

The Role of Data and Analytics in Responding to the Covid-19 Challenge

*Supporting society's efforts to safely
re-open the built environment*

SkyFoundry

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It's important to start this paper by confirming that there is no single technology or product that can provide definitive protection from Covid-19. Medical science is on the front line of that endeavor and we all share in our support of their efforts. Data and analytics, however, are an essential element in the toolset for facility owners, operators and managers as society works to re-open the built environment.

Our goal in this paper is to highlight the role that data and analytics plays in supporting the wide range of the activities needed to respond to this unique challenge.

Start with Best Practices

Any response to the Covid-19 challenge should first center on identifying and adopting best practices. Those include the facility's responsibilities for sanitation of surfaces and spaces, the individual's responsibility for following personal hygiene social distancing guidelines AND the proper operation of the environmental systems that support the indoor environment.

Operation of Environmental Systems (HVAC)

ASHRAE, along with universities and scientific research organizations have provided detailed guidance on best practices in the operation of HVAC systems to minimize the risk of airborne transmission of "infectious aerosols" in indoor environments. Research has shown that proper indoor environmental conditions minimize the likelihood of aerosol transmission of virus particles. Proper control of humidity, temperature, filtration, pressurization and fresh air levels are fundamental to providing conditions that minimize the potential for transmission by HVAC systems. "ASHRAE is uniquely qualified to provide guidance on the design, operation, and maintenance of heating, ventilating, and air-conditioning systems to help reduce the dangers of pathogen transmission through the air in these settings. Transmission of SARS-CoV-2 through the air is sufficiently likely that airborne exposure to the virus should be controlled. Changes to building operations, including the operation of heating, ventilating, and air-conditioning systems, can reduce airborne exposures."

(Source : <https://www.ashrae.org/file%20library/technical%20resources/covid-19/eiband-airbornetransmission.pdf>)

We direct the reader to ASHRAE resources for their most up to date guidance, which can be found at this link: <https://www.ashrae.org/technical-resources/resources>

Data Analytics Role in the Operation of HVAC Systems

The operation of environmental systems to address best practice recommendations requires the use of modern automation systems. Tracking their operation and performance to confirm proper functioning and identify deviations is the role of data analytics. Application scenarios for the use of analytics include:

- Monitoring temperature and humidity levels and informing operators of deviations from desired performance
- Monitoring indoor air quality as measured by CO₂, VOC and other sensors which can act as a proxy for the content of fresh air versus recirculated air
- Monitoring the performance and servicing of air filtration, and pressurization of ducts and spaces

Data collected from automation systems and sensors is captured and analyzed to identify actual operating conditions and inform operators if issues and improper operation. Analytics has a major role in simplifying and automating reporting to both internal teams and outside agencies and regulators. Reports can be used to confirm desired conditions are being maintained as well as delineating deviations.

Data Analytics Support Manual Tasks as Well

When we think of data analytics in buildings, we think of data coming from equipment systems, sensors and meters over communication networks, but analytics can be effectively used with manually entered data such as cleanings events, status checks, and other manually entered readings. Employees can enter data manually through forms and integrate data collection from handheld devices via APIs and web services.

As we confer with owners and operators of facilities to gather their plans for reopening and risk mitigation, we see the following measures being put in place, some of which lend themselves to being recorded and made part of an organization's data resources:

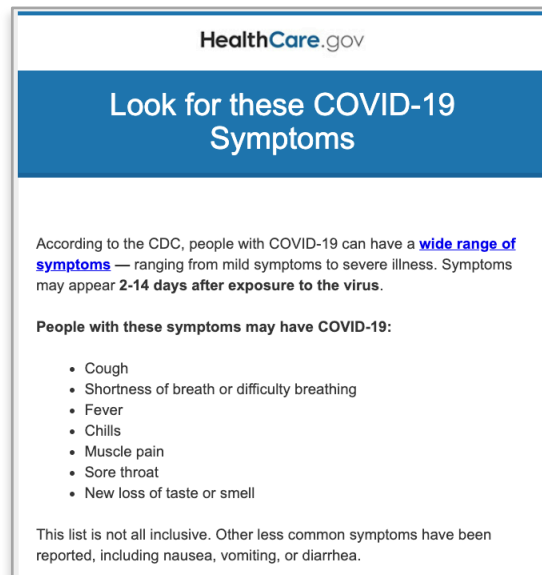
- Implementation of buffer times between use of conference rooms.
Data's role: record schedule times and actual occupancy activity to confirm buffer times are being adhered to
- Cleaning between use of conference rooms
Data's role: recording sanitation activities, comparing results versus plans

- Hand sanitizer stations located throughout facilities
Data's role: record deployment times and fill levels
- Providing masks for occupants that may not have their own
Data's role: record inventory levels, usage rates
- Significantly increased cleaning cycles for all surfaces
Data's role: record sanitation schedules and completed activities
- Installation of foot operated door openers
Data's role: Gather data confirming use and identifying any failures for automated door equipment with communications capabilities
- Transitioning to individually packaged condiments and single use plates, cups etc. in break and eating areas
- Limiting occupancy density through signage, removal of chairs and tables, and oversight
Data's Role: Collecting and analyzing data from occupancy sensors capable of detecting presence and counting of individuals
- Directing foot traffic with signage to minimize needless wandering
- Emphasizing continued social distancing through communications and signage, i.e., signs reminding people "no more hugs and handshakes"
- Installation of sneeze and cough guards and dividers between workspaces where possible
- Installation of HEPA filters on HVAC systems and HEPA level air purifiers in spaces
Data's role: monitoring status of filters via sensors, control and monitoring of active UV filtration devices
- Measuring temperature of people as they enter the facility
Data's Role: Recording temperatures, anonymizing data, identifying trends and correlations
- Providing government reporting data to inform occupants of virus cases activity in the surrounding geographic area
Data's Role: Integrating data from different sources and formats, processing into reporting, notifications and information displays to inform occupants
- Including rapid Covid-19 testing for all occupants/entrants
Data's Role: Recording test activity, and results, anonymizing data for trend analysis separate from informing individuals of personal results

Record keeping, data capture, reporting and analysis to confirm completion of cleaning and other manual tasks creates a valuable resource to both verify that actions are being completed and communicating that information to occupants to build and maintain confidence that mitigation measures are being actively executed.

A Shared Responsibility - Vigilance

A critical component of society's response to the pandemic is for all of us to remain vigilant in watching for symptoms in ourselves, co-workers and family, maintaining social distancing and practicing recommended hygiene. We offer the following as a reminder.



Source: https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html?utm_campaign=20200514trgals3ccplnrsnna&utm_content=english&utm_medium=email&utm_source=govdelivery

Helping with Your Data Needs

The team at SkyFoundry would be happy to discuss the ways in which SkySpark can aid your efforts to re-open your facilities, maintain and confirm best practices, mitigate risk and support occupant confidence through collection, management, analysis and reporting of critical data whether captured manually or via sensors and controls.

Contact us at info@skyfoundry.com or visit us at <https://skyfoundry.com/>

ABOUT SKYFOUNDRY

SkyFoundry's mission is to provide software solutions for the age of "the Internet of things". Areas of focus include:

- Facility Automation and Management
- Remote device and equipment monitoring
- Energy management, utility data analytics
- Asset management

SkyFoundry products help customers derive value from the data in smart systems. Contact us to learn more.

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