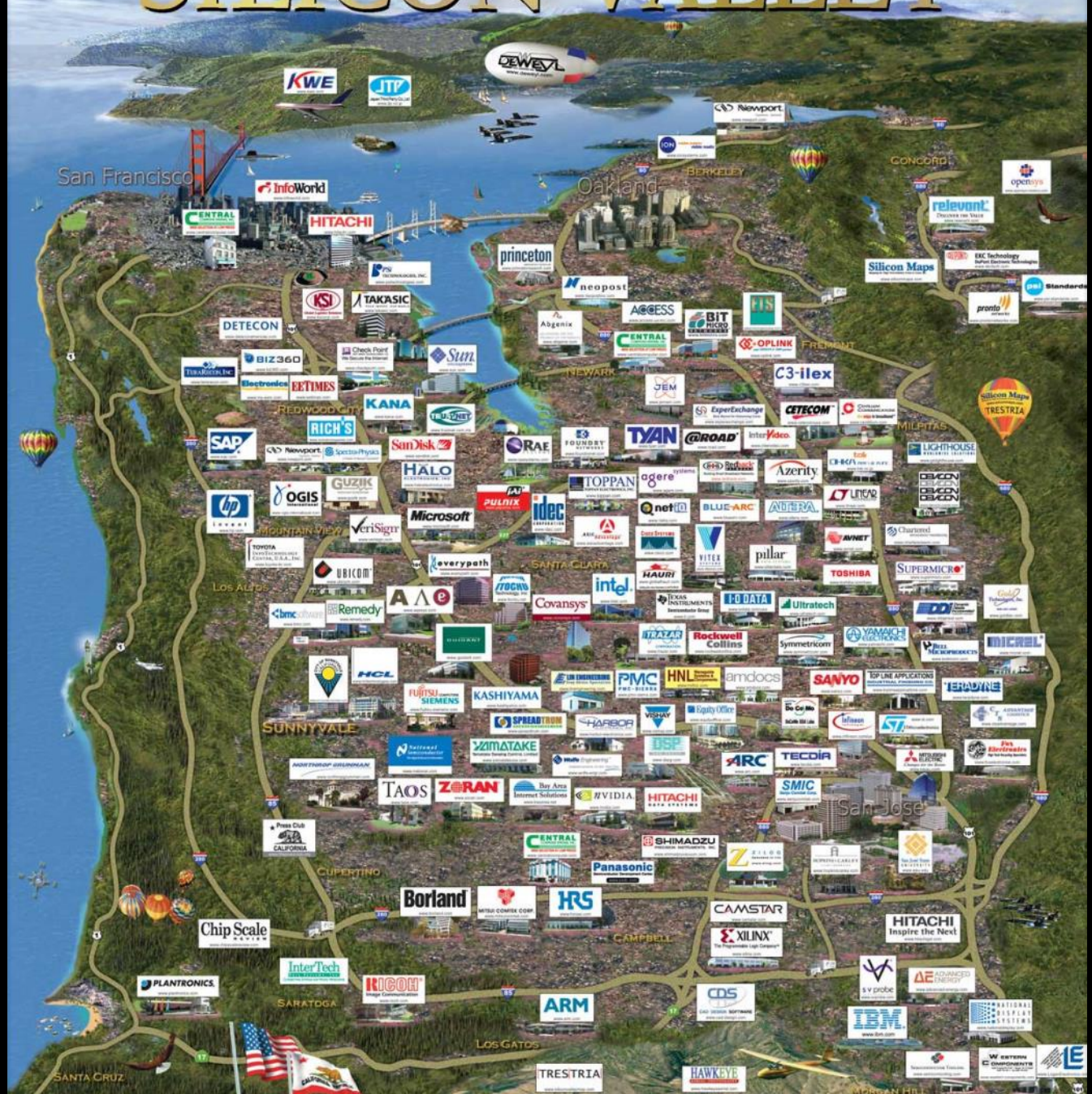







# SILICON VALLEY



# **BREAKING BOUNDARIES - THE CHANGING ROLE OF TECHNOLOGY**

IMPLICATIONS FOR BUSINESS AND GOVERNMENT  
LARRY HOWELL

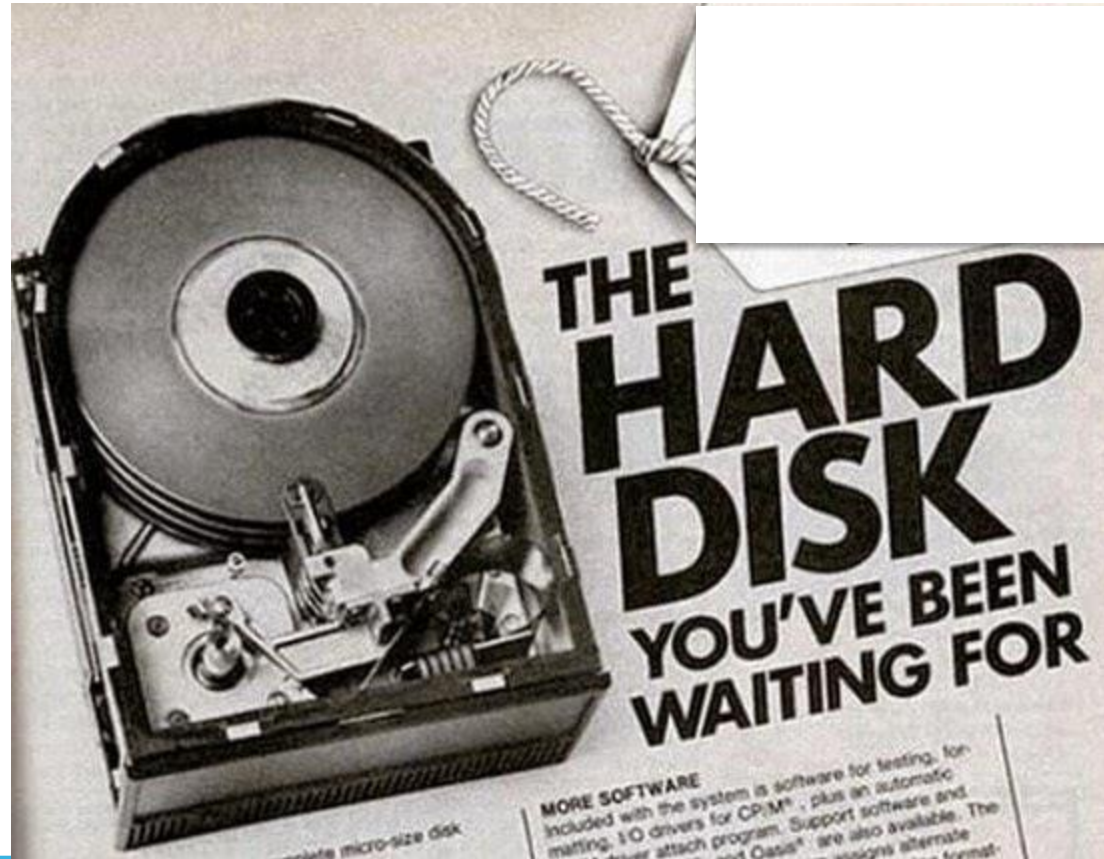
# INNOVATION AND TECHNOLOGY

- Tech over the last 40 years – How/Where/Why
  - Current State of Tech – Winners/Losers
  - Future of Tech – Role of Everyone
- 



