RRU Alumni Fall Tour (2016)

"*Smoke at Session*" Emerging Issues

Global Geopolitical Tension Flash Points and the Internet of Everything

Professor Terry Power, Wharton Fellow
Strategic and Advanced International Studies
Royal Roads University

Von Clausewitz:

"**War is nothing but a continuation of politics with the admixture of other means**"

World War III ?

Poke the bear ...

Consider ‘the facts’ ...

By the end of the session you may agree that there is “smoke” ...

Key link for geopolitical materials:

http://nextbigfuture.com/2016/07/reviewing-where-might-world-war-3.html

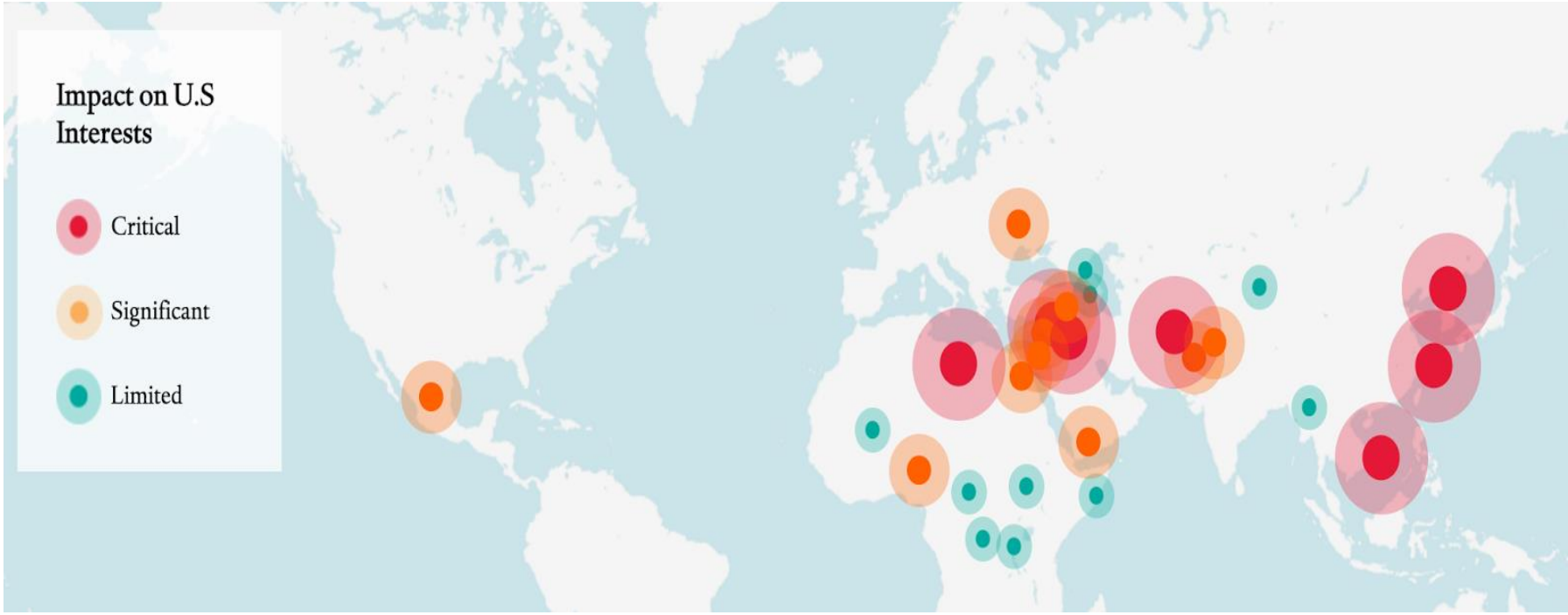
DOMAINS

Land | Air | Sea

Currently there are at least 12 armed conflicts

- Iran-PJAK conflict[*citation needed*]
- Fatah–Hamas conflict[69][70]
- South Yemen Insurgency[71]
- Yemeni al-Qaeda crackdown[73][74]
- Egyptian Revolution of 2011
- Bahraini uprising (2011–present)
- 2011 Yemeni revolution
- Syrian Civil War
- Sinai insurgency
- Iraqi insurgency (post-U.S. withdrawal)
- Syrian Civil War spillover in Lebanon
- Islamist unrest in Egypt (2013–2014)

