven Per Year
- Gallons of Gasoline Consumed
- Propane Cylinders Used for Home BBQ
- Number Of Urban Tree Seedlings Grown For 10 Years
- Number Of Smartphones Charged

The GhG App is a fully integrated SkySpark application providing the same navigation options, presentation formats and reporting features as seen across all SkySpark Apps.

New Case Studies Demonstrate the Success of SkySpark in All Types of Applications

SkySpark Is used in applications of all types, for facilities large and small – from district energy plants to industrial refrigeration and mission critical facilities. Here are a few of the most recent case studies demonstrating the benefits achieved with SkySpark. Find these detailed case studies at: https://skyfoundry.com/library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SkySpark® Case Study - Analytics in Action at the University of British Columbia

UBC's Pathway to Driving Value from Big Data

Case Study
July 2021

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Analytics and Fault Detection at UBC

In this case study, the University of British Columbia share's their journey of implementing analytics - a process of starting slowly, building value along the way, and generating buy-in across all levels of the organization. It describes a range of analytics use cases at UBC, highlighting how FD&D might bring value to your organization in ways you may not have considered.


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Xcel Energy
District Energy System

Denver, CO

SkySpa

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Applying Analytics in the Denver Colorado Xcel Energy District Energy System

Overview

Xcel Energy owns and operates a district energy system in downtown Denver offering steam heating and chilled water cooling to a variety of large customers. To improve the operation and management of this system, Xcel Energy has deployed analytics software using near real time data from the entire system including steam heat exchangers, chilled water heat exchangers, and five central chilled water plants.

In addition to the monitoring of customer heat exchangers, analytics and dashboards have been developed to evaluate the operation of multiple chilled water plants in a visual scorecard. Key metrics have been programmed for each plant including supply temperature deviation from setpoint, cooling efficiencies (kWh per ton-hour), and chemical levels. This automated scorecard has helped Xcel Energy improve system performance and manage operational costs.

PROJECT DETAILS

- District chilled water served by (5) distributed chilled water plants
- Advanced chilled water plant features such as ice storage and waterside economizer
- District steam served by main boiler plant
- Steam and chilled water distributed to customers throughout downtown Denver


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Energy Twin
SkySpark-based Machine Learning for Monitoring Based Commissioning

Case Study
May 2021

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Energy Twin – Machine Learning MBCx in SkySpark

Energy Twin (ET), a machine learning SkySpark extension for energy consumption analysis, is designed for efficient multiple building monitoring using artificial intelligence. ET aims to identify problems and reveal the potential for future energy consumption savings and optimization.

"This case study is a good example of how AI can improve our work. In this case, AI does not replace an expert; it makes their work more efficient. AI performs the repetitive and dull part of the job - such as comparing all measured data and detecting anomalies. The expert then spends precious time only with the events that matter and are worth investigating."

SkyFoundry Open Sources Core Software to Accelerate the IoT!

SkyFoundry's new initiative open sources many of SkySpark's core software modules to streamline development and reduce the cost of creating IoT devices for the built environment.

Haxall is an open-source software framework designed to streamline the process of building IoT data products—both hardware and software. It includes a core subset of proven SkyFoundry code that addresses critical functions needed to connect to devices and equipment systems, normalize their data, and makes it available to other applications in open standard formats.

Haxall provides the software functions to communicate with external devices, capture semantic tagging at the edge and communicate with external applications. It is powerful enough to run sophisticated applications **at the edge** or use it as a gateway to bring IoT data to cloud-based applications.

What Does Haxall Include?

Full Haystack 4 support. Haxall is bundled with SkySpark's full suite of Haystack APIs. This includes a rich set of APIs to model, encode, and query data using the Haystack 4 ontology.

Folio. SkySpark's revolutionary Folio database technology is at the heart of the Haxall platform. Folio is built 100% around the Project Haystack data modeling standard. Everything is stored as native Haystack "dicts" and queried using Haystack filters. Folio provides seamless integration with persistent and transient real-time tags making it a truly unique design to build IoT applications.

Axon. Haxall includes the Axon functional scripting engine. Create scripts to onboard, query, and transform your Haystack data using a rich library of hundreds of functions. The Axon function library has been leveraged for more than a decade to streamline working with Haystack data.

