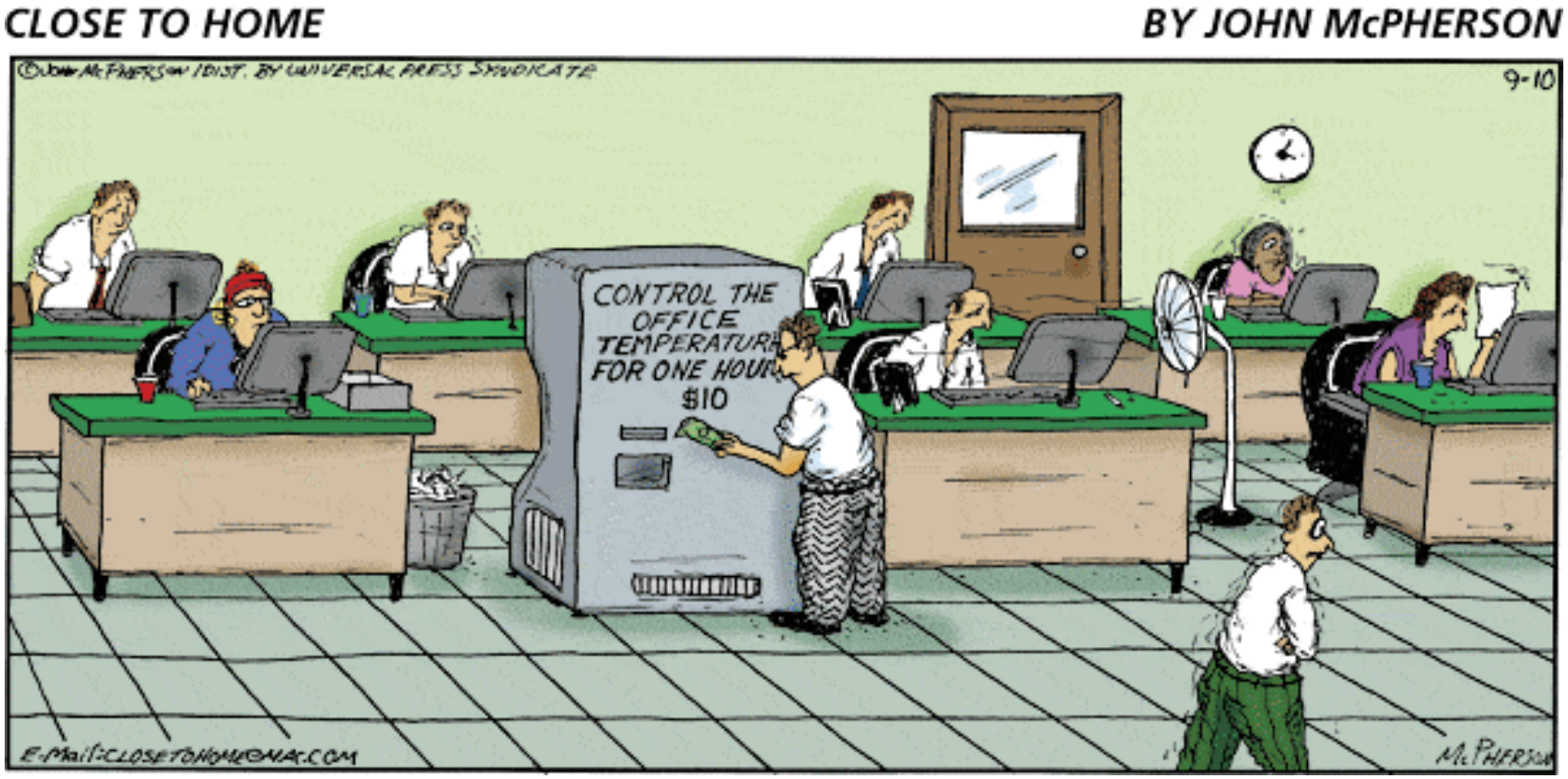
CONTROL WORKS

CW Industries

Converse Area New Development Organization
CANDO

The Changing Nature Of Building Controls



This is not our idea of good building control!

Building Controls are undergoing a significant transformation with new options:

- Technology
- Delivery of Control Systems
- Cost Model Associated With Controls
- How Control Systems Are Supported

From the time that ancient Romans piped hot or cold water and air under their floors to create a more comfortable interior building environment.

Caldarium from the Roman Baths at Bath, England. The floor tiles have been removed to expose the empty space through which hot exhaust gases flowed, heating the tiles.

To the time that temperature controls meant opening a window or, putting another log on the fire,

The desire to create a more comfortable interior building environment has been with us.

