

MANAGING TECHNOLOGY/BUSINESS DISRUPTION

GETTING READY FOR THE 5G/EDGE POWERED BRAVE NEW POST COVID WORLD

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John Nikolopoulos is a multilingual Mobile/Cloud/Telecom/IT global technology/consulting executive with 25+ years in senior leadership roles in Sales, BD/GTM, Product/P&L Management, and Solution/Systems Architecture teams driving global channels, partnerships & enterprise deployments with \$billions of global sales in diverse industry verticals within F500/Large Cap enterprises (Accenture, Nortel, and Sagemcom) as well as high profile start-ups such as Corvis Corp., where he was part of the senior GTM/execution team leading to one of the largest exits in tech industry history with a 1.1 billion\$ IPO.

John has a significant international technical publication (50+) and public speaking record, contributed to multiple patent filings, achieved senior member status within the IEEE, and gained extensive Wall Street/Silicon Valley Analyst/Board of Directors executive communications experience.

Since 2018, he has also been a guest lecturer at McGill University's graduate level Data Science/ML/AI program focused on managing disruption, innovation and complexity within the context of emerging technology (5G/IoT, AR/VR, multi/hybrid cloud, blockchain, quantum computing, Industry 4.0, smart cities, and autonomous transport).

John holds Bachelor's (Honours) and Master's Degrees in Electrical Engineering and an MBA in Finance & Strategy from McGill University in Montreal. He also completed the graduate level Network Engineering Program at the University of Toronto.

AGENDA

Thoughts on
Disruption



5G/EDGE
Technology/Business
Trends



COVID-19
Impact



-Eureka!



Everyone has a plan 'till they get punched in the mouth.

Mike Tyson

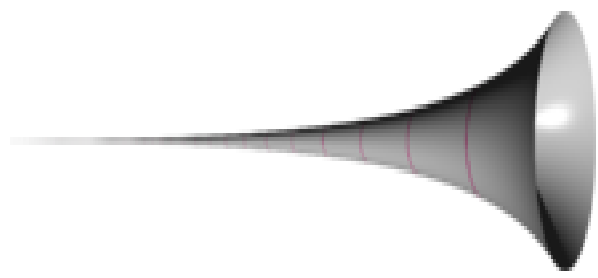


Tyson Gets Knocked Out...Shocking the Sports World, Feb. 1990

RED vs BLUE Pill



“The Unexamined Life is Not Worth Living” [Socrates]



Gabriel's Horn – Judgment Day!

Fundamental Shift Across Talent, Process, & Technology Ecosystems



4G/Pre Covid/Covid World

Digital Platforms

Cloud Native Centric



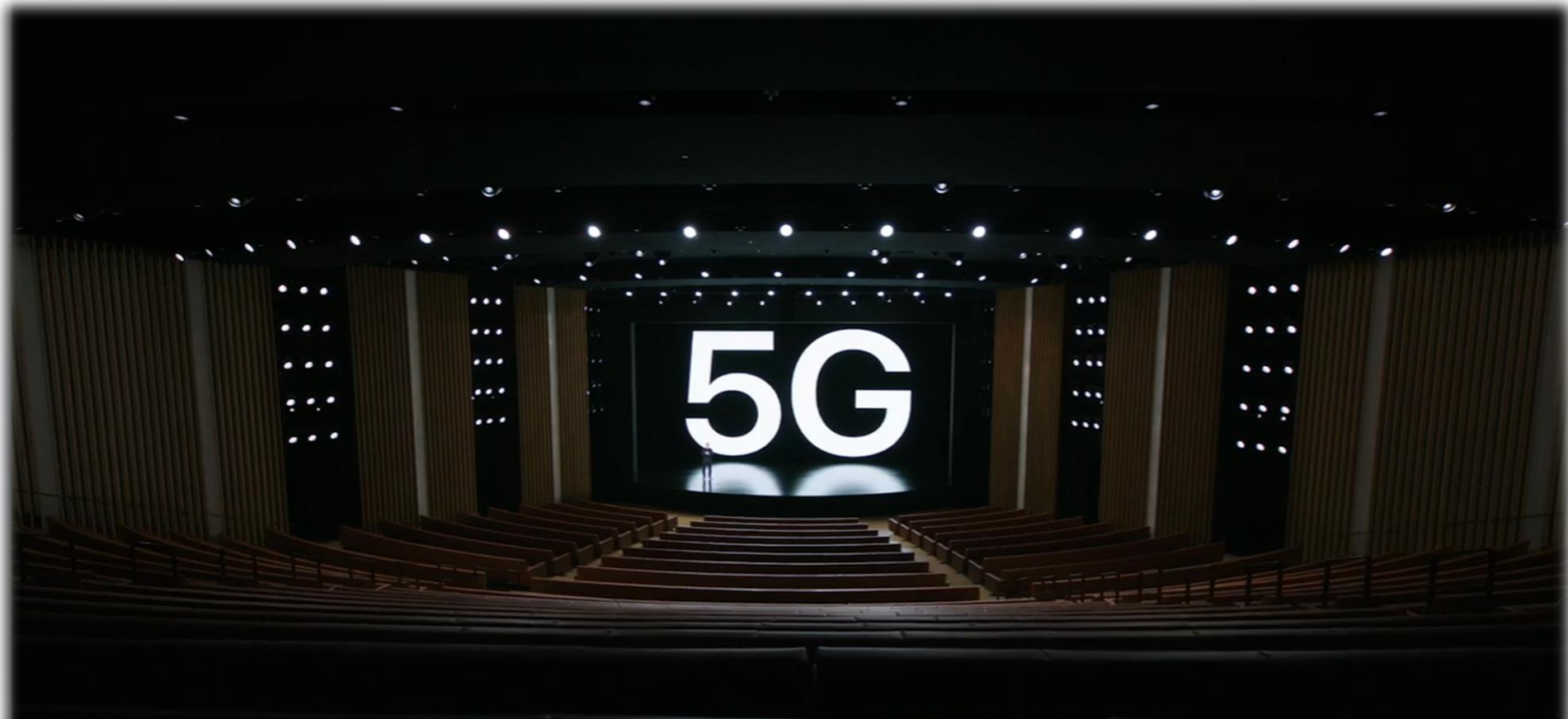
Janus - the Roman god of beginnings and transitions

5G/Edge Post Covid World

Industry/Edge Platforms

Edge Native Centric

Apple Oct 13, 2020 Livestream – Launch of 5G!



Innovation meets COVID realities!



Humble beginnings for the new mobile industry in the 1980s

**What was the
“killer application
or use case”?**

What will your life be like in 2025?

What about 2030?



[BTW: Do you remember what it was like in 2010 or 2000?]

