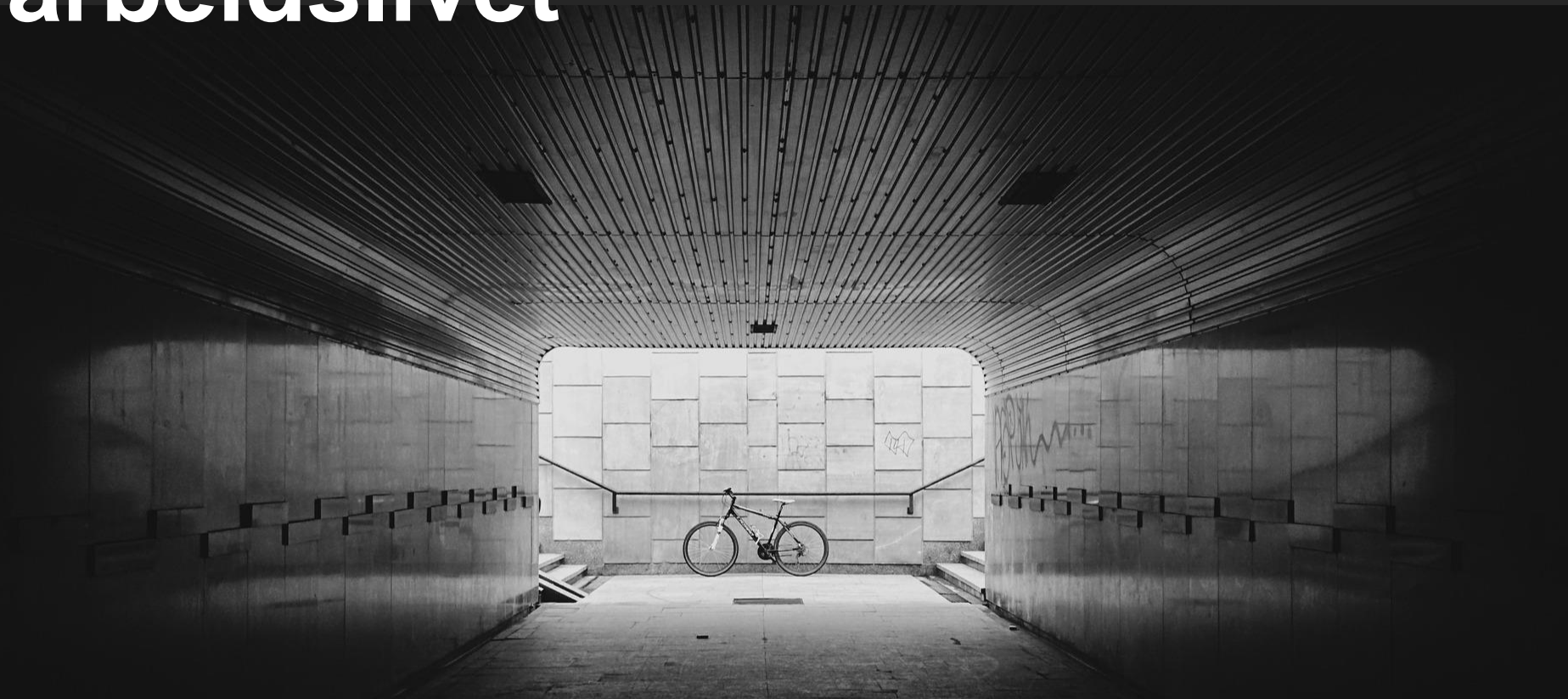


Digital omveltning og arbeidslivet



Silvija Seres

Moss Industri- og Næringsforening

Moss, 20 September 2016

Teknolog:

MSc Informatikk @ UiO
Dr Matematikk @ Oxford
AltaVista @ Silicon Valley
Programmering @ NCC
Leder @ FAST and Microsoft

Internasjonal:

Forsker @ Kina
Professor @ Saudi Arabia
MBA @ INSEAD
Oppvekst @ Jugoslavia
Investor @ Scandinavia







Samfunnsengasjert:

President @ Polyteknisk Forening
Medlem @ Teknologirådet
Mentor @ Alarga, Seema
Styremedlem @ NFR, Simula, Sintef
Elev @ Sjefskurset FHS

Navigating the next industrial revolution



Revolution	Year	Information	
	1	1784	Steam, water, mechanical production equipment
	2	1870	Division of labour, electricity, mass production
	3	1969	Electronics, IT, automated production
	4	?	Cyber-physical systems

Denne gangen er det annerledes:
Eksponentiell, polariserende og kombinatorisk.

