

The Internet Of Things?



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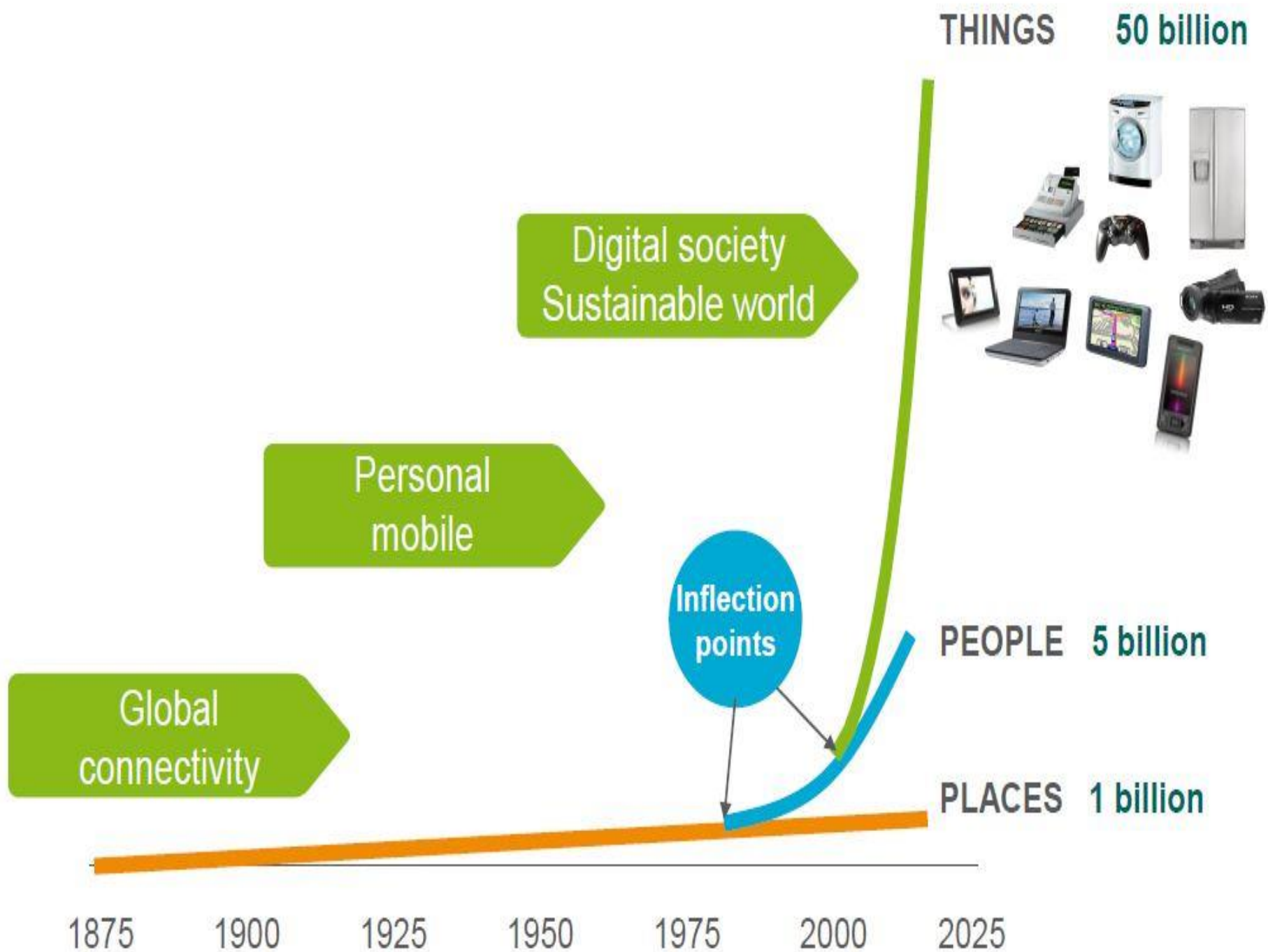
The Internet of Things

- The term Internet of Things was first used by **Kevin Ashton** in 1999.
- Refers to uniquely identifiable objects (things) and their **virtual representations** in an **Internet-like structure**

