

TECHTalk

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AUTOMATION SYSTEM DEGRADATION AND WHAT TO DO ABOUT IT

If you are like most system owners your Building Automation System (BAS) is in a state of semi-automated status once it hits its fifth birthday. You as the system owner or operator have had to make certain adjustments based upon the original system's design not fully meeting your expectations and on-going needs. You have had to put certain of the "automated" functions "in-hand" or manually enable or disable certain sequences or equipment based upon the actual conditions in your now fully "loaded" or occupied building.

Even if the system "out of the box" attained all of your greatest expectations, after a period of about 3-5 years the system itself, despite not generating the complaints from the building occupants that it used to, is probably not working optimally. There is a long list of things that happen over time to the system. No single item may be a huge problem, but their cumulative effect is a substantial degradation of the system's performance. Sensors drift, linkages on dampers break, weather patterns change, points get locked out and building occupants learn to cope with being uncomfortable. Ever seen a building occupant wearing a sweater in the office in summer...I have!

Facility Managers of any kind of building have a veritable tsunami of issues coming at them every day and to make matters worse...their budgets are pinched. The typical plan that I have witnessed in this era of constricted budgets is to get the system "working OK" after the commissioning and then just leave it alone.....at least that's the plan. If it does not "appear" broken, don't mess with it. **This is the point when there are few to no occupant complaints but energy is being wasted to the point where money is literally flying out the window.**

WHY DOES THIS HAPPEN?

No system, since it is engineered and installed by intrinsically imperfect people who are unable to predict the future, is perfect. Furthermore, there may be issues with the sizing of equipment, building envelope issues, tenant use and or tenant mix and so on.

Facilities Folks are like emergency room physicians. The complaints of their "patients" or building occupants need to be dealt with immediately. Since this "triage" approach does not often enable the Facilities Folks to deal with "root causes" the symptoms are dealt with and once the symptom subsides, the follow up root cause analysis goes into the already VAST to-do list of the Facilities Folks until the problem invariably arises again.

WHAT IS THE RESULT OF TREATING "SYMPTOMS" INSTEAD OF THE "DISEASE"?

Ultimately the "quick fixes" are not addressing the underlying cause. Instead of truly delving into the root causes of the literally hundreds of issues that can happen with automation systems we develop a pattern of "coping" and very often disabling some key sequence programming and can lead to other problems cropping up in ways that we could not have foreseen. In other words, by treating one symptom, we can often be the cause of another problem.

This behavior pattern contributes to the degradation of the intended system performance and completely eradicates energy efficiency. I've seen systems where literally the Facilities Folks were making manual decisions on percentages of outside air instead of fixing their flawed economizer sequence since it made the building occupants uncomfortable. Energy **inefficiency** is the direct outcome of treating "symptoms" instead of the "disease". In almost all cases a retroactive analysis of the energy use of the building would show you that despite spending thousands of dollars on a "new" or "state of the art" automation system, your energy spend has grown.

HOW DO WE BREAK THE CYCLE?

As a SERVICE and RETROFIT company, my company's focus is on fixing just this sort of thing for our customers. Normally, we are hired after several years of the OEM failing to rectify the list of issues that initially came out of the commissioning of the new system. Sometimes just a fresh set of eyes on an old problem is just what's needed. The same way a second opinion of another surgeon may yield a new perspective and cure the underlying problem.

A system owner may not have the funds for a complete re-commissioning of their system. "Re" or "Retro" commissioning a system would require a very thorough review of original system parameters. Often these original parameters were not correct or were quickly out dated when the building occupants moved in and the use of the space morphed. Spending thousands of dollars to return a system to original design parameters that no longer suit the use of the building is a waste of money. You need to understand who and what's in the building and "live" in the building with the system owner. Only then can you make changes that make sense and save money.

System owners may not understand everything that's wrong with their systems but they usually have a long list of things that they KNOW are wrong with their systems. Getting to the root causes here will lead the automation service professional down the trail to curing the "disease"...remember, don't just treat the "symptoms"!

1. **Ask questions and actually listen.** While the system owner/operator may not be a sophisticated automation programmer or engineer, they have ALL of the history of living with this system. They know what seems or feels wrong, they need the chance to articulate it and they need to have someone that knows how to cure the problem LISTEN to them.
2. **Prioritize according to the customer's complaints.** This may be as simple as "On a scale of 1 to 10 how much pain does this particular problem cause?" You should also understand the order of the surfacing of the symptoms. This can often point you in the right direction as to how to help the customer prioritize this list of issues and help unearth the actual causation.
3. **Actually fix the underlying problem.** Sounds simple. Execution is tough. You can't fall into the trap of once again treating the symptoms. Automation systems are complicated, the connected equipment can be complicated and the solution may be complicated as well. There can be no substitute for taking the issue all the way to the conclusion....all of the issues. It's not "done" till it's actually "done".
4. **Follow up on the treatment.** This would mean monitoring of the situation going forward. If the underlying issues are dealt with carefully and thoughtfully, an issue that resurfaces can often be dealt with much more quickly. Moreover this will allow the BAS maintenance provider to achieve real system improvements that can truly return the system to its intended performance and over time save SERIOUS MONEY.

There's no substitute for a good "bedside manner" in the profession of automation system maintenance. This begins and ends with the service provider's ability to be an EXCELLENT listener. Get to the root cause, get the system back to actually being an "automated" system and watch the energy bills shrink as a consequence.

That's all for now and always remember, us **SERVICE GUYS** don't care how large or small the job is, we just want to be the call you make!

Regards,
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