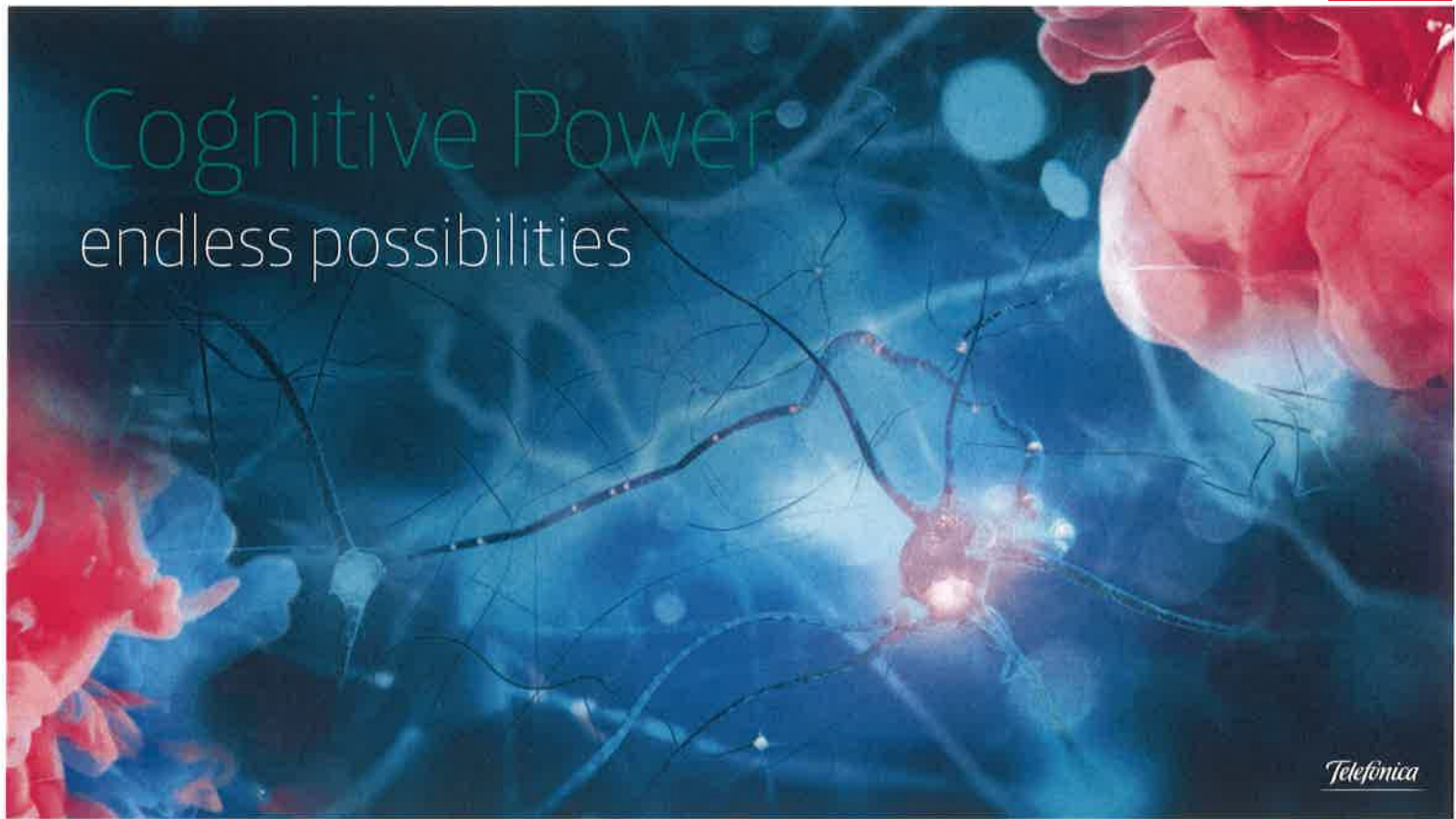
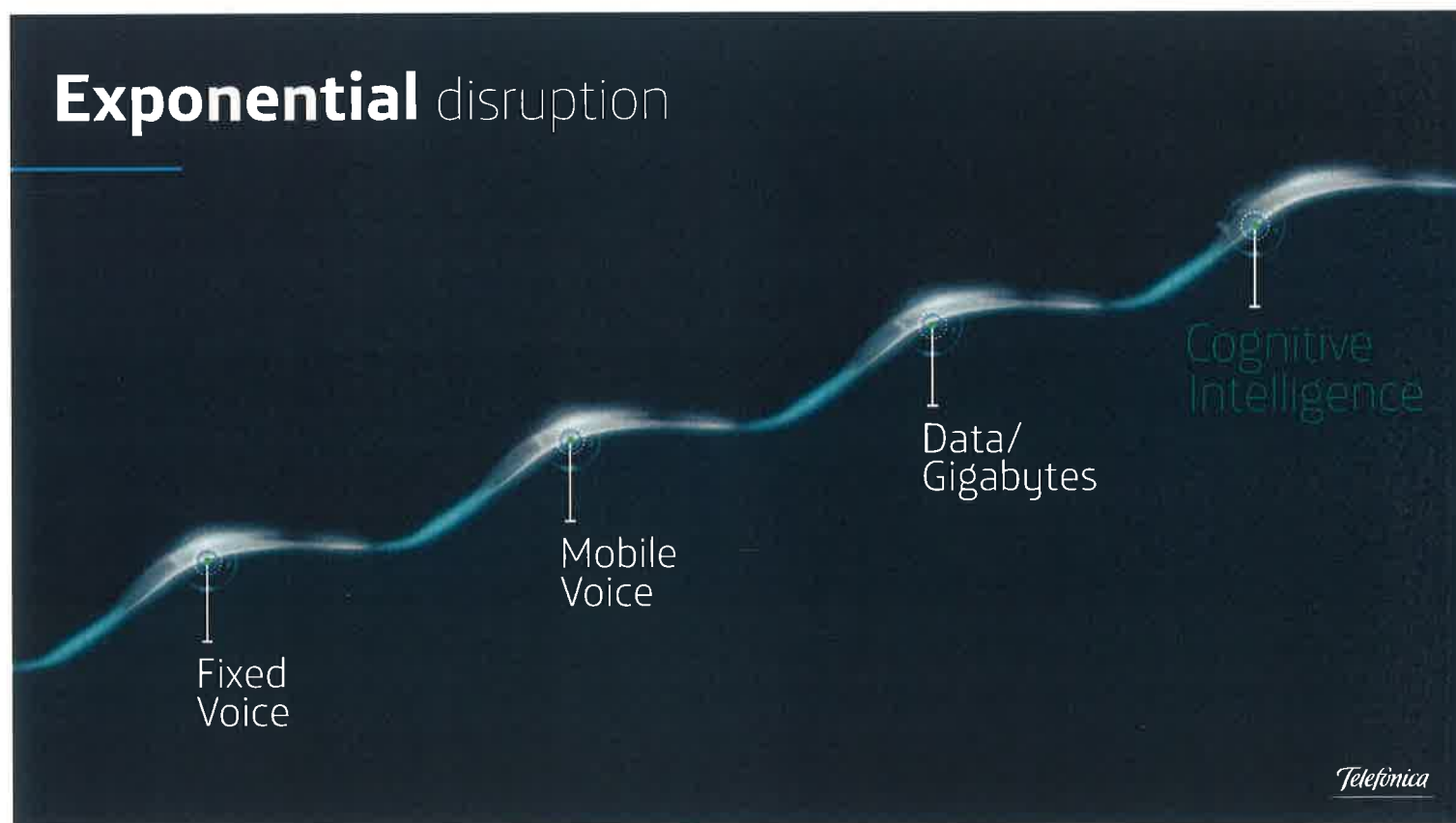
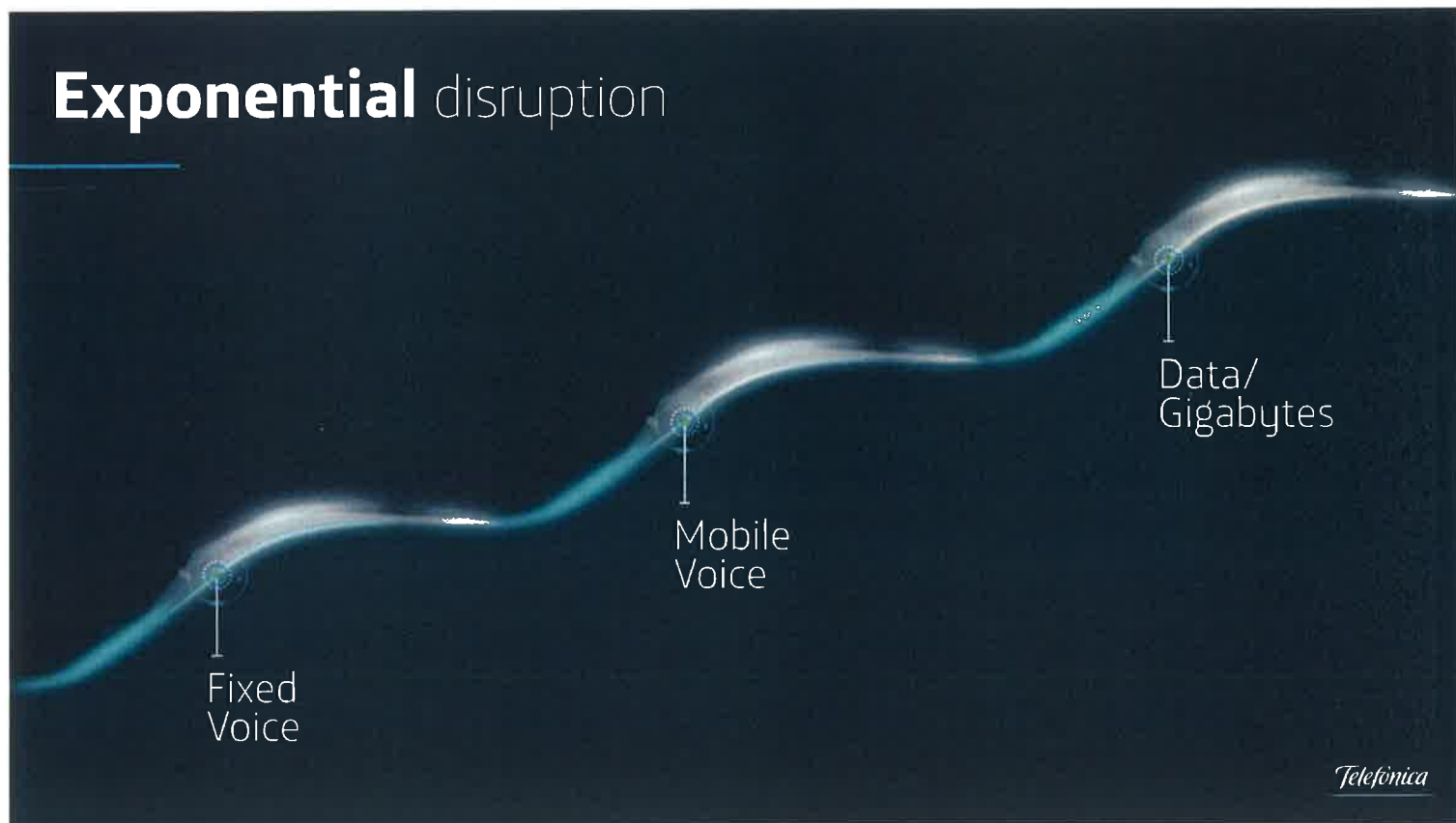
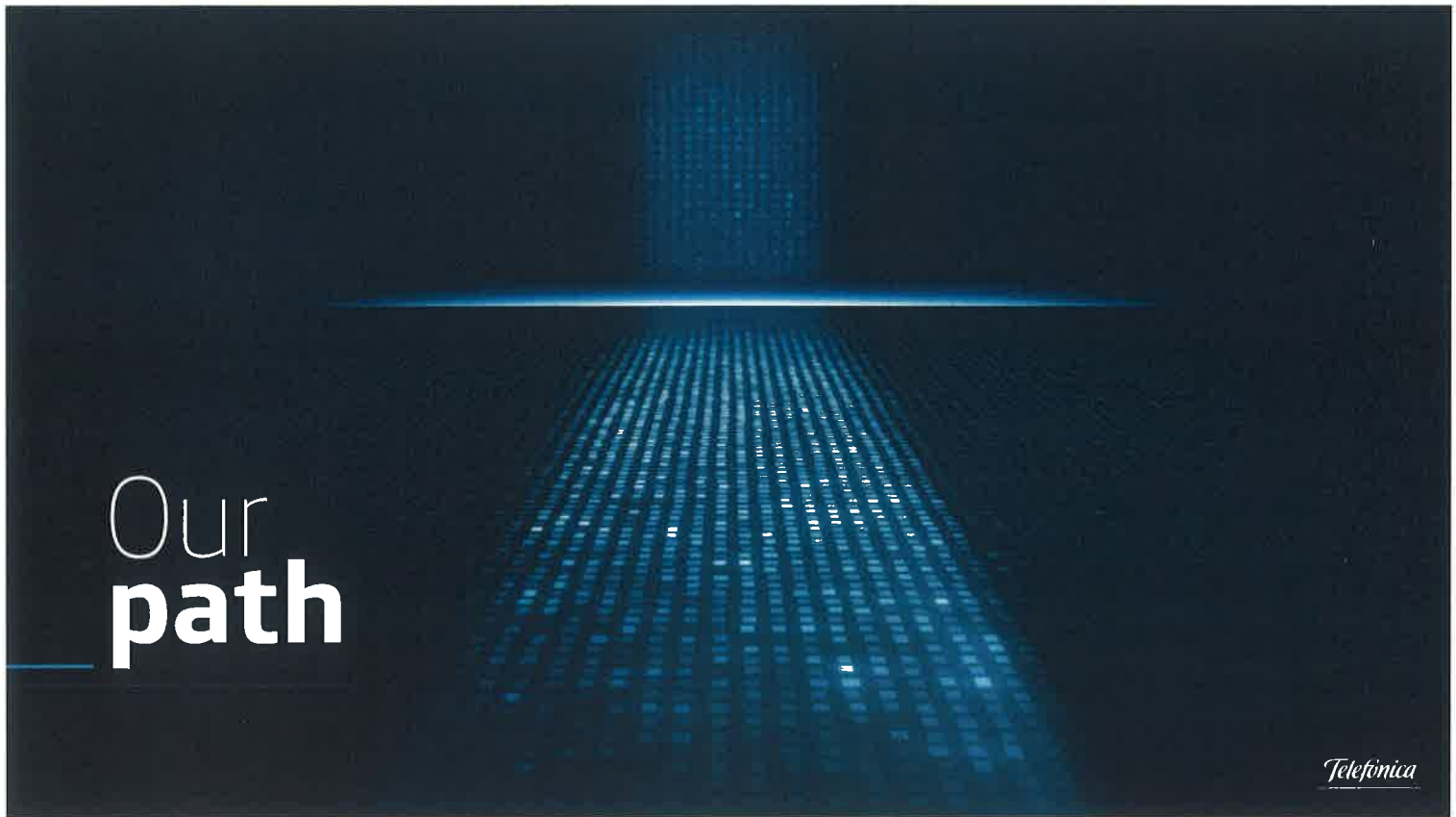