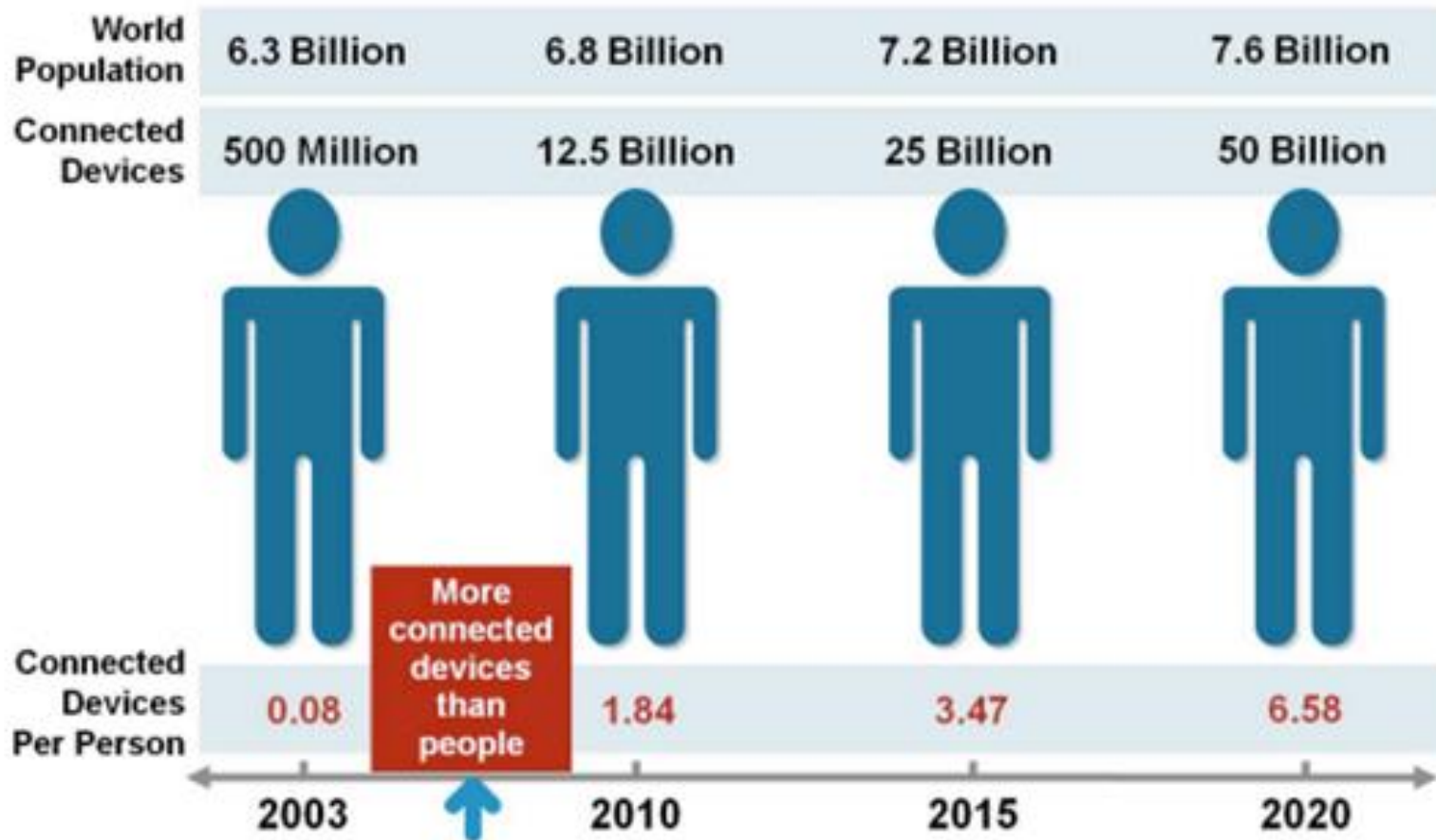


Internet of people





Internet Usage and Population Statistics



Source: Cisco IBSG, April 2011

Video Demo



Internet of devices



Companies in IOT space

Platforms & Enablement (Horizontals)

IFTTT Sympl ioBridge haystack electric imp ThingWorx NODE EVERYTHING BUGSWARM	Open Source Platforms sense spark ThingSpeak Nimbits	Software Platforms sense Withings xively OSITO SmartThings NINJABLOCKS TWINE zonoff	Sensor Networks MESHSYSTEMS SAFECAST	Enabling Networks FreedomPop SocialSign.in SIGFOX Open Garden	Corporates IBM LG CISCO Honeywell
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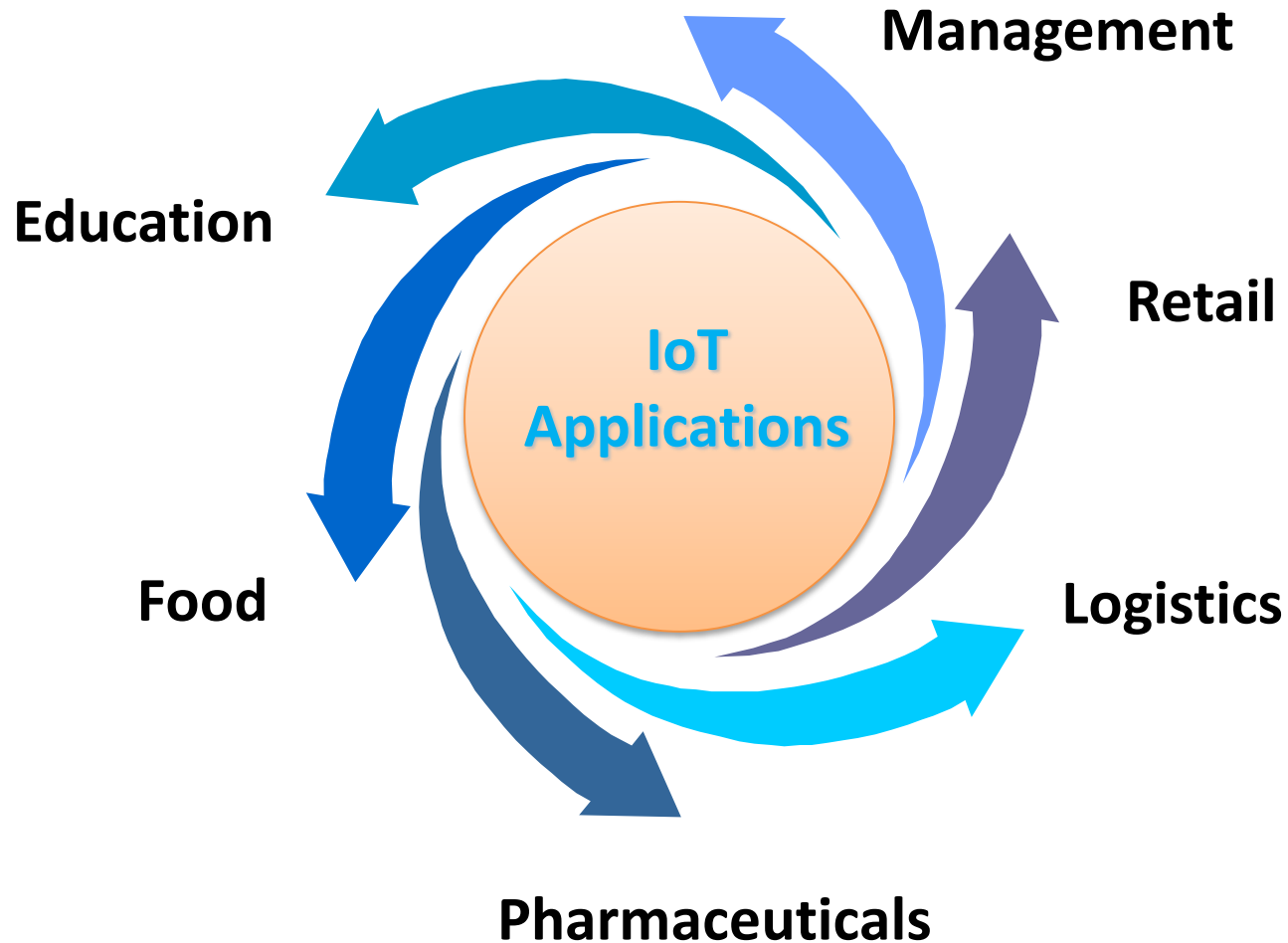
Applications (Verticals)

