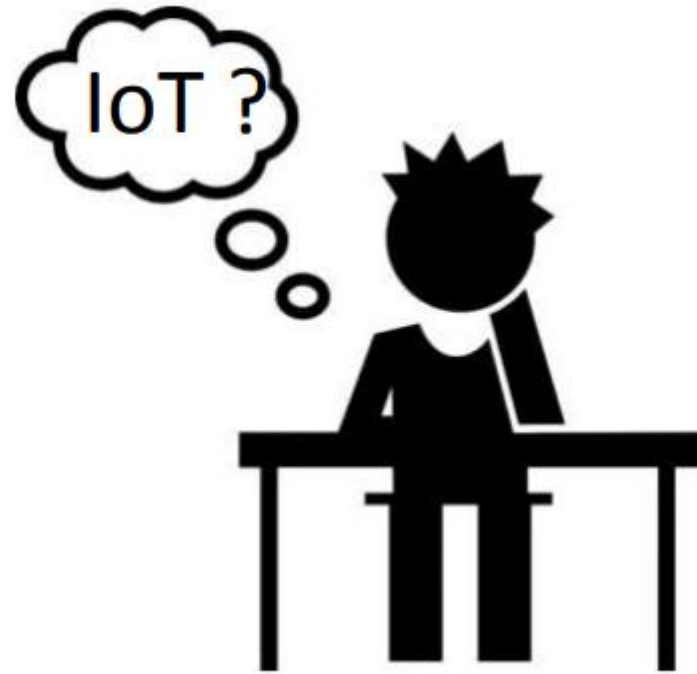


# **INTERNET OF THINGS : AN OVERVIEW**

## **UNIT I**

**WHAT IS**  
**INTERNET OF**  
**THINGS**  
**(IoT) ?**



## What is IoT

### THE “INTERNET” OF “THINGS”:

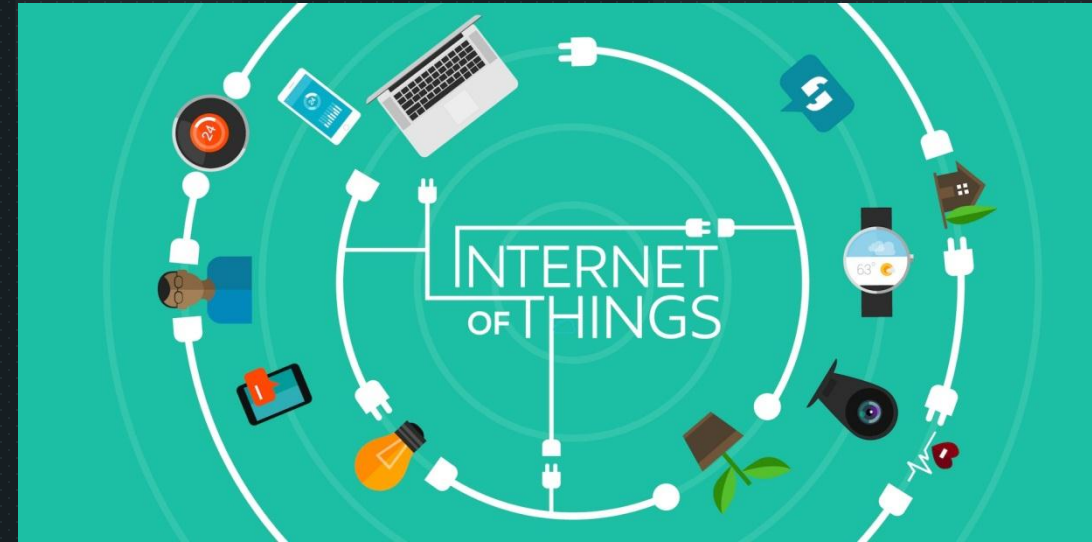
- All the cases we saw used the Internet to send, receive, or communicate information.
- And in each case, the gadget that was connected to the Internet wasn't a computer, tablet, or mobile phone but an object, a Thing.

