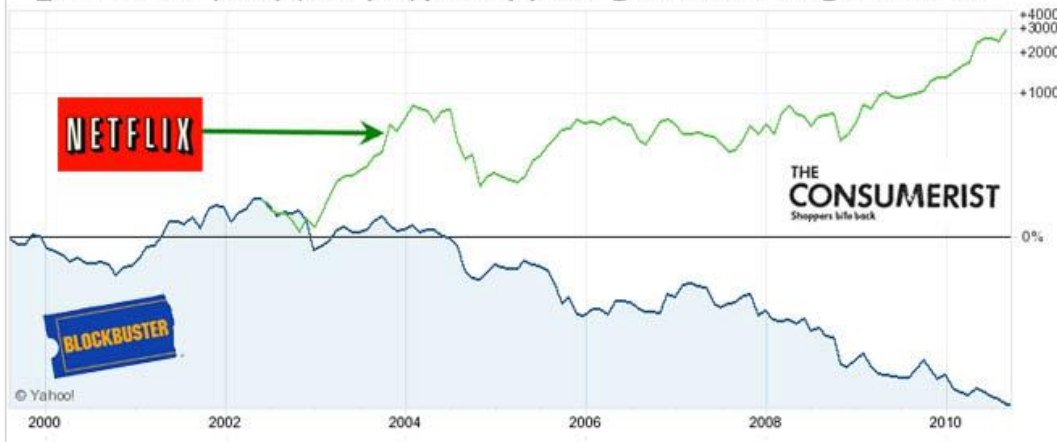


TECHNOLOGY TRENDS: THE NEXT DECADE

OCTOBER 2019

SOME TECHNOLOGIES FADE (AND COMPANIES WITH THEM)

EVERYTHING YOU NEED TO KNOW ABOUT BLOCKBUSTER'S BANKRUPTCY



FAILING TO INNOVATE: A FEW MORE...

NOKIA

Aol.


BlackBerry

YAHOO!

