

The year LTE became the wireless standard



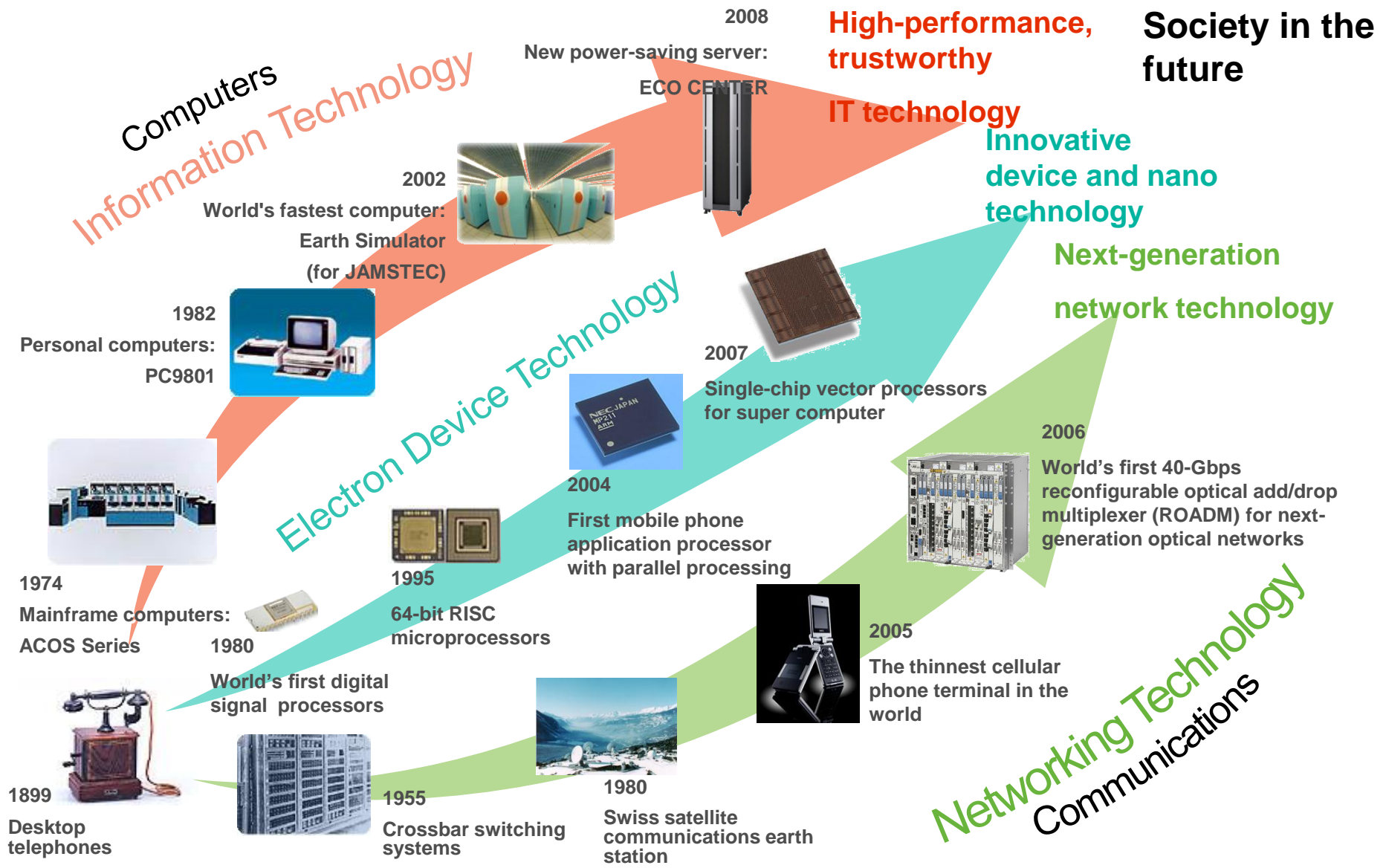
November, 2013

Agenda

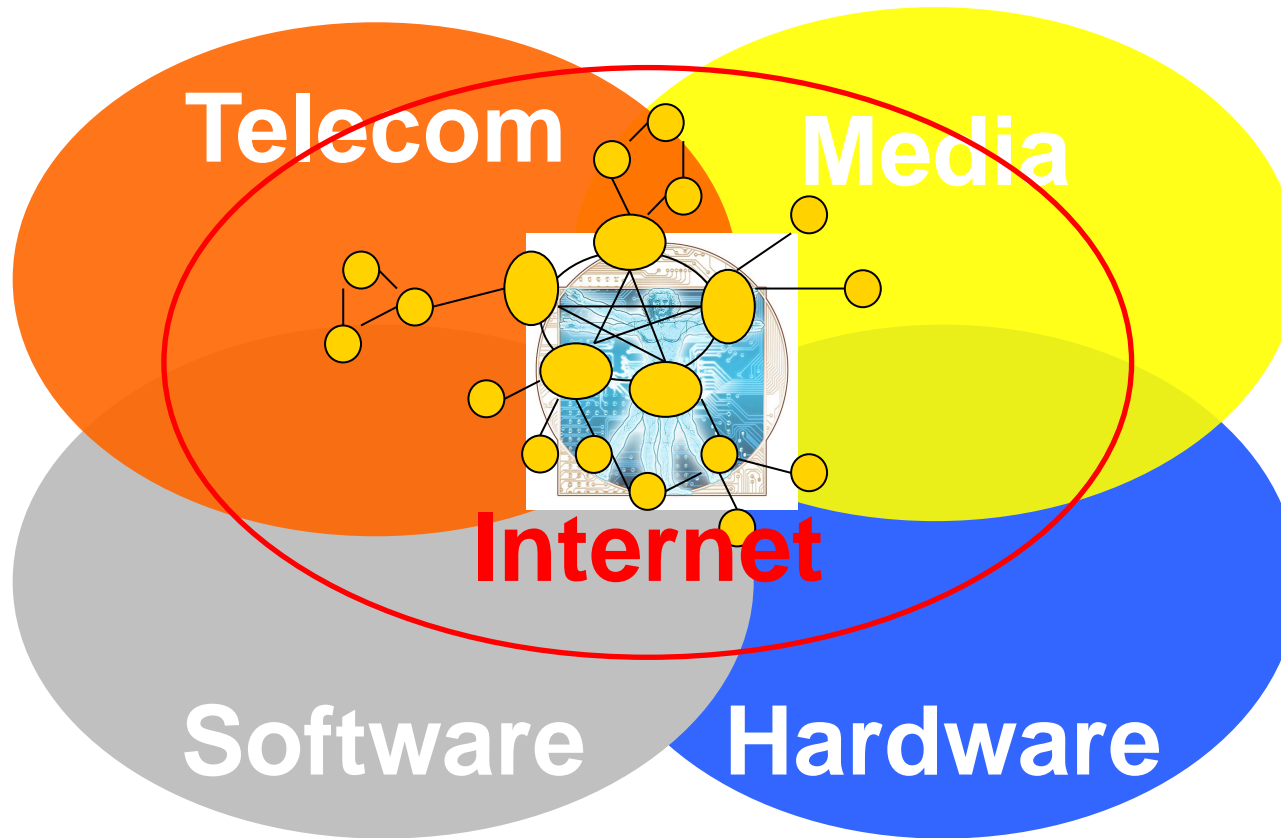
- Digital trends
- Mexican digital demographics
- Why LTE?
- LTE in LATAM & Mexico
- The future

Digital trends

A History of C&C Innovation



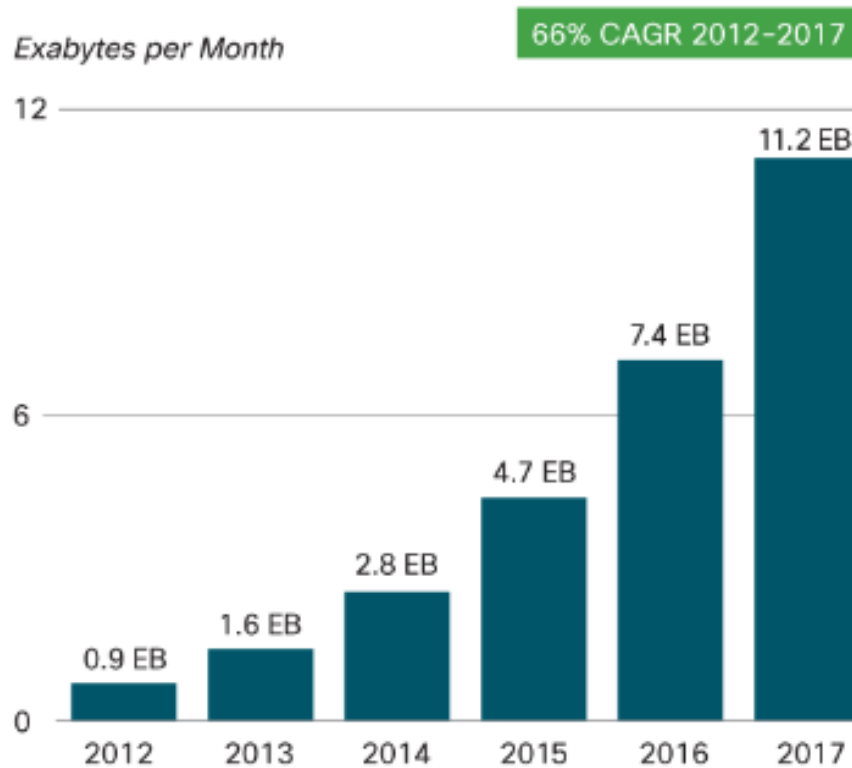
Convergence is driven by customers, with the Internet as innovation platform



Source: NEC Mexico strategic planning.