Objectives of a Building Control System

Comfort

- Temperature
- Air Quality
- Air Flow
- Reliability
- Noise
- Vibration

Cost

- Energy
- Maintenance
- Resources
- Budgets

Sustainability

- Manage Natural Resources
- Today
- Tomorrow

20th century technologies have changed a lot about mechanical systems for HVAC and building control.

Problems continue:

- Buildings are still uncomfortable
- Energy use is still excessive
- Maintenance costs are still too high
- Skilled resources to work on complicated systems are limited
- Costs are escalating

Why?

The historical approach of how building are built works against having an efficient and comfortable building.

Design Process Weak

•Many Mechanical Engineers don't understand building controls

•Lack of holistic approach to design
    - •Devices for temperature change
    - •Devices for transport
    - •Combined effect

•High level specifications with little detail on Sequence of Operations, points list etc.

•Often influenced by brand reputation to make a "safe" decision

•What worked in the past is ok for today

•Relies on the control contractor to make it work
    - •Controls contractor won't get paid if the system doesn't work

The historical approach of how building are built works against having an efficient and comfortable building.

Build

First cost control means

•Spec the minimum

•Win the bid

•Try and make some money

First, The historical approach of how building are built works against having an efficient and comfortable building.

Commissioning:

•An immediate fix for design build / issues

•System correct when the commissioning is finished

But

Almost immediately the system performance and building comfort start to slip due to changing conditions over time:

•Weather
•Seasons
•Building use
•Building occupancy
•Maintenance

Long Term Success?

Design + Build + Commissioning ≠ Working Building

The culture of the controls industry stifles innovation.

•Proprietary systems lock in owners and operators to a particular vendor or contractor

•So called open systems really don't leverage the capability of new, smart technology.

•A business model that needs to make service calls

These and other factors all contribute to keeping systems from reaching their full potential for:

•Comfort

•Cost control

•Sustainability.

The concept of Automated Continuous Commissioning

ACC is enabled by changes in technology, which leads to changes in the delivery of controls, the cost model and how systems are supported.

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What are the components of a modern controls system and making it work?

On-Site Services

- Installation
- Maintenance
- Repair

Products/Technology

CrossTalk™ Platform
- Hardware - Controls, Interfaces
- Software - Local Interface
- Best Practices - CW Methodology, Operations Standards
- Controls Programming

CrossTalk ACCES™
- Automated System Operation - Monitoring, Automated Alerts, Automated Maintenance Dispatch,
- Best Practices - CW Methodology, Standards Based System Performance, Automated Continuous Commissioning
- Software Updates

- Contract Administration

IT/Infrastructure/ Connectivity

- Wide Area Network - Connectivity
- Hosting Services
- Manned System Operation - Monitoring, Maintenance Dispatch
- Help Desk - 24/7
- System Financing
- Contract Administration

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The concept of Automated Continuous Commissioning

ACC is enabled by changes in technology, which leads to changes in the delivery of controls, the cost model and how systems are supported.

What is Commissioning?

- Design Build Review
- System Operation Optimization
- System Maintenance

What is Continuous Commissioning?

- On a Schedule
- Monthly
- Quarterly
- Yearly

What is Automated Continuous Commissioning?

- Real Time
- Ongoing
- Minimal Human Involvement

The concept of Automated Continuous Commissioning

Technology Review

DDC/PLC Controls are digital in their operation and in the information they supply and use

Digital enables computer use

But

A computer *interface* to your controls is not necessarily computer *management* of your controls.

But

Many vendors call a computer interface Building Automation

Might have some limited management capabilities.

But

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The concept of Automated Continuous Commissioning

Technology Review

Building Automation should be an Expert System delivering

Automated Continuous Commissioning

- System Operation Optimization
- System Maintenance
- On a Schedule
- Real Time
- Ongoing
- Minimal Human Involvement

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The concept of Automated Continuous Commissioning

An ACC Expert System must be capable of:

Measuring

Monitoring

Alarming

Logical Alarming

Controlling

Maintain Historical Date

Relate All Components

Notification

On all devices that change temperatures, control transport, sense and measure

The concept of Automated Continuous Commissioning

An ACC Expert System should also be capable of integrating multiple control protocols:

BACnet

LON works

Modbus

Proprietary?

