Mobile Computing

COMPUTER LITERACY

Mobile Computing - Definition

- A technology that allows transmission of data without having to be connected to a physical link.
- Describes technology that enables people to access network services any**time** and any**where**
- From the Latin mobilis - “to move”
- Two types of mobility:
  - Device portability
  - User mobility

Wired vs. Wireless

Wired Networks

- High bandwidth
- Low bandwidth variability
- High power machines
- High resource machines
- Need physical access
- Low delay

Wireless Networks

- Low bandwidth
- High bandwidth variability
- Low power machines
- Low resource machines
- Need proximity
- Higher delay
- Less secure

Why Mobile?

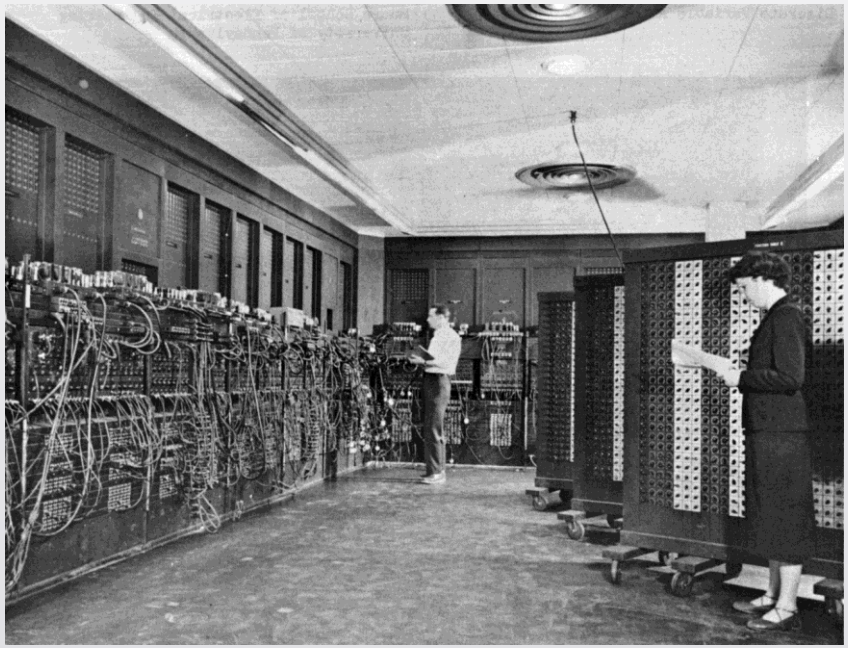
- Enables anywhere / anytime connectivity
- Bring communication to areas without preexisting infrastructure
- Enable mobility
- Enable new applications

Evolution of mobile computing

- Can be categorized into seven major focus areas
  - Portability
  - Miniaturization
  - Connectivity
  - Convergence
  - Divergence
  - Apps
  - Digital ecosystem
- Each section is a different area that was focused on making mobile computing what it is today

Portability

Reducing the size / weight of hardware to allow physically moving hardware easier