The Internet is the largest experiment involving anarchy in human history.

Billions of people are creating and consuming untold amounts of digital content in an online world not truly bound by terrestrial laws.

Virtual space is becoming as relevant as the physical one.

Internet Users – 1995 → 2014... <1% to 39% Population Penetration Globally

1995
35MM+ Internet Users
0.6% Population Penetration

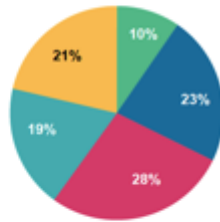


■ USA ■ China ■ Asia (ex. China) ■ Europe ■ Rest of World

KPCB Source: eMarketer, ITU, US Census

4

2014
2.8B Internet Users
39% Population Penetration



Mobile Phone Users – 1995 → 2014... 1% to 73% Population Penetration Globally

1995
80MM+ Mobile Phone Users
1% Population Penetration



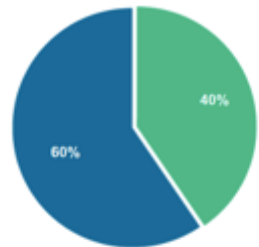
■ Smartphone ■ Feature Phone

KPCB

Source: Informa, World Cellular Information Service (WCIS). Assumes in 1995, one mobile phone subscription per unique user (no dual-sim). Note: In 2014, user base per KPCB estimates based on Morgan Stanley Research and ITU data. Smartphone users & mobile phone users represent unique individuals owning mobile devices, mobile subscriptions based on number of subscriptions & may therefore overstate number of mobile users.

5

2014
5.2B Mobile Phone Users
73% Population Penetration



There are **5.2 billion mobile phone users**,
up from 80 million in 1995.

The laws of speed and computing power #6

Moore's Law: processor chips double in speed every 18 months.

Photonics Law: the amount of data coming out of fiber optic cables, doubles every nine months.

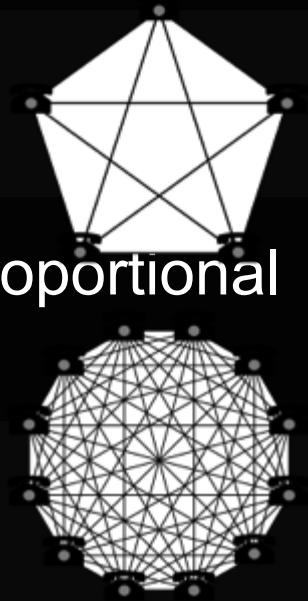
Exponential growth unleashes huge possibilities in graphics, virtual reality, driverless cars, tough-controlled robots, AI, etc.

The two network laws

#7

Reed's Law: utility of large networks, particularly social networks, scales exponentially with the size of the network.

Metcalfe's Law: the value of a telecoms network is proportional to the square of the number of connected users.



Consequences for the networked business: **winner takes all** dynamics.