# Idea: Move from Internet of People

# → Internet of Things

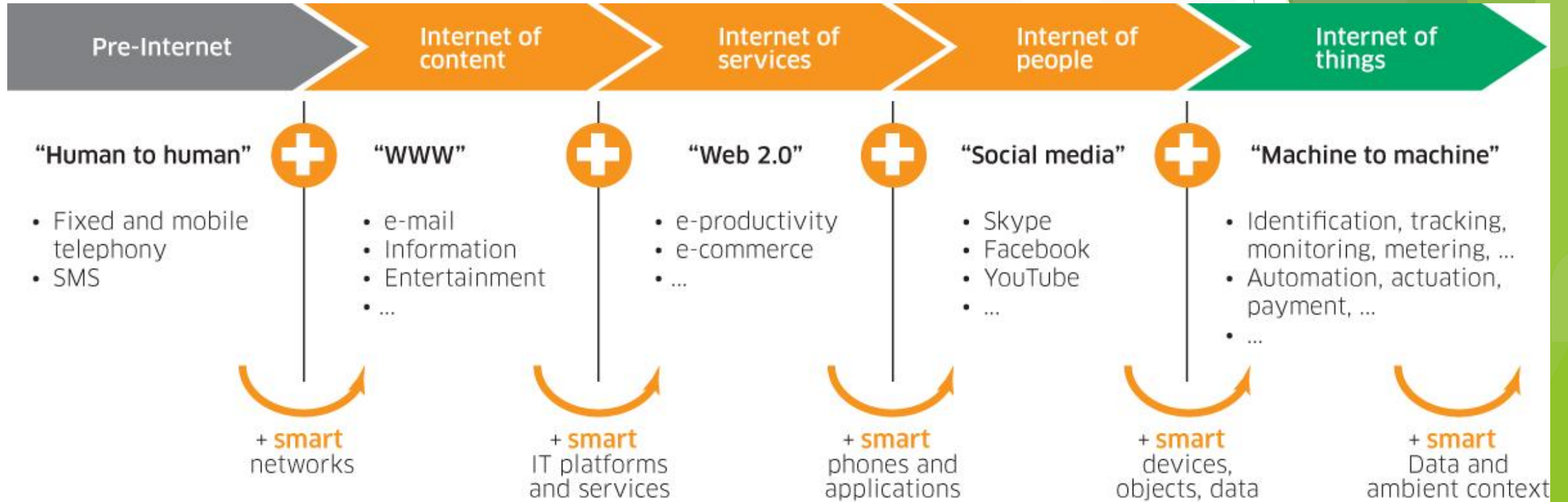


- 📶 **Internet appears everywhere in the world**
- ❖ **It is primarily connection between people**



- ❖ **Internet of Things is a plan to connect things also using the same medium**