**What BRAVE NEW BUSINESS MODELS
will emerge in the decade ahead?**

Some History on Mobile Technology

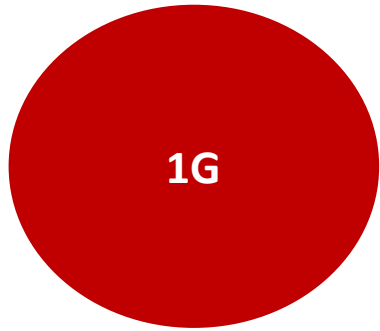
~ 1980

~ 1990

~ 2000

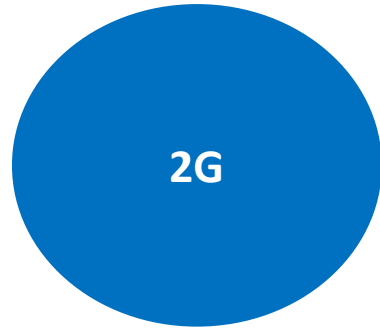
~ 2010

~ 2020



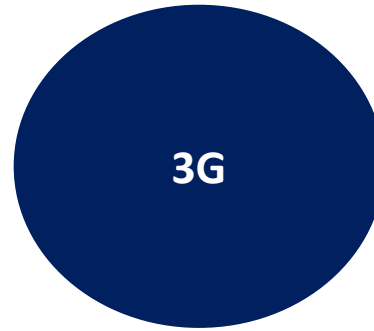
1G

Analog Voice



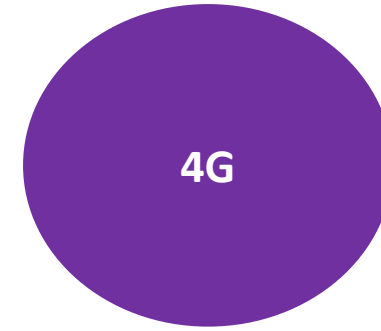
2G

Digital Voice
Text



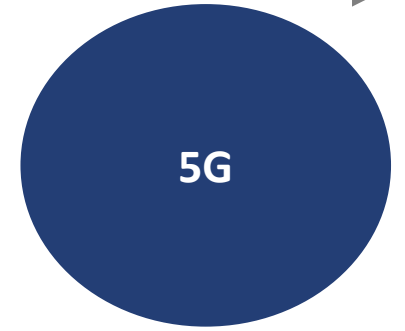
3G

Digital Voice
Multimedia Text
GPS, Internet



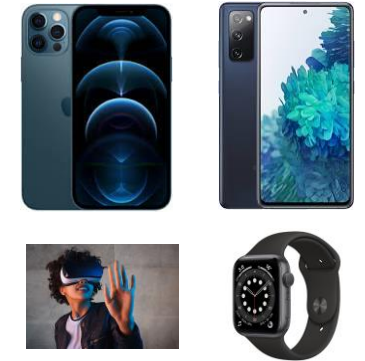
4G

High Quality Voice
Multimedia Text
GPS, HS Internet
HD Video



5G

???



~ 10 Year Mobile Tech Upgrade Cycle

4G is ubiquitous - Is this not enough?

Life is Beautiful.... Right?

What ***MORE*** can an
end user ***ASK*** for?



Re: Charles Dickens, Oliver Twist

WHY 5G is so VERY DIFFERENT!

Innovation @ Massive Scale and Speed



Talent Ecosystem Disruption



Complexity



Techno-Convergence & Timing



SEISMIC Shift from B2C to B2B Monetization!



Techno-Geopolitics



Some Curious Market Data Points...



By 2025: Mobile data usage will grow almost fourfold to **50 GB/month/user (NA)** and **35 GB/month/user (EU)**. [GSMA, 2020]



By 2023: **13.4 networked devices/connections per person (NA)**. For Western Europe ~ 9.4.
[Cisco, 2020]

By 2023: 5G speeds will be 13 times higher reaching **575 Mbps**.
[Cisco, 2020]

By 2025: Global installed and connected base of IoT units will reach **40-50 billion**
[Gartner, IDC, 2019]

Consumer autonomous vehicles (AVs) will each generate up to **4 TB / day** (Intel, 2020) and perhaps as much as ~ **15 TB/day** (various industry analysts, 2020).
Robo-Taxis may be generating **10X** this number - **100s of TB / day**.

Amazon's Zoox Robo -Taxi



5G Impact on the Global Economy

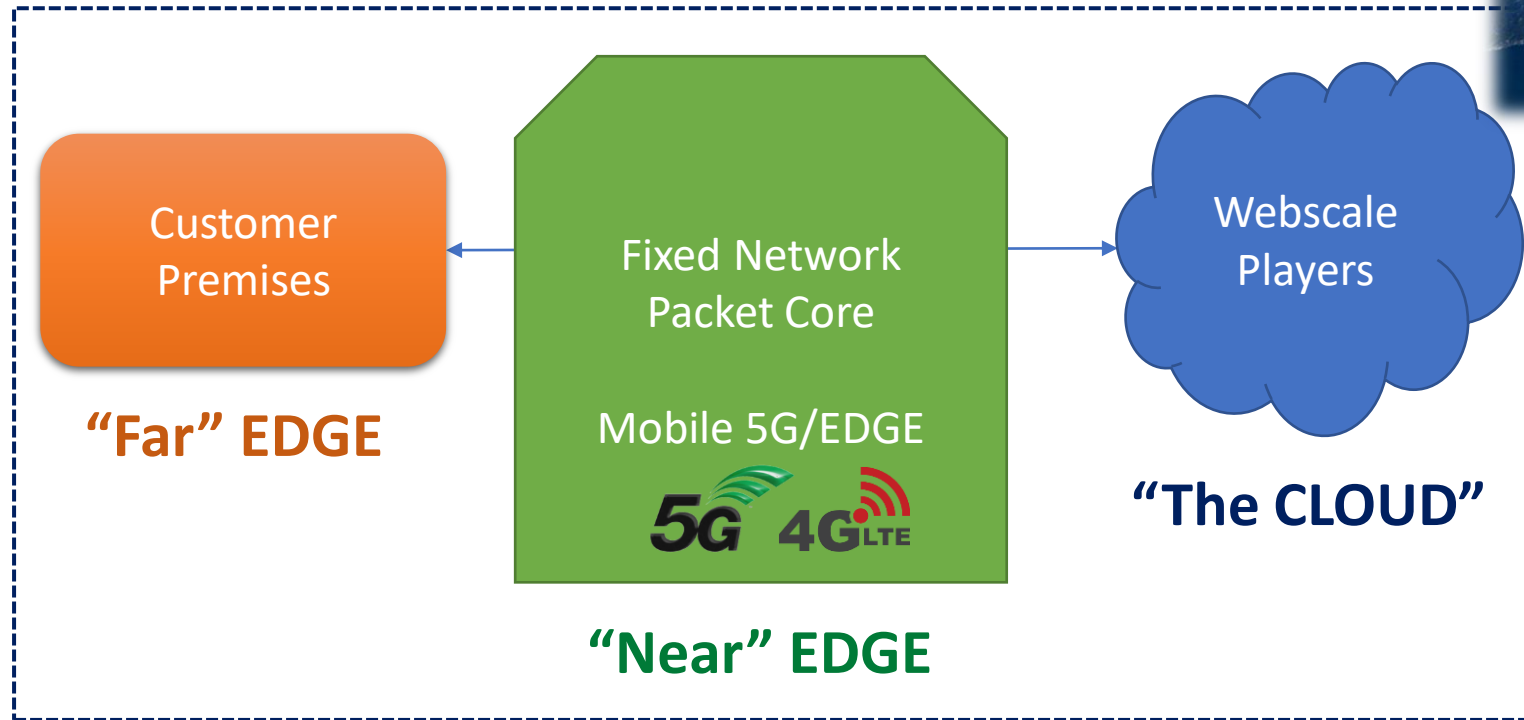


Contribution of mobile to the overall GLOBAL economy will approach ~ 5% of GDP by 2025 with 5G representing ~ 50% of connections in North America and 34% in Europe.
[GSMA, 2020]



Wireless providers will invest approximately ~ \$300B in infrastructure over the next few years, which could create up to 3M+ jobs and boost annual GDP by ~ \$600B
[Accenture, McKinsey, 2019-2020]

What Exactly is the EDGE?



