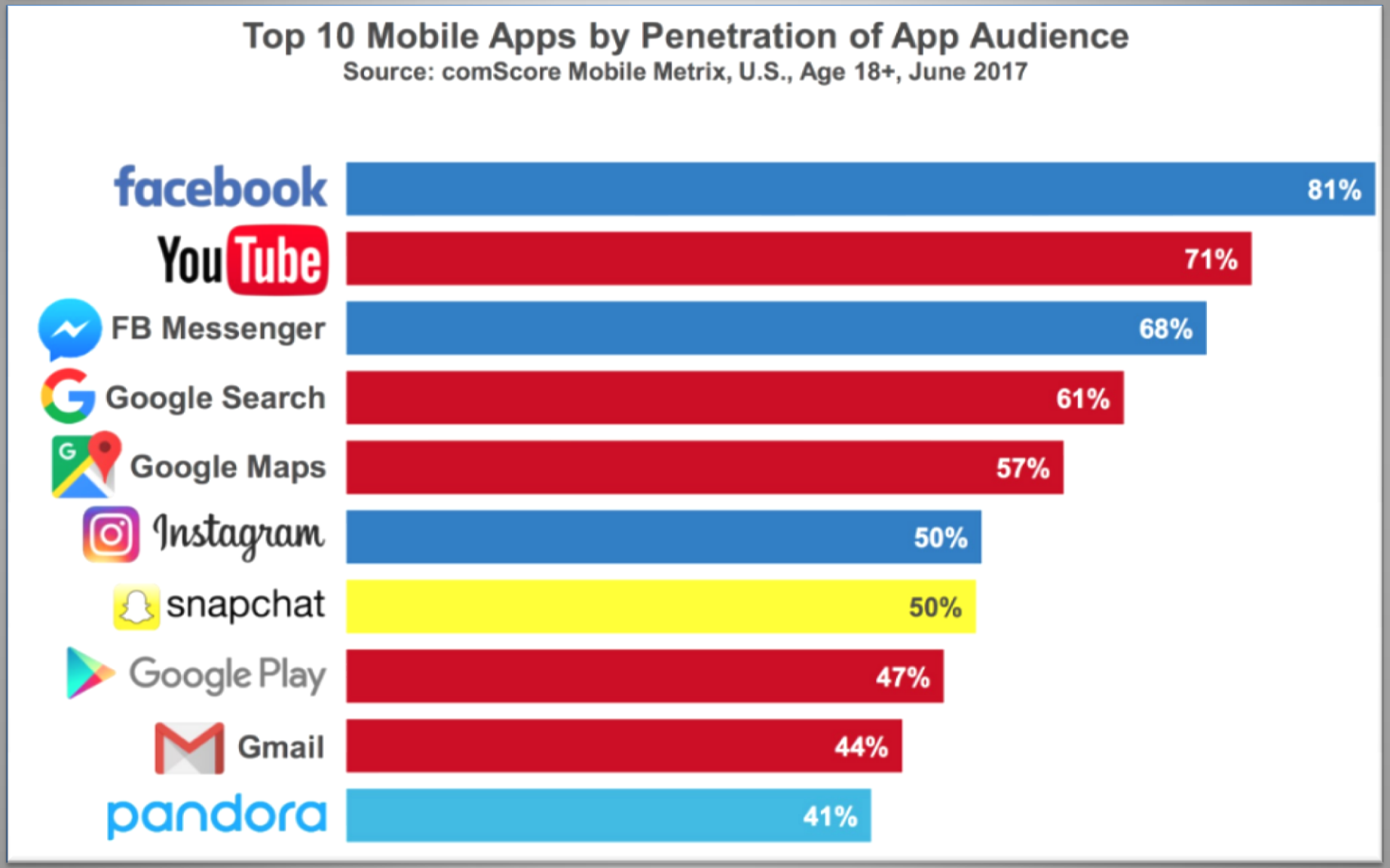
WELCOME
Mobile Applications Testing

Mobile Ecosystem

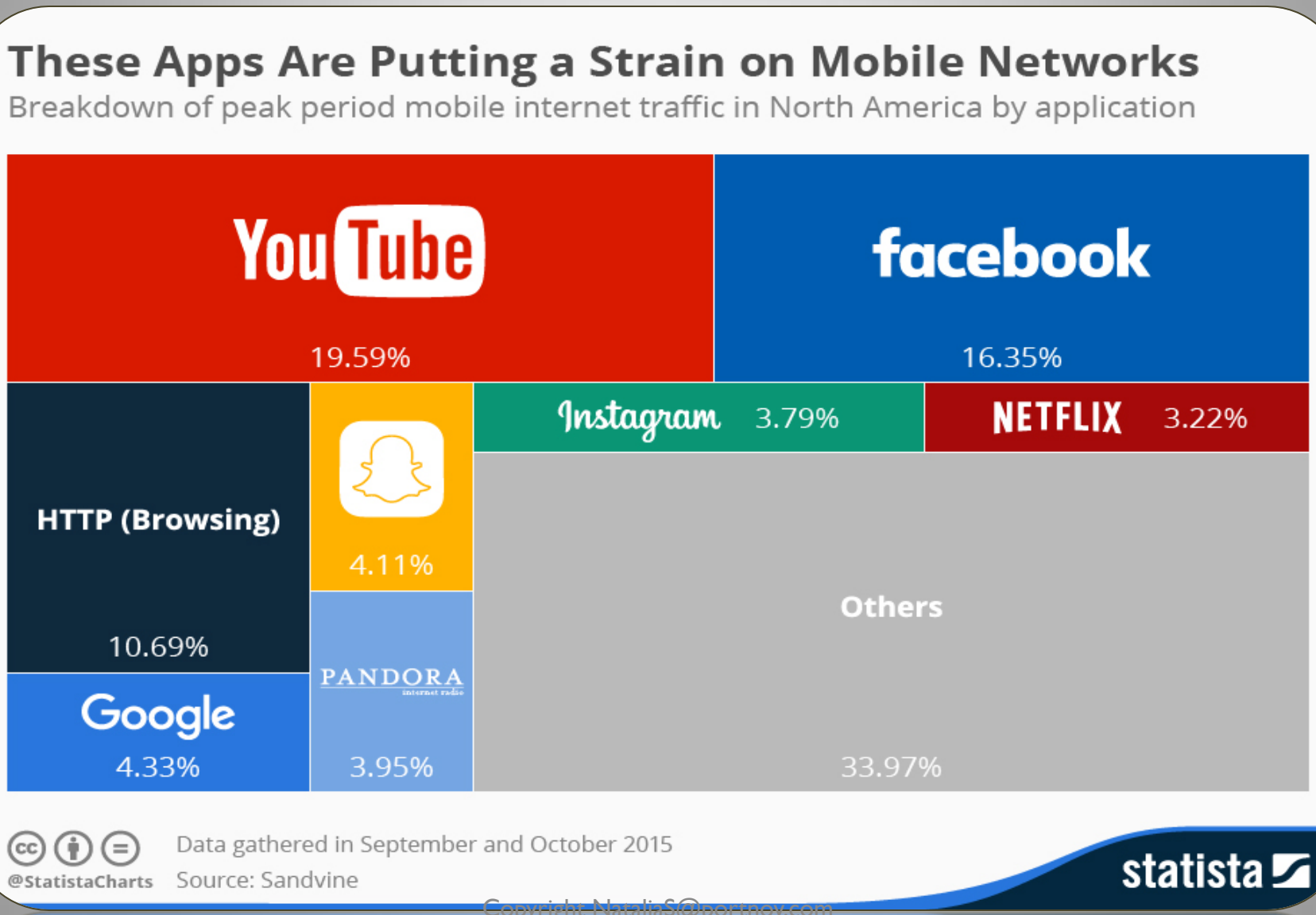
- **Mobile World Statistics**
- Carriers
- Networks
- Manufactures
- Devices
- Platforms/OS
- Frameworks
- API-Apps
- Services