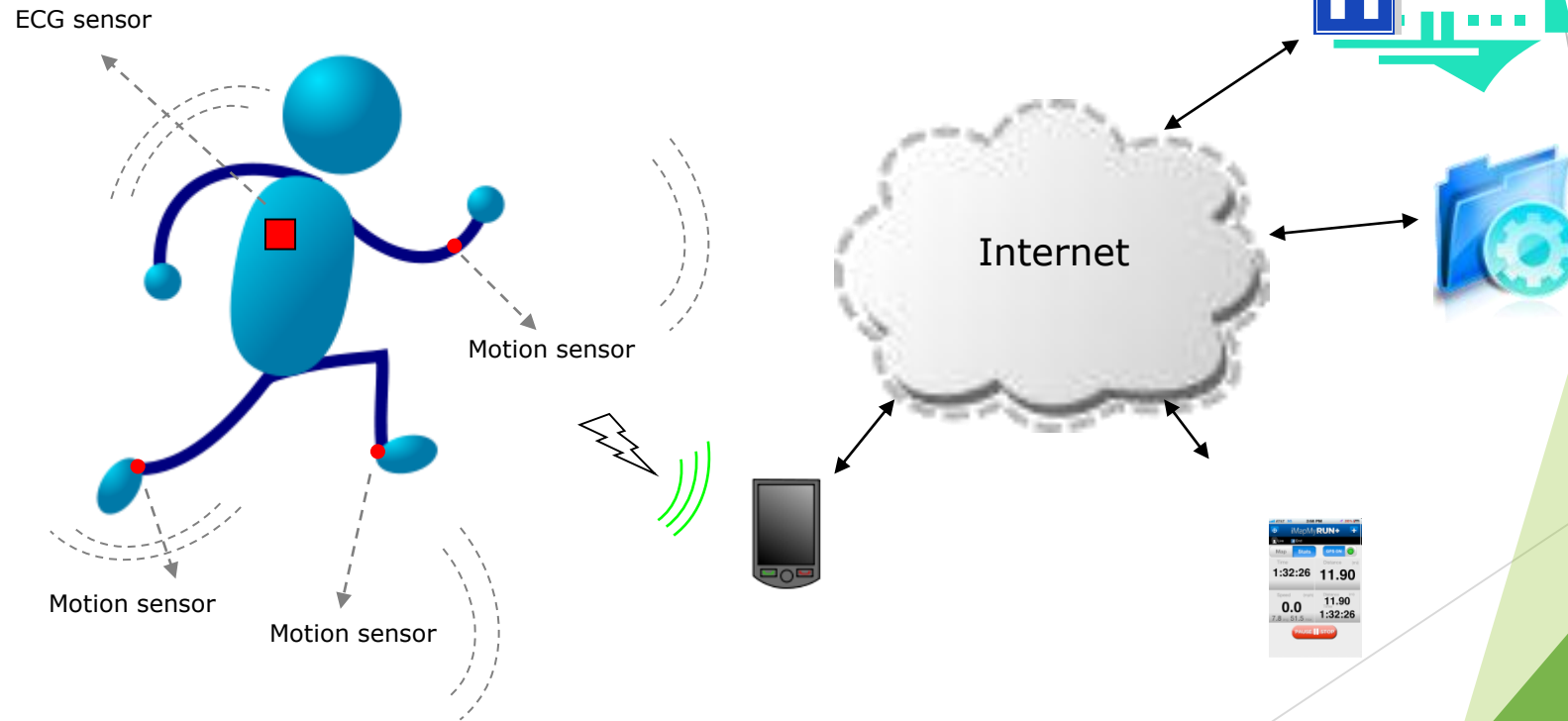
# Internet of Things - Evolution



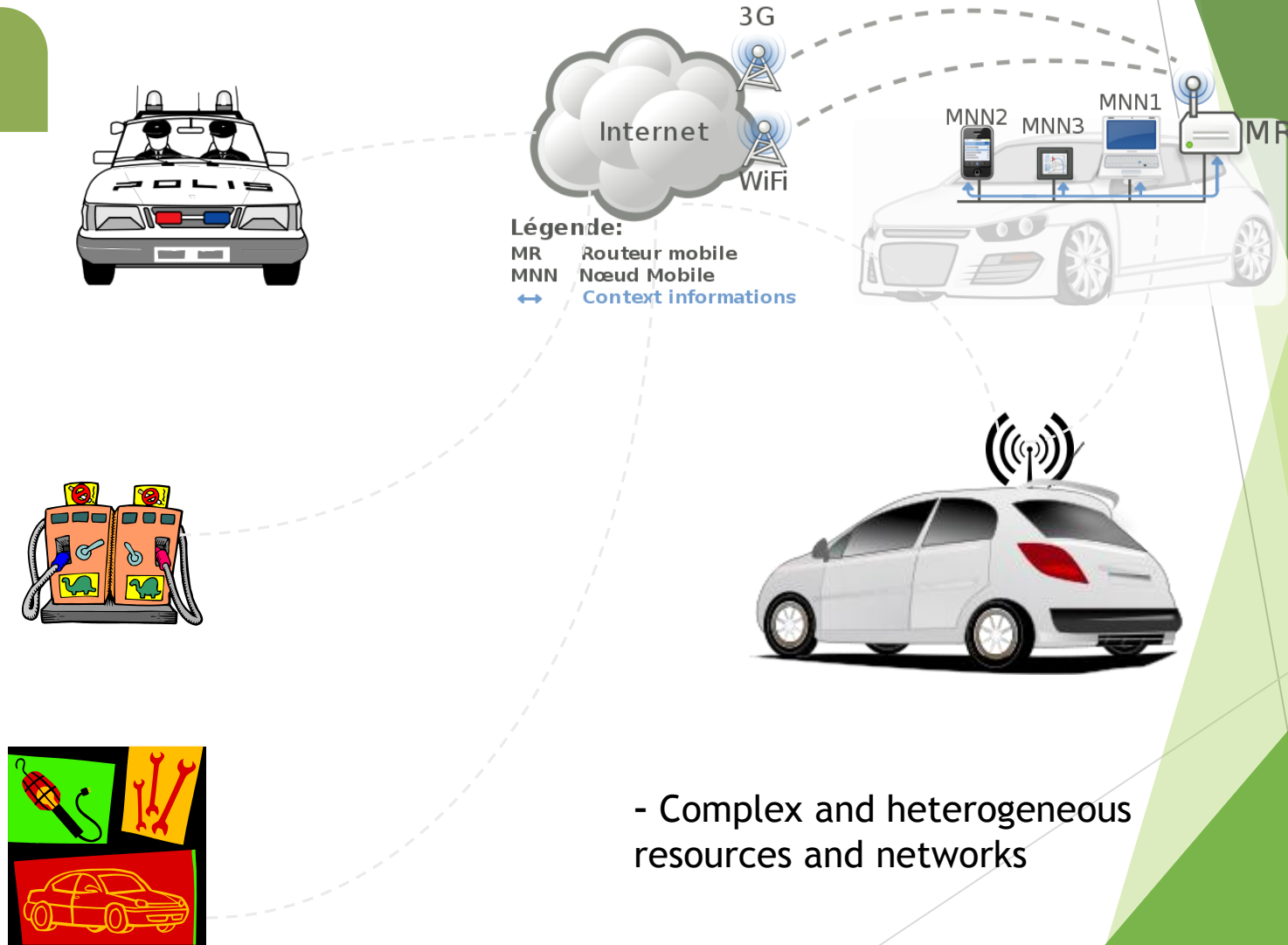
## ENCHANTED OBJECTS:

- Technologist, David Rose has talked about Enchanted Objects and has categorised various objects drawn from fairy tales and fantasy literature in ways that apply as much to technological objects.

# IOT: People connecting with Things



# IoT: Things connecting with Things





# APPLICATIONS OF IoT

# IoT Applications : Intelligent Home

## Home Automation



Source: Raymond James research.

# HAPIfork

The HAPIfork is an electronic fork that helps you monitor and track your eating habits. It also alerts you with the help of indicator lights and gentle vibrations when you are eating too fast.

<http://www.hapi.com/products-hapifork.asp>



# MyVessyl Cup

It can hold 13 ounces of liquid.  
The battery takes 60 minutes to fully charge and will last for 5-7 days. Also has wire-free charging.

<https://www.myvessyl.com/>



# Smart Egg Tray

Egg Minder syncs with your smartphone to tell you how many eggs you've got at home (up to 14 eggs) and when they're going bad.



<http://www.quirky.com/shop/619>

# Smart Lighting

Control your bulbs one at a time or altogether. Find just the right shade of white. Pick that perfect tone to match the moment. Or recreate any color from a photo.

<http://meethue.com/>



# Smart A/C

Aros learns from your budget, location, schedule, and usage to automatically maintain the perfect temperature and maximize savings for your home.



<https://www.quirky.com/shop/752-aros-smart-window-air-conditioner>

# Smart Sleep System

Visualize your sleep cycles, understand what wakes you up, and compare nights. From the palm of your hand you can control your personalized wake-up, and fall-asleep programs.



