Emerging Technology Impact: The "Need-to-Knows" for Business Continuity Professionals

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"Today, we are functionally linked together in a vast organic system…The earth is not only becoming covered by myriads of grains of thought, but becoming enclosed in a single thinking envelope." *–Teilhard de Chardin, 1925*

"Every once in a while, a new technology, an old problem, and a big idea turn into an innovation." *– Dean Kamen*

Agenda:

- Objectives
- Retrospective – the world as we knew it
- Exponential growth in our linear world
- Technology impacting you faster than you think possible
- Aligning business continuity with today/tomorrow/future
- Discussion/Q&A

My Objectives:

- Get your adrenaline flowing!! Risk and opportunities abound!!
- Inspire your thinking - how fast will your organization have to change?
- Challenge your current understanding - at least 1 or 2 “AHA!” moments
- Give you tools and resources – leverage the world’s knowledge
- Arm you with new questions for your suppliers and partners
- Take heart – Civilization has never collapsed – humans are very resilient
- No pressure – the world is depending on us to keep civilization moving forward in the face of countless threats

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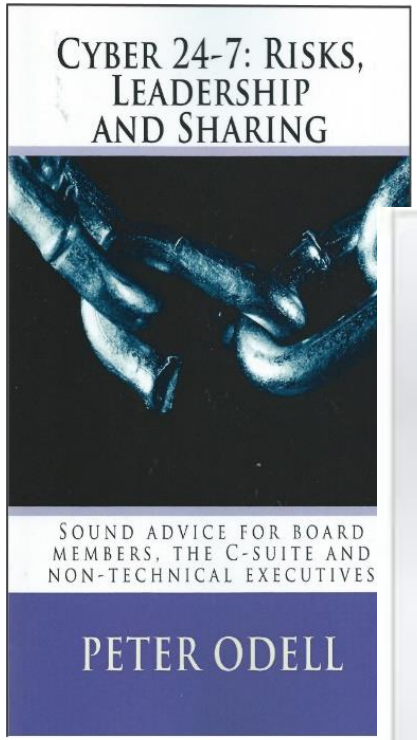
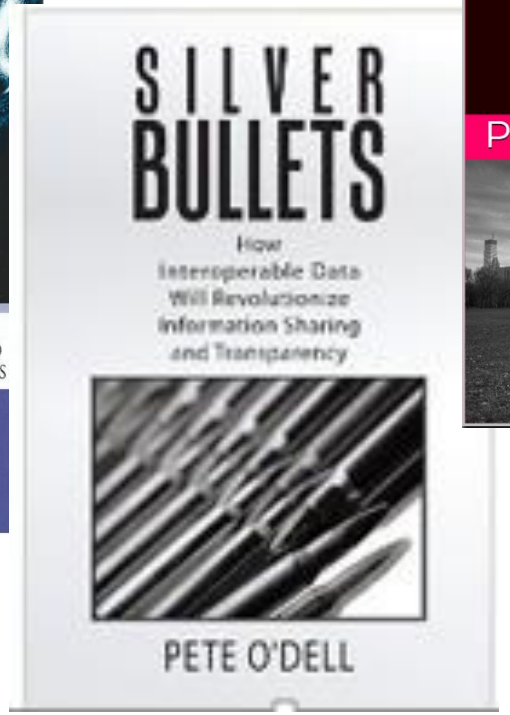
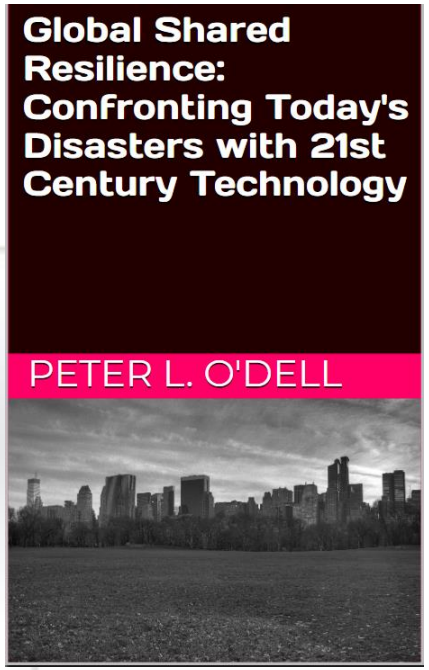
SWAN ISLAND NETWORKS

TX360®







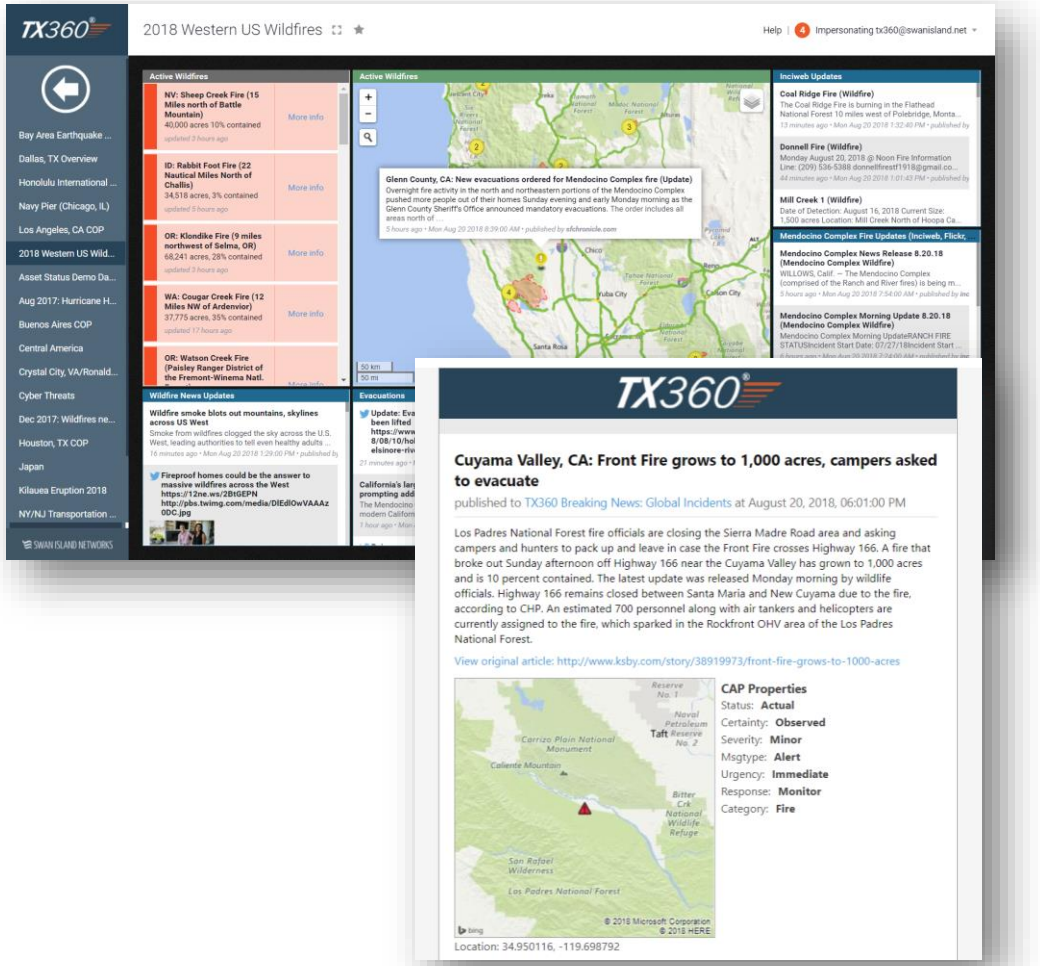
Background

CEO, CIO, COO, board member, entrepreneur, consultant, founder, veteran in technology, security, manufacturing, services. Poor golfer, avid fly fisherman, veteran non-profit, technology evangelist.

Author

Cyber 24-7: Risks, Leadership and Sharing
Silver Bullets: Interoperable Data
(digital copies available free – email me)
Upcoming (2019?): **Global Shared Resilience**

TX360 Situational Awareness



- Watch your front! Seconds count!
- Hazard/Threat monitoring
- 2000 global sources + add your own
- News, social, gov, geo, more….
- Easy to deploy and use in hours
- Integrates with other tools
- Scalable, redundant cloud platform
- OPEX affordable

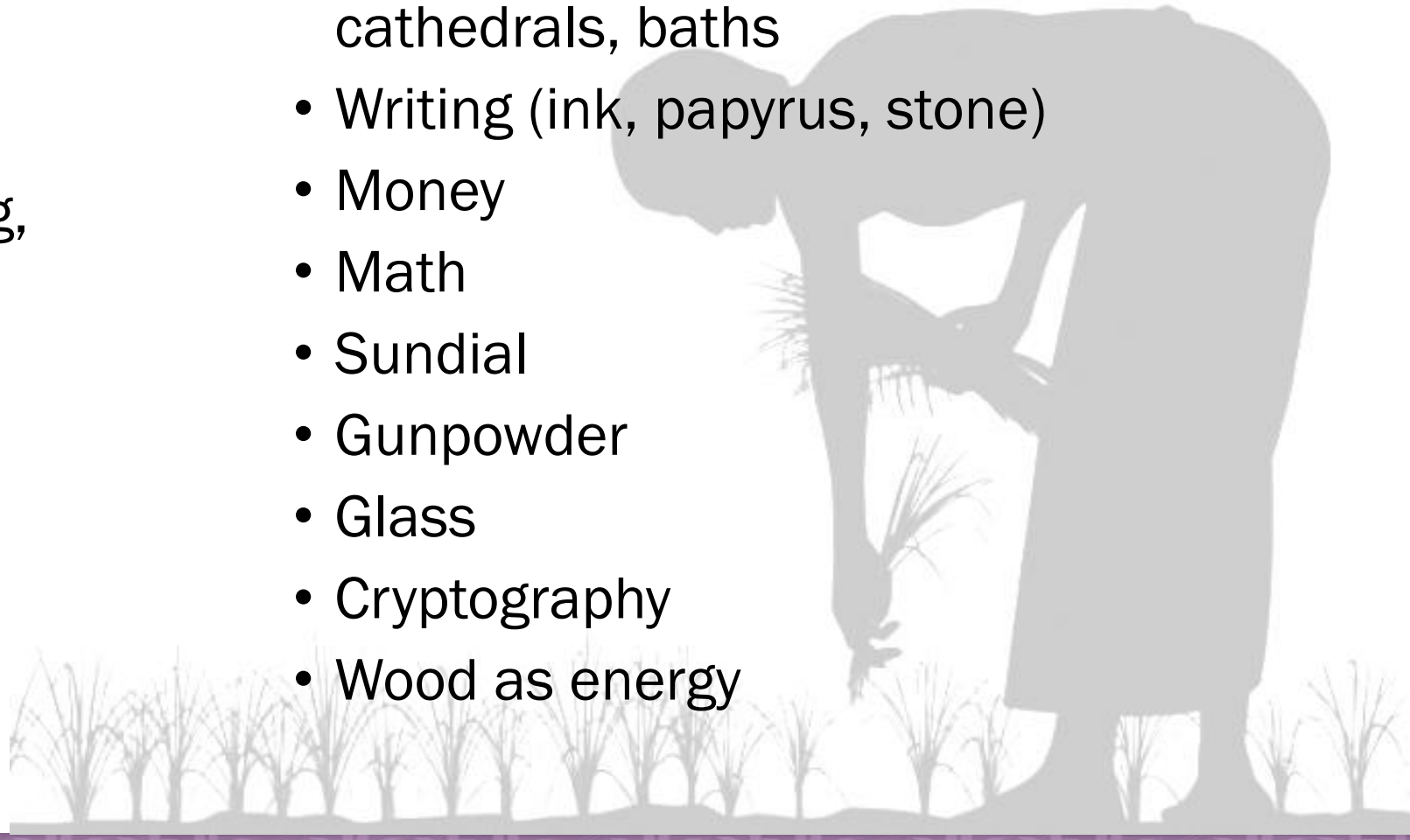
A quick look back (1.9M years ago to last night) – What's been happening?

"Nothing vast enters the life of mortals without a curse."

