Predications for Smart Buildings in 2012

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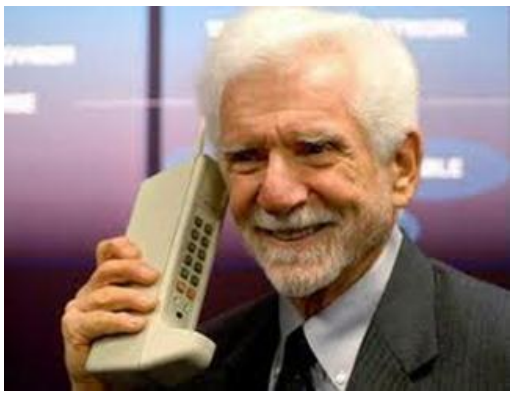
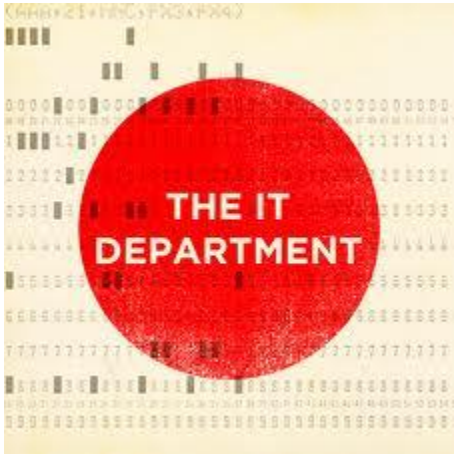
"The best way to predict the future is to invent it." *Alan C. Kay, American computer scientist who has been called the father of the personal computer*

The Upcoming Evolution in Building Management Systems (BMS) will be Software Platforms Similar to the IPhone and Android. These will be open-source platforms able to integrate into any building system and with third parties developing a plethora of applications. Building owners will procure a base software platform with a middleware application to normalize and standardize data points into a "meta" database. They then go to a "Building Apps Store" and choose the applications they would like to run. This will provide facility managers multiple options for selecting fault detection, energy management, demand response and alarm management software. The market for traditional BMS systems from major manufacturers will quickly perish, their offerings resembling clunker three-pound cell phones from the 1980's; however they will react by acquiring some of the companies with the new smart building management platforms.

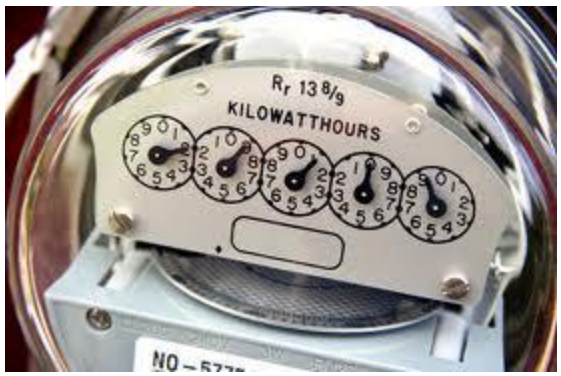


Data and Metrics for Building Occupancy will Finally Move to the Top of the Agenda as Key Indicators in Building Performance. Aside from the base environmental needs of a building, a simple energy management approach for buildings is to have energy consumption aligned with actual building occupancy. Yet few building owners know how many people occupy their building, where they go, when they're there, etc. Building owners are more likely to know how many cars entered their parking garage than how many people entered their building. How can you possibly know when and how much heat or cooling or light should be provided without knowing the occupancy of your building spaces? A variety of means for gathering occupancy data

are now available; we have lighting control systems with not only occupancy sensors but more sophisticated occupancy systems able to track the movement of the occupant. In addition, there is access control, video surveillance with people counting capability, room and personal scheduling systems, infrared people counters for doorways, as well as RFID technology able to provide some level of occupancy data. In 2012 occupancy data will drive energy management and curtailment strategies for demand response and space planning. Expect new hardware and software tools generating or using occupancy data metrics to be adopted by facility management.



The IT and Facility Management Departments will Sort Things Out. Over the last few years we've seen several IT companies overreach into areas that looked like the "next big thing", including building systems, energy management, smart meters, etc. Many of those companies found out that they had little or no credibility when it came to the technical details of building and energy systems such as HVAC, electric or lighting. Building personnel on the other hand see the IT infrastructure penetrate the daily operations of building systems and at times feel threatened that they need to rely on and involve the IT department. What is sorting out now however are IT departments that are seen as a strategic service group within large organizations – IT provides services to Purchasing, Accounting, Facility Management, etc., but really don't determine what those groups need to be doing. Facility personnel now understand the unrelenting advances in the technology and the need to have a good relationship with IT. What you'll see in 2012 is not only better relationships but possible realignment of the IT and FM organizations (Department of Systems Engineering?) resulting in tighter coordination and improved building performance. Yes, we can all get along.