Possible breakout locations …
Let us look at a few



10-16

Estimated number of nuclea weapons

70

Estimated number of state officials executed under Kim Jong Un

28,500

Number of U.S. troops in South Korea

Tensions in the East China Sea

81,000 SQ. MILES

Total area of disputed maritime boundary

8

Number of disputed islands

200 MILLION

Estimated barrels of oil reserves in the East China Sea

Taiwan ‘to test-fire missiles in US’ as China tensions rise

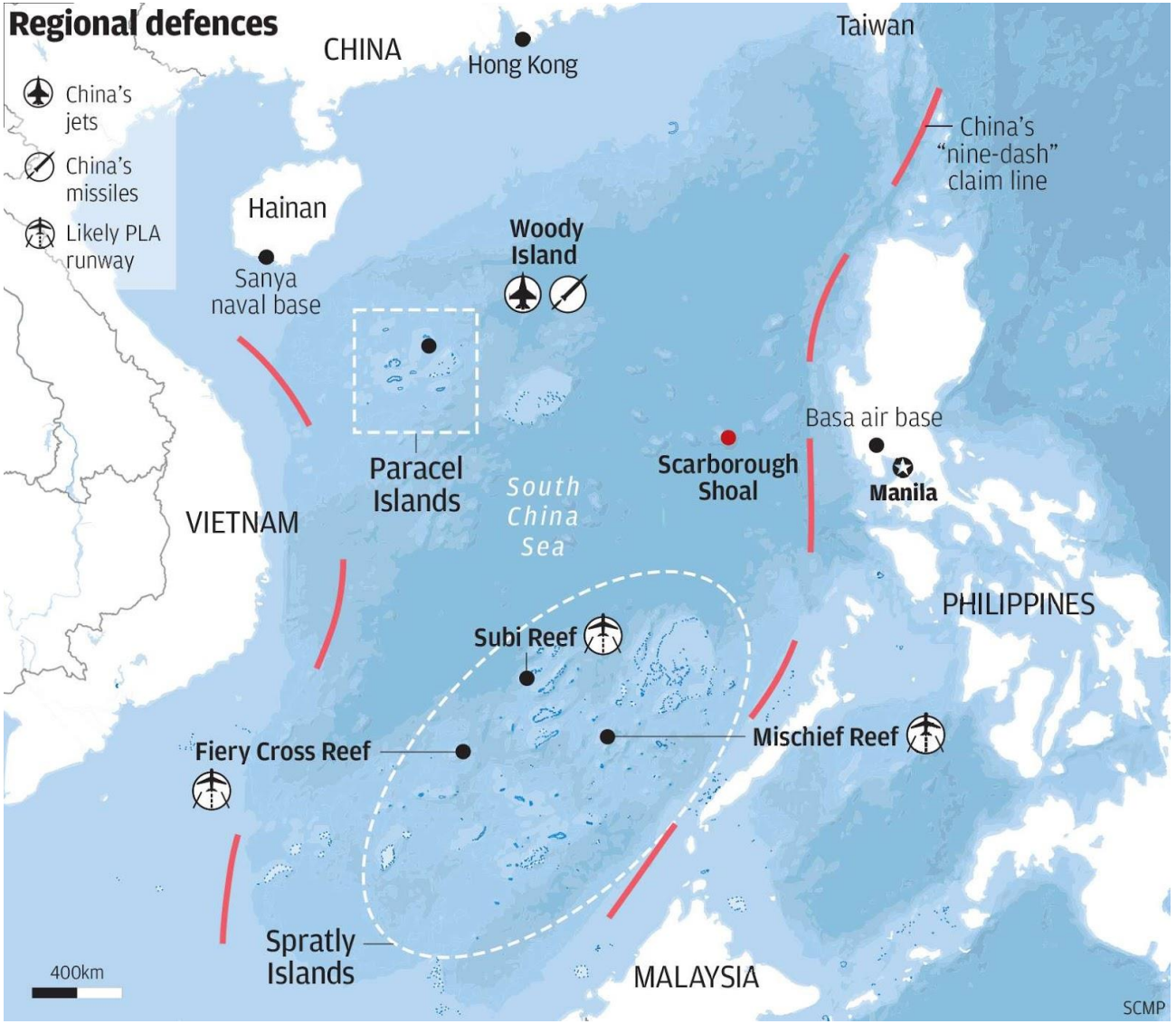
Taiwan acquired the Patriot Advanced Capability-3 (PAC-3) missile system as part of a $6.5 billion arms sale in 2008 (AFP Photo /Yoshikazu Tsuno)

Taiwanese Defence Minister states 1500 Chinese missiles aimed at Taiwan.