— Sophocles

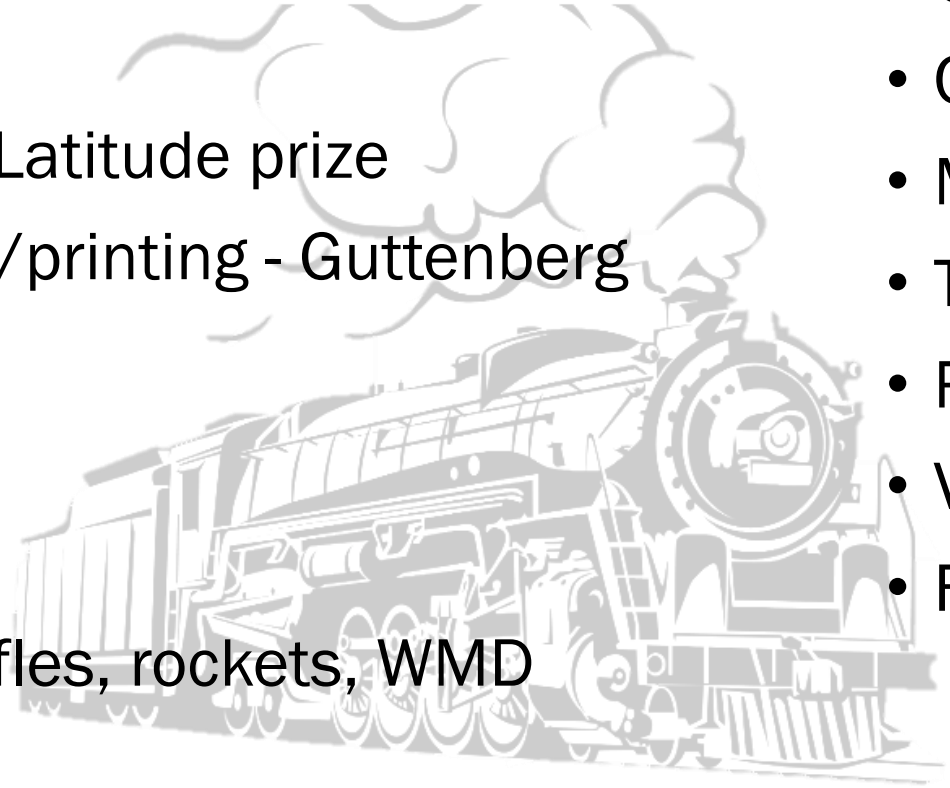
Early Technology (Pre-1000 AD)

- **Agriculture**
- Fire
- Stone tools
- Arts – cave paintings, song, musical instruments
- Wheel
- Weapons for near and far
- Boats and sails
- Windmills
- Metals – bronze, iron
- Urban Centers – aqueducts, cathedrals, baths
- Writing (ink, papyrus, stone)
- Money
- Math
- Sundial
- Gunpowder
- Glass
- Cryptography
- Wood as energy



Next 900 years (1000 – 1900 AD)

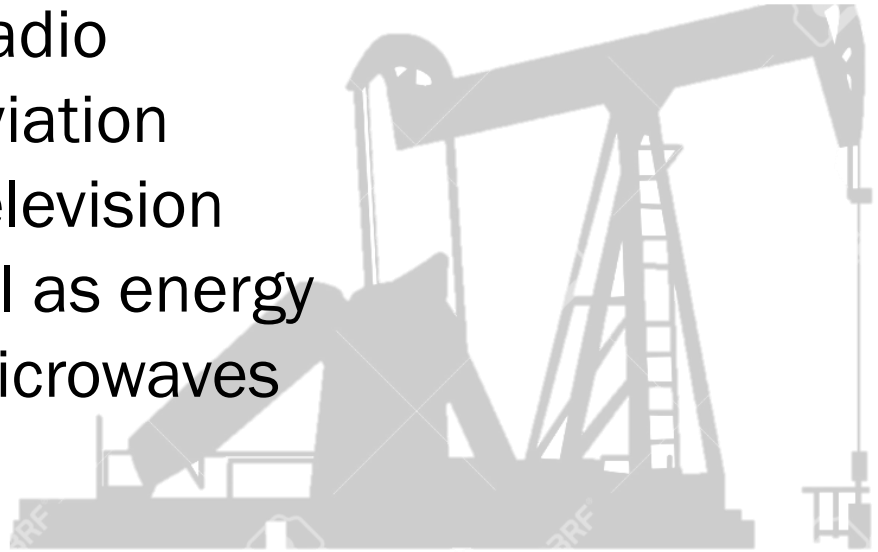
- <u>Steam engine – Industrial Revolution</u>
- Steel
- Navigation – Latitude prize
- Movable type/printing - Guttenberg
- Telegraph
- Railroads
- Coal mining
- Weapons – rifles, rockets, WMD

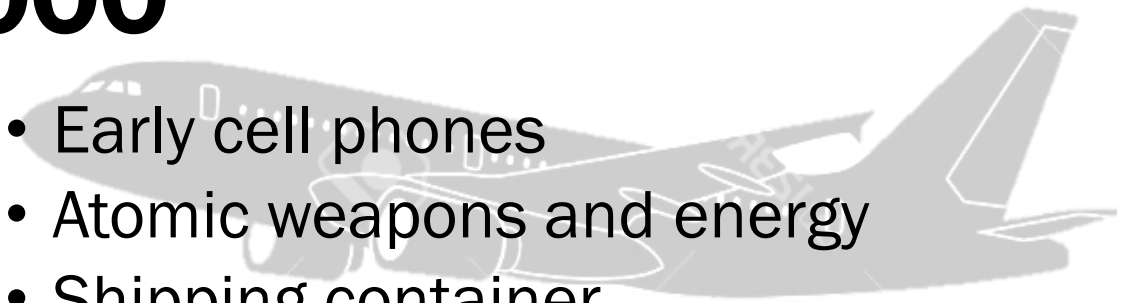


- Photography
- Clocks
- Coal as energy
- Mapping/cartography
- Textile mass production
- Refrigeration/preservation
- Vaccines (smallpox)
- Food preservation (canning)

20th Century – 1900-2000

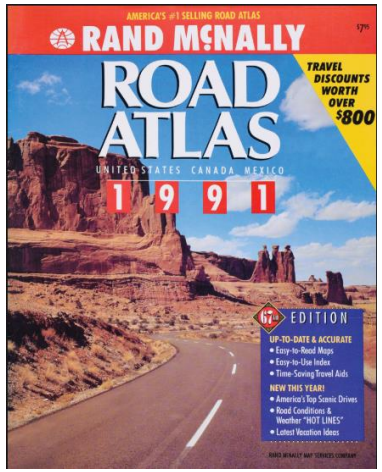
- Computing – ENIAC, IBM, DEC, Intel, HP
- Electricity – man's biggest machine
- Assembly lines
- Automobiles
- Telephone
- Radio
- Aviation
- Television
- Oil as energy
- Microwaves

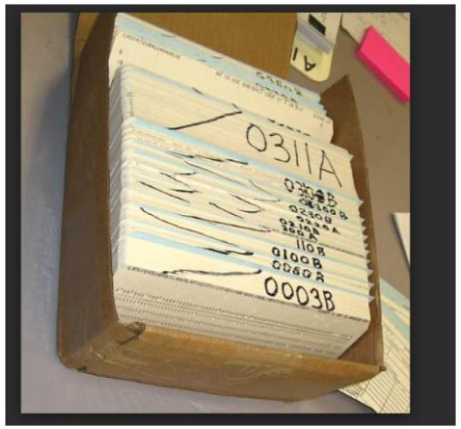




- Early cell phones
- Atomic weapons and energy
- Shipping container
- Transistors/Semi-conductors
- Personal Computing – Microsoft, Apple, Compaq, Dell
- Internet & World Wide Web
- First wave of Artificial Intelligence
- Satellites, Moon landing
- Global Positioning System (GPS)
- Medical - transplants

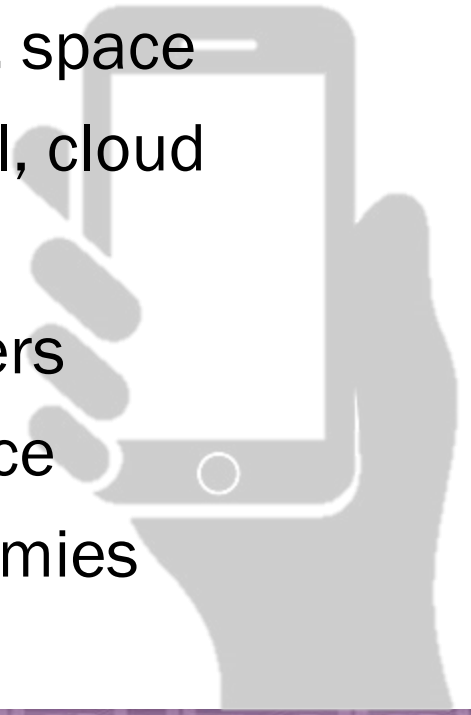
What do you recognize? What are you still using?



