

GreenPeak White Paper

Why is the so-called Smart World still So Stupid

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Have you heard? The Smart Home will change everything.

The Smart Home will revolutionize how the electronic and technology industries function in the future. Because of the Smart Home, how we live our lives will totally change.

The industry is alive with Smart Home buzz, excitement and promises. Unfortunately a lot of it is just hype. It is just not real. Yet.

Smart Homes and the IoT

Various analyst groups and industry prognosticators have been tossing out some very big numbers. According to these fortune tellers, within the next few years, there will be hundreds of millions, tens of billions, even trillions of smart homes connected by the Internet of Things.

However, if you take a careful look at what is really happening – if you actually count up the number of homes that actually are “smart” – having intelligent systems installed within them that actually make our lives smarter, easier and safer, you will see that the number is actually pretty small. Why?

Because today’s – and tomorrow’s smart homes – are not very smart. In fact, most of them are still downright dumb.

This is because people are confusing “connected” with “smart”. Just because a house, its devices and its systems are connected to each other and to the Internet, enabling the home owner to monitor and maybe even control what is happening in the home from a smart phone, does not make the house smart.

To be smart, the smart house actually needs to have some intelligence of its own. It needs to be able to gather information from its network of sensors, review and analyze that data, and then take some kind of action – without a human person in the loop to make the decisions for it. Sentrollers need to actually do something without waiting for us – their masters – to tell them what to do!

Smarter Cars

Let’s compare our cars to our homes. Yes cars are smaller and in most cases, less expensive than a house. Usually cars also have much quicker technology cycles than our homes. If you look at the big picture, a house’s technology really has not changed much in the last century whereas automobiles have went through many evolutions. Aside from having four tires and a steering wheel, today’s cars would be totally unrecognizable to a driver from a century ago.

How are cars so much smarter than homes? One of the most obvious is automatic door locking. You can press one button on your key fob and all the car doors lock or unlock. If you are sitting in the car, and you press the lock button, all the doors lock. Or when you drive away, all the doors automatically lock as a standard security measure. Wouldn't it be nice if all the doors in your home also worked this way?

Also ABS – Anti Lock Braking. Your car is smarter than you are. Designed to help prevent skidding during a sudden stop, ABS overrides your foot slamming on the brakes in an emergency and instead pulsates the brakes, enabling you, the driver, to keep much better control of the car as you safely screech to a sudden halt.

What happens when you take your modern car to the garage? The technicians can hook up a device to your car's central computer, and within minutes, can discover the status of many of the vehicle's systems and subsystems. In addition, if the auto maker has come up with better software and tuning for your vehicle, it can download them to the car and improve safety and performance. It would be great to have our home's air conditioning, heating, appliances, etc. and other systems able to be upgraded in a similar way. Recently, Tesla announced a software upgrade to their latest electric cars that will activate the vehicle's various sensors and enable the car to be now be smart enough to operate without a driver. A software upgrade will make existing vehicles on the road smarter and autonomous. That is impressive.

With the advent of the autonomous car, the era of truly smart car is coming and will be here before smart homes become commonplace. The autonomous car uses a network of built in sensors with local onboard intelligence recognizing the traffic around it and is connected to cloud intelligence for navigation and traffic control. This combination of local and cloud network intelligence enables the car to safely move from one location to another at high speed, with an optimized travel itinerary, all without the driver ever touching the wheel.

Why can't our homes be this smart? It is not like we need to worry about high speed collisions or traffic jams in our neighborhood.

The Smart Home revisited

Let's us look at a few smart systems in our homes that are not quite as smart as they should be.

This is a real life example: we recently installed a so-called "smart meter" at our home. Our family attempts to be "green aware" and we thought that this "smart" device would change and improve the way our family consumes energy.

Well, it was just a façade.

Just a few weeks after this meter was installed by our local utility, the hot water pipe in the basement broke. Hot water from the water heater was spilling all over the basement floor for days before being noticed. As the water continued to leak, the water heater kept refilling and reheating causing even more warm water to be wasted.