xerox 

 **RadioShack**

 **pets.com**

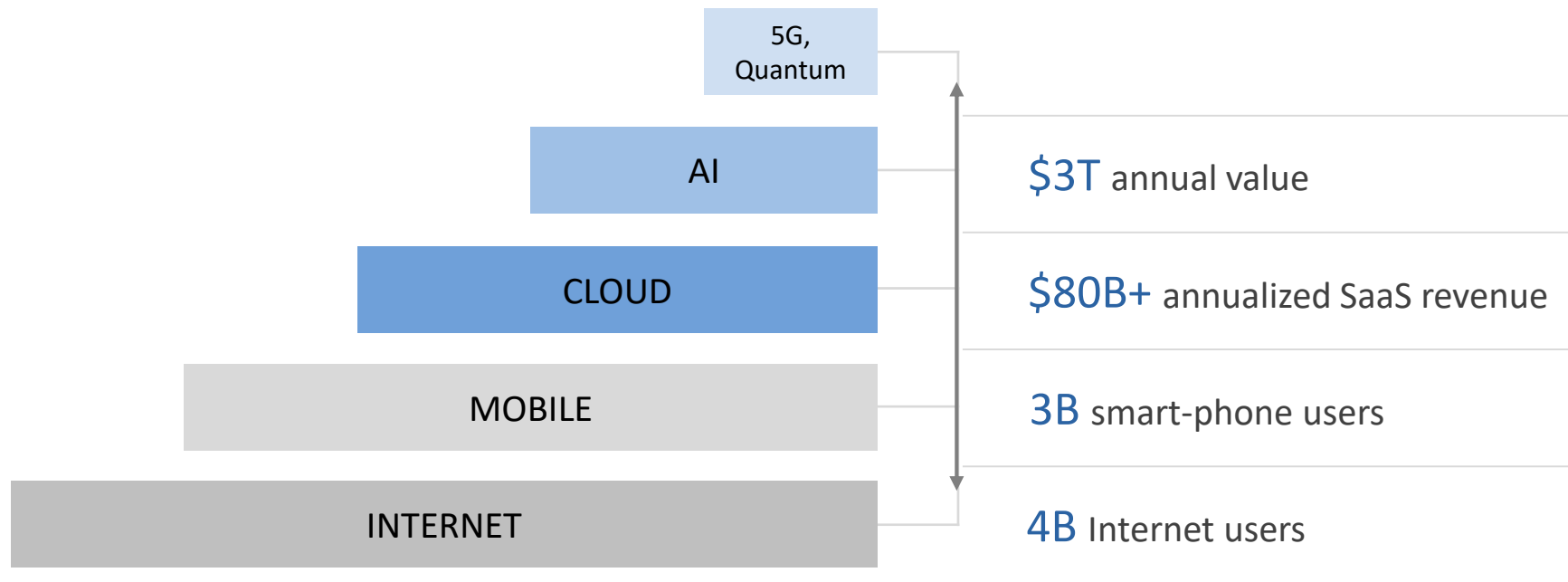

myspace
.com

 **Polaroid**

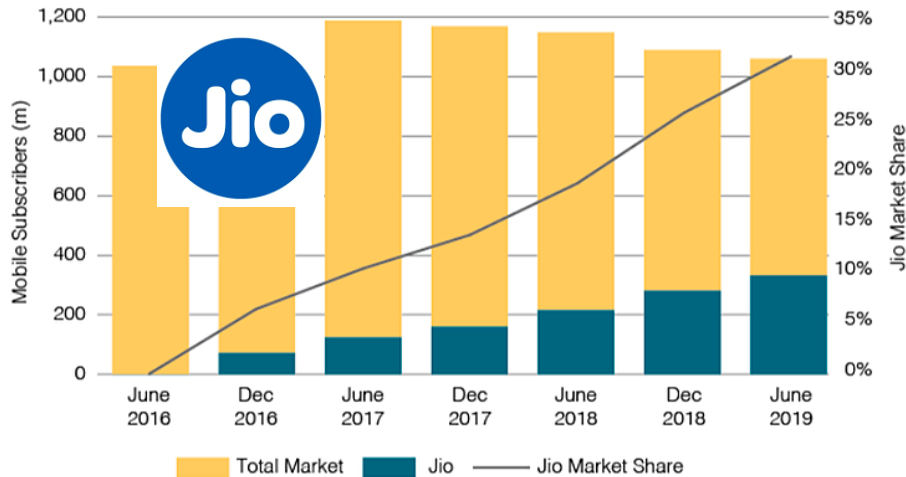
SOME TECHNOLOGIES CHANGE HISTORY



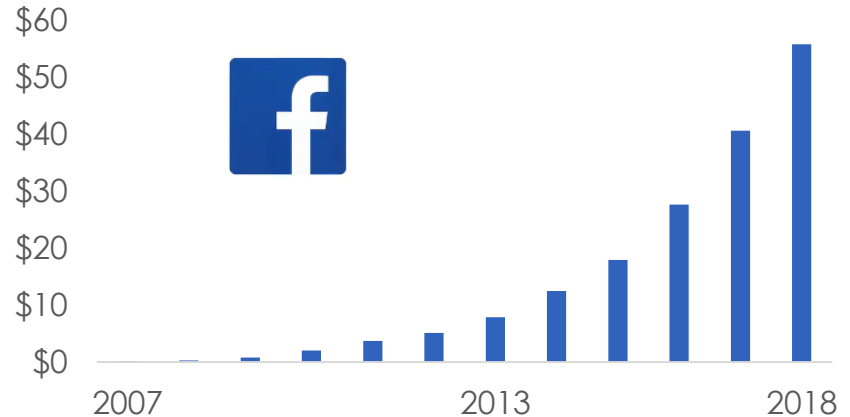
TODAY THESE MATTER MOST



BECAUSE OF CONNECTIVITY, COMPANIES GROW BIGGER AND FASTER THAN EVER



Facebook Revenue (\$B) (2007-2019)



BECAUSE OF CONNECTIVITY,
COMPANIES GROW BIGGER AND FASTER THAN EVER