Miniaturization

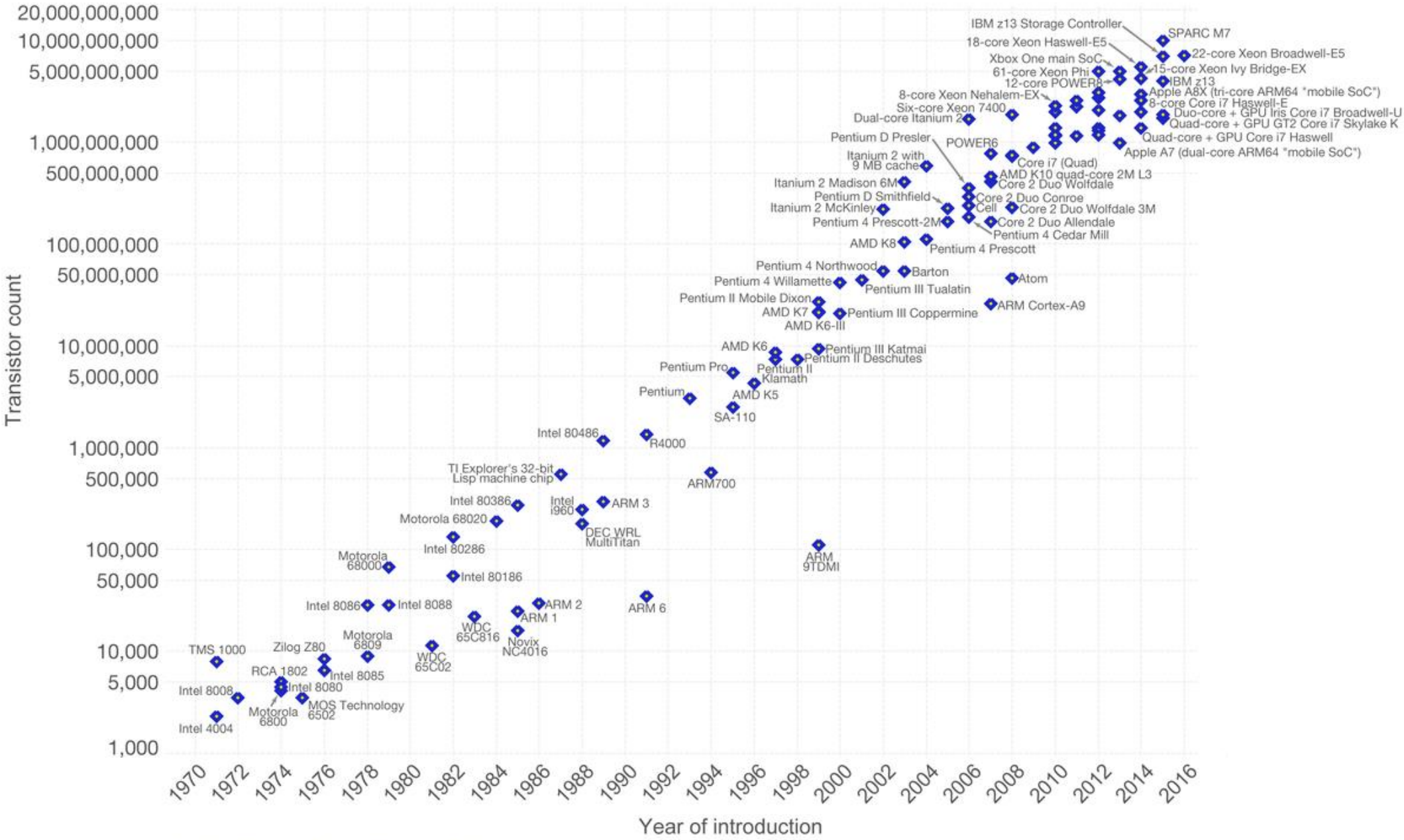
Creating smaller components that allow the use of mobile devices

Moore's Law – The number of transistors in an integrated circuit doubles every two years.

Moore's Law – The number of transistors on integrated circuit chips (1971-2016)

Our World in Data

Moore's law describes the empirical regularity that the number of transistors on integrated circuits doubles approximately every two years. This advancement is important as other aspects of technological progress – such as processing speed or the price of electronic products – are strongly linked to Moore's law.



Data source: Wikipedia (https://en.wikipedia.org/wiki/Transistor_count)

The data visualization is available at OurWorldinData.org. There you find more visualizations and research on this topic.

