

# SkyFoundry Insider

Changing the Game for the User eXperience –

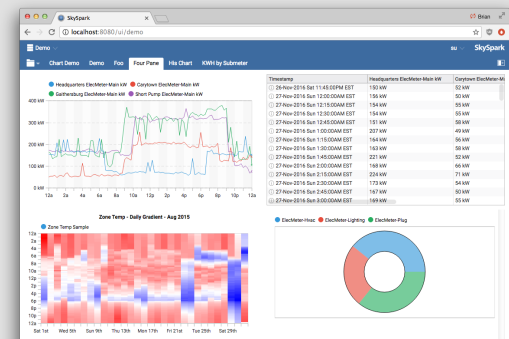
*SkySpark View Builder* combines all of the benefits of automatically generated Apps, with the ability to create customized views

## Introducing SkySpark® View Builder – Enabling Easy Assembly of Custom Apps, Views and Reports

One of the main features of SkySpark that has made it so successful is that it **automatically** creates rich visualizations of analytic results and operational data without requiring engineering effort to build displays. This capability was a break-through when first introduced in 2011. It has eliminated countless hours of labor typically associated with creating graphical displays of equipment data, operational conditions and analytic findings.

While our users love the efficiency the automated apps provide, there is often a desire to create customized presentations of operating data and analytic findings. SkySpark's new View Builder technology takes the next step in data visualization by enabling users to create their own visualizations, reports and fully interactive Apps without needing software development skills. **View Builder** provides an extensive library of display widgets and a simple point and click tool for creating views.

View Builder provides more than charts and graphs – it truly enables users to create customized user experiences that combine graphs, tables, text, selection boxes, data entry fields and more. And, once created, views are easily reused and combined to further streamline project work.



Sharing analytic findings is key to creating value from equipment system data – all views created with View Builder are easily exported in a range of standard formats. With View Builder, SkySpark combines all of the benefits of automatically generated Apps, with the ability for users to create their own customized views quickly and easily. In this issue of the Insider we will provide examples of View Builder – *but to really grasp the full power of this new technology you will want to see a live demonstration.*

# The User eXperience – Making Data Meaningful – the Key to Delivering Value

## The UX – Making Data Analytics Meaningful to Operators

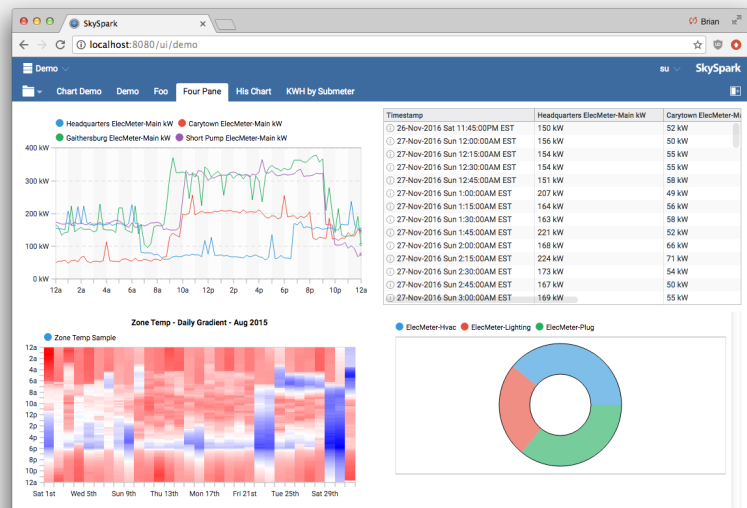
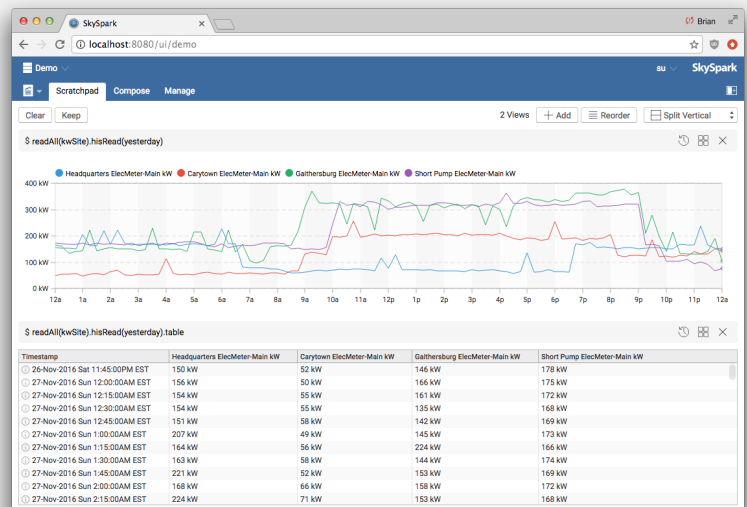
Analytics results are only valuable if they drive a process to address issues to improve efficiency and reduce cost. If the process required to create those visualization results in significant costs and extra effort the value of the analytics is diminished and the potential savings will not be realized. SkyFoundry addresses this challenge with a number of unique User eXperience solutions.

