

IoT, Empowering a Connected World

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Roger Hacking
TMC Electronics, V15
4 November 2015

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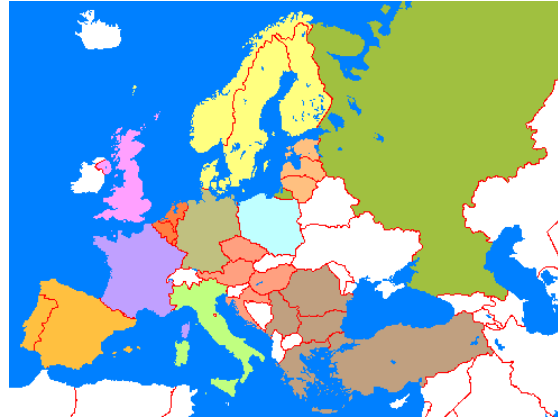
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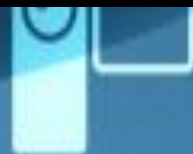
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THE INTERNET OF THINGS



The Internet of Things

(1) The Internet of Things, also called The Internet of Objects, refers to a **network** between **objects**, usually the network will be wireless and **self-configuring**.

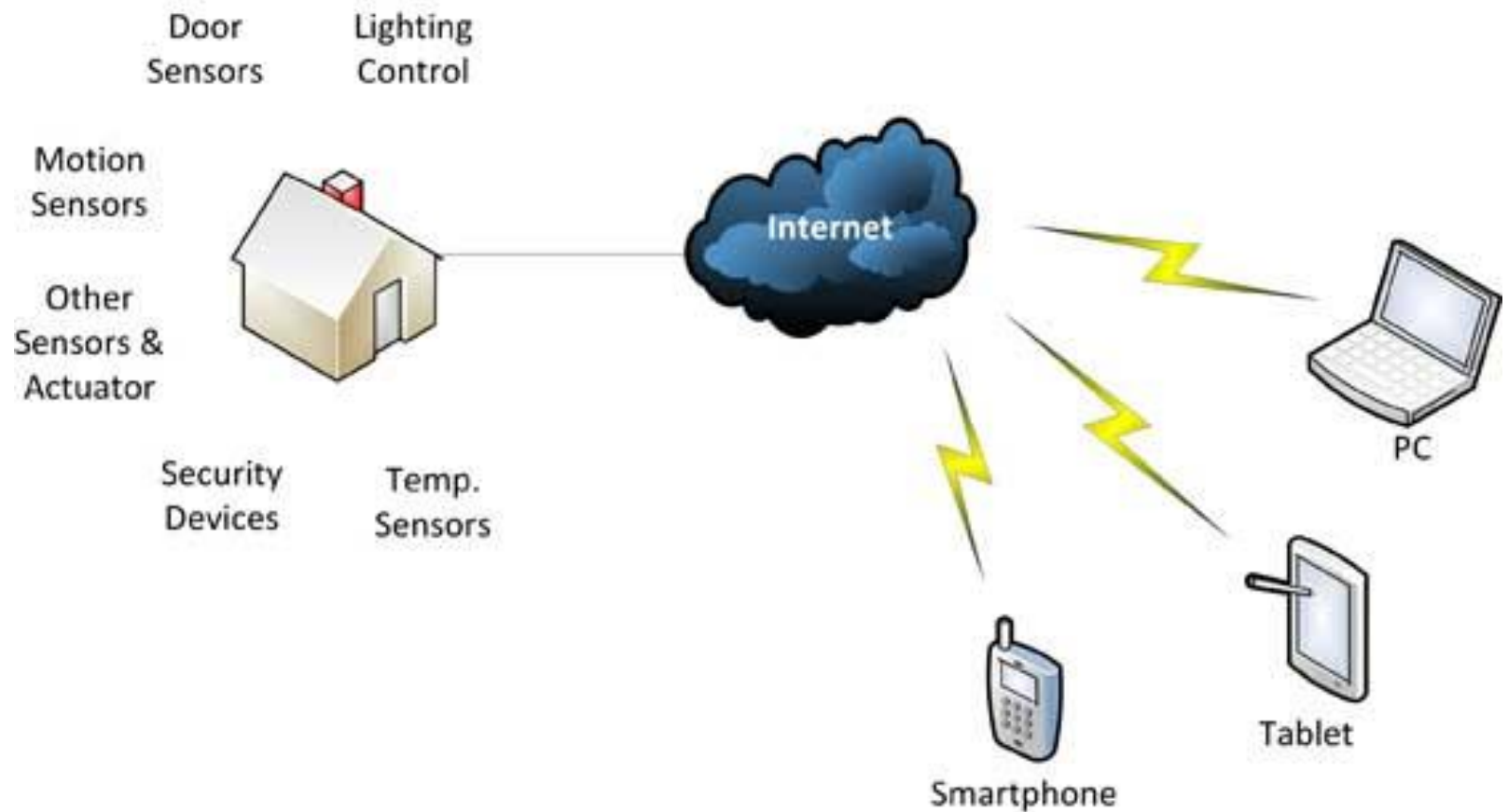
(2) Internet of Things refers to the concept that the Internet is no longer just a global network for **people** to **communicate** with one another using computers, but it is also a platform for **devices** to **communicate** electronically with the world around them.”