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Connectivity

Developing devices and applications that allow users to be online and communicate via wireless data networks while mobile

Convergence

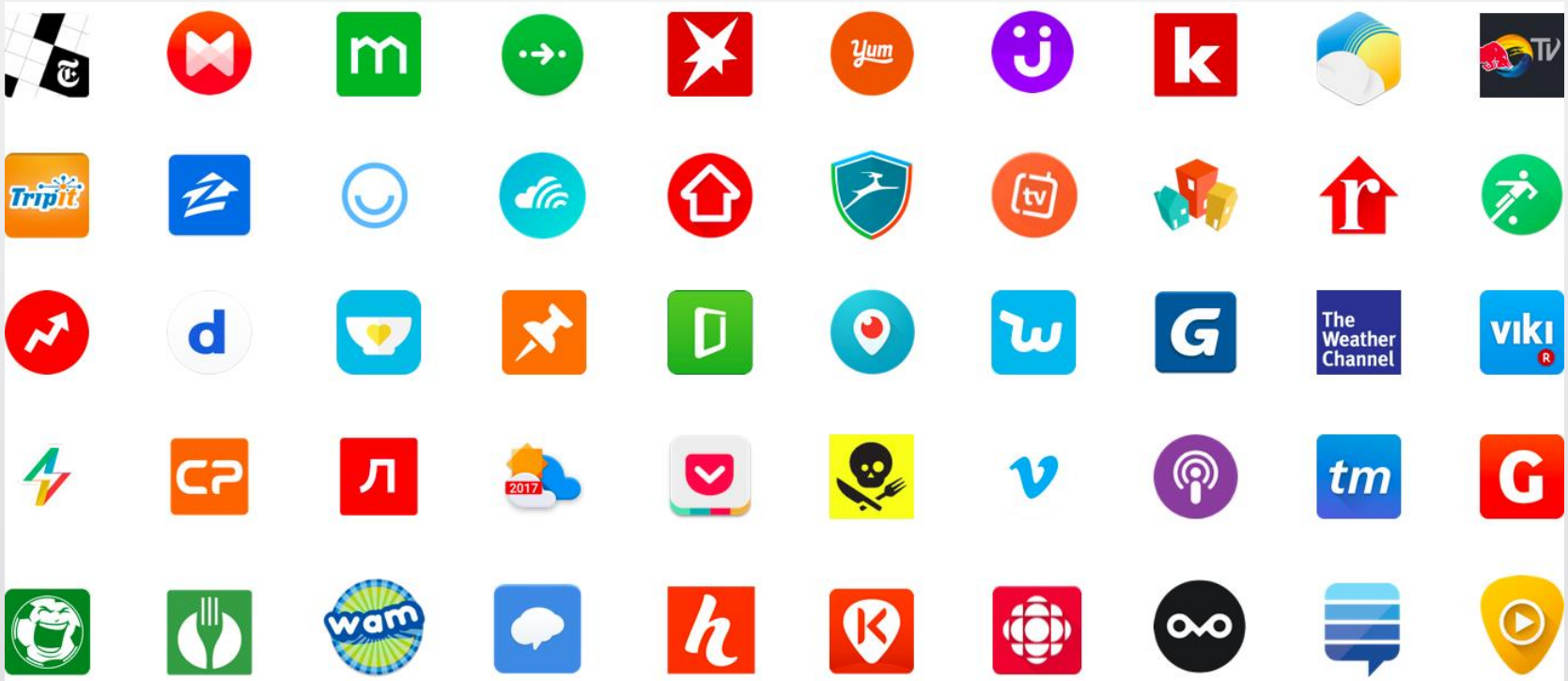
Integrating emerging types of mobile devices, such as personal digital assistants (PDAs), phones, music players, cameras, games, etc., into hybrid devices

Divergence

Opposite approach to design; promoting information appliances with specialized functionality rather than generalized ones

Applications (Apps)