## Automatic Generation of Information Visualizations

Finding patterns and transforming data may be the technological core of an analytics platform, but to make results useful we need to present those findings in visualizations that make it easy for operators to understand and act on them. SkySpark automatically generates rich, intuitive visualizations to show operators analytic findings, trends, correlations and relationships without the conventional approach of requiring assembly of graphical displays.

## “Compose-able” Applications

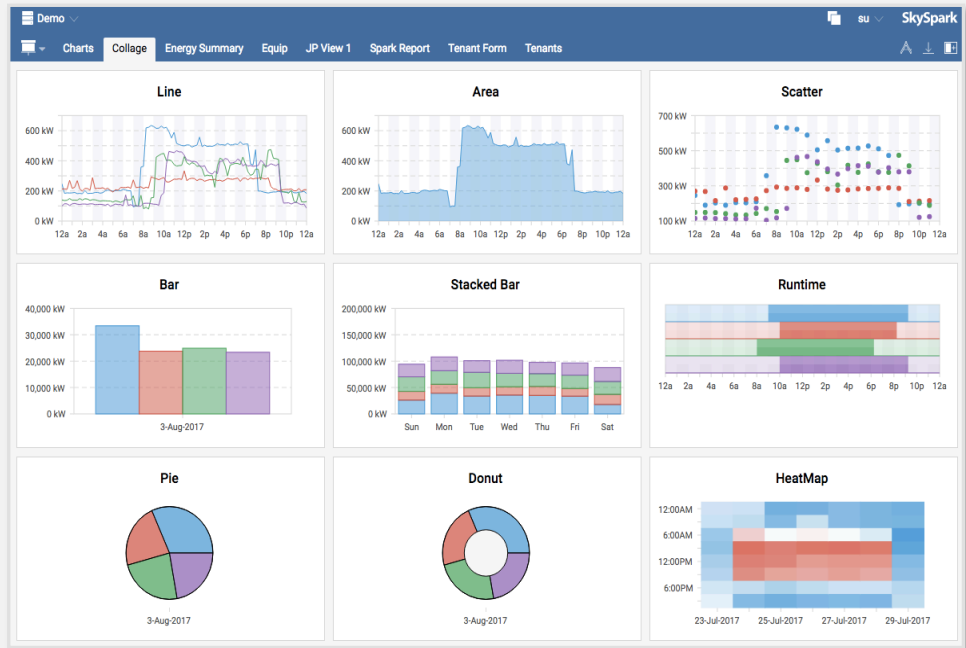
Different users and applications have different needs and often want to see their data and analytics results in different ways. SkySpark combines the power of automatically generated visualizations with the ability to combine our standard tools into custom views with a feature we call compose-ability. This is not simply assembling information and charts into fixed reports, but truly combining visualizations into unique applications that accept user input for selection of date ranges, equipment, data and other items. We think it's a revolutionary new take on web-based UI's for smart device, data-rich applications.



# Assemble Views from a Wide Range of Built in Display Widgets

Flexibility and simplicity is key to making custom views effective – if it's too hard, or the tools are too limited, users can't achieve the desired results.