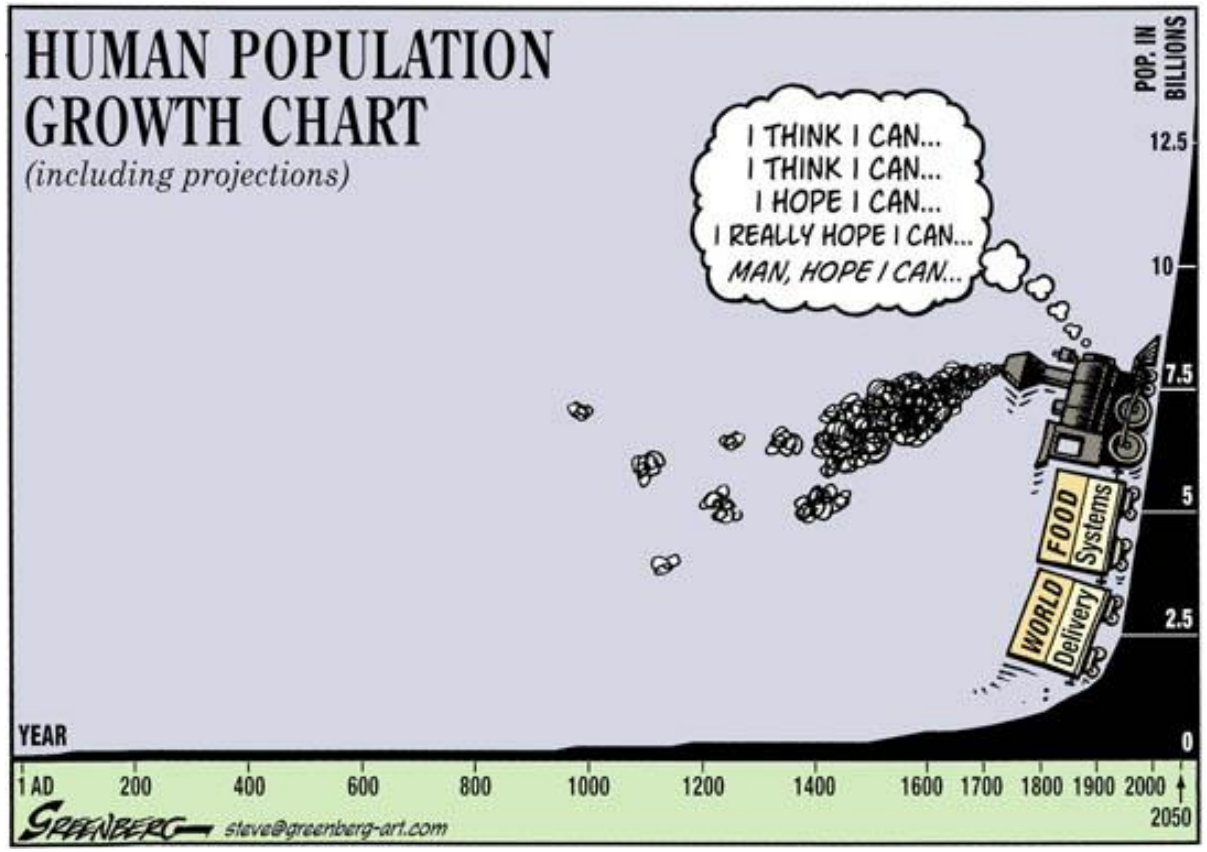


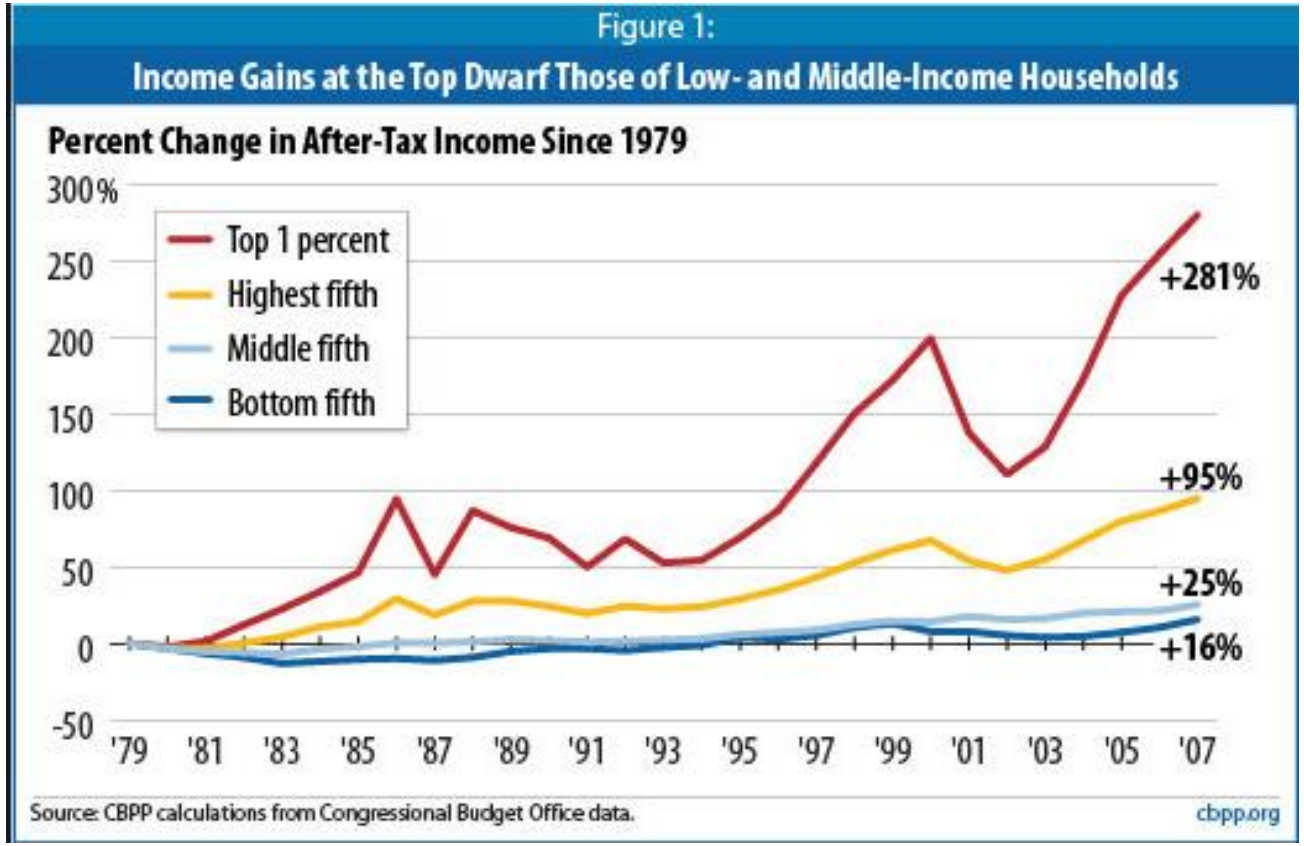
21st Century – 2000 to April 15, 2019

- Smartphones – mobile revolution
- 3G & 4G & Wi-Fi connectivity
- Apps for everything
- Cloud computing
- Cyber attacks and defenses
- Solar and wind become viable contenders for future energy
- Voice assistants – Siri, Alexa, Google
- Next wave of Artificial Intelligence
- Google and Facebook
- Uber, Airbnb, Netflix, Spotify
- Tesla – cars, batteries, space
- Amazon – books, retail, cloud
- Twitter, Instagram
- Internet – 3 Billion users
- Commercial Space Race
- Gig and sharing economies

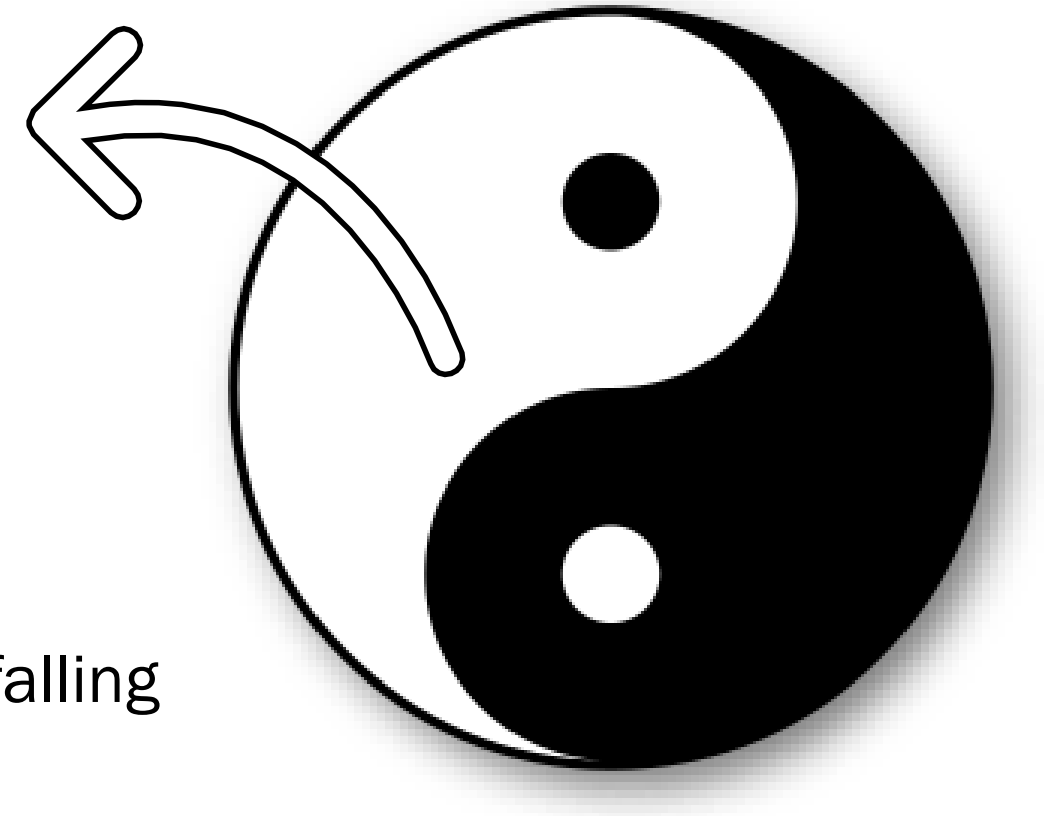


Remarkable, but also worrisome





State of the Planet 2019 – High Anxiety/Excitement



Improving or Good:

- Poverty/hunger: 1-2B better off
- Disease: Vaccines/cures globally
- Education: New web based models
- Internet: 3B more people coming on
- Life expectancy rising/infant mortality falling
- Renewable Energy prices dropping
- White Swans

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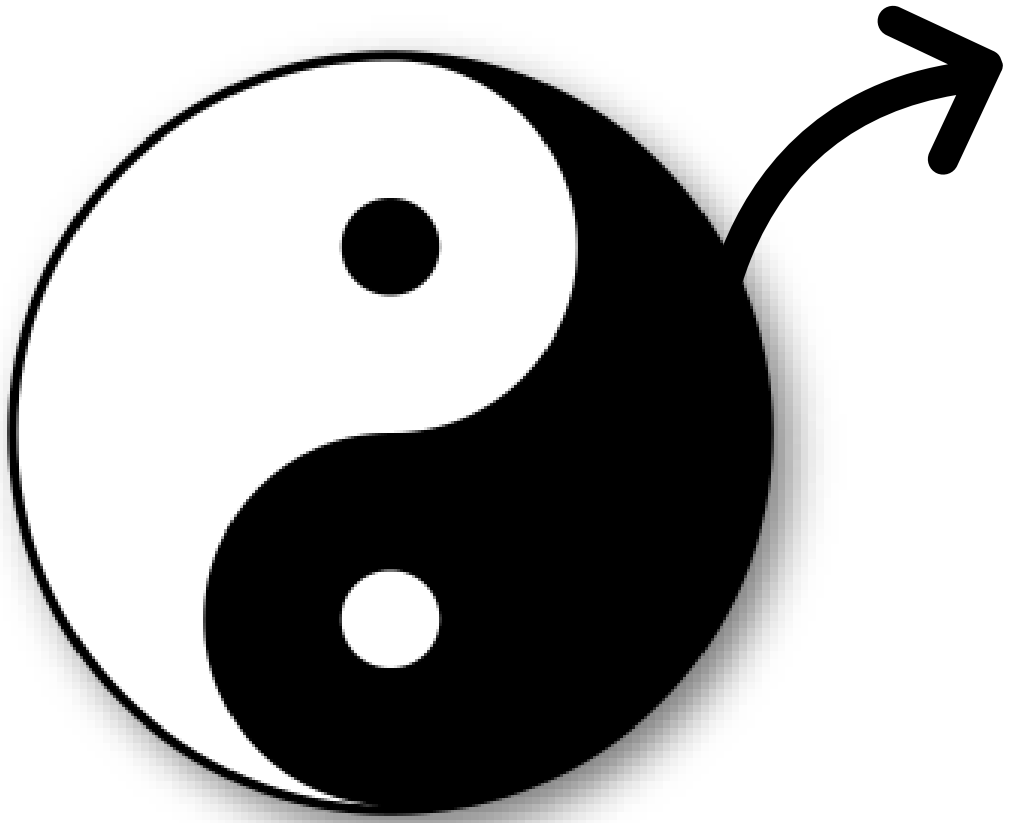


Threats and Challenges:

- Nuclear weapon proliferation
- Cyber vulnerabilities/threats
- Climate Change/Severe Weather
- Economic volatility/Financial inequality
- Terrorist attacks
- Global Pandemic threats – natural/WMD
- Privacy – digital and physical
- Black Swans and Complexity Meltdowns

So where are we going?

(Spoiler Alert: Nobody knows with certainty, but we're going to get there very quickly!)

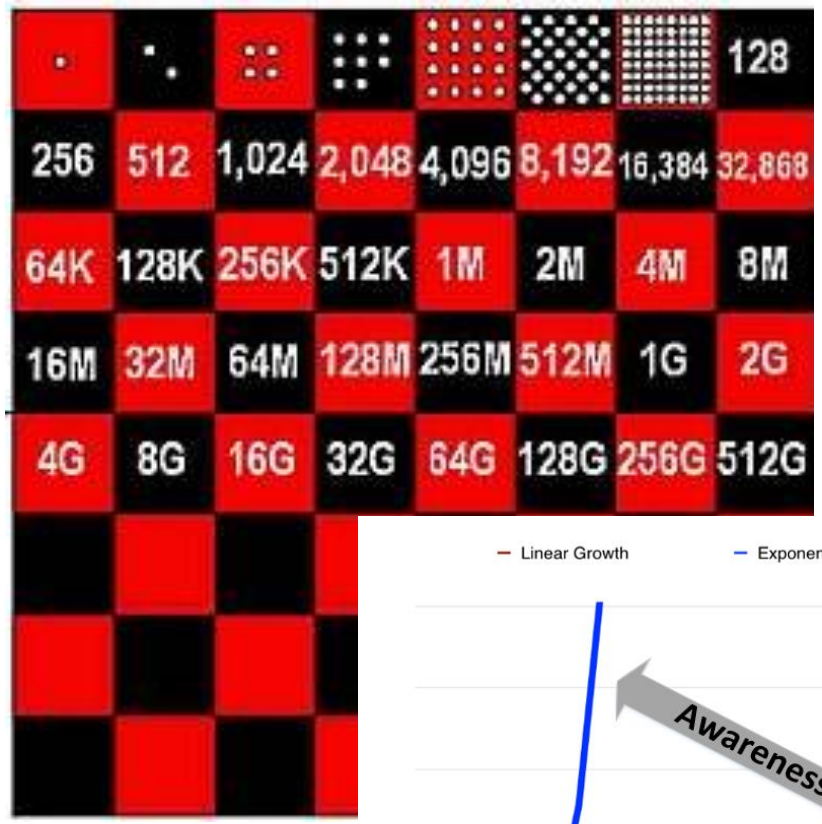
Our world will change more in the next 20 years than the previous 300 years

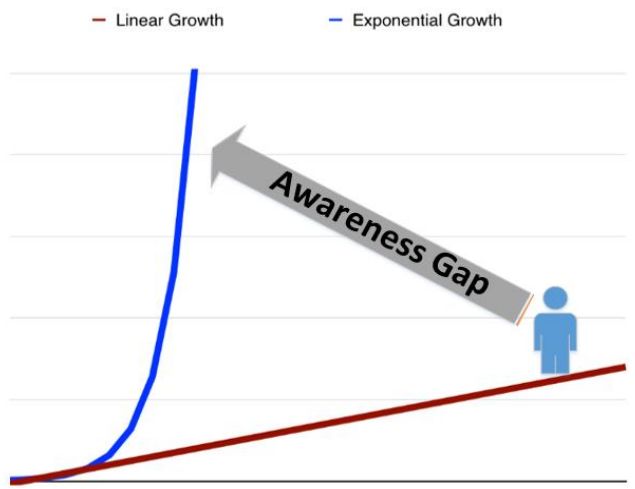
Linear vs Exponential Acceleration:

- 20 **linear** 3ft steps = 60ft – you can see back to starting point and next 60ft (Simple)

  VS

- 20 **exponential** 3ft steps = 297 miles, next 10 steps = 305,000 miles (no going back)
- Relevant example: Data Speed
  - 1980: 300 baud modem (wire)
  - Today: FiOS (fiber, 940mb/sec)
  - Tomorrow: 5G wireless (10-20GB/sec)
- Others: Digital Images (Kodak), CPU (Intel), Storage, Video (YouTube)
- Discontinuous change an added stressor





Performance increases, costs decrease

Silicon chips	DNA sequencing	3D printing	Drones	Industrial robots
$150 per 1k transistors (1971)	$10 million (2007)	$40k (2007)	$100k (2007)	$500k (2008)
$0.003 (2015)	$1k (2014)	$100 (2014)	$700 (2013)	$22k (2013)
33 million times drop in cost (2^{25}) in 50 years	10,000% drop in cost in 7 years	400% drop in cost in 7 years	142% drop in cost in 6 years	23% drop in cost in 5 years

Source: Gerd Leonhard

Fundamental Inventions drive Adjacent Possibilities….