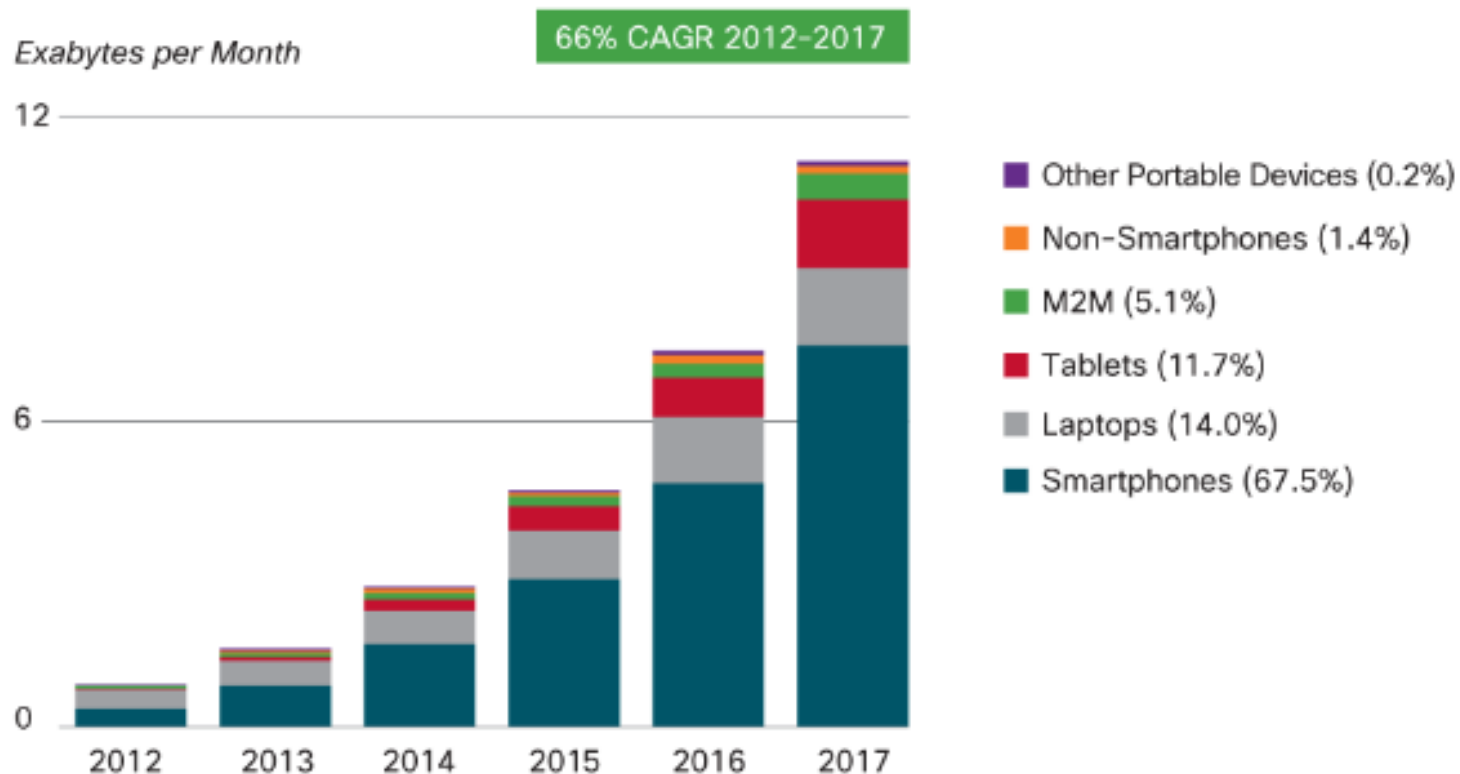
Mobile data will grow >60% in average for the next four years

Figure 1. Cisco Forecasts 11.2 Exabytes per Month of Mobile Data Traffic by 2017



Source: Cisco VNI Mobile Forecast, 2013

Smartphones will reign in the mobile world

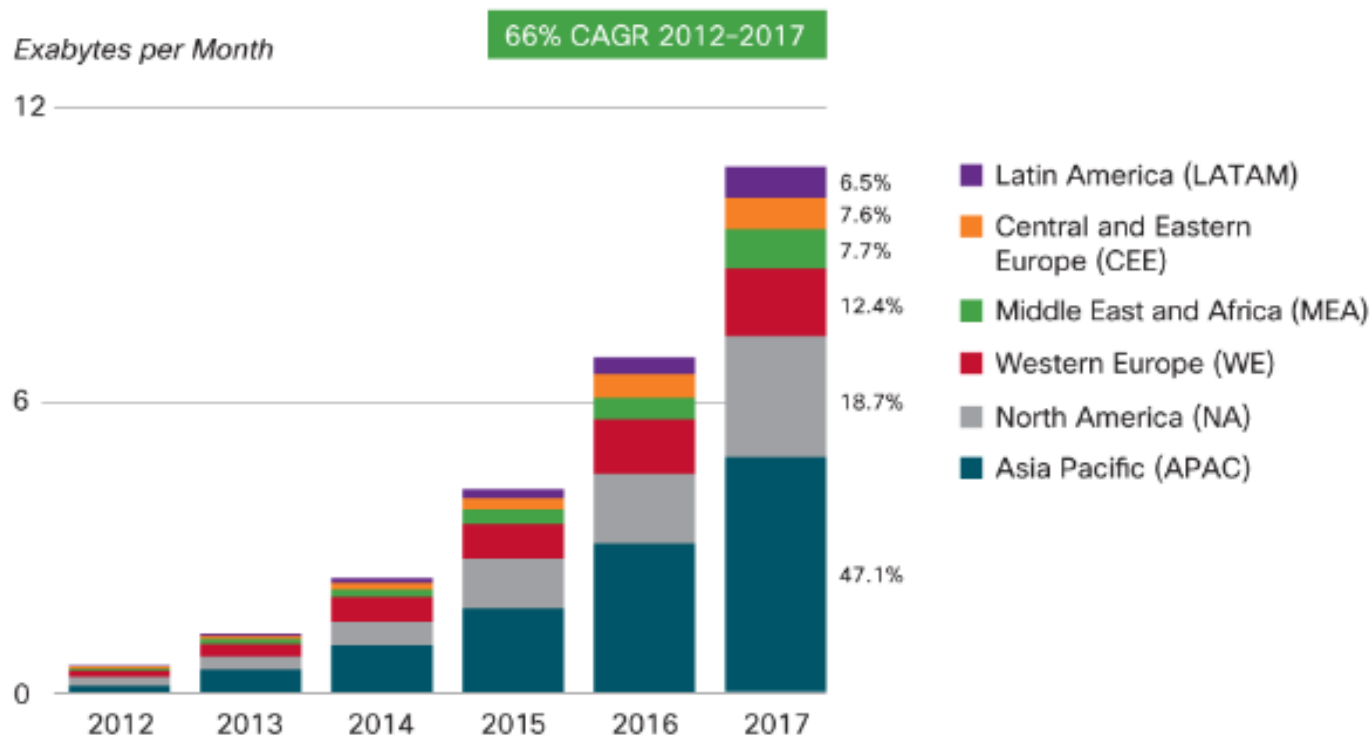


Figures in legend refer to traffic share in 2017.