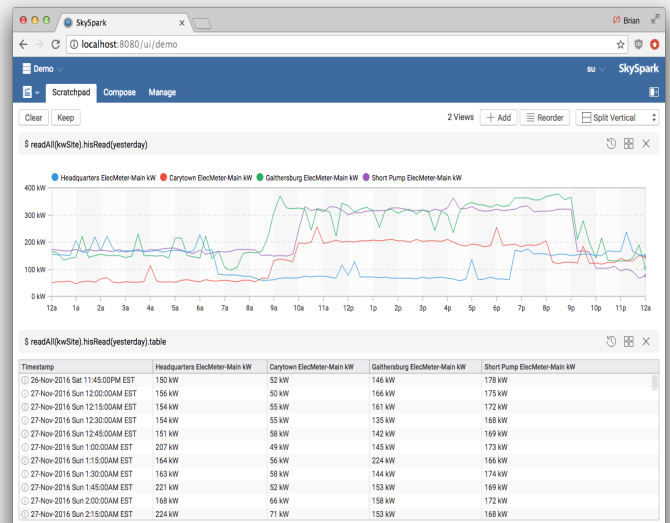
With SkySpark View Builder you can build visualizations from a wide range of display widgets and combine them with formatted text and tables of data as shown.



SkySpark's Data Display Widgets

The screenshot shows a report with the following sections:

- AHU Cool-Heat Mode Cycling:** AHU is cycling between cooling and heating and not meeting a min amount of time required between these two modes.
- AHU Cool Failure:** Unit is cooling, but temperature drop between return sensor and discharge sensor is under expected threshold. Recommended Actions: 1. Check to see if cooling coil is dirty, 2. Check refrigerant levels in cooling system. Priority: Medium.
- Temp Sensor Failure:** Sensor has failed to change over 24 hour period. Because it requires a full day of analysis, this rule always skips today. Recommended Actions: 1. Check calibration settings in control system, 2. Physical replacement of the sensor. Priority: Medium.
- AHU Group Cool and Heat:** A group of AHUs have at least one unit in cooling mode at the same as another unit is in heating mode. These units may be "fighting" each other to maintain temperature setpoints. Recommended Actions: Check control sequences. Priority: Medium.
- AHU Fan Short Cycling:** Point is cycling on/off more often than its min on/off times.
- AHU Fan Failure:** Fan is on but dischargePressure is below threshold of 0.05kPa or 0.25inHg.
- Lights On and Unoccupied:** Lights are on and site is unoccupied. Recommended Actions: 1. Check that schedules are linked to lighting system in control system, 2. Check if lights have been left in override mode.



Sample report combining temperature chart and temperature values in a table

Add formatted text to reports with SkySpark's fast and easy "Fandoc" format

# Reports – Turning Rich Information Displays into Easily Shared Documents

Not all users involved in data analysis work directly with software applications. Many team members need to be provided with conventional reports, and View Builder provides a wide range of reporting features.

## Anything You See Can Be a Report

With SkySpark, if it's on the screen its available as a Report – this includes analytic results, rule descriptions operator instructions and equipment system data.

## Fast and Easy Export in PDF Format

Any view in SkySpark can be quickly exported as a PDF document. User can easily export views manually, or reports can automatically be sent as attachments to emails generated by the system.

date	dur	rule/ief	target/ief	times
3-Aug-2017	3.5hr	KW Exceeds Target	Gaithersburg ElecMeter-Main	9:15a (1hr), 10:30a (15min), 12:00p (15min), ...
3-Aug-2017	10.5hr	KW Exceeds Target	Headquarters ElecMeter-Main	8:15a (10hr, 15min), 7:00p (15min)
3-Aug-2017	15min	AHU On and Fan Off	Short Pump RTU-1	10:00a (15min)
3-Aug-2017	24hr	AHU Cool Failure	Carytown RTU-1	12:00a (14day)
3-Aug-2017	3.25hr	KW Exceeds Target	Short Pump ElecMeter-Main	10:30a (2hr, 15min), 4:00p (30min), 5:15p (15min), ...
3-Aug-2017	15min	AHU On and Fan Off	Gaithersburg RTU-2	4:00p (15min)
3-Aug-2017	2hr	AHU Cool Failure	Headquarters AHU-1	11:30a (2hr)
3-Aug-2017	24hr	Temp Sensor Failure	Carytown RTU-1 DischargeTemp	12:00a (14day)
3-Aug-2017	1.25hr	AHU Fan Short Cycling	Gaithersburg RTU-2 Fan	6:45a (15min), 2:45p (15min), 4:00p (15min), ...
3-Aug-2017	24hr	Temp Sensor Failure	Carytown RTU-1 ZoneTemp	12:00a (14day)

