

The Internet of Things: Will Extension Be Ready?

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eXtension Fellow on the Internet of Things (2015-16)

Introduction

The world is going through the largest technological disruption since the invention of the Internet. It's called the Internet of Things. An increasing number of consumer devices are equipped with embedded sensors and microprocessors that allow them to be in constant communication with the Internet. Consumers are increasingly able to monitor, manage and control many of their devices through their smartphones-- from thermostats and appliances, to automobiles and homes.

The Internet of Things (IoT) will bring massive changes to all those areas for which Extension has a passion, including personal health, youth development, food safety, nutrition, and agriculture. The goal of my eXtension IoT Fellowship was to explore the nature of the IoT revolution and its implications for Cooperative Extension. In a nutshell, my research shows that our organization desperately needs a deeper awareness of IoT. Are YOU going to be ready?



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We Don't Know What We Don't Know

The majority of information about IoT is aimed at the corporate IT world, with a few others discussing the impacts of IoT on K-16 educators, and only tangentially relevant to Extension. Currently there are *zero* publications exploring the implications of IoT and Cooperative Extension in the literature.

But the absence of Extension references in the IoT literature does not imply irrelevance; rather it underscores *a lack of basic awareness of this technology within our organization*. It also identifies a game-changing opportunity for Extension to make a difference in this fast-moving technological revolution. As IoT further penetrates the daily lives of our Exten-

sion customers¹, they will be looking for supportive information, guidance and the kind of research-based, on-the-ground know-how that they have come to expect from Cooperative Extension.

Agriculture may be the highest profile candidate for the implementation of IoT. The ever-increasing deployment of Internet-connected remote sensors to gather information on crop health, soil moisture and conditions, and harvesting data will place demands on Extension agriculture professionals to become literate in the technology, or face increasing irrelevance.

Personal health is experiencing widespread effects from the IoT revolution. Consumers are increasingly embracing personal health monitoring systems like the FitBit and Apple Watch, which monitor and archive activity, sleep and other health metrics. Our clients will look to Extension--or someone else--to help them make informed decisions about appropriate lifestyle changes in response to what their wearable devices are telling them.

The aggregation of personal health monitoring data will also provide opportunities for understanding larger social trends. This data could lead directly to Extension health programs designed to change behaviors at a scale and precision previously unheard of.

Youth development specialists will see an increase in IoT literacy among their constituents. Youngsters will become increasingly involved with the design, programming, and construction of IoT devices. This will have a huge impact on STEM programs administered by Extension.

Food & Nutrition personnel will see an increasing use of IoT in the “food stream” from farm to fridge. The introduction of smart IoT appliances will accelerate the demand for relevant IoT-informed educational materials in nutrition and food preparation.

Imagining and Preparing for Opportunities

Our clients will be searching for information, advice and learning opportunities to better operate in an increasingly connected world. It's easy to imagine Extension workshops with the following titles:

- “Understanding and Using Your Fitbit to Manage Family Health”
- “Building Your Own IoT Devices to Monitor Your Home”
- “Applying IoT in Your Garden and Landscape”
- “Using IoT for Precision Agriculture On Your Small Farm.”

The impacts and applications of IoT could lead to a whole new body of Extension educational outreach materials, including print publications, videos, webinars, infographics and multimedia apps. A vast unexplored landscape of opportunity also exists to publish scholarly works on IoT and its application to specific Extension program areas.²

1 In 2016, there are 5 billion IoT devices worldwide. By 2020, that figure will climb to 200 billion.

2 “Big Data and the Internet of Things: A Litmus Test for Extension” (Hill P., & Hino, J.) is currently in publication with the Journal of Extension.

We are entering a very exciting and challenging new era of connectivity. Cooperative Extension could play a major role in informing, educating, and serving the public as they navigate this brave new connected world. Over 100 years ago, Extension rose to the challenge of the Industrial Revolution. Now Extension must rise to the challenge of what could be an even more profound revolution: the Internet of Things.

What Can You Do Now?

I invite you to familiarize yourself with a basic understanding of IoT and explore the intersection of IoT and your specific program area. Here are some references to get you started:

[A Simple Explanation Of 'The Internet Of Things'](#)

An excellent summary with supportive video and infographics on IoT.

[Digital Life in 2025](#)

15 theses are offered...both good and somewhat scary---about the advent of an IoT world.

[Here's how the Internet of Things will explode by 2020](#)

While somewhat business oriented, you'll find good statistics and implications of IoT in this report.

[California agriculture embracing the 'Internet of Things'](#)

A brief overview of IoT implications in agriculture.

[How the 'Internet of Things' Will Impact Food Safety](#)

The title says it all.

Here are a few informative IoT infographics:

[Smart World](#)

[How Will The Internet of Things Evolve?](#)

[The Internet Of Things: The Past, The Present, And The Future](#)

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