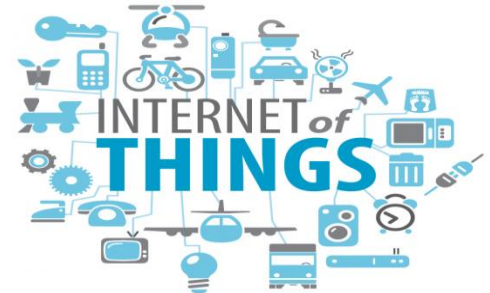




# What is the Internet of Things (IoT)?

- **GSMA definition:** The Internet of Things describes the coordination of multiple machines, devices and appliances connected to the internet through multiple networks.
- **Devices in IoT:** Vast array of devices covering many vertical industries; smartphones, tablets and *consumer electronics*, and others including vehicles, monitors and sensors equipped **with M2M communications** that allow them to send and receive data.
- **Growing number of connections:** IoT sees innovative new business models create value by connecting existing and new “Things” together to create new business processes and efficiencies including data analytics.



‘Anything that will benefit from being connected will be connected’  
Networked Society 2012

# Major growth verticals of M2M/IoT connections

## Connected vehicle



- By far the largest, scalable opportunity
- Long production and in-use cycles for connected vehicles – there is a need to future proof thus OEMs are **now** fitting **LTE modules into vehicles**
- Opportunity for MNOs to partner with OEMs on developing telematics and entertainment applications

## Healthcare



- Positive influence generated by the recent healthcare related developments in the US market in the form of:
  - Legislation - factors reducing operational costs and/or provide remote monitoring abilities and compliance with medication
  - Advancements in standardisation
- Issues around re-imbursement **remain** and will have to be addressed at country-level

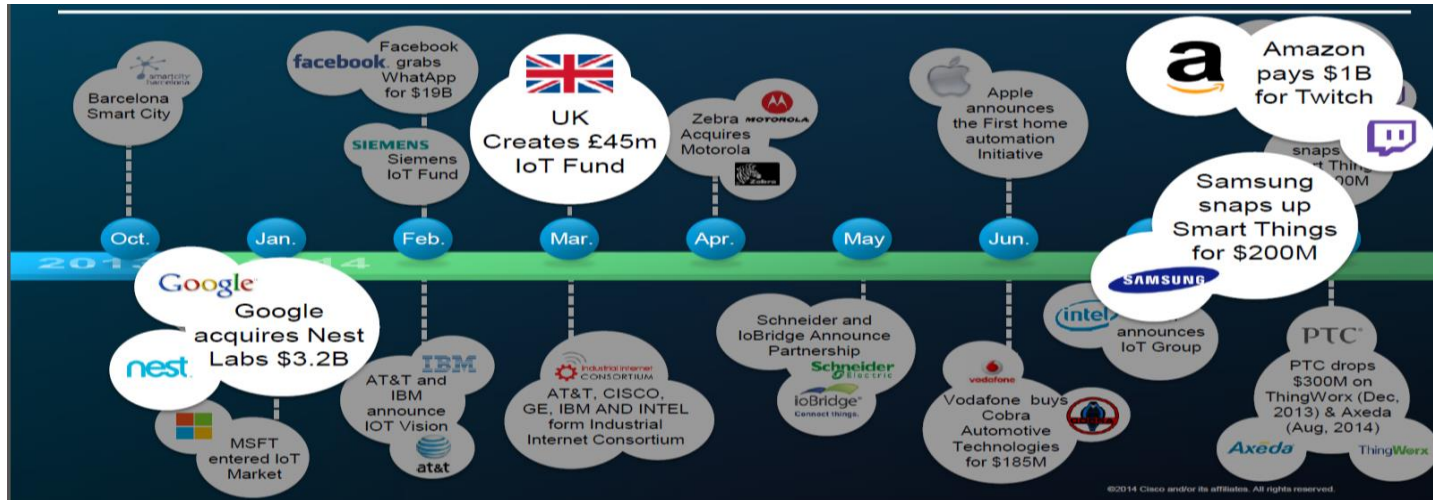
## Wearable technology



- Currently perceived as an accessory – smartphone's extension – but that will change
- Potential use across a wide range of business and consumer sectors
- Potential to use data buckets and alternative billing plans
- Wrist wear (smartwatches and wrist bands) to be dominant form of wearables. Some forecasts say wrist wear will account for over 80% of smart wearable shipments in future. e.g. by 2018