Accelerating Structural Technology Areas:

Artificial Intelligence	Wireless – 5G, LoRaWAN	Big Data, Database Tech	Sensors and Controls
Intelligent Imaging/Video	3D and 4D Printing	Blockchain	Mobile Hardware, Apps and OS
Augmented and Virtual Reality	Miniaturization	Solar, Wind Power, Battery advances	Voice Interfaces
Advanced Materials	Cloud Infrastructure	Quantum Computing	Bio Everything

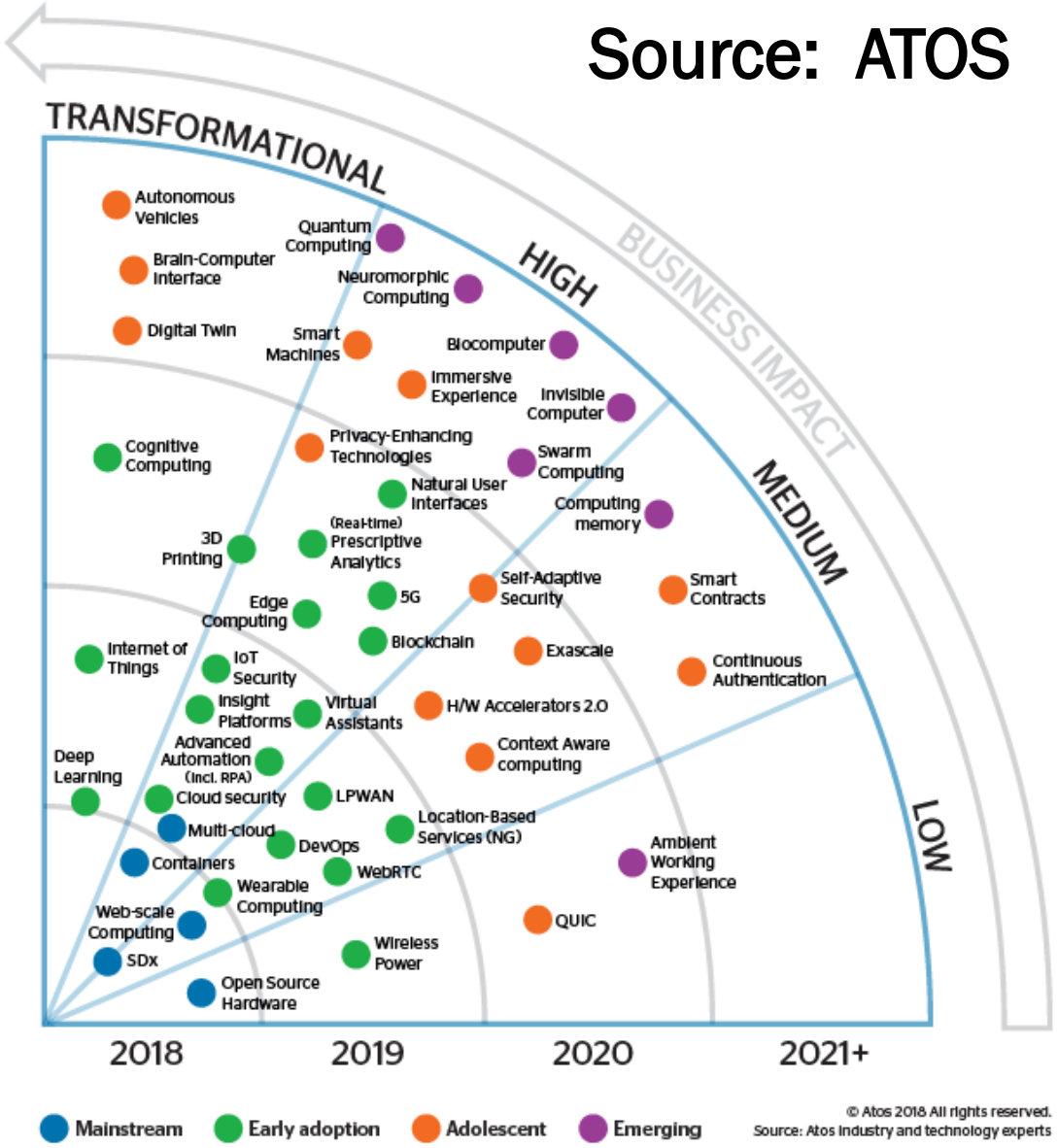
Combinant Solutions – Endless Possibilities

Drones/Robots	Autonomous Vehicles	Lifecycle Tracking	Nextgen Access Controls
Smart Buildings, Transit, Cities	Temporary Critical Infrastructure	Cloud Platforms	Real-Time Situational Awareness
Voice-Driven Assistants	Wearables/ Implants	Integrated Logistics and Supply Chains	Internet of Things Ecosystems
Cryptocurrencies	Digital Twins	Advanced/Micro Satellites	Commercial Space and Tourism

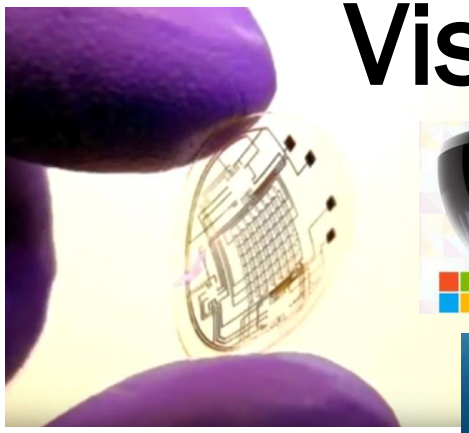
> **Disruptive innovation can hurt, if you are not the one doing the disrupting.**
>
> – Clayton M. Christensen

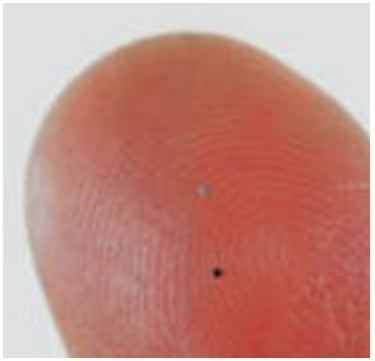
> "The greatest danger in times of turbulence is not the turbulence— it is to act with yesterday's logic."
>
> – *Peter Drucker*

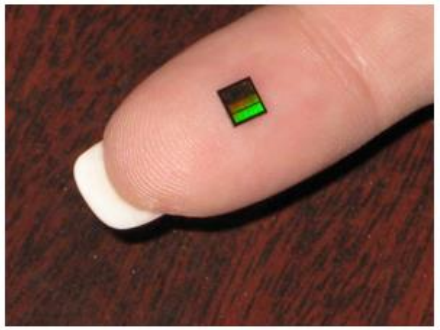
Source: ATOS

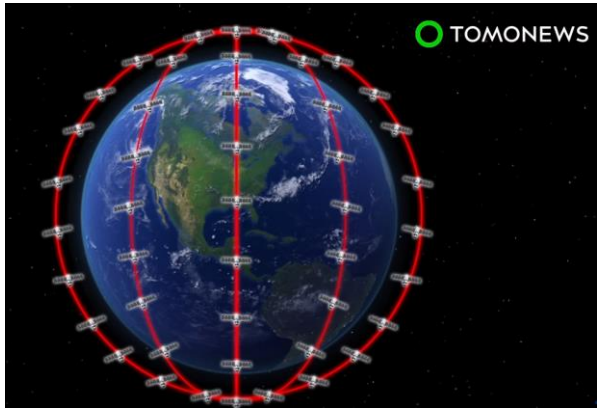


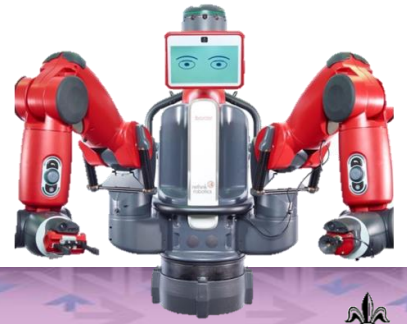
Visions of the future…some are already here











How does this affect your role?

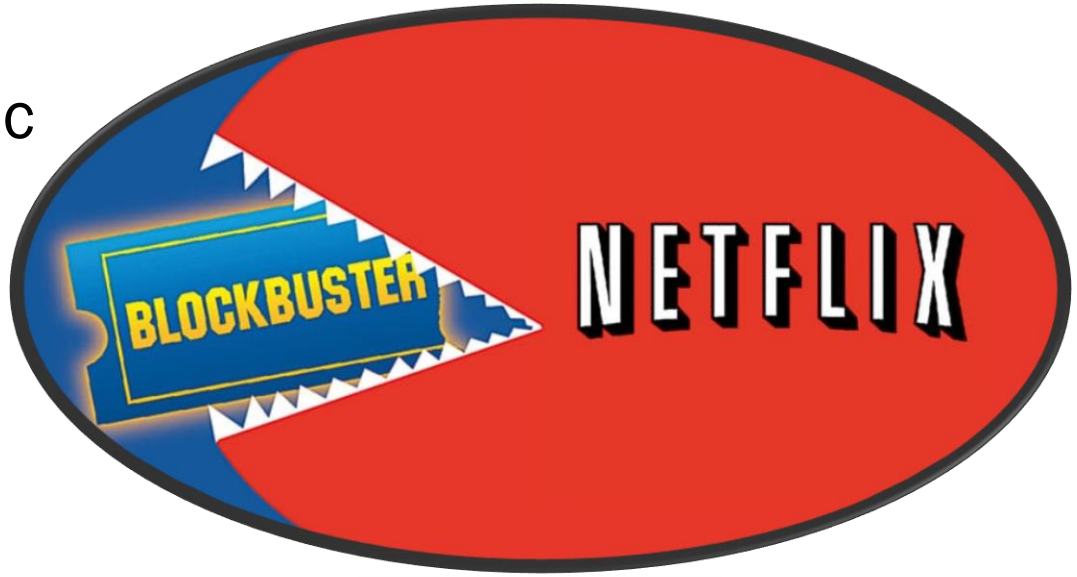
How do you maintain continuity in the middle of all this discontinuity and change?

Are you David, Goliath?

...both, or neither?

Disruptions of Note – Every Sector Vulnerable

- Kodak: Invented the digital photography that killed it!
- Uber/Lyft: Taxi industry under attack!
- Airbnb: Disruptive to the hotel/hospitality industry
- Netflix: 1 Blockbuster left (Bend, OR)
- Apple/Google: What happened to Nokia & Blackberry & Microsoft?
- Tesla: Every automotive maker going electric
- Amazon: Disrupting everything - scale/economies/synergies
- Global: WeChat, 10Cent, Face++

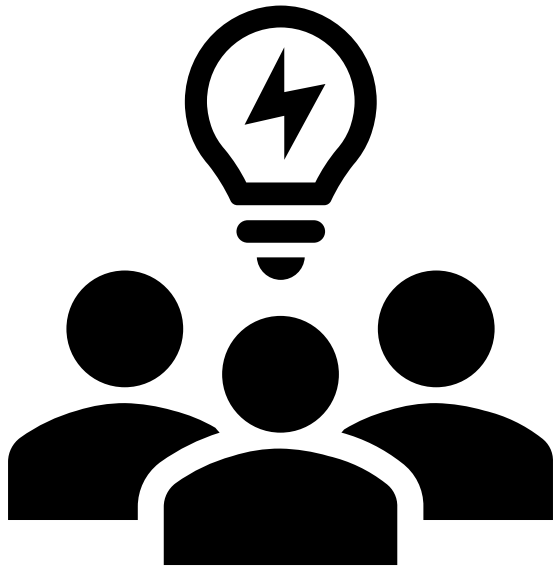


Who is gunning for your organization?