Source: Cisco VNI Mobile Forecast, 2013

By 2017 LATAM mobile traffic still relatively low vs. NA

Figure 2. Global Mobile Data Traffic Forecast by Region

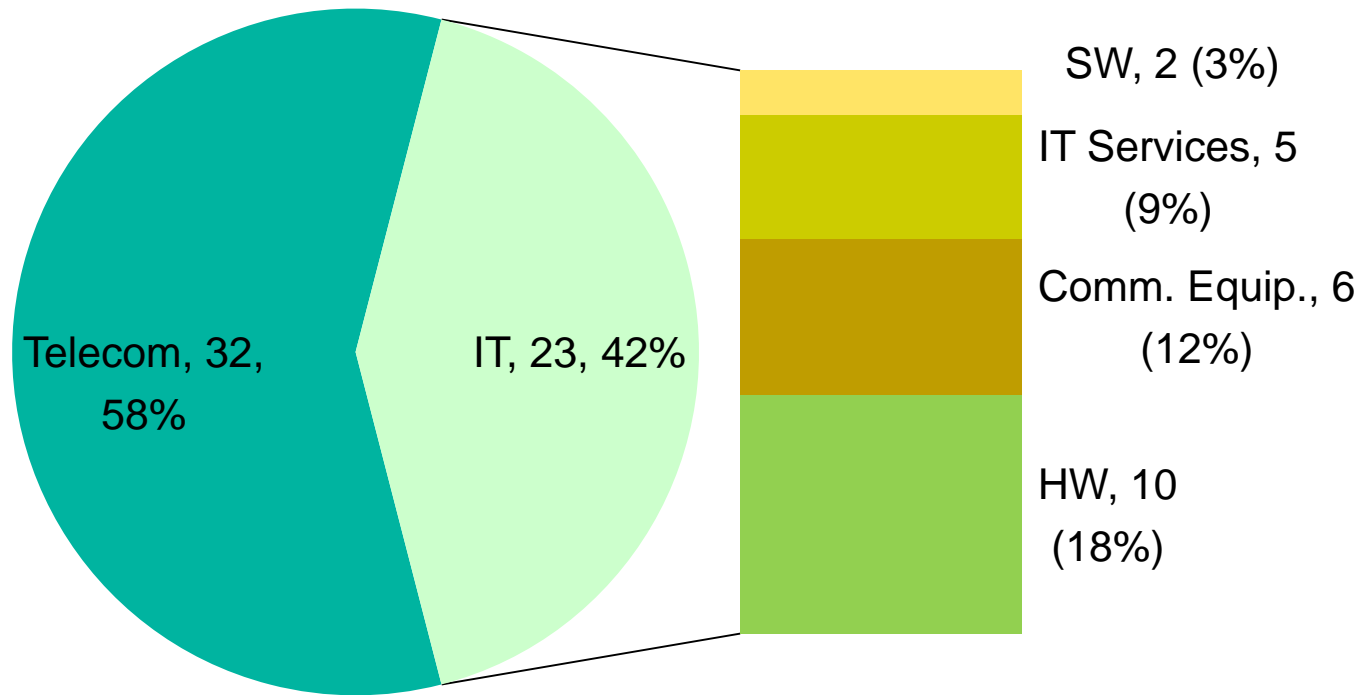


Source: Cisco VNI Mobile Forecast, 2013

Mexican digital demographics

Mexican ICT market: Huge opportunities

Mexico ICT Market Size in USD billion, 2012*

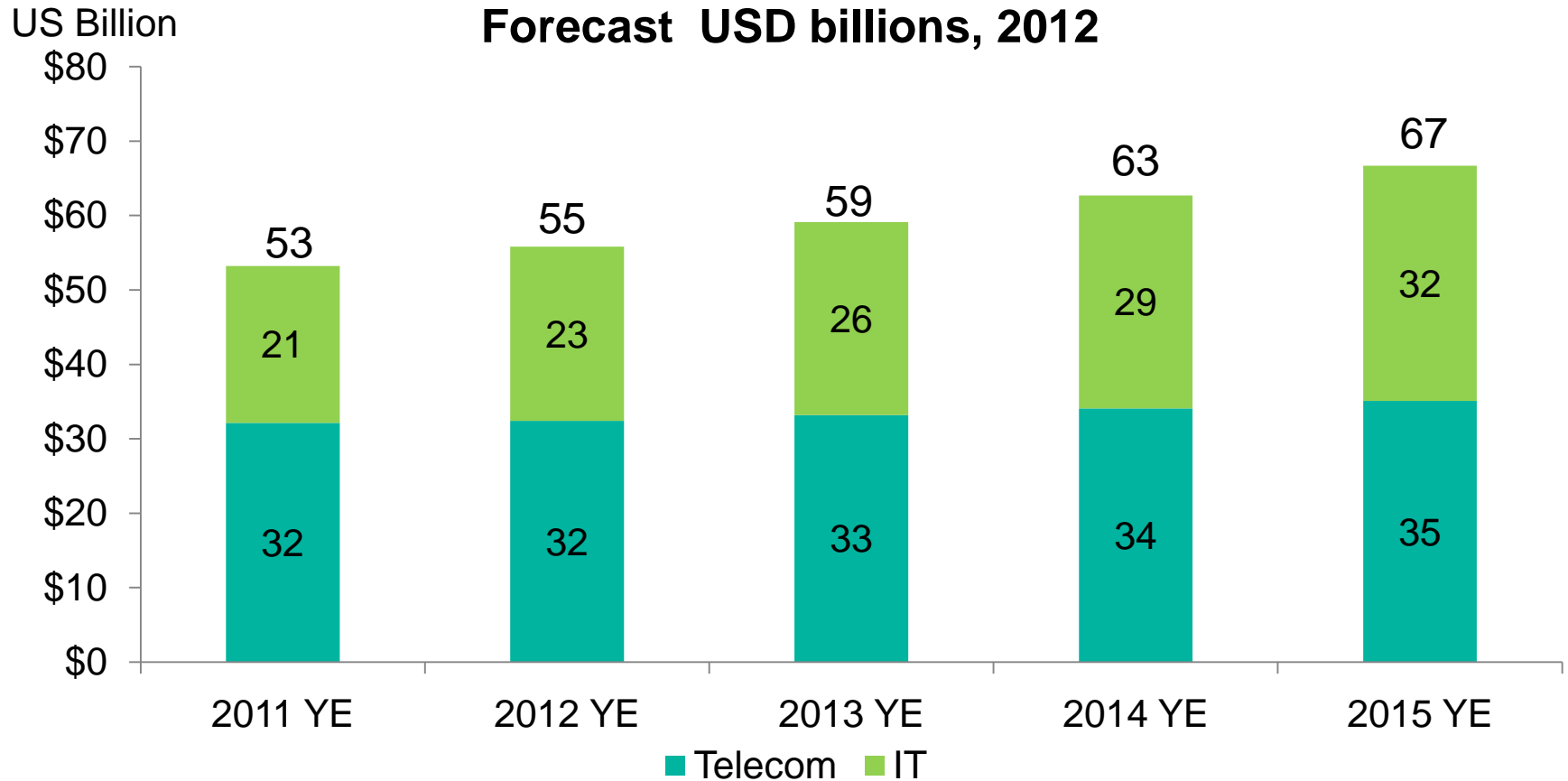


Total ICT market : \$56 USD billion

Telecom Services represent two thirds of the ICT total

ICT sector size 2010-2015

Mexico, Telecom and IT Market, Forecast USD billions, 2012



IT is growing faster than Telecom.

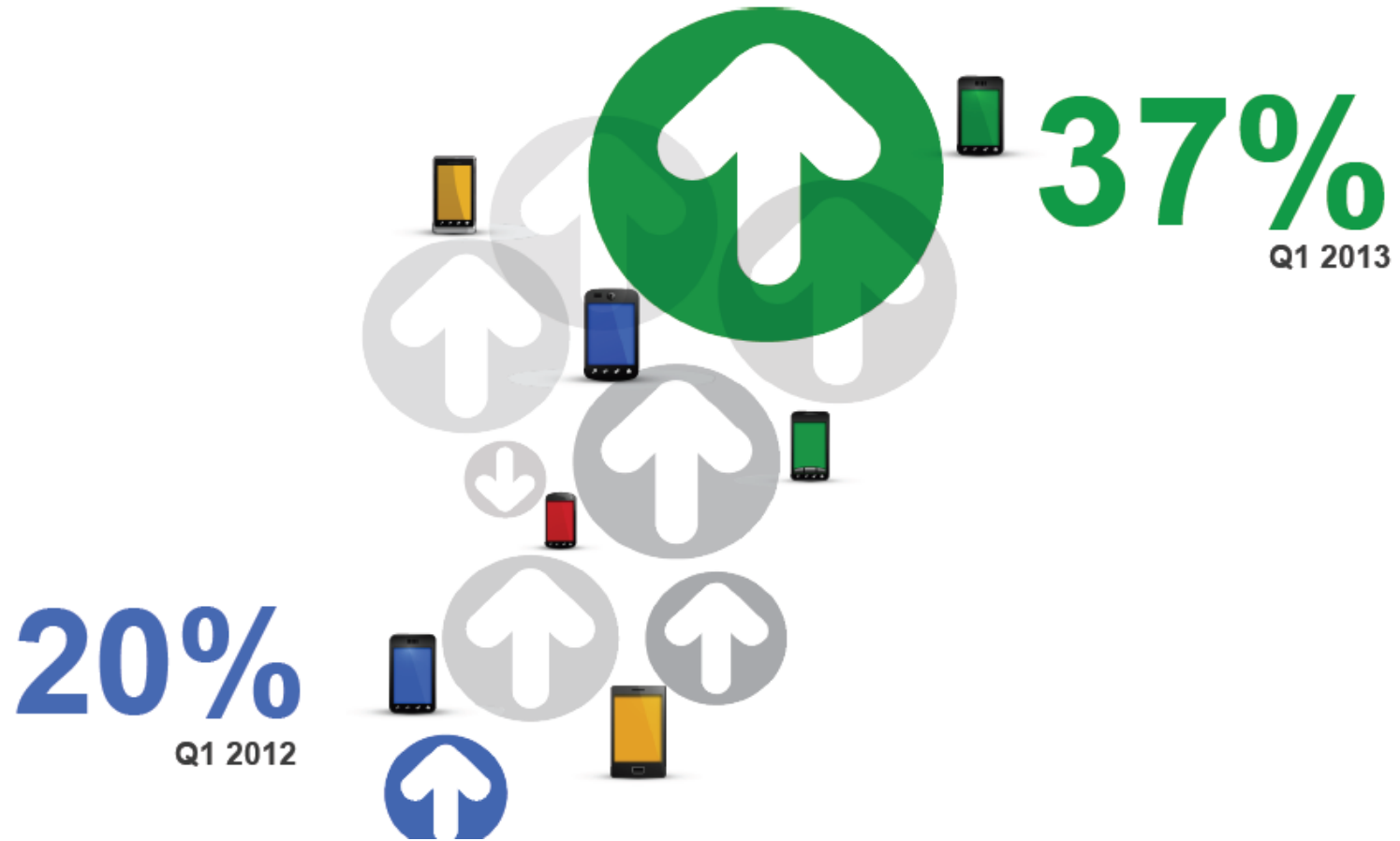
Source: The CIU, 2012

Mexican digital demographics

- 1) 100 million mobile subs
- 2) 47 million Internet subs
- 3) 15 million mobile broadband subs
- 4) 70% Internet accesses through mobile devices
- 5) 4 hours spent per day in average
- 6) 3 hours per day in smartphones
- 7) 3 apps downloaded per user in the last 6 months

Source: COFETEL, IAB, 2013.

Smartphone penetration almost doubled this year



Source: Our mobile planet Mexico, Google, 2013.

Smartphones became extensions of our physical body

Smartphones Have Become so Important to Consumers that ...

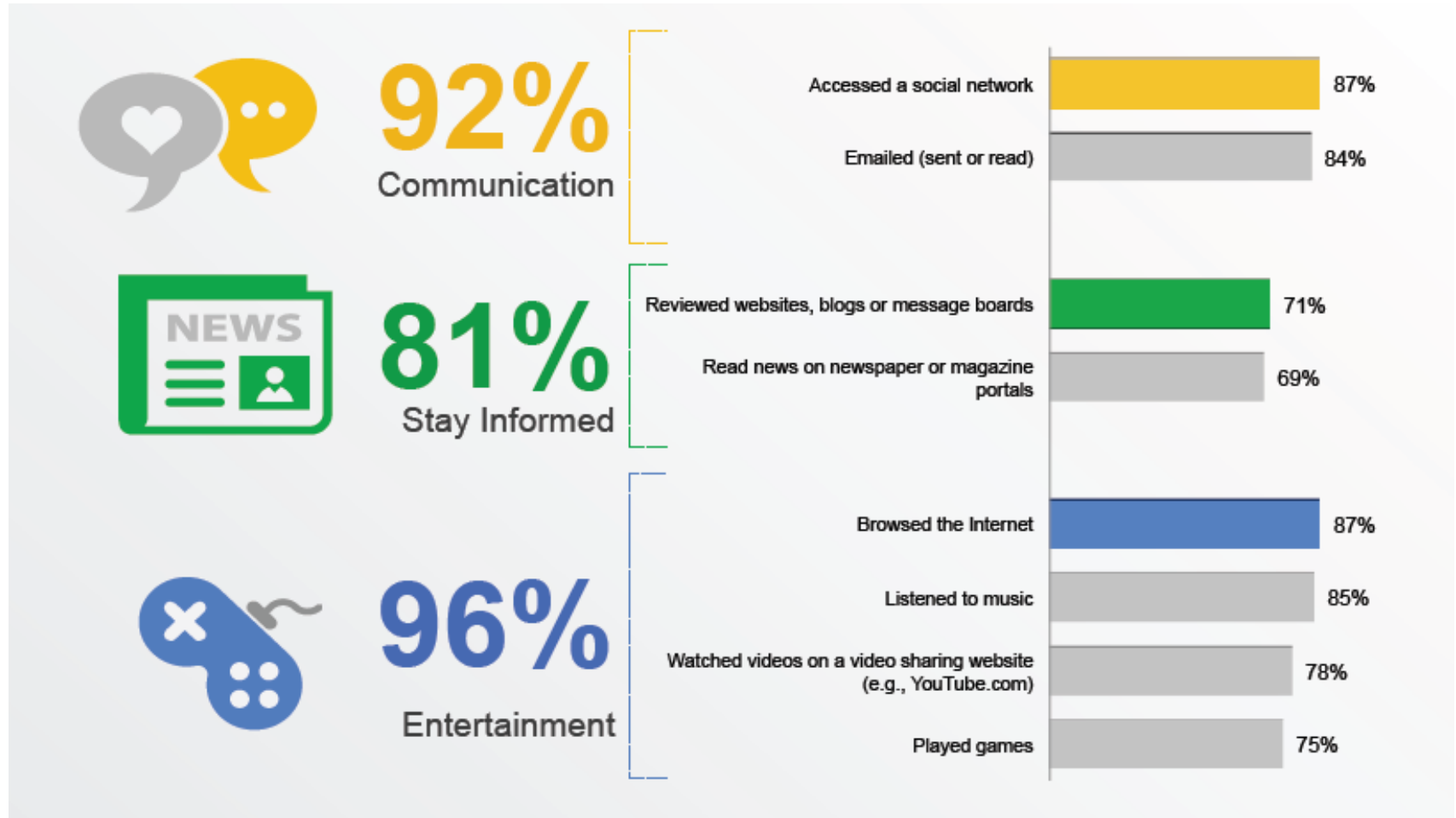
40%

would rather give up
TV than their smartphone



Source: Our mobile planet Mexico, Google, 2013.

