An Introduction to IoT and its Impact on Society

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27 August 2017

Imagination Accelerated™
Our Journey to Understanding the Internet of Things (IoT) and its Impact on Society
What are my ultimate goals? The 3E’s.

Educate  Explain  Exhort
My Experience: Barrier to entry reduces with Market pull

Wait... I have this great technology!

Yeah, but it doesn’t meet our needs
What problem are we trying to solve? Convenience.

Convenience to the consumer (end customer) → operational efficiency and accuracy to the industry.
How do we get to convenience? Connectivity.

Information a finger away, everything in touch\(^1\)

New services and devices, connecting new industries and empowering new user experiences (i.e., connecting people and things across a diverse set of scenarios).

Wirelessly Connected Industries
- Manufacturing
- Agriculture
- Hospitals
- Education
- Transportation system
- Finance
- Environment
- Smart city, home and campus
- Wearable devices
- Large venues
- Enterprise

White paper: 5G vision and Requirements, IMT-2020 (5G) promotion group 05,2014
What is the Internet of Things (IoT)?

* Internet of things – Wikipedia


Properties

• The inter-networking of devices, vehicles, buildings, etc.
• Embedded with electronics, software, sensors, actuators and network connectivity
• Enabled to collect and exchange data
• Sensed or controlled remotely

Result

• Improved efficiency, accuracy, economic benefit and reduced human intervention

Examples

• Smart grids, virtual power plants, smart homes, intelligent transportation and smart cities

Market Size

• IoT will consist of about 30 billion objects by 2020 ($11T by 2025**)
What examples of IoT did we see?
What is the impact of IoT? IoT will cause a shift in the way we communicate and use technology in the future.

- Data Throughput and Capacity
- Open Operating Systems
- Cloud media storage
- Unlimited bandwidth
- Ubiquitous Displays
- Shared applications
- Energy Efficiency
- Ultra low latency
- Connectivity
- Coverage
- Mobility

Many developmental opportunities before what we saw becomes an obtainable, reliable reality.
What are the opportunities?

**CDAIT’s* Current Working Group Leadership**

**IoT EDUCATION & TRAINING**
- **Dr. Russell Clark – Chair**
  Associate Director, GT Research Network Operations Center (GT-RNOC), Georgia Tech College of Computing, School of Computer Science; and principal leader of the Georgia Tech Convergence Innovation Competition
- **Ms. Grace Kitzmiller – Vice Chair**
  Educate Technical Program Manager - Amazon Web Services
- **Mr. Marvin Laster – Vice Chair**
  Executive IT Architect – IBM

**IoT STARTUP ECOSYSTEM**
- **Mr. Blake Patton – Chair**
  Managing Partner – Tech Square Ventures
- **Mr. Adam Rykowski – Vice Chair**
  Vice President, Product Management – VMware
- **Mr. Yasir Qureshi – Vice Chair**
  Director, Internet of Things (IoT) Platform and Digital Architecture - Stanley Black & Decker

**IoT THOUGHT LEADERSHIP**
- **Dr. Karen I. Matthews – Chair**
  Manager of Technology and new Business Development, Science and Technology – Corning
- **Dr. Paul Baker – Vice Chair**
  Senior Director, Research and Strategic Innovation, Center for Advanced Communications Policy – Georgia Tech
- **Mr. Clay Mahaffey – Vice Chair**
  Global R&D & Innovation Director – Kimberly-Clark

**IoT SECURITY & PRIVACY**
- **Dr. Margaret Loper – Chair**
  Chief Technology Officer, CDAIT; Chief Scientist, Information & Communications Laboratory (ICL), Georgia Tech Research Institute (GTRI), and Associate Director-Trust, GT Institute for Information Security & Privacy (IISP)
- **Mr. Jason Christman – Vice Chair**
  Product Cybersecurity Chief – Honeywell
- **Mr. Tim Hahn – Vice Chair**
  Chief Architect, Internet of Things Security – IBM

**IoT STANDARDS & MANAGEMENT**
- **Mr. Robert Kamp - Chair**
  Senior Director, Internet of Things Group (IoTG), Markets and Channels organization, Intel
- **Mr. Bill Eason – Vice Chair**
  Research Scientist, GT Research Network Operations Center (GT-RNOC)
- **Mr. Daniel Walton – Vice Chair**
  Director of Software Development - Cisco

**IoT RESEARCH**
- **Mr. Kenji Takeuchi - Chair**
  IoT software products and platforms, Honeywell
- **Mr. Jay Sexton – Vice Chair**
  Chief Operating Officer, CDAIT, Georgia Tech Research Institute (GTRI)
- **Mr. Saud Khader – Vice Chair**
  Senior Internet of Things Architect – Verizon

* Center for the Development and Application of Internet of Things Technologies
Center for the Development and Application of Internet of Things Technologies (CDAIT)

WHO WE ARE

The Center for the Development and Application of Internet of Things Technologies (CDAIT) is a global, non-profit, student-led center located in Atlanta, Georgia that bridges interdisciplinary research and innovation while driving general awareness about the Internet of Things (IoT).

CDAIT bridges partners with Georgia Tech faculty and researchers as well as industry members with similar interests.

CDAIT’s broad research mission is to support and promote IoT’s huge potential and transformative capabilities.

WHAT MAKES CDAIT UNIQUE?

1. Anchored at the Georgia Tech Research Institute (GTRI), a highly respected applied research and development organization with a global impact and focus on real-world research for government and industry.
2. Led by Georgia Tech’s diverse and distinguished community of faculty and researchers.
3. CDAIT aims at successfully identifying, understanding and solving the challenges and problems that may arise along the entire Internet of Things value chain.

CDAIT MEMBERSHIP BENEFITS

- Access to Georgia Tech faculty and student expertise
- Certificate program available to employees
- Complimentary passes and discounts on all CDAIT-sponsored events
- Non-exclusive licensing of intellectual property (IP) developed in CDAIT member-funded research
- On-site customized IoT workshops
- Opportunity to be involved in CDAIT’s international IoT standards-related initiatives as they emerge
- Option to negotiate an exclusive license for IP developed under member-funded research
- Participation in CDAIT research projects
- Pre-publication access to all CDAIT reports
- Recognition in CDAIT materials and on website
- Seat on Executive Advisory Board (depending on sponsorship level)

November 2016

Mark Lown, CDAIT Managing Director • +1 404-457-6200 • mark.lown@gaitech.edu • www.cdait.gatech.edu
Description: The introduction to CDAIT presented “hands-on” give a general overview of Internet of Things. Specific details can be found on our website.
1. Where are the limits of the connected world and humans?
2. How will data ownership and security issues be addressed?
3. How will the business models (including monetization models) look and be measured?
4. Roadmap: When will the revolution of IoT today be the norm of tomorrow?
Opportunities: Control (System) Engineering and IoT

**IoT** = The Internet (Interconnection) of Intelligent (Smart) Things

**Control (systems) engineering** = practical application of control theory
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