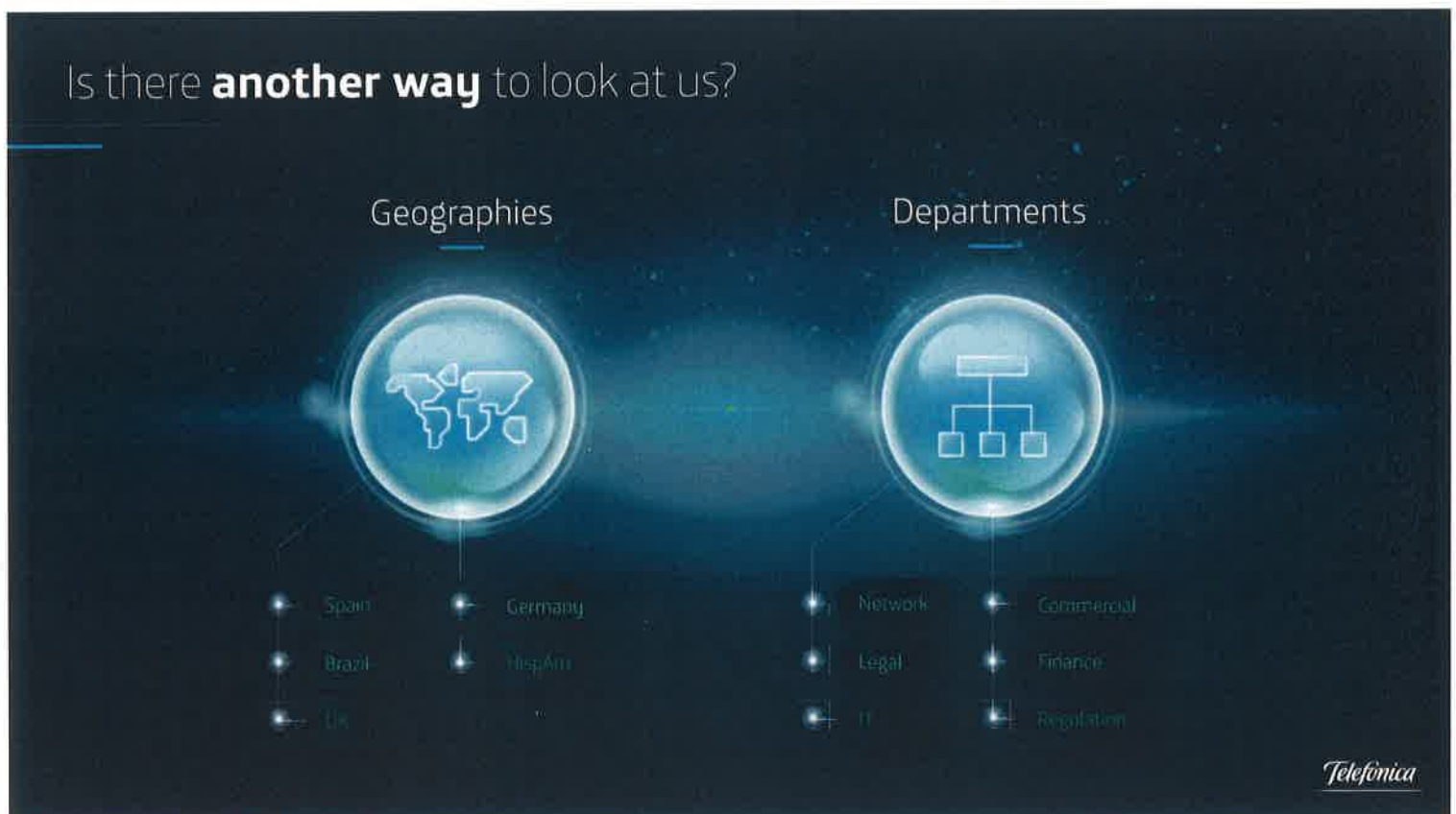


MWC: traditional way to approach **Telco's**

Smartphone
Cloud
VoLTE
VoIP
VoWiFi
SRVCC
LTE
4k video
Cloud of clouds
5G
NfV
FTTx
GFAST
SDN
FullStack
XaaS
EPC
Smart Meters
IoT
3GPP
DocSis 3.0
FTTH
GPON

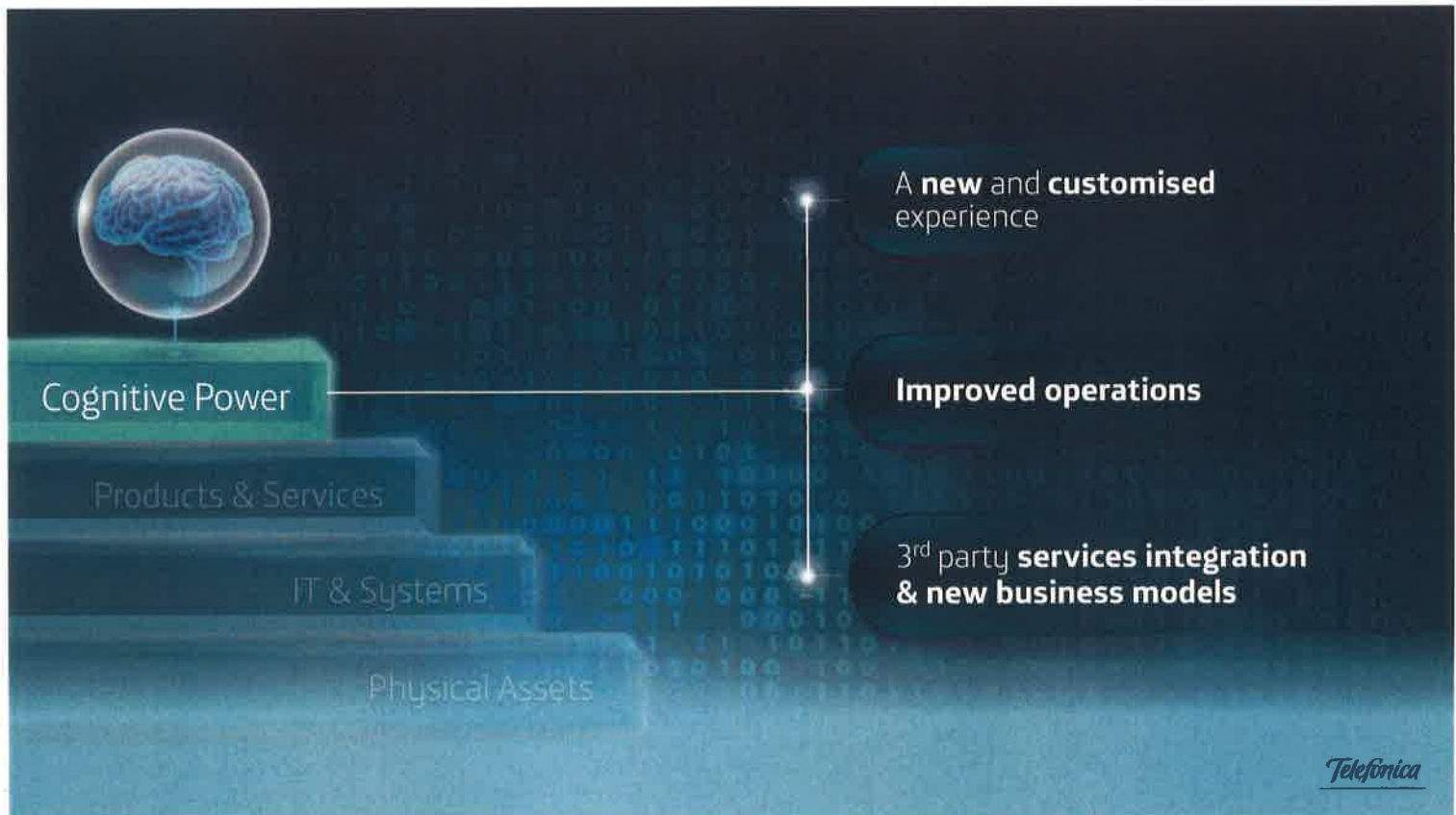


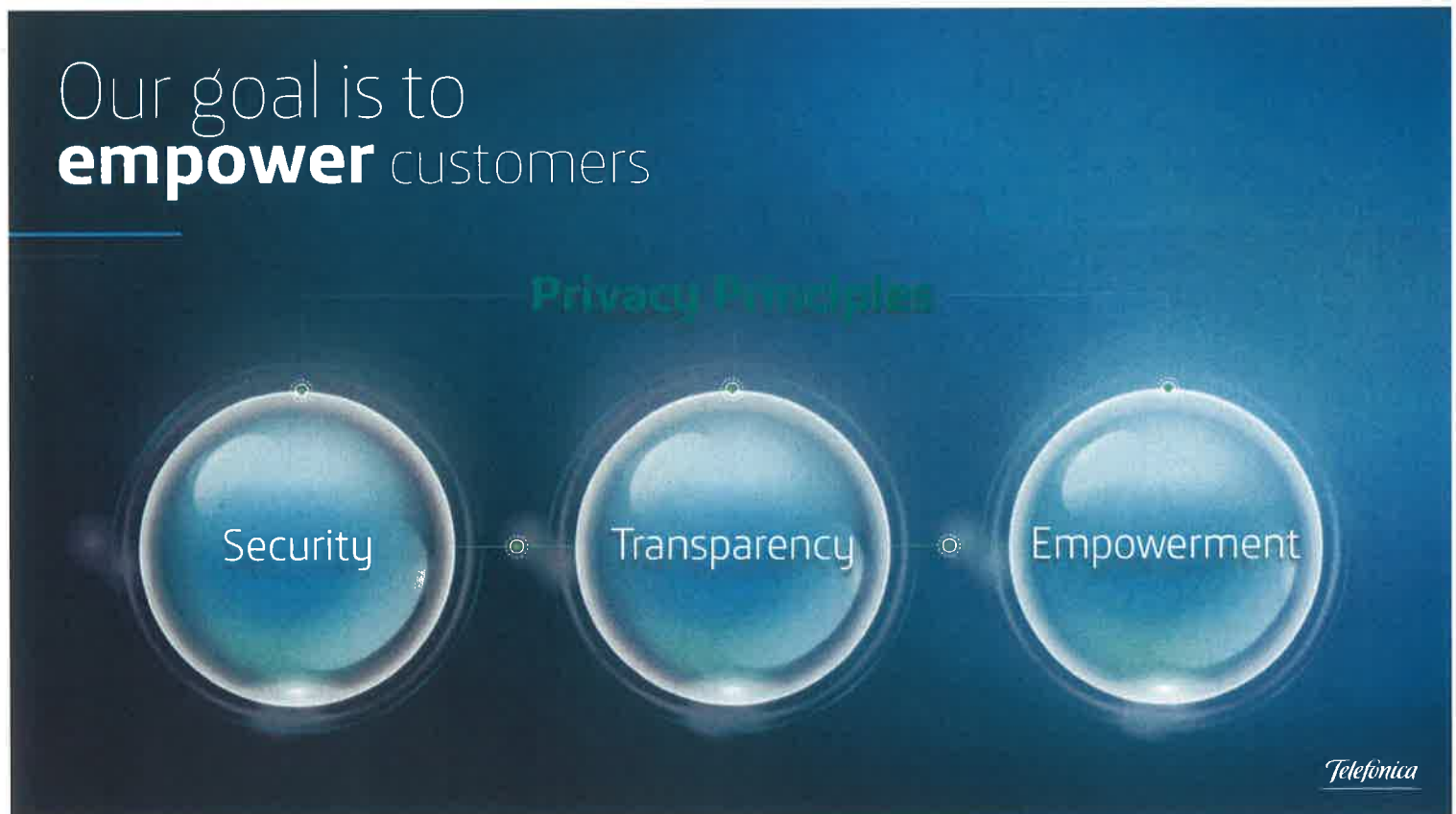
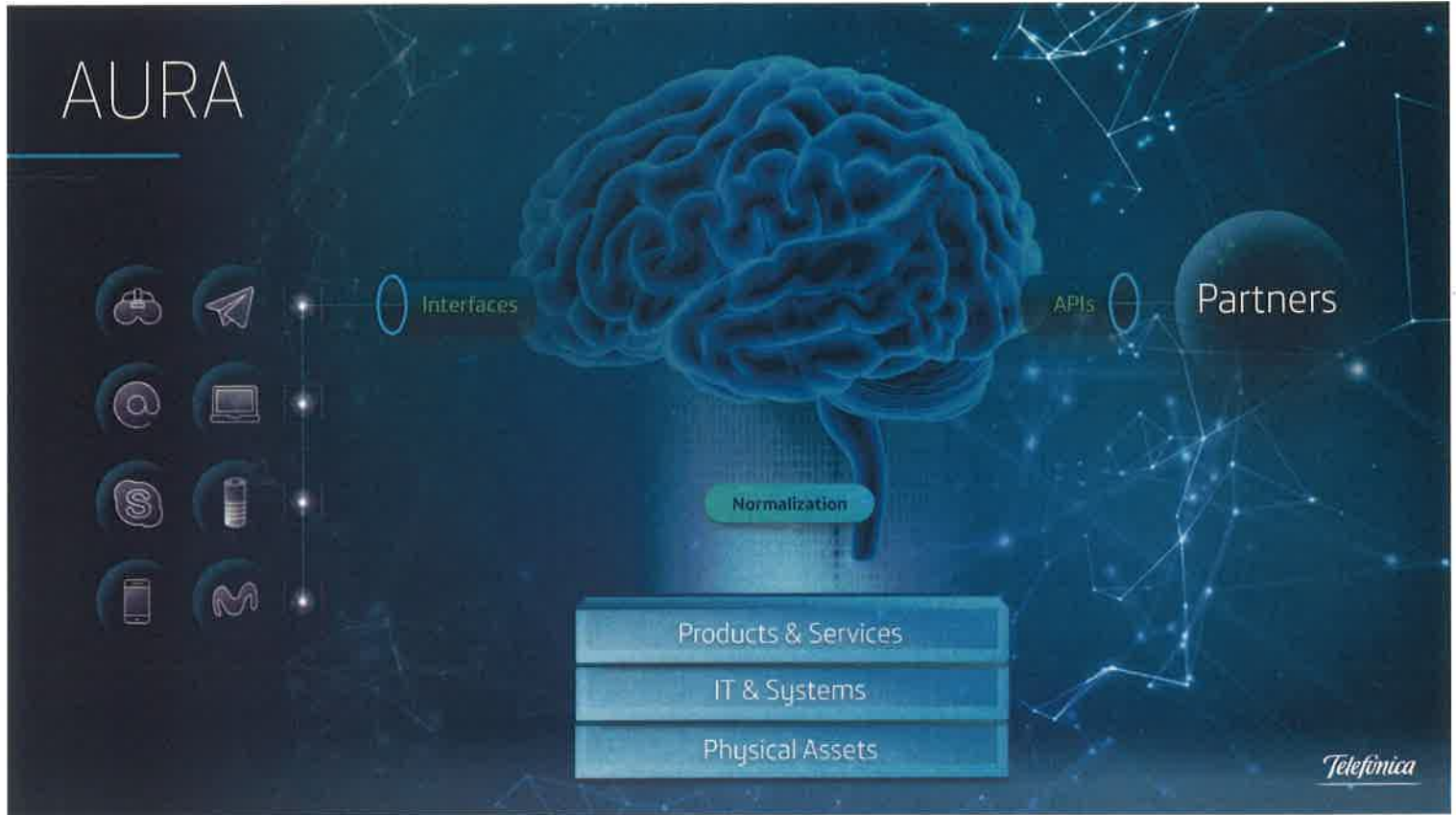