We use the smartphones for comms + infotainment



Source: Our mobile planet Mexico, Google, 2013.

Mexican online adults are apps addicts

App Usage is Ubiquitous



21

apps installed
on average

10

apps used in the
last 30 days

4

paid apps installed
on average

Source: Our mobile planet Mexico, Google, 2013.

Half of us watch videos at least once per day

Smartphones Users are Avid Video Watchers



Source: Our mobile planet Mexico, Google, 2013.

We use the device to socialize

Smartphone Users are Frequent Social Networkers

97%

visit social
networks

82%

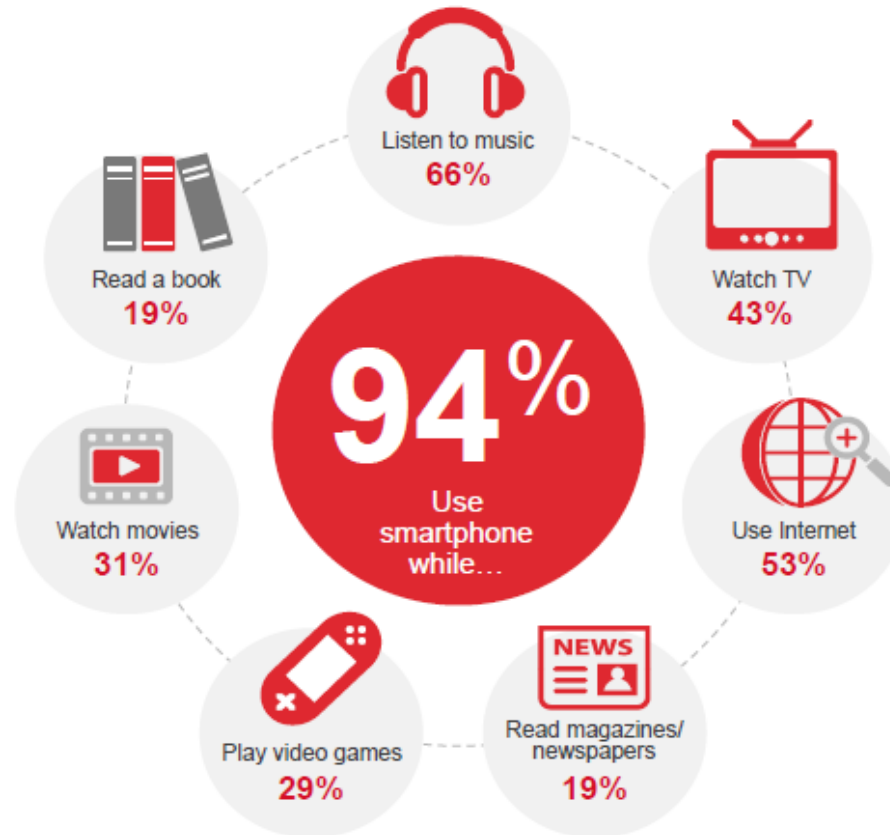
visit at least
once a day



Source: Our mobile planet Mexico, Google, 2013.

Smartphones are becoming the central screen

Smartphones Are Used While Multi-tasking with Other Media



Source: Our mobile planet Mexico, Google, 2013.

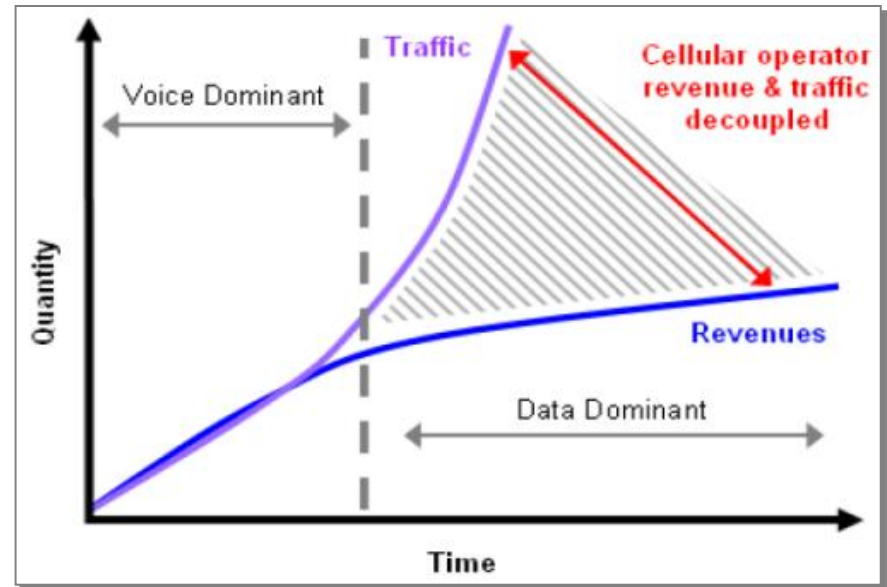
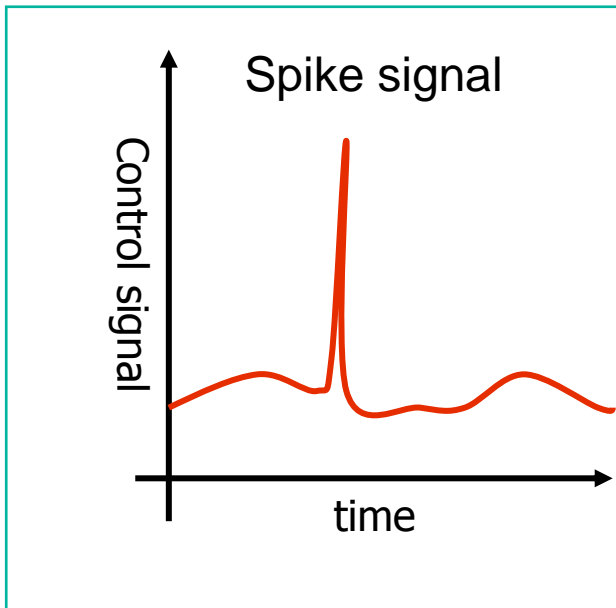
Why LTE?

Mobile networks traffic issues

■ Traffic problems required increased investments in 3G/ LTE network elements

■ Disturbance caused by smart phones applications (spike signal)

■ Gap between Traffic and Revenue growth



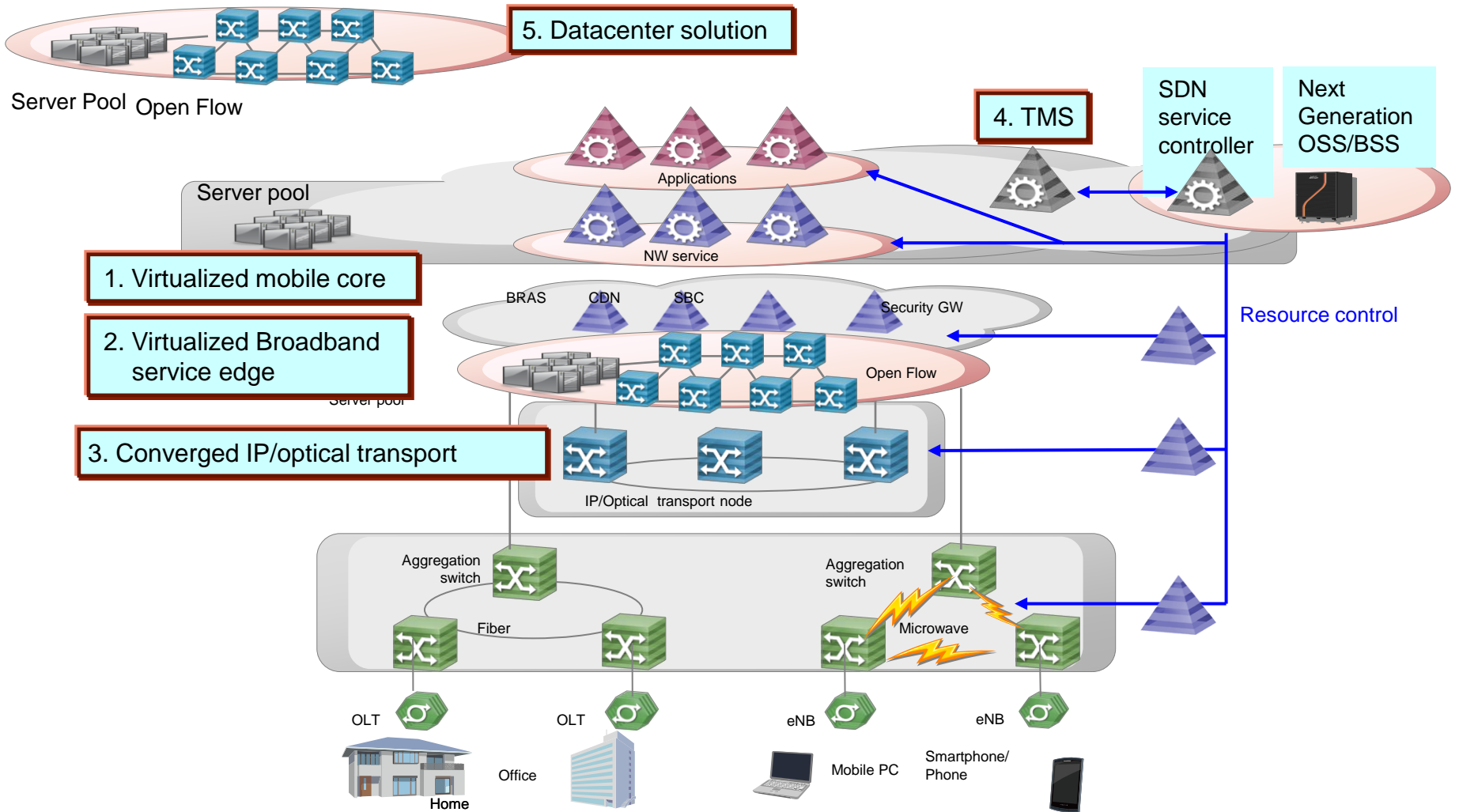
Source: NEC Mexico strategic planning.

