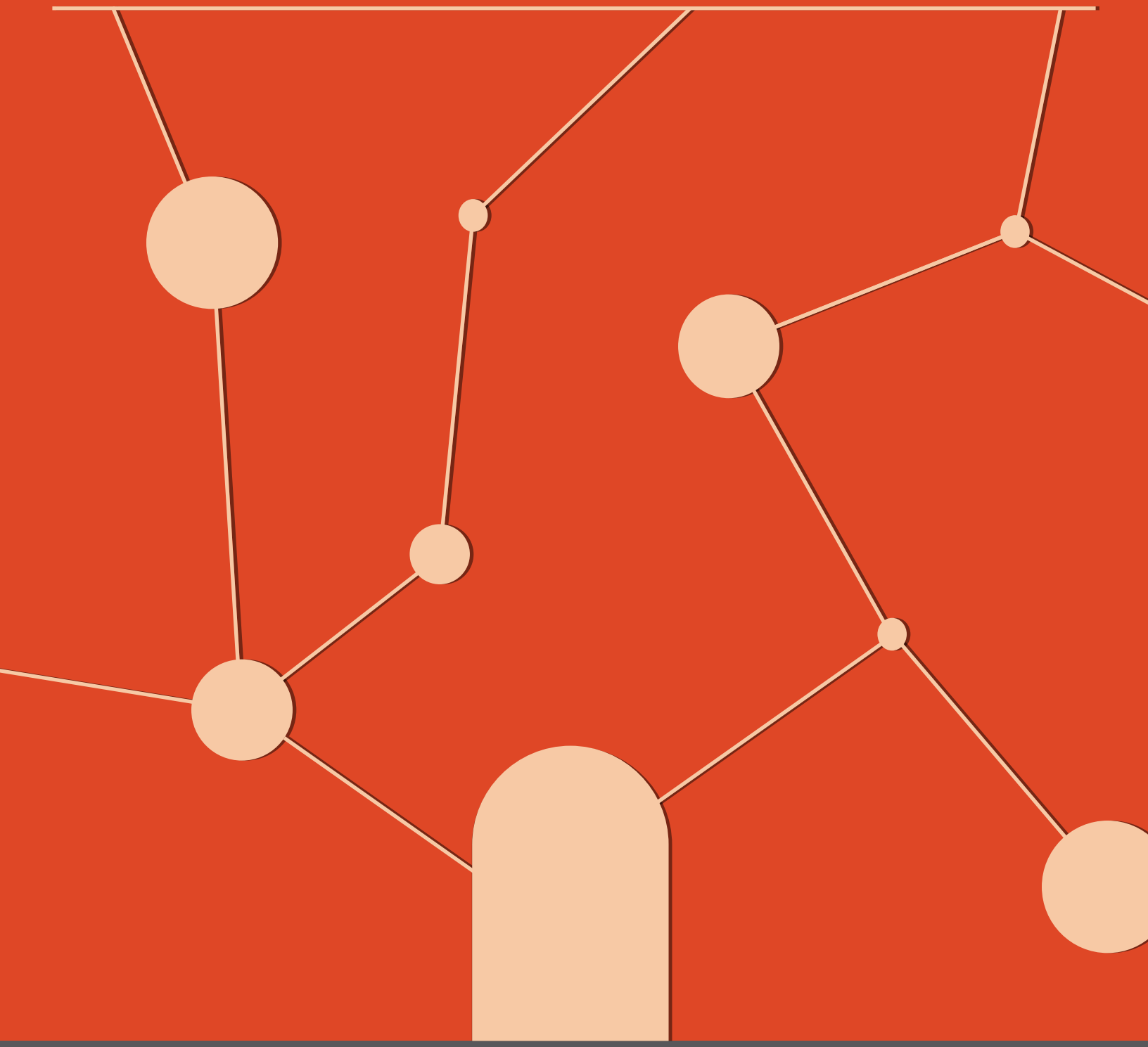
THE EMS IS DEAD



Deep Thoughts by Deepinder Singh: Part 1

A series on the future of cloud computing, big data and buildings

We are excited to launch *Deep Thoughts*, a thought leadership series addressing the evolution of technology and how we can embrace it to increase our knowledge, better our efficiencies and even improve our environment. For our first topic in the series, we were inspired by the question our team hears most frequently, "Are you an Energy Management System?" The easy answer is no, our capabilities and energy savings go far beyond an EMS, but this simple question poses an excellent starting point for this series.