# Key Trends in IoT Industry 2013 - 2014

- **Google** moving away from core specialism in desktops, mobile phones and android operating system = purchased **Nest Labs (Jan 2014)**, robot-maker **Boston Dynamics (Dec 2013)**, and human-gesture recognition start-up **Flutter (October 2013)**.
- **Government support** - an **influence on IoT**: UK government pledges an additional **GBP45 million (US\$75mil)** to UK IoT Fund (Future cities, Location based services, Digital health, etc.)
- **Samsung** purchase of Smart things: shows its interest in open platform enabling users to remotely monitor, control and automate devices in the home by using a mobile application.



# M2M Market Potential by 2020

2014  
**13 Billion**

Total Connected  
Devices

2020

**27 Billion**

Total Connected  
Devices

2020

**10 Billion**

Mobile Connected Devices

2014

**7.3 Billion**

Mobile Connected Devices

Total Addressable Opportunity  
in 2020

**\$1.96  
Trillion**

## 2020 Addressable opportunity by vertical sectors

Connected Health

**\$87 Billion**

Connected Car

**\$152 Billion**

Connected Cities

**\$26 Billion**

Connected Industry

**\$63 Billion**

Connected Living & Working

**\$939 Billion**

PCs/Handsets/Tablets

**\$ 691 Billion**

## 2020 Total Addressable Opportunity by region



CREATING OPPORTUNITIES THROUGH CROSS-INDUSTRY COLLABORATION

# M2M Market Potential for Operators by 2020

2014  
**13 Billion**

Total Connected  
Devices

2020  
**27 Billion**

Total Connected  
Devices

Total Addressable Opportunity For  
Mobile Network Operators in 2020

**\$1.1  
Trillion**

Total Addressable Opportunity  
in 2020

**\$1.96  
Trillion**

2014