Quantified Self Wearable Computing GLASS Pebble Fitness FUEL amiigo Withings fitbit JAWBONE Health BASIS LUMO HAPIfork wahoo FITNESS NuMetrex Family REST Good Night Lamp Withings EVADO FILIP	Lifestyle Leisure blossom ICA kitchen remee HEXBRIGHT Thimble iGrill sobi Pets gibi FITBARK Toys sifteo MakieLab KAROTZ greenGOOSE! Music glor Gardening BITPONICS plantlink Koubachi Home Improv. netatmo Radiator Labs	Connected Home Home Automation SmartThings NINJABLOCKS revolv Ubi NODE lapka electric imp Wovyn Energy Efficiency knut ecobee tado° belkin echo nest LIFX wemo micasaverde Security Kwikset BOSCH CANARY ALARM.COM Lockitron HomeMonitor iSmartAlarm New Interfaces NeuroSensory gestigon sphero PrimeSense EQUISO emotive Interaxon LEAP	Industries Retail Nomi euclid placemeter Healthcare Visi MOBILE AdhereTech TEL CARE AliveCor intelligent M Automotive Dashiabs OpenXC Microsoft Smart Buildings APOGEE Johnson Controls Schneider Electric 3D Printing Stratasys formlabs shapeways MakerBot INDUSTRIES RepRap	Industrial Internet KIVA Systems Double Robotics Airware ROBOTEX 3D Robotics MOMENTUM Greentech BigBelly SOLAR Axeda enlighted GRIDMOBILITY 3D Systems MezzoMill Stratasys formlabs shapeways MakerBot INDUSTRIES RepRap
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Building Blocks

Connection Protocols neul ZigBee macheen RFID NFC WiFi Bluetooth MBus MQTT 2G 3G 4G	Telecom at&t verizon T-Mobile boost	M2M Jasper gemalto Numerex Telit ERICSSON
Software amazon web services hadoop	Mobile iOS Parse	Hardware spengate ARDUINO beagleboard.org spark
Parts / Kits MAKET MAKE ready mate	Services DRAGON International makexyz CIRCUIT LAB	Incubators BOLT LEMNOS Labs springboard()
Funding KICKSTARTER indiegogo	Distribution Onno St. Anvil	