Exponential growth

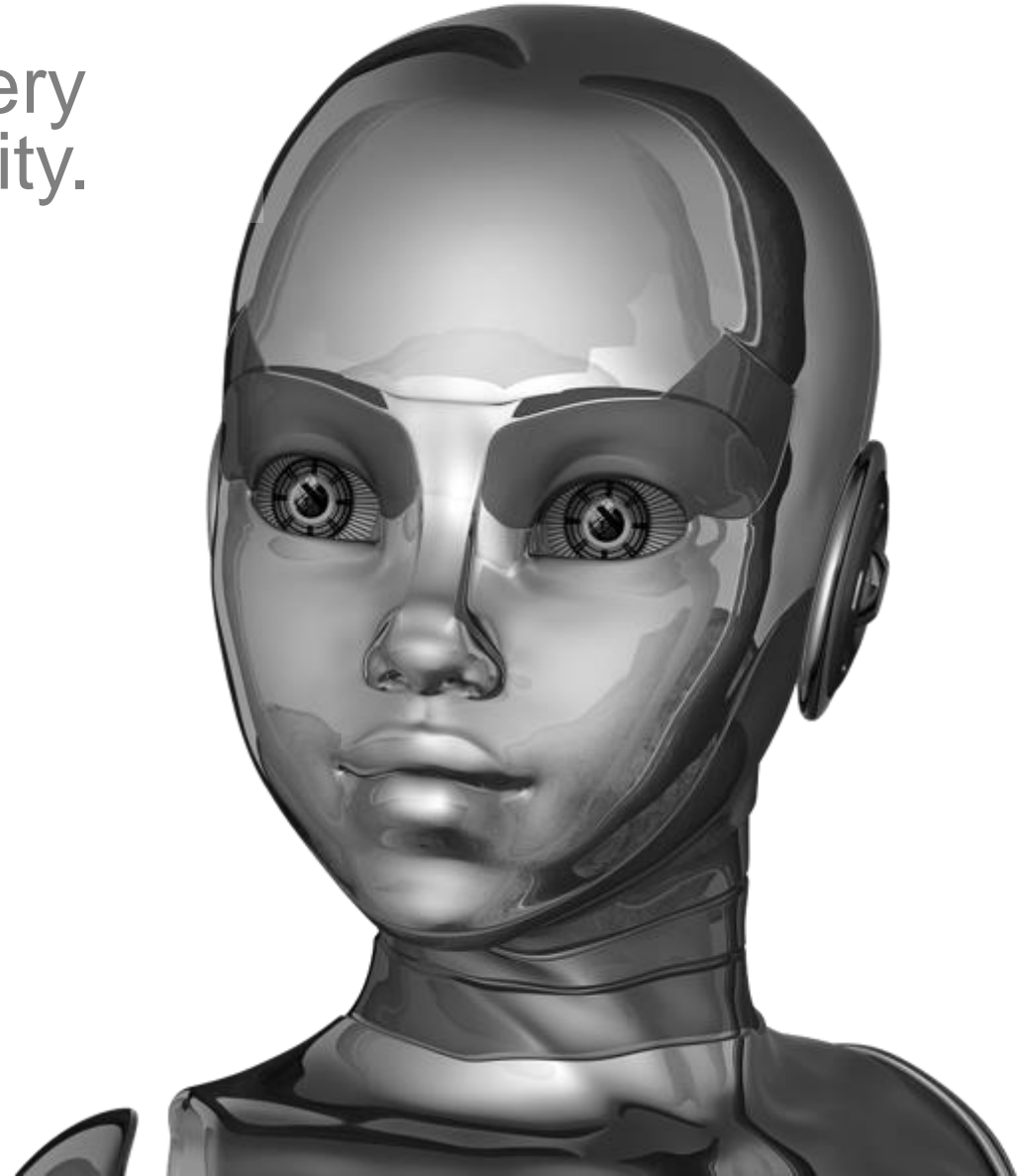
#8



Take 30 linear spaces: 30 meters

Take 30 exponential paces: 26x around the Earth!

Challenging the very
concept of humanity.