**7.3 Billion**

Mobile Connected Devices

2020

**10 Billion**

Mobile Connected Devices

2020 Addressable Opportunity for Mobile Operators  
by region

2020 Addressable opportunity for Mobile Operators in  
selected vertical sectors\*

Connected Health

**\$31 Billion**

Connected Car

**\$135 Billion**

Connected Cities

**\$26 Billion**

Connected Industry

**\$18 Billion**

Connected Living & Working

**\$188 Billion**

PCs/Handsets/Tablets

**\$ 687 Billion**



CREATING OPPORTUNITIES THROUGH CROSS-INDUSTRY COLLABORATION



# It's already happening - 1Q 2015 Cellular M2M Data



**Rogers, Canada**  
1.5m, 14% of Base



**Deutsche Telekom, Germany**  
3.9m, 10% of Base



**Sprint, USA**  
7m, 13% of Base



**Verizon, USA**  
13m, 10% of Base



**AT&T Mobility, USA**  
19m, 16% of Base



**Claro, Brazil**  
3.9m, 5% of Base

**USA – 44.5m**

**W. Europe – 21.6m**



**Du, UAE**  
0.07m, 1% of Base



**Etisalat, UAE**  
0.6m, 6% of Base



**Ooredoo, Oman**  
0.09m, 3% of Base



**Ooredoo, Kuwait**  
0.1m, 4% of Base

**Russia – 8.5m**



**China Mobile**  
46.5m, 5% of Base

**China – 74.2m**

**S. Korea – 3.0m**



**MTN, South Africa**  
2.2m, 8% of Base

**South Africa – 5m**



**Telstra Australia**  
1.5m, 9% of Base

**World  
Total Addressable  
Revenue**

US\$1.1 trillion in 2015  
Forecast to grow to  
US\$1.96 trillion in  
2020

**World M2M MNO  
Addressable revenue**

US\$640 billion in 2015  
Forecast to grow to  
US\$1.1 trillion in 2020

Source: Machina Research  
2015

M2M commercially available

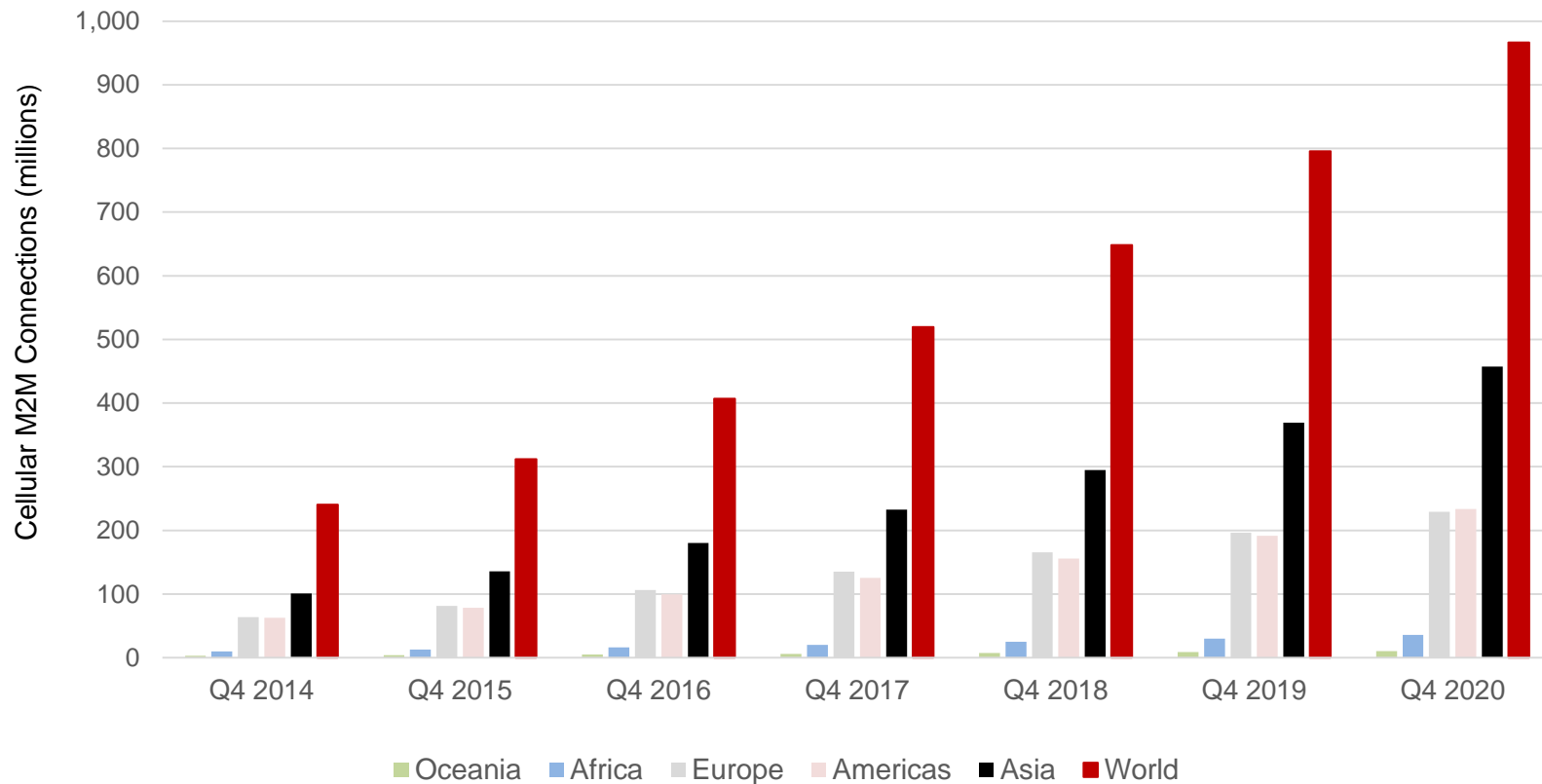
M2M not commercially available

Source: GSMA Intelligence, 2015