Possible solutions

- 1) Traffic management system
- 2) 3G Femto with satellite backhaul
- 3) LTE macro and small cells deployment

Source: NEC Mexico strategic planning.

Future networks topology: Virtualized networks

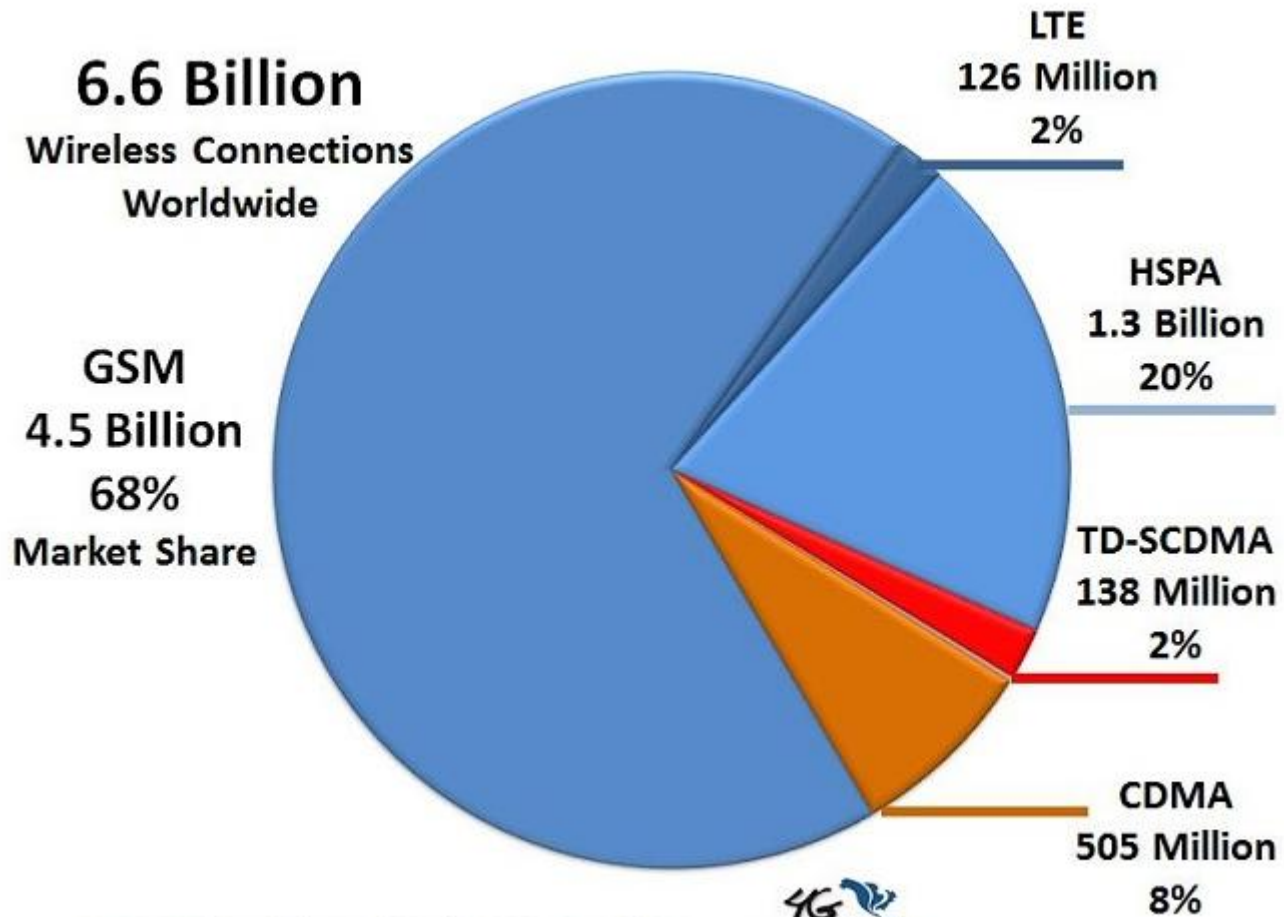


Source: NEC Mexico strategic planning.

