

# THE INTERNET OF THINGS (IoT) in the Caribbean: Opportunities & Challenges

## *IoT in the Caribbean: Opportunities & Challenges*

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# THE INTERNET OF THINGS (IoT) in the Caribbean: Opportunities & Challenges

## AGENDA

1. What is IoT?
2. Some Popular Applications (Opportunities)  
Health Care, The Home, On the Road, In the Air
3. Some Risks (Hacking, Privacy & Personal Data)
4. Question: IoT Specific Laws ? **OR**  
Upgrading/Expanding/amending Current Laws?
5. Regulatory Considerations
6. The Barbados Regulatory Framework vis-à-vis IoT

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## DENIFINITIONS/DESCRIPTIONS

**IETF Description:** *“The basic idea is that IoT will connect objects around us (electronic, electrical, non-electrical) to provide **seamless** communication and **contextual services** provided by them. Development of RFID tags, sensors, actuators, mobile phones make it possible to materialize IoT which interact and co-operate with each other to **make services better and accessible at anytime from anywhere.**”*

**ITU-T Y.2060:** *“... a **global infrastructure** for the information society, enabling advanced services by **interconnecting** (physical and virtual) things based on existing and evolving **interoperable** information and communication technologies.”*

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## IoT Applications Examples

- Self-driving cars
- (Driverless) Drones
- Smart Grids
- Smart meters on household devices
- Surveillance Systems
- Smart Cities
- Drones
- Home healthcare and Hospital care

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## *WHAT IS IT? – FUTURE*

- **Gartner Inc:** 20.8 billion devices on the IoT by 2020
- **ABI Research:** 30 billion devices connected wirelessly by 2020
- **Pew Research Internet Project 2014 Survey:**  
83% (Technology experts and engaged Internet users):  
**Notion:** The Internet/Cloud of Things, embedded and wearable computing will have widespread beneficial effects by 2025.

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## IOT: So What is The IoT... Really?

“... refers to scenarios where network connectivity and computing capability extends to objects, sensors and everyday items that are not normally considered to be computers, allowing these devices to generate, exchange and consume data with minimal human intervention.” (Internet Society, March 2017, Antigua)

### Bottom Line

Not simple!

IoT rapidly becoming the root of a **Hyper-connected World!**

IoT will impact almost every living human being on some way!

**This is why it matters!!**

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### IoT -Opportunities (Healthcare)

- Insulin pumps and blood pressure cuffs that connect to a mobile app
- Particularly beneficial to the aging patients, for whom connected healthcare devices can provide treatment options that would help them manage their healthcare at home without the need for long-term hospital stays.
- Patients can give caregivers , relatives and doctors access to their health data through these apps.
- Generally, connected healthcare devices can Improve quality of life and safety by providing a richer source of data to the patient's doctor for diagnosis and treatment.

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## IoT -Opportunities (The Home)

- Smart meters can enable energy providers to analyse consumer energy use and identify issues with home appliances.
- Home Automation Systems: Can provide consumers with a single platform that connect all the devices within the home with a single app for controlling them.
- Eg: Connected Ovens that allow consumers to set their temperatures remotely
- Smart TVs (be very careful here, privacy issues)
- Smart Refrigerator



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## IoT -Opportunities (On the Road)

### Driverless cars

- require an immense amount of data gathering and analysis due to their connection to cloud-based traffic and navigation services, among other outlets for connectivity.
- "By 2020, ... 250 million cars will be connected to the internet," (Gartner)
- autonomous cars will make roads safer through their interconnectivity (via the IoT), meaning fewer accidents
- Insurance (Premiums) Implications

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## IoT -Opportunities (In the Air)

### Unmanned Aerial Vehicles (UAVs) Drones – many great Uses

- Surveillance
- Surveys/Mapping
- Inspections (Wind turbines, power lines, pipelines, railroads, buildings, towers)
- Security
- Search & Rescue

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## IoT –Risks

- **Enabling Unauthorise access and misuse of Personal Information**

Eg: Smart Television

Smart Refrigerator

- **Facilitating attacks on other systems**

**Recall:** October 2016 Attack on **Dyn**

**Mirai** Botnet largely made up of **IoT** devices such as digital cameras and DVR players.

> 100,000 malicious endpoints!