We had no idea what was happening. We did not notice the loss as our water heater was large enough that we could take showers and wash dishes despite the leak. The basement was flooded and it wasn't

until we went down into the basement and saw all the water that we finally realized we had a big problem. Then we could take action!

So here is the question? Why didn't my smart energy meter recognize this sudden spurt in energy usage and alert us?

In reality, this so-called "smart" energy meter was equally as dumb as its predecessor and somewhat useless when it came to energy issues that really impacted my family. In fact, it is now obvious that the term "smart meter" is little more than a misleading marketing slogan. In reality, our smart meter is just a 'digital meter connected to the internet' that enables allowing the utility to remotely monitor our energy use.

It does not "do" anything. Therefore, it is not a smart meter.

We need a utility meter that is really smart. So how do you make a smart meter?

First - a truly smart energy meter would track and know what the family's average energy consumption is, so if there was an unexplained spike in energy usage, it would recognize that there was something that needed attending to and would send me some kind of alert.

The smart meter would maintain a database of past energy usage patterns, and with allowances for climate seasonality and family usage patterns, it would then track and notice changes outside the norm. For example, if it had been snowing for the last few weeks, an increase in energy consumption for heating would make sense.

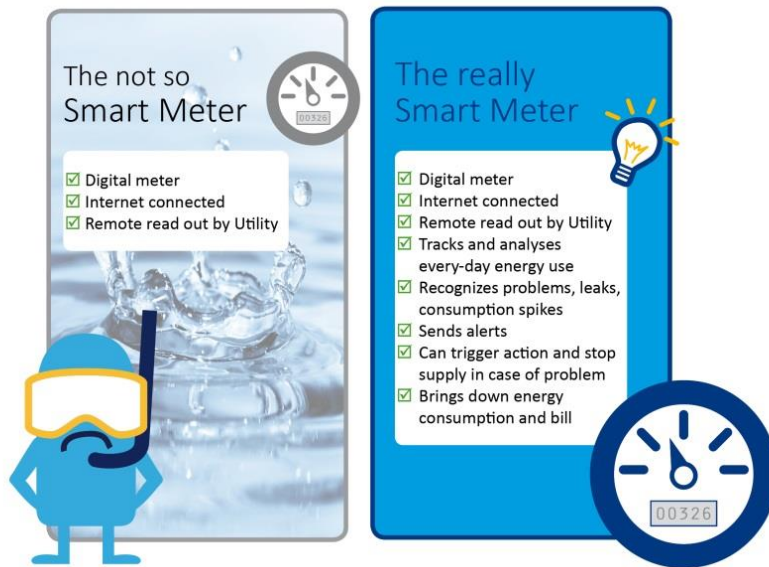
To be really smart (and very useful), in addition to sending an alert, a truly smart meter could take action, stopping the supply of water and electricity (or in this case natural gas), if something is really wrong, like a gas leakage. Even better, a smart energy meter could talk to a leak detection sensor in the basement to provide a more precise alert. Not only would the residents be alerted to a sudden increase in water and energy usage, but the leak detection would provide a specific cause for action. Now that is smart!

Now imagine that the smart meter noticed that there was a big increase in energy usage for a period of hours in the summer. If the house had sensors to notice that there was nobody home it could send an alert explaining that the HVAC system was running without anyone home, and could allow the home owner to remotely turn it off. If it was really smart – knowing there was no point to cooling down an empty house, it would turn off the system on its own.

What if the house noticed that the heater was blasting and temperature was staying the same? Wouldn't it be smart if the house could access sensors on the windows and doors and notice if they were open or closed? If the windows were left open, and no one was home, the house would be smart enough to turn off the heater as to not waste the energy. Actually, even better, if the house sensed that windows were open, that no one was home, it could not only send an alert, but it could close the windows itself. Just like in our automobiles where the windows are remotely controlled.