Applications of IoT



Consumer & Home



Smart Infrastructure



Security & Surveillance



Healthcare



Transportation



Retail



Industrial

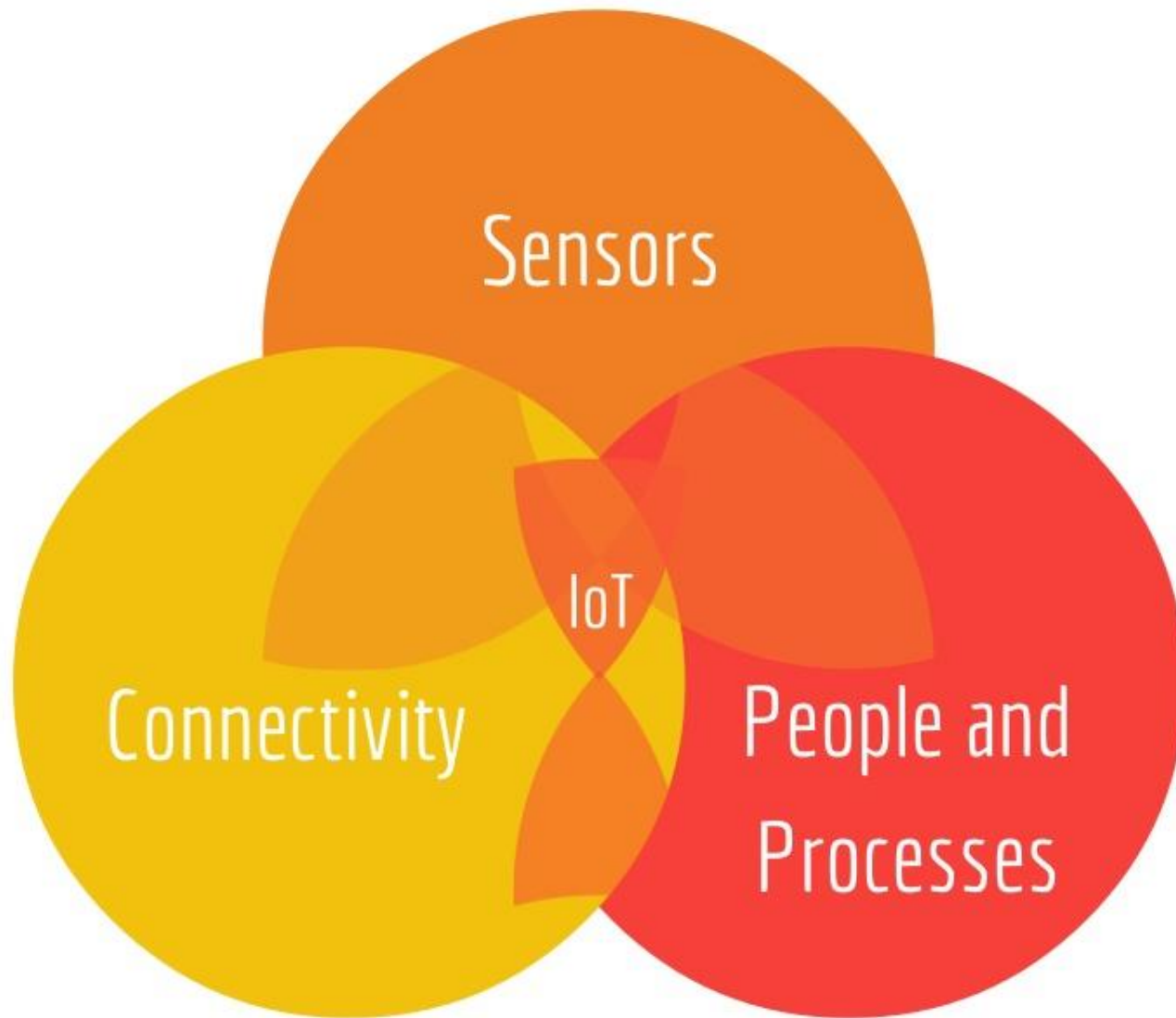


Others



Network

The Internet of Things is a combination of:



Technical Perspective



Sensing Layer

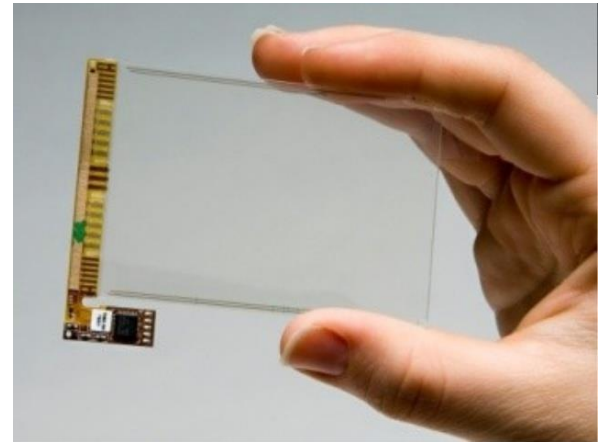
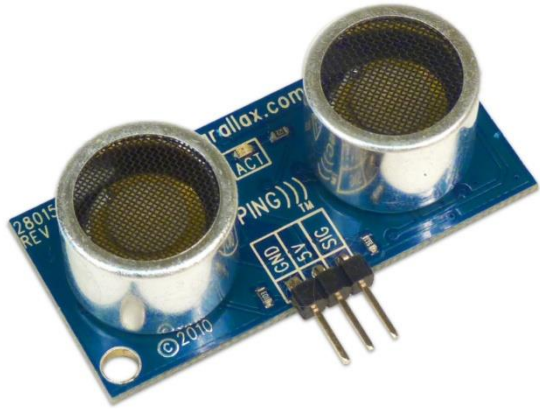
Communication Layer