The Internet of Things

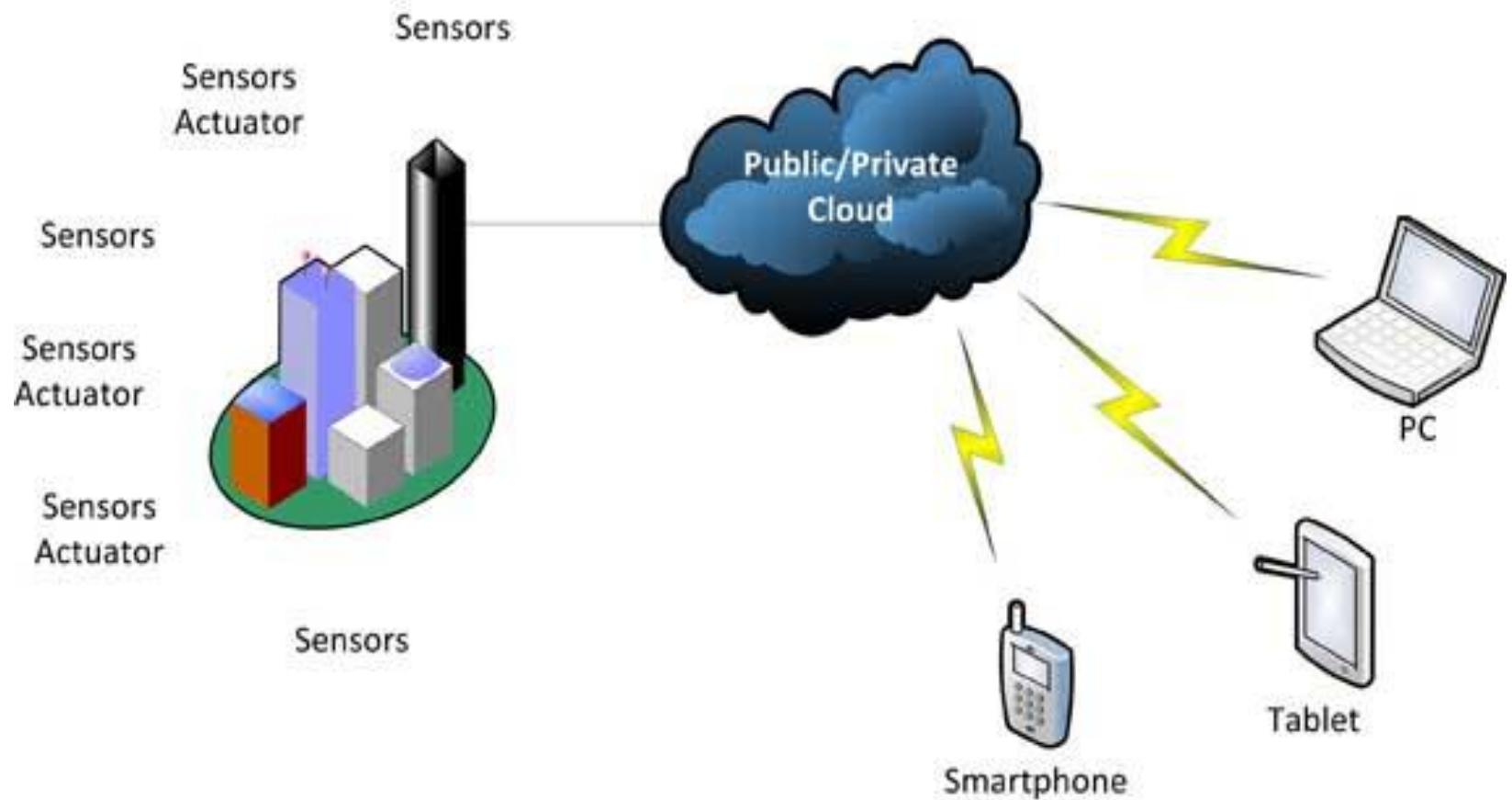
(3) The term "Internet of Things" has come to describe a number of technologies and research disciplines that **enable the Internet to reach out** into the real world of **physical objects**.

(4) “**Things** having **identities** and virtual personalities operating in smart spaces using **intelligent** interfaces to connect and **communicate** within social, **environmental**, and **user contexts**”.

Systemview



Systemview



Empowering a connected World ?



Are Ants IoT?