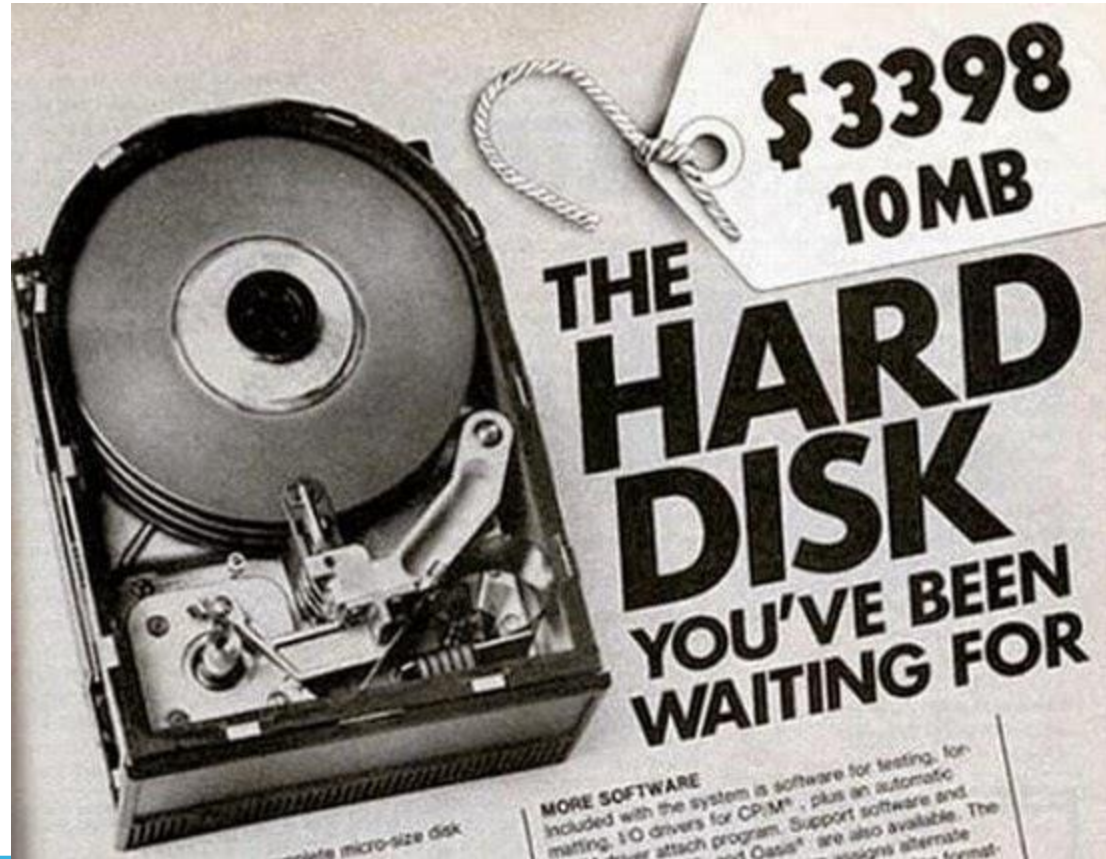
# INNOVATION AND TECHNOLOGY

Tech over the last  
50 years –  
How/Where/Why



# INNOVATION AND TECHNOLOGY

Tech over the last  
50 years –  
How/Where/Why



# The Digital Revolution

## 1 The accelerating pace of change ...



## 2 ... and exponential growth in computing power ...

Computer technology, shown here climbing dramatically by powers of 10, is now progressing more each hour than it did in its entire first 90 years

### COMPUTER RANKINGS

By calculations per second per \$1,000



**Analytical engine**  
Never fully built, Charles Babbage's invention was designed to solve computational and logical problems



**Colossus**  
The electronic computer, with 1,500 vacuum tubes, helped the British crack German codes during WW II



**UNIVAC I**  
The first commercially marketed computer, used to tabulate the U.S. Census, occupied 943 cu. ft.

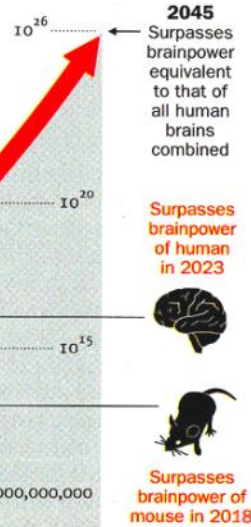


**Apple II**  
At a price of \$1,298, the compact machine was one of the first massively popular personal computers



**Power Mac G4**  
The first personal computer to deliver more than 1 billion floating-point operations per second

## 3 ... will lead to the Singularity



1900 1920 1940 1960 1980 2000 2015 2020 2045

ELECTROMECHANICAL → RELAYS → VACUUM TUBES → TRANSISTORS → INTEGRATED CIRCUITS





CALENDAR  
**75 YEARS**



CALENDAR  
**38 YEARS**



CALENDAR  
**13 YEARS**



CALENDAR  
**4 YEARS**



CALENDAR  
**3.5 YEARS**



CALENDAR  
**3 YEARS**



CALENDAR  
**2.5 YEARS**



CALENDAR  
**50 DAYS**



CALENDAR  
**35 DAYS**

# Reaching 50 Million users

*It took about 75 years for the telephone to connect 50 million people. Today a simple iPhone app like Draw Something can reach that milestone in a matter of days. In the past 10 years the rate of adoption of new technologies has accelerated at a dizzying speed. Can we keep up with it all?*