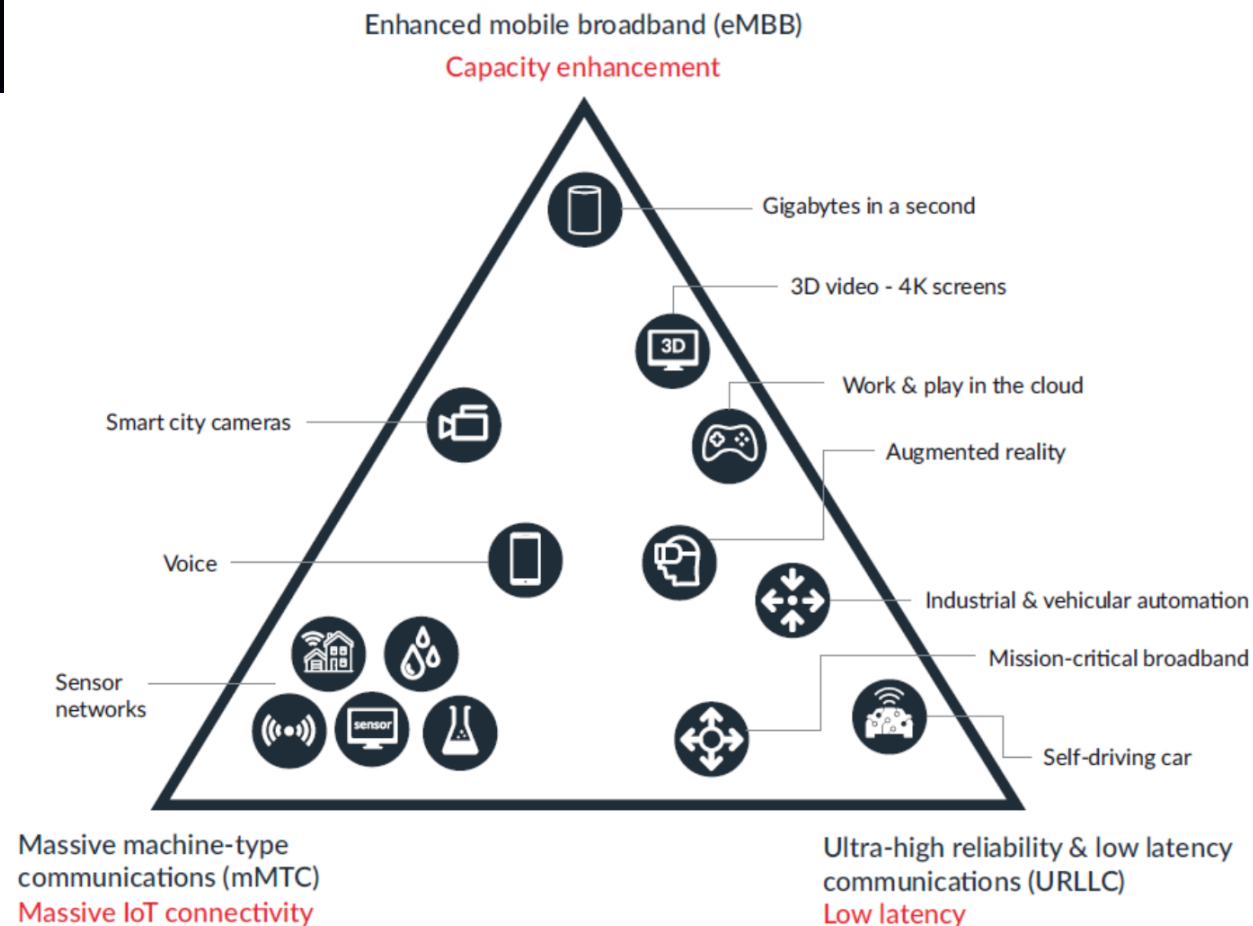
5G+ EDGE + IoT/Industry 4.0 = Innovation @ Scale and Speed



Let the 5G “Party” Begin!!



BETTER on 5G
VS
ONLY on 5G



5G
improvement
over 4G
10X-100X!

TM Forum, 2020 (based on ITU graphic)

Massive TALENT Transformation and Disruption



Re: Gartner (HBR, Jan 2021) – Trends that will shape work in 2021 and beyond

- Employers will shift from managing the employee experience to managing the employee LIFE experience.
- Employers will look to “rent” talent to fill the skills gap.
- States will compete to attract individual talent rather than trying to get companies to relocate.
- Leading companies will make bulk purchases of the COVID vaccine for employees — and will be sued over COVID vaccine requirements.



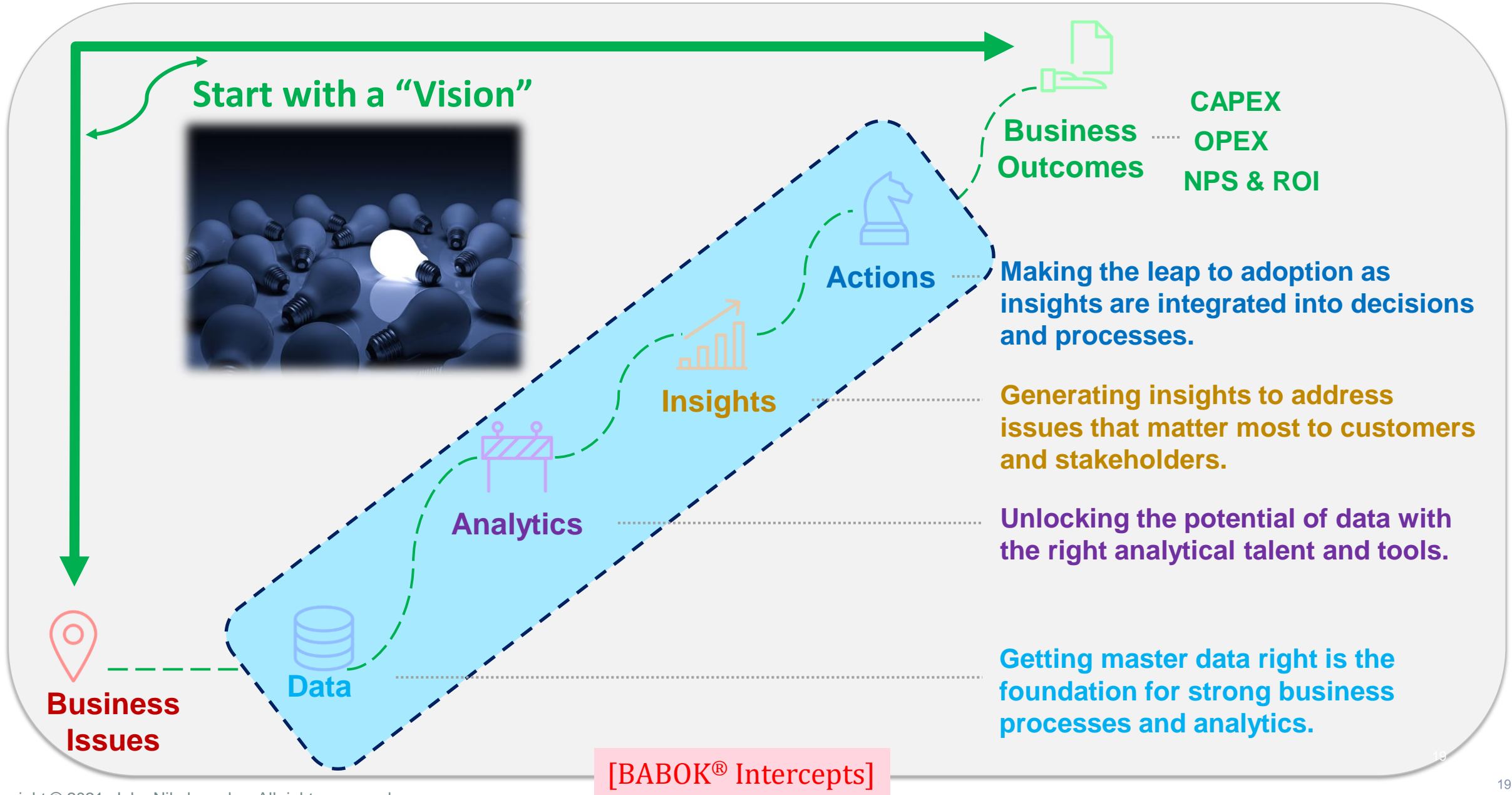
Talent Transformation: **RED QUEEN** EFFECT

- **Evolving Roles and Definitions**
 - BA vs PM vs PO [BABOK®]
 - Industry vertical specific
 - OEM vs SI vs Consulting
- **Onshore vs Offshore vs Outsourcing**
 - Buy local impacts?
- **Permanent vs Contract**
- **Diversity/Inclusion Corporate Goals**
- **WFH evolving to WFAA!**

Through the Looking-Glass [Lewis Carroll]
“Now, here, you see, it takes all the running you can do, to keep in the same place.”