THE EMS PROBLEM

1. **The EMS has been around since the 1990s and not much has changed.** Simply put, an EMS provides users with the ability to monitor, control and measure their buildings' energy loads. They centrally control devices like HVAC units and lighting systems across multiple locations, making them useful for building and facility managers who oversee multiple spaces.

   The problem with the EMS is that the last big refresh was in about 2005, meaning it's been roughly 10 years since new technology has been applied! Within those years, technology has evolved significantly, most notably being the birth of cloud computing and the Internet of Things. EMS companies, however, have not leveraged this evolution in technology effectively.

2. **An EMS is a step up from manually correlating spreadsheets, but it does not intelligently process or act on the data it collects in a meaningful way.**

   An EMS was once a great tool for consolidating information and reviewing energy usage trends, while comparing them across multiple sites. What's blatantly missing, however, is that they have very little localization knowledge. That is to say that an EMS knows the address of your building, but does not know its orientation, building usage pattern, or local weather. A simple thing like orientation can make a huge difference in regards to how much energy is being used.

   With an EMS, it's left upon the user to go back and determine what energy usage patterns are occurring in a building and then do the correlation across their building portfolio. With the technology available today, there is no reason why such inefficiencies should exist.

3. **While an EMS allows remote control and consolidation, it does so only within very simple parameters.**

   An EMS will allow you to turn your lights off or change the set point of a thermostat, but anything beyond that is outside its capabilities. If there are gross mistakes, the EMS can help to identify those. For example, if your HVAC system is running 24/7, the EMS will recognize that and help you program it remotely. But if you are truly seeking energy efficiency beyond that of scheduling or receiving alarms based on fixed parameters, you need a smarter system. You need one that learns about the equipment that is installed, how it is performing and how you should best optimize that equipment.

4. **The problem with every EMS today, is that it is only as efficient as the equipment in place.**

   An EMS takes a very high level overview of the system. As far as it's concerned, a piece of equipment is merely a piece of equipment. The EMS does not consider the energy efficiency ratio (EER) of any particular unit. It is not smart enough to consider how the actual performance compares to the expected performance.

   Today, EMS systems are installed in locations where there are no building automation systems already in place. In some ways, one could say that an EMS is a very lightweight version of an automation system, but they don't come close to doing justice to the amount of control and savings that are available with a self-learning system.

INVEST IN PREDICTIVE SYSTEMS

Technology exists today that allows us to build predictive and proactive systems that make buildings more energy efficient. Not only that, but these systems are intelligent enough to keep individuals in those buildings more comfortable and productive. Why use a high end excel spreadsheet when you can access technology that drives real change? Cloud computing has been a real game changer, allowing more data points to be collected, stored and analyzed in a meaningful timeframe.

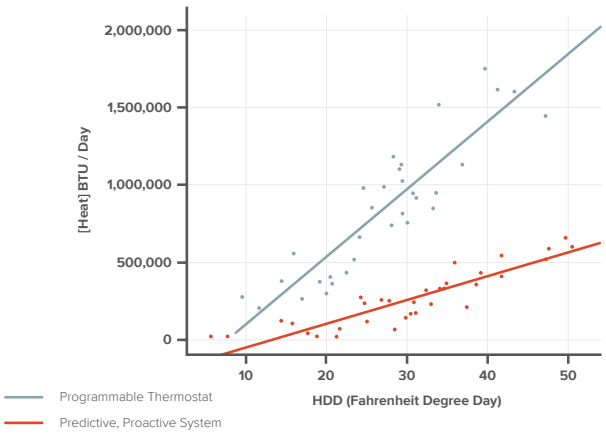
For reference, a typical EMS today takes into account 15-20 control points, typically within a 5- 15 minute segment. On the generous side, that breaks down to tracking only 2 control points every 30 seconds and yet being able to trend those is considered a great victory.

In comparison, a predictive solution that leverages cloud based algorithms can log hundreds of variables every minute! It's not just building automation, it's building intelligence.

The result is an intelligent building solution that enables buildings to function more efficiently, save more energy and even make people more comfortable.