**468 operators**  
**190 countries**  
**256 million connections**



## Global and Regional Cellular M2M Connections, 2014 - 2020

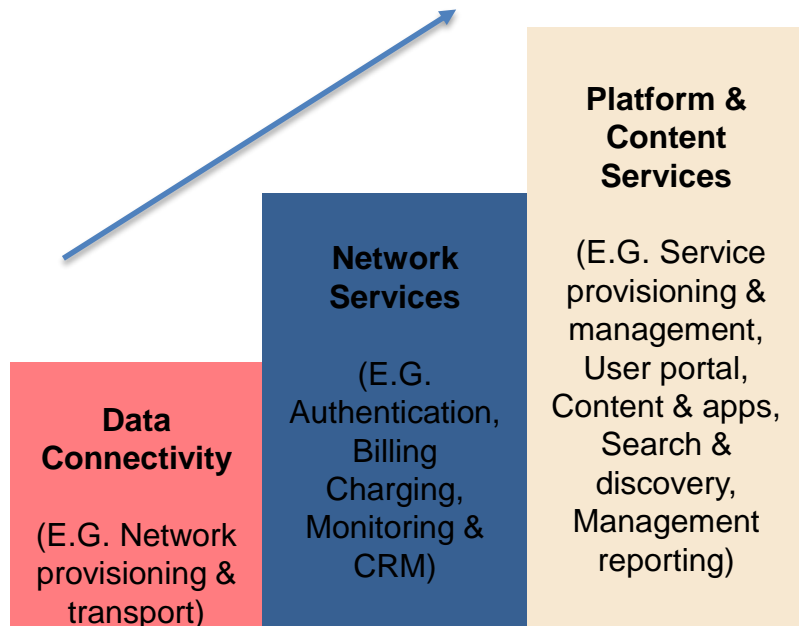






## Operators enable the IoT market throughout the value chain

Operator value starts with connectivity and increases up the chain



*drive like a girl*



The UK's leading telematics insurer



Simple Valuable Business Model

Lower cost driver premiums

Traditional insurance - £3k

Connected Insurance - £1.4k

UK driver aged 17, annual premium actual data 2014

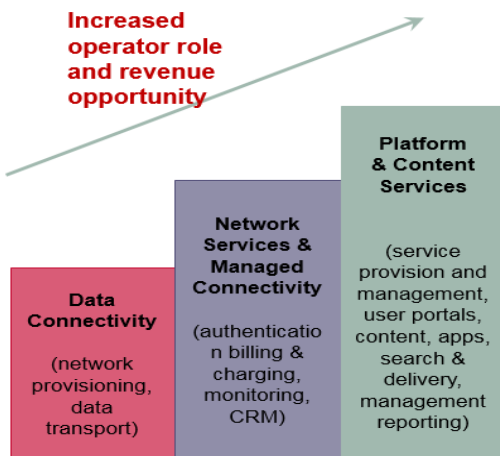
Insure the Box, the parent company  
after 4 years valued at £140m, 2014



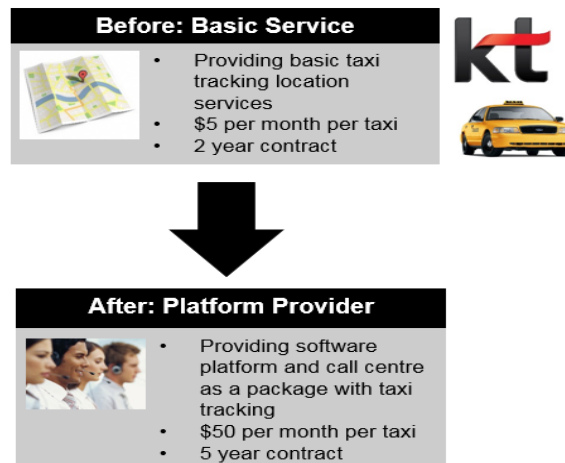
# Where is the Market Value in the IoT?



Value increase further up the value chain



As shown with Korea Telecom's taxi fleet management solution



- The type of **business model** that organisations use in the IoT will be important in seizing market value. **Entities close to the service area**, and services applications closest to the customer, will generate the most revenue
- Success will be linked to business models that focus on providing **a service orientated business**, rather than a **product orientated business**.
- **Collaboration/Partnerships** between IoT players will help to focus on targeting certain application groups, leveraging knowledge from each other for wider scale M2M/IoT deployments



## GSMA intelligence - Smart Home devices tracker

How many devices have we tracked so far?

245 products

What are the key products?

Home Appliances: 125  
Home Security and Control: 77  
Sensors: 20  
Environmental Control: 9  
Health and fitness: 8  
Pets and Kids: 6

What is the key connectivity?