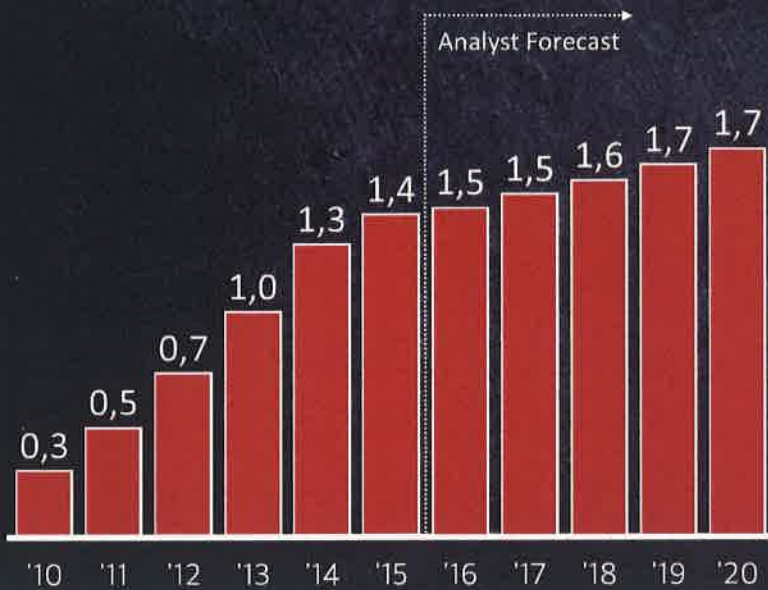




Inconvenient Truth

Smartphone Shipments

(Bn)



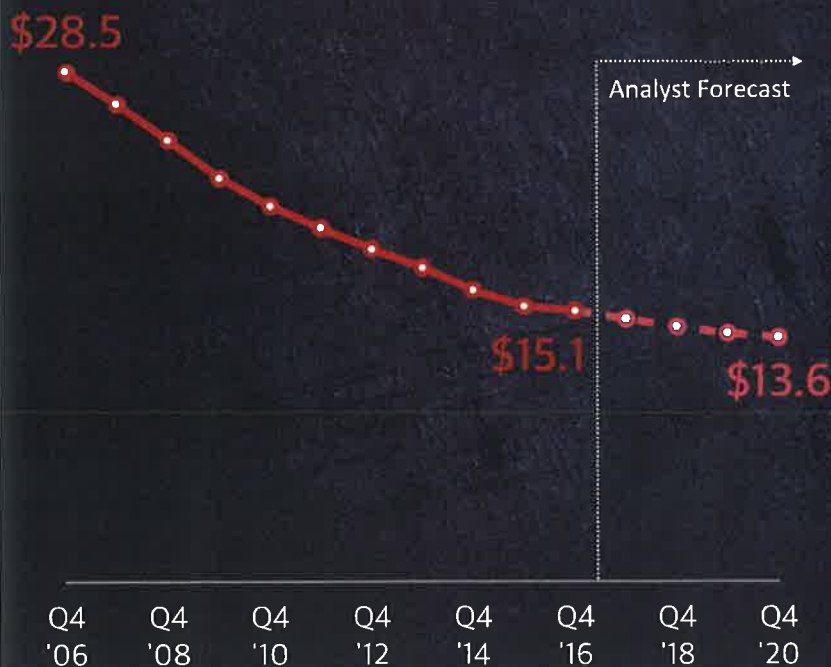
CAGR

37% → **4%**

(2010-2015) (2016E-2020E)

Source: IDC

ARPU (blended)



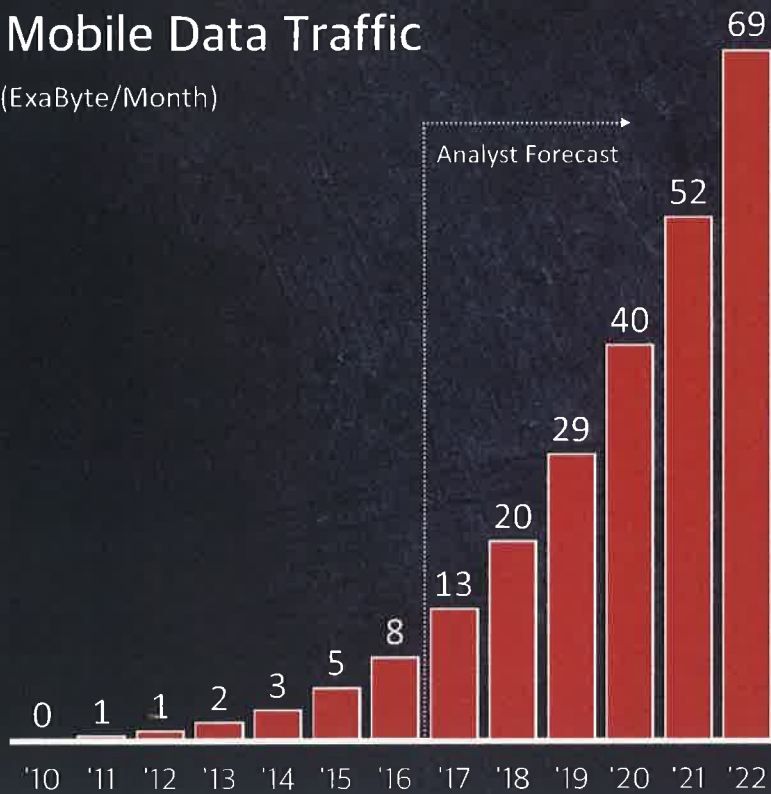
47% Down

(2006-2016)

Source: GSMA

Mobile Data Traffic

(ExaByte/Month)



8x

(2016E-2022E)

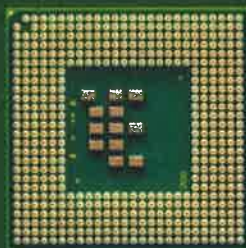
Requires
more CAPEX

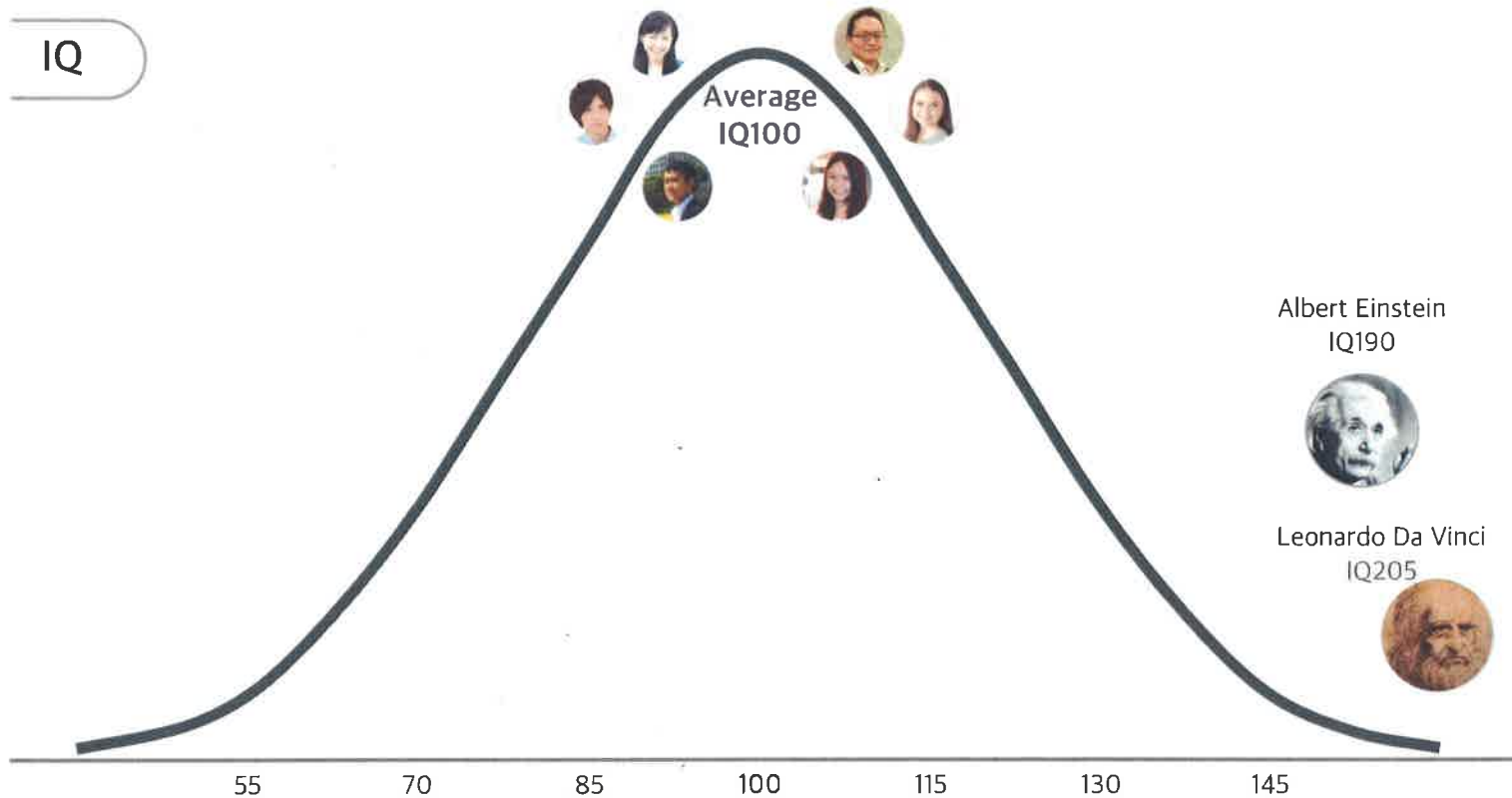
Source: Ericsson

Future

SINGULARITY

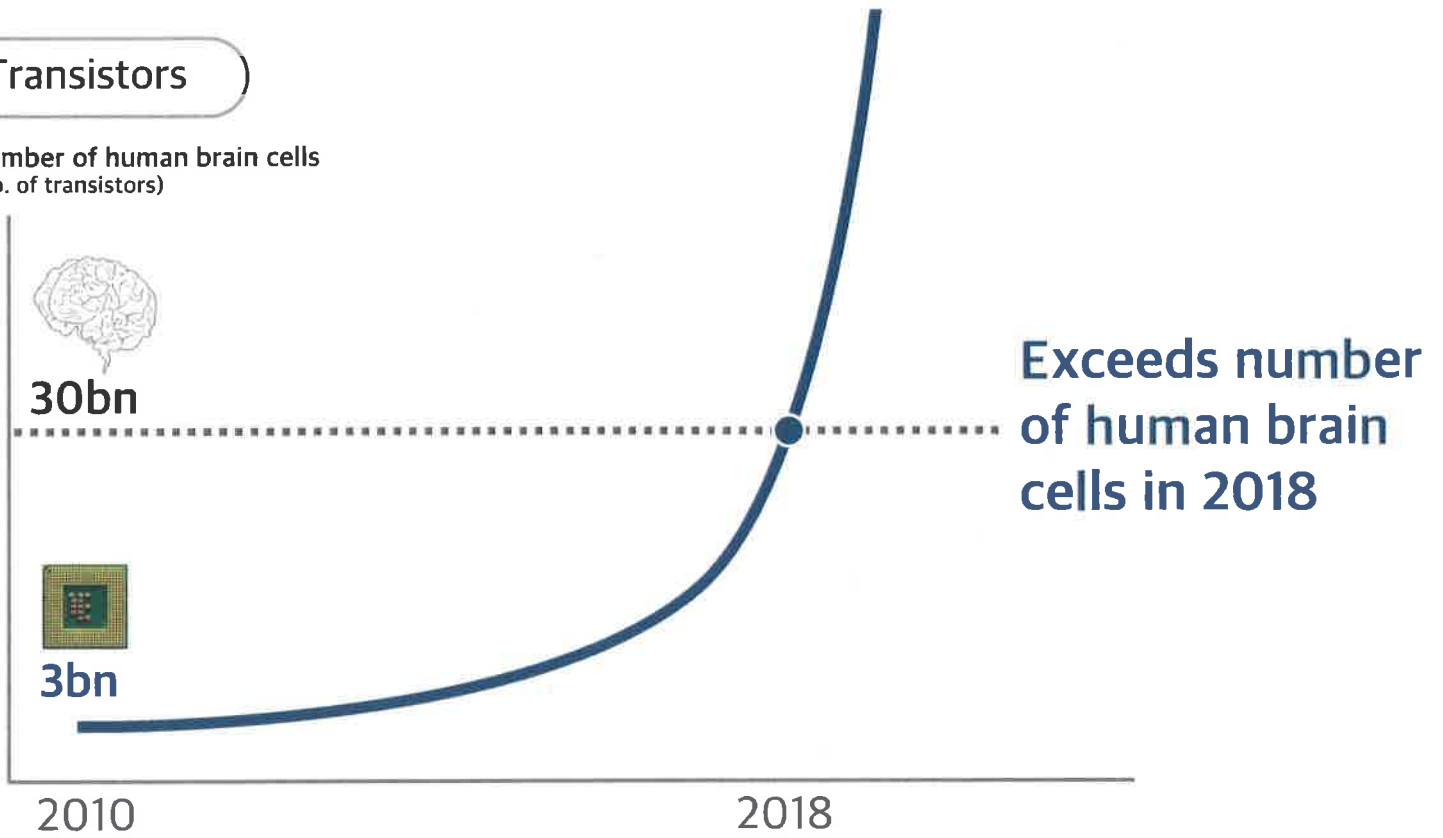
The day computers exceed
the human brain