Energy Procurement will Become as Important as Managing Energy Demand for Building Owners. Facility managers and building

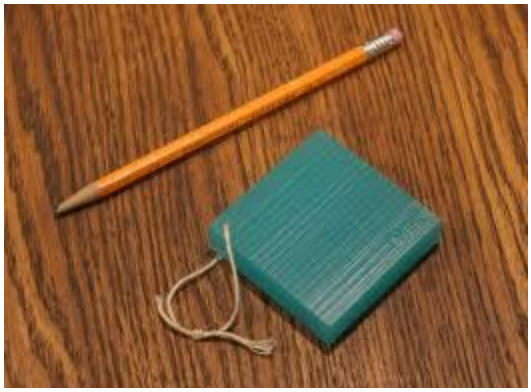
owners have primarily focused on energy conservation measures, damping down their energy demand. 2012 will be the year they "discover" cost savings in improved and more sophisticated procurement transactions. The major beneficiaries will be building owners with large portfolios that can aggregate their usage. Depending on their size, some will use third party aggregators or co-op purchasing agreements within their industry to get better deals on energy supplies. The largest impact in 2012 will be the introduction of energy procurement software for building owners. This is software that can profile energy loads for one or multiple buildings, taking real-time data from the energy commodity markets and then identifying optimum energy purchasing transactions based on the owner's risk tolerance.

The Use of Building System Technology will Finally Play a Part in Green Building Certifications. Ignored for years in the certification process and taken for granted, system technology is now recognized as a key component in long term energy management. The initial steps will be small but expect it to accelerate in 2012. When USGBC endorses a software application based on fault detection and diagnostics for continuous commissioning and opens an "Apps Lab", as Bob Dylan sings, "the times they are a changing". Large technology industry organizations that have been clamoring for years for LEED credits related to technology and were rebuffed have taken on their own sustainability and energy certification processes for building technology. It's unsure whether a new green certification program related to technology will have traction or whether USGBC will accede to credits related to technology. Another initiative, the Smart Building Institute, has taken a different approach, providing certification for use of advanced building system technology and integration, while awarding credits when the building systems support energy and sustainability. The successful operation of a high performance building will depend on building information facilitated or enabled by technology; activities such as continuous commissioning or measurement and verification depend on technology systems and applications. Somehow, someway technology systems will be given their due.

A New Benchmark for the Integration of Building Systems will Occur in 2012 – A building where every data point from every building system is brought to the enterprise level will start in 2012. All the building's data points are normalized and standardized into a "meta" database and the enterprise applications will be able to read and write to each data point as appropriate. Atop the database sits a variety of analytic software applications and hundreds

of dashboards for different interest groups. The technology for doing this has been around for a while – what was needed and has evolved is the smart building owner. This structure will be a milestone in building system integration, the viability of integrated building management systems and the management of high performance buildings. Stay tuned.

The Automation Campaign in 2012 will be about Open Source Programming Languages, and Standards for Naming Conventions, Building Systems and Integration. The movement is a "bottoms up" grassroots campaign. Part of it is driven by BMS owners and facility personnel that want an open source programming language for controls so they can have some flexibility and choices as to how to setup and maintain their BMS. The push for standardized naming conventions is a reaction to many situations in existing buildings, especially portfolios or campuses of existing buildings where multiple naming conventions are used, creating chaos, wasted time and inefficiencies. While the movement is grassroots, some large organizations have entered the "standards" fray. Organizations such as the International Society of Automation (ISA) have initiated the development of a standard titled ISA 111 Unified Automation for Buildings. In addition, NIST has a project that will provide the technical basis for improved industry standards for automation and controls and is also heavily invested in the interoperability standards between buildings and the smart grid. The standardization of technology aspects in the automation industry reflects the penetration of IT in building systems, the increased complexities in high performance buildings and the increased need for data and data management. It's an initiative that will transform the industry over the years to come.



Nascent Initiatives Outside the Realm of Facility Management will Eventually have a Significant Impact on Building Systems. It involves not being a connected society, but a pervasive hyperactive connected world of people and objects. Some are ideas such as the "Internet of Things" and "ambient intelligence". The "Internet of Things" is an idea born in the 1990's,

involving the extensive connectivity of physical objects. The physical object is tagged and identified, and data from the device can then be captured. Originally the idea was based on the utilization of RFID tags with potential uses for the aerospace and the transportation industry but it has expanded to any physical object and many different technologies.

A companion to the "Internet of Things" is "ambient intelligence" which involves an environment, such as a building space, sensing and responding to people based on analysis of data. This level of sophistication for the built environment using such approaches are beyond just relying on occupancy data but sensing who and where each person is and automatically adapting, anticipating and even personalizing the space environment. For a couple examples of the "Internet of Things", take a look at Botanicalls (http://www.botanicalls.com/), a system that allows thirsty plants to reach out for human help, or Twine (http://www.kickstarter.com/projects/supermechanical/twine-listen-to-your-world-talk-to-the-internet), essentially a block of plastic communicating via Wi-Fi containing an accelerometer, a temperature sensor and a processor, with slots for other sensors. Welcome to 2012.

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