Examples of rate of change

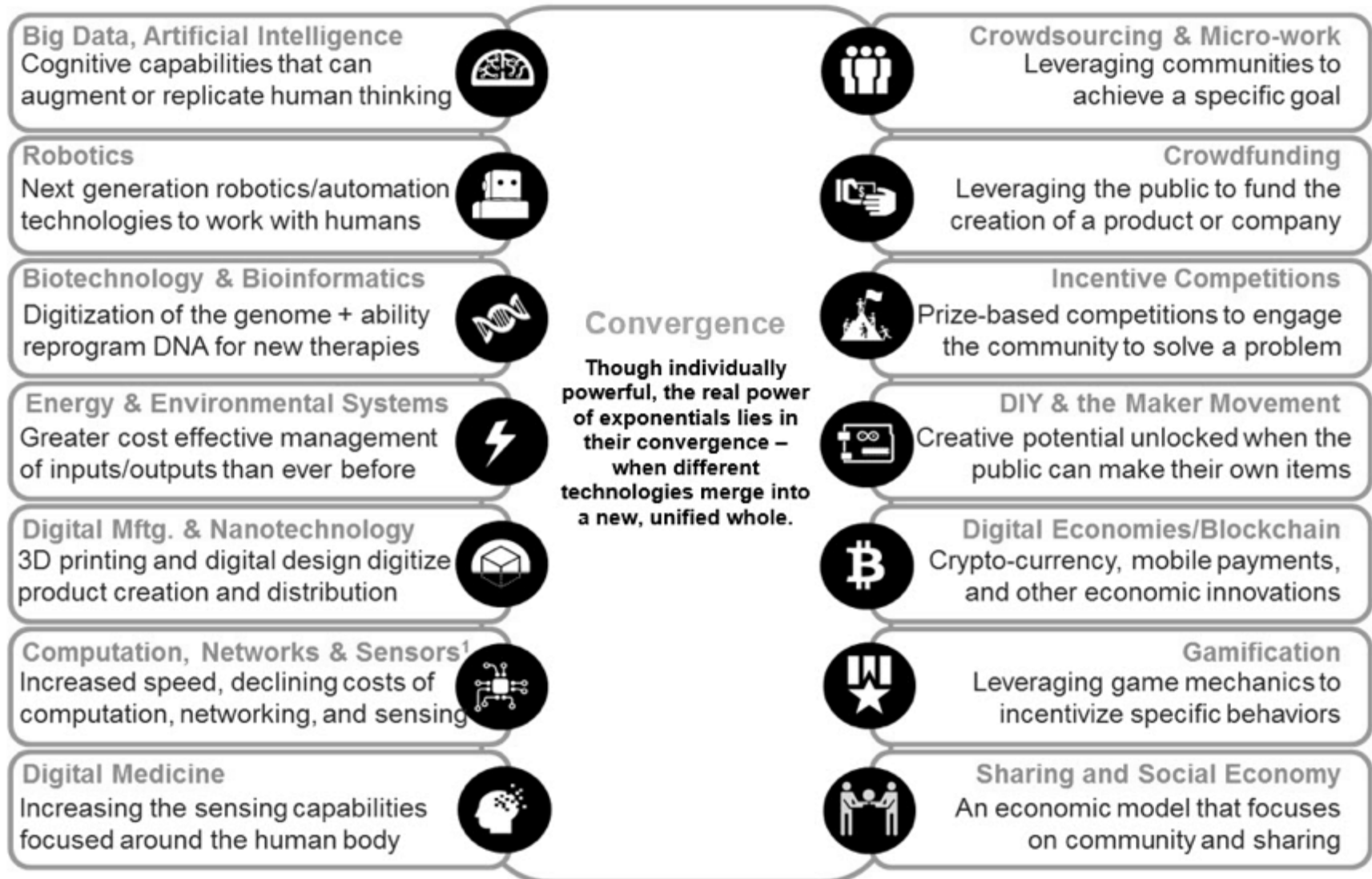
Technology	Average cost for equivalent functionality	Scale
3D printing	\$40,000 (2007) to \$100 (2014)	400x in 7 years
Industrial robots	\$500,000 (2008) to \$22,000 (2013)	23x in 5 years
Drones	\$100,000 (2007) to \$700 (2013)	142x in 6 years
Solar energy	\$30 per kWh (1984) to \$0.16 per kWh (2014)	200x in 20 years
3D LIDAR Sensors	\$20,000 (2009) to \$79 (2014)	250x in 5 years
DNA genome seq	\$10,000,000 (2007) to \$1,000 (2014)	10,000x in 7 years
BCI neuro devices	\$4,000 (2006) to \$90 (2011)	44x in 5 years
Full body med scan	\$10,000 (2000) to \$500 (2014)	20x in 14 years



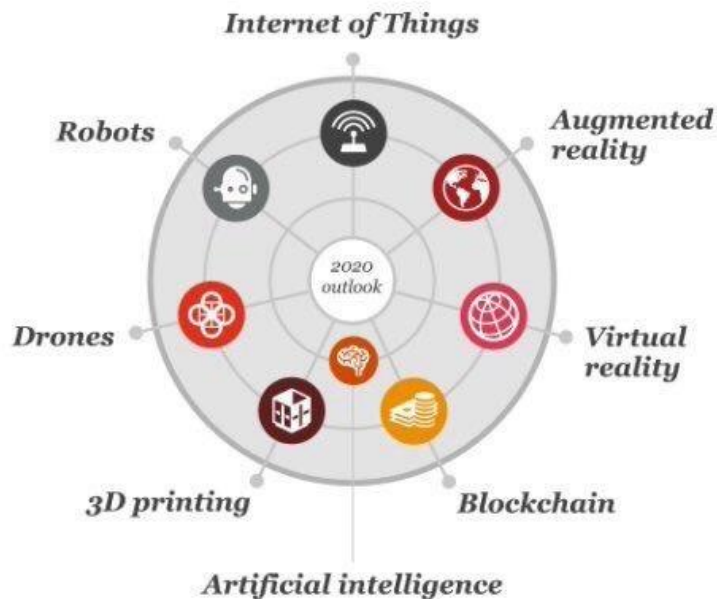
Source: "Exponential Organizations"