That is yet another example of how our homes are not as smart as our cars.

Regarding our smart meter, instead of us really getting a smart meter, instead we got a digital usage meter that was presented as a smart meter by the utility company's marketing department.



Most current smart meters are actually quite dumb. A true smart meter needs to be able to assess and analyse the data from the home and then do something with it. Just reporting the data on an online dashboard is not smart.

The power company provided us with what was essentially a stupid digital meter connected to the internet, as it only measures the energy consumption and then communicates that ongoing use with a host computer.

But nothing gets done with this information unless someone in the home decides to take the time to log in on the utilities' web site and check the power consumption. That is not very useful. And then what do we do about it? If there is a big energy spike, do we know how to identify the source or fix the problem? How do we know which appliance is sucking up all this energy and increasing our bill? There is nothing smart about this meter (or metering). The current crop of smart energy meters are just stupid. At a minimum a smart meter or device should be able to detect and alert exception situations!

To be smart, devices need to do much more than just collect data and then transmit it to a dashboard on the web. It has to be actionable – the device information needs to be analyzed using online cloud-based intelligence, and then, if appropriate, some kind of action needs to take place.

Of course, this applies to much more than just installing “smart energy” meters.



Imagine a home filled with life style sensors that track, monitor and understand how the family lives their life. What time does the family get up, when are they are usually home doing the day, when are they gone on vacation. Which rooms should be lit and heated? When should these actions occur? In other words, what is normal in the house and what is not?

By understanding how we as humans live our lives, using truly smart devices and systems, our lives will become much more healthy, efficient and useful.

The Smart Home Hype Cycle

The term “smart” has been applied to almost every web connected device and system in our homes. In addition to smart phones and smart meters, we are besieged by marketers bragging about smart clothing and smart shoes, smart lights, smart homes, smart buildings, and smart watches.

If you have spent much time in the technology industry, you have probably survived numerous hype cycles. Remember Y2K?

What is the hype cycle and where are we now?

Right now everyone is jumping onboard the Smart Home and Internet of Things avalanche. Many analysts and large companies are making incredible predictions and forecasts which may come true. But it still may take a few years.

So what is next? As the peak of the inflated expectations subsides, these former promoters will get disillusioned and the critics will then launch their attacks. This is already occurring with the IoT and smart home technologies – we are already hearing complaints and tirades about lack of interoperability, ongoing standard wars and protocol disputes, primitive user interfaces, concerns about privacy and security – all of which are valid arguments and need to be solved.

But hopefully, as these concerns get analyzed, worked out and resolved, we will get back onto the slope of enlightenment. The IoT and smart home has the amazing potential to totally revolutionize how we

live – how we coexist with our surroundings, with our homes, cars, and businesses, as well as with other. We just need to recognize where we are from a technology perspective and make sure that the entire industry moves forward – together – recognizing that intelligence is just as important as the connectivity and the Sentrollers themselves.

For the emerging smart home – Internet of Things industry to succeed, it needs to conquer a lot of issues - interoperability, user interaction, standards, etc. – but most importantly , it has to develop, integrate and roll out cloud intelligence that will transform our dumb smart devices into truly smart Smart Devices!

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About GreenPeak Technologies

GreenPeak Technologies is an award winning fabless semiconductor/system company and the world recognized leader in the IEEE 802.15.4 and ZigBee market with a rich offering of semiconductor products and software technologies for Smart Home data communications and the Internet of Things.

The GreenPeak founders have significantly contributed to the invention of WiFi and made it into a commercial success used by several billion people today. GreenPeak is recognized as a leader in developing new wireless technologies for consumer electronics and Smart Home applications, demonstrating rapid growth and adoption by major customers.

GreenPeak is privately funded. It is headquartered in Utrecht, The Netherlands and has offices in Belgium, China, France, USA and Korea.

For more information, please visit www.greenpeak.com.