Taiwan must tread carefully with China

- Background … Long March
- Growing economic interdependence: Beijing Taipei (39%)
- Notwithstanding ‘benefits’, the new generation favour independent policies (74% of Taiwanese now identify themselves as Taiwanese up from 44% in 1996).
- Pres. Tsai clear majority for national’s policies. International bodies. USA “protector”?
- Taiwan, which shares territorial claims with China in the disputed area **sends naval frigate to patrol the disputed waterway** to show the government’s “determination” to defend its national interest.

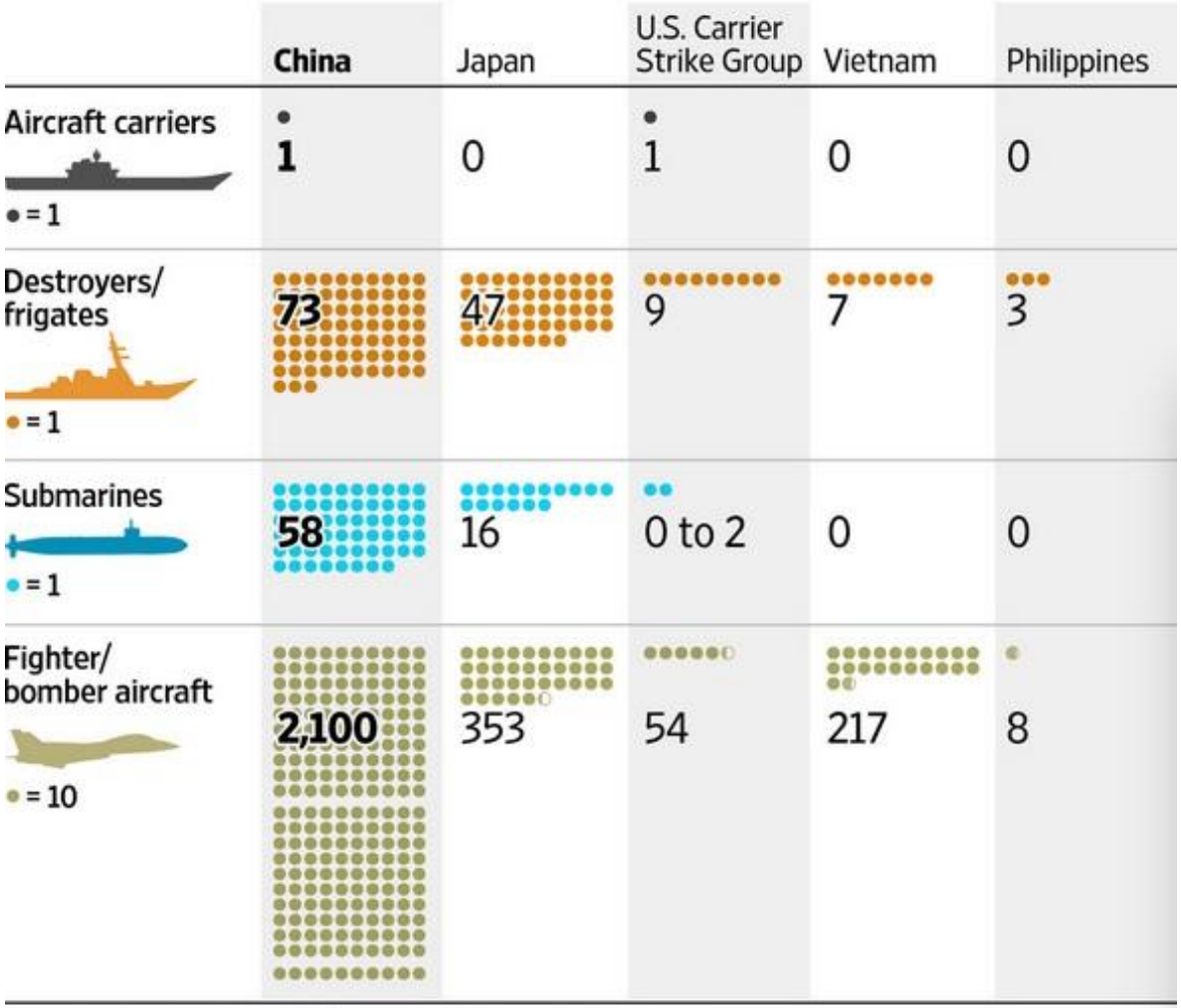
South China Sea



Center for Strategic and International Studies shows the construction of what appear to be reinforced aircraft hangars at Fiery Cross, Subi and Mischief Reefs, all part of the disputed territories.