<http://www.slideshare.net/vangeest/exponential-organizations-h>

@dw2



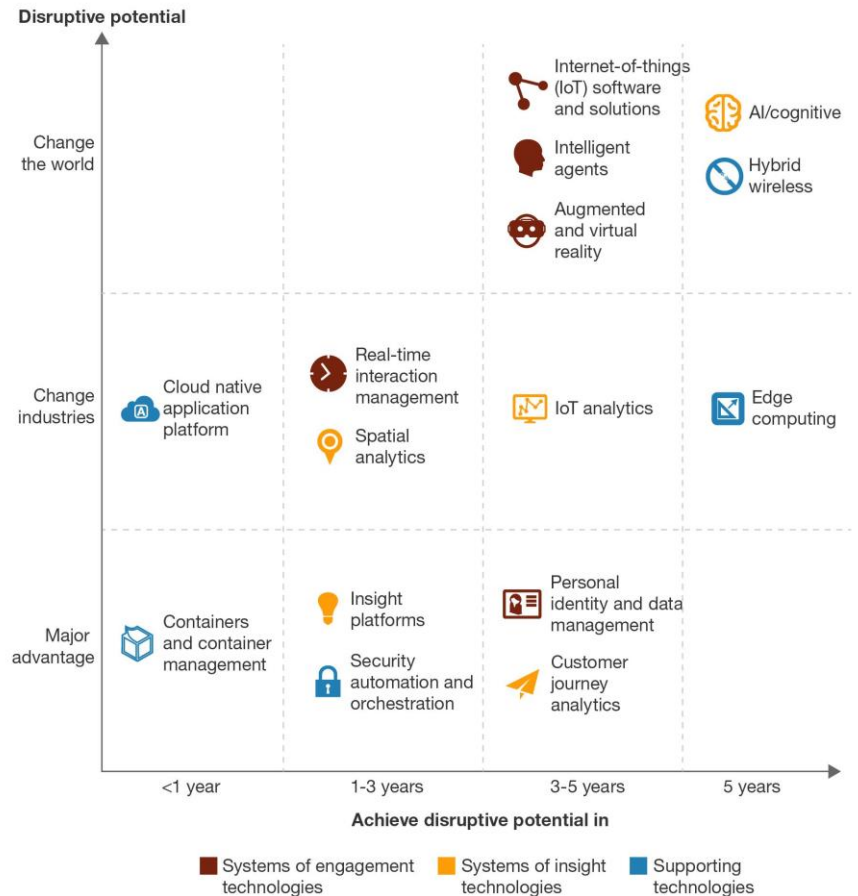
The essential eight technologies



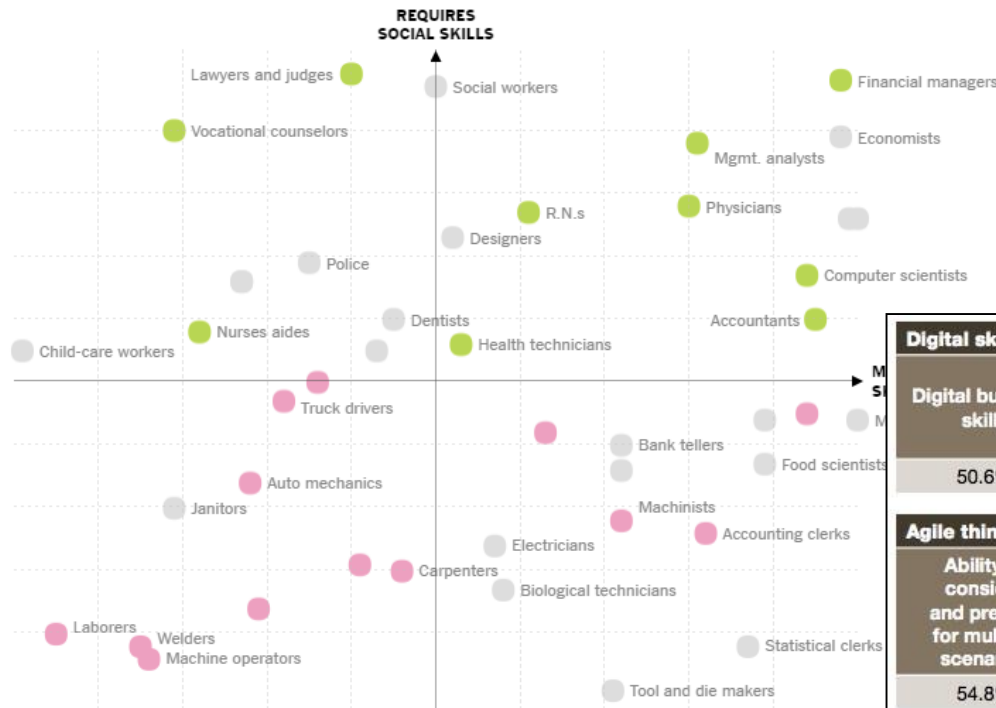
FORRESTER RESEARCH | CIOs

Five Emerging Technologies Will Start To Change The World Within Five Years

The Top Emerging Technologies To Watch: 2017 To 2021



KEY: Change in share of jobs, 1980 to 2012 ● Fell ● About the same ● Grew



Source: David Deming, Harvard University

Digital skills

Digital business skills	Ability to work virtually	Understanding of corporate IT software and systems	Digital design skills	Ability to use social media and "Web 2.0"
50.6%	44.9%	40.1%	35.2%	29.3%

Agile thinking skills