Mobile World Statistics

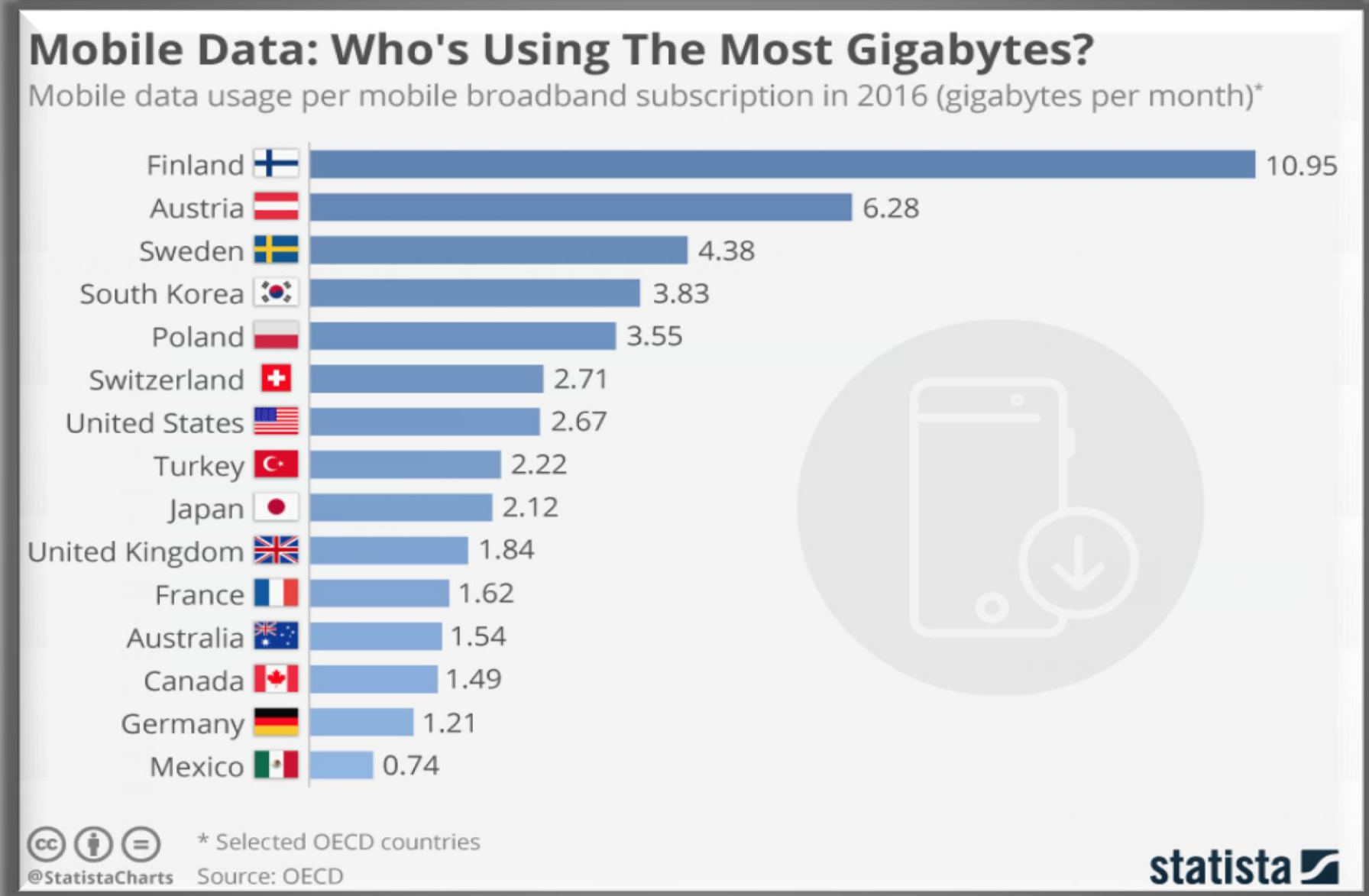


Mobile World Statistics

Mobile World Statistics



Mobile World Statistics



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