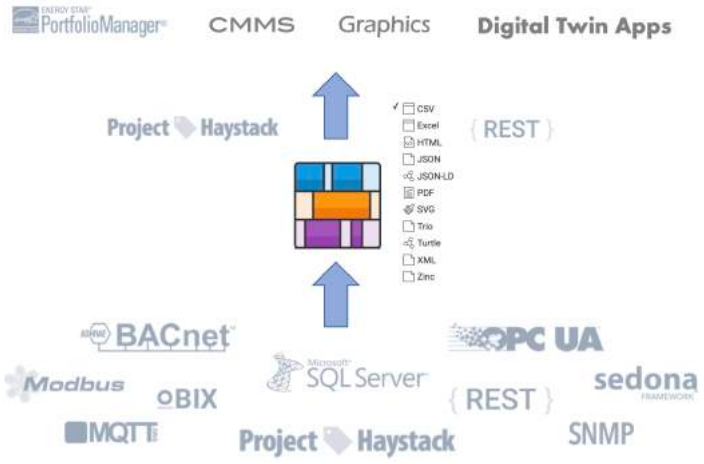
Haxall Daemon. A complete runtime called the "Haxall Daemon" is provided to quickly get your IoT applications up and running. The Haxall Daemon comes with "batteries included": tools to create new databases, built-in user management and authentication, a webserver with full support for the Haystack HTTP API, dynamic module management, and an Axon shell for remote management. In addition, Haxall provides runtime support for both the Java VM and JavaScript environments.

Connectors. Haxall includes a connector framework to acquire data from external devices and normalize diverse IoT protocols into the Haxall ecosystem. A suite of ready-to-use connectors is provided as open source including **Haystack HTTP API, MQTT, Modbus, oBIX, SQL, and Sedona Sox**. An in-memory trending engine is included to historize connector data into time-series data. Haxall also includes an Arcbeam™ module that provides seamless connection of Haxall devices into SkyFoundry's SkySpark software.

How Haxall Helps Accelerate the BIoT. Haxall streamlines development and reduces the cost of building IoT data acquisition devices by providing proven software components. Haxall is available as open source under the widely adopted Academic Free License ("AFL") v. 3.0 https://opensource.org/licenses/AFL-3.0.

Haxall Is Available Now. The code for the Haxall software modules are available now on GitHub

SkySpark's Role in Achieving the Promise of Digital Twins for the Built Environment



One of the new areas of technology gaining traction in the built environment is "digital twins". The term conveys the concept of a digital representation of a facility implemented via a software application. The representations can extend from the physical structure of the building to the actual data produced by the equipment systems that maintain the occupant environment, and the energy and resource flows associated with those systems.

As a platform for acquiring, managing, visualizing, and performing analytics on facility and equipment data, SkySpark has a key role in achieving comprehensive digital twins. By combining the platform's industry leading capabilities for acquisition of data from real world equipment systems (see sidebar), the highly efficient storage of data in its Folio database, its high-speed industrial historian and analytics processing engine, and comprehensive suite of data visualization apps, SkySpark provides essential capabilities essential to achieving the digital twin. Read our detailed White Paper here: https://skyfoundry.com/file/462/SkySparks-Role-in-Achieving-the-Promise-of-Digital-Twins.pdf

To optimize building performance over time, we need to collect and efficiently manage large volumes of sensor and equipment data, as well as asset data and other data. For example, to determine how a building responds in relation to design expectations we need to be able to compare actual results with expected performance, weather conditions, building usage and other factors – all of which change over time. SkySpark's highly efficient Folio database enables the storage, processing, and analysis of truly big data sets. And advanced math functions and machine learning tools enable the implementation of predictive analytics providing advance notice of conditions leading to loss of performance and failures.

Delivering Data to External Applications. Because all of the data contained in SkySpark, including all analytic results, KPIs and other calculations, are directly available to other applications, SkySpark provides the data foundation to serve the wide range of applications that provide users with their "digital twin experience".

The Platform for Operational Data

SkySpark brings together sensor and equipment data, web-services data, historical data, analytic results, KPI's, energy cost and more in a single platform.

Connect - BACnet IP, Modbus TCP, Obix, Haystack, SNMP, Sedona, OPC UA, MQTT, SQL, CSV import, REST API, and a connector development toolkit

Collect - Store vast amounts of device data

Transform - Normalize data and relationships

Analyze - Automated analytics processes rules and algorithms on your data

Present - Apps visualize your data & analytic results

Deliver – Transmit data to external applications via a variety of standard formats (see above)

We are very excited to be back **in person** for SkyPosium 2021! SkyPosium is designed for the entire community of SkySpark users—our reseller partners, end users, engineering consultants, and SaaS providers—everyone that uses or applies SkySpark.