Ability to consider and prepare for multiple scenarios	Innovation	Dealing with complexity and ambiguity	Managing paradoxes, balancing opposing views	Ability to see the "big picture"
54.8%	46.0%	42.9%	40.9%	15.3%

Interpersonal and communication skills

Co-creativity and brainstorming	Relationship building (with customers)	Teaming (including virtual teaming)	Collaboration	Oral and written communication
48.3%	47.4%	44.9%	30.4%	29.0%

Global operating skills

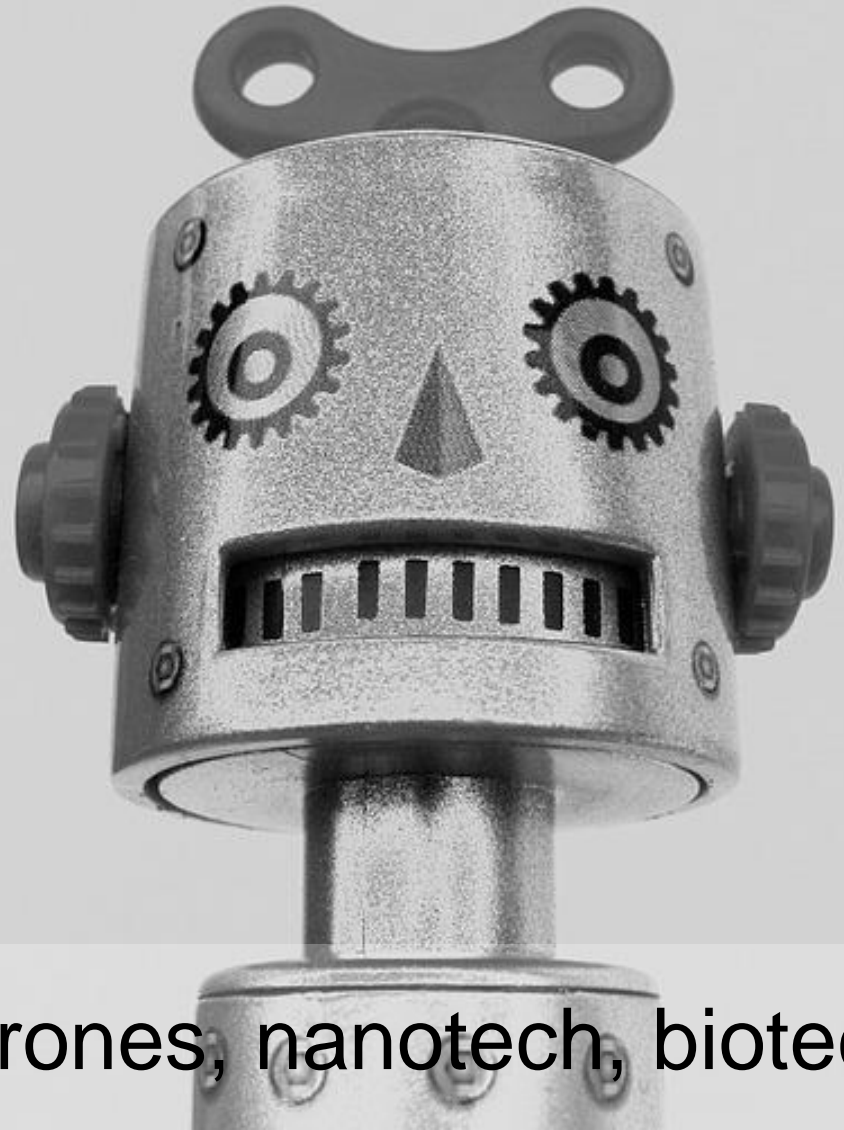
Ability to manage diverse employees	Understanding international markets	Ability to work in multiple overseas locations	Foreign language skills	Cultural sensitivity
49.1%	45.7%	37.5%	36.1%	31.5%



