

# The Internet of Things (IoT): Platforms, Analytics, Security, Business Model, and Human Interaction

## Panel

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## ABSTRACT

According to Consumer Electronics Show (CES) 2017 and a number of recent research reports in 2016 and 2017 from Gartner, Deloitte, McKinsey, and Info-Tech Research Group, the Internet of Things (IoT) is projected to be a multi-trillion dollar opportunity. However, there are numerous issues and requirements in IoT, such as platforms, analytics, gateways and devices (including sensors) management; communication services (i.e., M2M and networking protocols); security and privacy; and user interactions. In addition, various perspectives for monetizing IoT, as a business model, will be considered. The IoT panel proposal will cover IoT platform, gateway and devices; communications services; IoT analytics; security and privacy; business model and business value of IoT; and human interaction with IoT. Each panelist will present the assigned IoT topics.

## Keywords

The Internet of Things, IoT, Platform, Analytics, Security, Business Model, Human Interaction

## INTRODUCTION

The Internet of Things (IoT) is the most challenging research and teaching topic in Information Systems (IS) field. The purpose of this panel is to disseminate new points of view on the Internet of Things and to stimulate an engaging discussion, i.e., IoT platforms; standards/protocols; analytics; security and privacy; monetizing issue and business model; and human interactions. All panelists will discuss the latest trends and themes of IoT in various industries and education.

## DESCRIPTION OF THE OVERALL APPROACH

Given the time allotment for a 90-minute session, the panel session moderator/chair would like to take the following format and time for the IoT panel session: the Panel Moderator/Chair will deliver an overview, current status of IoT, IoT platforms, and numerous issues. Each of the panelists will deliver on the assigned topics: analytics, security/privacy, business model, and human interactions. After all panelists' presentations, we will begin Q&A for 20 minutes. During Q&A, all panelists will be able to discuss topics not touched upon earlier. For the remaining 10 minutes, all panelists will discuss some comprehensive questions such as, "which industries and organizations are early pioneers and benefitting from IoT?"; what do we need to teach IS students for the IoT?

## STATEMENT OF WHY THE PANEL IS IMPORTANT TO PRESENT TO AMCIS 2017

The topic of IoT has been receiving increased attention from industry practitioners and academic professionals. Various IoT topics will be quite interesting, timely, and informative to AMCIS audiences.

## THE INTERNET OF THINGS TOPICS FOR PANELISTS

The invited faculty members are well qualified to serve as panelist:

### 1. IoT Platforms (J. P. Shim, Georgia State University)

The Internet of Things platform, also dubbed as the "platform of platforms," enables connectivity between things or devices. As IoT proliferates, so do the unprecedented amounts of data it generates. Firms, government agencies, and other organizations have taken and are taking initial steps to implement IoT's component parts such as sensors, devices, software, and connectivity. As the use cases for IoT grow, the number of IoT platforms available in the market also increases. Recent reports including ReadWrite and IoT Analytics stated that there are 360-plus IoT platforms in the industry. Among these, Amazon AWS IoT, AT&T IoT, IBM Watson IoT, Sierra Wireless' AirVantage, Samsung ARTIK platform, and Nest are only a handful of the key players in the field of IoT platforms. In addition, there are several major standards such as Sigfox, LoRa, NB IoT, and LTE-M.

### 2. IoT Analytics (Ramesh Sharda, Oklahoma State University)

Internet of Things is the phenomenon of connecting the physical world to the Internet, in contrast to the Internet of people that connects us humans to each other through technology. In IoT, physical devices are connected to sensors that collect data on the operation, location, and state of a device. This data is processed using various analytics techniques for monitoring the device remotely from a central office or for predicting any upcoming faults in the device. Ramesh's presentation will include examples of analytics applications of IoT, including illustrative data management and algorithmic issues in developing IoT analytics. These include sensor analytics in supply chain, transportation, and healthcare.

### 3. IoT Security and Privacy (Aaron French, University of New Mexico)

The IoT revolution is generating greater volumes of data from a wide variety of sources as connectivity between devices continues to grow. Gartner estimates that 26 billion devices will be IoT enabled by 2020, creating huge opportunities for data centers, hardware makers, developers, and designers, but also opportunities for hackers. This creates a new scope of privacy and security risks that needs to be addressed. IoT attacks could range from a Denial of Sleep (DoS) attack designed to drain the batteries of the device or run up your electricity bill to the theft of sensitive information and home intrusion. IoT security and privacy requires three primary issues that will need to be addressed: authentication, encryption, and Transport Layer Security (TLS) protocols.

