CASE STUDY APPLICATION:

Fan Runtime Optimization Using CASLink and Artificial Intelligence (AI)

PRODUCT SPOTLIGHT:

Demand Control Ventilation (DCV)

CASLink, CaptiveAire's proprietary Building Management System, collects live equipment performance data that provides a window into the operation of CaptiveAire products. Artificial Intelligence (AI) models leverage this data for training and performing continuous, comprehensive data analysis of the equipment. The models scale to effectively review thousands of locations for specific performance characteristics.

CASLink also provides the ability to remotely update system settings. This capability enables CaptiveAire's Engineering Services team to swiftly act upon insights gained from AI model outputs. The team can coordinate with the location to implement remote changes that result in savings, general performance improvements, or both.

CaptiveAire's Engineering Services team trains Machine Learning models to review Demand Control Ventilation (DCV) sensor data and determine expected system fan runtime. This output is compared to the actual system fan runtime data to identify locations running excessively – a telltale sign of other root issues. Corrective actions are determined for those systems, ultimately resulting in energy savings. The top 10 locations from the initial review were analyzed for this case study:

- **5 of 10 had root issues that were installation-related**
  - o CaptiveAire's Field Service team was notified of these locations
- **4 of 10 had root issues that were settings-related**
  - o These were remotely updated – at no cost to the customer
  - o Specifically, fan activation, deactivation, and schedule-based settings were adjusted to align with the location's specific needs
- **6 of 10 locations did not have a direct line of communication for support**
  - o Either were not sold directly by CaptiveAire or were new tenants
  - o The model enabled CaptiveAire to introduce CAS Service to the customer, establishing communication for future needs
- **Substantial savings and performance improvements were realized**
  - o 42% energy savings across the updated sites
  - o $1,100 saved on average in annual fan energy per site
    - ▪ In addition, reduced airflow resulted in HVAC savings
  - o Elimination of overnight fan cycling and reduced manual overrides signaled general performance improvements
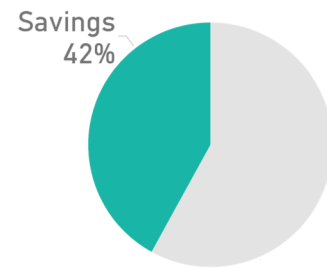
This model is used in a variety of ways by CaptiveAire's Engineering Services team to ensure optimal performance of all DCV systems monitored by CASLink.
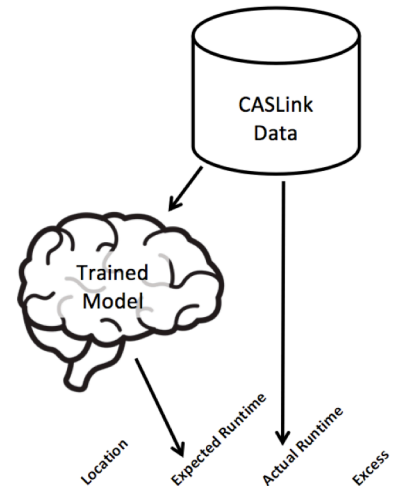
CONCLUSION:

CaptiveAire is continually improving the value of CASLink by leveraging AI. These techniques enable data from CASLink locations to undergo continuous, detailed, individualized analysis. Model outputs ensure CaptiveAire's Engineering Service efforts are focused where solutions are needed.

$1,100

Avg. Annual Cost Savings per Location

Savings 42%

Overall Fan Energy Savings

Location	Expected Runtime	Actual Runtime	Excess
Site A	10 hrs	24 hrs	14 hrs
Site B	10 hrs	22 hrs	12 hrs
Site C	14 hrs	24 hrs	10 hrs

Process Overview