SKYPOSIUM 2021 AGENDA PREVIEW

Day one will be a half-day, beginning in the afternoon. Day two will be a full day. The agenda will include program tracks covering applications, business topics, best practices and hard-core developer topics with significant portions of the content presented by community members. A general session delivered by SkyFoundry opens the event to bring everyone up to speed on the latest features and capabilities of SkySpark and provide a preview of our roadmap. SkyFoundry delivered content will include:

General Session with Demonstrations

- Haxall – the open-source initiative to accelerate the BIoT – strategy, capabilities, use cases
- The GhG App – overview and demonstration
- The new Notify Extension – overview and demonstration
- Card View and Customizing Charts – do you know how to utilize the latest charting and visualization features
- HTML export – new options for delivering information
- The All-New Doc structure and search capabilities

Technical and Developer Sessions

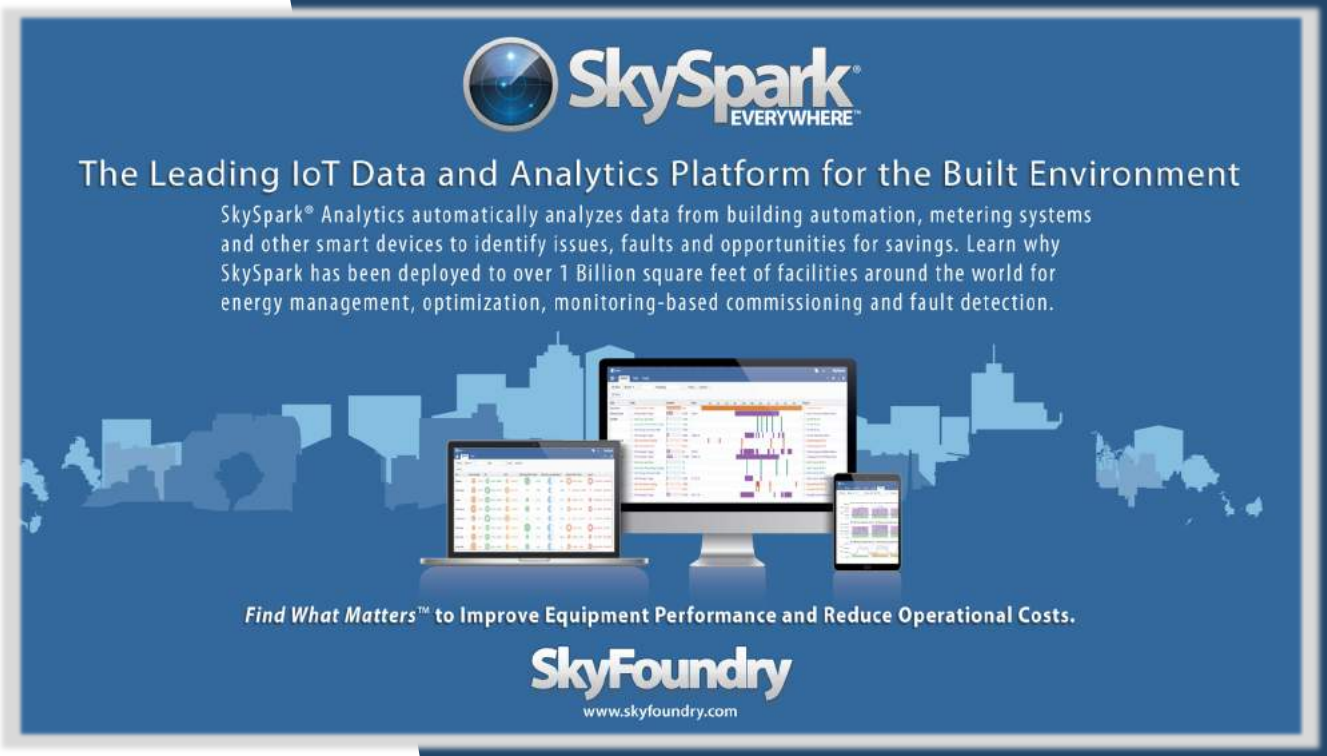
- Building Card Views – a live tutorial
- Single Sign On, SAML, LDAP and security enhancements – technical review
- Haxall – developer session
- Using the new Notify Extension – technical review
- GhG App – technical review

SkyPosium provides two program tracks—one for hardcore developers and the other focused on applications, with the majority of presentations provided by the community. SkyFoundry opens the event to bring everyone up to speed on the latest features and capabilities and provide a preview of our roadmap. With major portions of the program delivered by community members, it's a true community event.

Data science for the built environment is one of the hottest areas of technology and there is no question that the SkyFoundry community is leading the way. SkyPosium is a unique one-of-a-kind event that brings the community together for shared learning and networking.

The event also includes a **vendor showcase** that provides attendees with the opportunity to meet with companies that offer complementary products and services to the SkyFoundry community.

Find full details at this link: https://www.skyfoundryevents.com/skyposium-usa-2021/



Learn More About SkySpark® and How to Apply the Industry-leading Data Analytics Solution to Your Application

Join us for a comprehensive demonstration webcast

Find our calendar of upcoming sessions and other events here:
https://skyfoundry.com/calendar

Or contact us at: info@skyfoundry.com