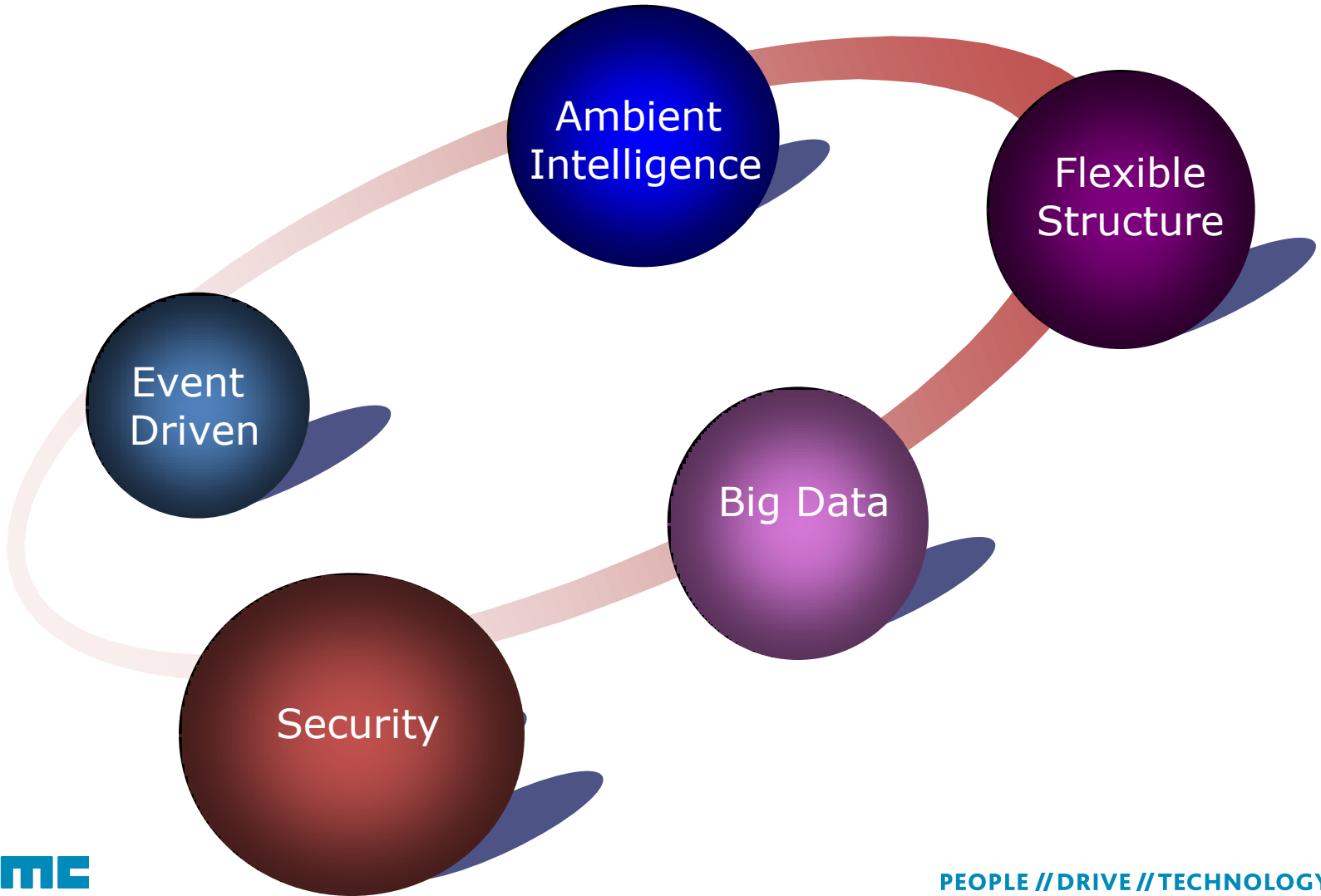


Empowering a connected World ?