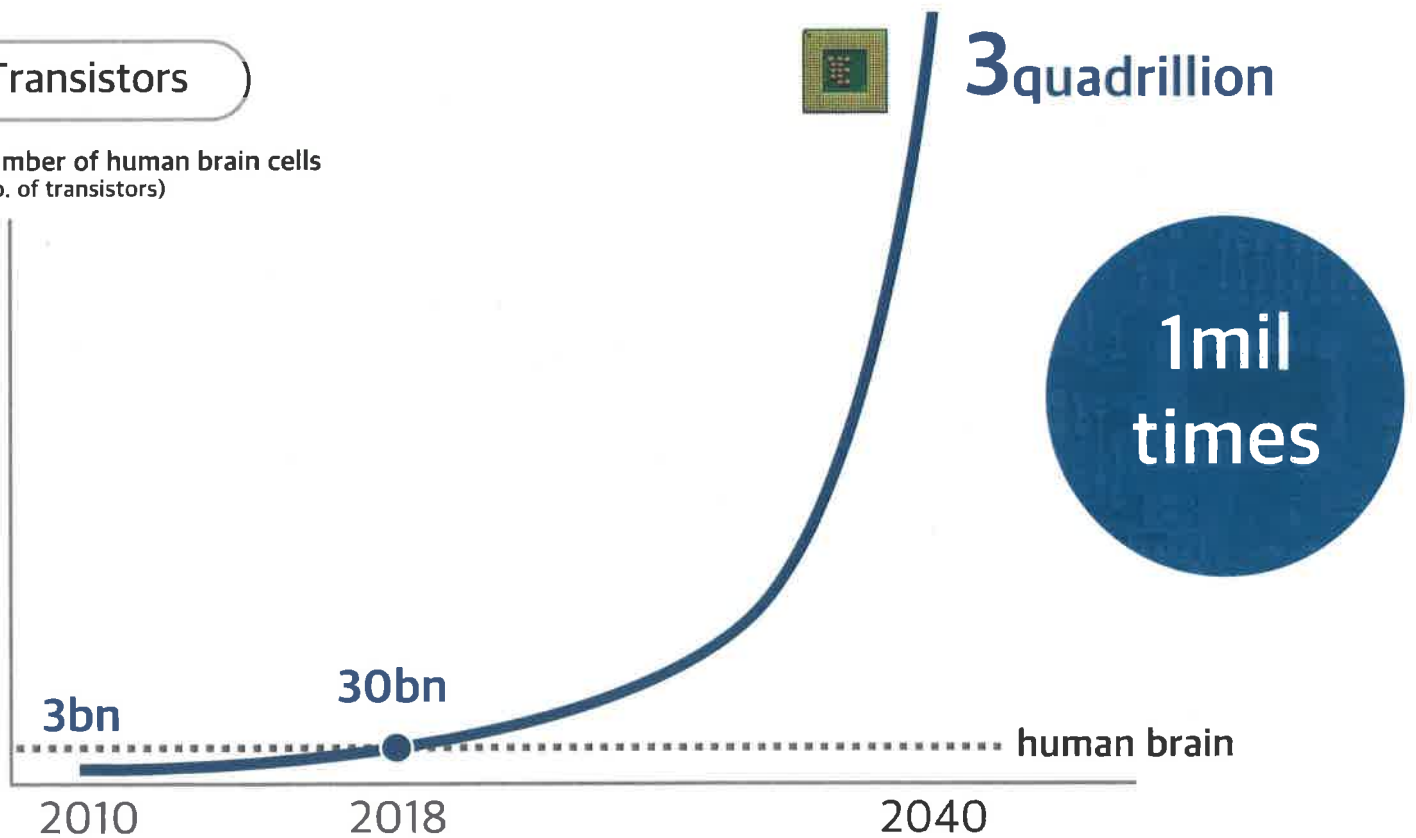
Transistors

Number of human brain cells
(No. of transistors)

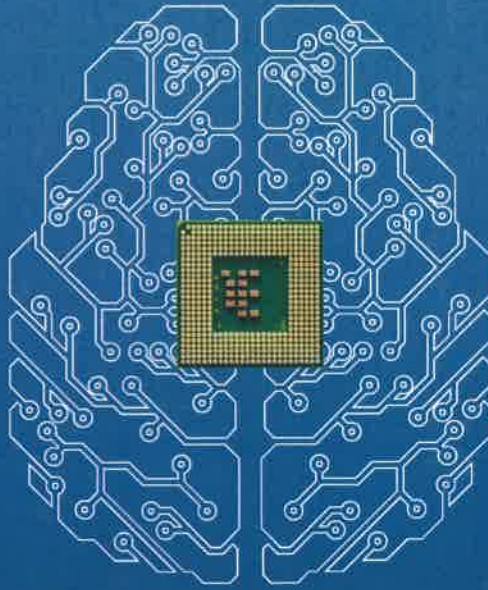


Transistors

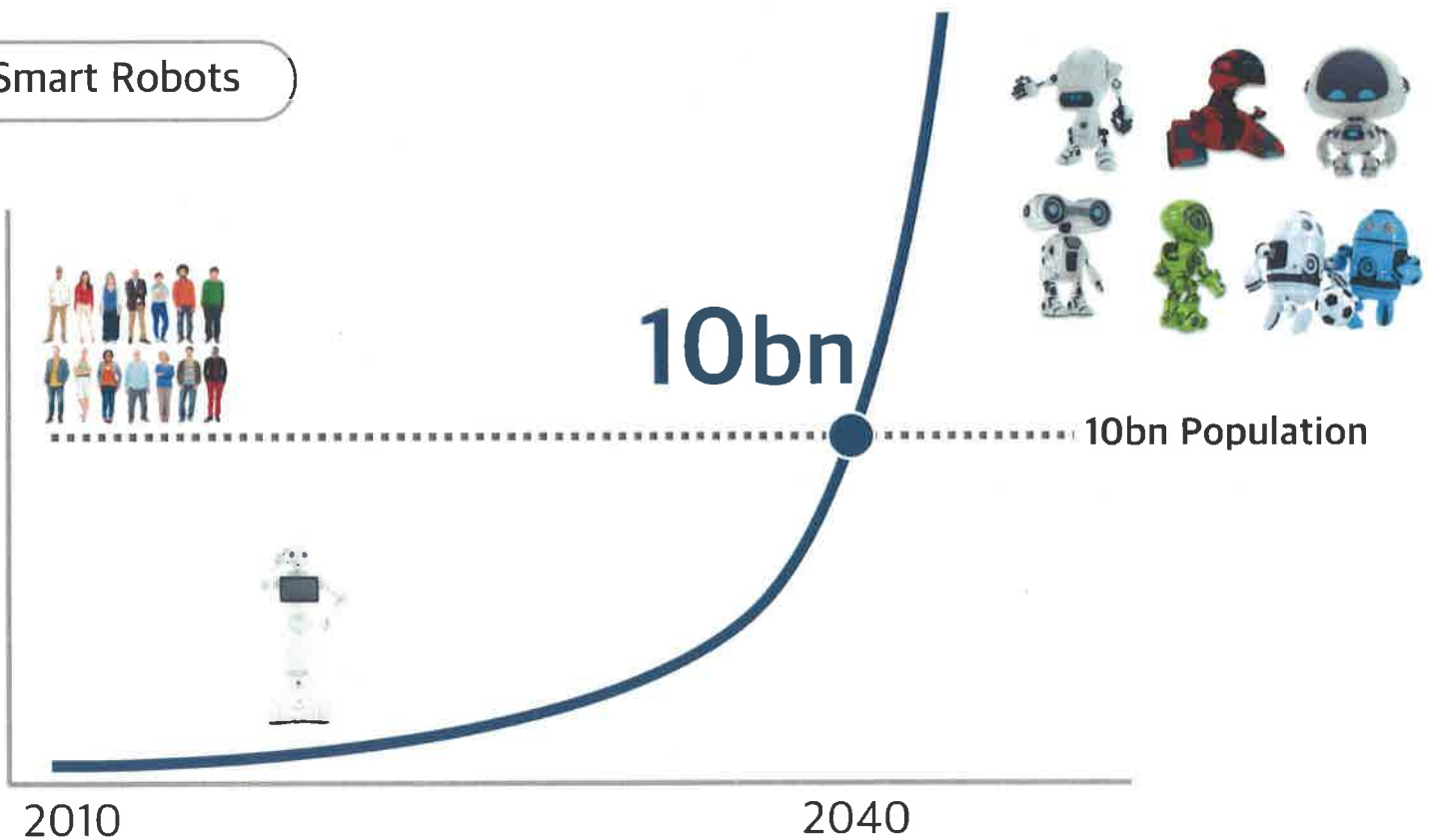
Number of human brain cells
(No. of transistors)