Wi-Fi, 3G and Bluetooth

### Example of Smart Home devices



Withings Smart Baby Monitor Camera



Anova Precision Cooker



Withings Aura Sleep System



Keen Home Smart Vents



## Business models: M2M Business Models evolution is a driver in itself with operators moving from being product focused to being service focused

### Operators and vendors reasoning behind business model adoption

Business Model as a Lever in itself	<ul style="list-style-type: none"> <li>➤ <i>"Business model – is the most important driver. Operational efficiencies are important"</i></li> <li>➤ <i>"Operators need to start thinking the business models; how to ease up the B2B business model"</i></li> </ul>
Moving from a product business to a service business	<ul style="list-style-type: none"> <li>➤ <i>"Business Models - look at General Electric - the have embraced industrial internet – entire push is more towards services and away from the hardware business"</i></li> <li>➤ <i>"The predictive maintenance of connected devices within the consumer goods space is a necessity .. Customer experience to be seamless is important"</i></li> <li>➤ <i>"New commercial business models including hardware + SIM + connections into the proposition"</i></li> </ul>
Partnership and collaboration	<ul style="list-style-type: none"> <li>➤ <i>"There is potential to partner with consumer companies – Samsung etc., we see that in the digital and M2M space"</i></li> <li>➤ <i>Business model needs to be worked out between operator, manufacturer, etc....</i></li> <li>➤ <i>"International collaboration to focus on certain application groups, leverage partners knowledge for wider scale M2M deployments"</i></li> </ul>
Big Data	<ul style="list-style-type: none"> <li>➤ <i>"As the industry expands we need to make new business models based on data generated by IoT devices – this will become more important and will generated a new area of business opportunities "</i></li> <li>➤ <i>"You can do Big Data business even as an operator because you have good information about consumers, which allows you to make money"</i></li> </ul>
Advertising	<ul style="list-style-type: none"> <li>➤ <i>"Advertising becomes part of device to help boost volume. Model where people have strong interest in wearing connected device"</i></li> </ul>

# Channels to Market: B2B is *still* the priority channel in terms of delivering cellular M2M to the market

## Key Takeaways:

- The majority of interviewees ranked the **B2B as the key channel in terms of M2M distribution** and they see it as being their main focus in the short term

*"B2B will continue for a couple of years but the big players will be driving the opportunity in B2C"*

- Some respondents view **B2B2C as a next stepping stone**, with a number of the operators already present in this area

*"M2M is still B2B/B2B2C market. We see connected consumer looking to automotive, infotainment, bandwidth – driver – differentiator for traditional M2M."*

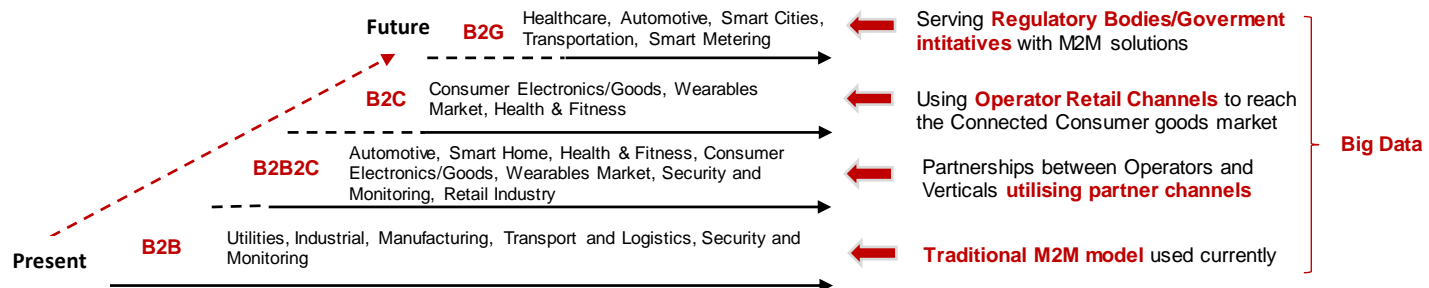
- Some operators view the move towards more customer oriented approach (**B2C**) as **challenging** due to separate OSS/BSS and the required investment to reorganise and restructure business units (consumer and enterprise)

*"B2B & B2C are not linked at all in most operators in the organisations and that may need to change in the future to capture IoT growth"*

- The respondents' take on **B2G (Business to Government)** as a channel to market is heavily impacted by the regulation and the role cellular M2M can play in delivering solutions that are required by the specific government regulations