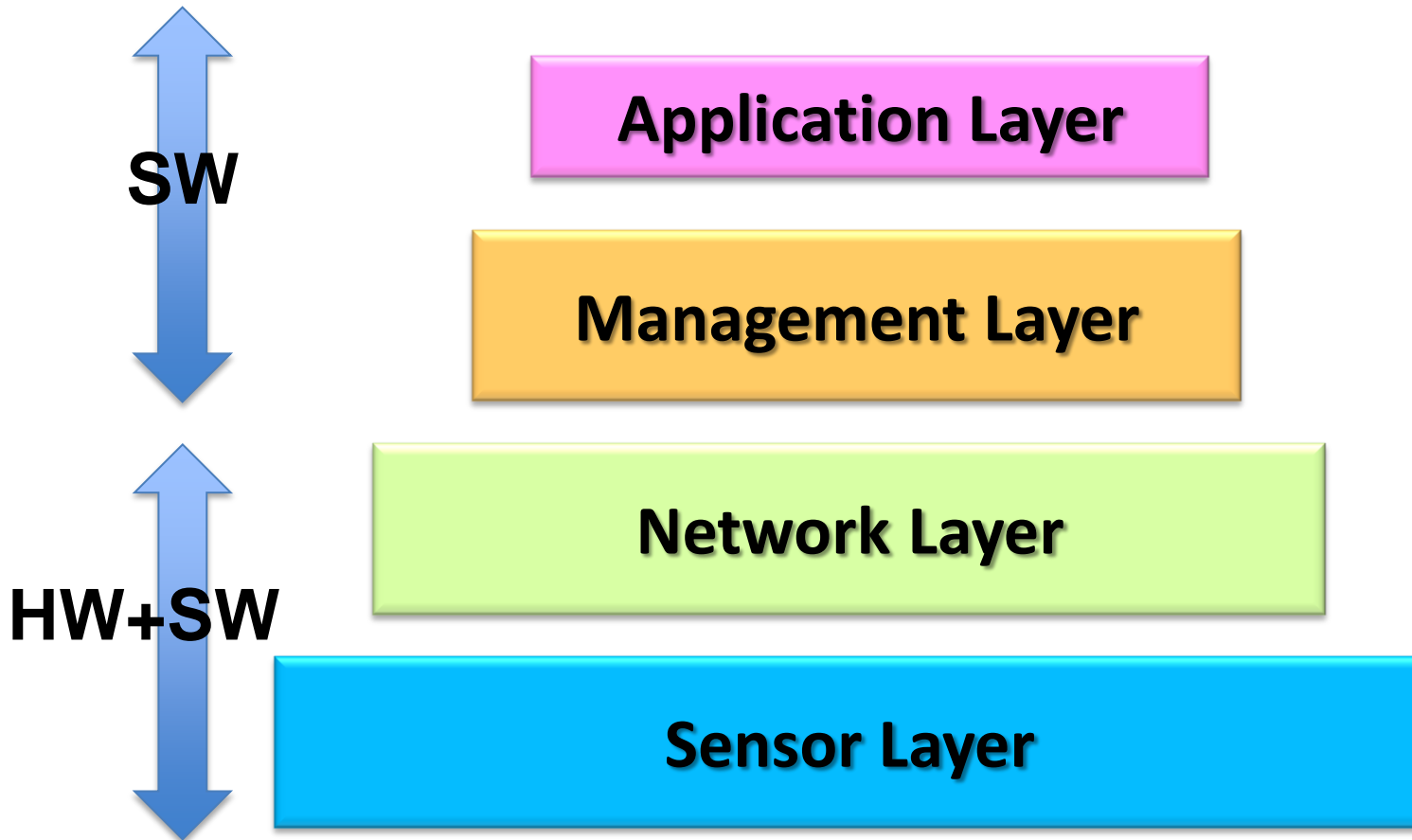


Are Ants IoT? First the Basics

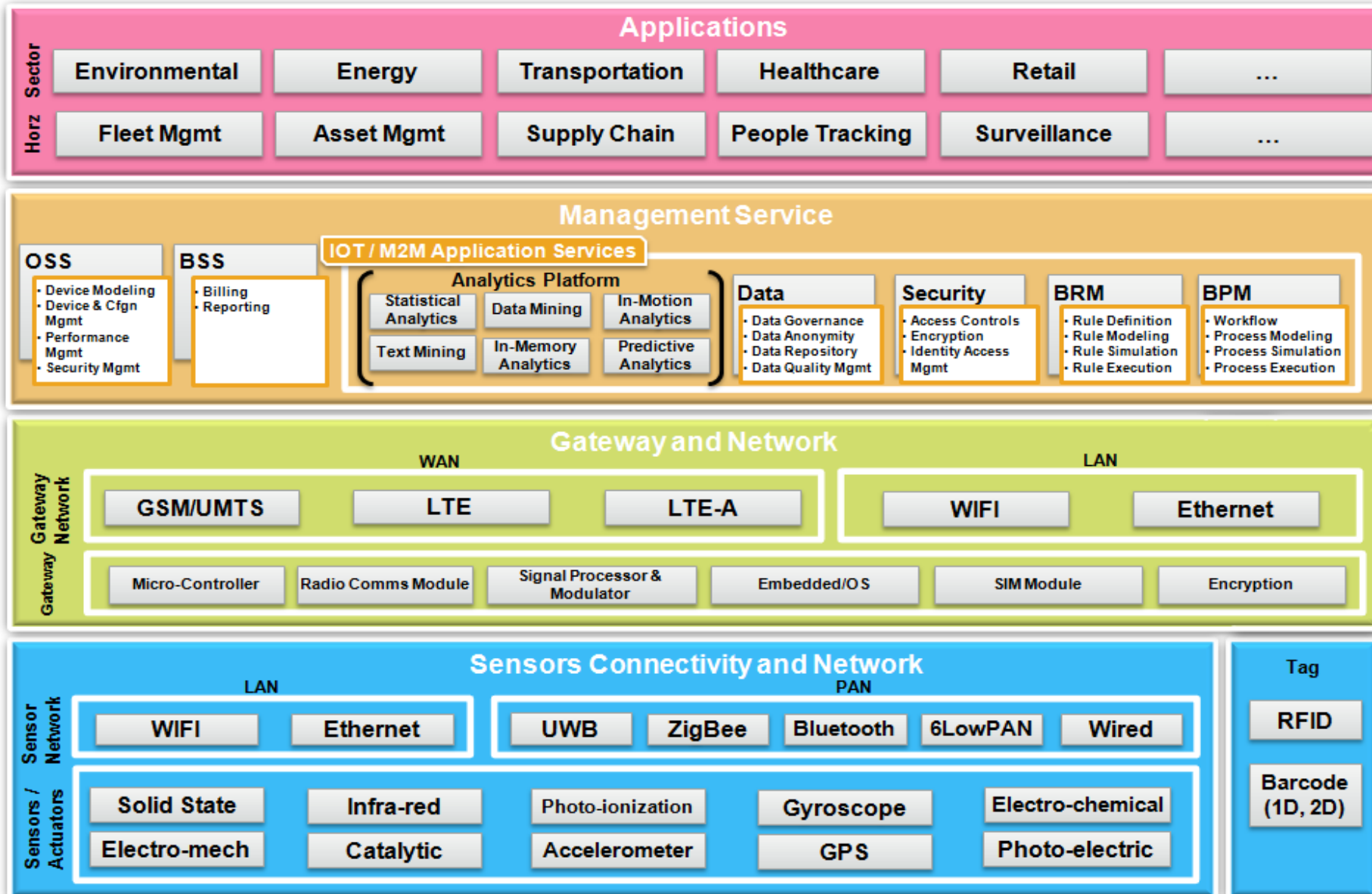
Characteristics IoT



Technical Perspective



Architecture of IoT



Sensor Layer

- Incorporated to measure **physical** quantities
- Interconnects the physical and digital world
- Collects and process the **real time** information



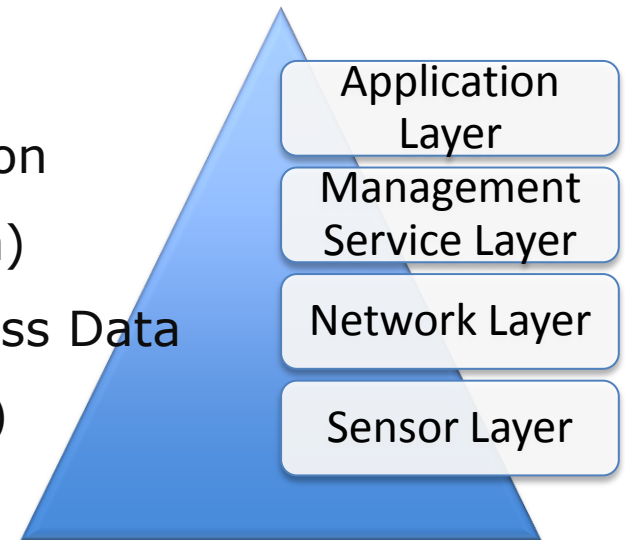
Network Layer

- **Robust network** infrastructure
- Supports the communication requirements for latency, bandwidth and **security**
- **Smart Algorithms or Ambient Intelligence** for first processing of sensor data



Management Layer

- Capturing of periodic sensory data
- **Data Analytics** (Extracts relevant information from massive amount of raw data, **Big Data**)
- **Smart Algorithms (AI)** combine and process Data
- Streaming Analytics (Process real time data)
- Ensures security and privacy of data.



Application Layer

- Provides a **user interface** for using IoT.
- Different applications for various sectors like Automotive, Healthcare, Agriculture, Home Automation, Supply chains, Government, Retail etc.