The concept of Automated Continuous Commissioning

An ACC Expert System should also be capable of integrating all of a building's infrastructure systems including:

- HVAC
- Lighting
- Power
- Irrigation
- Snow Melt
- Access Control
- Video
- Elevators
- Fire / Safety

Changes to the Delivery Model influenced by changes in technology

- How systems are designed
- Remote access

Managed Services

- Programming
- Monitoring
- Notification
- Hosting
- Network
- Computers
- Help Desk

Changes to the Cost Model influenced by changes in technology

Direct

•Reduced Energy Expense

•Reduced Maintenance Costs

•Improved Worker Productivity

Indirect

•Improved tenant productivity

•Improved returns for building owners

Managed Services

•No capital outlay

•Paid as a monthly fee

•Paid from reduced costs savings

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Changes to the Support Model influenced by technology changes

- Remote access enables remote support
- Programmer not required on staff
- Less Training
- Scheduled maintenance
- Efficiencies create opportunities
- Shared maintenance responsibilities

What's the practical application of all this?

Colorado School District

~1,000 classrooms

Problem:

Too hot / Too Cold

30 calls a day

Requires classroom visit to fix

Solution:

Individual web page for each classroom allows teacher to see:

Room temperature

Set point

Outside Air temperature

Adjust set point -/+ 5 degrees

What's the practical application of all this?

Colorado School District

~1,000 classrooms

Result:

30 calls a day to 10 per month

A gain of ~250 man hours per month

All benefits associated with better classroom environment

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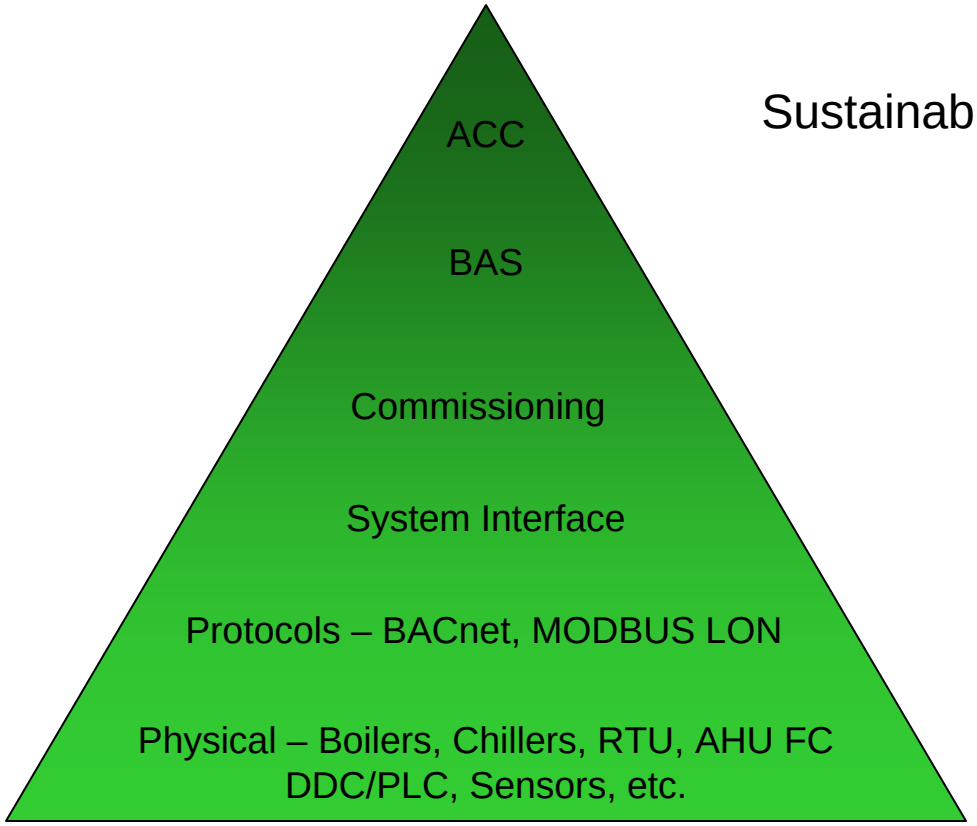
Sustainable System



Basic Operations

Where are you?