*"M2M is still B2B/B2B2C market... B2G still needs development"*

## Evolution of channels to market:



## M2M Forecast – starting point (Oct 2015)



*How many operators offer  
M2M? In how many countries?*

M2M Operator  
Tracker

505 MNOs  
192 countries





# M2M Methodology

- Our M2M connections modelling methodology relies on a **bottom-up approach**, aggregating data for each mobile operator that has commercially deployed M2M services
- Our data model is based on a set of historic M2M connections reported by mobile operators and regulators (**99 operators**), along with market assumptions based on our large scale survey of M2M operators and vendors (**>100 interviews**)

*Question?*

*Answer:*

How many operators offer M2M?

505 operators in 192 countries based on the M2M Operator Tracker

How many operators report M2M connections?

53 operators in 29 countries, including operator data reported by regulators\*

How many additional operators do we have data for (from interviews)?

53 operators

What is the % of global M2M connections those 99 operators represent?

75% of total M2M connections

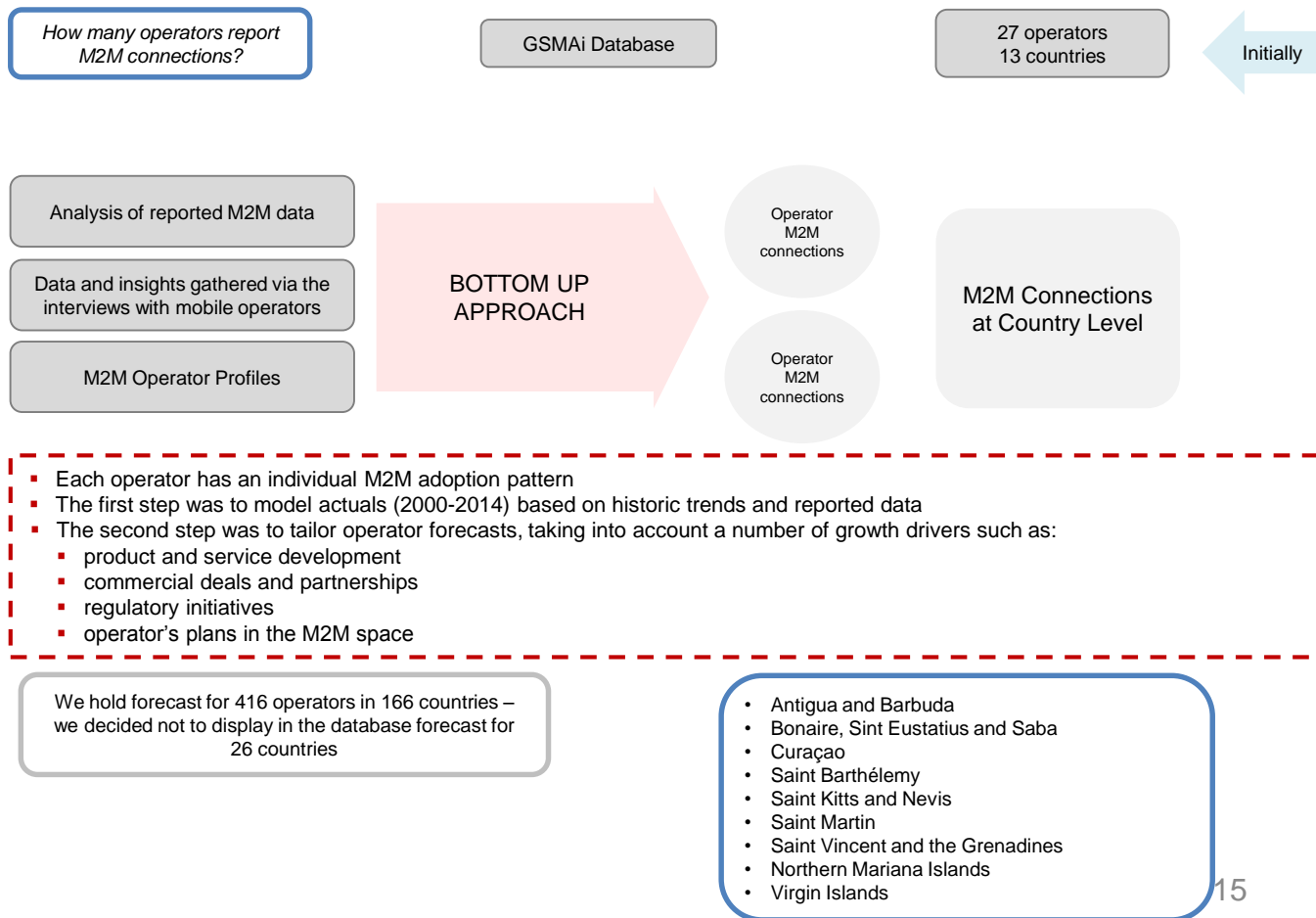
How many interviews have we conducted to define forecast assumptions?