Power Projections

China aims to boost its maritime forces, but it already has an edge over its rivals in terms of the sheer size of its air and naval fleets.



Sources: U.S. Department of Defense, World Air Forces 2015 report, Japan Self-Defense Force (Japan fighter)

THE WALL STREET JOURNAL.

Conflict Between India and Pakistan

118,950 SQ. MILES

Total disputed territory

450 MILES

Length of disputed border

3

Number of disputed territories

THE SECTARIAN BALANCE OF POWER IN THE MIDDLE EAST

As 2016 dawned, tensions between the chief historical rivals of the Middle East, Saudi Arabia and Iran, dominated the headlines. The proximate cause was the execution of a Shiite cleric in Saudi Arabia, but tensions between the two countries -- one the standard-bearer for Arab and Sunni Islam, the other the seat of the ancient Persian Empire and Shiite Islam -- stretch back for centuries.

Saudi Arabia is combating Iran on multiple fronts: The kingdom leads a broad coalition against the Iran-backed Houthi rebels in Yemen, it supports rebel groups in Syria and it pays Sunni Arab tribes in Iraq to fight the Islamic State. In less direct ways, Riyadh's influence can also be seen and felt in neighboring states such as Egypt, Sudan, Morocco, Jordan, Qatar and the United Arab Emirates, which are also home to large Sunni and Arab populations.

Because Shiites comprise a minority in the Muslim world, Iran's allies are fewer in number, but the path of power projection for Tehran is clear and unmistakable. It has extended its reach through neighboring Iraq (with its majority Shiite population) to Syria, where it supports Bashar al Assad's Alawite regime, and into Lebanon and the Mediterranean coast. Militant groups like Hezbollah also have extended Iran's influence through the region.

As tensions between the two powers flare, the schisms are often clearly seen in follow-on actions throughout the region.

Turkey: Russia's Putin and Turkey's Erdogan meet after damaging rift

Tension

- Turkey background – EU – NATO – Muslim Crescent?
- Putin expressed support for Erdogan's government during the coup's early hours and has remained silent as Erdogan jails those his government accuses of treachery.
- Turkey continues its push for full membership in **the Shanghai Cooperation Organization**, a China- and Russia-led alliance that NATO fears might one day become a military bloc.
- October visa issue or 'out of there'? German Immigration
- Strain, but will not leave?

US moves nuclear weapons from Turkey to Romania

50 US tactical nuclear weapons have been stationed at Turkey's Incirlik air base (approximately 100 kilometres from the Syrian border).

Two independent sources told EurActiv.com that the US has started transferring nuclear weapons stationed in Turkey to Romania, against the background of worsening relations between Washington and Ankara. 20+ Nukes