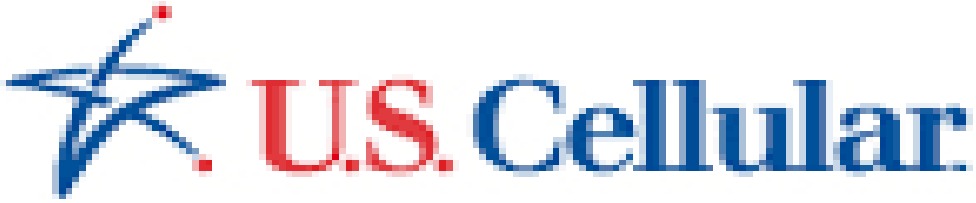
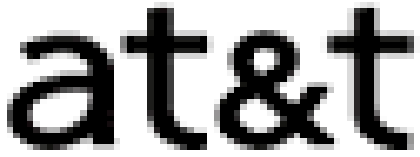
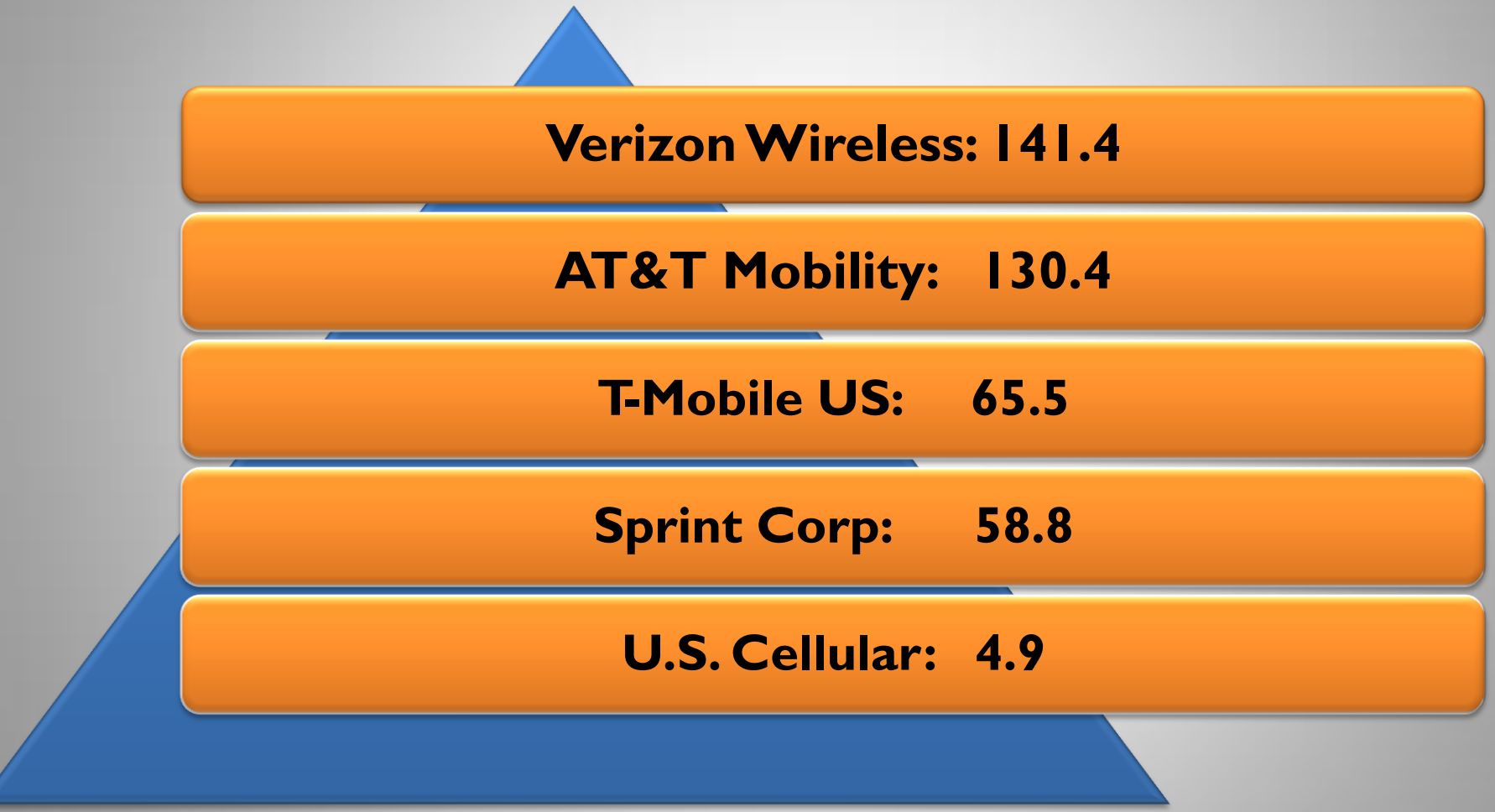
Carriers/Service Providers