# INNOVATION AND TECHNOLOGY

Current State of  
Tech –  
Winners/Losers

## Age of Digital Disruption or Digital Economy



World's largest taxi company owns no taxis



Largest accommodation provider owns no real estate



Largest phone companies own no telco infrastructure



World's most valuable retailer has no inventory



Most popular media owner creates no content



Social



Mobile



Cloud



Big Data

# 2017 Top 13 (Market Cap) Public Companies Globally

Ranking of the companies rank 1 to 100	Market value in million U.S. dollars
Apple	752
Alphabet	579.5
Microsoft	507.5
Amazon.com	427
Berkshire Hathaway	409.9
Facebook	407.3
ExxonMobil	242.2
Johnson & Johnson	338.6
JPMorgan Chase	306.6
Tencent Holdings	277.1
Wells Fargo	274.4
Alibaba	264.9
General Electric	261.2

# 2017 Top Unicorns by Valuation

## PRIME UNICORN INDEX



### TOP 10 COMPONENTS (RANKED BY VALUATION)

Company	Sector	Valuation*	Weight (%)*
Uber Technologies, Inc.	Software	\$44,271,240,905	1.17%
AirBnb, Inc.	Consumer Products and Services, Software	\$29,252,091,441	1.17%
Space Exploration Technologies Corp	Industrial/Energy	\$18,402,468,776	1.17%
WeWork Companies, Inc.	Business Products and Services	\$11,255,230,718	1.17%
Pinterest, Inc.	Media and Entertainment, Software	\$10,447,526,463	1.17%
Lyft, Inc.	Consumer Products and Services, Software	\$9,623,402,325	1.45%
Dropbox Inc	Software	\$9,379,097,564	1.17%
Magic Leap, Inc.	Computers and Peripherals, Software	\$4,984,103,961	1.17%
Social Finance, Inc.	Financial Services	\$4,497,866,541	1.17%
Tanium Inc.	IT Services, Software	\$3,847,707,751	1.17%