<http://www.withings.com/us/withings-aura.html>



# Smart Weather Station

The Netatmo Weather Station allows you to use indoor temperature, relative humidity and CO2 readings to live in a healthier home.



<http://www.netatmo.com/en-US/product/weather-station/>

# Smart Slow Cooker

Enjoy remote access to all your slow cooker's functions, no matter where you are.



<http://www.belkin.com/us/Products/home-automation/c/wemo-home-automation/>

# Smart Garbage Cans

BigBelly alerts when it needs to be emptied so smarter collection decisions can be made.

BigBelly  
SOLAR™



<http://www.bigbelly.com/solutions/stations/smartbelly/>

# Smart Gardening

Bitponics gives data on plants and conditions surrounding them for better gardening.



<http://www.bitponics.com/>

# Smart Tooth Brush

The Beam Brush is a connected toothbrush that engages users with their daily hygiene routine.



<http://www.beamtoothbrush.com/toothbrush/>

# Glucose Monitoring

A cellular-powered glucose meter transmits each test result to a secure server and provides instant feedback and coaching to patients. This equips doctors, nurses, diabetes educators with real-time clinical data.



<http://www.telcare.com/>

# Smart Piggy Bank

The Porkfolio wirelessly connects to an app on your device so you can track your balance and set financial goals from afar. Its nose lights up in celebration every time a U.S. coin is inserted and it holds up to \$100 in quarters.

<http://www.quirky.com/shop/607-porkfolio-save-big-with-this-pig>



# Smart Washing Machine

Smart Aqualtis is the first Indesit Company washing machine designed to be integrated in 'Smart' ecosystems, covering a wide range of use cases.

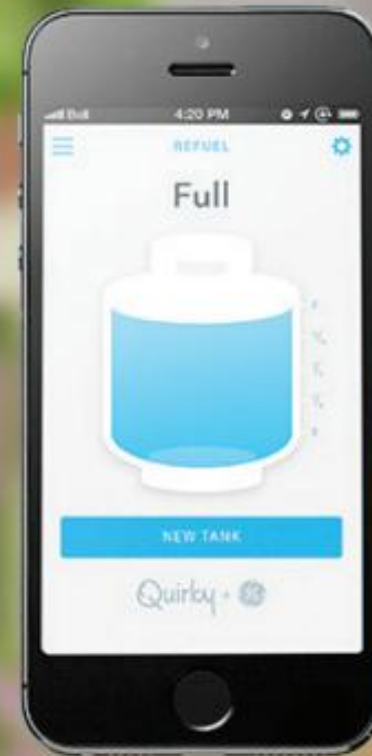
<http://zigbee.org/Products/ByStandard/AllStandards.aspx>





# Smart Propane Tank

This super smart propane tank gauge connects to an app on your mobile device so no matter where you are, you'll always know when it's time to refuel.



<http://www.quirky.com/shop/732-refuel-smart-propane-tank-gauge>

# Hydroponic System

Niwa is the first fully automated hydroponic system that attends to all of your plants' needs and water them, feed them and make sure they have optimal growing conditions 24/7.

<http://geniwa.com/>



# Smart Sprinkler Control

Lono lets you control your sprinkler system anywhere, anytime with your smart phone. And the things that should be automated, finally are.



<http://lono.io/>

# Fiction Arcade Machine

The Choosatron is a fun kit that assembles into a small interactive fiction game box, great for social reading and playing. As you play, you make decisions that affect the outcome of the story, and is printed on a paper scroll.



<http://choosatron.com/>

# Smart Home Security

Canary is a complete security system packed into a single, device. It adapts to your home over time and sends intelligent notifications with HD video directly to your smartphone.



<http://canary.is/>

# Smart Pet Game

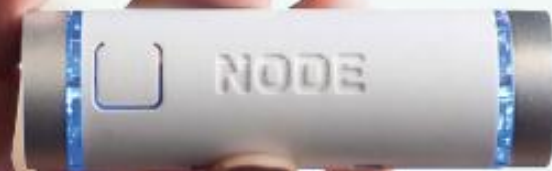
CleverPet is a smart WiFi-connected game console for your dog. Automatically entertain and educate your dog, even when she's home alone.

<http://getcleverpet.com/>



# Analyze with NODE+

Analyze speed, acceleration, movement, direction, shock, tilt, magnetic fields, and more.



<http://variableinc.com>

# Bluetooth-Enabled Insoles

Shares navigation, directions and orientation.



<http://lechal.com/products.html>



# Smart Plane

The SmartPlane works with the latest BluetoothSmart wireless technology for long range and flight time - and there is no cumbersome pairing.

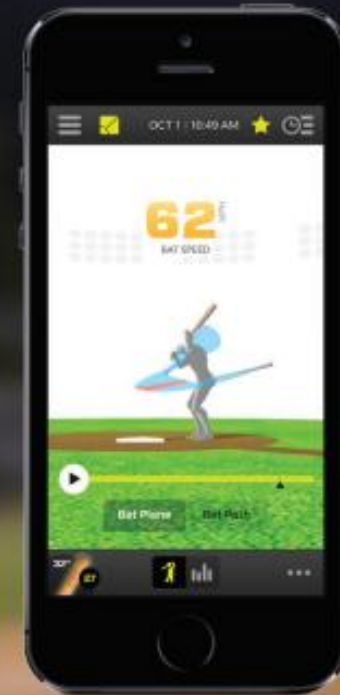
<http://www.smartplane.net/>



# Swing Analyzer

Make your Zepp Sensor multi-sport, all you need to do is purchase additional sport specific mounts and download the app.