LTE in LATAM & Mexico

LTE still in its infancy

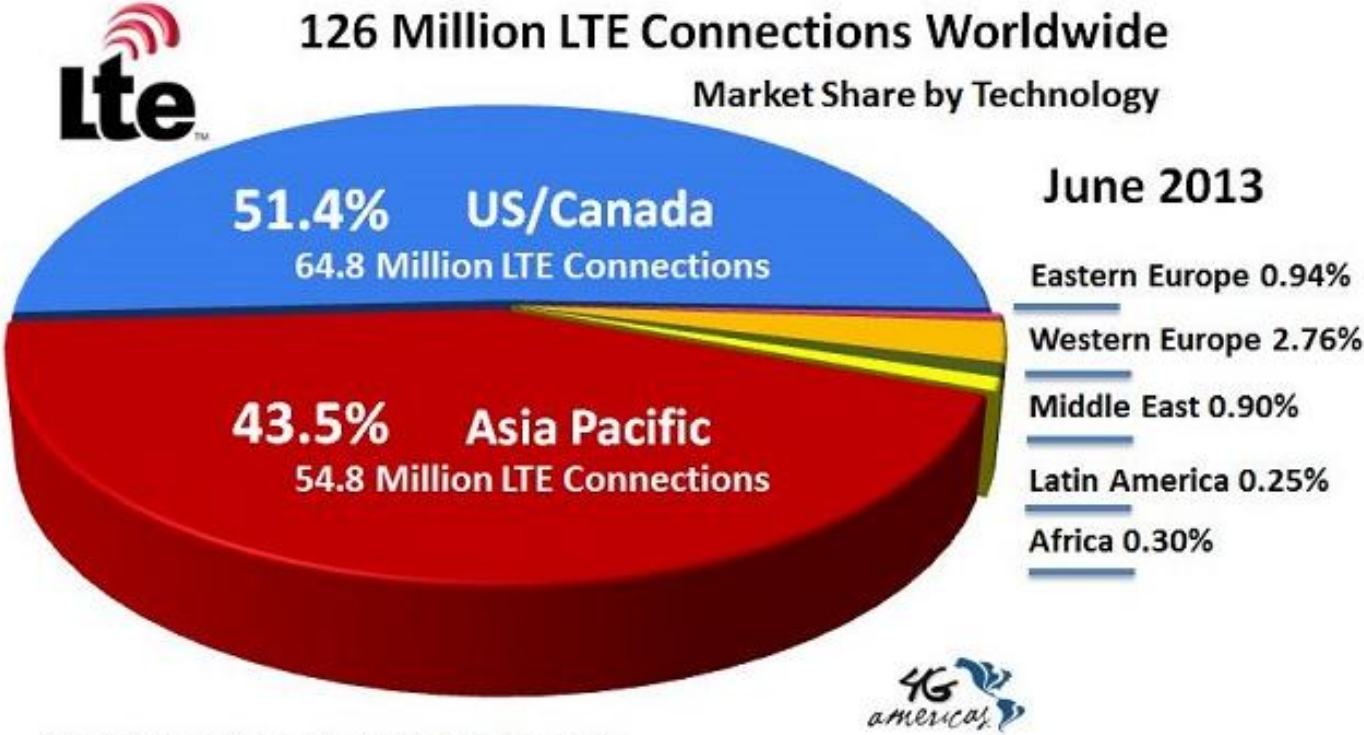
Mobile Market Shares by Technology



Source: Informa Telecoms & Media, WCIS+ June 2013

...and LATAM represents less than 1% of LTE subs

Global LTE Connections



...But operators in the region are showing commitment to LTE

LTE Networks in Latin America

LTE in Latin America & Caribbean



27 Commercial Networks in 13 countries



Band (MHz)	Networks
2500-2690	9
1700/2100	7
700	4
1900	3
1800	3
850 / 1900	1

Data as of 14 November 2013

*Indicates TDD networks
 All remaining networks are FDD

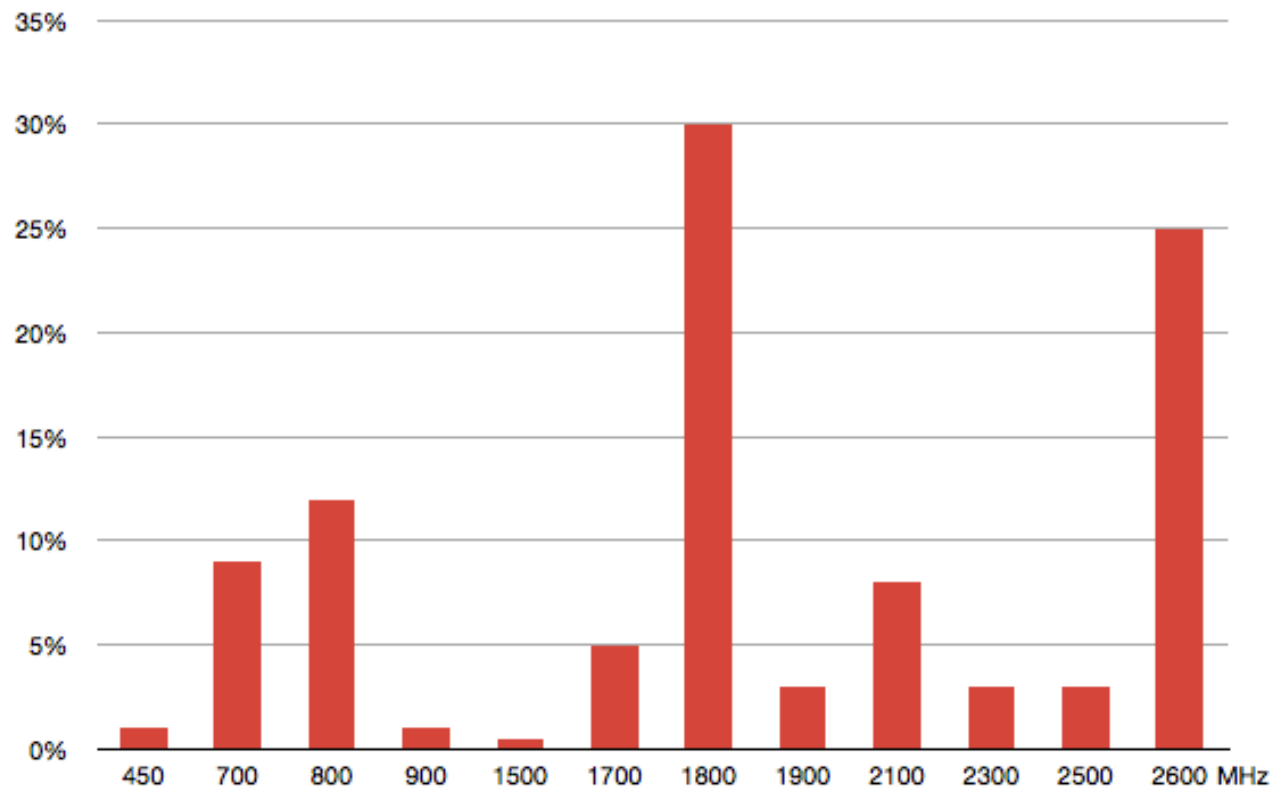
Source: Public Announcements, Regulatory Bodies

www.4gamericas.org



Operators LTE deployments in 700 MHz

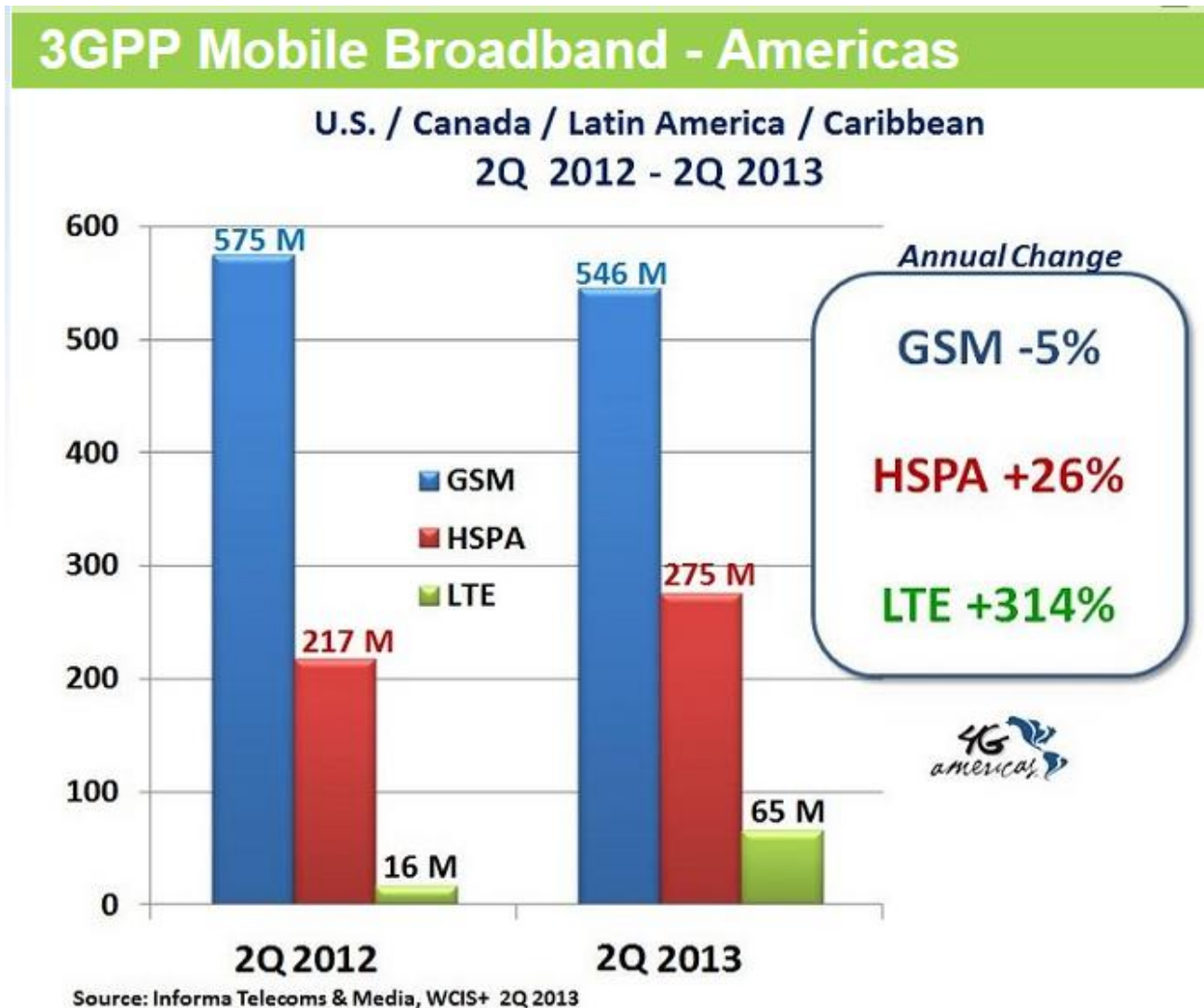
- Private: 18
- Government: 1 (Mexico)



% frequency bands (MHz) used in global LTE deployments, as of July 2013

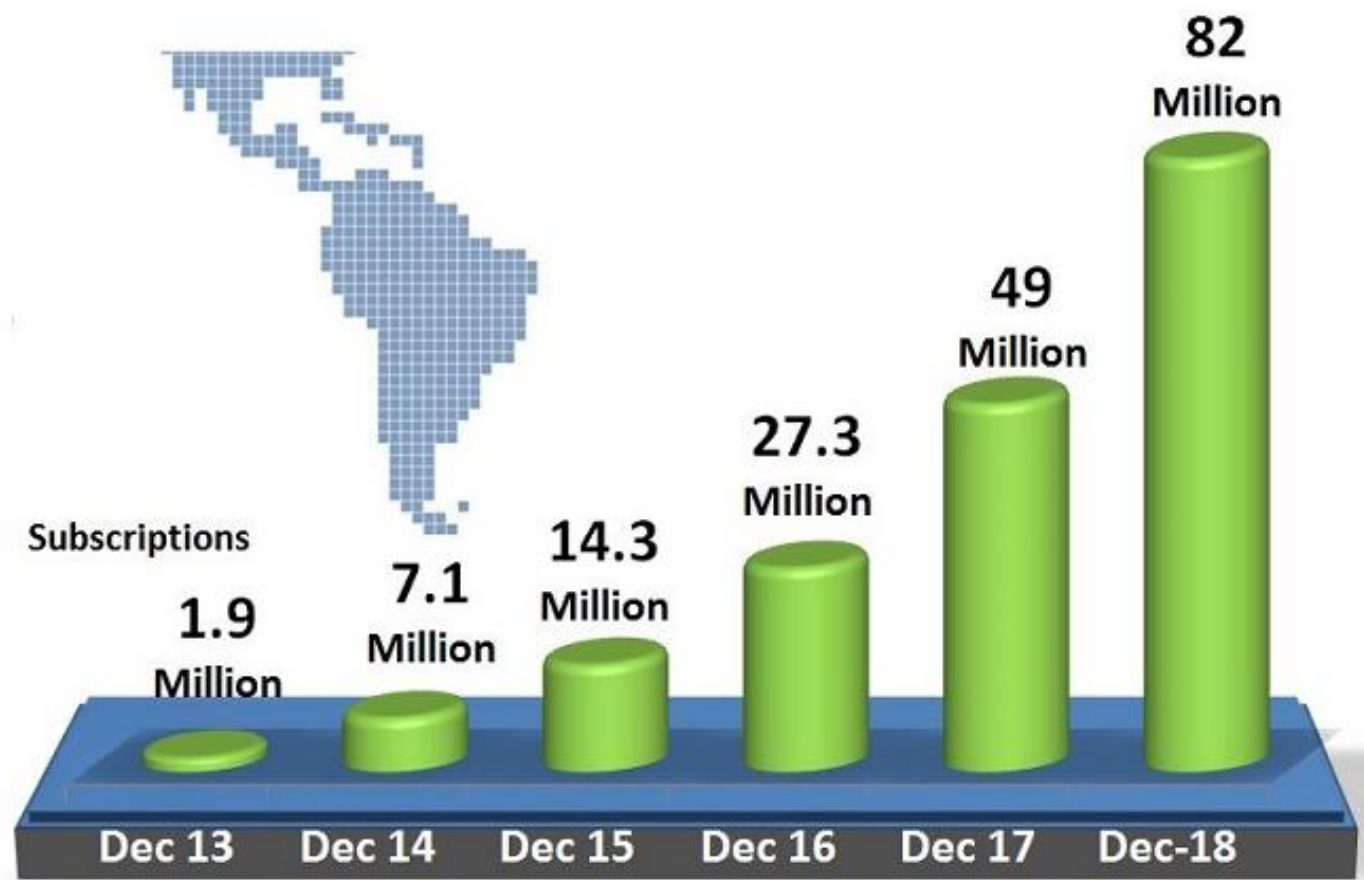
Source: GSMA Intelligence

...In the Americas, this year GSM subs will fall and LTE will grow at an impressive rate