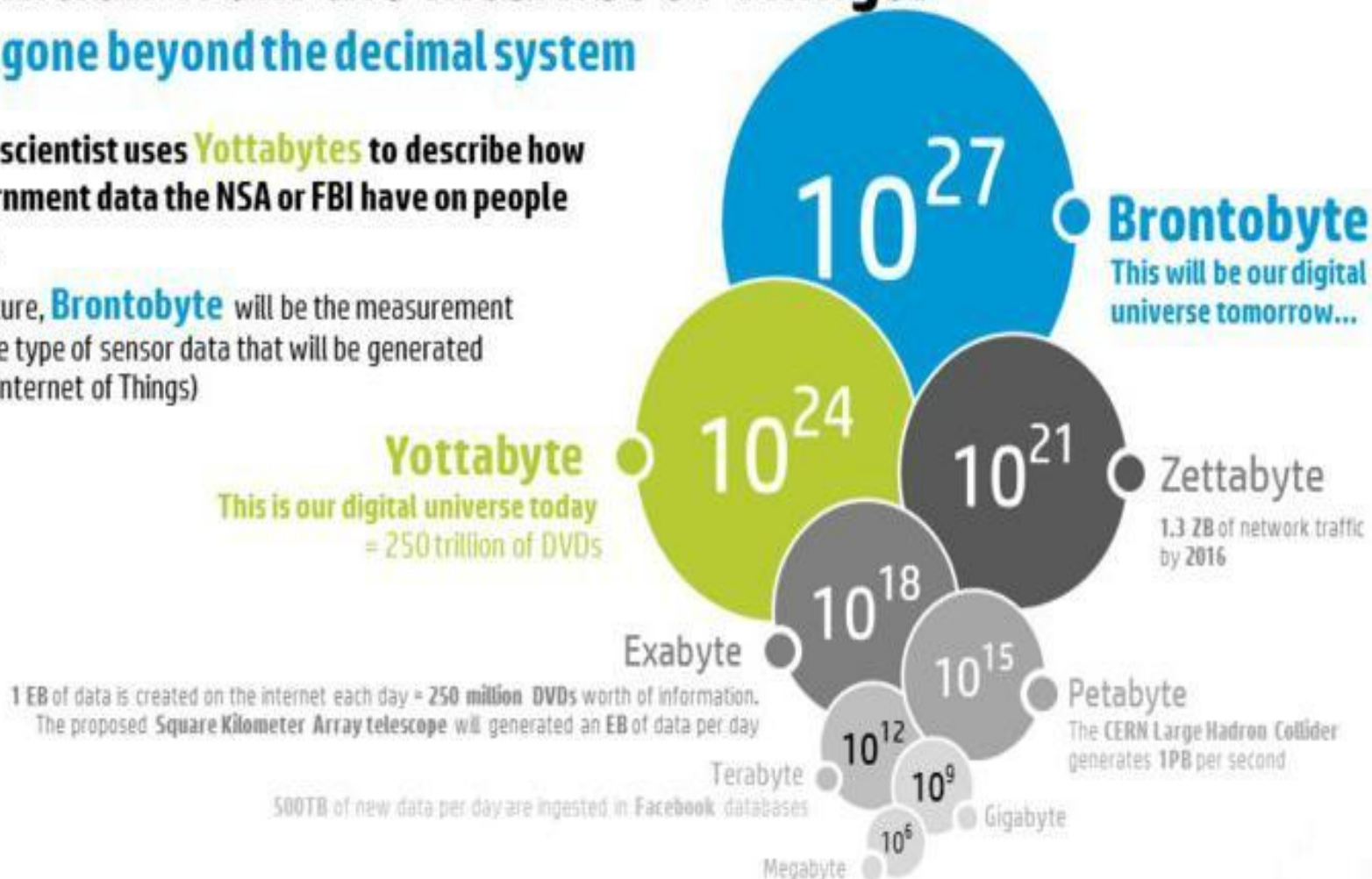
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Ambient Intelligence Challenge

Information from the Internet of Things: We have gone beyond the decimal system

Today data scientist uses **Yottabytes** to describe how much government data the NSA or FBI have on people altogether.

In the near future, **Brontobyte** will be the measurement to describe the type of sensor data that will be generated from the IoT (Internet of Things)



The Challenge, making it Smart

Sensors generate huge amount of raw data,
we need **smart algorithm** in the **network layer**, but:

- algorithms have to use limited resources
- need to be power efficient
- Sometimes has to run on a battery for a long time
- have limited wireless bandwidth
- need to be realtime

On the Server side, Big data (sensor + others sources) needs to analysed, We need smart algorithm in the management layer, but:

- How to search quickly in exa/yotta bytes of data
- Which businessmodel **SaaS, IaaS, PaaS**
- What data is usefull to give back to the user
- Security

It's not only hardware and software, but a multi-disciplinary system approach is needed



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To Empower a connected world