<http://www.zepp.com/>



# Blood Pressure Monitor

Simply slip on the cuff, turn on the Wireless Blood Pressure Monitor and the Health Mate app will automatically launch.



<http://www.withings.com/us/blood-pressure-monitor.html>

# Dancing Robotic Spider

The TX8 is now Wi-Fi enabled, this opens up a lot more possibilities to the number of things you can do and the ways the robot can be controlled.



<http://www.robugtix.com/t8x/>

# Internet-Connected Mirror

We are looking to bring a product to market that can make your life easier, while doing something you already spend time doing each day, looking at a mirror.

<https://www.kickstarter.com/projects/860592058/imirror>



# Smart Tennis Racket

Track your game with Babolat's breakthrough innovation. See where you stand in the global ranking and by category within your online community.



<http://en.babolatplay.com/>

# Petnet

Petnet will control your pet's feeding from anywhere and tracks their nutrition.

<http://www.petnet.io/>



# Smart Mirror

A reflective mirror with programmable applications and digital display for the home, office and public environments (hotels, hospitals, retail shops).



<http://www.cybertecturemirror.com/>



# Smart Cardio

eCardio is a single component, dual-modality remote cardiac monitor.



<http://www.ecardio.com/>

# Smart Doorlock

The Genie Smart Lock - A door lock that allows you to lock and unlock your home using your smart phone, bluetooth keyring or computer.



<http://www.geniesmartlock.com/index.php>

# Nod

Nod transforms your movements into commands. It brings the world around you to life, as you control everything from your laptop to your living room lights with a wave of your hand.

<https://hellonod.com/>



# Smart Socks

Socks infused with proprietary 100% textile sensors. They are paired with a Bluetooth Smart cool and detachable anklet that delivers accuracy in step counting, speed, calories, altitude and distance tracking.



<http://store.sensoriafitness.com/>

# Smart Shirt

Monitors how your body behaves over time, includes heart rate recovery and breathing at rest, to monitor improvements in health.

<http://omsignal.com/>



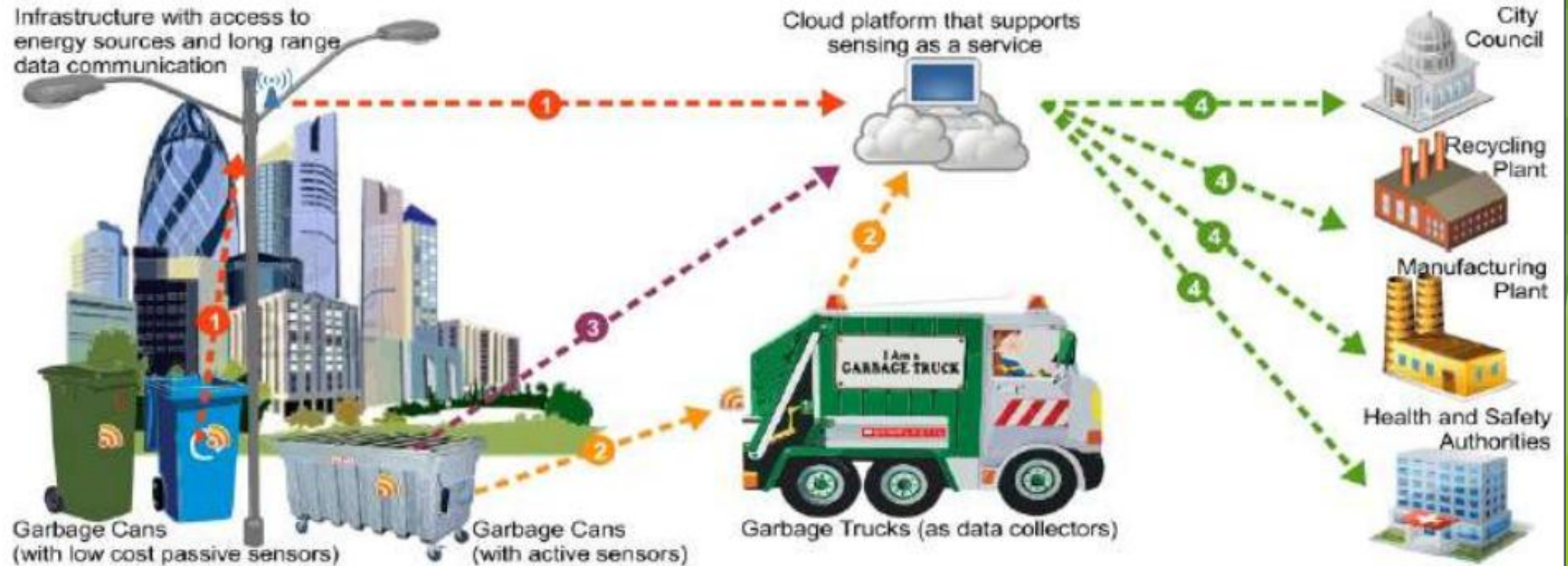
# Smart Bike

Valour by Vanhawks gives directions, reroutes to avoid traffic, and tracks riding metrics.