Well over 100 interviews with operators and vendors

\* As of Q4 2014, in Q2 2015 34 operators across 23 countries



# M2M Forecast – process







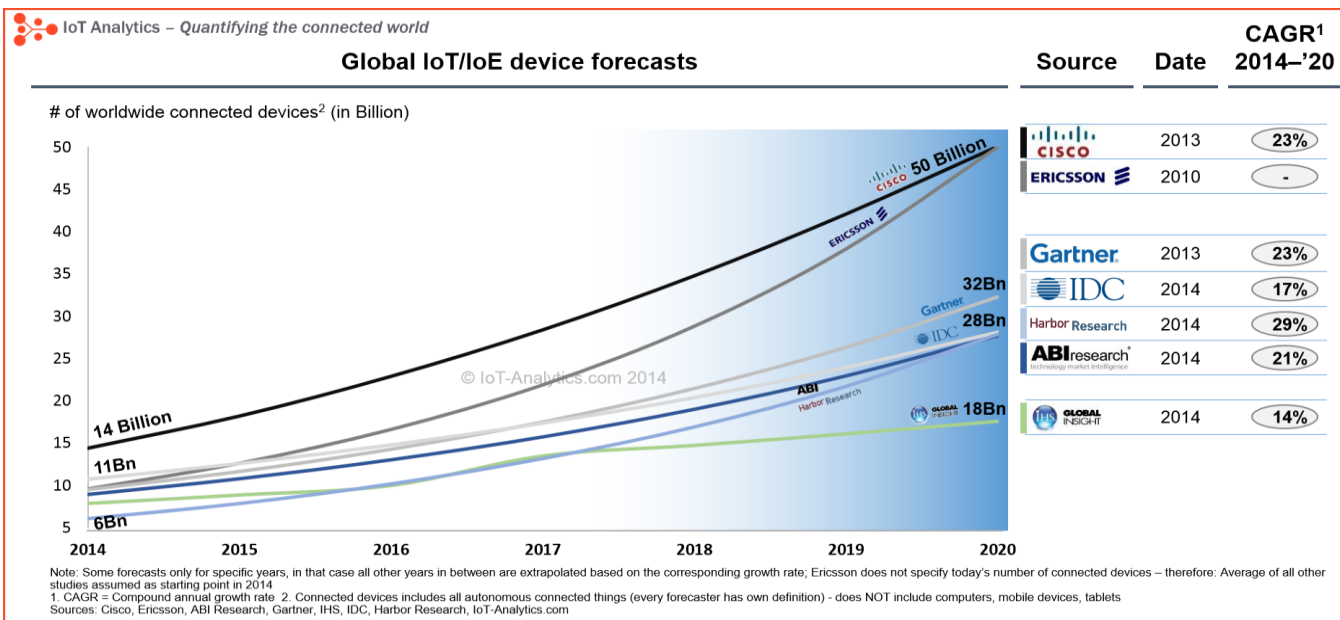
# Moving beyond M2M into IoT

How many IoT devices do you have?

What are your thoughts on this?

<https://www.youtube.com/watch?v=eMrdVNynlJI>

A lot of confusion what IoT actually is and even more about its size...





