Overview of IoT

- Internet of Things (IoT) refers to a system of interrelated, internet-connected objects that are able to collect and transfer data over a wireless channel without human intervention
- IoT describes the network of physical objects - "things" - that are embedded with sensors, software, and other technologies for the purpose of connecting and exchanging data with other devices and systems over the internet
- IoT enables to analyze and act on data, facilitating the decision making process with aid of insights obtained

Overview of IoT

- Insights aid in transforming business and lower costs with aid of reliable real-time data through,
  - Reduction of wasted materials
  - Streamlined Operational and Mechanical Processes
  - Expansion into new lines of business

IoT – How it Works?

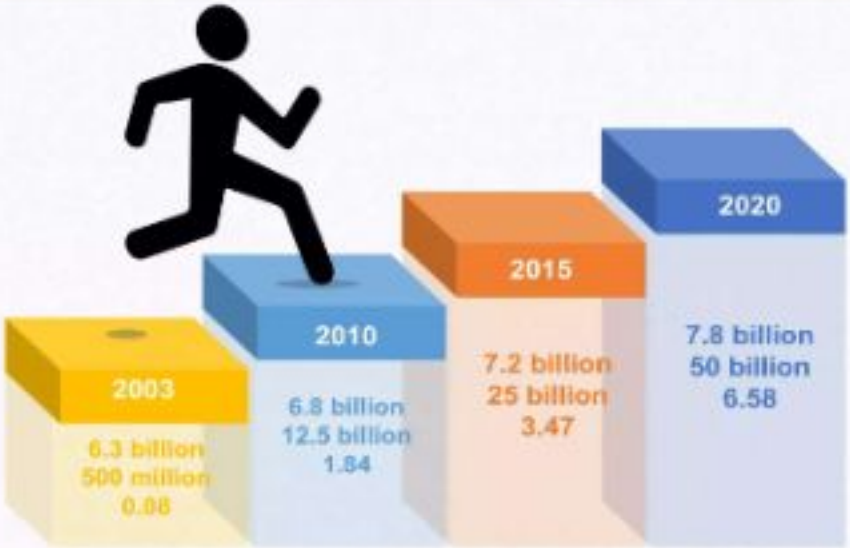
Sensors/Devices
Collecting data

Data Processing
Making data useful

Connectivity
Sending data to cloud

User Interface
Delivering information to user

History Of IoT

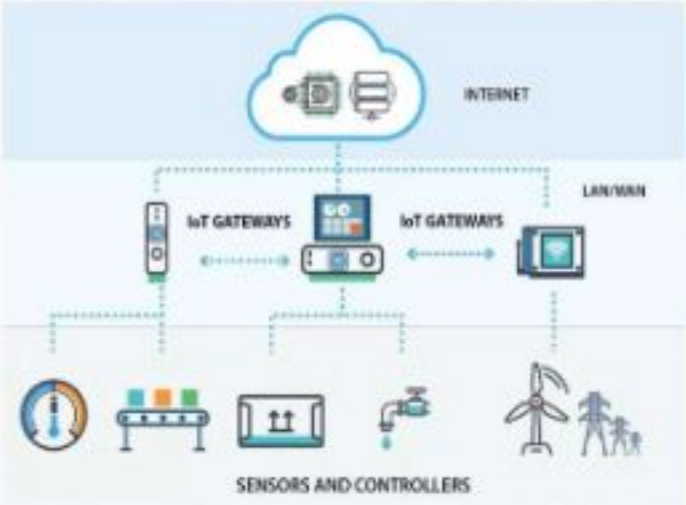

2003
6.3 billion
500 million
0.08
2010
6.8 billion
12.5 billion
1.84
2015
7.2 billion
25 billion
3.47
2020
7.8 billion
50 billion
6.58
* CISCO Report

Economic Impact of IoT

* Gartner's Survey

IoT Architecture

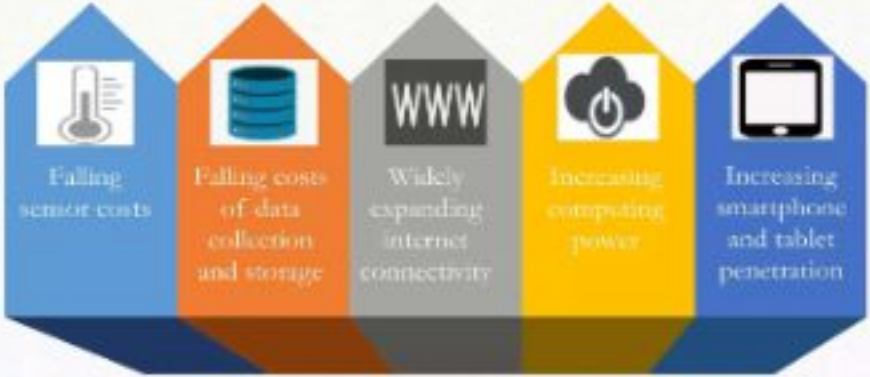
- Things, Sensors and Controllers
- Gateways and Data Acquisition
- Edge Analytics
- Data Centre / Cloud Platform



Layers in IoT Architecture

Layers in IoT Architecture

Factors Spurring Rapid IoT Expansion



Advantages of IoT

Disadvantages of IoT

01 Security Network Attacks

02 Privacy

03 Complexity Designing, Developing, and Maintaining

Remote Monitoring

- Monitor – Machineries, Vehicles, Crops and Livestock
- Monitor anywhere, either continuously or at regular intervals
- Track location, performance, condition, or environmental factors
- Insights aid in,
  - Reduce service costs and refine business processes
  - Understand how products are performing to provide a better experience for your customers
  - Increase the number of appointments per day, cut fuel costs, and reduce wear-and-tear by using machine learning capabilities to route freight or vehicles more efficiently
  - Know where resources are at any given moment—down to which vehicle they're in—for improved field service, stronger security, and increased employee safety