<http://www.vanhawks.com/>



# Efficient Waste Management in Smart Cities Supported by the Sensing-as-a-Service



## Smart Parking

Create **USD 41 Billion** by providing visibility into the availability of parking spaces across the city.



Residents can identify and reserve the closest available space, traffic wardens can identify non-compliant usage, and municipalities can introduce demand-based pricing.

[Source: <http://www.telecomsceller.com/2014/01/11/cisco-study-says-40e-can-create-savings/>]



## Sensors in even the holy cow!



In the world of IoT, even the cows will be connected and monitored. Sensors are implanted in the ears of cattle. This allows farmers to monitor cows' health and track their movements, ensuring a healthier, more plentiful supply of milk and meat for people to consume. On average, each cow generates about 200 MB of information per year.

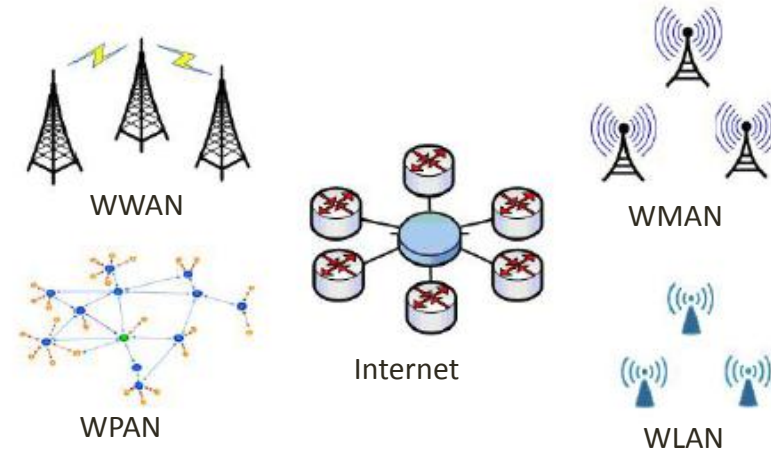
## Integrated Application



## Information Processing



## Network Construction



## Sensing & Identification



# IoT TECHNOLOGIES



**Hardware (Device)**

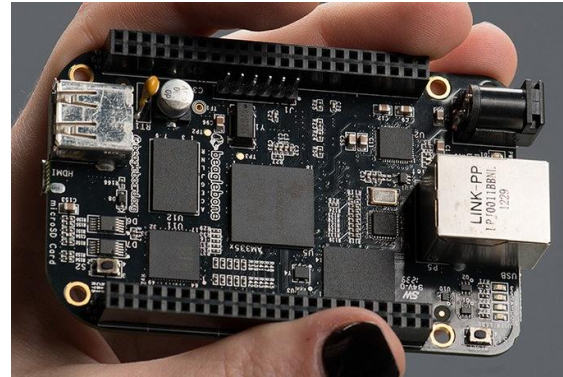