Carriers/Service Providers Subscriber Data (Q1 2016 in MM)



Carriers/Service Providers

Install Cellular Towers

Operate the Cellular Network

Responsibilities

Make Services (Internet) available for Mobile Subscribers

Handling Billing , Support and Sales

Network : GSM : AT&T and T-Mobile

GSM Standard - Global System for Mobile Communication

- **Service:** Voice calling, text, messaging, data service similar to CDMA

- **Feature:** One of the key features of GSM is the Subscriber Identity Module, commonly known as a **SIM card**.
- The SIM is a detachable smart card containing the user's subscription information and phone book. This allows the user to retain his or her information after switching handsets.
- SIM card that identify the user on the network and could be used as a storage.
- SIM cards allowed users switch phones by simply moving their SIM's between the phones.

Network : CDMA : Sprint, Verizon and US Cellular

CDMA Standard - Code Division Multiple Access

❖**Service:** Voice calling, text, messaging, data transmission

❖**Features:** Five times up of GSM capacity. More secure –used by military.
❖QUALCOMM designs the chips for the CDMA air interface.

❖**CDMA** phones cannot roam internationally as extensively as GSM phones nor can they transmit voice and data at the same time like GSM handsets.

❖**CDMA** phones are locked to a carrier. It's usually **cheaper to buy unlocked GSM phones** than on-contract CDMA phones.

Network : CDMA vs GSM :What's a difference ?

Click here to watch a Video

NETWORK: LTE

- An acronym for **Long Term Evolution**

- **LTE** is a 4G wireless communications standard developed by the 3rd Generation Partnership Project (3GPP) that's designed to provide up to 10x the speeds of 3G **networks** for mobile devices such as SmartPhones, Tablets, NetBooks, Notebooks and Wireless Hotspots.

NETWORK: WiFi

- **WiFi** is a technology that uses radio waves to provide network connectivity. WiFi- most widely accepted definition for the term in the tech community is **Wireless Fidelity**.

- Wireless technology has widely spread lately and you can get connected almost anywhere; at home, at work, in libraries, schools, airports, hotels and even in some restaurants.

- Like mobile phones, a **WiFi** network makes use of radio waves to transmit information across a network. The computer should include a wireless adapter that will translate data sent into a radio signal.

NETWORK: WiFi Frequencies

- Wireless networking is known as WiFi or 802.11 networking as it covers the IEEE 802.11 technologies. The major advantage of WiFi is that it is compatible with almost every operating system, game device, and advanced printer.