\* As of December 31, 2017

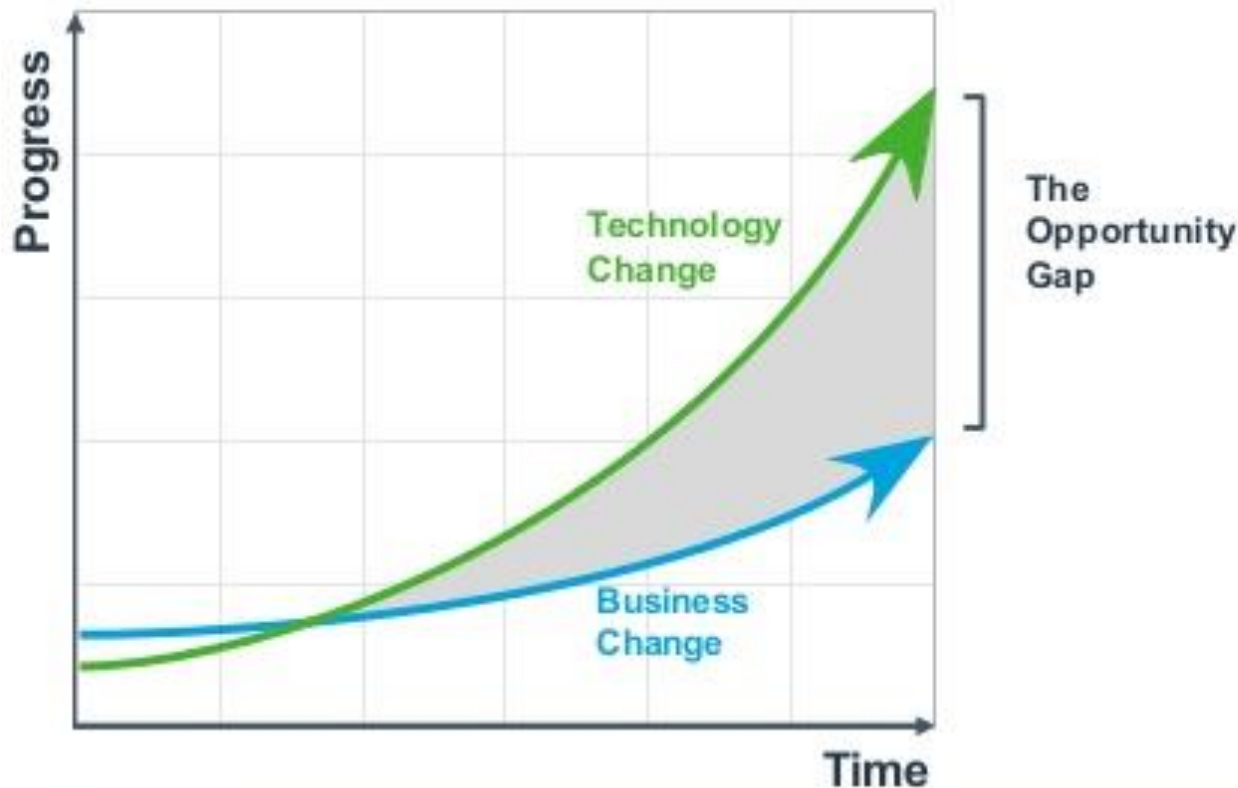


# INNOVATION AND TECHNOLOGY

Future of Tech –  
Role of Everyone



# And the rate of technology change is exponentially faster than the speed at which most businesses run



## Top 10 Strategic Technology Trends 2016

1. Device "Mesh"
2. Ambient User Experience
3. 3D Printing Materials
4. Information of Everything
5. Advanced Machine Learning
6. Autonomous Agents & Things
7. Adaptive Security Architecture
8. Advanced Customer Architecture
9. Mesh App & Service Architecture
10. IoT Architecture & Platforms

Gartner research, 2015

# Energy tech startups are creating new businesses in 12 categories



## Energy Technology

[Learn about](#) our full 743 company report with \$44B in funding





# 67 STARTUPS MAKING YOUR HOME SMARTER

## PET & BABY MONITOR

Petnet<sup>®</sup> iBaby<sup>®</sup> Petcube  
nanit sevenhugs LULLY