Organizations 2019 - Challenges

- Cyber is special category – major risks!
- Business disruption – new/traditional
- Institutional knowledge loss
- Amount of information growing daily
- Legal/compliance complexity
- Inadequate information sharing
- Global & instant visibility of errors
- Complexity & uncertainty increasing
- Fading risk sensitivity (9/11, 2008)
- Board & C-Suite overload

Organizations 2019 – Potential Positives



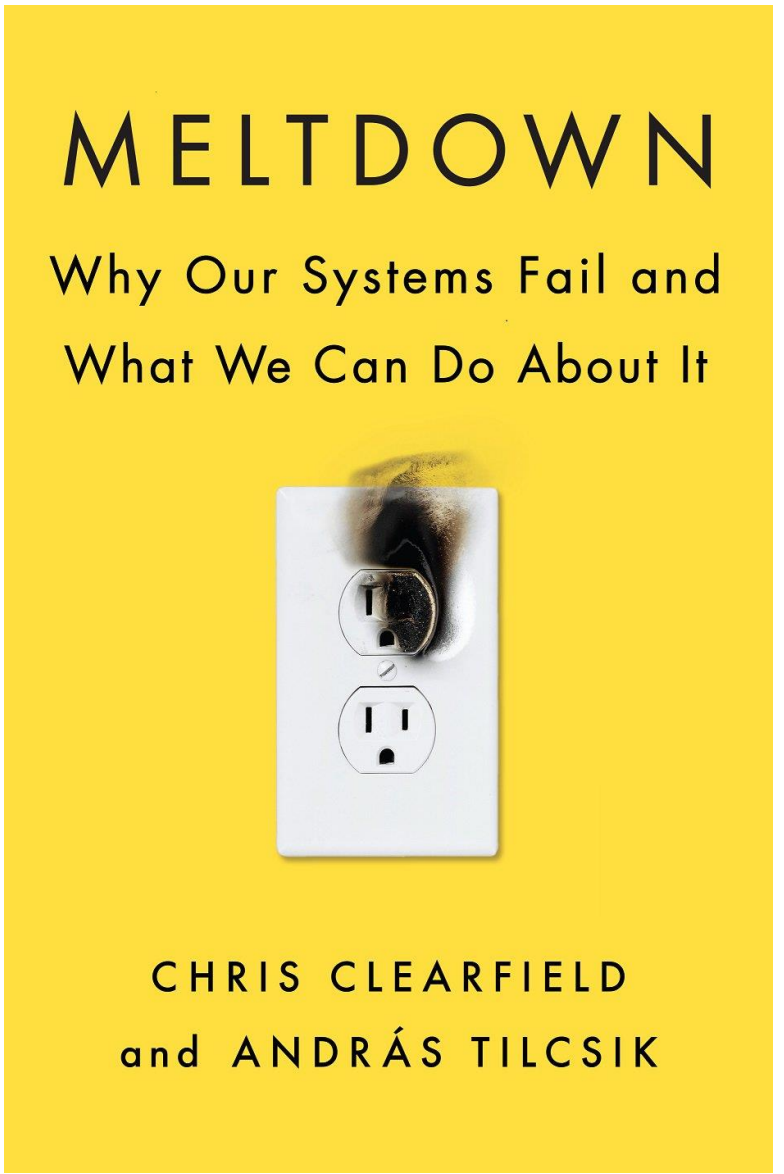
- Tools getting better/more integrated
- Lower tech costs allow more experiments
- Language barriers – SAYHI, Google translate
- Distributed capability - Cloud
- Growing “as-a-Service” providers for surges
- Resilience efforts – Cell Network Providers
- Power and communications backup options
- Internet “word of mouth” on breakthroughs
- YouTube as a source of learning

Complexity/Coupling

- Increasing interlock/reliance raises complexity
- Tight coupling/complexity can cause unforeseen cascading failures (unknown unknowns)
- Complexity can be outside/hidden/indirect
- Complexity opens cyberattack windows

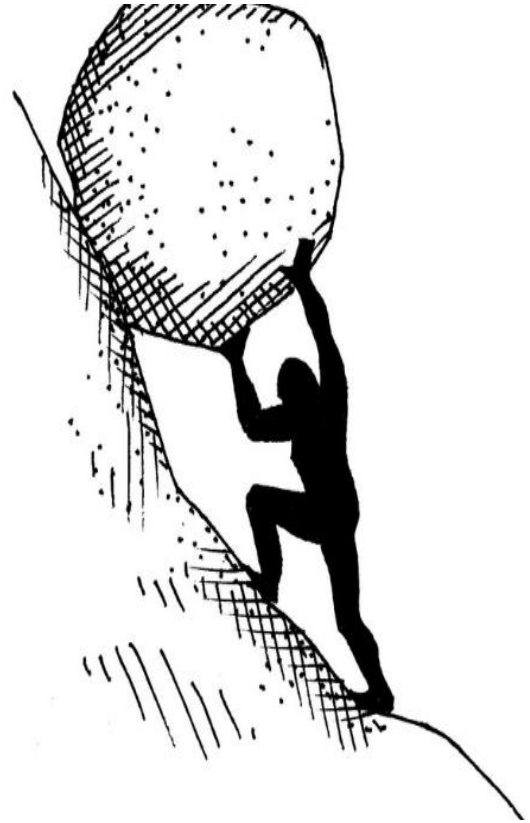
For Want of a Nail

For want of a nail the shoe was lost.
For want of a shoe the horse was lost.
For want of a horse the rider was lost.
For want of a rider the message was lost.
For want of a message the battle was lost.
For want of a battle the kingdom was lost.
And all for the want of a horseshoe nail.



What is working against your BC efforts?

- Acceleration on many fronts
- Complexity – infrastructure, supply chain, apps
- Fragility – cascading failures, IT reliance, apps
- Dependence on increasingly more vendors
- Retirement of corporate knowledge
- Disparity of global regulations, capabilities, standards
- C-Suite indifference/impatience to risks – just do it!



Some Proactive Steps for Future

- Isolate highest risk/rewards and focus resources there
- Find those “ounces of prevention” areas – Watch Your Front!
- Build/enhance your data collection & repository (need for AI)
- Integrate your silos any way you can (talk, meet, share)
- Share and collaborate with everyone outside your organization
- Identify the right partners for your worst days – contract now
- Practice and cultivate a sense of urgency – seconds may count!

Special Focus: Power and Communications

- Multiple “grid at risk” cyber warnings
- What’s your plan for a regional outage? How long can you last?
- Can you realistically recover without both power/comms?
- Do you have a backup email capability? Cloud based solutions?
- Can you relocate or shift work geographically?
- Do you have critical phone numbers on paper? (personal also)
- Leave your phone home sometime and analyze results/panic

Artificial Intelligence – One Slide Explanation

- Narrow, general, and super categories (NAI,GAI,SAI)
- Exponential growth today – mostly narrow, will impact all areas
- NAI extension to current computing paradigm (Iron -> Steel)
- Ability to learn from data/experience is a defining difference
- Conception & creation = hard
- Consumption - transparent and sometimes magical
- Hype abounds – AI in every sales presentation now
- “More important than fire/electricity” – Sundar Pinchai, Google

BC Technology Areas to Watch/Utilize

Near term (now-18m):

- Intelligent/AI enhanced video
- 5G Trials/early deployments
- Sensors that can warn/pre-empt
- AI components/services/apps
- Power/Comms redundancy/augment
- Cloud platforms with integration
- Advanced access/tracking systems
- Simple things – e.g. cheap tablets

Mid-Term (18M – 36M):

- 5G rollout and widespread use
- AI Integrations and critical mass
- Autonomous vehicles
- Robots and drone capabilities
- Blockchain/Smart Contracts
- Satellite based communications
- Portable Critical Infrastructure

Some Personal Opinions

- Artificial Intelligence important++ but hard – hype not over, mistakes will occur along with the miracles that reset our world
- Robots becoming amazing – Dull, Dirty, Dexterous, Dangerous, Dear
- Huge social changes likely - CRISPR, life extension, implants, more
- US has formidable technology competitor in China - worrisome
- 2100 closer than you think – who has a grandchild under 10?
- I'm hoping self driving cars show up before I lose my license!
- I'm looking for a fish spotting drone
- I'm confident in civilization long term, paranoid short/mid term

What have we learned today?

- Our world is accelerating – no slowing down!
- Complexity and uncertainty are increasing
- Threats are increasing in impact and speed
- BC efforts must keep pace – think exponential where you can
- Prioritization, flexibility and common sense still the best tools
- Collaborative efforts will yield big benefits

Resources:

- Presentation available through Continuity Insights
- People and Organizations:
  - Gerd Leonard - https://www.futuristgerd.com/ - fantastic YouTube videos
  - Singularity University – Ray Kurzweil, Peter Diamandis, more
  - Charles Jennings – Artificial Intelligence: Rise of the Lightspeed Learners
  - Chris Clearfield – Meltdown: Why our systems fail and what we can do about it
  - James Canton – Institute for the Global Future
  - Amy Webb – Future Today Institute - https://www.youtube.com/watch?v=g7k5ceY2qkU&t=40s
  - Jeremy Rifkin – The Zero Marginal Cost Society
  - Yuval Noah Harari – 21 Lessons for the 21st Century
- World Economic Forum: The Global Risk Report 2019 (14th edition)
- Deloitte, KPMG, Accenture – great risk papers
- ATOS - Lookout 2020 Tech Trends
- https://thenewreality.info/poster - 20 ways to digital transformation

Q&A/Discussion – What do YOU think?

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Carl Sagan in 1995 book – “The Demon Haunted World”

"Science is more than a body of knowledge; it is a way of thinking. I have a foreboding of an America in my children’s or grandchildren’s time — when the United States is a service and information economy; when nearly all the key manufacturing industries have slipped away to other countries; when awesome technological powers are in the hands of a very few, and no one representing the public interest can even grasp the issues; when the people have lost the ability to set their own agendas or knowledgeably question those in authority; when, clutching our crystals and nervously consulting our horoscopes, our critical faculties in decline, unable to distinguish between what feels good and what’s true, we slide, almost without noticing, back into superstition and darkness."


7 DEADLY SINS OF INNOVATION
TOM FISH BURNE
DROP EVERY-THING! IT'S A SEXY NEW TREND!
LUST
IF OUR COMPETITOR DOES IT, WE SHOULD TOO.
ENVY
THE MORE FEATURES, THE BETTER.
WISH LIST
GLUTTONY
NO ONE WILL NOTICE IF WE CUT A FEW CORNERS.
GREED
IF WE WORK FAST, WE MIGHT LAUNCH IN 3-4 YEARS.
SLOTH
WITH OUR BRAND ON IT, IT'S SURE TO BE A HIT.
PRIDE
IF IT FAILS, I'LL JUST SACK THE TEAM.
WRATH
© marketoonist.com


OUR LATEST INNOVATION IS A GOOSE THAT LAYS EGGS OF SOLID GOLD
THAT'S A DISTRACTION FROM OUR CORE
AND WE HAVE NO BUDGET FOR GOOSE-RELATED EXPENSES
ON THAT NOTE, WE'LL NEED THE FEATHERS AND LIVER FOR ANOTHER PROJECT

What if?