Microsoft

\$1T
Market Cap



\$1T
Market Cap

amazon.com

\$858B
Market Cap



\$849B
Market Cap

2X+ LARGEST OIL & GAS COMPANIES

ExxonMobil

\$301B
Market Cap



\$225B
Market Cap

BECAUSE TECHNOLOGIES ARE ADDITIVE,
NEW ONES ARE ADOPTED FASTER

 = TIME TO MASS MARKET

INTERNET



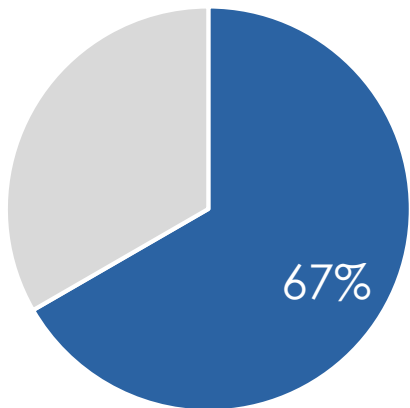
CLOUD



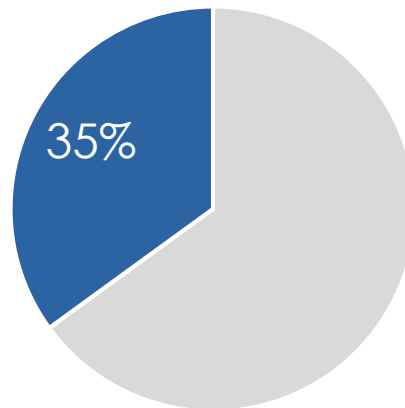
AI



A FEW RESULTS...