5G/EDGE BIG DATA/ANALYTICS - JOURNEY TO ROI

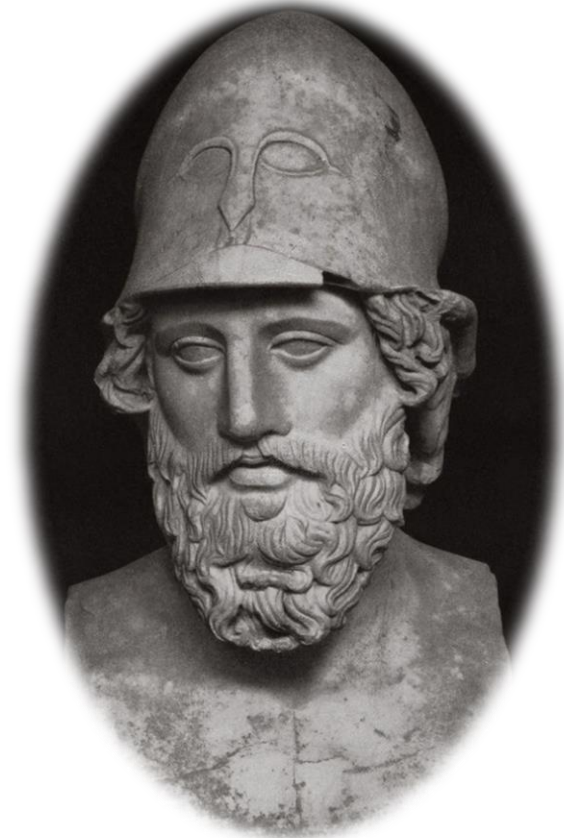


Action and Change...Driven by VISION!

I never learned how to tune a harp or play upon a lute.



But I know how to raise a small and inconsiderable city to glory and greatness.



Themistocles
5th century B.C.
Athens

OF SILVER, SHIPS AND...DISRUPTION!

The WINNING Lottery Ticket



The WINNING Business Model



The ARC of Global History Fundamentally Changed

***Extraordinary* Business Models Require
Extraordinary Vision, Execution and Innovation!**

LET THEM EAT ~~CAKE~~ 5G!

The NEW WINNING Lottery Ticket

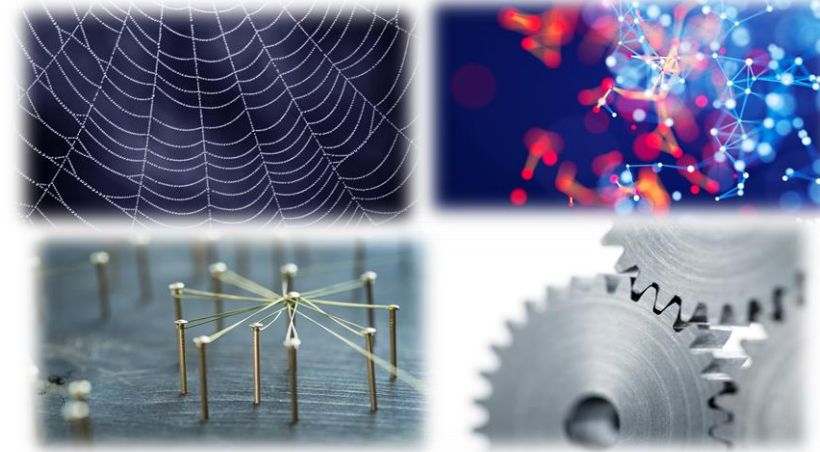
AI/ML/FL
Serverless
Multi-Cloud
Industry 4.0

5G+EDGE COMPUTING



AR/VR/XR
IoT, LEO
Quantum Computing
Blockchain/DLT

The NEW WINNING Business Model



DIGITAL CONNECTIVITY +++



Marie Antoinette

**5G Powered *Brave* New Business Models Require
Brave New Vision, Execution and Innovation!**

21st Century “Survivalist Triumvirate”