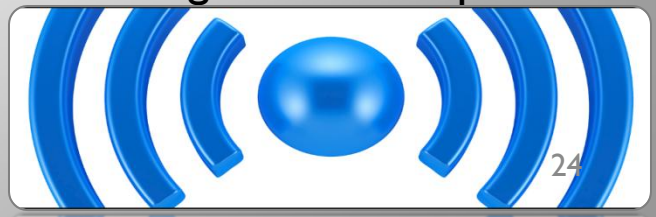
- A wireless network will transmit at a frequency level of 2.4 GHz or 5GHz to adapt to the amount of data that is being sent by the user. The 802.11 networking standards will somewhat vary depending mostly on the user's needs.

  The **802.11a** will transmit data at a frequency level of 5GHz. The Orthogonal Frequency-Division Multiplexing (OFDM) used enhances reception by dividing the radio signals into smaller signals before reaching the router. You can transmit a maximum of 54 megabits of data per second.

  The **802.11b** will transmit data at a frequency level of 2.4GHz, which is a relatively slow speed. You can transmit a maximum of 11 megabits of data per second.

  The **802.11g** will transmit data at 2.4GHz but can transmit a maximum of 54 megabits of data per second as it also uses an OFDM coding.

  The more advanced **802.11n** can transmit a maximum of 140 megabits of data per second and uses a frequency level of 5GHz.



NETWORK: 1G to 4G

EVOLUTION

1G
1981

2G
1992

3G
2004

4G and 4G LTE
2010 and 2011

5G
2020

NETWORK: 1G to 4G LTE Evolution

- ***1G*** *analog signal used by cellular towers*
- ***2G*** *technology upgraded the analog signal to digital and powered the inclusion of sending text messages across the network*
- ***3G*** *technology made use of electromagnetic wavelengths, known as spectrum, to broadcast a wireless broadband signal that allowed users to access the Internet and download applications using a 3G data card or a handheld mobile device*
- ***4G*** *called an "ultra-broadband" access for mobile devices. 4G networks are based on an all Internet protocol packet switching instead of circuit switching*
- ***4G + LTE*** *Long Term Evolution (LTE) is a 4G wireless broadband technology developed by the Third Generation Partnership Project (3GPP), an industry trade group. It's a type of 4G technology, and it delivers the best performance and speeds available today.*

NETWORK: is 5G around the corner ?

- Aug 28, 2013 – Huawei (Chinese company) intends to introduce commercial 5G networks by 2020, a service touted as "100 times faster" than current 4 G networks.
- May 15, 2013 - Samsung says it has successfully tested technology that will be at the core of 5G mobile connectivity.

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MANUFACTURES / MAKERS

Rank	Manufacturer	Units (M)	Market Share	Q4 2014 Share	Supported OS
1	Samsung	82.8	24.3%	20.1%	Android, Tizen, Windows
2	Apple	61.6	17.9%	20.1%	iOS
3	Lenovo	18.7	5.5%	6.6%	Android (Tizen)
4	Huawei	17.5	5.1%	6.6%	Android (Tizen)
5	LG	15.4	4.5%	4.2%	Android
6	Xiaomi	15.0	4.4%	4.6%	Android
7	ZTE	12.5	3.5%	3.6%	Android, Firefox
8	Coolpad/Young	11.5	3.4%	4.0%	Android
9	TCL/Alcatel	9.7	2.8%	4.5%	Android
10	Vivo	9.3	2.7%	3.1%	Android
	Others	97.1			
Total		340.8			

MANUFACTURES / MAKERS

Responsible for :

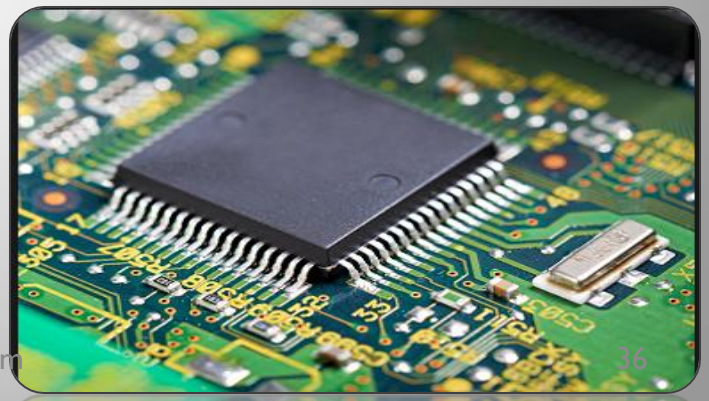
Concept and Prototyping:

- Designs, features, and interface options (like keypad or touchscreen)
- The phone's weight, scale, size, portability

Hardware and Software:

- Printed circuit board, LCD screen, keypad, antenna, microphone, speaker and battery
- Firmware/OS
- GPS and WiFi capabilities

Documentation.