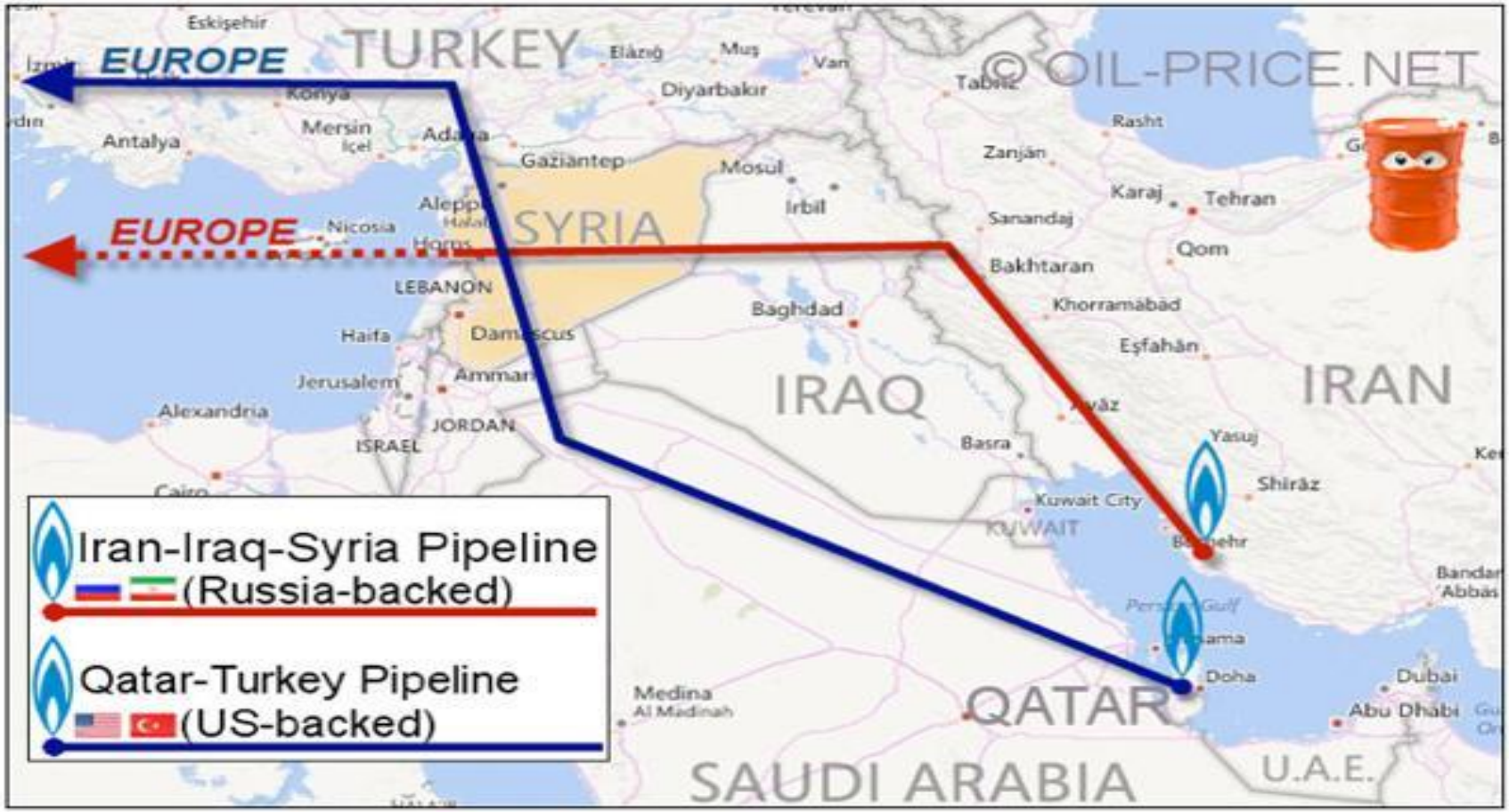
US activates Romanian missile defence site, angering Russia

NATO Secretary-General Jens Stoltenberg (L) and Romanian Prime Minister Dacian Ciolos arrive for an official inauguration ceremony at Deveselu Air Base in Romania on 12 May. [Reuters]

Ukraine - Russia

- Background
- Military (Naval & Land)
- US has given 600 million in aid BUT no missiles
- Russian war games increasing…

Syria


EUROPE
EUROPE
TURKEY
SYRIA
IRAQ
IRAN
QATAR
SAUDI ARABIA
U.A.E.
LEBANON
ISRAEL
JORDAN
KUWAIT
Eskişehir
Antalya
Mersin
İçel
Gaziantep
Aleppo
Nicosia
Haifa
Damascus
Amman
Jerusalem
Alexandria
Cairo
Diyarbakır
Mosul
Irbil
Baghdad
Basra
Kuwait City
Tabriz
Rasht
Zanjān
Karaj
Tehran
Sanandaj
Qom
Bakhtaran
Khorramābād
Eşfahān
Yasuj
Shirāz
Doha
Dubai
Abu Dhabi
Medina
Al Madinah
© OIL-PRICE.NET
Iran-Iraq-Syria Pipeline
(Russia-backed)
Qatar-Turkey Pipeline
(US-backed)

Syria

The Players …

DOMAIN: ECONOMIC

Demand Supply Curve

Economic US Debt Clock:
http://www.usdebtclock.org/

DOMAIN: ECONOMIC

Vehicle Currency: IMF - China

The Chinese renminbi will be the 5th currency added to the basket. However, **it will instantly jump to the 3rd most important currency in the SDR basket.** Nearly an 11% SDR total allocation will be given to the renminbi, ahead of the yen and GBP.

This is huge for China's global power standing

Currencies are selected "**due to their importance in the world's trading and financial systems**."

