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The Convergence of Digital and Non-Digital Technologies

At a recent press event in New York City, representatives from many different companies were trying to explain to me how their new products were, in some way, going to change society. At the Black & Decker booth, company reps were showing off their new Smartech technology which lets you control their line of 20 V MAX products with a Black & Decker smartphone app. Seeing the kind of tools that I have used for years impossible to turn on because of a smartphone made me realize just how far the Internet of Things (IoT) movement has come since the introduction of the NEST smart thermostat in 2011.

Companies that are building IoT products are finding ways of giving digital devices the power to control digital and non-digital technologies through the use of smartphones, tablets, and/or computers. The person using a digital device to control a previously non-digital technology could be in the same room or thousands of miles away.

The convergence of digital and non-digital technologies doesn't have to include the internet. The digital controller could be built into the machine, hardwired to one or a number of machines, Bluetooth connected, or working wirelessly in a firewalled network.

At this point in time your smartphone can control all sorts of machines, regardless of their size, if the machines have been designed so they can connect with Bluetooth or Wi-Fi, have sensors that can upload and download data, and have the necessary actuators to perform manual tasks. These tasks can be as simple as locking a tool or as complex as performing robotic surgery.

What I always liked about small hand power tools was that they needed to be plugged into a wall out-

let to become dangerous. Unplugged, these tools are rendered reasonably safe if a child started to treat them as toys.

For convenience indoors, or necessity outdoors where electricity isn't usually available or convenient, many of these tools are now powered by battery packs. The hedge trim-

Photo 1—Using Black & Decker's Smartech battery, you can control and monitor equipment such as this hedge trimmer with your smartphone.



Photos courtesy Black & Decker

mer shown in Photo 1 comes with a Smartech battery (Photo 2). After you download the app, you can use your smartphone to lock, monitor, or, when you are within Bluetooth range, locate the tool the battery powers.

I tested the system with three Smartech™ batteries; a company representative told me that there is no limit to how many tools you can control with their smartphone app. For the locate feature to work, you need to be in Bluetooth range, which would be helpful if you were searching in a room full of battery powered tools. At this point, the app can not help you recover a stolen tool once it is out of Bluetooth range.

The convergence of digital and non-digital technologies is a universal phenomenon. There are implanted medical devices that automatically upload the patient's vitals to the appropriate medical professionals. When necessary, device adjustments can be made over the internet or at the doctor's office using the appropriate app. The physical side of so many medical tests is now carried out by automated systems.

The IoT in your home is called the connected home and all kinds of devices that were developed ages ago, from a door bell to major appliances, can now be controlled by your smartphone. The connected car is now self driving, using all kinds of sensors to provide blind spot and lane departure warnings, and even automatic braking if the vehicle's sensors determine a collision is imminent. There are also smart buildings and smart factories.

We are on the cusp of machine learning designed to bring about intelligent machines. There isn't an area of technology where human control is not at times shared with smart

Photo 2—The Smartech battery

systems under the digital control of a computer program or app.

Taking It a Step Further

1. Do you feel that battery-powered tools that can be controlled by an app are safer to use and store than the same tool without a smart battery?

2. What products/appliances do you have in your home that are controlled by a digital program?

3. What products/appliances do you have in your home that are or can be controlled by a separate digital device or smartphone? ©

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