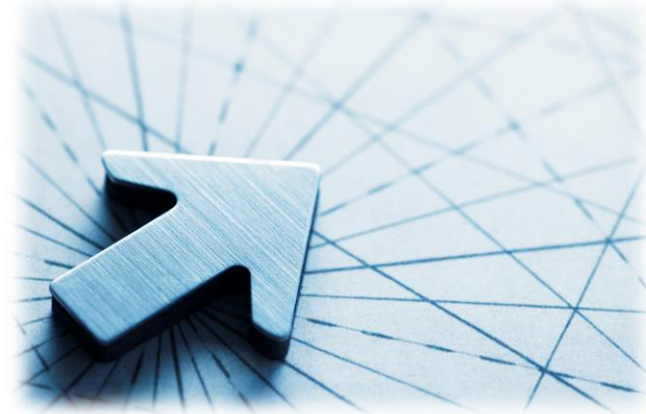
Disruption



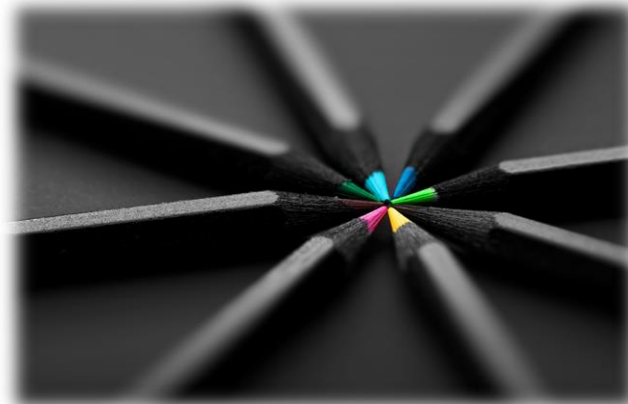
Vision



Relevance



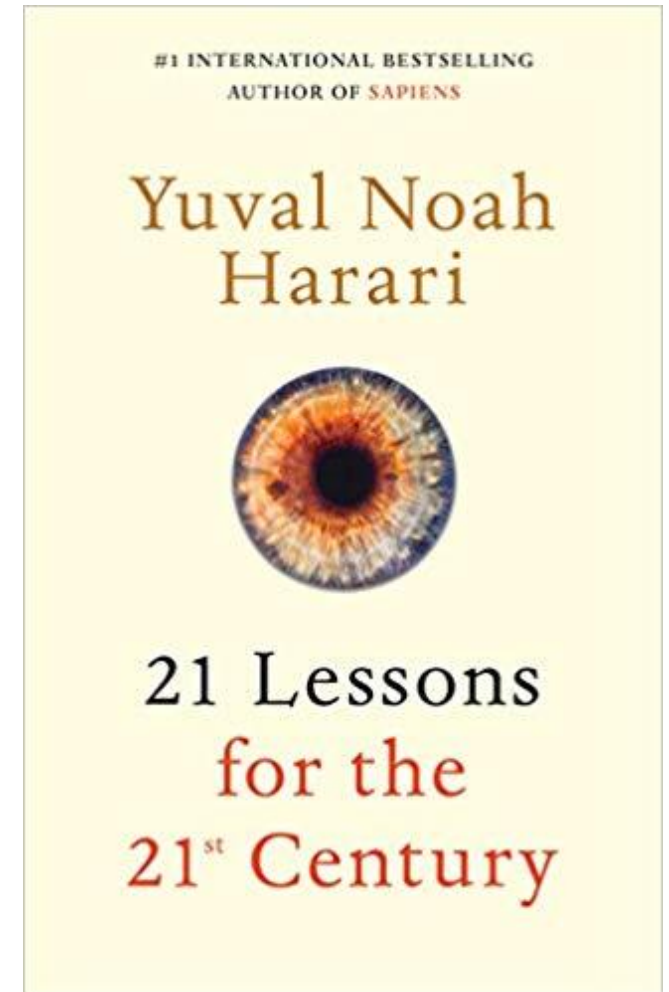
Storytelling



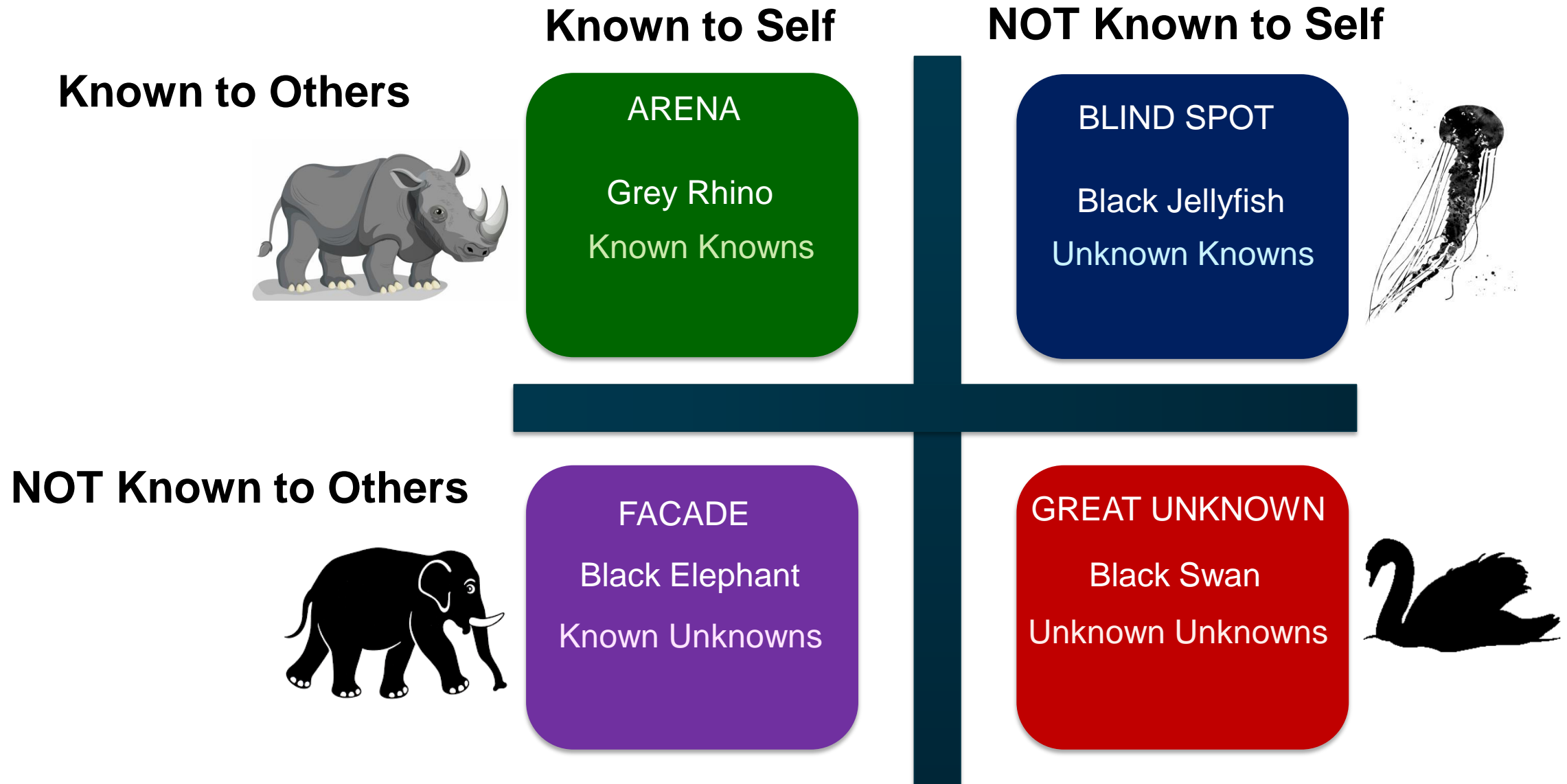
“In a world deluged by **irrelevant** information, **clarity** is **power**”



“**Struggle**” is changing from against...
“**exploitation**” vs “**irrelevance**”



Mapping Disruption Models to **Johari Window** Framework



Speed and Complexity of Disruption drives new levels of *Stress* in our Socio-Economic infrastructure



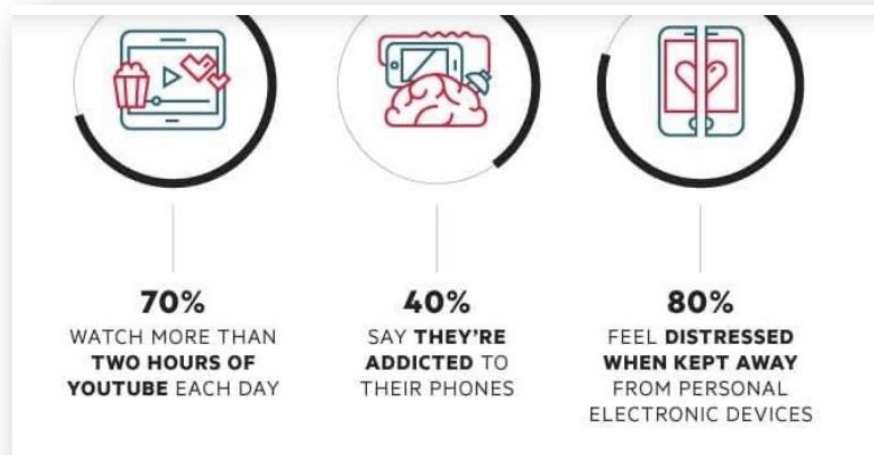
“Nomophobia” vs “Anomophobia”

Hyperconnectivity Induced Stress!

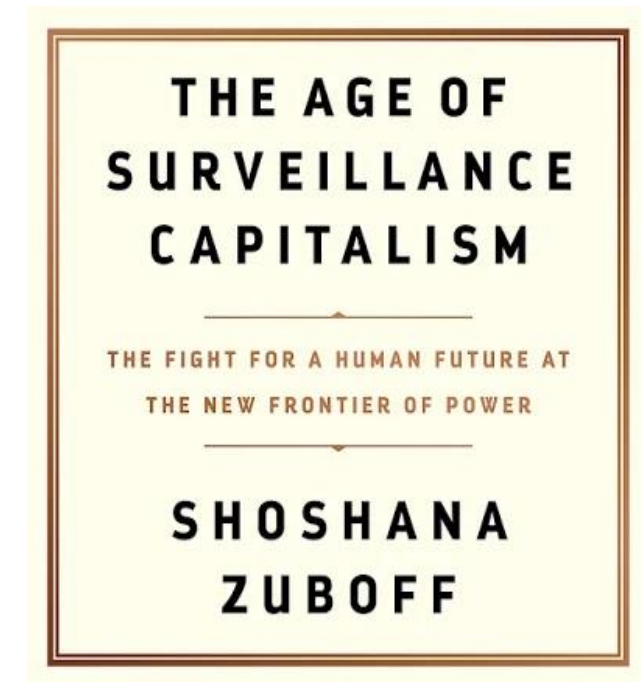
no – mo – phobia
(no mobile [connectivity] fear)

**The
Ultimate
Faustian
Bargain!**

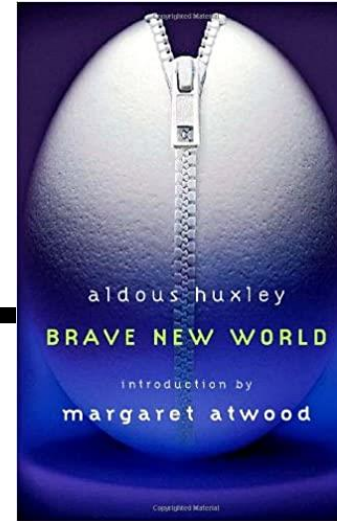
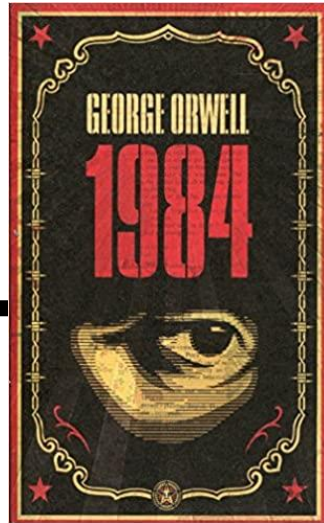
**Gen Z Profile
(born after 1997)**



re: Visualcapitalist.com



What SURVEILLANCE Model Do You Prefer?



**COVID has
Amplified and
Accelerated
This Debate!**



**New
5G/EDGE Infra
Will Drive Emerging
Surveillance Model**

S. Zuboff, New York Times, Jan 2020

How to respond when faced with a **5X** or **10X**
- **potential or expected** -
“change in business activity volume” ...within a relatively
short period...say **2-5 years**???



5G/Edge Innovation at SCALE and SPEED!