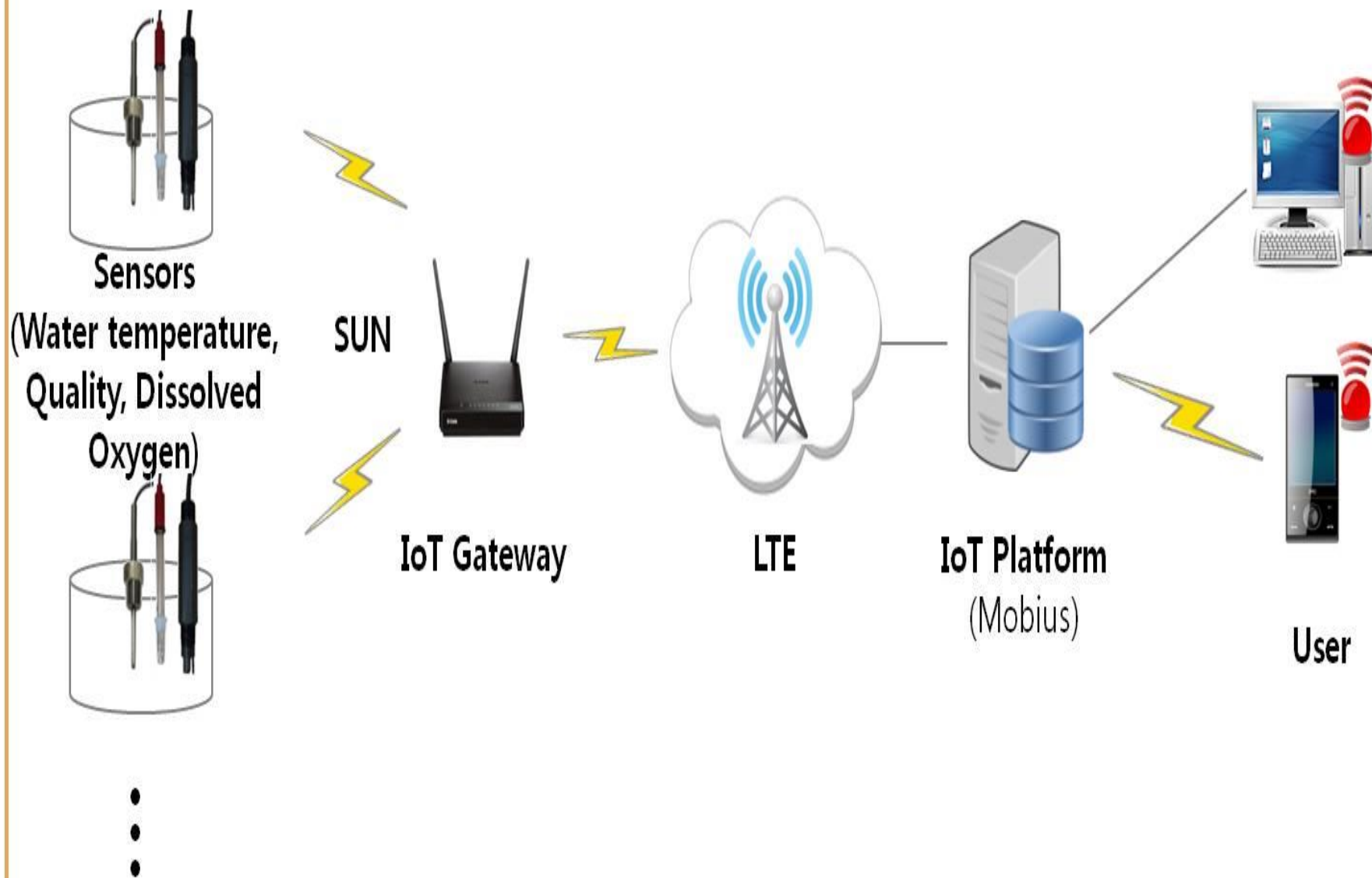
Management Layer

Sense



sensors

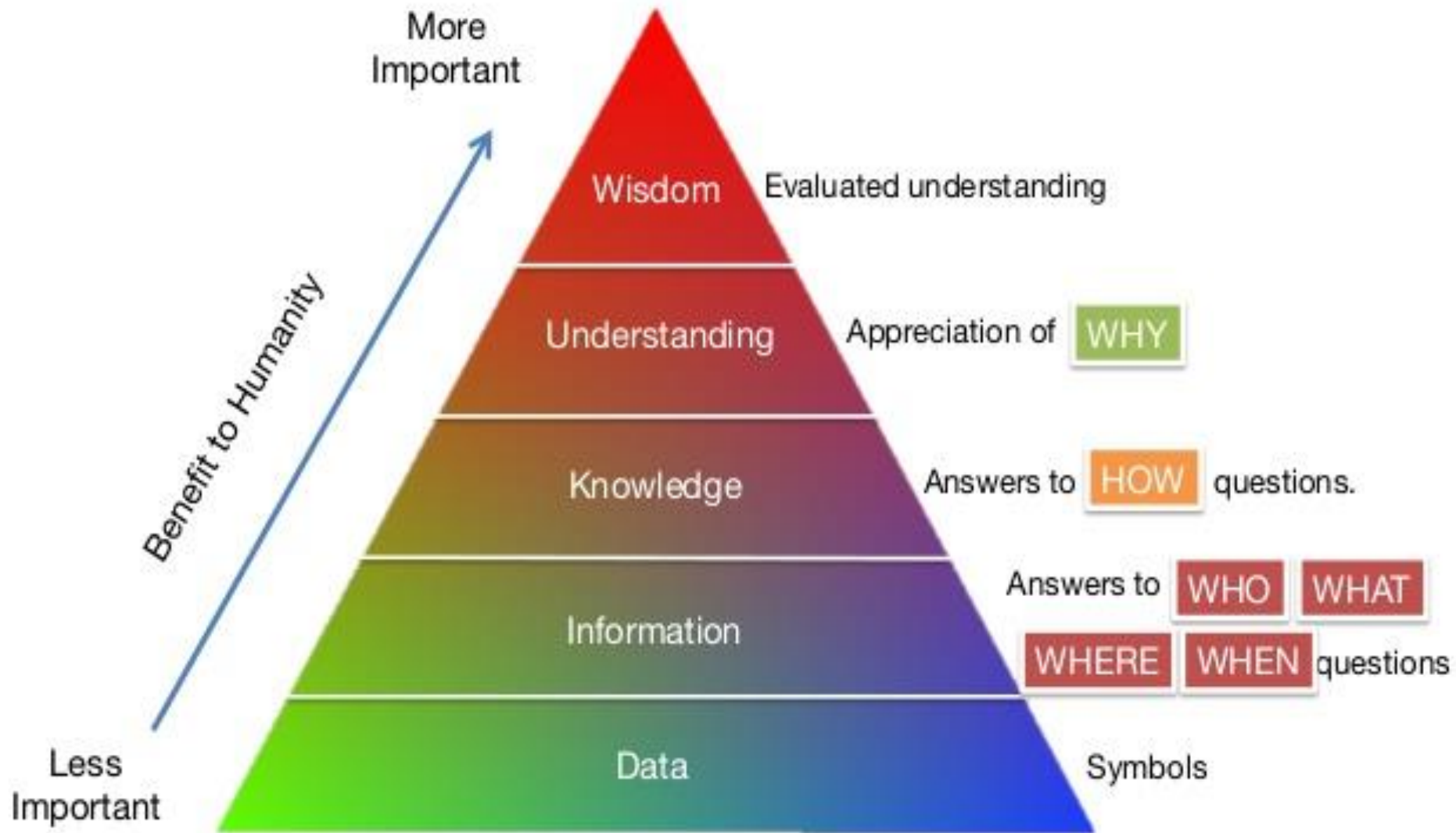




Internet of Things







The more data that is created, the better understanding and wisdom people can obtain.