# Connected Living Programme 2015/16

## GSMA Connected Living – “Mobilising the Internet of Things”

Remote SIM  
Provisioning

Interoperable  
M2M Remote  
SIM Provisioning  
Adoption

Future IoT  
Networks

Evaluation of Low  
Power, Wide Area  
and Security  
Requirements

Industry  
Engagement

Implementation  
of technology  
pilots and big  
data aggregation

IoT Business  
Enablers

Operator Self  
Regulation  
Toolkit

Vertical Ecosystem Engagement – Automotive, Transportation, Utilities and Health





# GSMA Connected Living Programme

MOBILISING THE INTERNET OF THINGS – ENABLING GROWTH & OPPORTUNITY

## MARKET GROWTH

### CONNECTED LIVING PROGRAMME SCALING THE CELLULAR IOT

#### Cellular M2M Connections

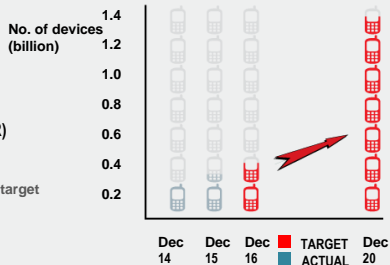
2020 Forecast	2020 Growth target
970m	1.25bn

#### Compound Annual Growth Rate (CAGR)

2020 Forecast	2020 Growth target
26%	32%

Source: GSMA Intelligence

Cellular M2M connected devices supported (2G, 3G, 4G)



## MARKET OPPORTUNITY

### TOTAL ADDRESSABLE MARKET FOR MOBILE NETWORK OPERATORS IN 2020

**\$1.1**  
TRILLION

Source: Machina Research

Increased operator  
role and revenue  
opportunity



ENABLING OPERATORS TO MOVE UP THE VALUE CHAIN TO  
ACHIEVE FULL MARKET POTENTIAL

## FOCUSED DELIVERY ON KEY MARKET ENABLERS

UNIFYING THE IOT  
COMMON GLOBAL  
SPECIFICATIONS



SECURING THE IOT



CUSTOMER FOCUSED  
SERVICE - REMOTE SIM  
PROVISIONING



SUSTAINABLE IOT  
REGULATORY &  
POLICY ENVIRONMENT



MANAGED CONNECTIVITY



## ECOSYSTEM ENGAGEMENT

ACTIVE INDUSTRY ENGAGEMENT VERTICAL  
MARKETS - AUTOMOTIVE, TRANSPORTATION,  
UTILITIES AND HEALTH



DEMONSTRATION & ENCOURAGEMENT OF IOT  
INNOVATION





# Connected Living Vision & Aims 2015/16



**Our Vision:** To enable the Internet of Things, a world in which consumers and businesses enjoy rich new services, connected by intelligent and secure mobile networks.

**Our Aim:** To help operators add value and accelerate the delivery of new connected devices and services in the M2M market. Achieved by industry collaboration, appropriate regulation, optimising networks as well as developing key enablers to support the growth of M2M in the immediate future and the IoT.

## **Secure IoT Networks**

The GSMA is working to establish security requirements for how machines should communicate via the mobile network in the most secure way.

## **Mobile IoT**

The GSMA is working with mobile operators & ecosystem partners to assess solutions for low power, low data to enable further scaling of the IoT.

## **Remote SIM Provisioning for M2M**

The GSMA's vision is to unite all stakeholders behind a single, common, & interoperable global embedded SIM specification accelerate the growing (M2M) market.

## **IoT Business Enablers**

The GSMA is working to create a sustainable M2M regulatory & policy environment that enables operators to unlock the consumer and business benefits of the IoT.

**Ecosystem Engagement** to drive adoption and impact the market through the key verticals automotive, transportation, utilities & health plus support scaling of key market applications like wearables, smart home, smart cities and big data.



# How to get involved in the Connected Living programme ?

## GSMA Connected Living – “Mobilising the Internet of Things”

### Remote SIM Provisioning

Interoperable M2M  
Remote SIM  
Provisioning  
Adoption

### Future IoT Networks

Evaluation of Low  
Power, Wide Area  
and Security  
Requirements

### Industry Engagement

Implementation of  
technology pilots  
and big data  
aggregation

### IoT Business Enablers

Operator Self  
Regulation  
Toolkit

**Vertical Ecosystem Engagement – Automotive, Transportation, Utilities and Health**

Email: [connectedliving@gsma.com](mailto:connectedliving@gsma.com) to track progress or join the Interest Groups

Visit [www.gsma.com/connectedliving](http://www.gsma.com/connectedliving) for more information on the Connected Living Programme, upcoming events & Industry Research