GLOBAL MOBILE DEVICE PENETRATION
+5B

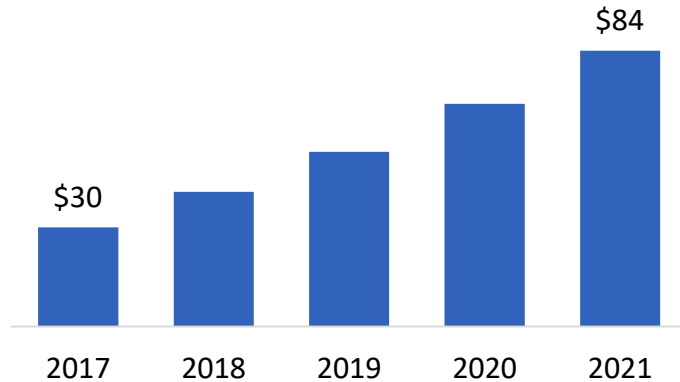


GLOBAL SMARTPHONE PENETRATION
~3B

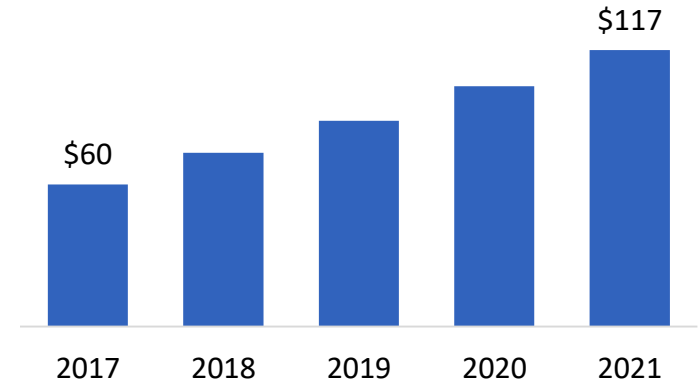
CLOUD UNLOCKED CATEGORIES & DELIVERY MODELS



IAAS REVENUE \$B (PUBLIC CLOUD)