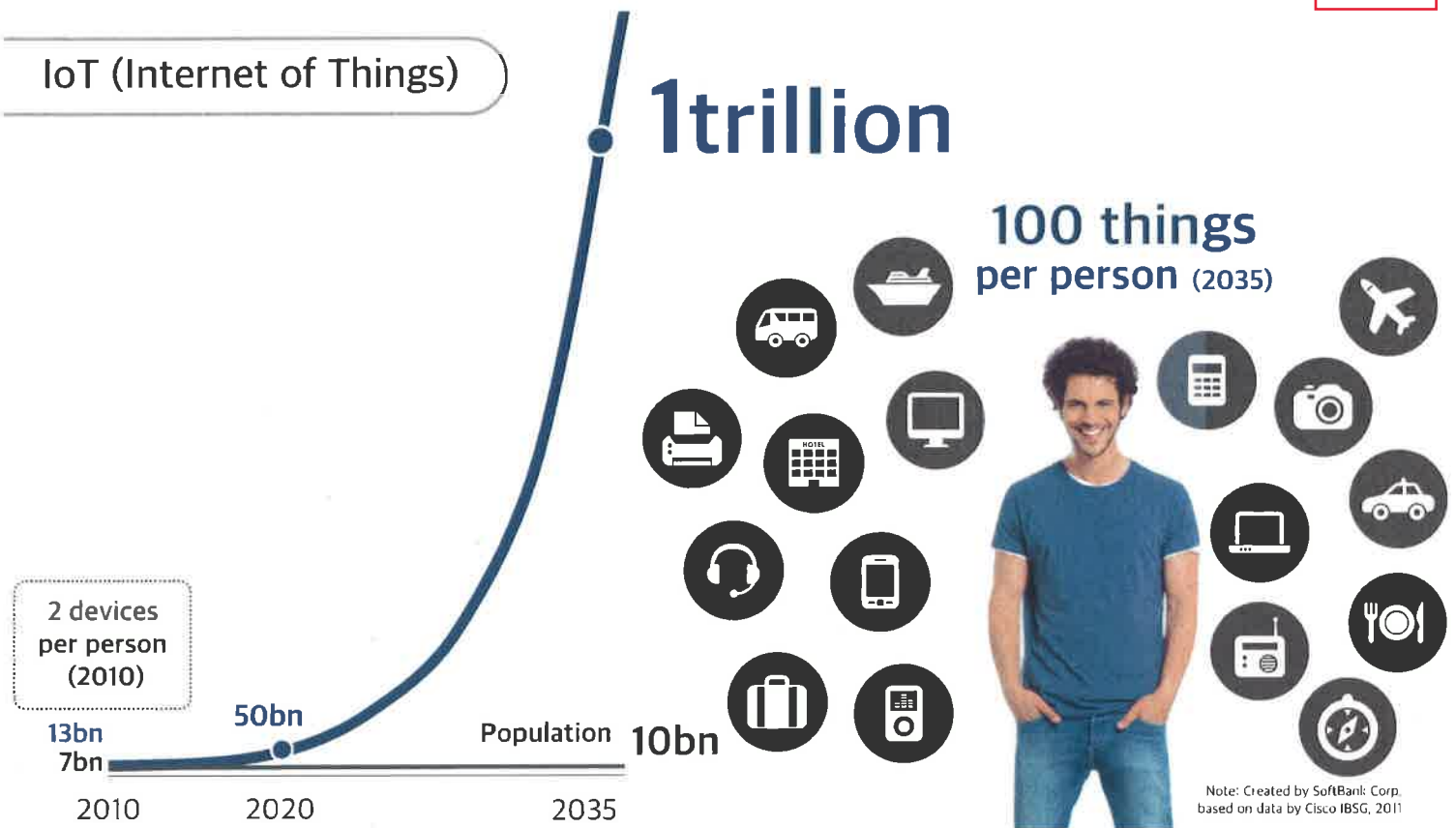


Birth of Super-Intelligence

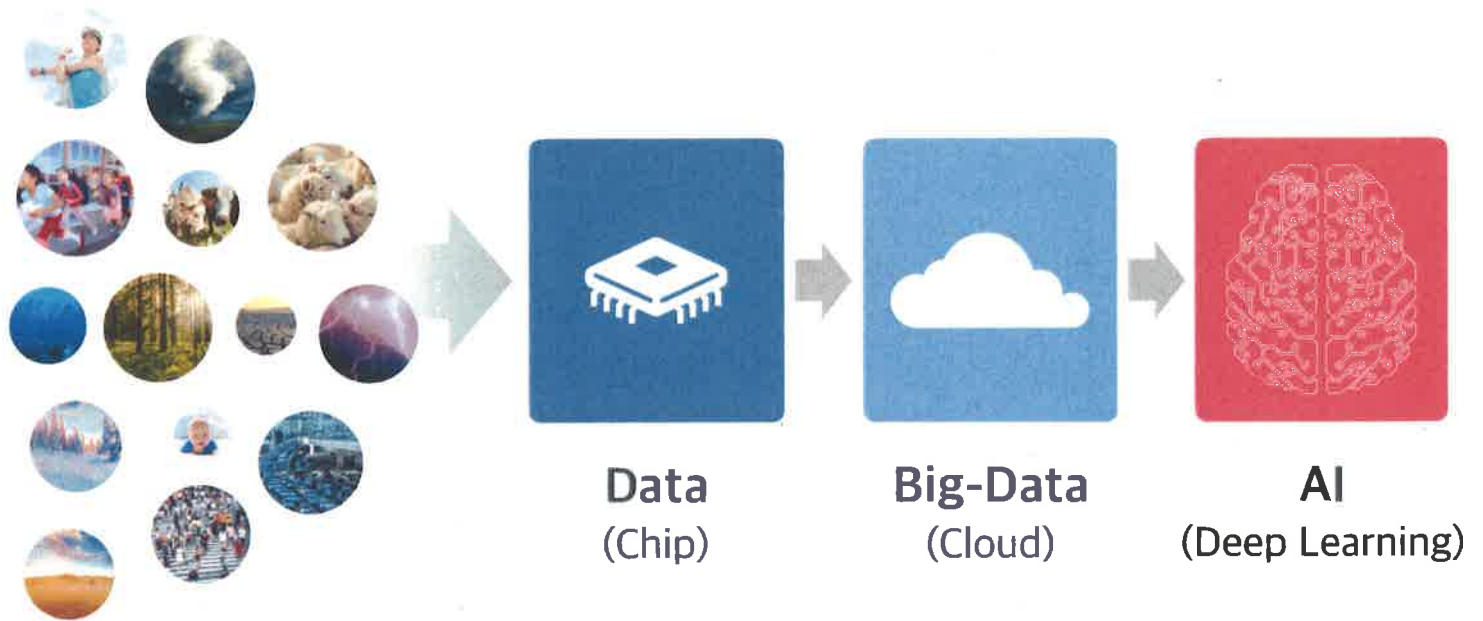


Smart Robots





Huge Value Generated by IoT



Huge Value Generated by IoT (Automotive)



Autonomous driving eliminates traffic accidents

Huge Value Generated by IoT (Healthcare)



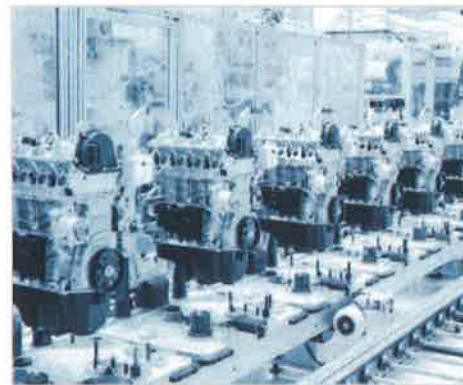
Constant monitoring prevents diseases

Huge Value Generated by IoT (Consumer Service)



Detailed analysis greatly improves services

Huge Value Generated by IoT (Industrial)



Demand forecast improves profitability

Key Technology to IoT Era

ARM[®]

Key Technology to IoT Era

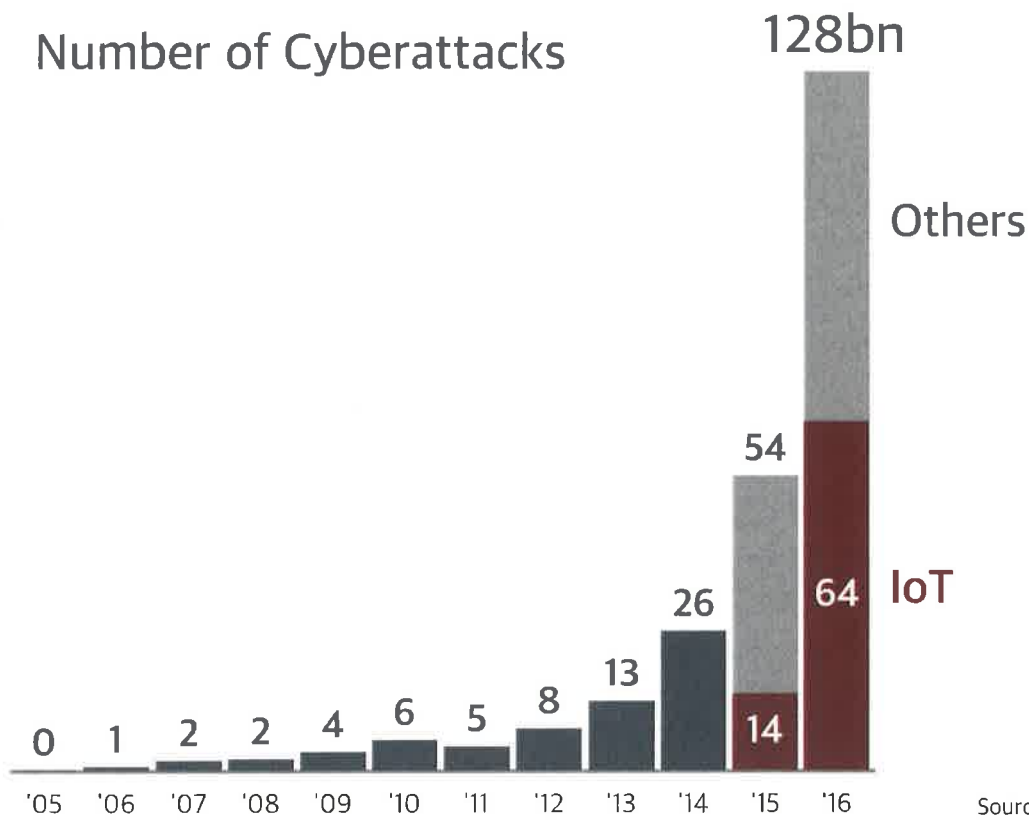


Key Technology to IoT Era



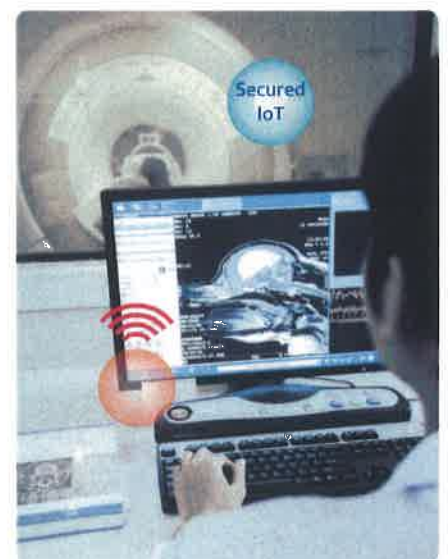
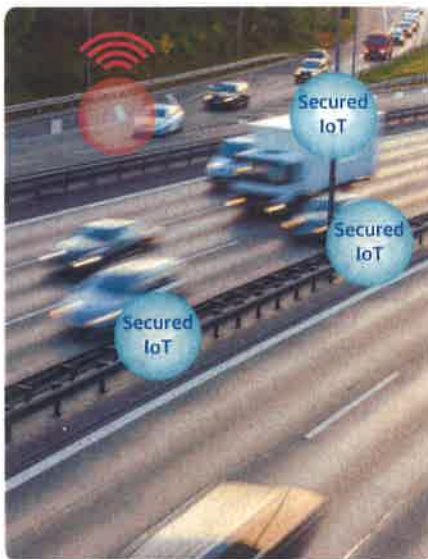


Number of Cyberattacks

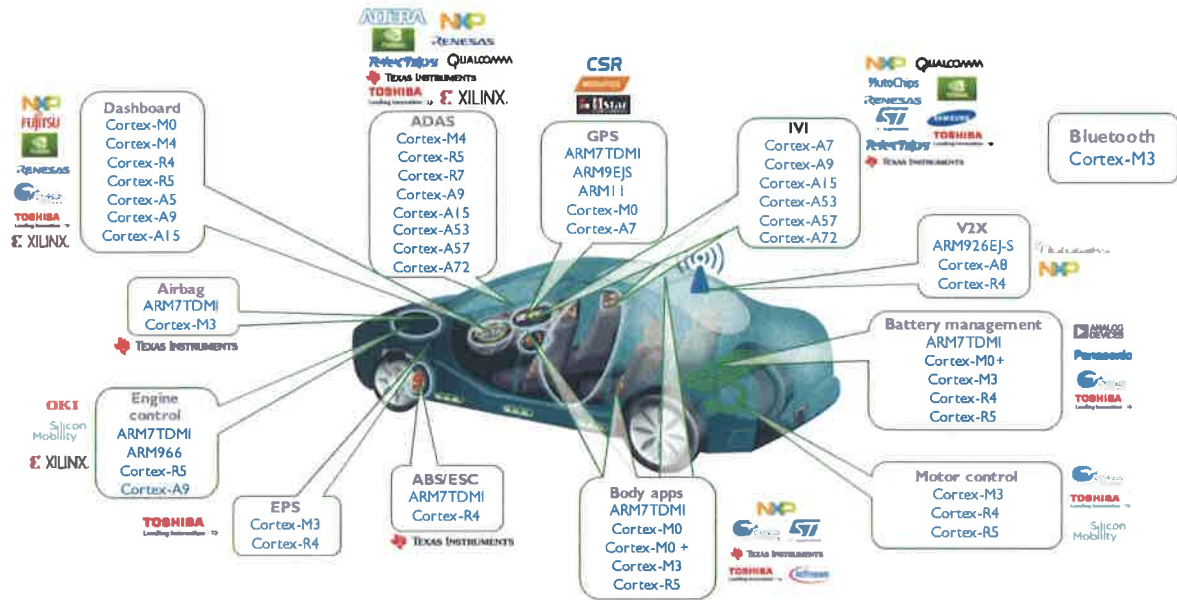


Cyberattacks
against IoT
YoY 4.5x

Source: NICT Note: Not Classified (2005-2014)

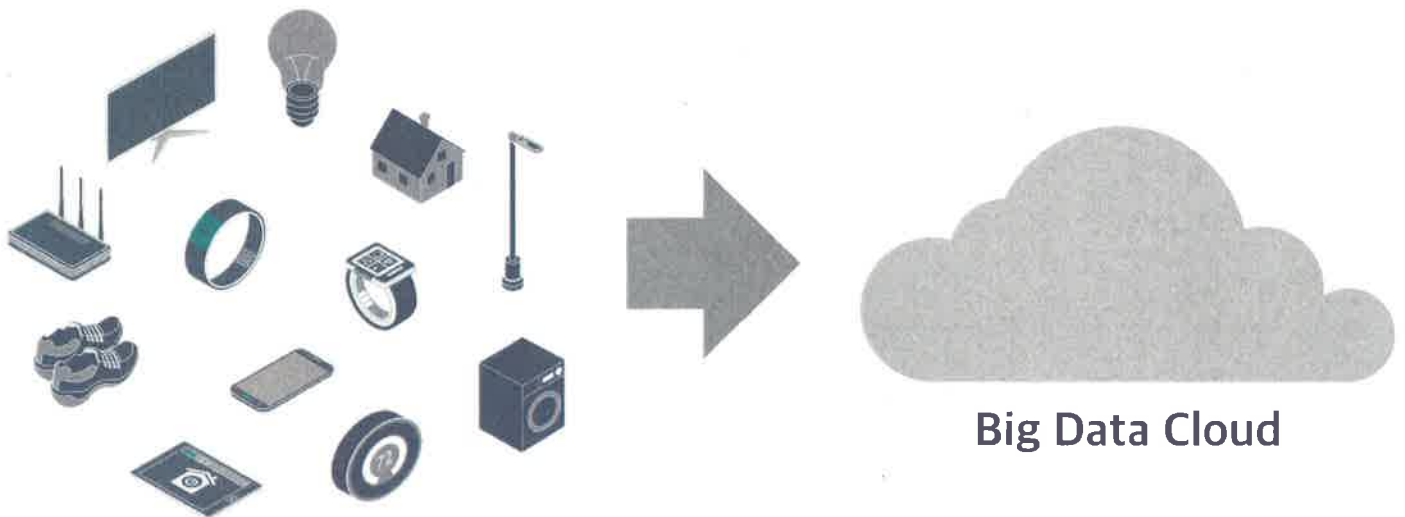


Security is essential for IoT devices

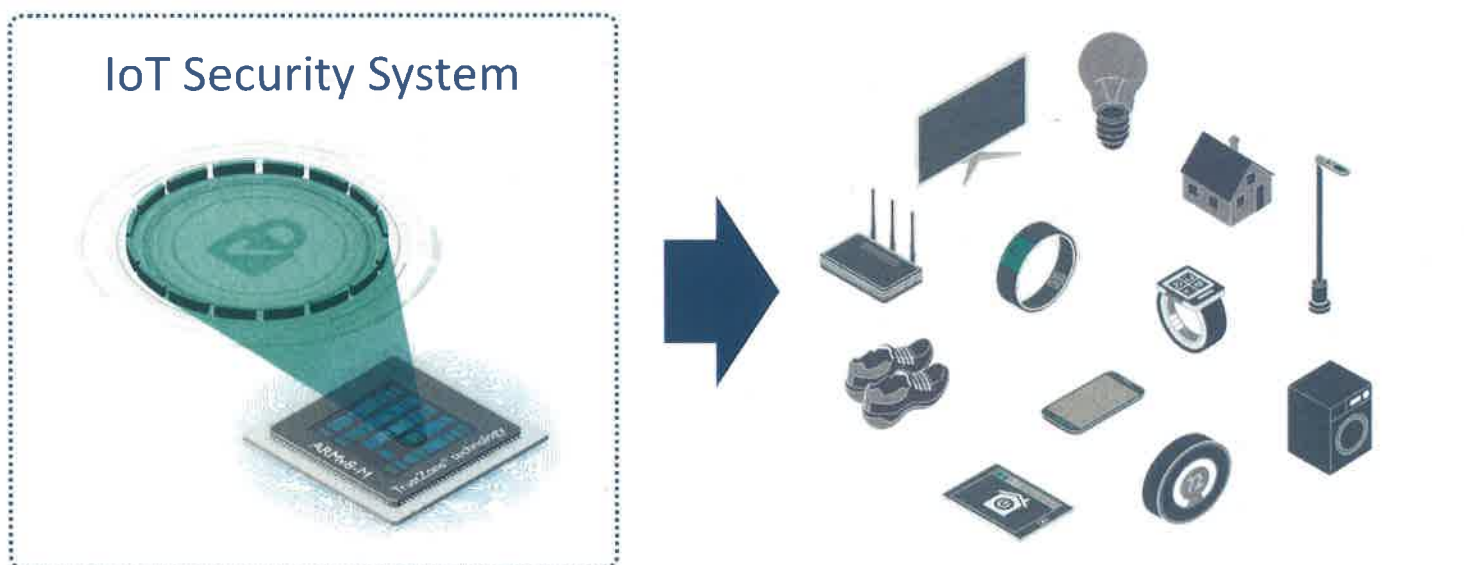


Many chips in a car





IoT devices have to be connected to cloud securely



ARMv8-M: Bringing TrustZone to all IoT devices

Key Technology to IoT Era

**ARM**

NB-IoT for Low Power Wide Area Connectivity



The diagram illustrates the architecture of an NB-IoT system. It consists of the following components and their interconnections:

- RF transceiver**: A large green block on the left representing the radio frequency front end.
- RF interface**: A narrow blue vertical bar connecting the RF transceiver to the digital front end.
- Digital front end**: A grey block that receives data from the RF interface and sends it to the offload and accelerators.
- Offload & accelerators**: A grey block that processes data and sends it to the Cortex-M processor.
- NB-IoT software**: A white box containing three green blocks labeled **Layer 1**, **Layer 2**, and **Layer 3**, representing the protocol stack.
- Cortex-M processor**: A grey block that runs the software and is connected to the AHB interconnect.
- AHB interconnect**: A wide blue horizontal bar at the bottom that connects the Cortex-M processor to the rest of the system.

ARM[®]

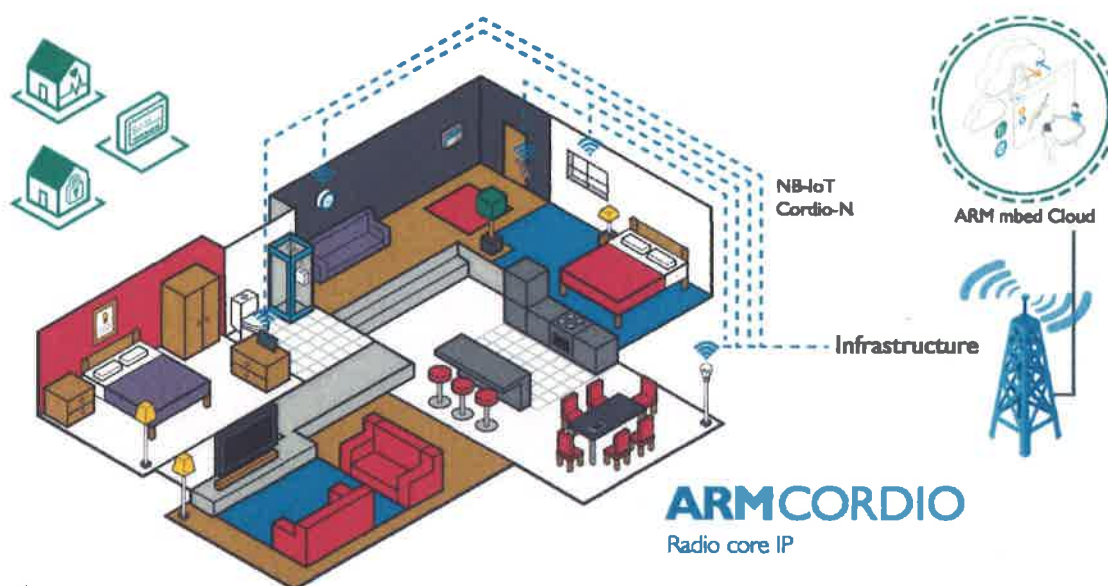
Bluetooth 5
802.15.4 mesh
NB-IoT



Bluetooth 5 + 802.15.4
Cordio-C50

26

NB-IoT: Smart Home



(Theoretical)

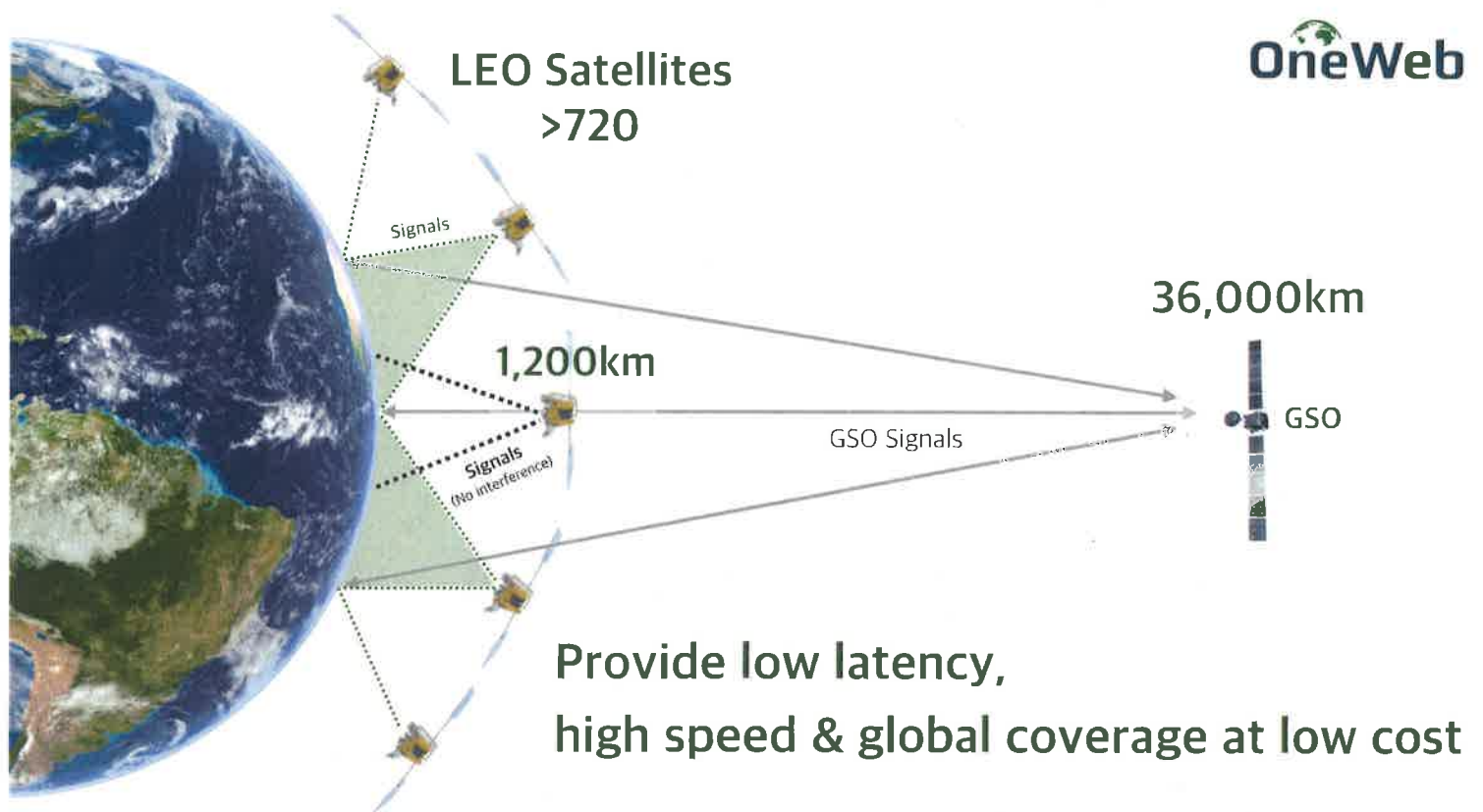


On top of that,

 **OneWeb**

Wireless Backhaul
for Ubiquitous Network





OneWeb
ACCESS FOR EVERYONE

Communication Speed

Downlink
(max.)

200Mbps

Uplink
(max.)

50Mbps

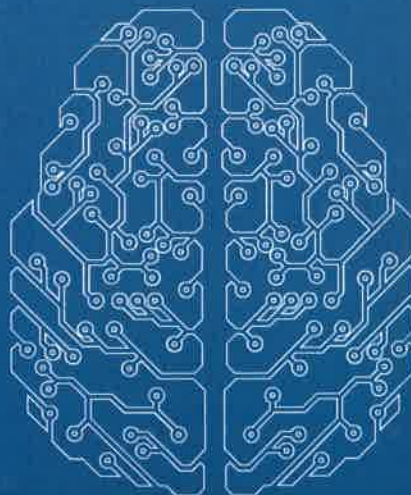


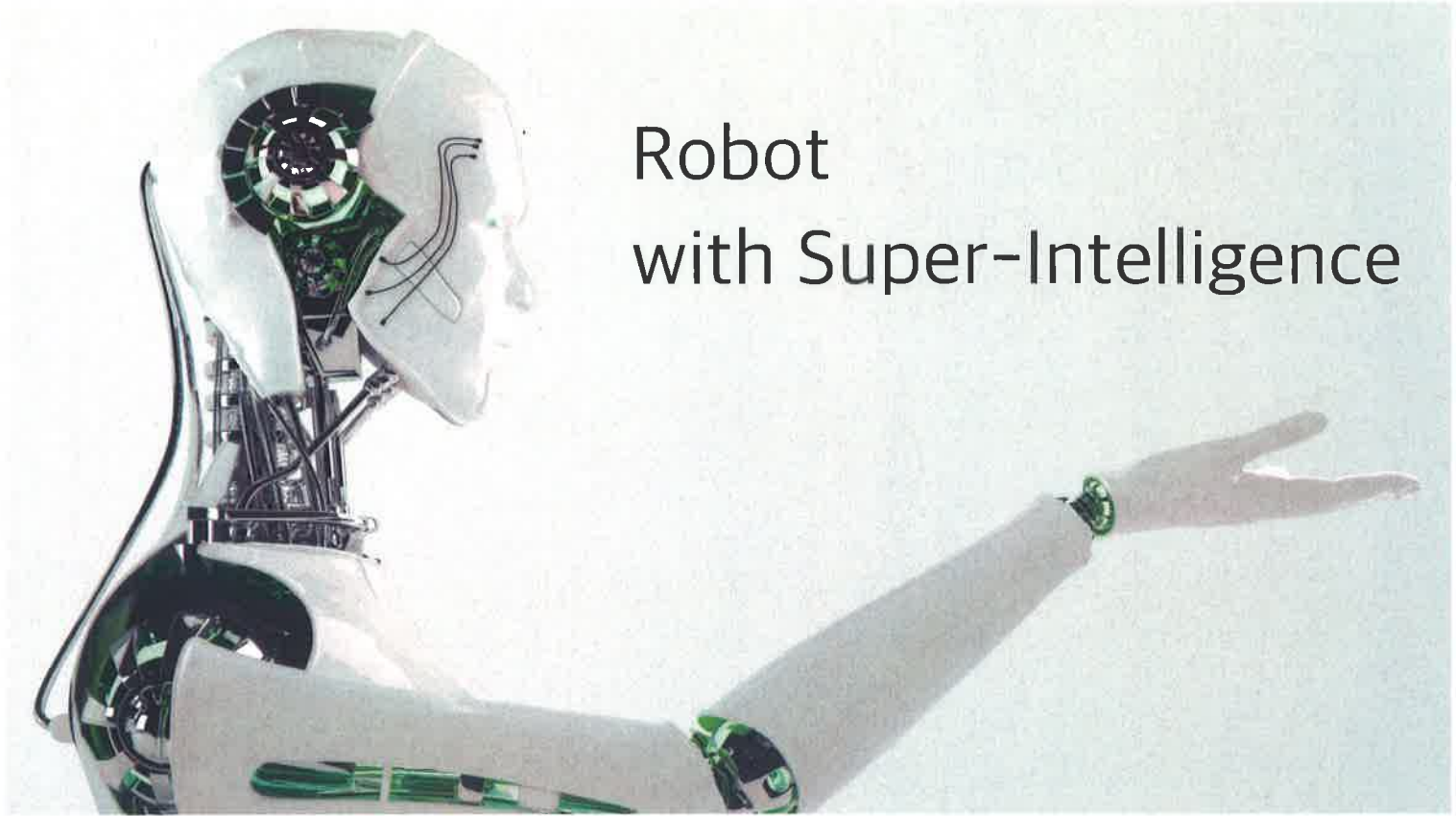


Ubiquitous Coverage for 1 bn Subscribers



Birth of Super-Intelligence





Robot with Super-Intelligence

SINGULARITY

SINGULARITY

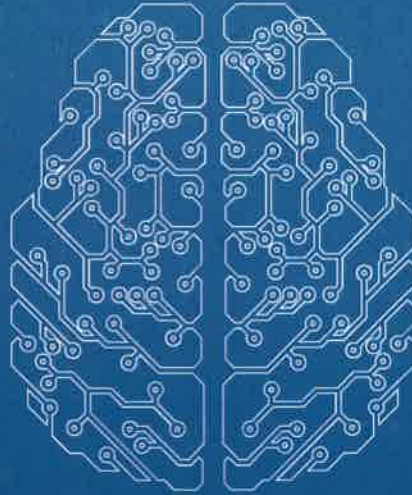
Good or Bad ?