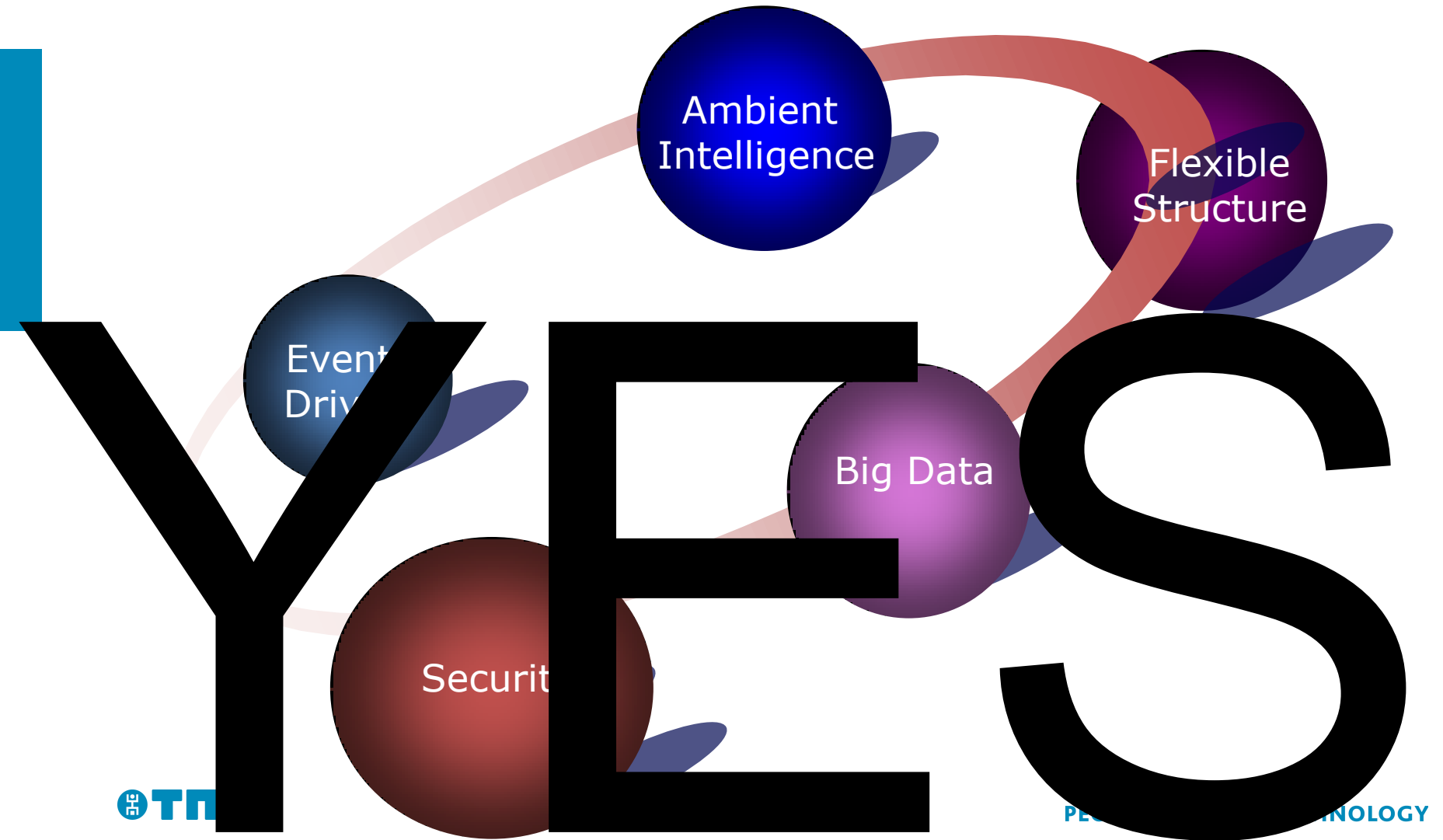
- > Many Disciplines involved, Need a Multi discipline system view
- > Strong and in depth knowledge of at least 1 technical discipline
- > Communicate with other disciplines and have global knowledge of these disciplines
- > Is focused on System Development and Engineering and Integration and Useability
- > Is focused on the **Why** of the customer and is able to translate this into solutions (**What** and **How**), in other words **into Smart Algorithm**

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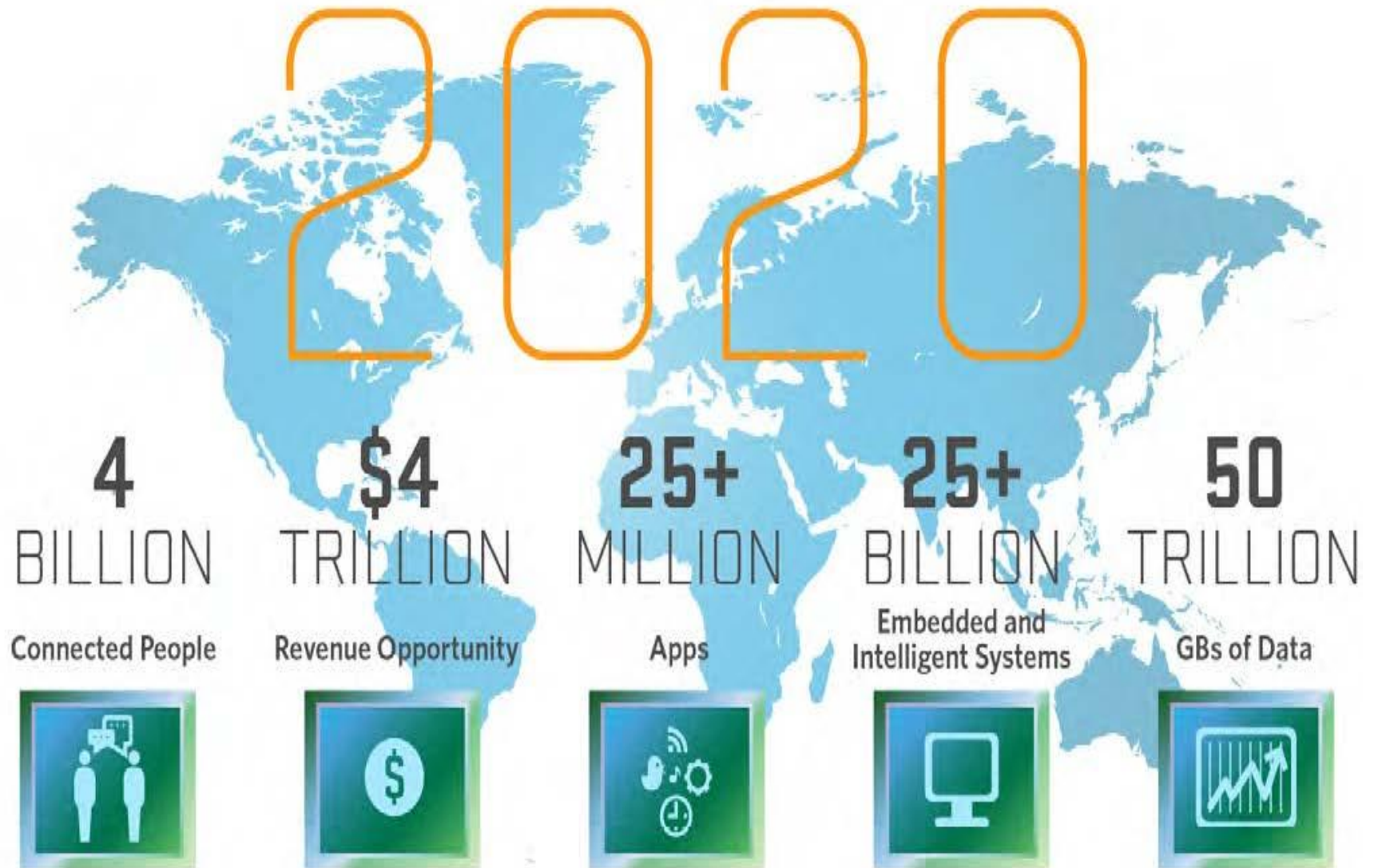
And the Ants, IoT ???