In LATAM & Caribbean, LTE will grow at a 112% CAGR for the next five years

LTE Forecast for Latin America & Caribbean

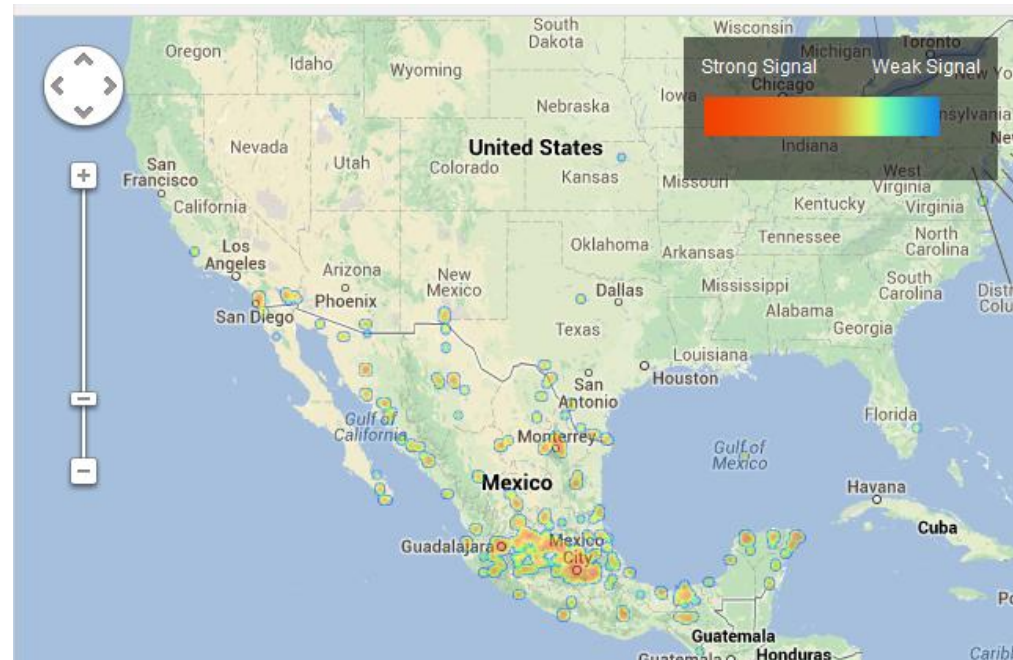


Source: Informa Telecoms & Media, WCIS+ Forecast, July 2013

www.4gamericas.org

What about LTE in Mexico in 2013?

- 1) 26 cities
- 2) 2 operators
- 3) Business districts and high density areas
- 4) Average speed (download): 11 Mb/s
- 5) Average speed (upload): 8 Mb/s
- 6) Investment: US\$1B
- 7) >1M users, all postpaid



Source: Opensignal.com, Informa.

Wireless in the near future: 5G

- 5G technologies will allow 100 Mb/s download speed
- Serve a 5 billion devices market
- Apps with low latency that will pose high demand to the mobile networks

The future

“Exponential growth looks like nothing is happening, and then suddenly you get this explosion at the end”

The Singularity is Near, Ray Kurzweil, 2004

The universe is very complex

Today we know that the universe is mainly comprised of dark energy and dark matter (95%), it is anomalous and is not subject to universal laws.

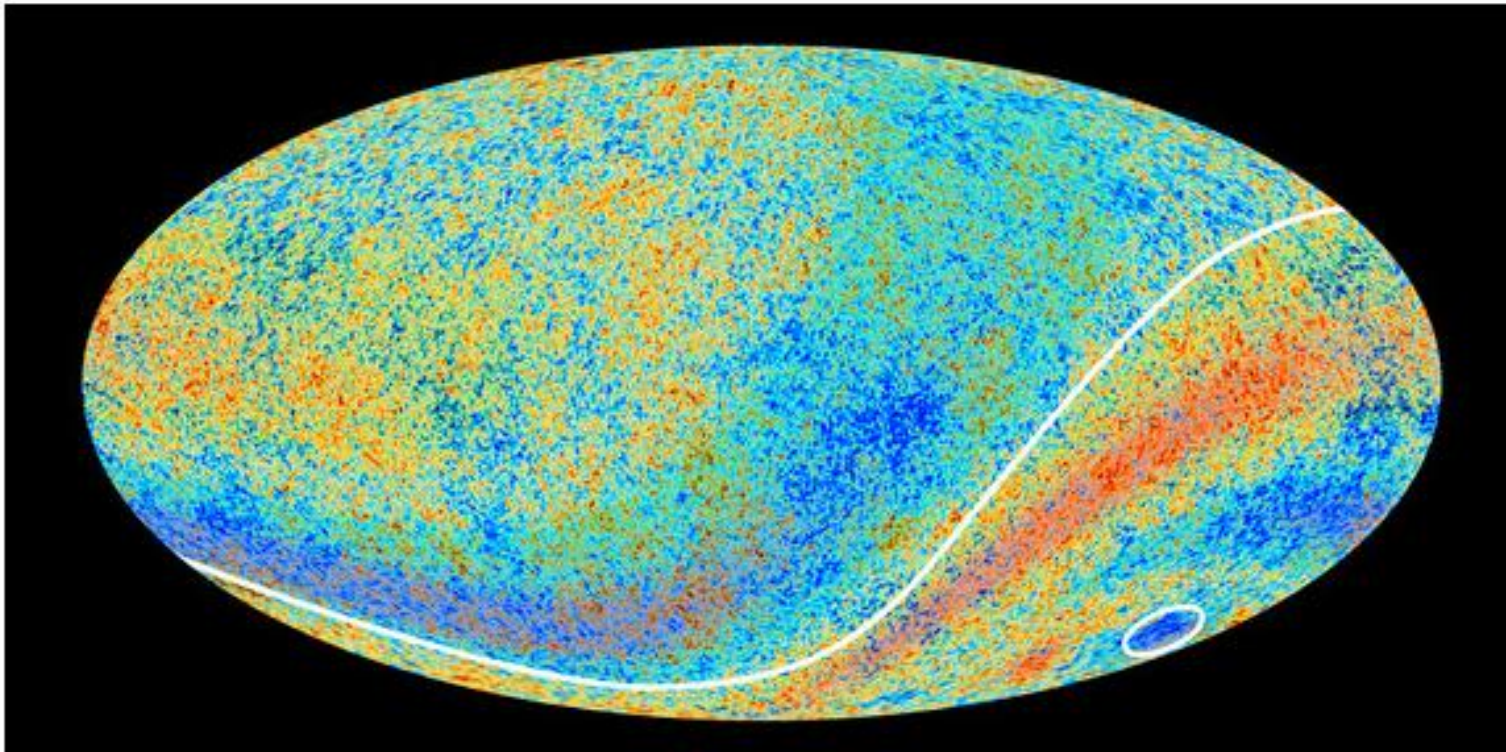


Image: Universe map, ESA-Planck, 2013.

Source: NEC Mexico strategic planning.

NEC's view of the future world

The Future World Economy

World population:

7 billion → **9 billion** (1.3 x)

Ratio of urban dwellers:

50% → **70%**

Scale of world economy → **4 x**



Present to 2050

* Prepared by NEC based on materials published by UN, FAO, OECD, PWC, IMF, etc

NEC's Concept of "Innovative Social Infrastructure"

For People to Live and Thrive in Society

Solutions for Society

Public
(Disaster prevention, security, electronic administration, finance)

Enterprise
(Retail, distribution, transport)

Telecom Carrier
(Information networks)

Smart Energy

Safety

Security

Innovation of social infrastructure via ICT

Efficiency

Equality

Physical and virtual worlds boundaries will disappear

The barrier between the physical and virtual world will be very diffuse. The physical reality will be enriched with virtual elements and people will immerse commonly in virtual worlds.

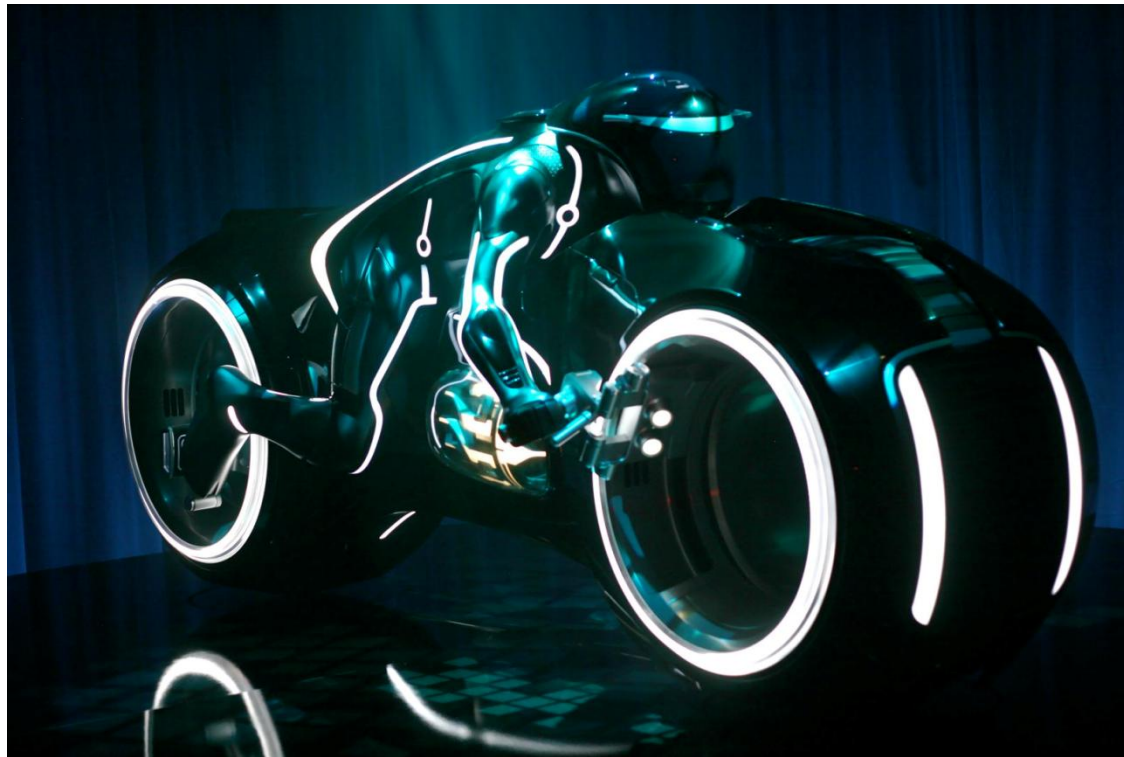


Image: Tron Movie.

Source: NEC Mexico strategic planning.

Humans will re-engineer themselves

The human being will use genetic engineering to improve its quality of life and attack sickness from its roots.