SAAS REVENUE \$B

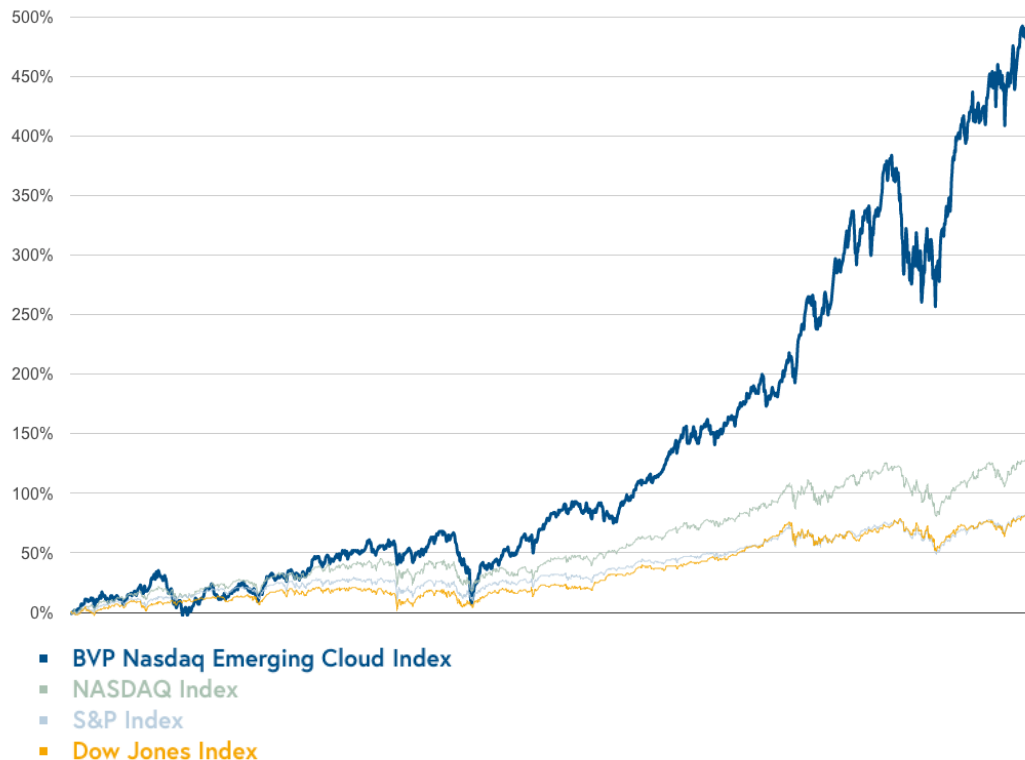


...THAT 4X OUTPERFORMED THE MARKET

BVP Nasdaq Emerging Cloud Index

50 Publicly Traded Nasdaq Emerging Cloud Companies

Indexed as of Aug. 2013 | @ 08/07/2019



CLOUD IN ENTERPRISE: DISRUPTION ACROSS FUNCTIONS

+\$45B

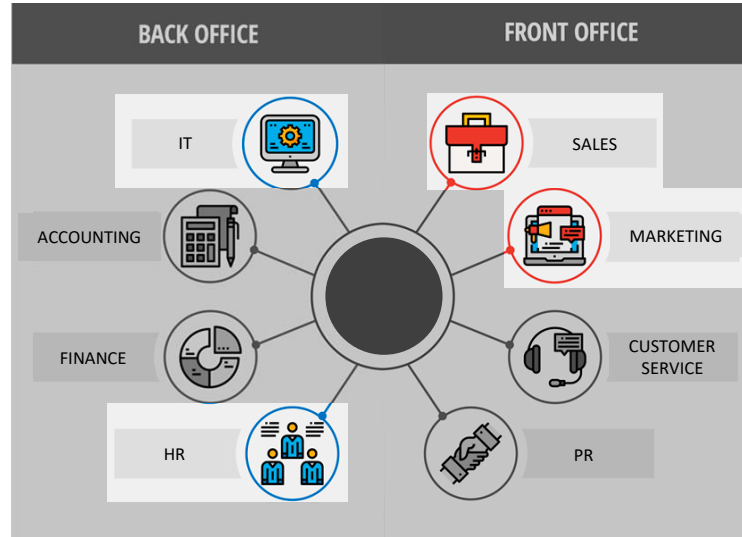
7-year change in market cap

servicenow

+\$34B

7-year change in market cap

workday



+\$128B

10-year change in market cap

salesforce

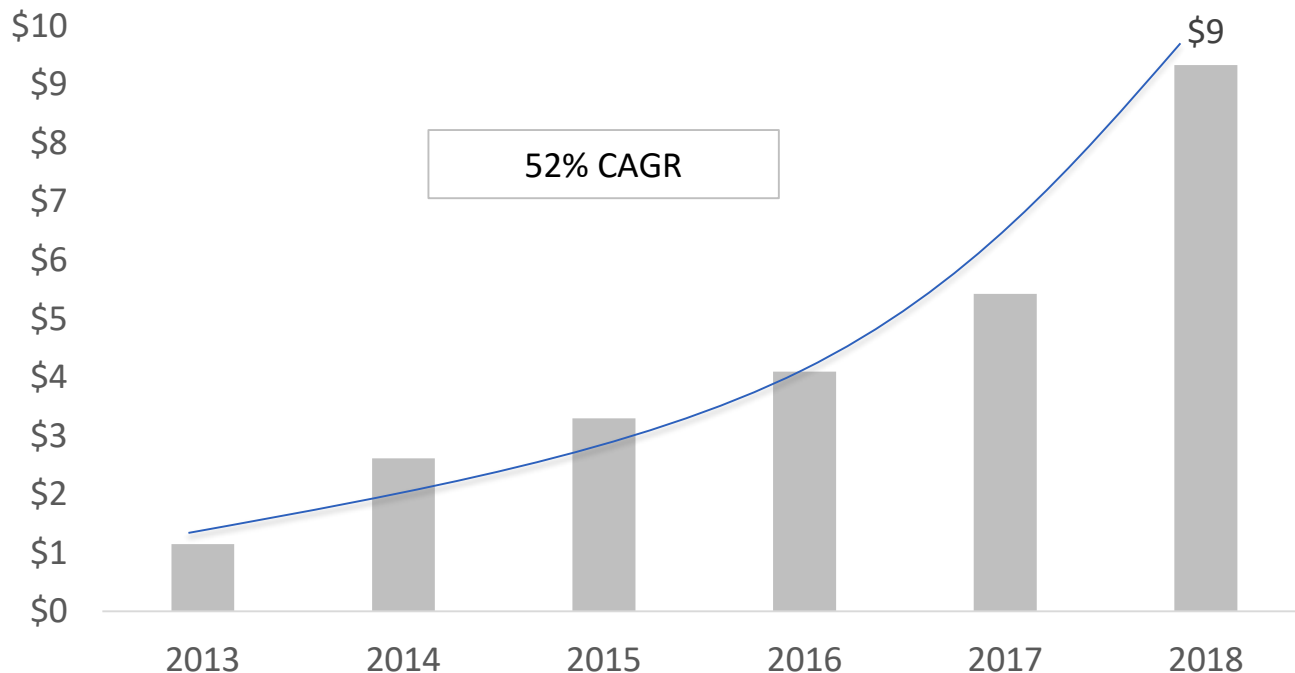
+\$827B

10-year change in market cap

Google

CLOUD

ANNUAL U.S. VENTURE FUNDING OF AI (\$B) BOOMING



ARTIFICIAL INTELLIGENCE: WHY NOW?