Attack Strength: 1.2 Tbps

**Affected Companies:** **Twitter, Pinterest, Reddit, GitHub, Etsy, Tumblr, Spotify, PayPal, Verizon, Comcast, the Playstation**

- **Creating Safety Risks**

**Recall:** Chinese Researchers Hacked a **Tesla Model S** from a distance of **12 Miles**.

**Interfering** with the car's brakes, door locks, dashboard computer screen

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## IoT –Risks

Question: Do We Need IoT-Specific Laws? **Arguably No.**

**Argument:** IoT is:

- **Not Necessarily Introducing New Crimes**

**Rather**

- **New Ways and Tools to Commit Crime**

**Action**

**-> Update/Improve Existing Laws (If we have them)**

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## IoT – Privacy & Personal Data Issues

- **Cybersecurity**
  - Hacking (Botnets, Thingbots)
- **Who owns the data?**
- **Privacy**
  - Do we have privacy policies for IoT?
  - Can the devices learn about your private life?
  - Can Consumers find out about the breach?
- **Control**
  - Would you like your refrigerator to decide when to order your favourite food?
- **Liability**
  - Suppose the sensors or Coms malfunction and send the wrong information. Who is liable?

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## IoT – Regulatory Considerations

- Establish Sound Cybersecurity Strategy & Framework
- Data Security: Should be built in from the Design stage  
IoT Manufacturers should ensure that data collection, storage and processing is secure at all times. Adopt a “**defence in depth**” approach, encrypt data at each stage.
- Data Consent:  
Users should have a choice as to what data they share with IoT companies  
Users must be informed if their data gets exposed.
- Data Minimisation:  
IoT Companies should collect only data they need  
Retain collected information only for a limited duration

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## IoT – Recommendations for Consideration (Key Consideration)

- **Establish Sound Cybersecurity Strategy & Framework**
- **National/Regional Cyber Incident Response Centres (CIRCs)**

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## IoT – And The Barbados Current Regulatory Framework

- **Sound Cybersecurity Strategy & Framework**  
(Early Stages)
- **National/Regional Cyber Incident Response Centres (CIRCs)**  
(Established, Early Stages)



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## IoT – And The Barbados Current Regulatory Framework

### Data Security: Should be built in from the Design stage

IoT Manufacturers should ensure that data collection, storage and processing is secure at all times. Adopt a “**defence in depth**” approach, encrypt data at each stage.

### Barbados Law – Non-Existent

- Is there Sense in having any Such Law?

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## IoT – And The Barbados Current Regulatory Framework

### Data Consent:

- Users should have a choice as to what data they share with IoT Companies
- Users must be informed if their data gets exposed.

### IoT Companies should collect only data they need

### Retain collected information only for a limited duration

### Barbados Privacy & Data Protection Bill (2005) Objectives

- The regulation of the collection, keeping, processing, use or dissemination of personal data; and
- The protection of the privacy of individuals in relation to **PERSONAL DATA**

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## IoT – What Can We Do? Really

- Establish National Cybersecurity Framework/Strategy  
(To Include National CIRCs)
- Create/Update/Improve Laws to Protect Privacy and Regulate Management of Personal Data.
- Public Awareness Programs/Campaigns on Risks/Dangers related to IoT
- Lobby and support Regional/Global Initiatives to get IoT Manufacturers to adopt “a Defence in Depth” Approach to the Design and Development of IoT Devices/appliances

# **THE INTERNET OF THINGS (IoT) in the Caribbean: Opportunities & Challenges**

**THANK YOU!  
QUESTIONS?**