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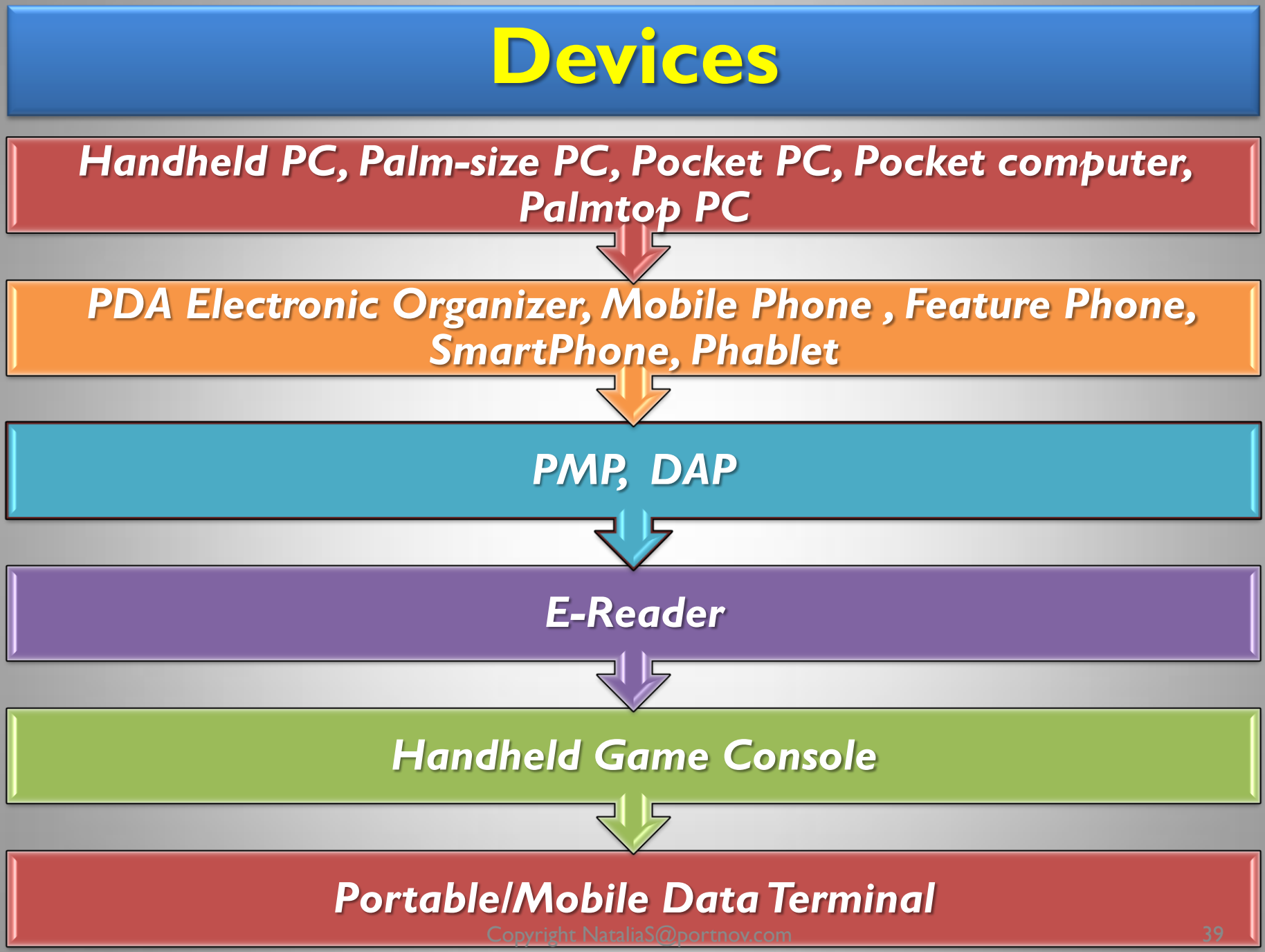
Devices

Devices



Devices: Principals of Mobile Computing

Portability

Facilitates movement of device(s) within the mobile computing environment

Connectivity

Ability to continuously stay connected with minimal amount of lag/downtime, without being affected by movements of the device

Social Interactivity

Maintaining the connectivity to collaborate with other users, at least within the same environment

Individuality

Adapting the technology to suit individual needs.