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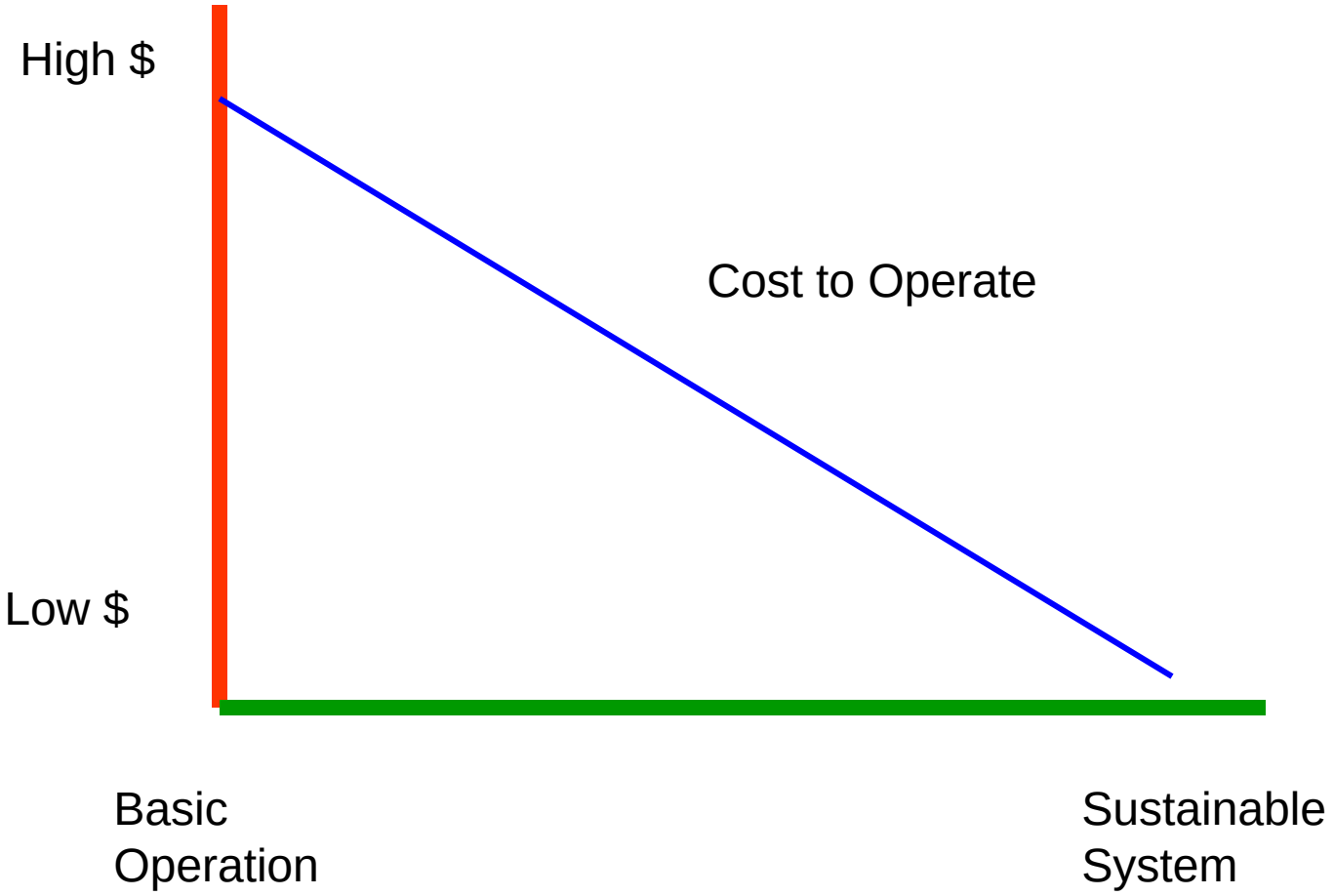

Sustainable Systems pay for themselves

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Building Automation should provide Automated Continuous Commissioning for system operation optimization and maintenance management

Building Automation should manage disparate control systems

Building Automation should incorporate all building systems

Design with Building Automation in mind & take a holistic approach

Leverage Managed Services for support and cost

Innovate while minimizing risk

The right Building Automation will

•Improve Tennant Comfort

•Reduce Energy Use

•Reduce Maintenance Cost

•Improve Worker Productivity

•Support Sustainability

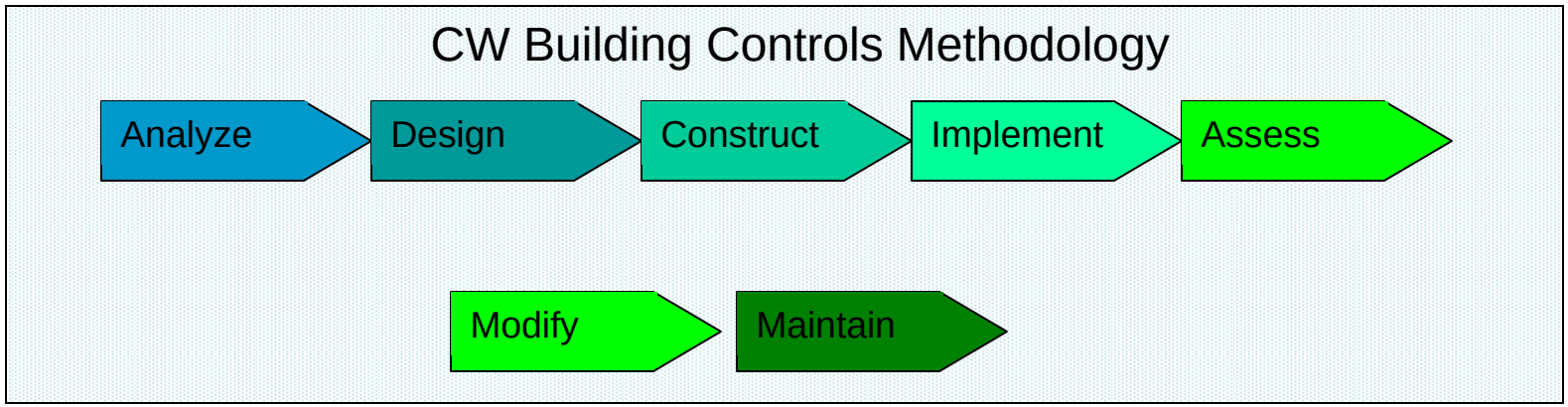
Questions?