DOMAIN: ECONOMIC

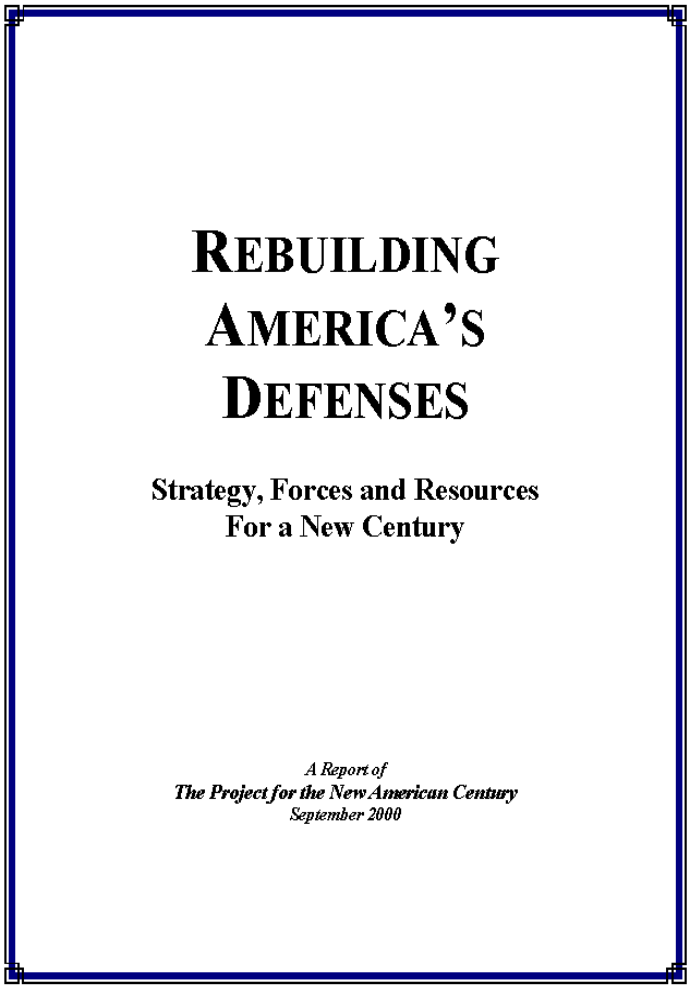
Information, then Communication

Digital Trust : https://www.youtube.com/watch?v=XnkI-i-lz4E

Gold backed Bitcoins?

It's an exciting time in the world as economies sail through unchartered seas of **shadow banking, negative interest rates and stock markets completely disconnected with reality**, but navigating the new normal requires learning fresh ways of looking at our economic future – new mental models.

DOMAIN: ECONOMIC
Driving the New American Empire?



REBUILDING
AMERICA'S
DEFENSES

Strategy, Forces and Resources
For a New Century

A Report of
The Project for the New American Century
September 2000

DOMAIN: ECONOMIC

Project for the new American Century: Key Members of "the Bush Administration"

https://web.archive.org/web/20130817122719/http://www.newamericancentury.org/RebuildingAmericasDefenses.pdf

Signatories to *Statement of Principles*

- Elliott Abrams[5]
- Gary Bauer[5]
- William J. Bennett[5]
- John Ellis "Jeb" **Bush**[5]
- Dick **Cheney**[5]
- Eliot A. Cohen[5]
- Midge Decter[5]
- Paula Dobriansky[5]
- Steve **Forbes**[5]
- Aaron Friedberg[5]
- Francis **Fukuyama**[5]
- Frank Gaffney[5]
- Fred C. Ikle[5]
- Donald **Kagan**[5]
- Zalmay Khalilzad[5]
- I. Lewis "Scooter" **Libby**[5]
- Norman Podhoretz[5]
- J. Danforth **Quayle**[5]
- Peter W. Rodman[5]
- Stephen P. Rosen[5]
- Henry S. Rowen[5]
- Donald **Rumsfeld**[5]
- Vin Weber[5]
- George Weigel[5]
- Paul **Wolfowitz**[5]

DOMAIN: ECONOMIC

The Neo-conservative agenda-Pax America

The report asserted that the United States should:

> **". . . seek to preserve and extend its position of global leadership" by "maintaining the pre-eminence of U.S. military forces."**

Specific Goals:

- Military budget at the expense of domestic social programs
- Topple regimes resistant to the corporate interests
- Forced democracy
- Replace the United Nations as a provider of international order

DOMAIN: ECONOMIC

Project for the new American Century

https://web.archive.org/web/20130817122719/http://www.newamericancentury.org/RebuildingAmericasDefenses.pdf

- At page 51…

  "Further, the process of transformation, even if it brings revolutionary change, is likely to be a long one, absent some catastrophic and catalyzing event – like a new Pearl Harbor".

