PREPARING FOR THE INTERNET OF THINGS

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INTRODUCTION

There's been a lot of talk lately about the "Internet of Things" and how technology will be changing the way we interact with our environment (or the way our environment interacts with us). There are all kinds of warm and fuzzy opinions about smart appliances and vehicles making our daily lives less tedious and more fulfilling. And there's also a fair amount of doom and gloom expected from those who see this as the first step toward a post-human Orwellian nightmare landscape of people and products as interchangeable and expendable commodities to be bought and sold in the marketplace.

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Regardless of which side of the debate you find yourself on, the Internet of Things is a very real concept, living and growing every day. Whether by means of RFID chips, barcodes or near field communication, most objects produced today come with a means of cataloguing and tracking. There is no longer a valid reason to debate the validity or necessity of the IoT. All that is left for us to do is find a way to make the most of it.

WHAT IS THE INTERNET OF THINGS?

In general, the Internet of Things is a theoretical concept used to describe a scenario where uniquely identifiable objects and their virtual representations are all contained within a virtual organizational structure like the internet. As opposed to an internet of information like text, video, images – all of which require human input – an internet of things would contain cars, refrigerators, phones, sweater-vests, any and all things. Once the thing is created and circulated, information about it would be continuously updated without any user assistance, the idea being that we can maximize the value of these things by knowing precisely when they need to be repaired, replaced or restocked without the fallibility and imprecision of human input. In fact, some people may suggest that humans themselves will be "things" in the new internet.

According to Wikipedia, the phrase was originated in 1999 by Kevin Ashton. It has since become something of a buzzword in certain circles, and with the proliferation of "smart" devices, its popularity has continued to grow. It has been estimated that the IoT will be populated by over 50 billion "things" by 2020. Another term bandied about in this regard is M2M (Machine-to-Machine), the obvious inference being that machines can communicate with and make decisions about other machines without a bunch of squishy, emotional, hairless apes mucking up the procedure. In either case, the dawning age of integrated intelligence is intended to create a more energy-efficient, cost-effective, safer world.

WHAT DOES THIS MEAN FOR SCADA?

The IoT should be a great thing for SCADA (Supervisory Control and Data Acquisition) software. More "smart" objects with more sensors means more data to monitor. That should increase the demand for SCADA systems, and it undoubtedly will. Unfortunately, many small to medium-size businesses will not be able to take full advantage of these advances right away. It costs money to replace older equipment with new; and it costs money to by the sensors and communication devices that would be required to turn yesterday's hardware into the intelligent objects of tomorrow.

In order for a company to make the leap into a more data-driven business model, it would seem to be necessary that the entire intelligent infrastructure of data points would have to be in place before any kind of data visualization software could be implemented. The time spent designing HMI (Human Machine Interface) screens and binding relevant data to them would be wasted if the entire process had to be repeated every time a new sensor is added.

The reality is that a new type of SCADA software will be required as we prepare for the new industrial revolution. SCADA systems will have to be more fluid, able to evolve and adapt to a changing workplace with changing information management needs. Innovative developers who recognize this trend and create software able to take advantage of these current conditions will set the new standard for HMI/SCADA vendors and consumers.

DATA MODELING

One innovative way to account for the new data-driven workplace is to implement a SCADA system that employs data modeling. A data model allows you to define the types of data that will be monitored, and also allows for new types to be added quickly and easily as new smart objects are added to the process. In fact, data modeling may be the only way to accommodate an ever-evolving information matrix. If you buy a new sensor to add to a particular type of pump – and you've got 100 of these pumps – your data model will allow you to add the new property to the pump "type" and easily expose that property for all instances of the pump "type". Then you can quickly and easily bind this property to a graphic on an HMI screen. And since the data model allows you to create a single "pipe" template and deploy the same HMI screen for every instance of pipe you want to monitor, it is possible to make these with a very small investment of time.

Data modeling also allows for all of these changes without requiring you to take the process down while you update your data visualization system. Since your graphics are bound to properties in your

model, you can even update your model and your HMI screens before the new sensors are even installed, which again can save a tremendous amount of time.

The data model also creates possibilities for integrating new types of data from different sources; it allows for a SCADA system to integrate asset management and maintenance data, financial data, performance management data – virtually any type of data that can be made available can be incorporated into the model and visualized in whatever way we choose. The same system used to create virtual control panels for operating personnel can be used to create CEO dashboards.

The Internet of Things is expected by many to be every bit as much of a revolution as the internet of information that we use today. Already, many companies are changing their information infrastructure to adapt to the new world. It is becoming apparent that the old way of organizing information is no longer adequate. To take full advantage of the increased efficiency, reduced waste and lower cost promised by this new revolution, we have to change the way we manage our data.

ABOUT THE AUTHOR

Rich Hunzinger's work in data visualization has brought him in close contact with the concepts surrounding the Internet of Things and Machine-to-Machine communications in industrial environments.

For more information on SCADA and HMI software and, particularly, how it relates to the Industrial Internet of Things, please visit http://scada.com.