## APPLIANCES & AUDIO DEVICES

hiku INDEPENDA innit SONOS  
SECTORQUBE KITU MUSAIC

## LIGHTING

LUMETRIC LIGHTING plum  
switchmate smart home simplified  
emberlight LIFX

## MISCELLANEOUS

KAMARQ  
notion<sup>®</sup>

## SAFETY & SECURITY

leeo BeONhome A new layer of home protection  
SimpliSafe roost  
MY ALARM CENTER myfox  
Eugust Lockitron  
canary ring  
LATCH audio analytic  
cocoon Glue



iStock.com/skypicstudio

## ENERGY & UTILITIES

Ecoisme  
sense.  
thinkeco  
rachio  
ecobee  
there.  
tado<sup>°</sup>

## DEVICE CONTROLLERS

SENTRI Fluent NINJA BLOCKS  
muzzley wigwag ivee  
peel avi-on Simple Bluetooth<sup>®</sup> Controls iRule

## HEALTH & WELLNESS

evermind  
beddit  
hello  
MedMinder<sup>™</sup>

## GENERAL SMART HOME SOLUTIONS

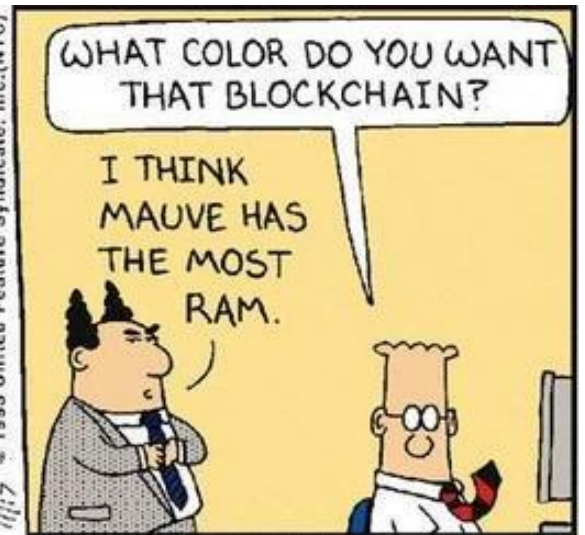
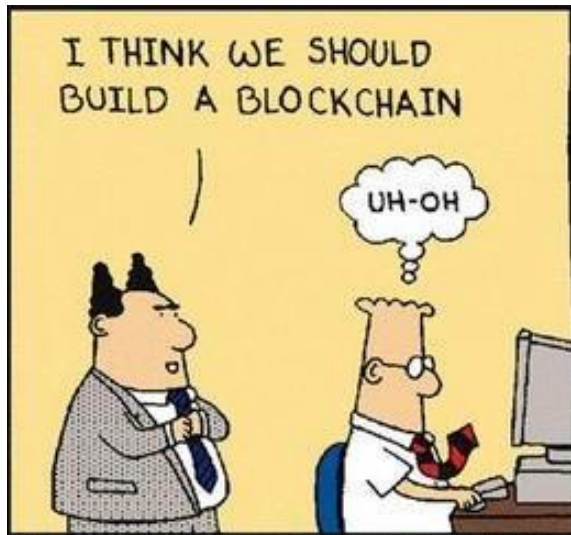
ecovent  
netatmo  
KEEN<sup>™</sup> home  
vivint.SmartHome