Developing programs for use on mobile devices



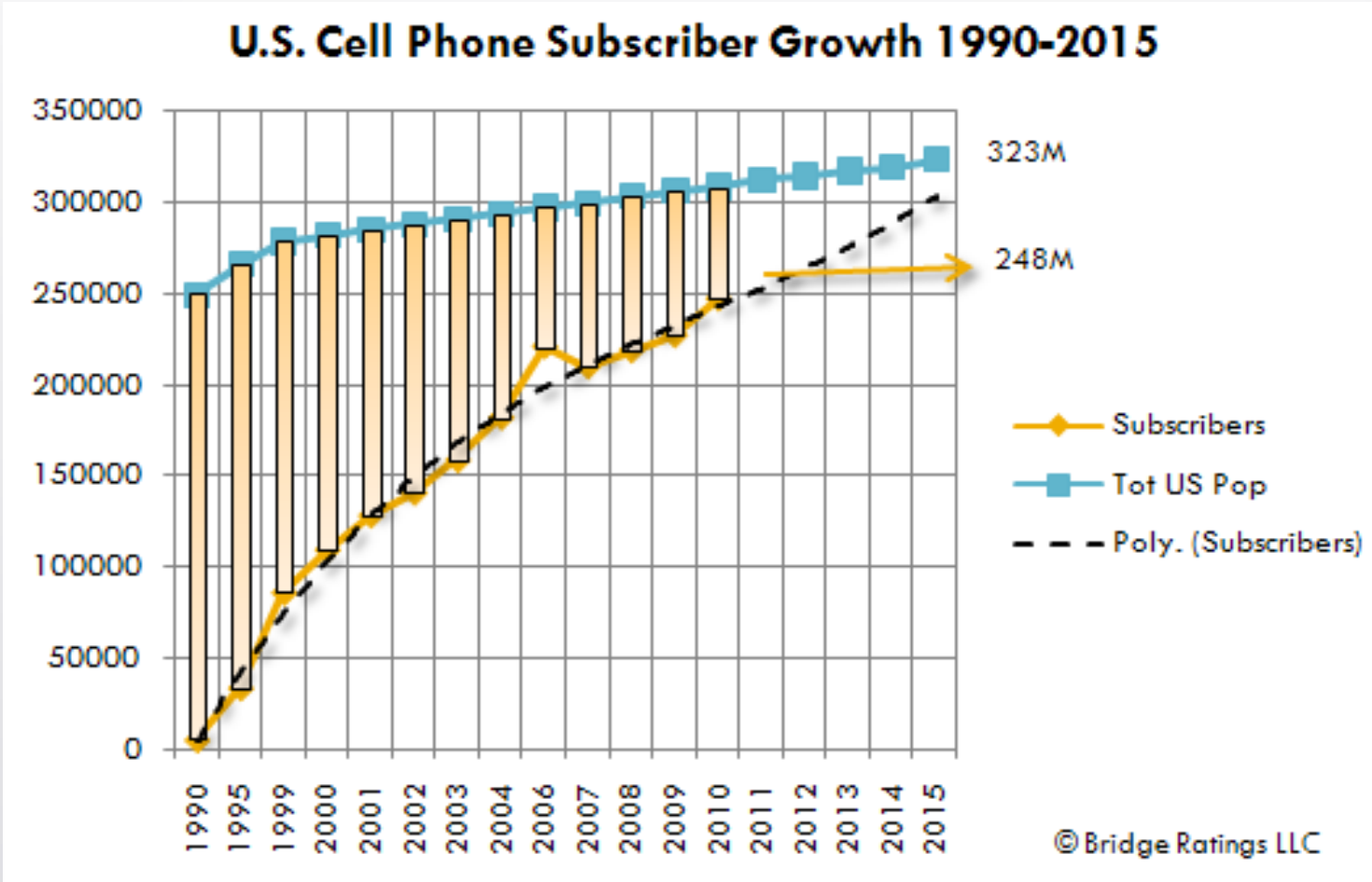
Digital Ecosystem

The emerging wave of digital ecosystems is about the larger whole of pervasive and interrelated technologies that mobile systems are increasingly becoming a part of