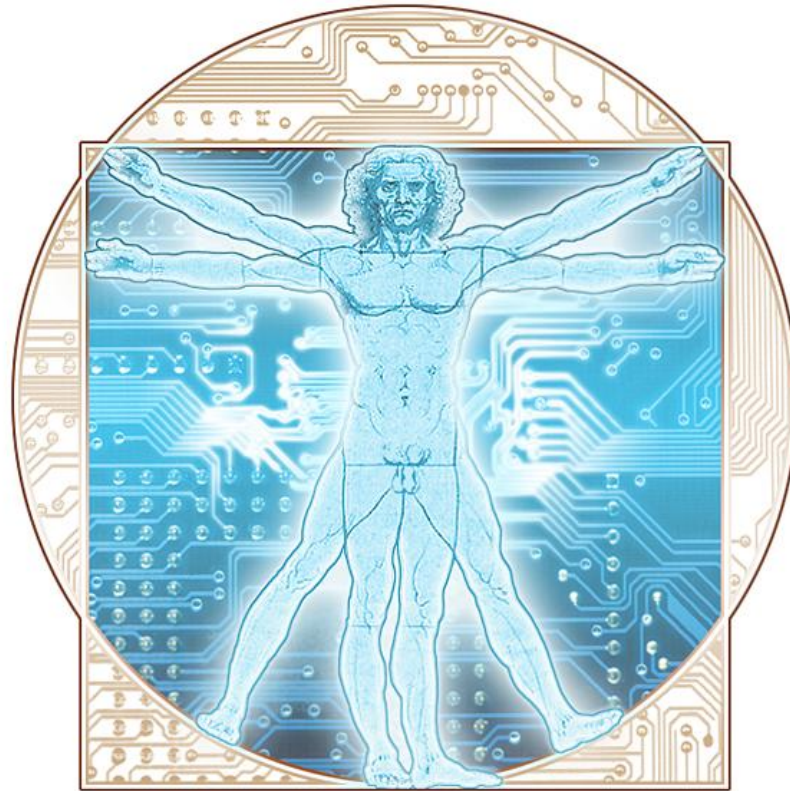


Image: Vitruvian man reinvented.

Source: NEC Mexico strategic planning.

Biobot networks

In order to facilitate its mobility and social acceptance, home robots will take familiar shapes, while commercial and industrial robots will take unusual (sometimes invisible) shapes, building networks.



Image: Coca Cola vending machine with M2M.



Image: PaPeRo communication robot, NEC.

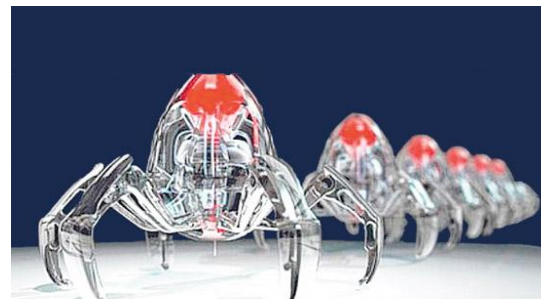


Image: Nanotecnologica.com

Behavioral biometrics

Biometrics will be extended to behaviour and new and sophisticated applied mathematical models will emerge.

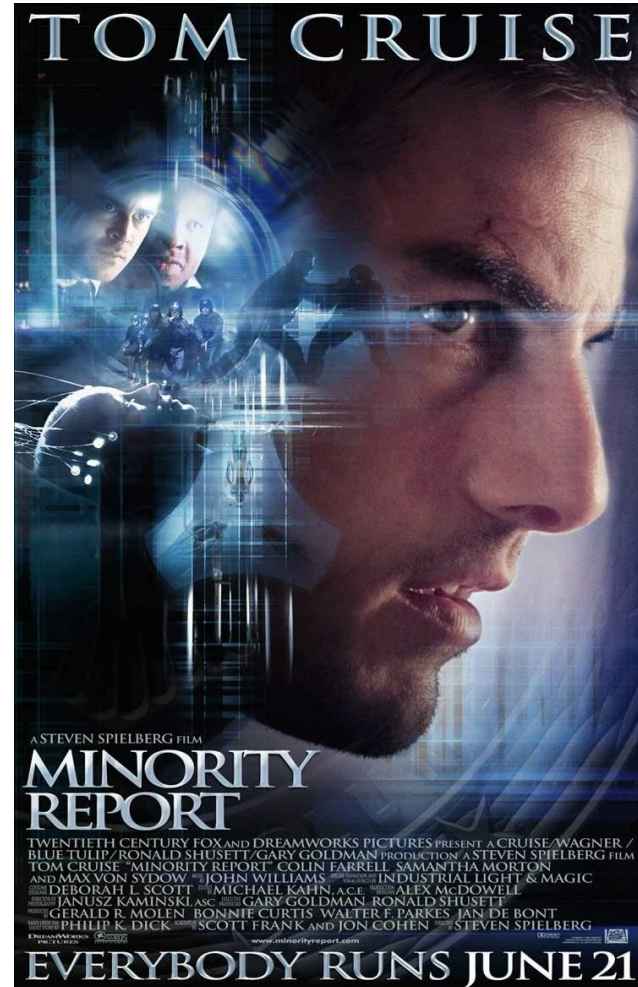


Image: Minority Report Movie.

Advanced artificial intelligence

Thanks to quantum computing we will create more and more complex artificial intelligence beings.



Image: Catana, Halo videogame franchise.



Image: Red queen, Resident Evil.

Intelligent surfaces



Image: Greyhound Ad.

Source: NEC Mexico strategic planning.

Aerospace uses biofuels

The human being will send robots to the space and will build space stations to explore the universe.



Image: Russian space station.

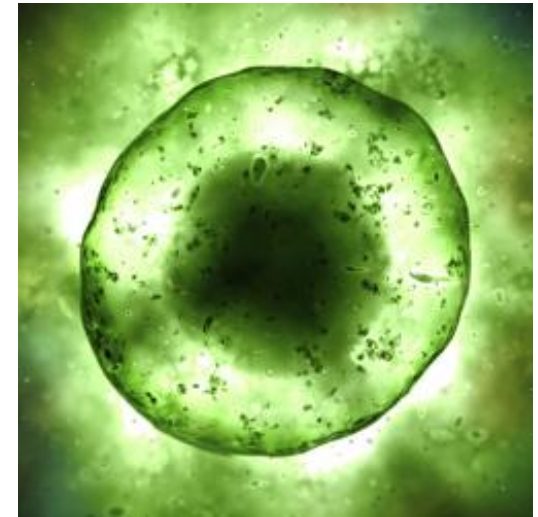


Image: Cell.

Source: NEC Mexico strategic planning.

Quantum computers with advanced analytical capabilities

Computers will simulate the human brain and
will equal human computing power



Image: Titan (NASA), fastest supercomputer in 2012 (18 petaflops)



Image: Tianhe-2 or Milky Way, fastest supercomputer in 2013 (34 petaflops)

Source: NEC Mexico strategic planning.

Quantum computing + neuroscience + big data

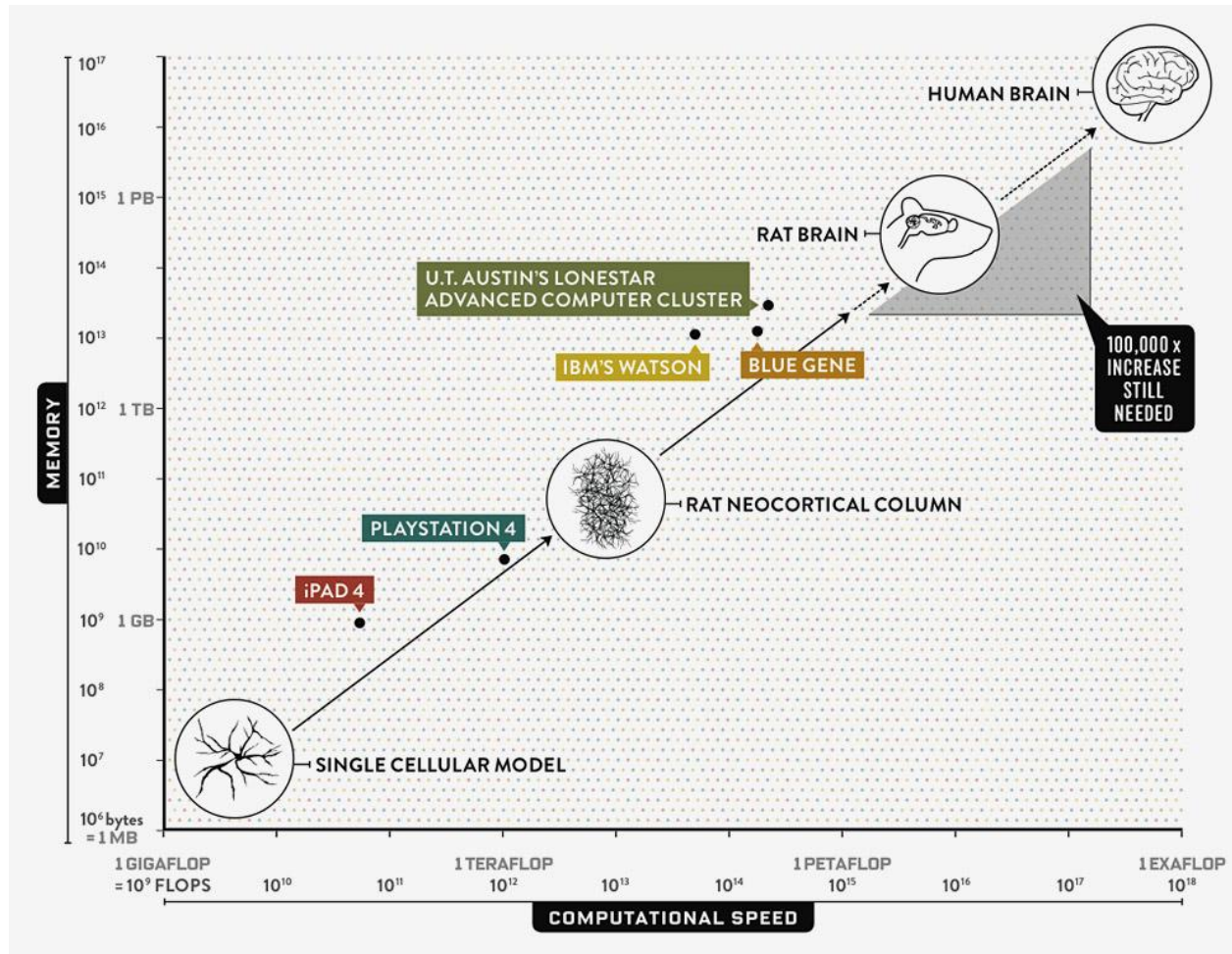


Image: Nextbigfuture.com

Source: NEC Mexico strategic planning.

Thanks!

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