**KW Exceeds Target**  
KW exceeds target of 400kW

**AHU On and Fan Off**  
The unit has some component in the 'on' state such as cooling or heating, however the fan is not running.

**AHU Cool Failure**  
Unit is cooling, but temperature drop between return sensor and discharge sensor is under expected threshold

**Recommended Actions**

1. Check to see if cooling coil is dirty
2. Check refrigerant levels in cooling system

Priority: Medium

**Temp Sensor Failure**  
Sensor has failed to change over 24 hour period. Because it requires a full day of analysis, this rule always skips today.

Export dialog box details:

- Filename: SparkReport.pdf
- Format: PDF
- pageSize: US Portrait (8.5in x 11in)
- Buttons: Download, Cancel

Copy data as options:

- CSV
- JSON
- Trio
- XML
- Zinc

Choose portrait or landscape, add page breaks or export as individual graphical elements as SVG or PNG images, or copy the data set in a range of standard formats (as shown in examples below).

**KW by Site • Week of 9-Apr-2017**

Chart showing kW for Headquarters, Carytown, Short Pump, and Gaithersburg over the week of 9-Apr-2017.

**All Sites Total Energy Use by Time of Day**

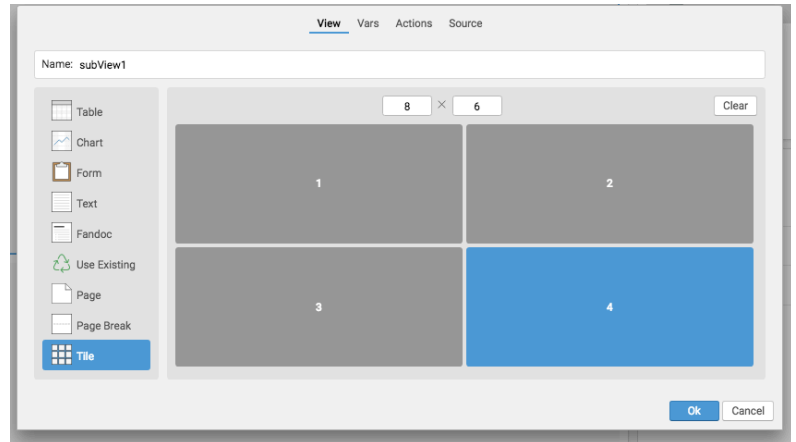
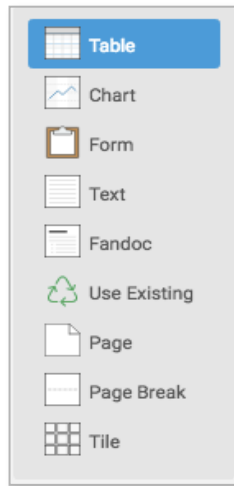
Site	Energy Use (kW)
Headquarters	179.0 kW
Carytown	104.0 kW
Short Pump	136.0 kW
Gaithersburg	122.0 kW

# Point and Click to Build the Views You Want

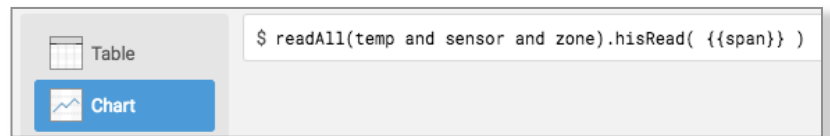
The goal of SkySpark View Builder is to enable users to create custom visualizations without needing software development skills. A **Point and Click interface** allows users to define the layout of views, Apps and Reports and specify the content to be displayed using standard SkySpark queries. **STEP 1** – define a layout →