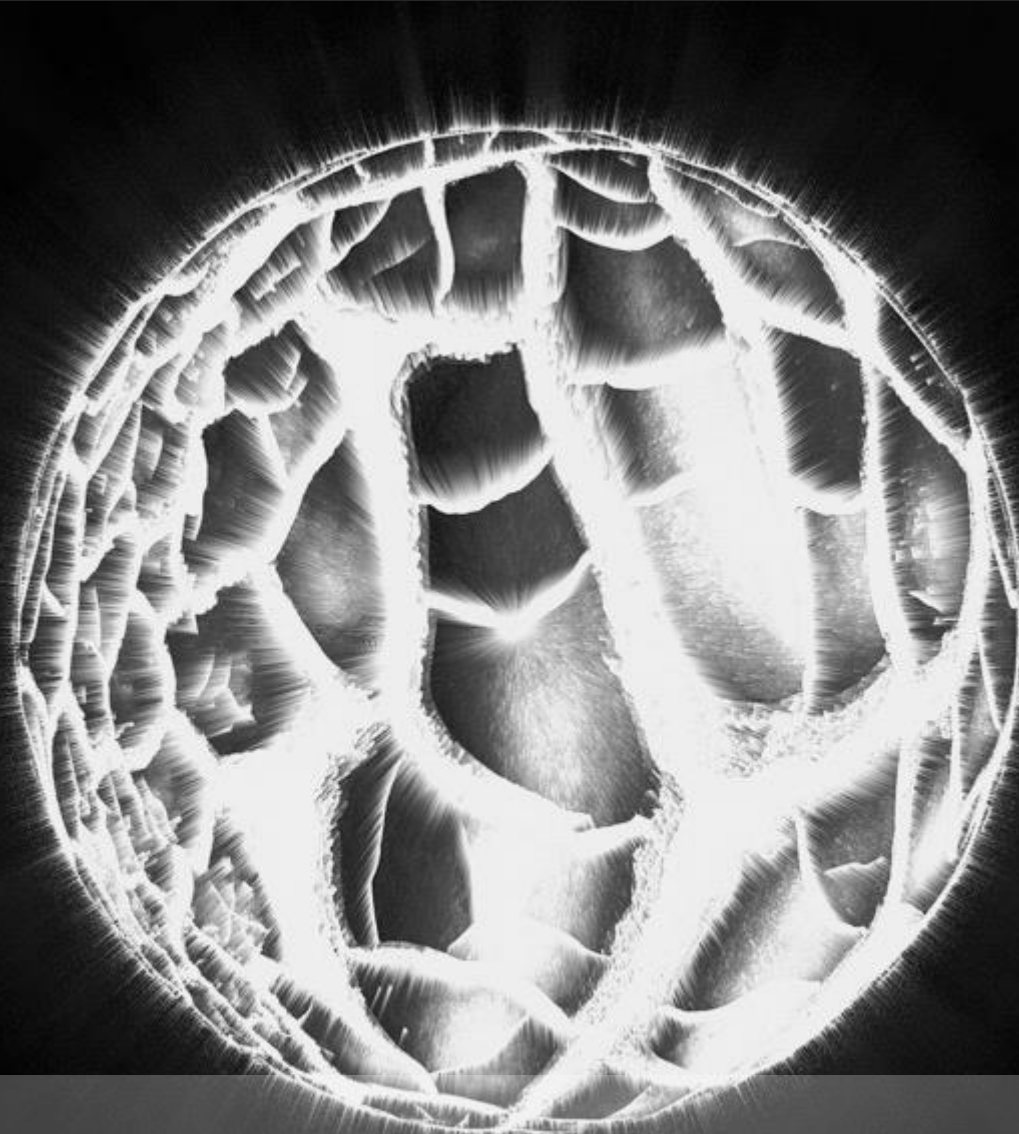
Skyen, big data, analytics of everything.