12 Risks That Threaten Human Civilization



Source: University of Oxford

Super-Intelligence Might Solve 11 Risks



Accelerating Evolution of Human



People can
predict the future

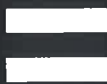


The world
will be united



Life expectancy
of over 100 years

Connectivity for Singularity

 SoftBank
Group

 **MOBILE**
WORLD CONGRESS
BARCELONA 27 FEB-2 MAR 2017

THE NEXT ELEMENT

AN EVENT OF
MOBILE &
WORLD CAPITAL
BARCELONA



Pyeongchang 5G



Moving Towards 5G



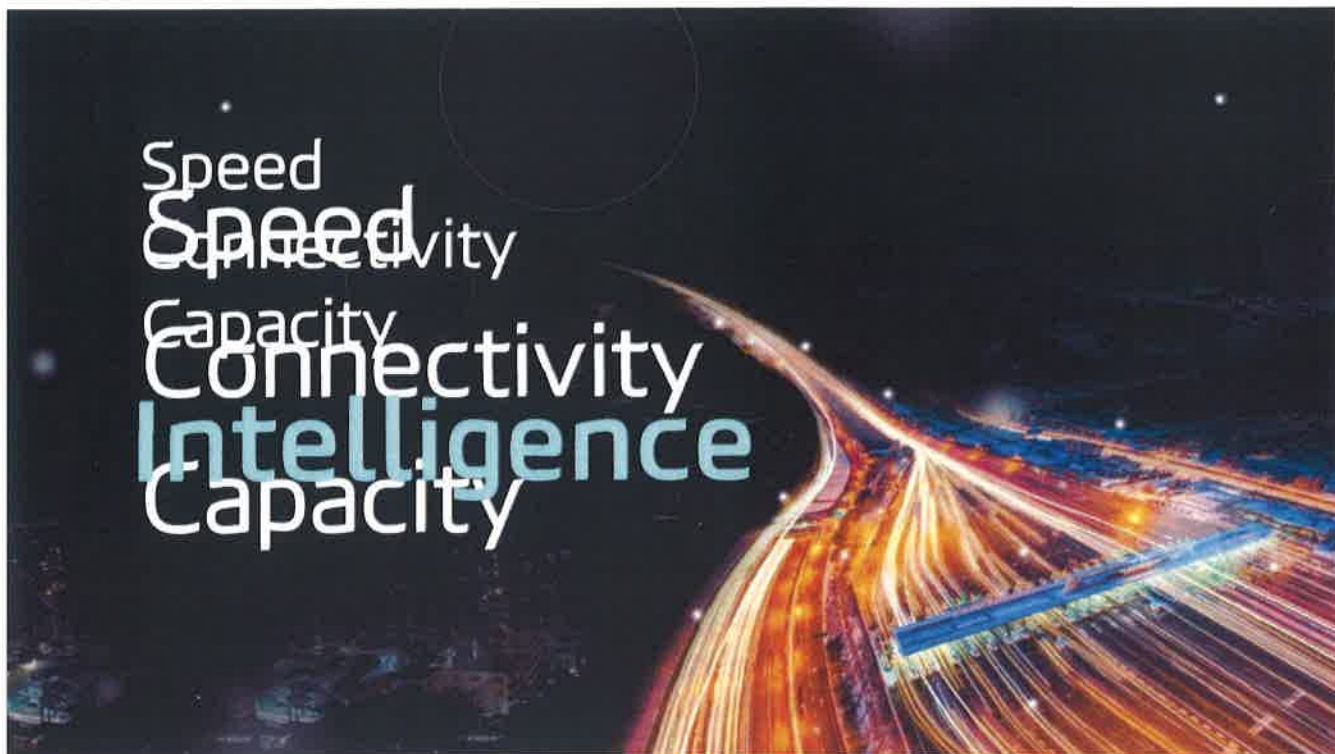


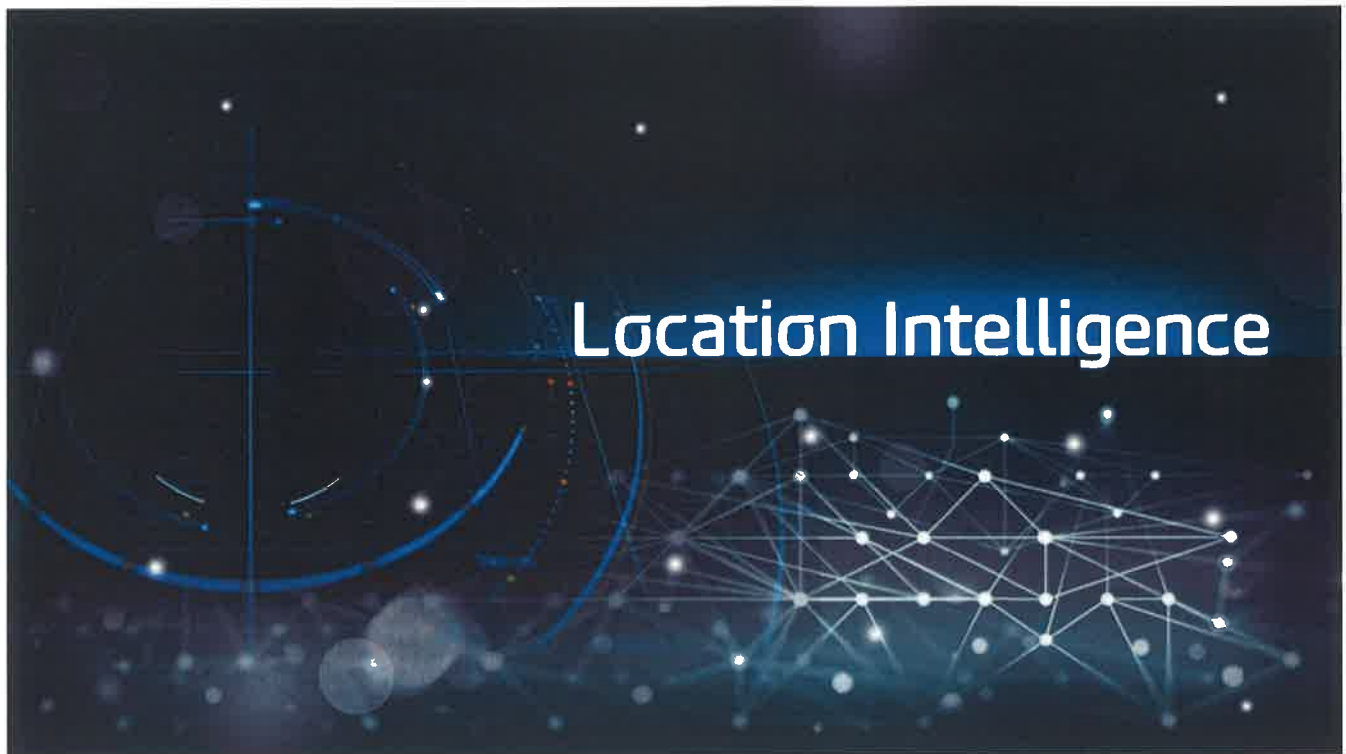
Making 5G a Reality

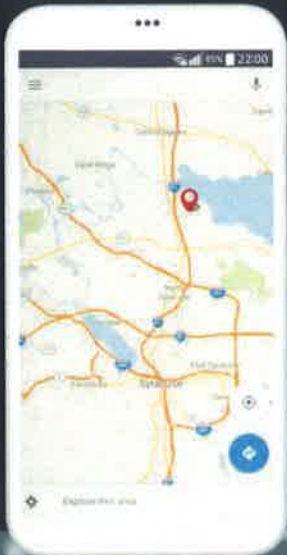












2D

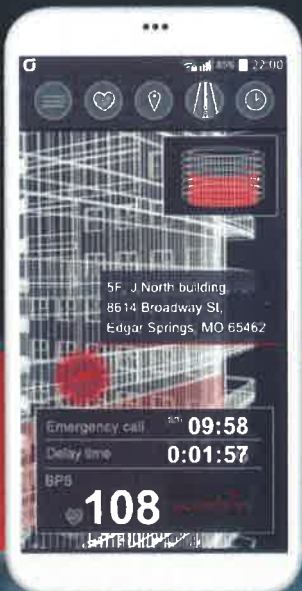
Mapping Application

Outdoors: **3~10m**

Indoors: **30m**

3D

KT GiGA
3D Locator



5F J North building
8614 Broadway St,
Edgar Springs, MO 65462

Emergency call on **09:58**
Delay time **0:01:57**
BPS **108**



BEACON

Base Station

Wi-Fi

GPS

3D

**KT GiGA
3D Locator**
radius < 1m



5F, J North building
8614 Broadway St
Edgar Springs, MO 65462

Emergency call 09:58
Delay time 0:01:57
BPS **108**



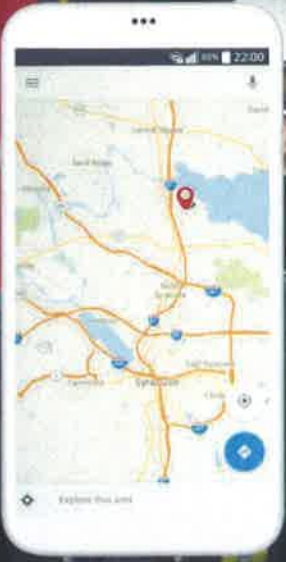
2D 3D

Mapping Application

Outdoors: **3~10m**

Indoors: **30m**

**KT GiGA
3D Locator**
radius < 1m




5F, J North building
8614 Broadway St
Edgar Springs, MO 65462

Emergency call 09:58
Delay time 0:01:57
BPS **108**

Network coverage
50 km

Network coverage
200 km

EMERGENCY

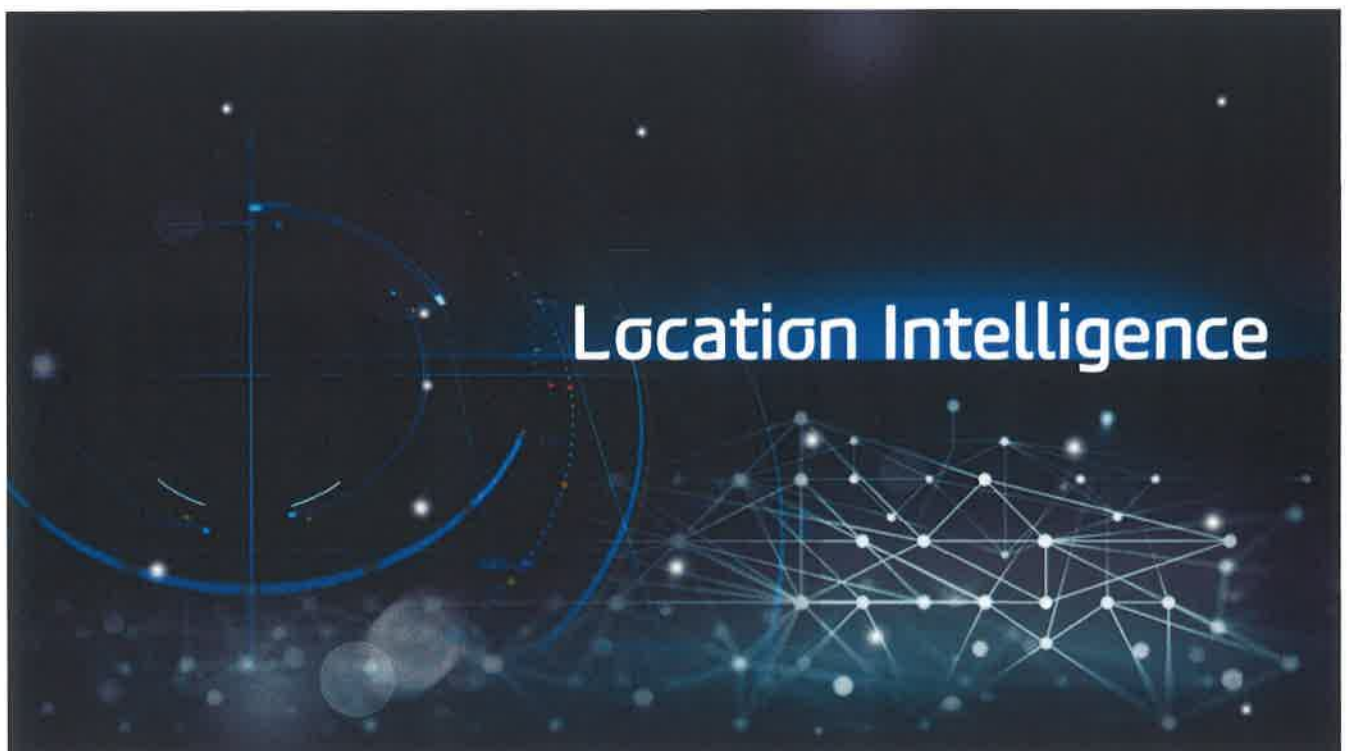
Over The Horizon Antenna
Satellite Life Jacket