Thank You!

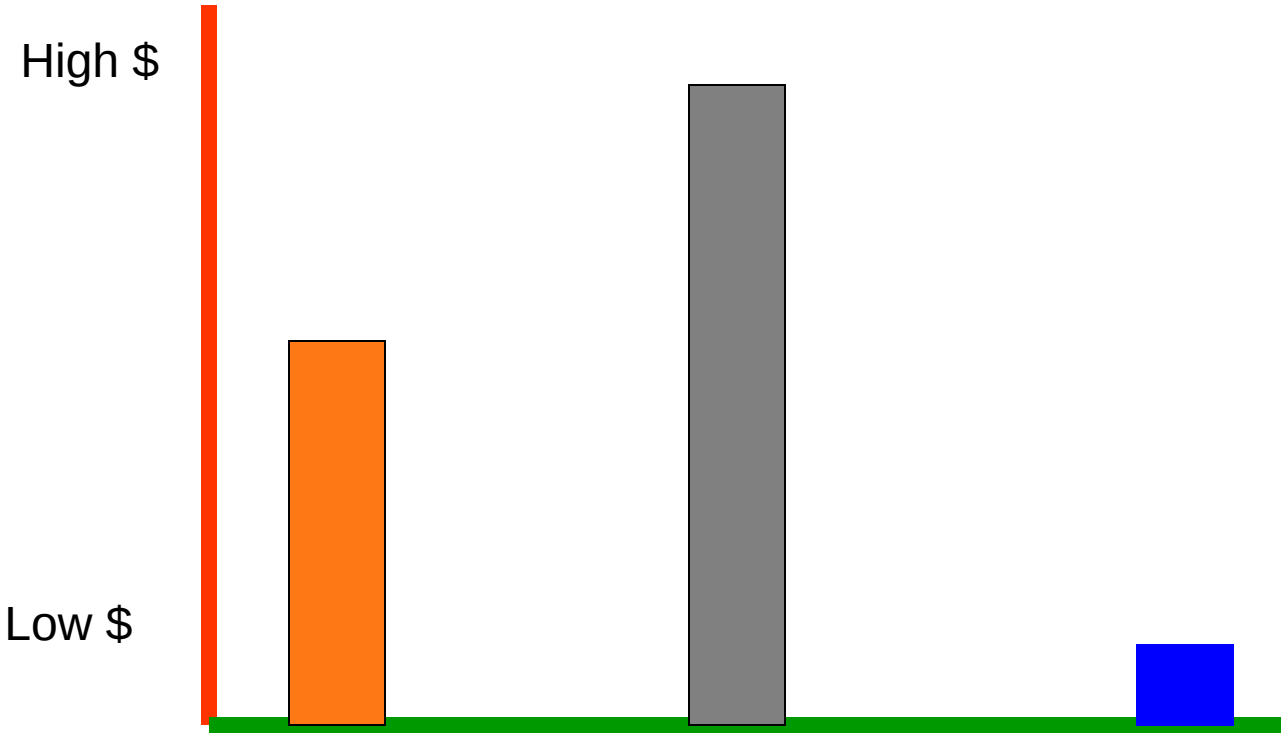
CW Industries
303 233 8653

What should you expect from a Building Automation provider?

Quality products, quality work, on time, on budget, done right, fair price. More importantly you should expect that the provider really understands controls and can contribute in all of these key areas:



The provider should have the proven capability to perform all of these in order to provide a true solution.


High $
Low $
“Brand Name” Basic Controls
“Brand Name” BAS
CW Sustainable System –
CrossTalk ACCES
Cost to Acquire