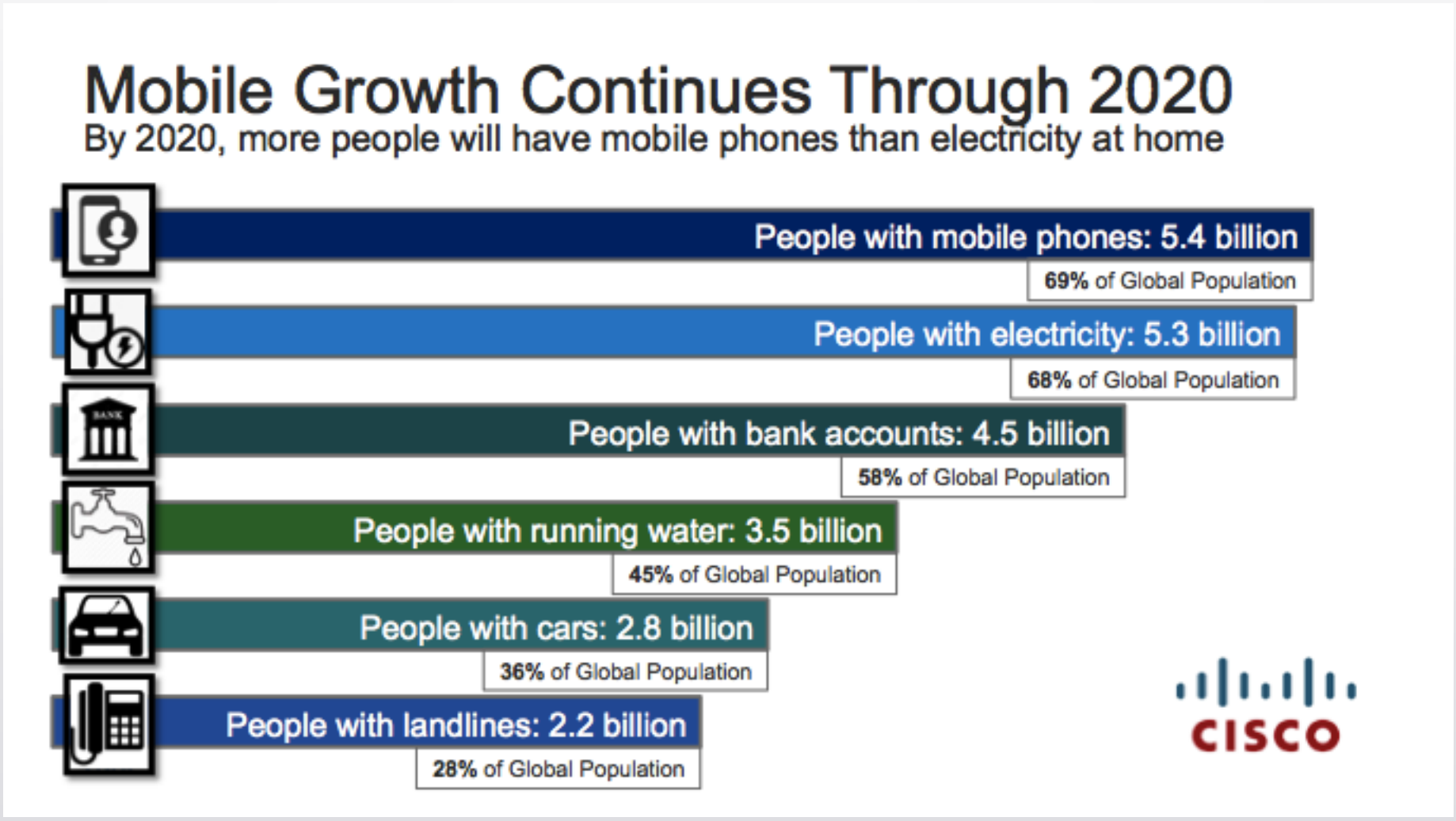
Example: Smart phone

- **Portability**: carry it anywhere
- **Miniaturization**: make it possible to fit device in your pocket
- **Connectivity**: WiFi, 4G LTE, cellular, Bluetooth
- **Convergence**: phone, camera, gaming, video streaming, music player, …
- **Divergence**: ?
- **Applications**: "Rise of the Apps"
- **Digital Ecosystem**: social networks, distributed gaming, work applications