Relevance of Business Analysis Core Concept Model™ (BACCM™)!

HOW RELEVANT ARE YOU?

SWORD of DAMOCLES



Damocles - Courtier in the court of Dionysius II of Syracuse, Sicily 4th-century BC

~ 1 TRILLION \$ LOST
in POTENTIAL REVENUE
DUE TO BRAND SWITCHING
IN THE US

reference to the imminent and
ever-present risk faced by those
in positions of power

** RE: Accenture 2018*

RELEVANCE – A Transport - Taxi Perspective

1800s



1912



1950s



2020



2009



Shared Mobility

2020



Shared Self-Driving

5G/Edge Powered

2025



Shared Aerial Mobility

2030



Shared Aerial Mobility
Self-Driving

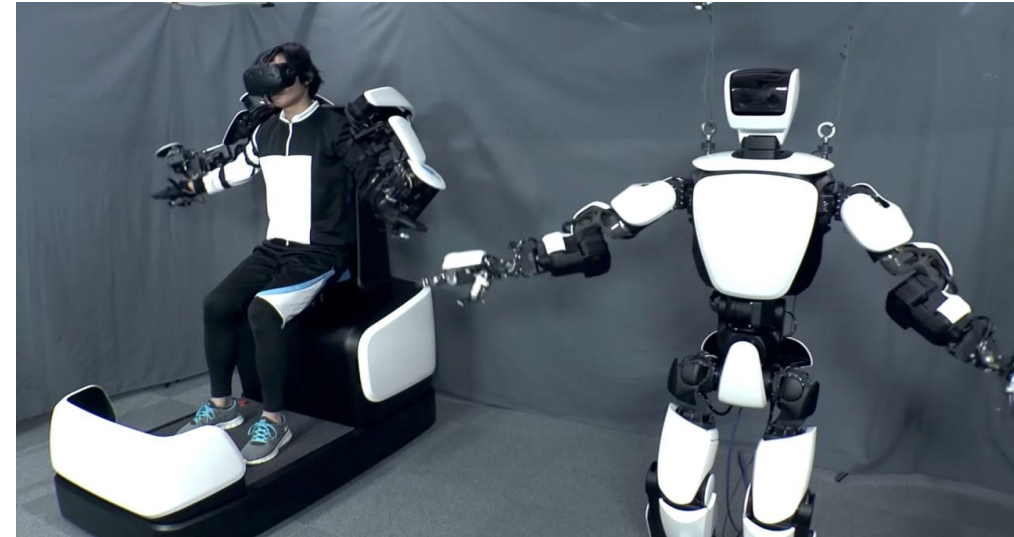
What happens to the **MILLIONS** of **TAXI** and **TRUCK** drivers in North America as we approach 2030??2040??

RELEVANCE – A Transport - Taxi Perspective - 2

Hold On! More 5G/EDGE Disruption Coming in the next 10 years!



Google: 3D avatars created from a full-body volumetric capture.

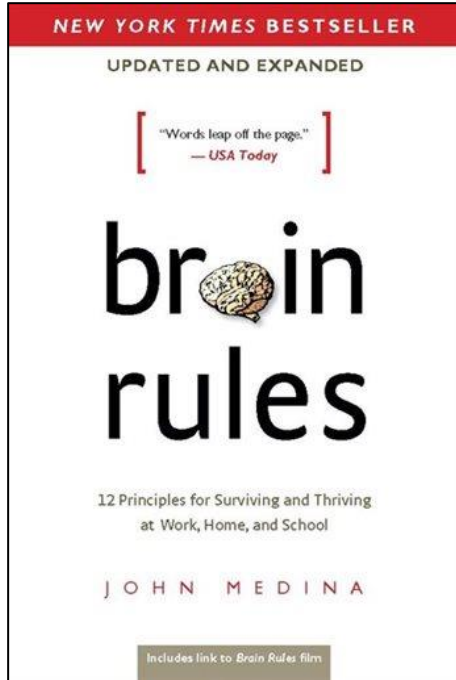


Robotic Avatars via VR Goggles + Haptic Suits.

First Horses, then Human Drivers, and possibly the “traditional” Automobile Transport Model are all made IRRELEVANT!

The universe is made of stories, not of atoms

(ref: *The Speed of Darkness*, Muriel Rukeyser)



The FIRST TWO MINUTES....
“COGNITIVE HALLOWED GROUND”

Tell the “Right Story”... the “Right Way”... AT & IN the “Right Time”!

The power of a brilliantly simple message!

Dr. Tom Frieden

[US CDC Director, 2009-17] [Dec 14, 2020](#)

An mRNA vaccine doesn't actually contain the virus itself. Think of it as an email sent to your immune system that shows what the virus looks like, instructions to kill it, and then—like a Snapchat message—it disappears. Amazing technology.



5G/EDGE Powered Real Time Translation Enabling *Compelling Frictionless Storytelling*



Personal Business

Support Stores Login

Products Plans Solutions Resources Contact Us Why Verizon



Home / Business Insights and Resources / Articles / 5G-enabled simultaneous translations: how companies are creating shared global experiences

Contact Us

Share

5G-enabled simultaneous translations: how companies are creating shared global experiences

Author: Satta Sarmah Hightower



What impact will this drive on requirements for bilingualism/multilingualism? Canada – Quebec ...are you listening? What about California, Florida? Europe?

When you get the story “RIGHT”...

{“The Most Remarkable Formula in Mathematics” [Richard Feynman]}

Euler's Identity

$$e^{i\pi} + 1 = 0$$

AWESOME!

Managing Complexity

“I think the next century will be the century of complexity”

[Stephen Hawking, 2000]



Complexity within single ecosystem and across converging ecosystems!

Emerging COMPLEX AI Morality Frameworks...

5G/EDGE Self – Driving Transport - “The Trolley Problem”



Should a self-driving car kill the baby or the grandma? Depends on where you're from

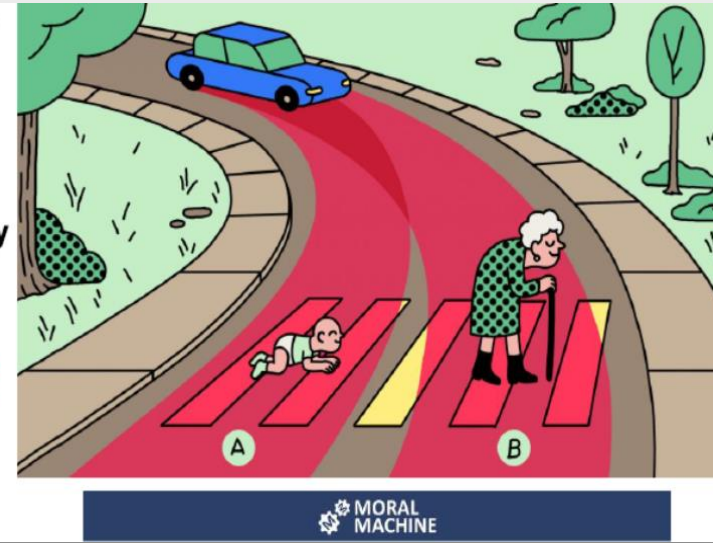
MIT
Technology
Review

The infamous “trolley problem” was put to millions of people in a global study, revealing how much ethics diverge across cultures.

by Karen Hao October 24, 2018

<https://www.technologyreview.com/s/612341/a-global-ethics-study-aims-to-help-ai-solve-the-self-driving-trolley-problem/>

In 2014 researchers at the MIT Media Lab designed an experiment called **Moral Machine**. The idea was to create a



“The needs of the many outweigh the needs of the few” (or “the one”)

Are we sure about that? Hmmm...

Beyond Morality/Ethics - Other Challenges:

- Regulations
- Infra Investment (Government vs CSPs)
- Security
- Consumer Trust
- “Human in the Loop” (HITL) triggers...

Future of Autonomous Systems

*The **NEED** for **HUMANS** in the **LOOP** (HITL)!!*

HITL= Humans in the Loop
HOTL = Humans Out of the Loop

Re: IEEE Spectrum, Oct/2019



Vasily Arkhipov



Oct 27, 1962
Cuban Missile Crisis

"This was not only the most dangerous moment of the Cold War.