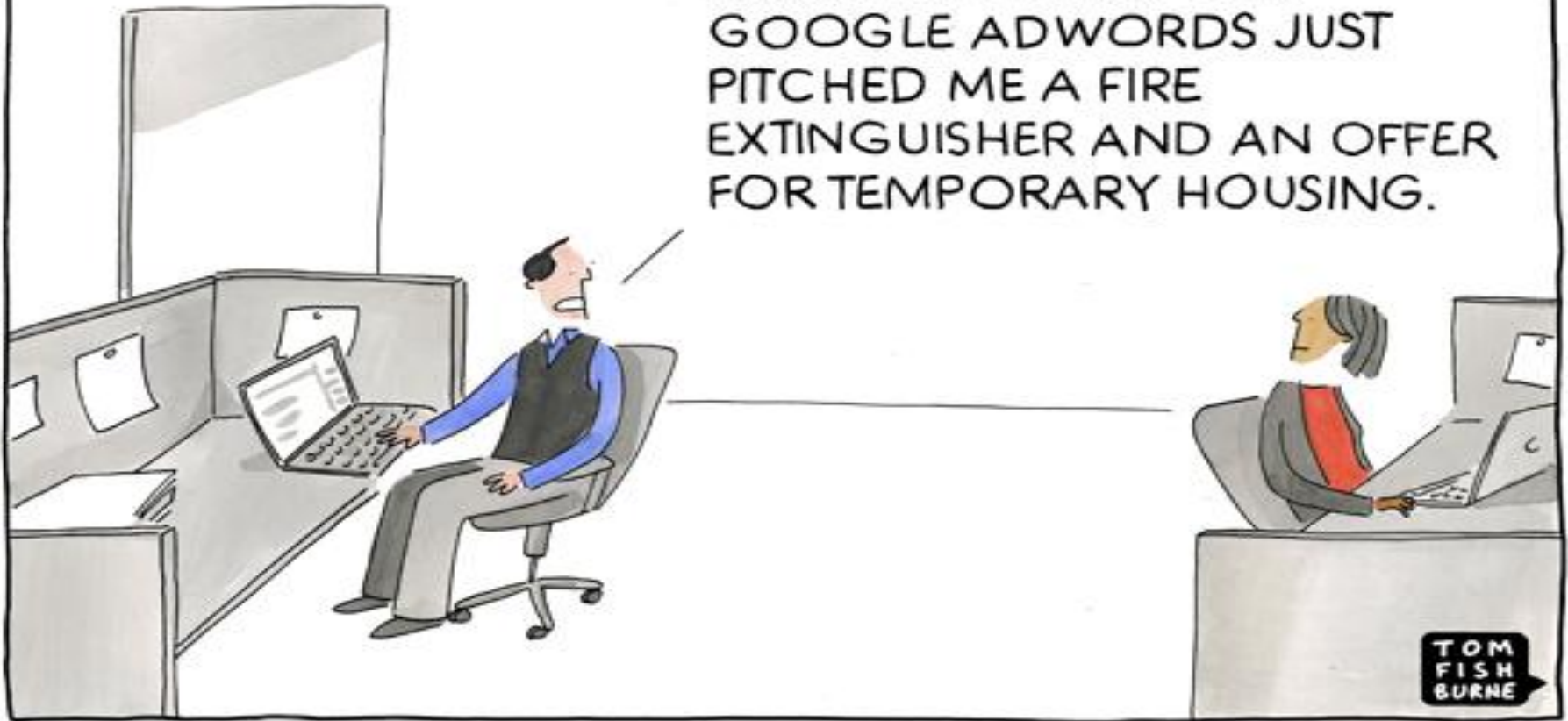
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I THINK MY NEST SMOKE
ALARM IS GOING OFF.
GOOGLE ADWORDS JUST
PITCHED ME A FIRE
EXTINGUISHER AND AN OFFER
FOR TEMPORARY HOUSING.



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