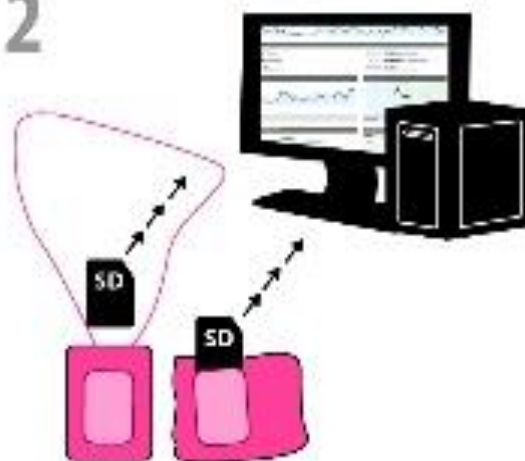
Sharing and Reusing – “Free or Paid”

1



COLLECT

2



SHARE

3



LEARN



IoT Applications - Examples





IoT for Agriculture

Start & Growth



Monitoring



Crop
monitoring



Animal
monitoring



Building
& equipment
monitoring



Applications

Miscellaneous



Research



Smart data

Actions



Mapping



Spreading



Variable-Rate
Fertility



Diagnosis
of diseases



Water stress



Crop yield



Soil erosion



wild game
damage

Analytics



UAV for spreading





What is the Smart Home

- Network interconnected
- Internet with high speed broadband
- Highly Automated
- Light control
- Climate control
- Improve comfort
- Ensure security

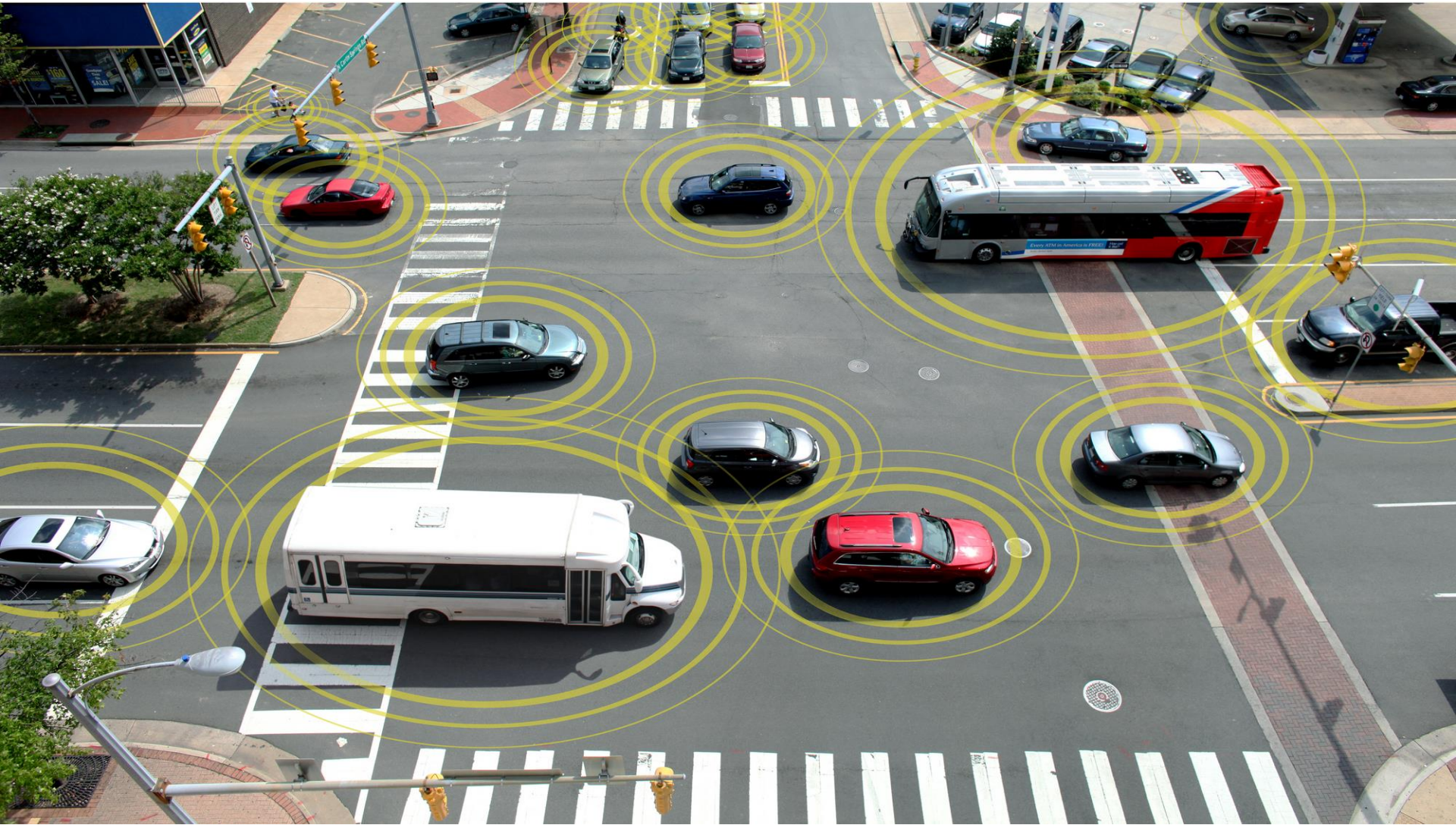


Smart home products



- Automate home Appliances
- Saves Energy bills
- Easily & Affordably secure your home
- Avoid water leakages and automate water levels on Over Head tanks
- Protect your children