## STEP 2 –

Once a layout is selected double click to choose the type of data display desired for each tile →



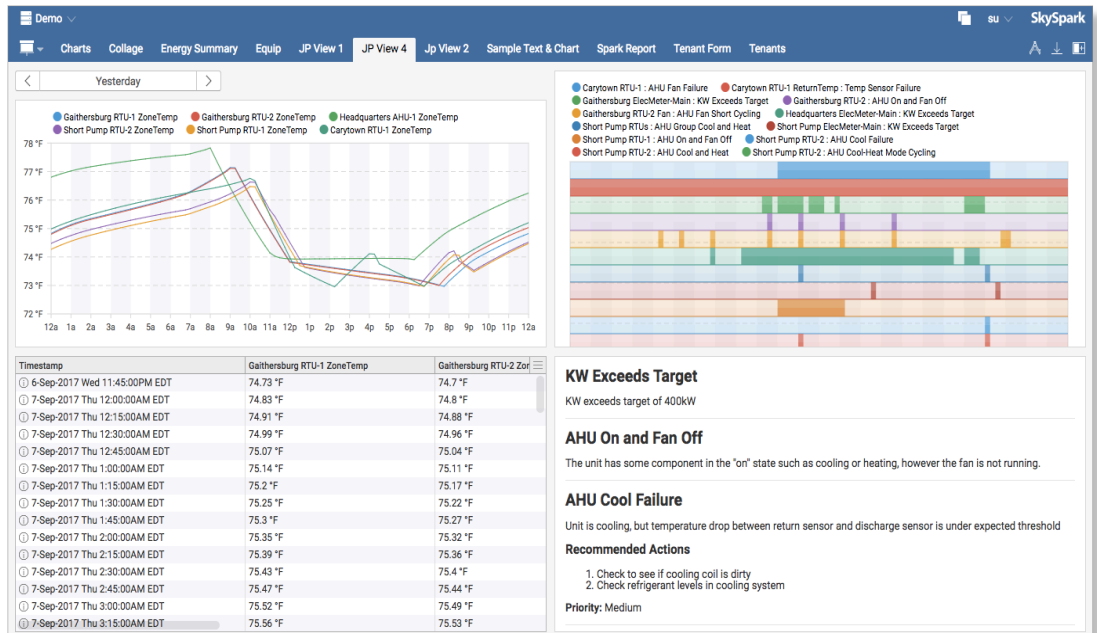
Here we are defining a view that will have 4 tiles displaying information



**STEP 3** – Select the data to be shown in each tile. Here we are requesting the temperature values for whatever date span is selected by the user. It's shown as the top left tile below.

Here is our end result – an **interactive** App that allows the user to choose the desired date range.

Tile 1 - shows Zone Temp values, Tile 2 – shows Sparks for the selected time period as sparklines, Tile 3 – shows Zone Temps in a scrollable table, Tile 4 – provides the Help for the Sparks shown in Tile 2.