It was the most dangerous moment in human history."

[re: Arthur M. Schlesinger Jr., an advisor for the John F. Kennedy]

5G/EDGE will amplify the HITL vs HOTL Debate!

"The greatest shortcoming of the human race is our inability to understand the exponential function."



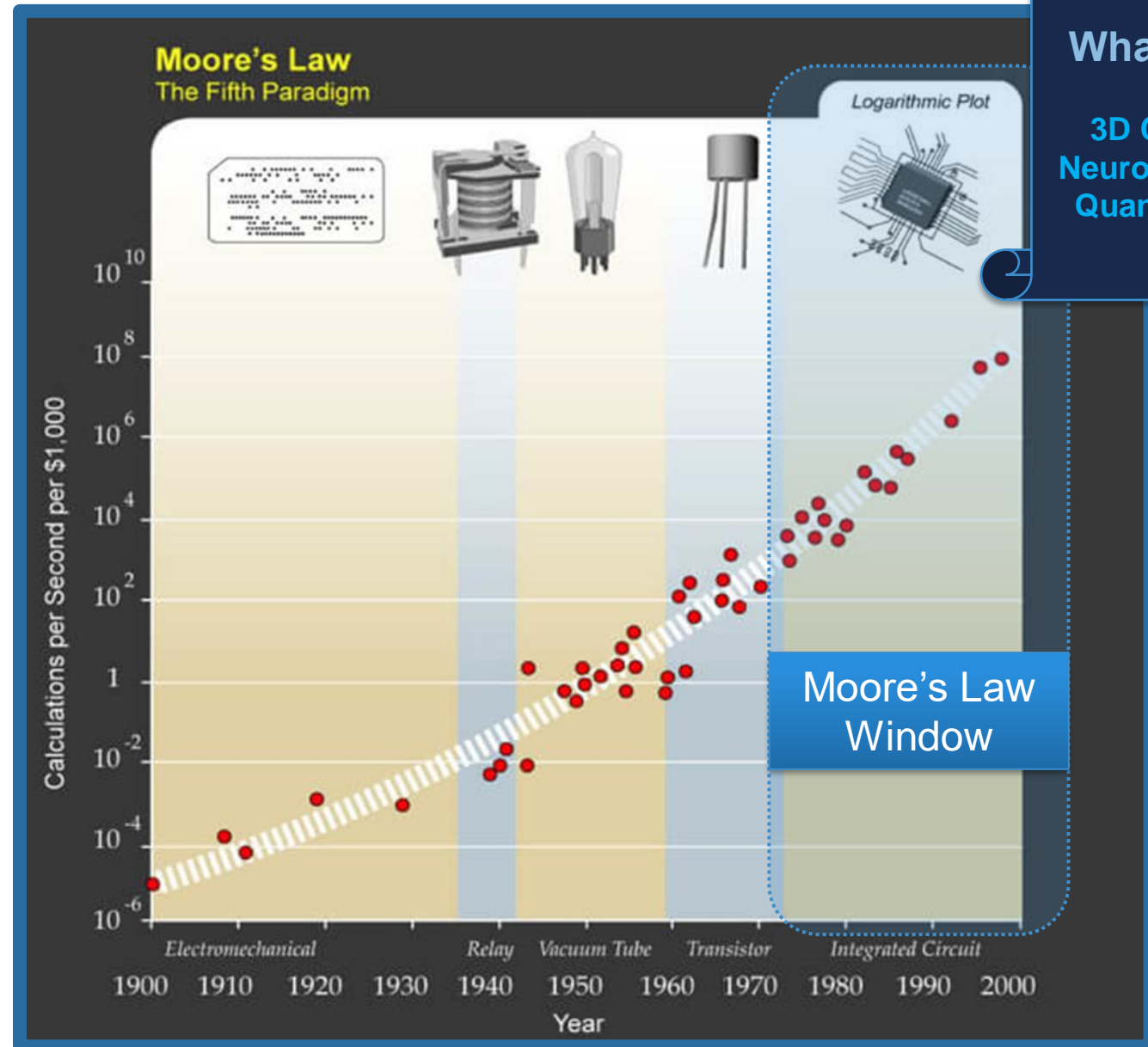
Albert Allen Bartlett (March 21, 1923 – September 7, 2013) was an emeritus professor of physics at the [University of Colorado at Boulder](#),

THE *GAME* HAS SHIFTED...

To the 2nd Half of the
Chessboard!

Each square on the chessboard
represents a “doubling” of performance

We have had ~ 30+ doublings
since Moore’s Law was first
coined in the late 1960s!



What's Next?

3D Computing
Neuromorphic HW
Quantum Comp.
?

What Took So Long?

Dick Tracy comic strip introed in 1931



- 2 Way Wrist Radio ~ 1946
- 2 Way Wrist TV ~ 1964

5G support in 2021!



**Dick Tracy
two-way
radio**

**Apple
Watch**

Give **Moore's Law** a break!

Needed time for sufficient performance doublings ~ 30-40!

Some material obstacles, but mostly a compute performance challenge.

Where are the Flying Cars?

The Jetsons ~ 1962



**We wanted flying cars.
Instead we got 140 characters.
[Peter Thiel, 2011]**

The POWER of CONVERGENCE!

“the blurry acceleration we’re witnessing today – that is, the answer to “Why now? – is the result of a dozen different technologies *[including 5G*]* converging.

It’s progress at a rate we have not seen before.”

[Diamandis/Kotler, *The Future is Faster Than You Think*]

** My addition*

Compute Power Metrics Evolution

WWII Computing Infrastructure



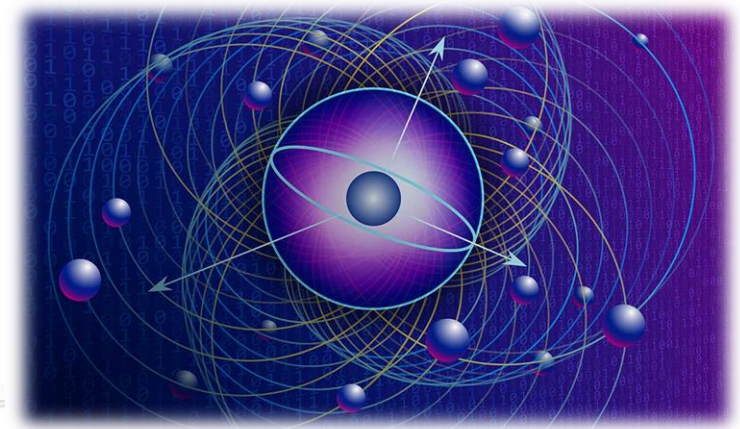
Kilo-Girls

Classical Computing



FLOPS & MIPS

Quantum Computing



**Quantum Volume
Algorithmic Qubits**

5G



FROM MVP TO MVE

MVP = Min Viable Product
MVE = Min Viable Ecosystem

Traditional Business Model

Gross Margin
Cost of Goods
Customer Lifetime Value
Sales Conversion
Customer Acquisition

MVP Focus

Platform Business Model

Ecosystem Growth
Ecosystem Value
Transaction Velocity
Frictionless Business
Consumer/Producer Balance

MVE Focus



Current/Emerging Platform Business Model Challenges

War on Talent!!

Scale Requirements
Global Expansion/New Markets
Techno Geopolitics
Stakeholder Diversity
Ecosystem Complexity Management

Potential Growing Balkanization of the Internet?

A New Digital Iron Curtain?