MONITORING AND CONTROLLING TRAFFIC



TESLA CONNECTED CAR



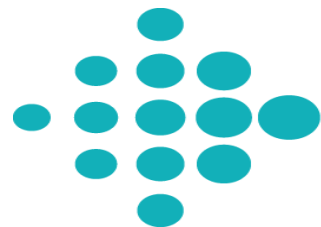
Game changer in Cold chain storage



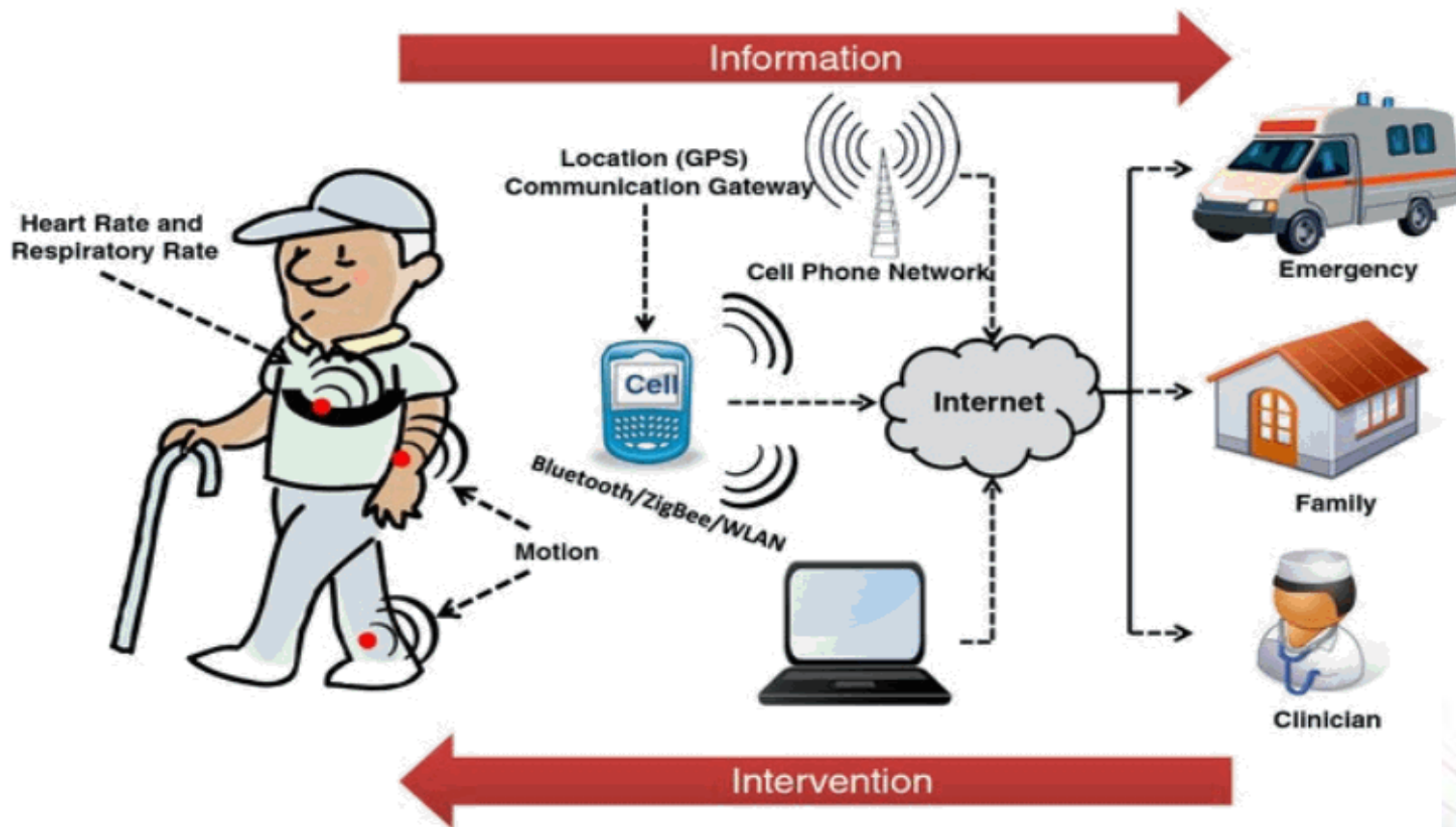
Smart Building



Health monitoring



fitbit®



IoT in Remote Health Monitoring



Blood glucose level monitoring



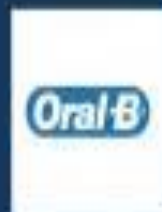
CAREGIVING IS GOING TO TAKE A NEW TURN



Oral-B - World's 1st connected toothbrush

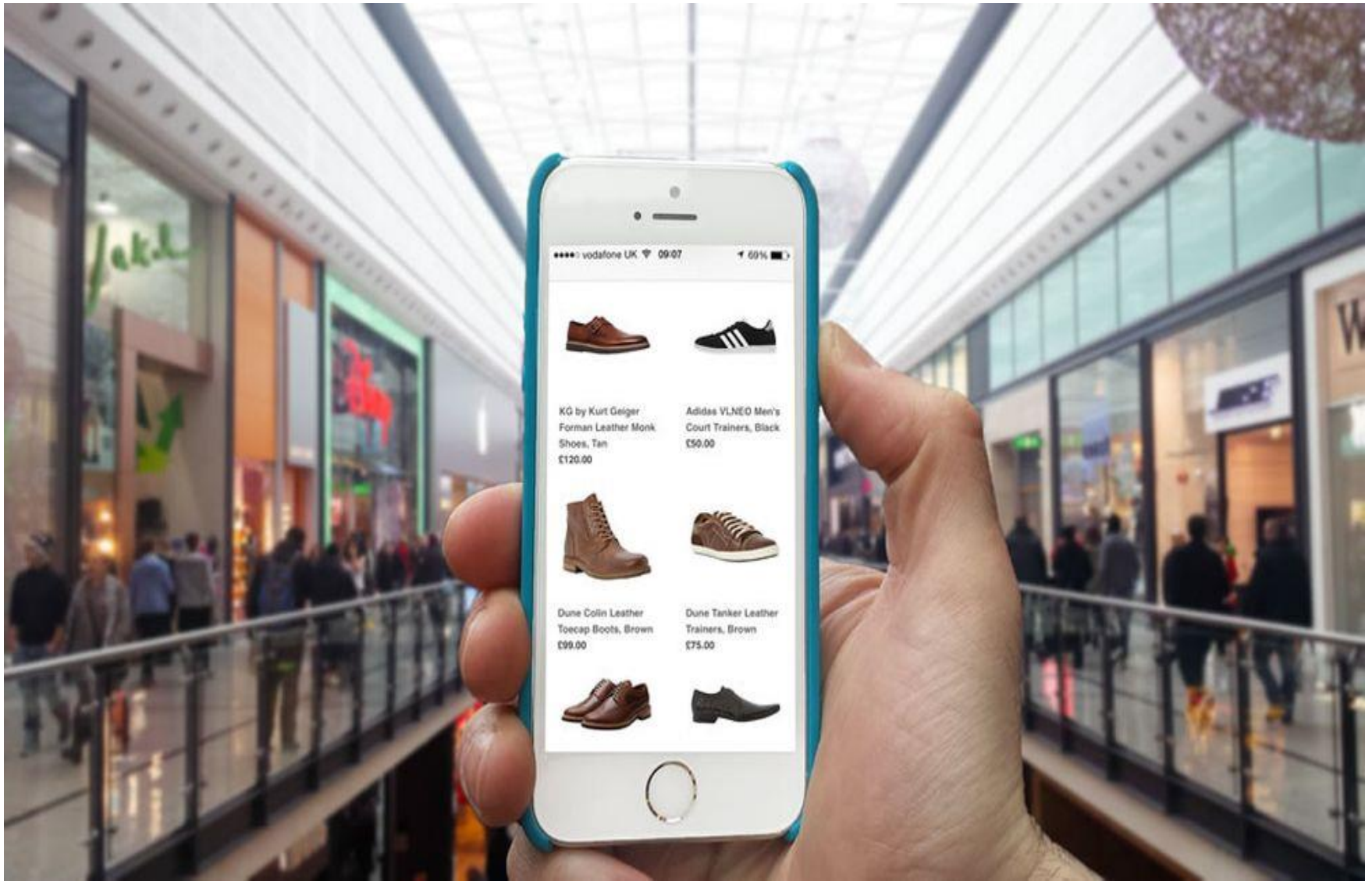
Oral-B's product innovation was initiated and pushed forward by iconmobile:

- brush hardware prototyped by iconmobile
- P&G process speed accelerated - to market in 18 months
- Over 7 billion media impressions since announced Mobile World Congress 2014
- Available in app store April 2014
- Available in 50 markets and available on iOs and android in 100 markets by summer 2015.



early prototype

Better Shopping Experience



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.





Smart glucose monitor





Bluetooth-Enabled Insoles

Shares navigation, directions and orientation.



Smart Garbage Cans

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



SMART RING

智慧戒指



BT 4.0

- Sync the state of smart phone
- Remote control
- Track your phone



Finger Gesture

- Different gesture corresponding different operation
- Be customized using APP



Fashion

- Waterproof
- UV detector
- Social network



Health Monitor

- Pedometer
- Cardiac Monitor



Smartphone as Your “Sensing Assistant”



Sensors:

- Camera – “Eyes”
- Audio – “Ears”
- Accelerometer – “Speed”
- GPS – “Location”
- Gyroscope – “Movement”
- Compass – “Direction”
- Proximity – “Closeness”
- Ambient light – “Eyes”
- Others...

Crowdsourcing Via Crowdsensing

Context

1. **Spatial** – Location / Speed Orientation
2. **Temporal** – Time / Duration
3. **Environmental** – Temperature / Light / Noise Level
4. **User Characterization** – Activity (Mobility Pattern) / Social (Friends, Interactions)