Performance Since 2009...

10,000x

COMPUTE

Innovations in sw/hw powered a 2.5x per year
improvement in computing performance

140x

NETWORK

Broadband increased from 7.1 mb/s
to 1 gigabyte/s

WHAT ARE TODAY'S AI BREAKTHROUGHS?

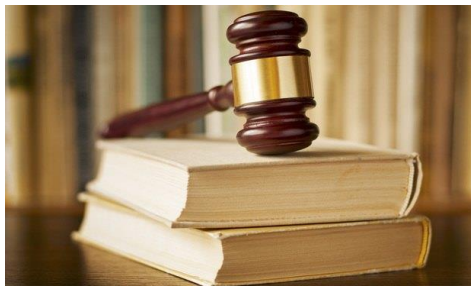
DIAGNOSING MEDICAL IMAGES



11% REDUCTION IN
FALSE POSITIVES

5% REDUCTION IN
FALSE NEGATIVES

REVIEWING CONTRACTS



TIME REDUCTION OF 99.5%

DRUG DISCOVERY



IMPROVED HIT RATES UP TO 10,000x

TECHNOLOGIES OF TOMORROW

5G BY THE NUMBERS



Decrease in latency



Connection density



Experienced throughput



Spectrum efficiency

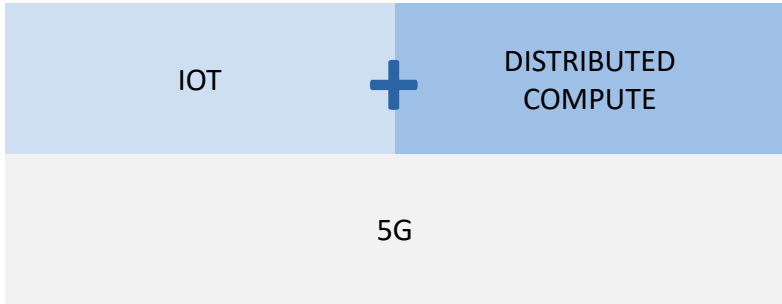


Traffic capacity



Network efficiency

MASS CONNECTIVITY: A NEW FUTURE



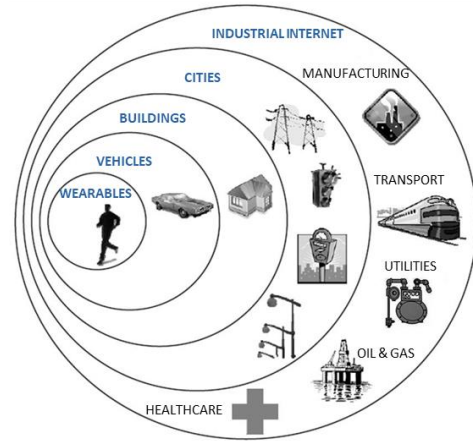
SMART CITY



AUTONOMOUS MACHINES

5G DENSITY & SPEED ENABLE IOT & EDGE

IOT



Number of Devices

5B in 2016 → **30B+** in 2020

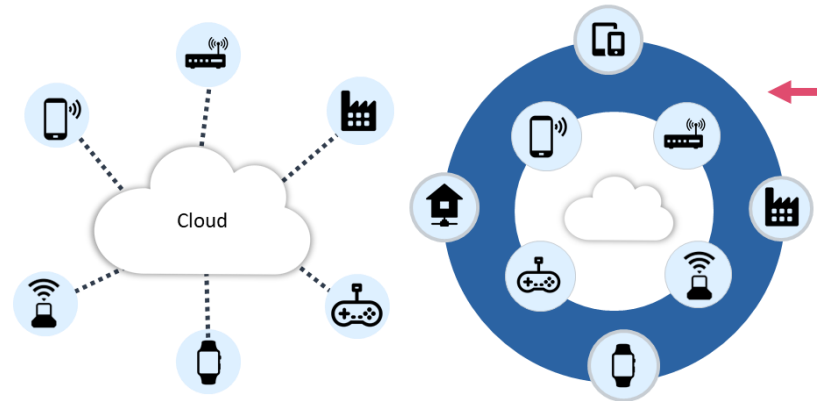
AREAS OF INVESTMENT:

- INFRASTRUCTURE
- SECURITY
- ANALYTICS

EDGE

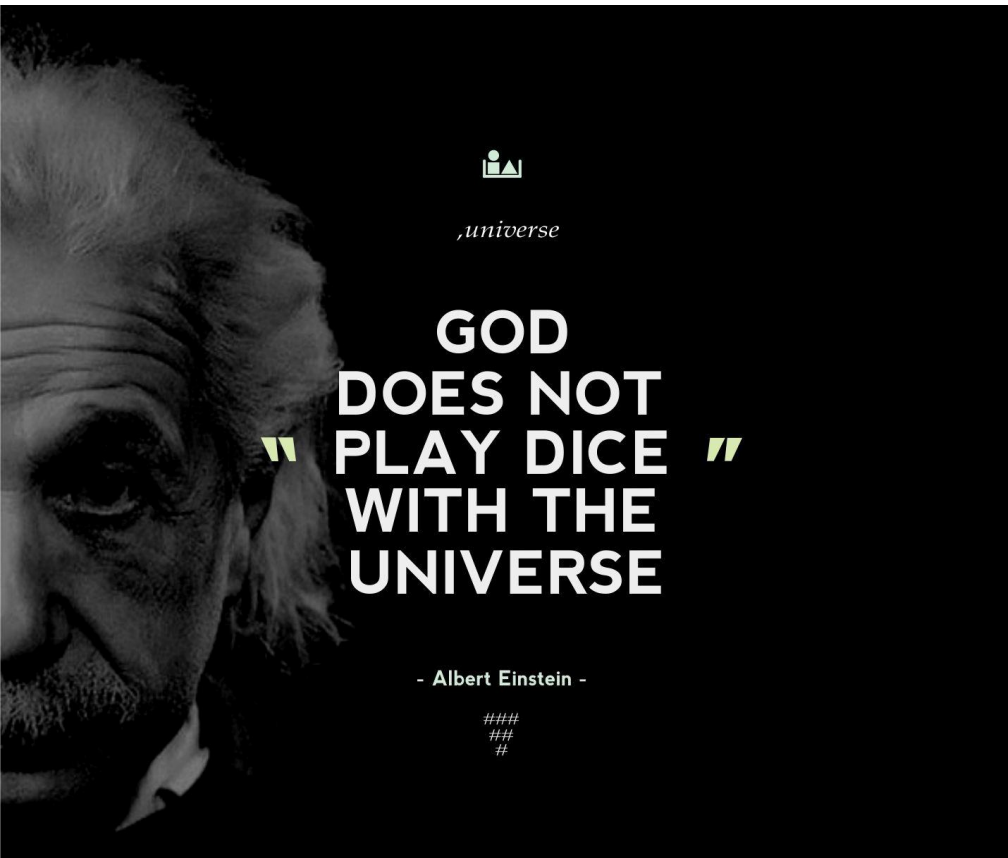
Centralized World

Decentralized World



COMPUTING DONE **AT THE EDGE** USING
ON-DEVICE MACHINE LEARNING

ELIMINATES NETWORK LATENCY &
PROTECTS LOCAL AUTONOMY



1900

Quantum theory is born

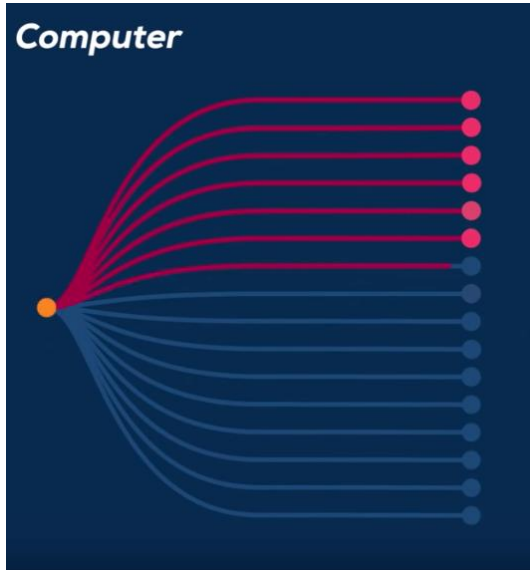
1980s

Recognizable theoretical framework for quantum computer

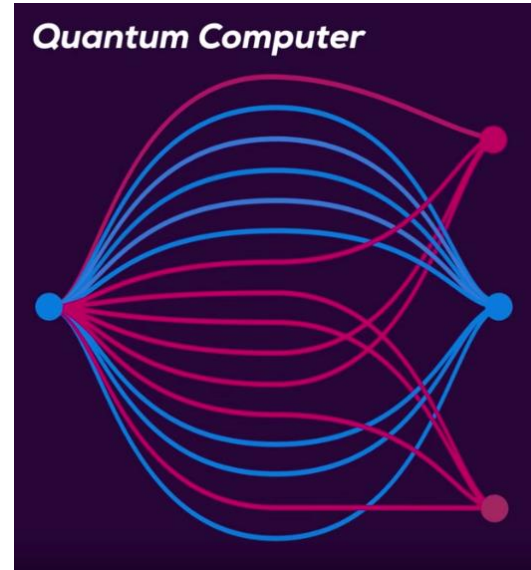
NOW

Foundation for commercial quantum

WHAT IS A QUANTUM COMPUTER?

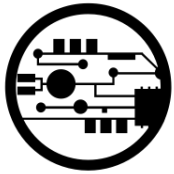


ONE AT A TIME



ALL AT ONCE

WHAT WILL BE AFFECTED?



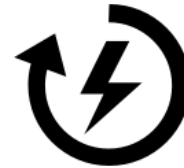
HIGH-TECH



INDUSTRIAL



CHEMISTRY



ENERGY



FINANCE

-
- | | | | | |
|-----------------|------------------|------------------|-----------------------|--------------------------|
| ▪ ML & AI | ▪ Logistics | ▪ Enzyme design | ▪ Network design | ▪ Trading |
| ▪ Search | ▪ Semiconductors | ▪ Pharma | ▪ Energy distribution | ▪ Portfolio optimization |
| ▪ Cybersecurity | ▪ Aerospace | ▪ Bioinformatics | ▪ Well Optimization | ▪ Fraud detection |

“Google Claims to Have Reached Quantum Supremacy”

Financial Times, September 20 2019

“this experiment marks the **first computation that can only be performed on a quantum processor**”

“researchers called it ‘**a milestone towards full-scale quantum computing**’... also predicted that the power of quantum machines would **expand at a ‘double exponential rate’**”

“The use of quantum machines to solve practical problems is still years away”

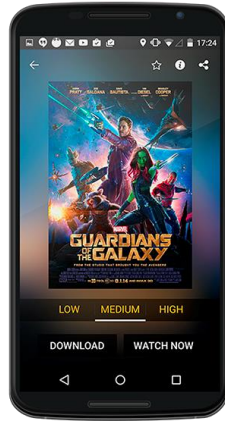
LIVE. WORK. PLAY.