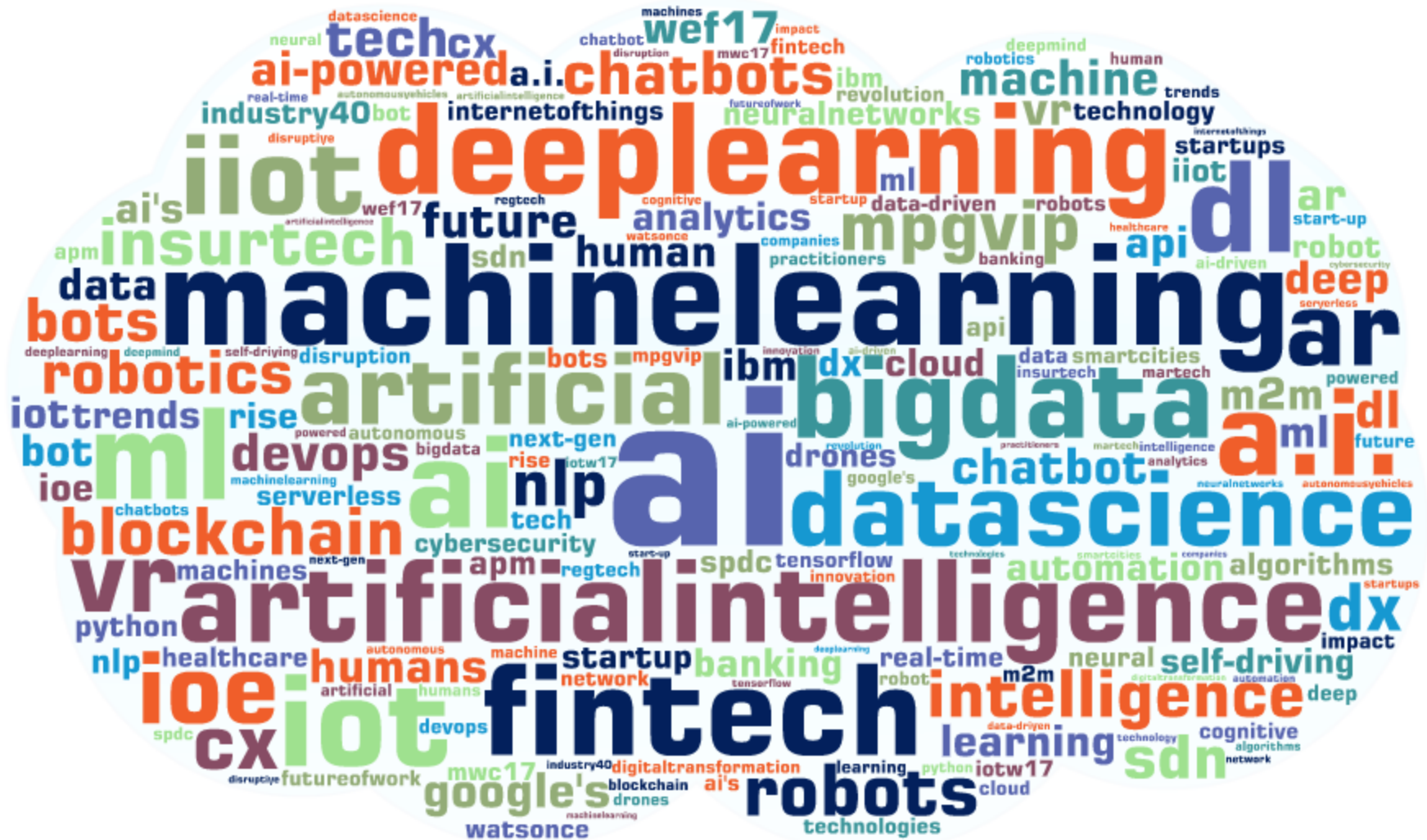
## HOME ROBOTS

jibo  
Rokid  
小鱼在家  
robart  
neato robotics<sup>™</sup>

## GARDENING

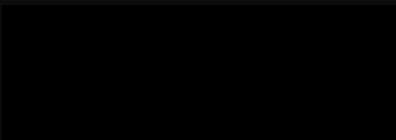
grove  
NIWA  
EDYN







“THE SECRET OF  
CHANGE IS TO FOCUS  
ALL OF YOUR ENERGY,  
NOT ON FIGHTING THE  
OLD, BUT ON BUILDING  
THE NEW.”



“THE SECRET OF  
CHANGE IS TO FOCUS  
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NOT ON FIGHTING THE  
OLD, BUT ON BUILDING  
THE NEW.”

— *SOCRATES*

The MGI Industry Digitization Index

2015 or latest available data



● Digital leaders within relatively undigitized sectors

Sector	Overall digitization <sup>1</sup>	Assets			Usage			Labor			GDP share %	Employment share %	Productivity growth, 2005-14 <sup>2</sup>
		Digital spending	Digital asset stock	Transactions	Interactions	Business processes	Market making	Digital spending on workers	Digital capital deepening	Digitization of work			
ICT	High	High	High	High	High	High	High	High	High	High	5	3	4.6
Media	High	High	High	High	High	High	High	High	High	High	2	1	3.6
Professional services	High	High	High	High	High	High	High	High	High	High	9	6	0.3
Finance and insurance	High	High	High	High	High	High	High	High	High	High	8	4	1.6
Wholesale trade	High	High	High	High	High	High	High	High	High	High	5	4	0.2
Advanced manufacturing	High	High	High	High	High	High	High	High	High	High	3	2	2.6
Oil and gas	High	High	High	High	High	High	High	High	High	High	2	0.1	2.9
Utilities	High	High	High	High	High	High	High	High	High	High	2	0.4	1.3
Chemicals and pharmaceuticals	High	High	High	High	High	High	High	High	High	High	2	1	1.8
Basic goods manufacturing	High	High	High	High	High	High	High	High	High	High	5	5	1.2