5. **Resource Availability** – Storage / Memory / Computational / Battery

A close-up photograph of a sandy surface with several footprints. The footprints are arranged in a path that leads from the top of the frame towards the bottom. The sand is a warm, golden-brown color. The text is overlaid on the center of the image.

HOW MANY STEPS
HAVE YOU
WALKED TODAY?

How Well Do I Sleep?

Sleep



Your sleep pattern asleep awake



You went to bed at
11:00PM

Time to fall asleep
0min

Times awakened
20

You were in bed for
6hrs 40min

Actual sleep time
6hrs 6min

8 h 50 mins asleep

Awake for 212 mins (81x)

Restless for 278 mins (91x)



Thursday, February 27

Sleep Stats

Time asleep over the past 30 days in hours



Times awoken over the past 30 days



fitbit flex.
Wireless Activity + Sleep Wristband



I Want To Know More About Myself

- Where you're going?
- Who you've interacted with?
- How long you've spoken to friends?
- The affinity of connections?
- How long it takes to get to work?
- The tone of your messages
- The amount you text, tweet or update?
- How much exercise you're getting?
- How much you get distracted?

Today



Can Internet of Things (IOT) Help Us To Know More About Ourselves?

Benefits of Lifelogging

It will take quite some time for people to feel comfortable with 'always connected' devices that can discreetly take photos or videos.



One question is if the benefits outweigh the negatives.

Benefits of Lifelogging - Security



A huge amount of crimes are being filmed these days by passer's by with cell phones. No need for security cameras when everyone in a building has a smart phone with a camera.

Challenges and Issues

Privacy – will be a huge issue when implementing IoT

Identity - Online Fragmentation of Identity

Efficiency – speed - person loses identity and is an IP address

Decisions – do not delegate too much of our decision making and freedom of choice to things and machines

Thank
you