### 4. IoT Business Model and Business Value of IoT (Rhonda Syler, University of Arkansas)

From operations optimization to enhanced customer service experiences, Internet of Things (IoT) innovations are revolutionizing the way we do business. As these technologies become ubiquitous and platforms and architecture begin to reach maturity, understanding the value proposition of IoT innovations becomes increasingly important. The benefits of IoT carry across a multitude of industries providing potential benefits such as process improvement and optimization, increased organizational efficiency, improved customer experiences, optimized cost structures, and risk mitigation. Understanding how to leverage these technologies to realize the potential benefits of IoT is key to deriving value. Three primary business models – platform-based, outcomes-based, and data-as-an-asset approaches - provide a typology for understanding best practices for leveraging IoT internally and externally for value creation and monetization.

### 5. Human Interaction with IoT (Karen Patten)

The Internet of Things (IoT) has commonly been understood to refer to the interconnectivity of devices through the Internet. In many cases, this has led to the reduction of human interaction as connected devices collect and exchange data resulting in

improved manufacturing efficiency, accuracy, and economic benefit. However, the ‘human interaction’ with IoT has the potential to radically change the way we live. Today, humans use ‘smart phones’ to interact with ‘smart objects,’ i.e., to manipulate the lights, or the energy, or the locks in our homes. We monitor our health through wearable devices interconnected to our smart phones. This section of the IoT panel focuses on how consumer IoT applications will change our everyday life.

### **IoT in Various Industries and Education**

Businesses in all industries can use Internet of Things to improve productivity, reduce operating expenses, and assist with new product development. The panelists will draw on their expertise and knowledge on IoT to discuss the latest trends and themes.

### **ABOUT THE PANELISTS:**

**J. P. Shim** is KABC Director and CIS faculty at Georgia State U. He was Professor, Notable Scholar, John Grisham Professor at Mississippi State U and published books and 100 papers, including *MIT Sloan Management Review*, *JAIS*, *EJIS*, *JSIS*, *CACM*, *DSS*, *IEEE*, *AOM Proceedings*, *ICIS Proceedings*. He was AMCIS Program Co-chair, WTS/IEEE IoT track/panel chair, and NSF grants recipient.

**Ramesh Sharda** is Vice Dean for Research and Graduate Programs in the Spears School of Business at Oklahoma State University. His research has been published in major journals in management science and information systems including *Management Science*, *Operations Research*, *Information Systems Research*, *Decision Support Systems*, *Decision Science Journal*, and many others.

**Aaron M. French** is Assistant Professor of MIS at University of New Mexico. He received his PhD from Mississippi State University. His research has been published in the *Journal of Information Technology*, *Information & Management*, *Behaviour & Information Technology*, *Journal of CIS*, and *CAIS*. His research interests include IoT, social networking, and cross-cultural studies.

**Rhonda A. Syler**, Ph.D., is faculty in the Sam M. Walton College of Business at University of Arkansas. Her primary teaching areas include business analytics, data mining, and enterprise resource planning. Rhonda's current research focuses on organizational impact and business value of disruptive technologies such as the Internet of Things (IoT).

**Karen Patten** is an Assistant Professor of IT at University of South Carolina and teaches telecommunications, networking and IT project management. Her research interests include agile senior IT management, small business emerging wireless and mobile telecommunications management, and IT curriculum development. She is currently researching IoT development in the Columbia SC metropolitan area.

### **Panel Session Logistics/Requirements**

1. Microphones are needed for this panel - each panelist needs a microphone
2. Session Q&A - wait for a microphone
3. The room needs several more microphones for questions/comments from the audience.

### **REFERENCES**

1. Gartner (2014). Gartner Says the Internet of Things Installed Base Will Grow to 26 Billion Units By 2020, Gartner Symposium/ITxpo in Barcelona, Spain, Nov. 9-13.
2. Kamilaris, A. and Pitsillides, A. (2016). "Mobile Phone Computing and the Internet of Things: A Survey," *IEEE Internet of Things Journal*, Vol. 3, No. 6, pp. 885-898.
3. Raynor, M. and Cotteleer, M. (2015) The more things change: value creation, value capture, and the Internet of Things, *Deloitte Review*, 17, 51-65.
4. Shim, J. P., Dam, R., Coursey, C., and Barnes, D. Internet of Things (IoT): Overview, Monetizing, Devices Efficiency, Platforms and Security, Wireless Telecommunication Symposium (IEEE) Panel, Chicago, 2017.