**Communication Technology**

**Protocols for IoT**

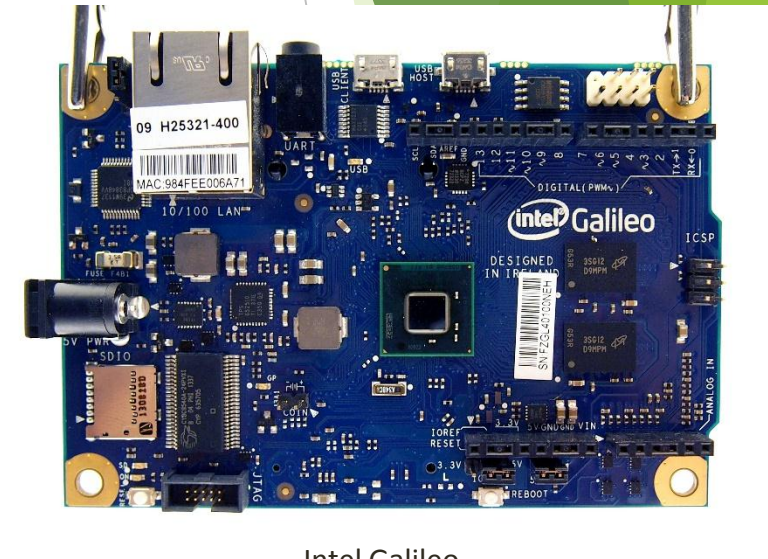
**Software (IDE)**

**Cloud Platforms**

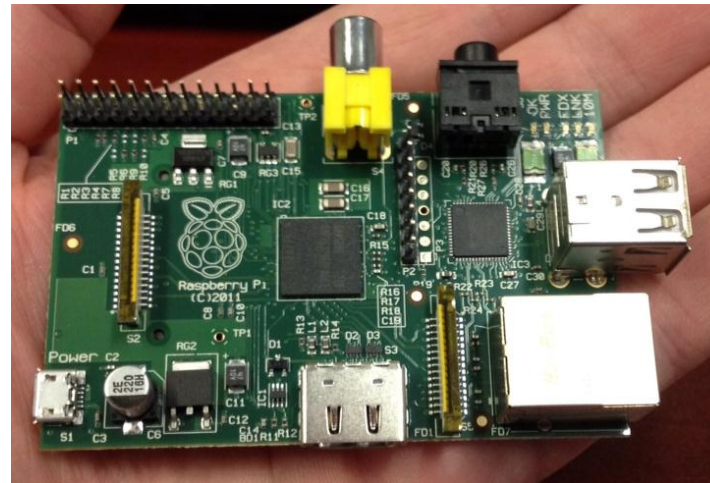
# Implementing Smart Objects



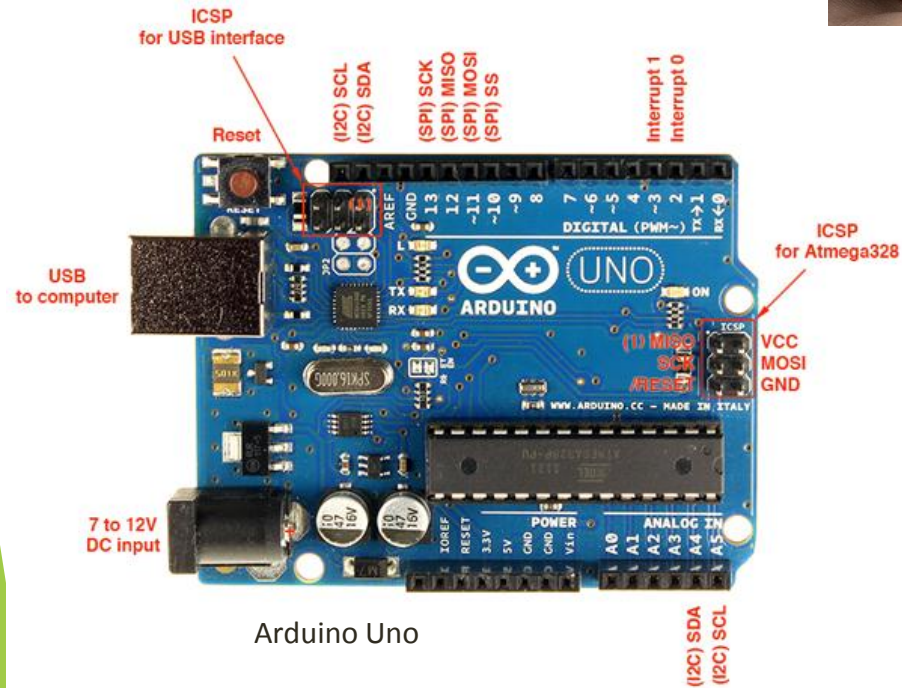
Beaglebone black



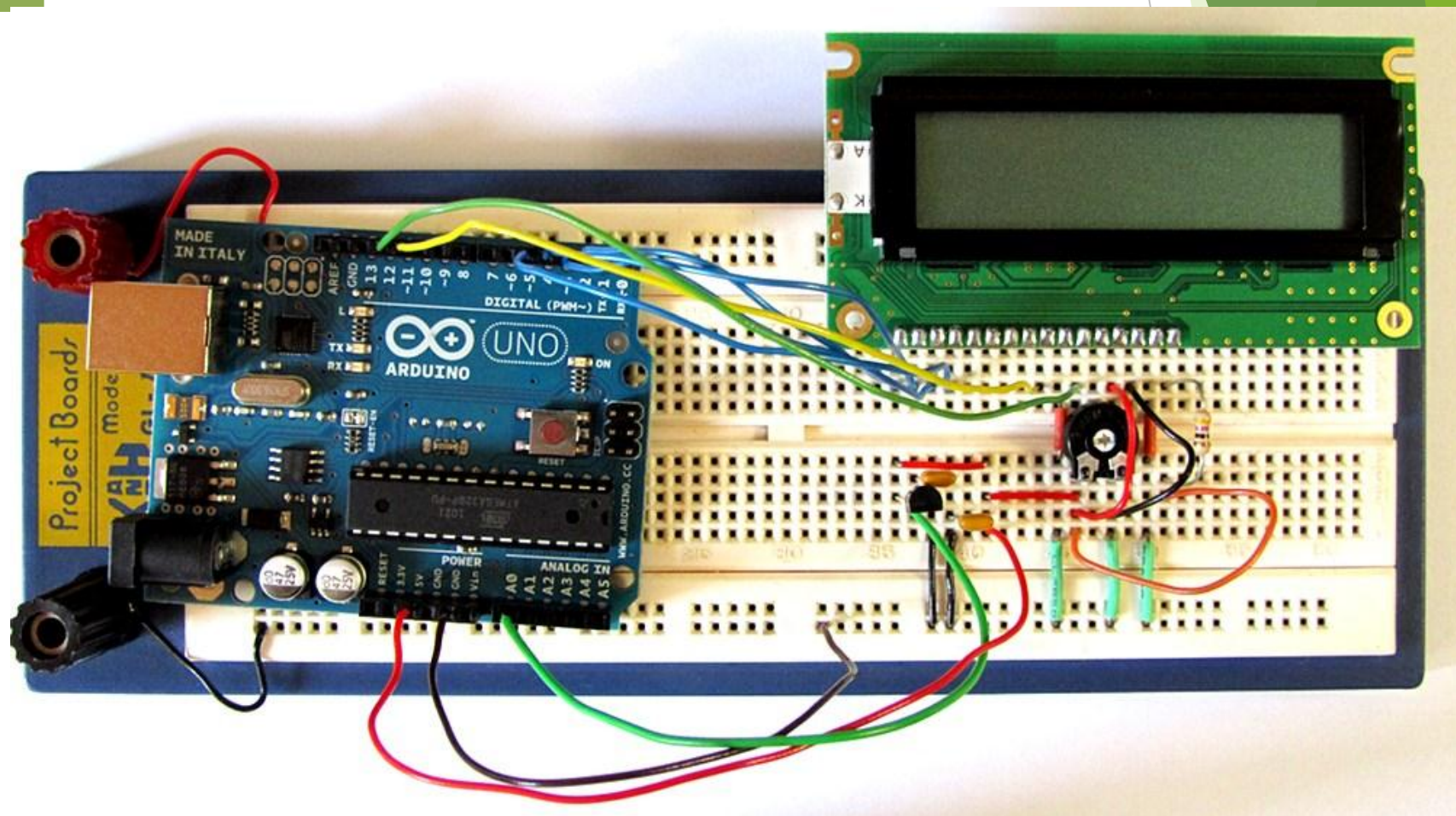
Intel Galileo

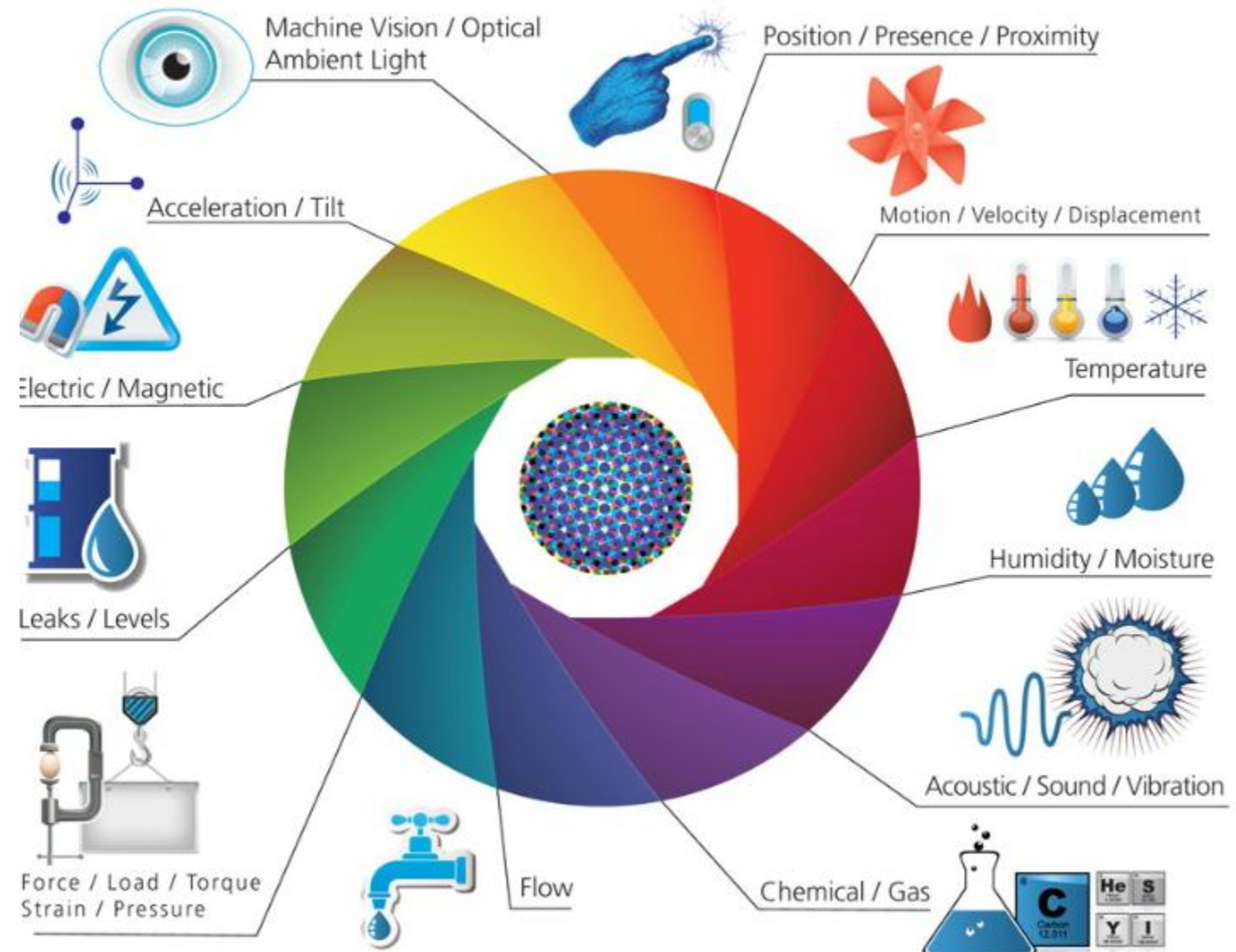


Raspberry Pi



Arduino Uno





# Sensors available in Market





# IoT Technologies : Cloud (Sensing as-a-service Model)