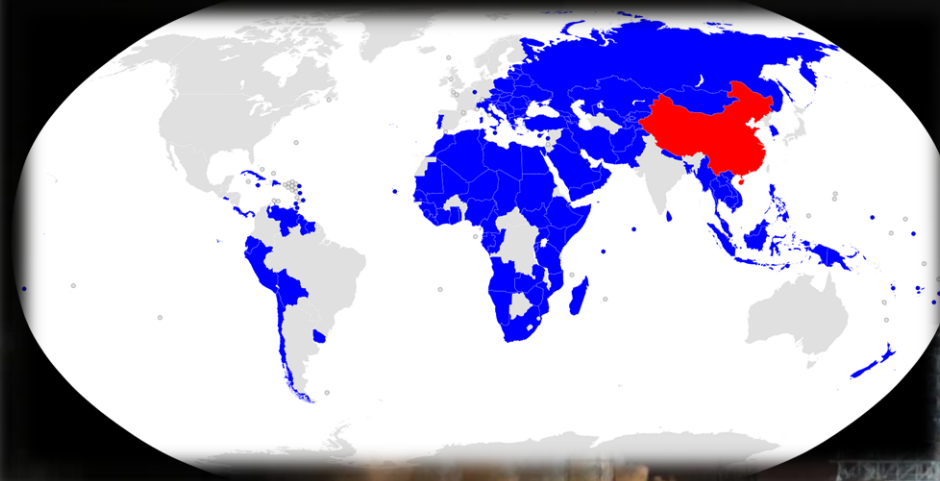


China nears completion of its GPS competitor, increasing the potential for internet Balkanization

Jonathan Shieber @jshieber / 7:45 am EST • December 28, 2019

GPS (US) vs Galileo (EU) vs Beidou (China) vs Glonass (Russia)

China - Belt and Road Initiative (BRI)



The Dangers and Disruption of the Rise of Global Techno Geopolitics!

COVID-19 IMPACT

New Terminology

- Zoom/Netflix fatigue
- Flattening the curve
- “Fake” Commute



Possible Future 5G/EDGE Market Intercepts?

- Contact Tracing
- “Over the skin” to “under the skin” surveillance
- **Vaccine Nationalism and Vaccine Passports!**

COVID-19 IMPACT - 2

- N. Taleb – **Not** a **Black Swan**
 - ❑ More like **Grey Rhino + Black Jellyfish?**

- Brave New Business Models

- ❑ Telehealth anyone?
- ❑ Downtown commercial real estate?

- “Localized” Supply Chains (e.g., medical/PPP)

- ***Digital Transformation Acceleration***

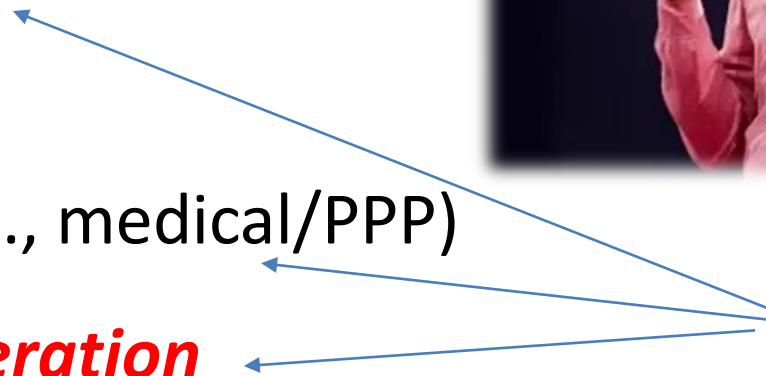
- Network infrastructure holding well!

- Key 5G 2020 frequency auctions across the globe delayed into 2021!

Bill Gates during a TED talk titled 'The next outbreak? We're not ready' in March 2015. (TED.com)



5G/EDGE Opportunities!

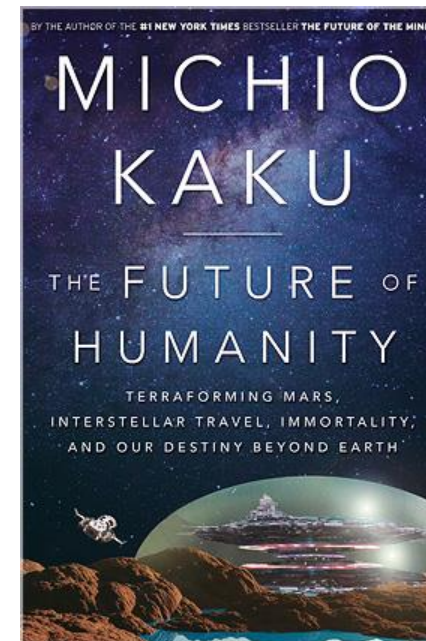


Be prepared...Be curious...



Killer asteroids are NATURE's way of asking...“How is that space program coming along?”

[Re: M. Kaku, *Future of Humanity*]



**Are you now ready to
start thinking about
what your life will be
like in 2030?**

Want to Learn More About Emerging Tech Disruption/5G/Edge?

McGill 5G Workshop

April 29/30 2021; 1 to 4:30 PM EST [delivered via Zoom]

<https://continuingstudies.mcgill.ca/search/publicCourseSearchDetails.do?method=load&courseId=10697335&selectedProgramAreaId=17721&selectedProgramStreamId=>



My McGill Emerging Tech Blog Series

*Understanding and Preparing
for the Coming Mobile 5G Tsunami! [4 parts]
October 2020*

<https://www.mcgill.ca/continuingstudies/article/understanding-and-preparing-coming-mobile-5g-tsunami>



Upcoming FREE Webinars on Emerging 5G/EDGE

Event Information: 5G for Investors and Entrepreneurs

Registration is required to join this event. If you have not registered, please do so now.



Event status: Not started ([Register](#))

Date and time: Thursday, March 18, 2021 12:00 pm
Eastern Daylight Time (New York, GMT-04:00)
[Change time zone](#)

Duration: 1 hour

<https://mcgill.webex.com/mcgill/onstage/g.php?MTID=e8056d4d04e5f02459a4dc1babdae3ad6>

Event Information: 5G, Health and the Environment

Registration is required to join this event. If you have not registered, please do so now.



Event status: Not started ([Register](#))

Date and time: Wednesday, April 7, 2021 12:00 pm
Eastern Daylight Time (New York, GMT-04:00)
[Change time zone](#)

Duration: 1 hour

<https://mcgill.webex.com/mcgill/onstage/g.php?MTID=e7fd76ba75bcad837ac6cf8614713ca74>

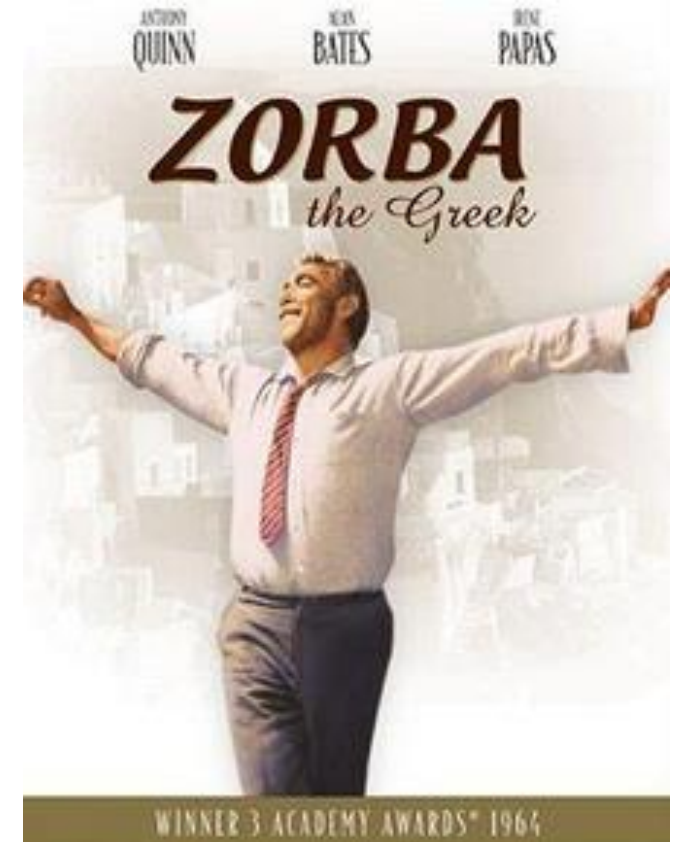
Thank You / Merci



Hey Alexa...did you get that?



**“What a strange machine man is!
You fill him with bread, wine, fish,
radishes, and out of him come
sighs, laughter and dreams.
Like a factory.”**



- Nikos Kazantzakis - 1883-1957
[Nobel nominated European author]
[*Zorba the Greek* – written in 1946, movie in 1964]