# The “Viz Framework” – The Next Generation of UX Technology Powers View Builder



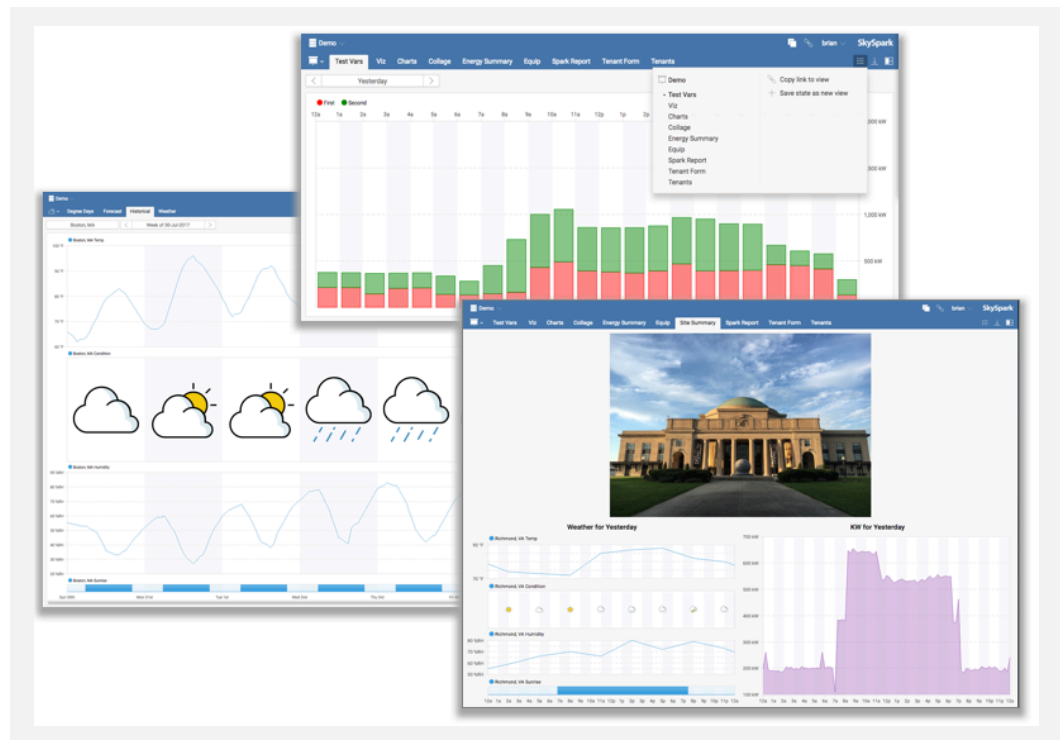
Underlying all of the View Builder examples we have presented is an all-new software framework – an advanced, browser-based visualization technology we call the “**Viz Framework**”. Based on the very latest techniques and technologies for browser-based applications, the Viz Framework is the engine that powers the easy to use View Builder tool and, it’s available for SkyFoundry partners and customers to create highly customized, differentiated applications of their own, further extending the flexibility of the SkySpark Informatics platform.

The **Viz Framework** is designed from the ground up to blend together graphical charting, tabular data, and styled text into one unified framework that renders views in SVG (Scalable Vector Graphics). SVG is widely accepted as the universal standard for visualization. The SVG specification is an open standard developed by the World Wide Web Consortium (W3C) since 1999. All major modern web browsers—including Mozilla Firefox, Internet Explorer, Google Chrome, Opera, Safari, and Microsoft Edge—have SVG rendering support. Two 'Mobile SVG Profiles,' SVG Tiny and SVG Basic, meant for mobile devices with reduced computational and display capabilities. And, Viz includes a new PDF engine that renders straight from SVG allowing SkySpark to export the icons, charts, and other presentations you see on the screen to PDF format with full fidelity and high resolution.

Utilizing SVG as the foundational visualization format in SkySpark provides the highest degree of compatibility and flexibility for presentation information across platforms.

If you think of View Builder as a drag-and-drop tool for easy assembly of views designed for use by almost anyone. The Viz

Framework provides more advanced users with the ability to presentations with any combination of features, styles, data and even graphic images. This approach furthers SkyFoundry’s commitment to make it *automatic and easy* to get standard views of data and analytics results with no engineering effort, while providing more advanced users with the tools they need to *create virtually anything* they can imagine.



# SkySpark® – Creating Value from Device Data

The new frontier is to efficiently manage and analyze data to *find what matters™*

The past decade has seen dramatic advances in automation systems and smart devices. From IP connected systems to support for web services and xml data schemas, it is now possible to get the data produced by the wide range of systems and devices found in today's buildings and equipment systems.

Access to this data opens up new opportunities for the creation of value-added services to reduce energy consumption and cost and to identify opportunities to enhance overall facility operations.

Access to the data is just the first step in that journey, however. The new challenge is how to manage and derive value from the exploding amount of data available from these smart and connected devices. *SkySpark directly addresses this challenge.*

Your equipment has something to tell you.

SkySpark® speaks its language.