Sharing economy, crowdfunding, crowdsourcing.



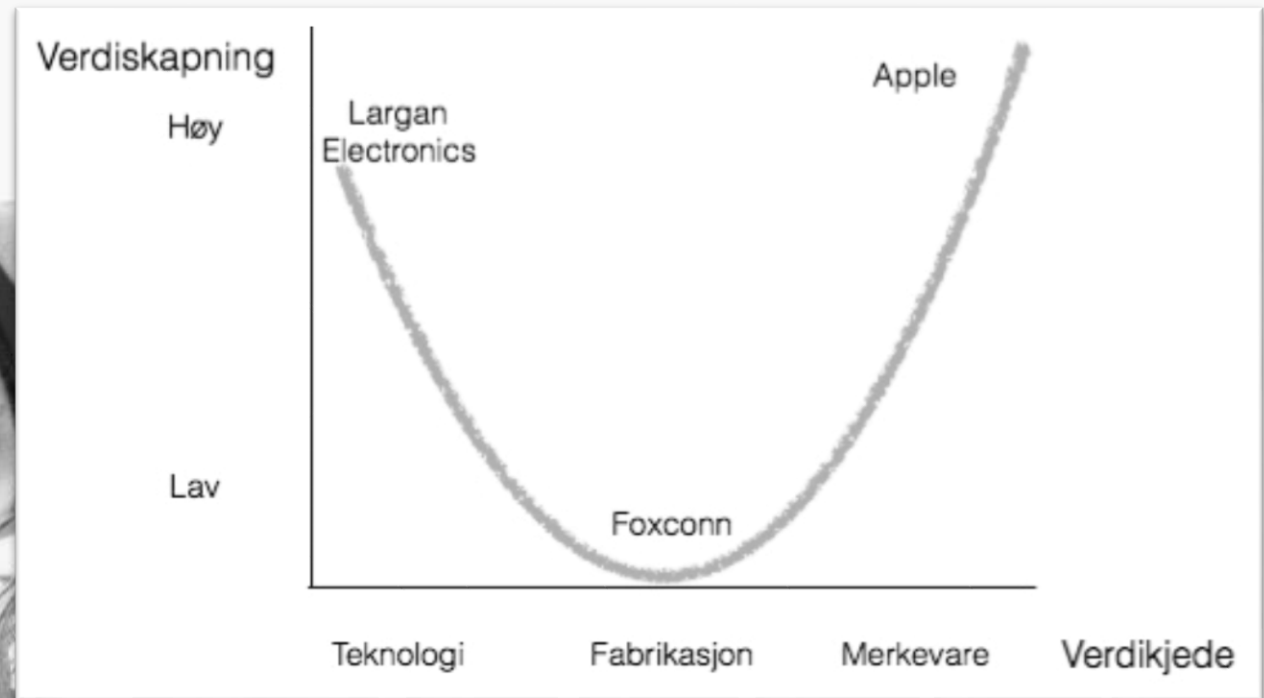
Robots, AI, VR, 3D, drones, nanotech, biotech.



Polarisering, algoritmisering, globalisering



Kompleksitet eller innovasjon?



Produksjon, skalering, kundekontakt



Lean, Devops, Design thinking



Nederst – infrastruktur; øverst – kundekontakt



Innovating at the edge, scaling at the core



Hvor er vår norske playbook for success?

Faresignaler:

1. "Vi har ikke slik kultur"
2. "Det er for mye legacy"
3. "Evig ressursmangel"
4. "Det skjer ikke hos oss"
5. "Ikke styreoppgave"
6. "Vi har prøvd det før"
7. "Vi gjør allerede masse"
8. "Vi venter på klarere modell"
9. "Vi venter på betalingsvilje"
10. "Ikke vår business"

Fallgruver:

1. Sende det til administrasjon
2. Sende det til IT avdeling
3. Tro det er bare IT
4. Jobbe fragmentert
5. Ikke tiltrekke nye talenter
6. Ikke utvikle eksisterende talent
7. Ikke feire små suksesser
8. Ikke ha MTP
9. Ikke måle
10. Ikke eksperimentere

Takk for oppmerksomheten

#25



Spørsmål?

silvija.seres@technorocks.com

[@silvijaseres](#)