Mining	High	High	High	High	High	High	High	High	High	High	1	0.4	0.5
Real estate	High	High	High	High	High	High	High	High	High	High	5	1	2.3
Transportation and warehousing	High	High	High	High	High	High	High	High	High	High	3	3	1.4
Education	High	High	High	High	High	High	High	High	High	High	2	2	-0.5
Retail trade	High	High	High	High	High	High	High	High	High	High	5	11	-1.1
Entertainment and recreation	High	High	High	High	High	High	High	High	High	High	1	1	0.9
Personal and local services	High	High	High	High	High	High	High	High	High	High	6	11	0.5
Government	High	High	High	High	High	High	High	High	High	High	16	15	0.2
Health care	High	High	High	High	High	High	High	High	High	High	10	13	-0.1
Hospitality	High	High	High	High	High	High	High	High	High	High	4	8	-0.9
Construction	High	High	High	High	High	High	High	High	High	High	3	5	-1.4
Agriculture and hunting	High	High	High	High	High	High	High	High	High	High	1	1	-0.9

- 1 Knowledge-intensive sectors that are highly digitized across most dimensions
- 2 Capital-intensive sectors with the potential to further digitize their physical assets
- 3 Service sectors with long tail of small firms having room to digitize customer transactions
- 4 B2B sectors with the potential to digitally engage and interact with their customers
- 5 Labor-intensive sectors with the potential to provide digital tools to their workforce
- 6 Quasi-public and/or highly localized sectors that lag across most dimensions

1 Based on a set of metrics to assess digitization of assets (8 metrics), usage (11 metrics), and labor (8 metrics); see technical appendix for full list of metrics and explanation of methodology.  
 2 Compound annual growth rate.