YOUR SMARTPHONE HAS (A MILLION TIMES+) THE
MEMORY OF THE APOLLO 11 COMPUTER

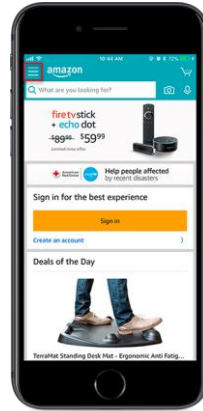




NAVIGATE



STREAM



PURCHASE



CONNECT

+ CONVENIENCE

+ # OF PURCHASES

+ SIZE OF FRIEND NETWORK

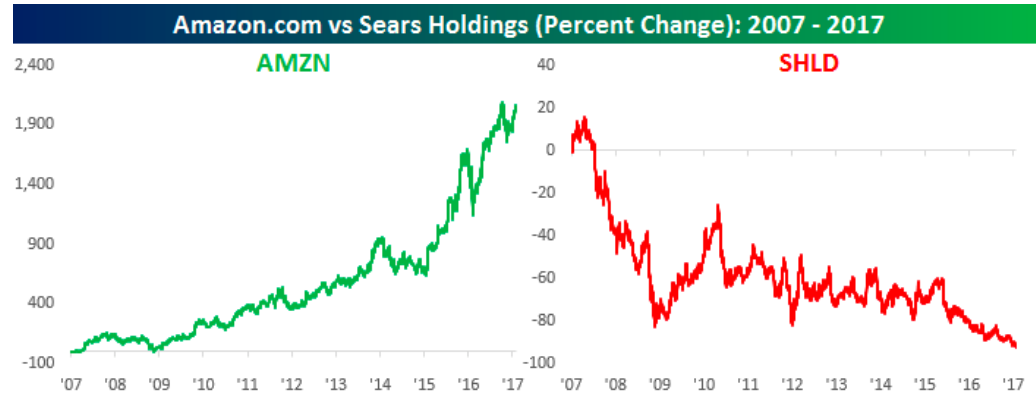
+ MEDIA CONSUMPTION

- PROPERTY OWNERSHIP

- # OF SEPARATE DEVICES

PHYSICAL ATTENDANCE NO LONGER REQUIRED

- ↓ STORE
- ↓ MOVIE THEATER
- ↓ SCHOOL
- ↓ WORK



THEN: WORK AT OFFICE



NOW: WORK ANYWHERE



DISTRIBUTED ENTERPRISE: A ZERO-HOST INFRASTRUCTURE



STORAGE



COMPUTE



MAIL



HR



ACCOUNTING

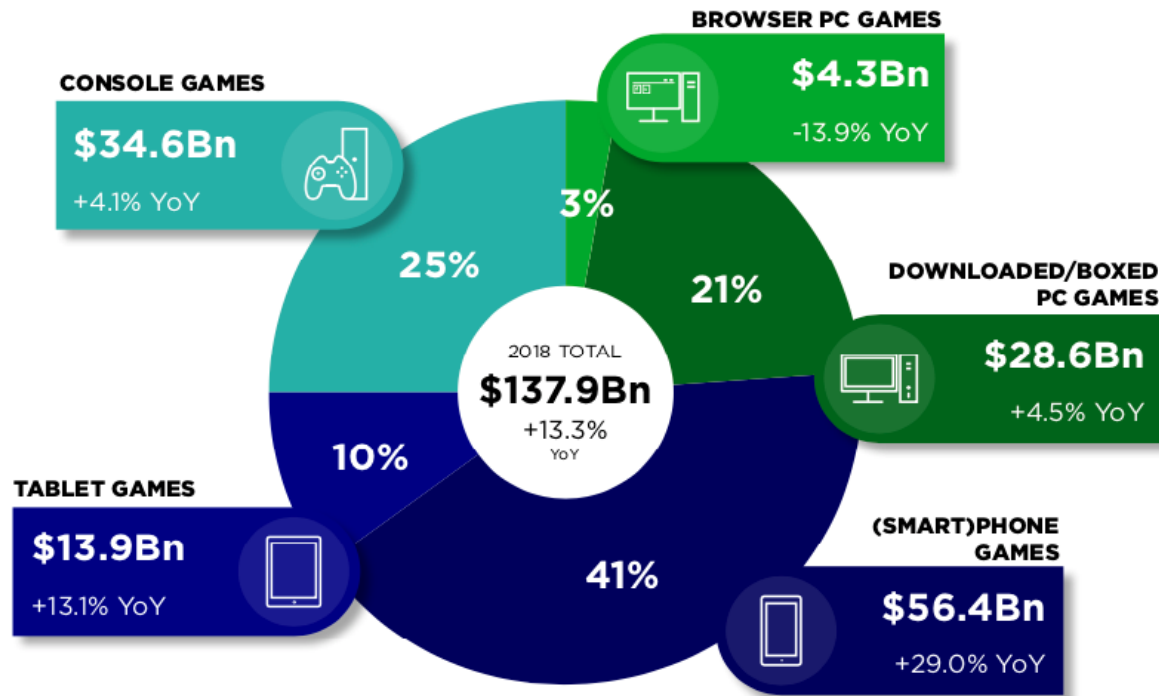
TOP PRIORITY:
CONNECTIVITY



PLAYING: THEN VS NOW



2.4 BILLION PEOPLE WILL GAME IN 2019



Source: Newzoo

EVERYTHING WE DO IS THROUGH DIGITAL



FLY



RIDE



DISCOVER, BOOK, REVIEW



EVENTS



STAY

IN THE FUTURE

DISAPPEARING DEVICE

- LAPTOP
- WALLET
- CAR
- TELEVISION
- DIGITAL CAMERA
- THERMOSTAT
- WIFI ROUTER
- WALL CHARGER



POTENTIAL TO DISAPPEAR
(OR DECLINE IN OWNERSHIP)

AR (NOT YET REAL BUT FUN TO TALK ABOUT)



AUTONOMOUS VEHICLES IN FIFTY YEARS?



INPUTS:

AI, 5G

BARRIERS:

Social Accountability

AREAS EFFECTED:

Car ownership

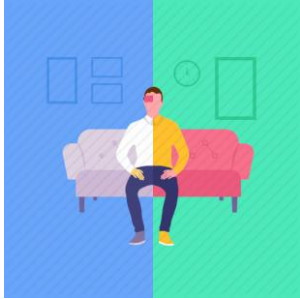
Traffic congestion

Urban planning

Oil & Gas

THINGS TO THINK ABOUT

MERGING VIRTUAL & PHYSICAL WORLD



SHIFTING GLOBAL POPULATION



ETHICS IN AI



THE FUTURE OF WORK Jobs, Talent, Automation



POLARIZATION OF POINTS OF VIEW



IN THE FUTURE...