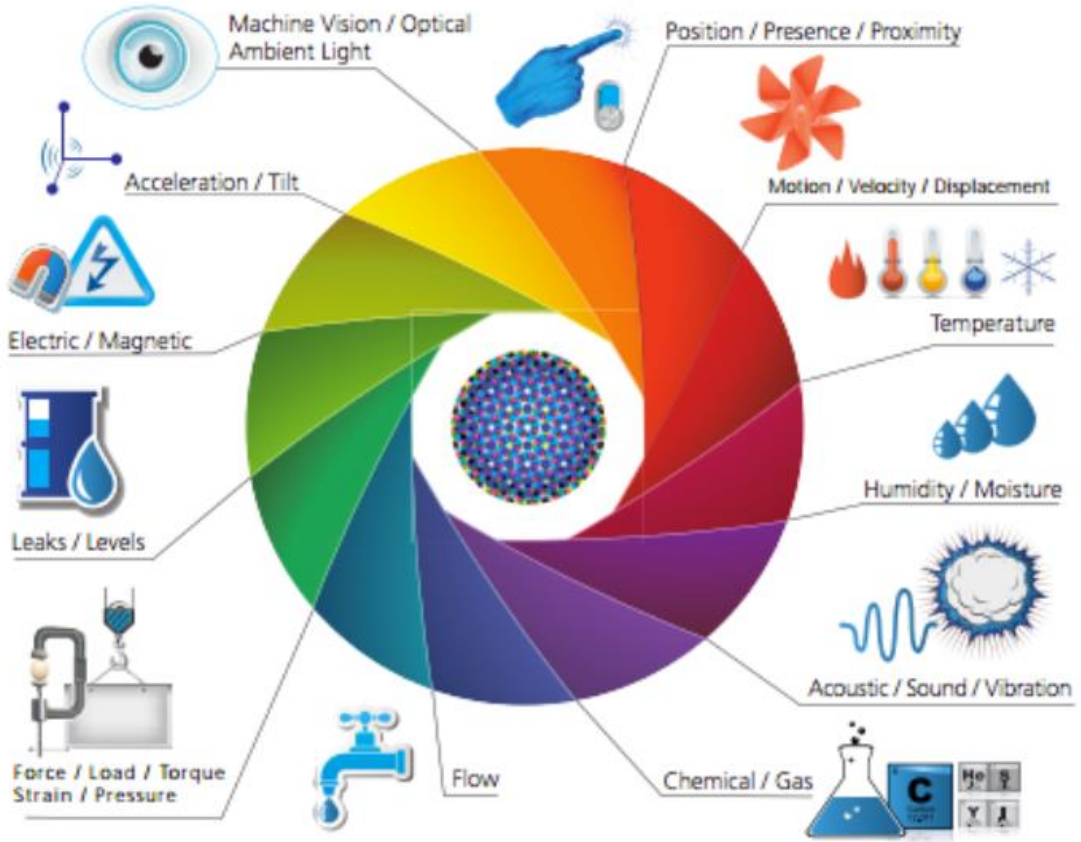
- Energy was unlimited, free, and non-pollutive?
- Every citizen of Planet Earth was connected to the Internet?
- You had maximum and real time visibility to happenings in your sphere of responsibility?
- Artificial Intelligence took away most of the drudgery and let you focus on the critical issues?
- It all broke one day and you need to get it fixed

Recent/Near Future Tech Examples:

- Surgery by Skype
- Puerto Rico drone based damage assessment
- P-Wave quake warnings
- Washington Mudslide Model – virtual/3d printed
- Airbnb humanitarian shelter program
- Real time shot detection and 911 notification
- Rubble Robots (MIT)
- Smart Gurneys
- Drone based defibrillators
- Los Angeles body scanners

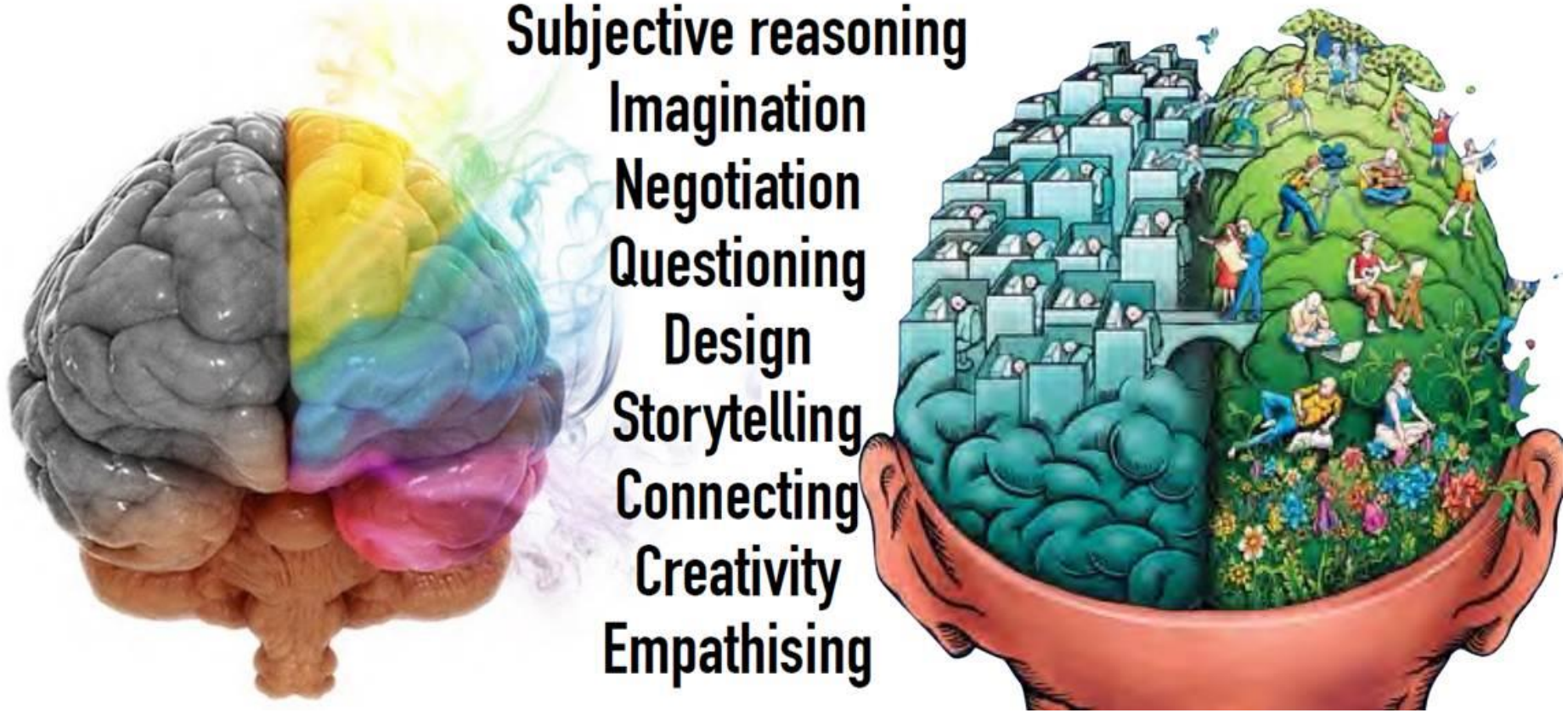
Sensors and Actuators

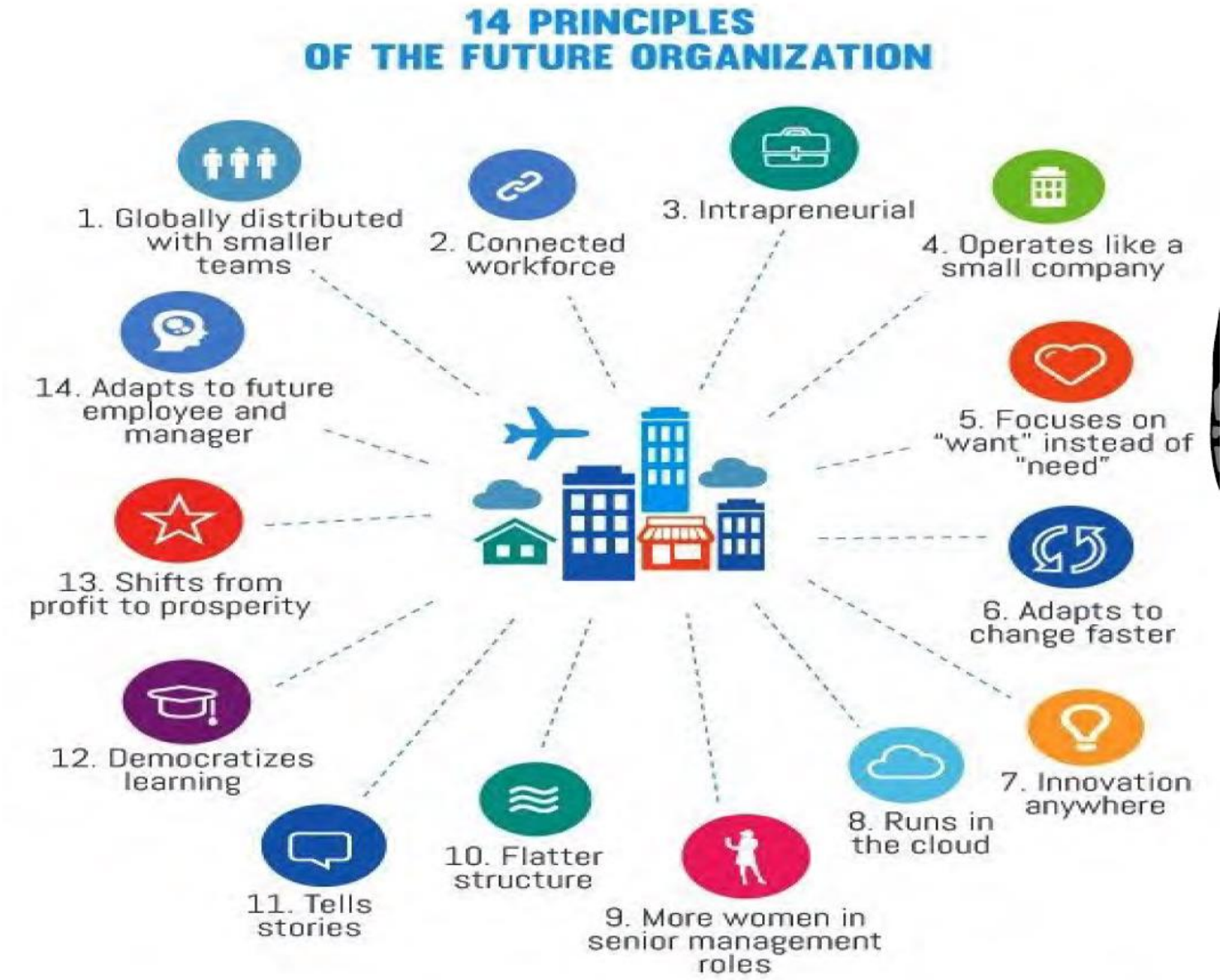
We are giving our world a digital nervous system. Location data using GPS sensors. Eyes and ears using cameras and microphones, along with sensory organs that can measure everything from temperature to pressure changes.



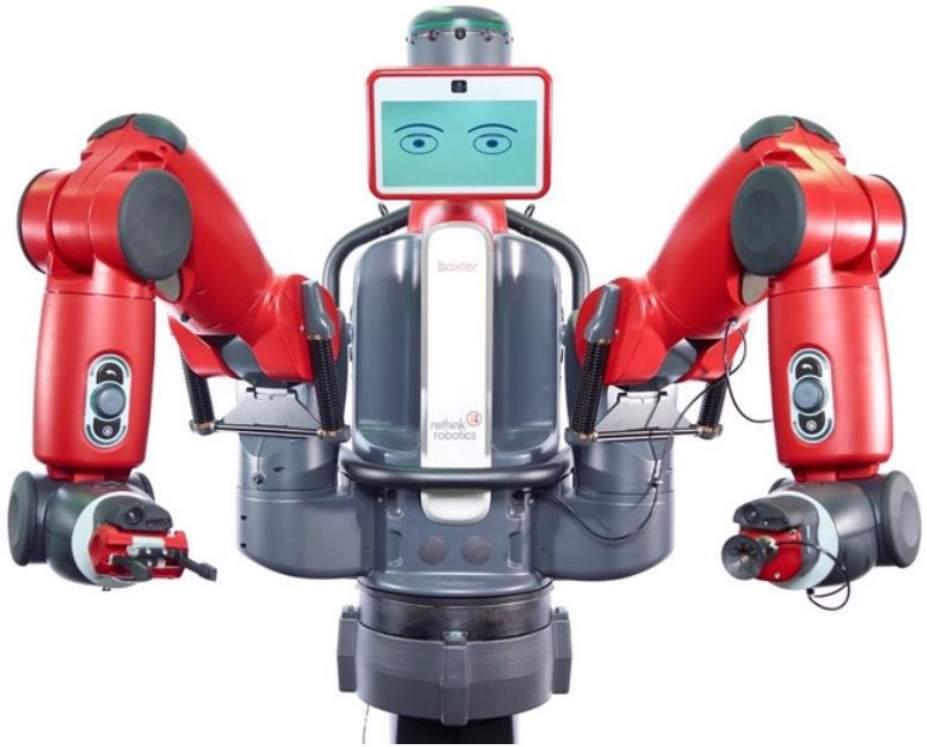
SOURCE: HARBOR RESEARCH

The future of work: the return of highly-human-only skills




14 PRINCIPLES
OF THE FUTURE ORGANIZATION
1. Globally distributed with smaller teams
2. Connected workforce
3. Intrapreneurial
4. Operates like a small company
5. Focuses on "want" instead of "need"
6. Adapts to change faster
7. Innovation anywhere
8. Runs in the cloud
9. More women in senior management roles
10. Flatter structure
11. Tells stories
12. Democratizes learning
13. Shifts from profit to prosperity
14. Adapts to future employee and manager