Devices : FeaturePhone vs SmartPhone

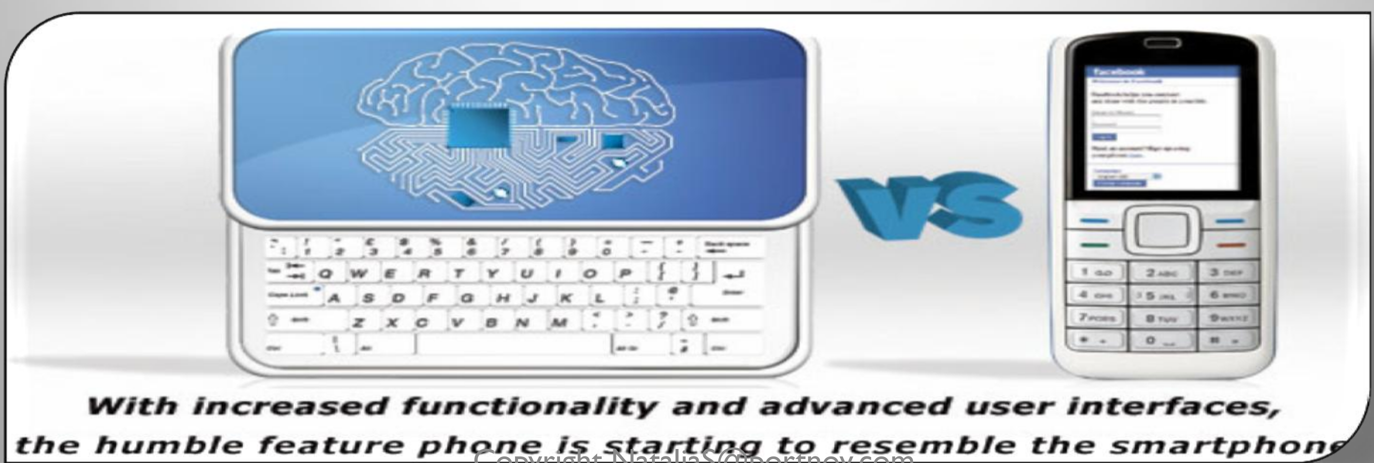
SmartPhones are those which have advanced computing capability than Feature phones