1. Predictive solutions have been proven to save more energy.

In 2015 a nationally recognized third party verification lab began a multiyear comparative study to examine the performance of an up-to-date programmable thermostat, which has been programmed for optimum efficiency within the given conditions. It compares those findings against a predictive, proactive system. The following graph depicts the data that was collected from Nov. 2015 – March 2016.



Let's break down this graph into its important components. The Y axis is the amount of energy in BTUs (British Thermal Units) that it took to reach the desired temperature. In this particular study, the desired temperature is approximately 72 degrees Fahrenheit. The X axis is the heating degree day in Fahrenheit. Heating degree day is the number of degrees that a day's average temperature is below 65 degrees Fahrenheit. For example, if it's a 45 degree day, that means it's a 20 heating degree day.

This gray line is showing you how many BTUs a programmable thermostat is using to reach the desired temperature. You can see that on a 30 heating degree day it uses approximately 1 million BTUs to heat the building. The orange line illustrates that a predictive system requires significantly less energy to heat the same building.

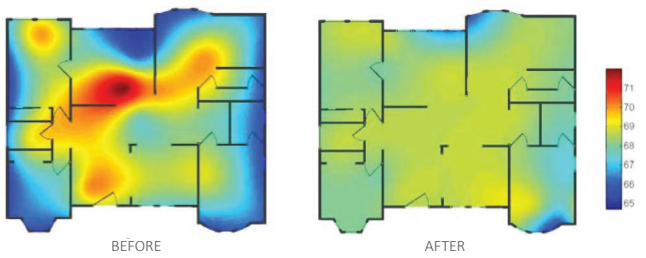
In fact, the predictive and proactive system uses less than 300,000 BTUs, indicating over 70% energy savings! Imagine how that would impact your energy bill.

So, why is this information relevant? Remember an EMS is only as effective as the system already in place. For most light commercial buildings, that's a programmable thermostat, which may or may not have been programmed for optimal use.

2. Predictive solutions can increase your bottom line in more ways than one.

Let's take the HVAC system of a commercial building as a primary example. Making up more than 40% of the energy usage within a commercial building, HVAC represents the largest opportunity to increase efficiency and your bottom line.

A predictive solution that leverages cloud computing algorithms can deliver more than just energy savings. With the ability to take in hundreds of data points, a predictive solution has the ability to consider factors like weather forecast, building orientation, positioning of the sun, humidity, air quality and mean radiant temperature to deliver comfort, all the while saving energy. Imagine algorithms that can model the thermal envelope and air quality of your building, before sending out the optimal strategy to achieve the perfect balance.



No need to imagine, the technology exists. The heat map on the right shown above illustrates the common kind of comfort and balance that comes from a predictive system, resulting in more productive employees, more frequent guest visits and lower energy bills.

3. Predictive solutions can still provide you with all the valuable information that an EMS would and then some.

A predictive solution can show you more than just your energy usage. Performance evaluation provides insight into equipment performance, which can help predict equipment failures and verify service actions. This drives even further efficiencies and helps to increase your bottom line.

User-friendly interfaces allow for new ways of viewing energy usage, equipment performance and more.

FUTURE DEEP THOUGHTS ARTICLES

In future articles within the Deep Thoughts series, you can expect to hear about advanced technologies that will drive energy savings and create comfortable environments. Building automation is not an entirely new concept, but building intelligence is now possible thanks to cloud computing and the Internet of Things. We'll address the power of these technologies, discussing how to best use this data to improve buildings and the way we view them. When it comes to HVAC, you will learn about the difference between zoning and balancing. The internet of comfort is another important concept and we'll address how much more than temperature factors into this equation, driving productivity and wellbeing. Lastly, we'll discuss big data and how it can be utilized to increase efficiencies, monitor buildings and even, lessen our impact on the planet.

ABOUT THE AUTHOR

Deepinder Singh founded 75F in 2012 after he designed some of the world's fastest core networks for Tier 1 service providers like AT&T, NTT and Verizon. With almost 25 years experience in electronics and computing, he's brought a wealth of embedded products to the market. His key goal in every endeavor is to simplify operational complexity and make products intuitive.

That's why he created 75F, an intelligent building solution that utilizes the Internet of Things and the latest in cloud computing to create systems that predict, monitor and manage the HVAC needs of light commercial buildings.

To make your building intelligent, visit www.75f.io