9 "ations" will change every enterprise in every sector, globally



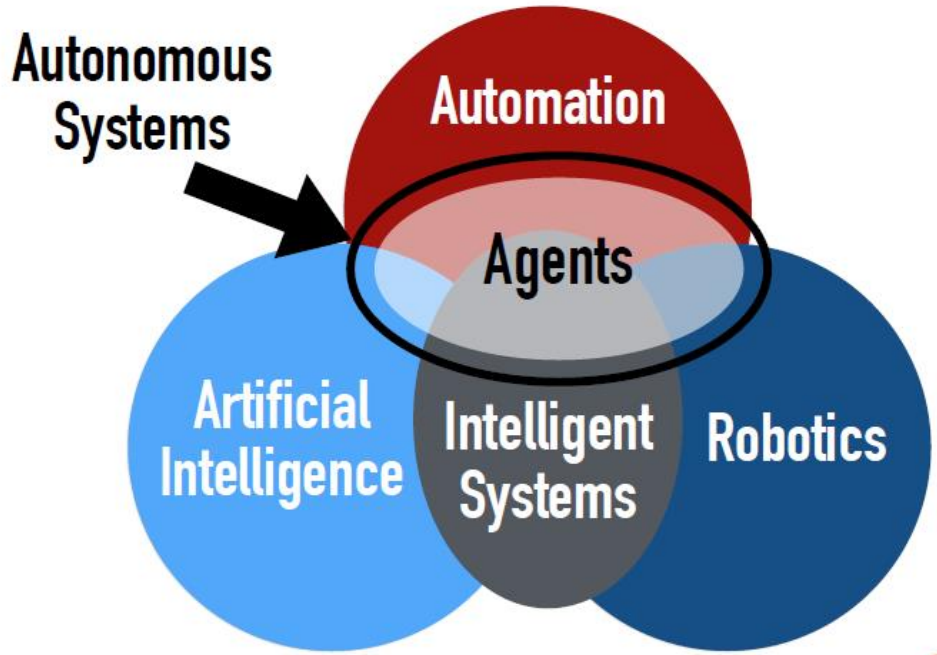
Digitization

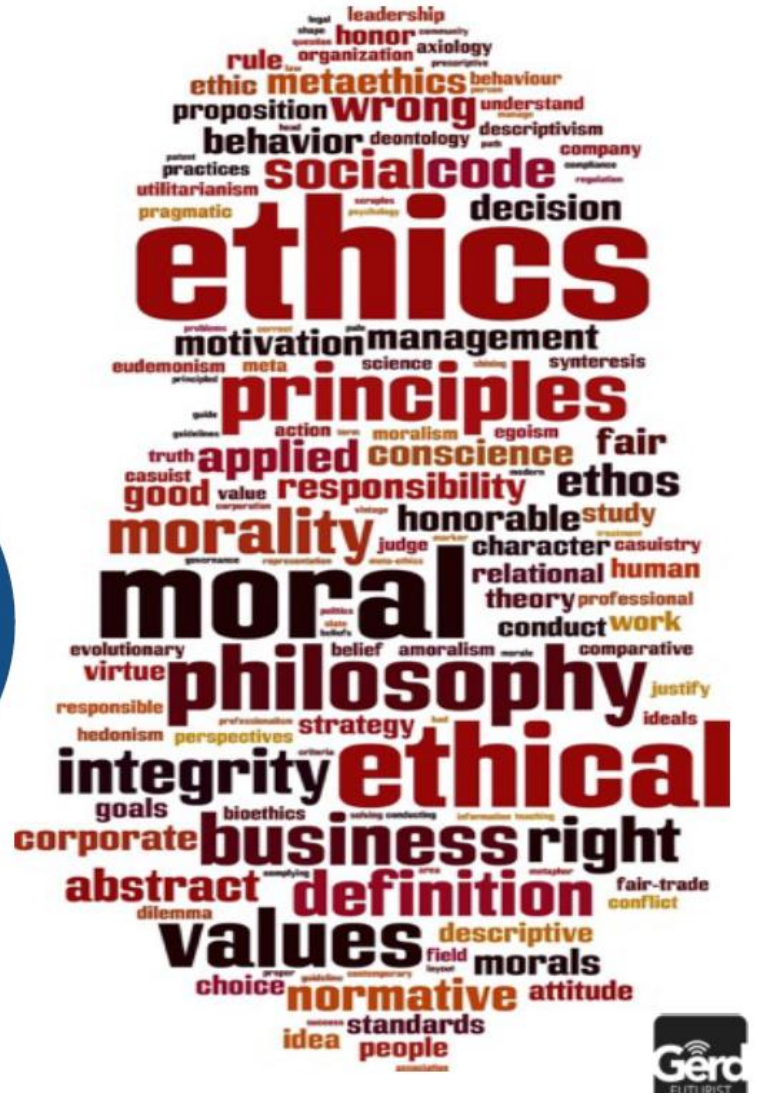
- Automation
- Virtualization
- Screenification
- Anticipation
- Augmentation
- Optimization

Robotisation

Gerd FUTURIST

‘Nothing vast enters the life of mortals without a curse’ Sophocles



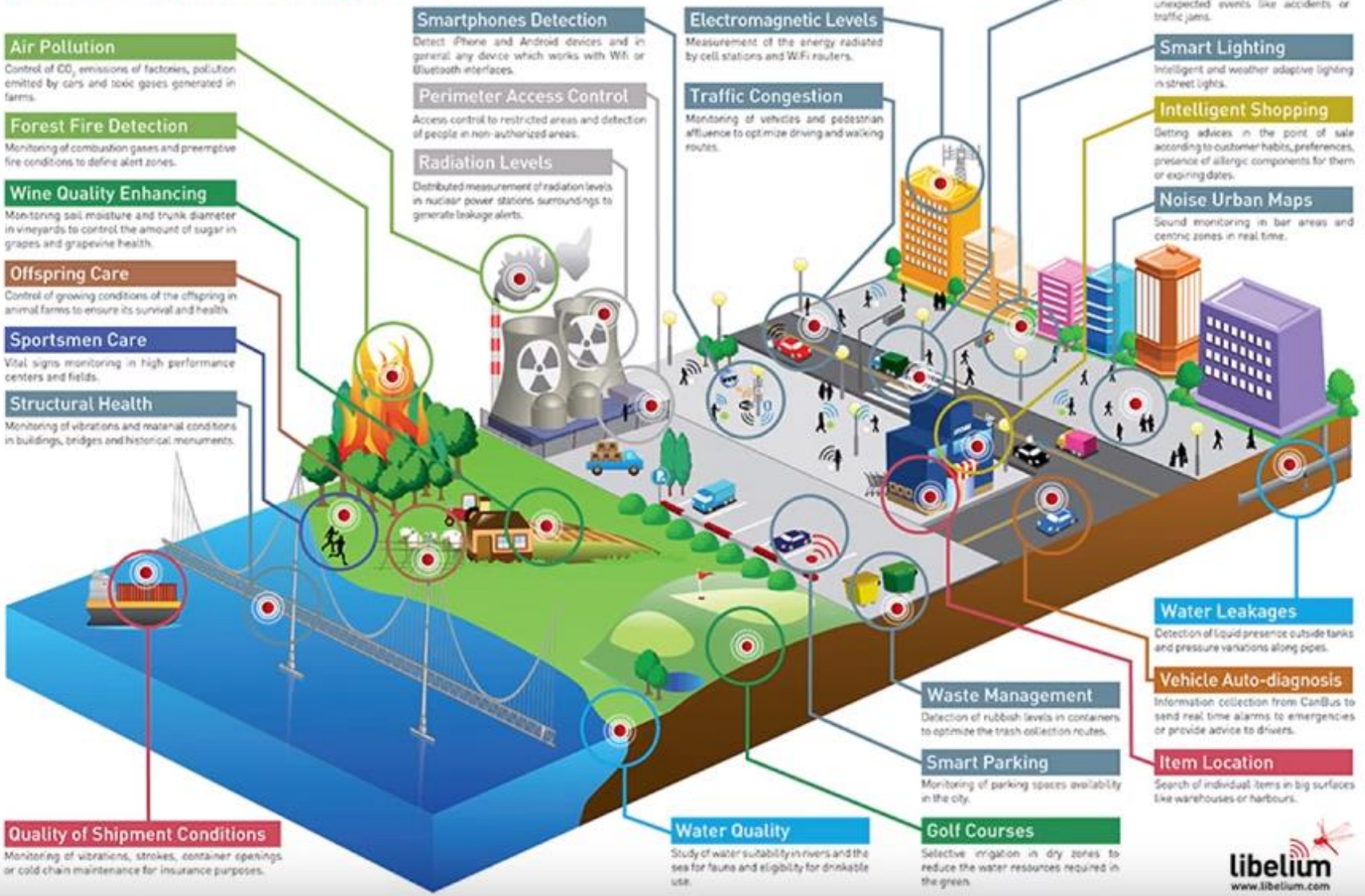


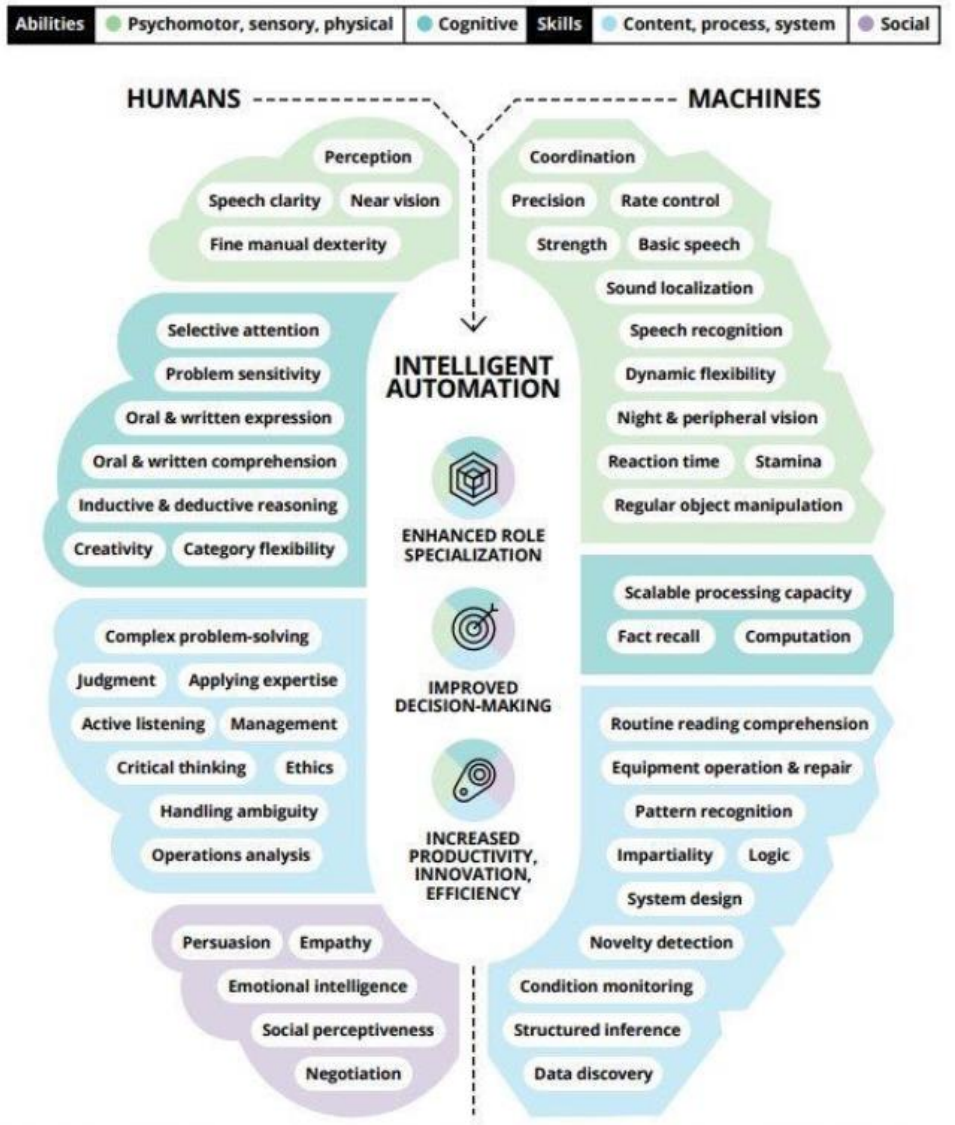
"Risk factors will increase exponentially!"