Trends in Mobile: Phone Subscribers

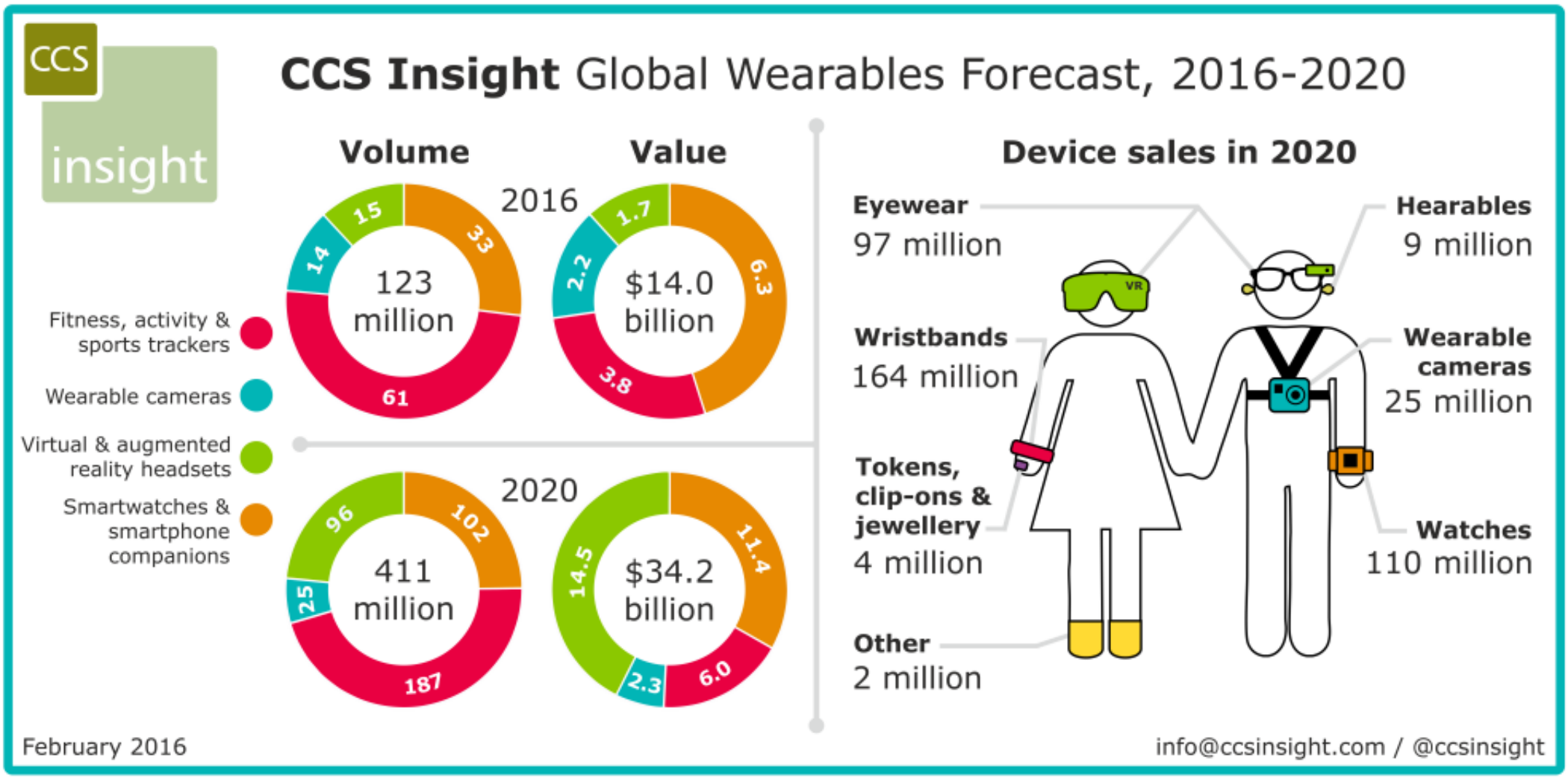


Trends in Mobile: Phone Subscribers