- Along comes 9/11
- Libya, Tunisia, Egypt, Iraq, Afghanistan, Yemen, Iran …
- Pandora's box open - this will go on for decades …

DOMAIN: ECONOMIC

US Election … and why it's important

- Plato vs. Aristotle
- Role of 4th Estate
- TPP
- Nationalism vs. Globalism
- NAFTA

DOMAIN: ECONOMIC

China – EU - Syria

- Today, the **EU is China's biggest trading partner**, while China is the EU's 2nd largest trading partner after the United States.
- Trade in goods between the EU and China is worth well over €1.5 billion a day, with EU exports amounting to €170 billion and imports to €350 billion in 2015. The EU and China therefore have a significant stake in each other's prosperity and sustainable growth.

- Reuters article: "China says seeks closer military ties with Syria"

  "**China and Syria's militaries have a traditionally friendly relationship, and China's military is willing to keep strengthening exchanges and cooperation with Syria's military" (Joins Russia)**

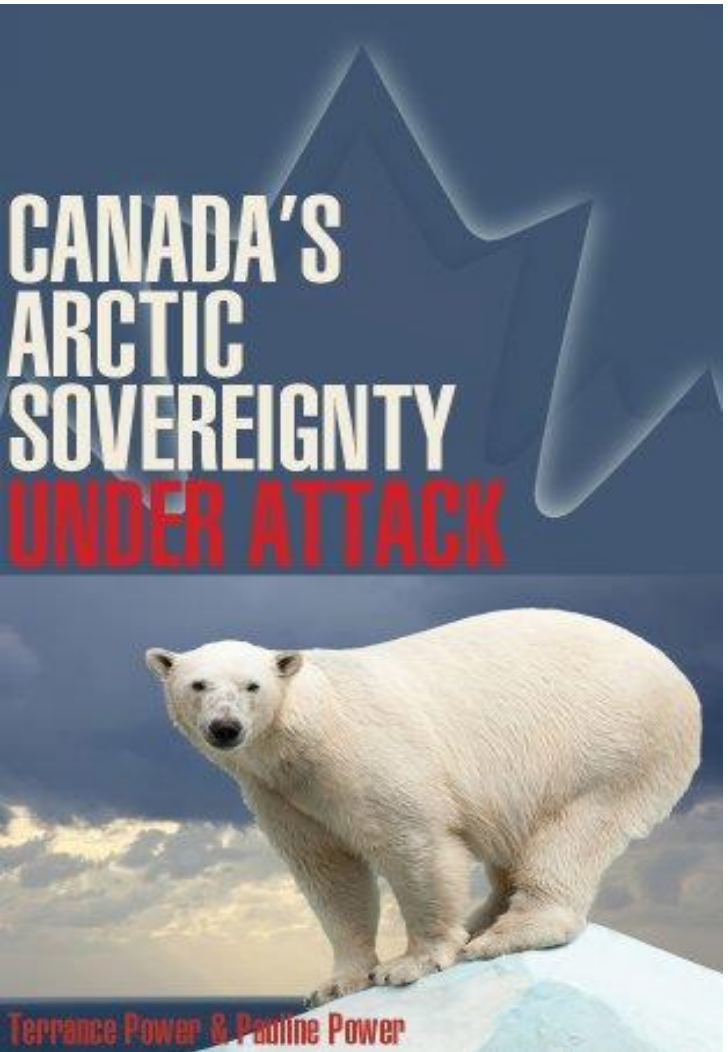
DOMAIN: ECONOMIC

China – Iceland

- The lesson comes too late for the United States. The **US abandoned its military base** and its foreign policy influence in Iceland in 2006
- Both **Russia and China** are now showing how keen they are to **fill the void** and take advantage of the growing strategic importance of the island nation at the **edge of the Arctic Circle**
- China agreed a free trade deal with Iceland, an independent nation of 320,000 people (which refuses to join the European Union), the first such deal signed with any European state