33 Dramatic Predictions

1. By 2030 over 80% of all doctor visits will have been replaced by automated exams. Details here.
2. By 2030 over 90% of all restaurants will use some form of a 3D food printer in their meal preparations. Details here.
3. By 2030 over 10% of all global financial transactions will be conducted through Bitcoin or Bitcoin-like crypto currencies.
4. By 2030 we will seen a growing number of highways designated as driverless-vehicle only. Details here.
5. By 2030, a Chinese company will become the first to enter the space tourism industry by establishing regular flights to their space hotel.
6. By 2030, the world's largest Internet company will be in the education business, and it will be a company we have not heard of yet.
7. By 2030 over 20% of all new construction will be "printed" buildings. Details here.
8. By 2030 over 2 billion jobs will have disappeared, freeing up talent for many new fledgling industries. Details here.
9. By 2030 a new protest group will have emerged that holds anti-cloning rallies, demonstrating against the creation of "soul-less humans."
10. By 2030 we will see the first city to harvest 100% of its water supply from the atmosphere. Details here.
11. By 2030 world religions will make a resurgence, with communities of faith growing by nearly 50% over what they are today.
12. By 2030 over 50% of all traditional colleges will collapse, paving the way for an entire new education industry to emerge. Details here.
13. By 2030 we will see a surge of Micro Colleges spring to life, each requiring less than 6 months of training and apprenticeship to switch professions. Details here.
14. By 2030 scientists will have perfected an active cross-species communication system, enabling some species to talk to each other as well as humans.
15. By 2030 we will see the first hurricane stopped by human intervention.
16. By 2030 we will see wireless power used to light up invisible light bulbs in the middle of a room.
17. By 2030 we will see the first demonstration of a technology to control gravity, reducing the pull of gravity on an object by as much as 50%.
18. By 2030 democracy will be viewed as inferior form of government.
19. By 2030 traditional police forces will be largely automated out of existence with less than 50% of current staffing levels on active duty.
20. By 2030 over 90% of all libraries will offer premium services as part of their business model. Details here.
21. By 2030 forest fires will have been reduced to less than 5% of the number today with the use of infrared drone monitoring systems. Details here.
22. By 2030 over 30% of all cities in the U.S. will operate their electric utilities as micro grids.
23. By 2030 we will have seen a number of global elections with the intent of creating a new global mandate, forcing world leaders to take notice. Details here.
24. By 2030 traditional pharmaceuticals will be replaced by hyper-individualized medicines that are manufactured at the time they are ordered. Details here.
25. By 2030 we will have seen the revival of the first mated pair of an extinct species. Details here.
26. By 2030 swarms of micro flying drones – swarmbots – will be demonstrated to assemble themselves as a type of personal clothing, serving as a reconfigurable fashion statement. Details here.
27. By 2030 marijuana will be legalized in all 50 states in the U.S. and half of all foreign countries. Details here.
28. By 2030 cable television will no longer exist.
29. By 2030 a small number of companies will begin calculating their labor costs with something called "synaptical currency." Details here.
30. By 2030 it will be common to use next generation search engines to search the physical world. Details here.
31. By 2030 basic computer programming will be considered a core skill required in over 20% of all jobs. Details here.
32. By 2030 we will have seen multiple attempts to send a probe to the center of the earth. Details here.
33. By 2030 a form of tube transportation, inspired by Hyperloop and ET3, will be well on its way to becoming the world's largest infrastructure project. Details here.

Libelium Smart World





Sources: Deloitte LLP, *Talent for Survival: Essential skills for humans working in the machine age*, 2016; Deloitte LLP, *From brawn to brains: The impact of technology on jobs in the UK*, 2015; Jim Guszcza, Harvey Lewis, and Peter Evans-Greenwood, *Cognitive collaboration: Why humans and computers think better together*, Deloitte University Press, January 23, 2017; Carl

Figure 2: Five areas where corporates are exploiting machine learning

Source: Secondary research of publicly available information. No company named is a client of machinable

The world's biggest problems are the biggest business opportunities: 10 9+

How will you positively impact 1 Billion in the next decade?

Disaster Resilience

Energy

Environment

Food

Global Health

Governance

Learning

Prosperity

1. *Meet Basic Needs*
2. *Quality of Life*
3. *Solve Completely*

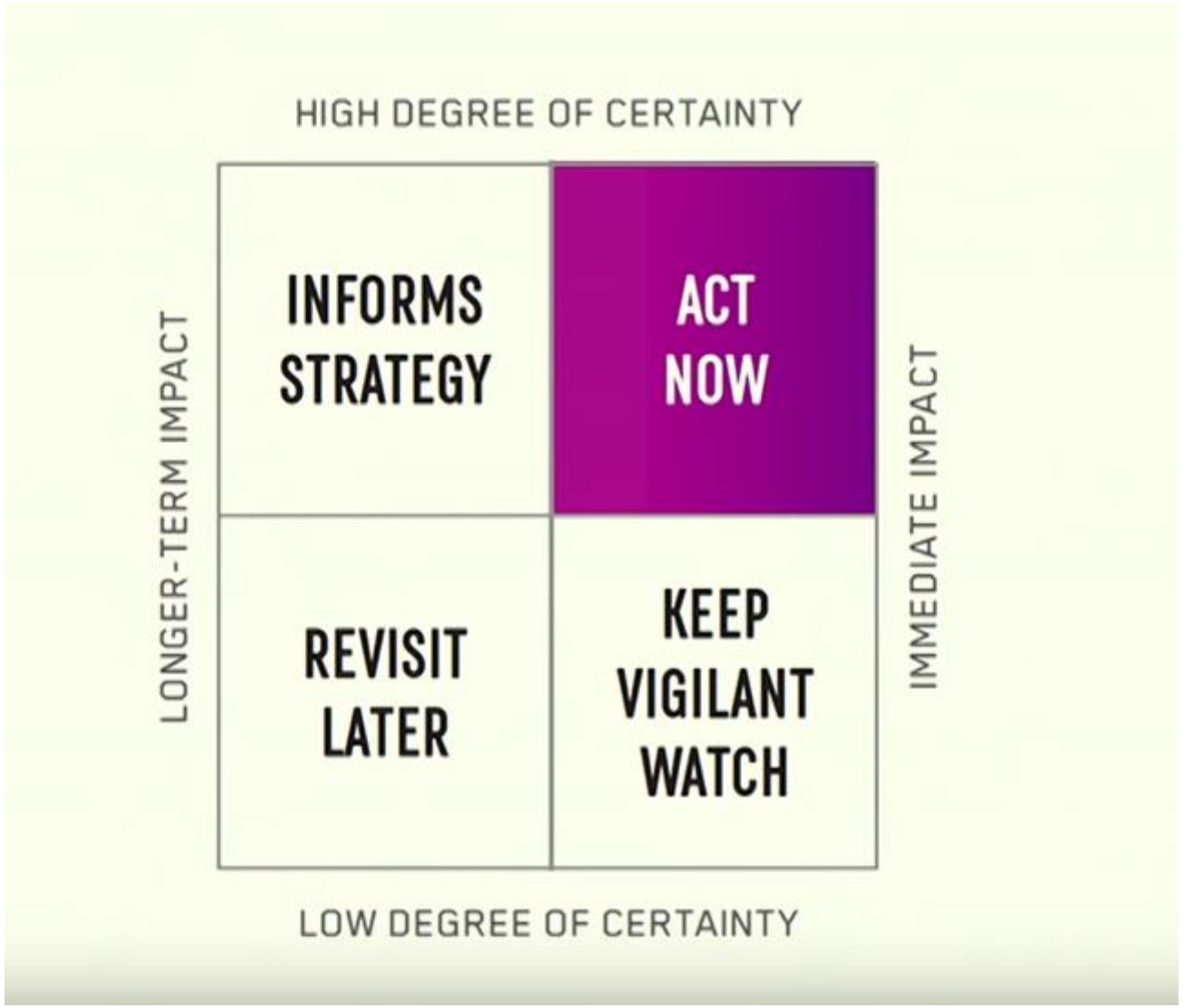
Shelter

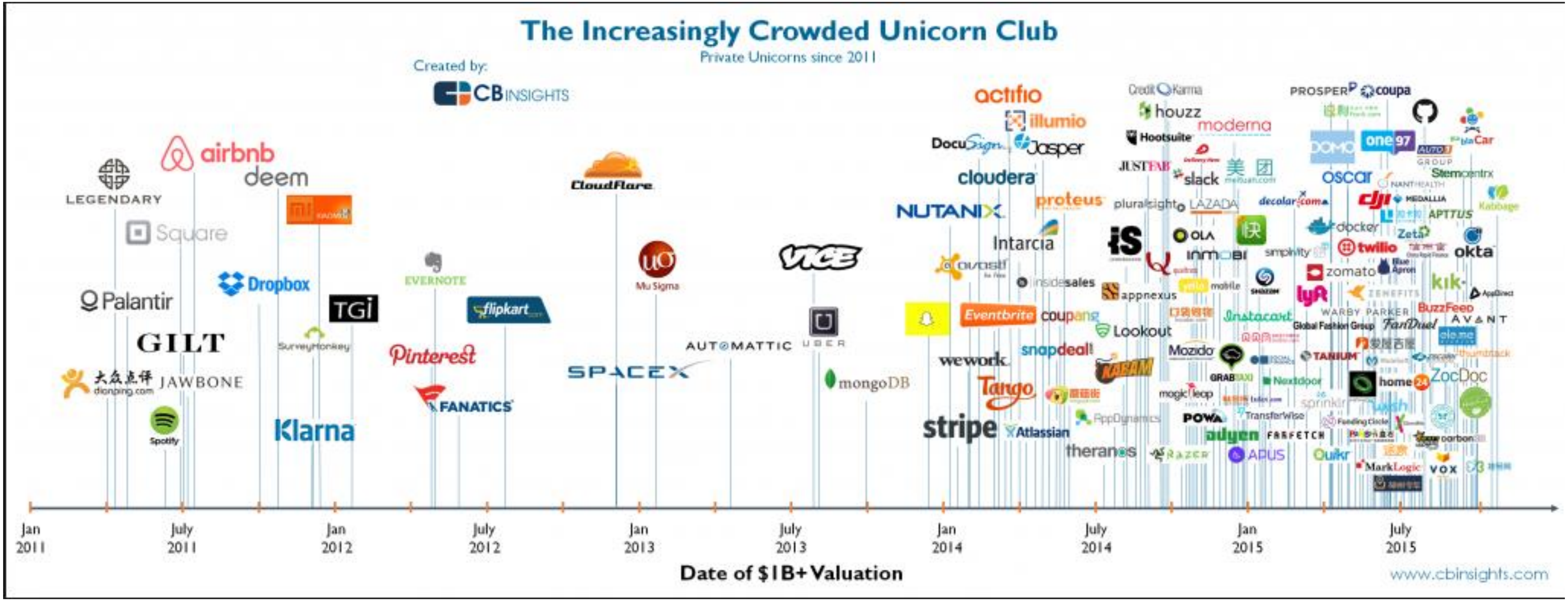
Security

Space

Water


Strategic Time Horizons
Less data and evidence, less certainty
More data and evidence, more certainty
Tactical Work
Strategic Planning
Vision
Research & Development
Workforce Development
Systems-Level Disruption and Evolution
Source:
Amy Webb, NYU
SXSW 2019
Now - 24 months
2-5 years
5-10+ years
10+ years
19:35 / 1:00:44


HIGH DEGREE OF CERTAINTY
INFORMS STRATEGY
ACT NOW
REVISIT LATER
KEEP VIGILANT WATCH
LONGER-TERM IMPACT
IMMEDIATE IMPACT
LOW DEGREE OF CERTAINTY



The Increasingly Crowded Unicorn Club
Private Unicorns since 2011
Created by:
CB INSIGHTS
LEGENDARY
airbnb
deem
Square
Palantir
Dropbox
GILT
JAWBONE
dianping.com
Spotify
SurveyMonkey
TGI
Klarna
EVERNOTE
flipkart
Pinterest
FANATICS
CloudFlare
Mu Sigma
SPACEX
AUTOMATTIC
VICE
UBER
mongoDB
actifio
illumio
DocuSign
Jasper
cloudera
NUTANIX
proteus
Intarcia
avast
insidesales
Eventbrite
coupang
wework
snapdeal
Tango
stripe
Atlassian
AppDynamics
theranos
Credit Karma
houzz
moderna
Hootsuite
JUSTFAB
slack
pluralsight
LAZADA
OLA
InMobi
appnexus
Lookout
Mozido
magic leap
POWA
adyen
APUS
TransferWise
FARFETCH
RAZER
Instacart
Nextdoor
PROSPER
coupa
DOMO
one97
oscar
BlaBlaCar
NANTHEALTH
MEDALLIA
Stemcentrx
dji
APTTUS
Kabbage
docker
Zeta
twilio
okta
zomato
Blue Apron
kik
lyft
ZENEFITS
WARBY PARKER
BuzzFeed
Global Fashion Group
FanDuel
AVANT
TANIUM
home24
ZocDoc
Quikr
MarkLogic
VOX
Jan 2011
July 2011
Jan 2012
July 2012
Jan 2013
July 2013
Jan 2014
July 2014
Jan 2015
July 2015
Date of $1B+ Valuation
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