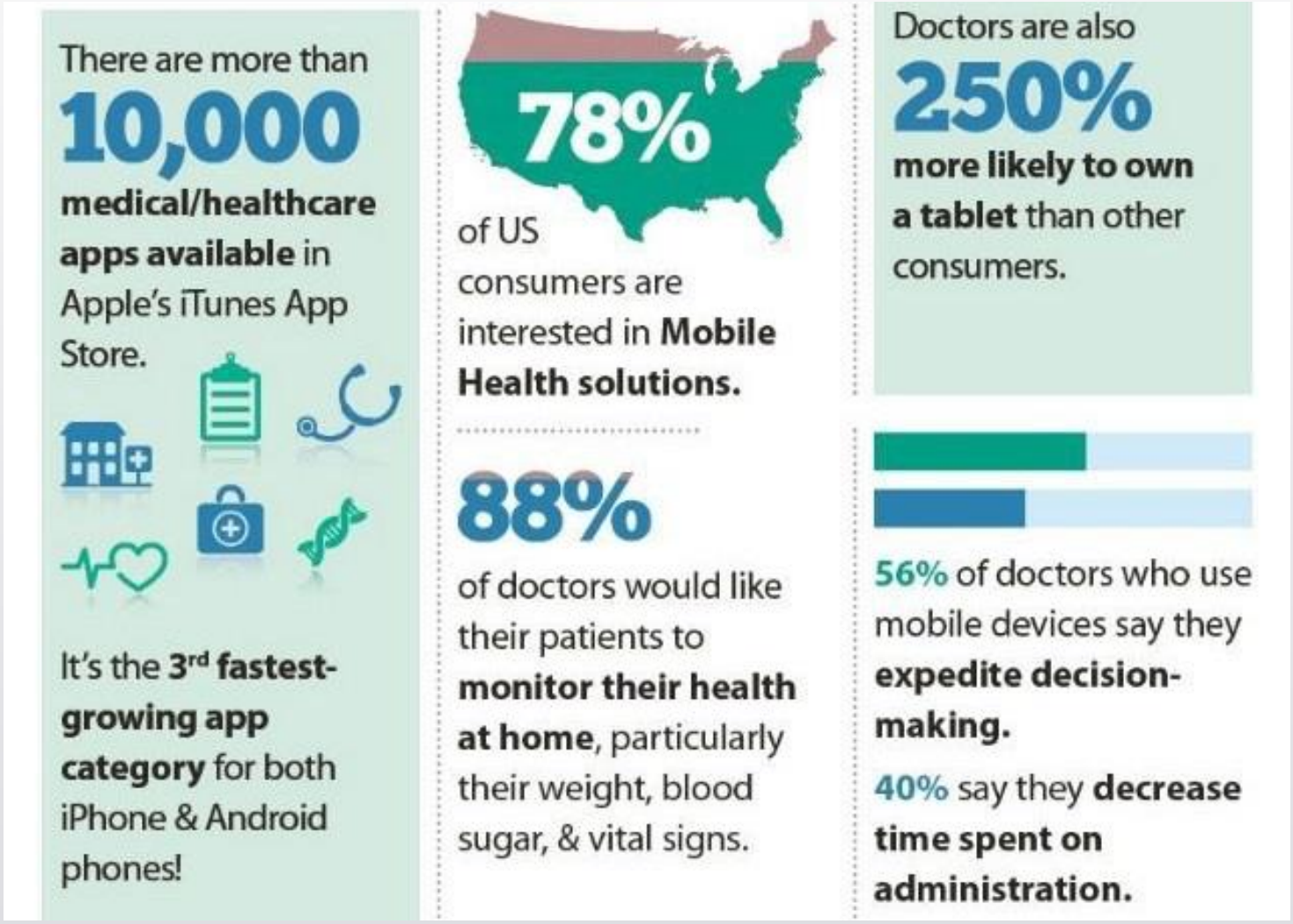
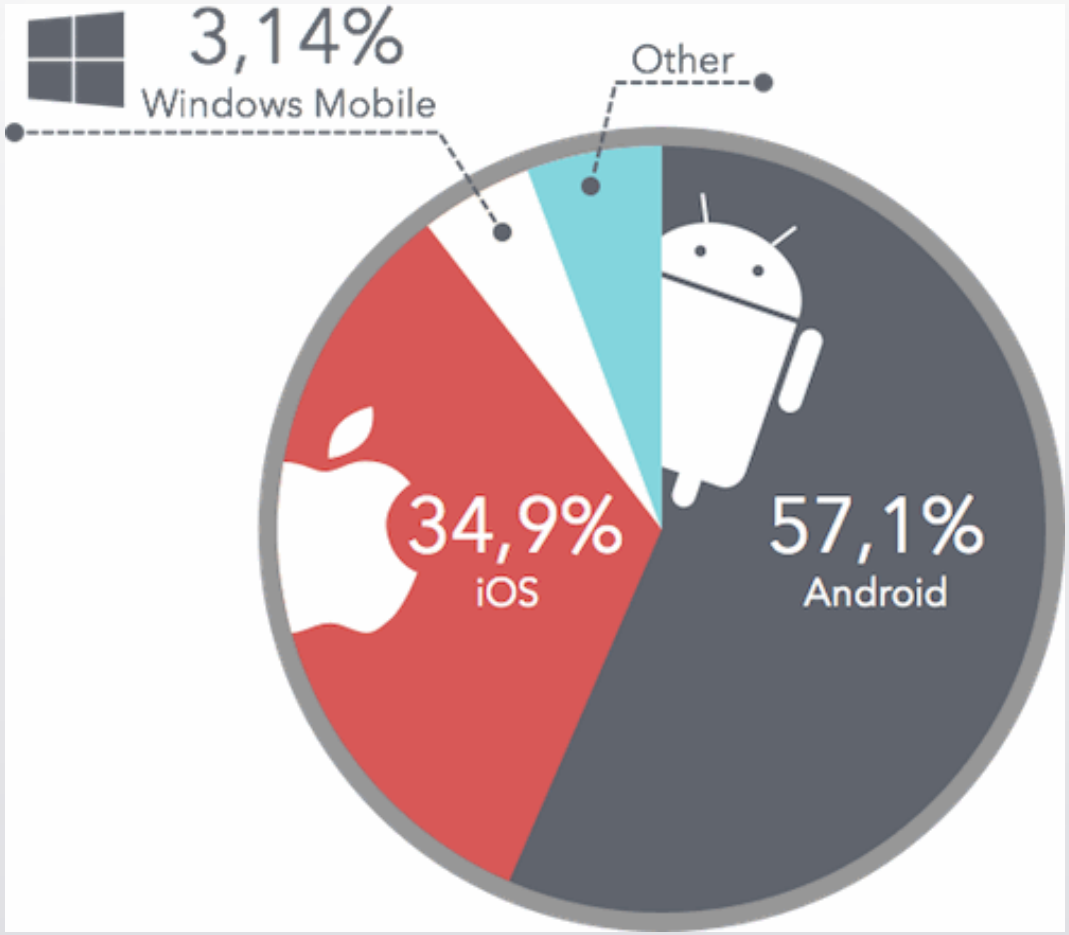


Trends in Mobile: Shopping

Trends in Mobile: Wearables



Trends in Mobile: Health care



Trends in Mobile: Smartphone OS