An Introduction to IoT and its Impact on Society

CDAIT Thought Leadership Working Group

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*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.

- Operational efficiency and accuracy
- Improved energy efficiency, reliability and safety
- Vertical Ex.: Public safety, agriculture, healthcare
How do we get to convenience? Connectivity.

Information a finger away, everything in touch

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)?*

- **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**)

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What examples of IoT did we see?
How will IoT impact our communities? One example - IoT will enable our living in smart cities

SMART CITIES: THE NEXT BIG THING

- **Smart Energy** uses digital technology for transmission and distribution of power
- **Smart Buildings** are green and energy efficient, with advanced automated infrastructure (manages lighting, temperature, security, and energy consumption)
- **Smart Mobility** enables mobility through the use of autonomous vehicles, low emission cars and multimodal transport systems
- **Smart Healthcare** uses eHealth systems, connected medical devices, and policies for health/wellness/well-being and monitoring/diagnostics as opposed to treatment
- **Smart Governance** uses policies and digital services from the government that help/support adoption of green and intelligent solutions (via incentives, subsidies, etc.)
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 IoT (in its totality) is an obtainable, reliable reality.
## What are the opportunities?

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<td>Mr. Kenji Takeuchi</td>
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<td>IoT software products and platforms, Honeywell</td>
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*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, nonprofit, partner-funded center located in Atlanta, Georgia, that brings interdisciplinary
research and innovation while driving general awareness about the Internet of Things (IoT).

CDAIT bridges sponsorships from industry and academic research as well as industry members with
academic research. CDAIT’s core value proposition is in the belief that only a holistic approach, i.e.,
integration of the entire IoT value chain and the institutional knowledge between the research firms, can
generate superior results. CDAIT’s broad overarching goal is to improve and promote IoT’s
tremendous potential and transformational capabilities.

CDAIT MEMBERSHIP BENEFITS

- Access to Georgia Tech faculty and student expertise
- Certificate program available to employees
- Complimentary tickets and discounts on all CDAIT sponsored events
- Non-exclusive licensing of intellectual property (IP) developed in CDAIT member-funded research
- On-site and virtual membership 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 websites
- Seat on Executive Advisory Board (depending on sponsorship level)

WHAT MAKES CDAIT UNIQUE?

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