GPS

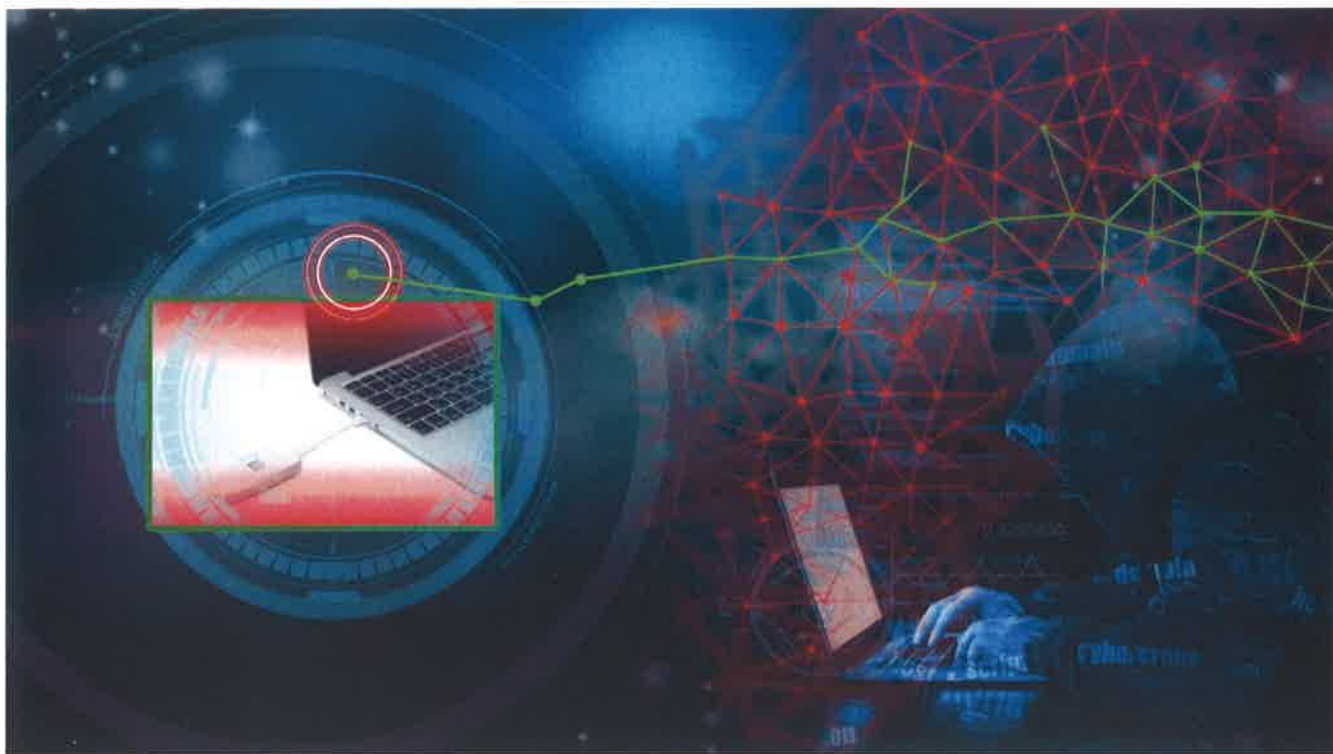
HEART RATE

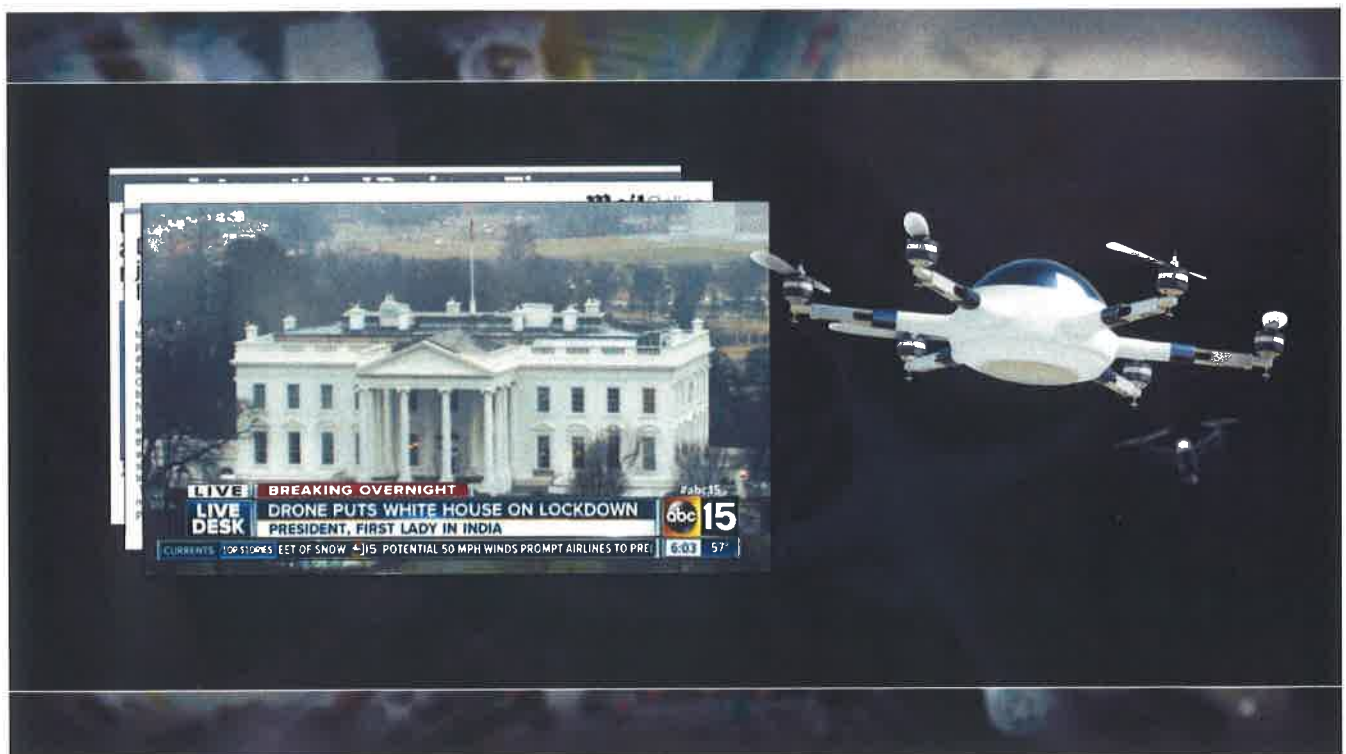
TEMPERATURE
33











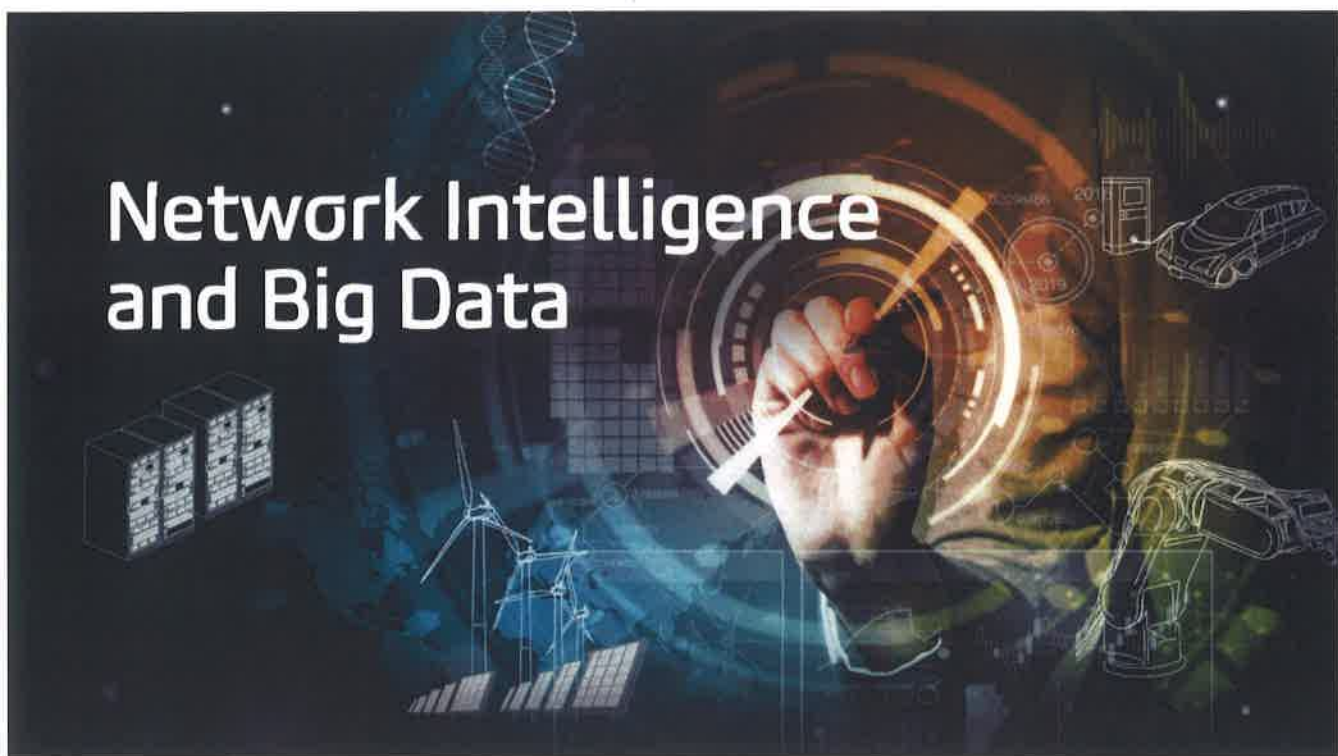




Network Intelligence and Big Data



Network Intelligence and Big Data















World's First
5G
in 2019

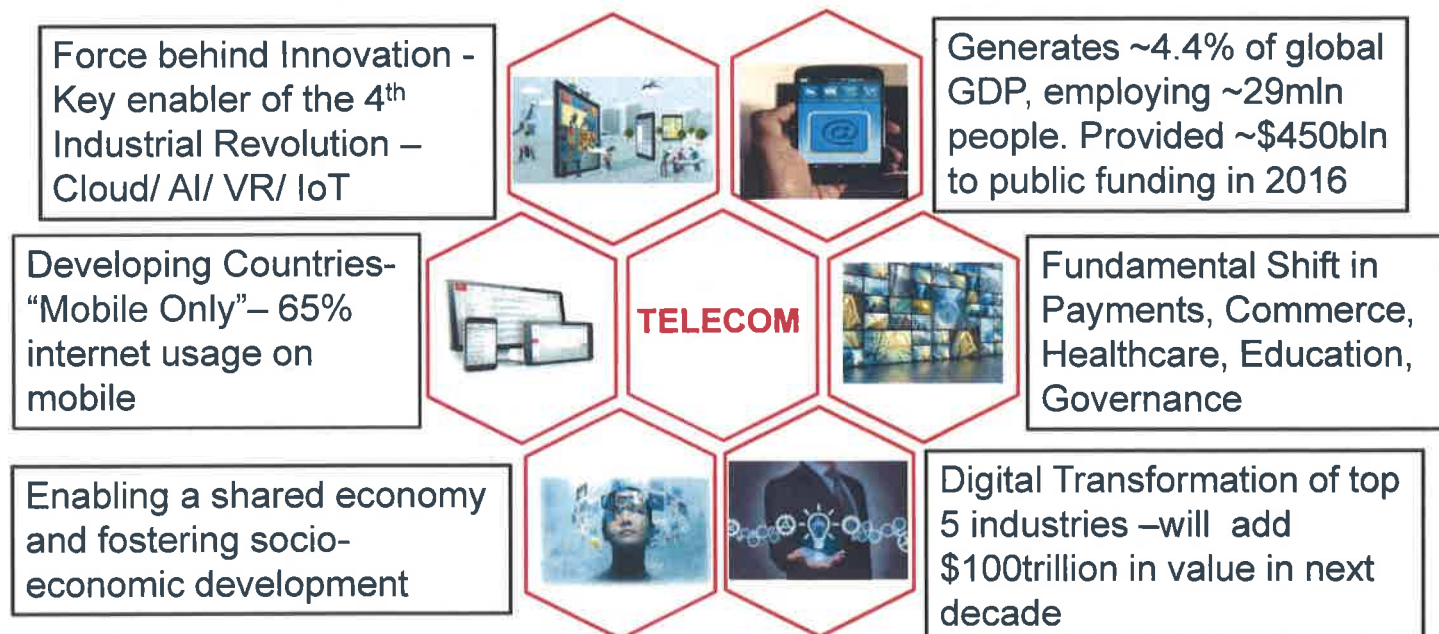
Economic value by 2035
\$12.3 Trillion

Source : IHS Markit 'The 5G Economy Report' (January 2017)



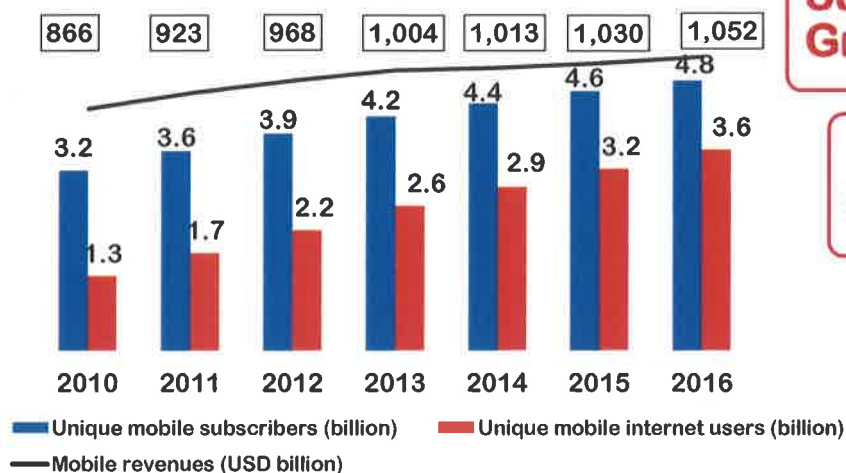


CORE OF DIGITAL LIFE



SNAPSHOT

Subscriber Base and Revenues



Subscriber Growth: +7%

Data User Growth: +18%

Operator Revenue Growth: +3%

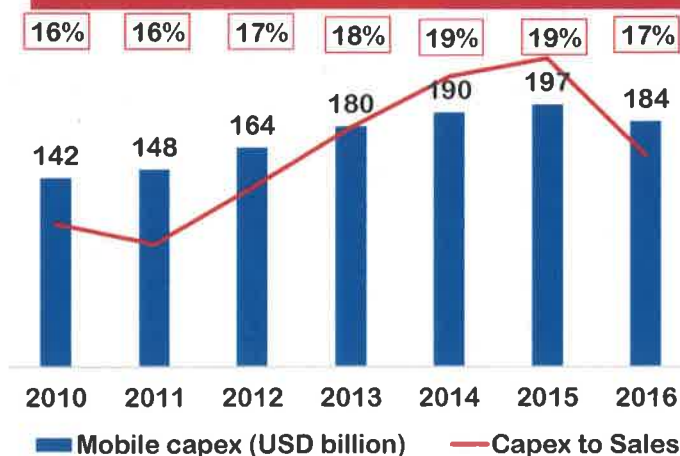


However, telecom at cross roads...

Source: GSMA Intelligence

OPERATOR INVESTMENTS CONTINUE

Annual Industry Capex and Capex/Sales



Industry spending ~\$200bln each year in Capex

Cumulative Capex since inception: \$2.25 trillion



Source: GSMA Intelligence

DECLINING INDUSTRY RETURNS

Industry Market Cap and Returns



Stagnant
market cap

Declining
ROCE

Heavy hand of
the exchequer



Source: Bloomberg

MWC

