



*BGC-026*

*ARTICLE 08.02.10*

## TOO MANY COOKS SPOIL THE UTILITY BILL

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We have all been taught that it makes good commercial sense to increase the amount of “value add” we provide to customers. The more added value in our solutions, the higher the margin a company will enjoy and the greater customer satisfaction and loyalty that ensues.

From a manufacturing point of view, this has led to everyone adding greater intelligence to the systems they provide. Everybody’s box has been given a brain, which is stand-alone, works hard and gets on with the job. Just like the ‘too many cooks’ metaphor, too many brains in the building just doing their own thing, leads to inefficiencies and discomfort. To make a building work, the cooks need to communicate with each other and shout “yes chef” a little more often!

Interoperability has been a hot topic for a few years now. Systems communicating via agreed standards are now the norm, but interoperability between systems will never be more than a nicety if it doesn’t help the energy in buildings. However, what has interoperability got to do with the energy in buildings? And how can open protocols like BACnet help to reduce my utility bill?

Just for completeness, we’ll kick off with the traditional reasons why people have interoperable systems:

Interoperability reduces the life cycle costs of a system. Facilities Managers who feel handcuffed to a particular supplier or system can now expand that system with another manufacturer. This miracle cure was promised for many years, but is now actually being delivered.

Interoperability reduces capital costs. We are now able to pick the best system for each application. We are not obliged to go down a one-size-fits-all route. Intelligent communication between packages allows more data collected over protocol connections rather than hard wired sensors. Engineering is also reduced as data is exchanged automatically rather than being manually inputted, multiple times.

Finally, we have the old chestnut that related building systems such as access control, can tell the energy management system what is happening in the building so that lights and HVAC can be turned on or off accordingly.

But life has now moved on, with systems getting more and more intelligent. Certainly, this evolution is often a source of headache rather than opportunity for the BMS industry. Packages controlling windows, split units, chillers, boilers, ventilation stacks etc, all purport to having their own intelligence. The result is that each package does its own thing. Time and time again we come across applications where one piece of plant is busy cooling an area and another is busy heating it. In short, there are too many cooks spoiling the utility bill. We recently had an example of a cinema that was spending around £7,000 each summer month in gas and electricity consumption. Following a change of company management and an MD's passionate drive to reduce energy, the cinema has been re-commissioned with expected savings of 50% over the year.

Historically, the BMS had a monopoly regarding the control of the plant room. For this reason, the conflicts evolved around the room control, where each manufacturer is trying to gain market share. Now, even the plant room is not free from cooking metaphors. Boilers now come with their own controls. This is fine; the BMS can offer enable and monitor signals allowing the boilers to get on with it. However, we often find end-users and specifiers requesting the BMS to take control. At this point the heating control is akin to a scene from 'Allo 'Allo!; each party pretending to understand each other, then carrying on regardless. Interoperability given to us via protocols such as BACnet can be so much more - allowing the BMS to collect energy data from boilers. Information such as the worst and best performing boilers, can then be obtained and acted upon.

We have also been involved in the construction of an "Education Village". Here, there was a concerted drive to keep energy bills low. The BMS co-ordinates the actions of the intelligent system which control the vent systems drawing air in, and the window systems letting air out.

Other stack ventilation systems are PLC controlled using their own CO<sub>2</sub> sensor and a set-point knob in the room. This is all well and good except the under-floor heating enabled by the BMS is not inter-linked as it uses its own wall mounted thermostat. In addition, a self contained window control system is quite happy to let out all the heat that the competing systems have fought hard with each other to produce. At best, the result is a confused building occupant and the carbon footprint of a 747. Such confusion does require large areas of wall space to house the myriad of knobs, dials and switches for each competing system. For now we will ignore the expense of installing overlapping systems, which often double the capital spend really required.

On a more lateral note regarding interoperability, the building controls industry is not known for its imagination. To keep the cooking metaphors going – it is more pub grub than fine dining. This is why it is heart-warming when you find successful interoperability, used to save energy, in some of the more lateral applications.

One such example is a cake baking factory (the food related stories just keep on coming) where the heat extracted from the fast-cooling of the cakes is used to heat the air in the AHUs. Cakes last longer if they are cooled at speed, and this heat can supplement up to 40% of the energy required by the AHUs.

On a recently completed a project, a similar method was used to harness and utilise the heat that was being emitted from a crematorium. Heat from the flue is collected via a form of run-around coil. The heat recovered is used as the first stage of heating so the boilers are switched off when not required.

Interoperability is currently seen by some as a threat to energy saving rather than an opportunity. The root of this conflict lies with each manufacturer wishing to take control so they can maximise the value added by their system. This value add often overlaps the value added by an adjacent system. The moral of the story is always the same and it involves a co-ordinated approach in the design and firm decision making, right from the start. This allows greater interoperability between intelligent systems.

More systems taking the role of sous chef shouting "yes chef" is what is required.