FeaturePhones are low-end device with lower-price

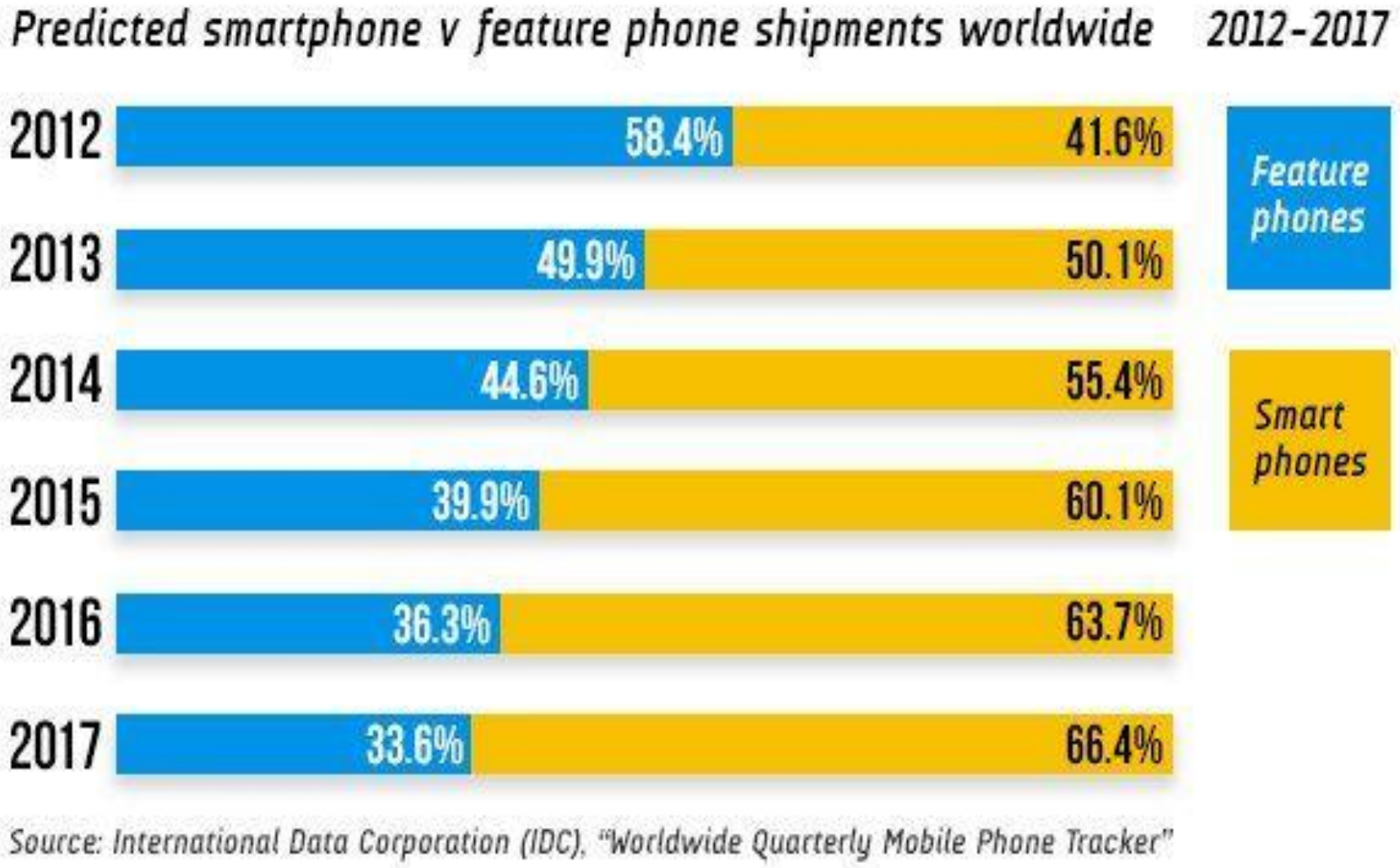
Devices : FeaturePhone vs SmartPhone

In short :

- *SmartPhones usually have a wider array of key features.*
- *These can include a full Web browser, 3G or 4G network support, Flash player capability, GPS, higher-resolution camera, third-party application support , video conferencing and more*



Devices :
FeaturePhone vs SmartPhone Comparison Data



Devices :

JAILBREAKING : iOS

JAILBREAKING

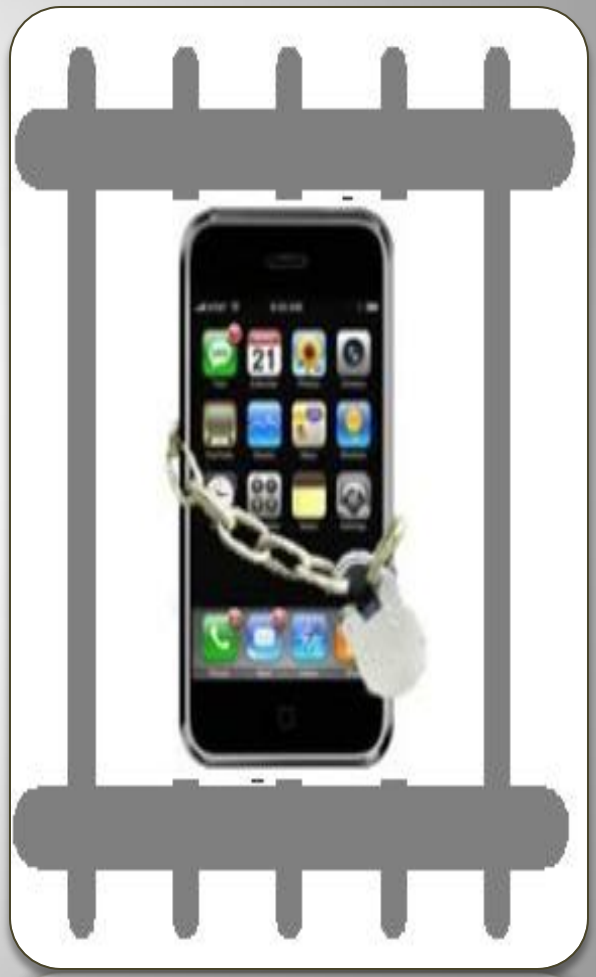
process of modifying iOS system kernels to allow file system read and write access.

JAILBREAKING TOOLS

(and exploits) remove the limitations and security features built by the manufacturer Apple (the "jail")

JAILBREAKING TOOLS

allow users to run code not approved and signed by Apple.



Devices :
UNLOCKING : IPHONE

An **UNLOCKED** iPHONE

can be used with any carrier, not just those that have been approved by Apple.

many **UNLOCKING** solutions only work with certain iOS models

Factory IMEI **UNLOCKS** is a popular solution that works with all iPhone models.

Devices :
ROOTING : ANDROID OS

Rooting is the Android equivalent of jailbreaking, a means of unlocking the operating system

you can install unapproved apps, deleted unwanted bloatware,

update the OS, replace the firmware or customize anything

Devices :
ROOTING : GLOSSARY

ROOT	• Rooting means you have root access to your device
ROM	• A ROM is a modified version of Android.
KERNEL	• A kernel is the component of your operating system that manages communications between your software and hardware.
RADIO	• Radios are part of your phone's firmware that controls your cellular data, GPS, Wi-Fi, and other things like that.
FLASH	• Flashing essentially means installing something on your device, whether it be a ROM, a Kernel, or a Recovery

Devices :
ROOTING : GLOSSARY

BOOTLOADER	• Lowest level of software on a device, running all the code that's necessary to start OS
RECOVERY	• Software on a device that allow user to make backups, flash ROMs, and perform other system-level tasks
NANDROID	• From most third-party recovery modules, user can make device backups called nandroid backups.
ADB	• ADB stands for Android Debug Bridge
BRICK	• Breaking device during flashing or other acts.