Predictive Maintenance

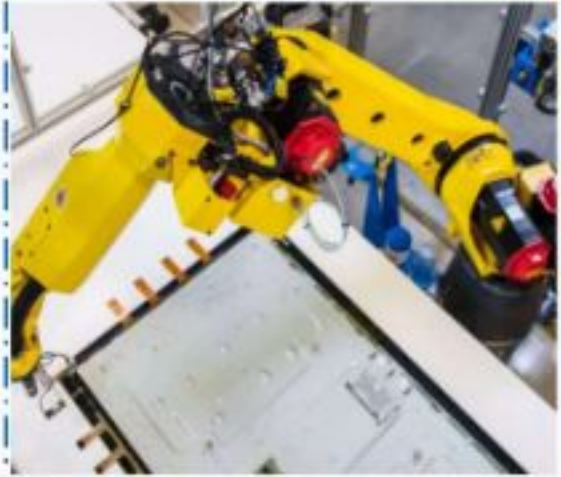
- Predictive maintenance incorporates machine learning software that analyzes data to predict outcomes and automate actions
- Predictive capabilities allow service providers to move beyond the traditional reactive and scheduled maintenance business model and use their data to identify issues before they become critical
- Insights aid in,
  - Figuring out what mechanical or operational conditions are causing failures or slowdowns
  - Better predict what spare parts to keep in inventory before repair issues arise
  - Move beyond a break/fix business model by preventing equipment failures through preventative maintenance

Facilities Management

- Monitoring buildings, infrastructure, and other spaces, allowing to improve energy efficiency, space utilization, productivity, and safety using the data collected
- Insights aid in,
  - Saving money by automating lighting or optimizing heating and cooling cycles
  - Increasing employee or occupant satisfaction by keep equipment running or ensuring that supplies are stocked

Manufacturing Efficiency

- To manage processes and product quality with data from your devices and sensors
- Insights aid in,
  - Identifying bottlenecks that reduce efficiency, enabling to improve process
  - Reducing downtime caused by unplanned maintenance or equipment failure
  - Eliminating substandard materials, parts, or errors before the product is complete
  - Reducing downtime caused by unplanned maintenance or equipment failure



Connected Products – Supply Chain Management

- Connected products have smart, connective components that allow data to be exchanged between the product and its user, manufacturer, or environment
- Insights aid to,
  - Streamline the development and maintenance of products
  - Provide more secure, connected experiences for customers
  - Create new lines of business with managed service and support
  - Monitor how products perform to improve design, manufacturing, and reliability

Challenges in IoT adoption

1. Hardware platforms enable wide range of applications

2. Data Planning
   Data Generated
   Data Collection

3. Privacy and Security

4. Sustainability
   Powered on 24/7

Smart Home

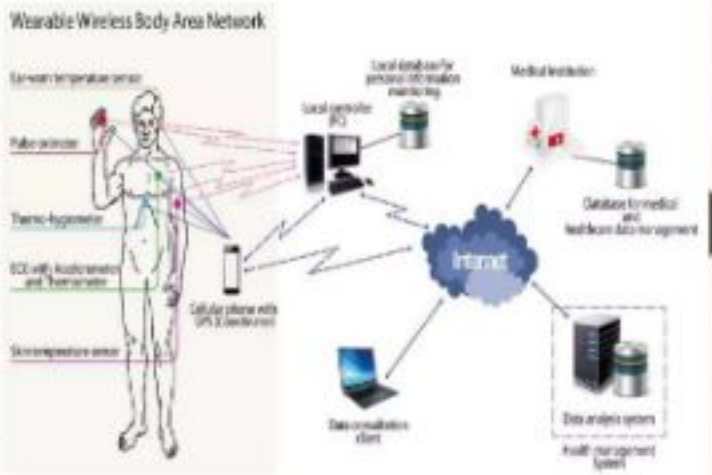
- Control and Monitoring
- Cost and Energy Savings
- Environment Impact
- Better Security
- Comfort

IoT in Agriculture

- Precise Farming
- Agriculture Drones
- Livestock Monitoring
- Smart Greenhouses

IoT in Health Care

- Remote Patient Monitoring
- Promoting Hygienic Hospitals and Clinics
- Depression and Mood Monitoring
- Pharmaceutical Temperature Monitoring



Case Study: Health Care

Diabetic foot ulcers (DFUs) are a leading cause of hospitalizations in the US for diabetics. The primary course of treatment for DFUs is an offloading device or non-removable cast, but compliance often remains a significant challenge, leading to a high treatment failure rate among patients with DFUs. Healing time can be accelerated with therapeutic footwear optimized via plantar pressure analysis to take weight and pressure off the area of ulceration.

To help providers personalize care and improve compliance, Sensoria partnered with leading DFU boot manufacturer, Optima Molliter, to create the Motus Smart Solution. These connected devices enable clinicians to remotely monitor patients when they leave the clinic to better track patient compliance and improve care plans.

IoT Tools & Platforms

Raspberry Pi

- The Raspberry Pi is a low cost, credit-card sized computer that plugs into a computer monitor or TV and uses a standard keyboard and mouse

Arduino

- Arduino is a prototype platform (open-source) based on an easy-to-use hardware and software
- It consists of a circuit board, which can be programed (referred to as a microcontroller) and a ready-made software called Arduino IDE

Thank You

Appendix


"IoT without security =
Internet of Threats"
Stéphane Nappo
CISO of OVHcloud


SMART HEALTHCARE


THINGS
INSIGHTS
ACTIONS