DOMAIN: ECONOMIC

China – Canada's North



- Arctic Council
- In September 2015 the 19,000 tonne Yong Sheng, the **first Chinese ship to transit the Northeast Passage**, completed her voyage, which the Financial Times called "historic…many hope that the Yong Sheng's voyage presages a new era for the global shipping industry."
- The two week voyage **took half the time of the traditional southerly route** from Busan, in South Korea, to Rotterdam
- This new Asian trade route makes Iceland look less far-north and more dead-strategic
- **Canada needs to be a junior partner in some form of alliance to protect its Arctic interests**? China -Canada's North

DOMAIN: ECONOMIC

China - Iran

- China plays greater role in Syria (US 'left out')
- China has always had a presence throughout the Middle East
- Lebanon: very quiet about it, very subtle
- They have been providing military assistance and training to the Syrian Army
- Russian defense official proposes non-NATO anti-terror coalition: Russia, China, Iran, India
- Oil

DOMAIN: ECONOMIC

Brexit -UK Exit:
Anti- 'new world order' global government

- Possible perception going to be good for them – many other nations are watching, therefore "***globalist***" will make it as difficult as possible.
    - * Financial
    - * Economic
    - * Jobs

- American election. USA's Arab Spring?

- France

- Germany

DOMAIN: ECONOMIC

UK Impacts

- **Funding the EU.** UK **contributed approximately $13 Billion** pounds in 2015 (FullFact.org,. 27 May 2016) … (approximately $250,000,000 per week to the EU). The **EU spent approximately $4.5 Billion** in the UK (2015) … the EU benefits by $8.5 Billion.

- **The British Pound**. At a 31 year low: 27 June 2016. Many analysts saying that the UK £ will be subjected to months of turmoil before markets and the sterling begin to stabilize and climb (Foster & Batchelor).

- **$250 Billion stimulus efforts.** Dropping the central bank's key interest rate: negative 0.5 %.

- EU or the UK. In 2013/2014, there were approximately **125,300 EU students** in the UK, bringing in **$224,000,000 in tuition fees to UK universities** (Boffey, Helm, & Bachelor,. 28 February 2016, Higher Education).

DOMAIN: ECONOMIC

UK Impacts continued …

Scotland

Scotland's position? An **overwhelming majority of Scots voted to remain as a member of the EU**, leaving the UK divided on its future as a united kingdom.

NATO and the UK

The UK is one of the original partners of NATO, joining in 1949, and remains a significant contributor of forces to NATO missions throughout the globe. UK's continued commitment to NATO a sign that **Brexit will not affect this partnership.**

DOMAIN: ECONOMIC

UK Impacts continued …

Expats: Social Effects

- What will happen to expat **Britons living abroad** in other EU nations? Under current legislation, they are covered under healthcare and receive their pensions automatically.

- There are currently **2,000,000 Britons** who fall under this category living abroad.

- Free movement has allowed **students** (approximately 120,000) to attend university throughout the EU, free from international travel visas (Boffey, Helm, & Bachelor, 28 February 2016).

DOMAIN: ECONOMIC

Impact on Canadians

- Canada **may be able to leverage a bi-lateral trade deal** with the UK (2020?) or North American Free Trade Agreement (NAFTA). There may have been some history and desire for the UK to join NAFTA originally in 1994 (Madrak, S,. 21 February 2014). Canadians would certainly benefit from free trade with the UK: currently taxed with expensive tariffs from non-NAFTA countries.

- British / Canadian Currency Exchange will continue to be an advantage to Canadian exports, investments and travel to the UK.

DOMAIN: ECONOMIC

European Banks

Deutsche Bank Unexpectedly Found To Have Massive Capital Gap, Larger Than Its Entire Market Cap – set to fail?

- 51 European banks showed a total capital shortfall of 123 billion euros, with the **largest gaps at Deutsche Bank**, Societe Generale (13 billion euros): **GREATER THAN ITS CAPITAZATION**!!! and BNP Paribas (10 billion euros).

- **" … only way to protect it against future shocks is to nationalise it"?**

DOMAIN: ECONOMIC

Source: Bloomberg

www.truewealthpublishing.asia

DOMAIN: CYBER WARFARE

WikiLeaks releases thousands of documents about Clinton and internal deliberations … DNC (and others)

Watch live hack attacks:

http://map.norsecorp.com/

DOMAIN: CYBER WARFARE

NATO Says It Might Now Have Grounds To Attack Russia

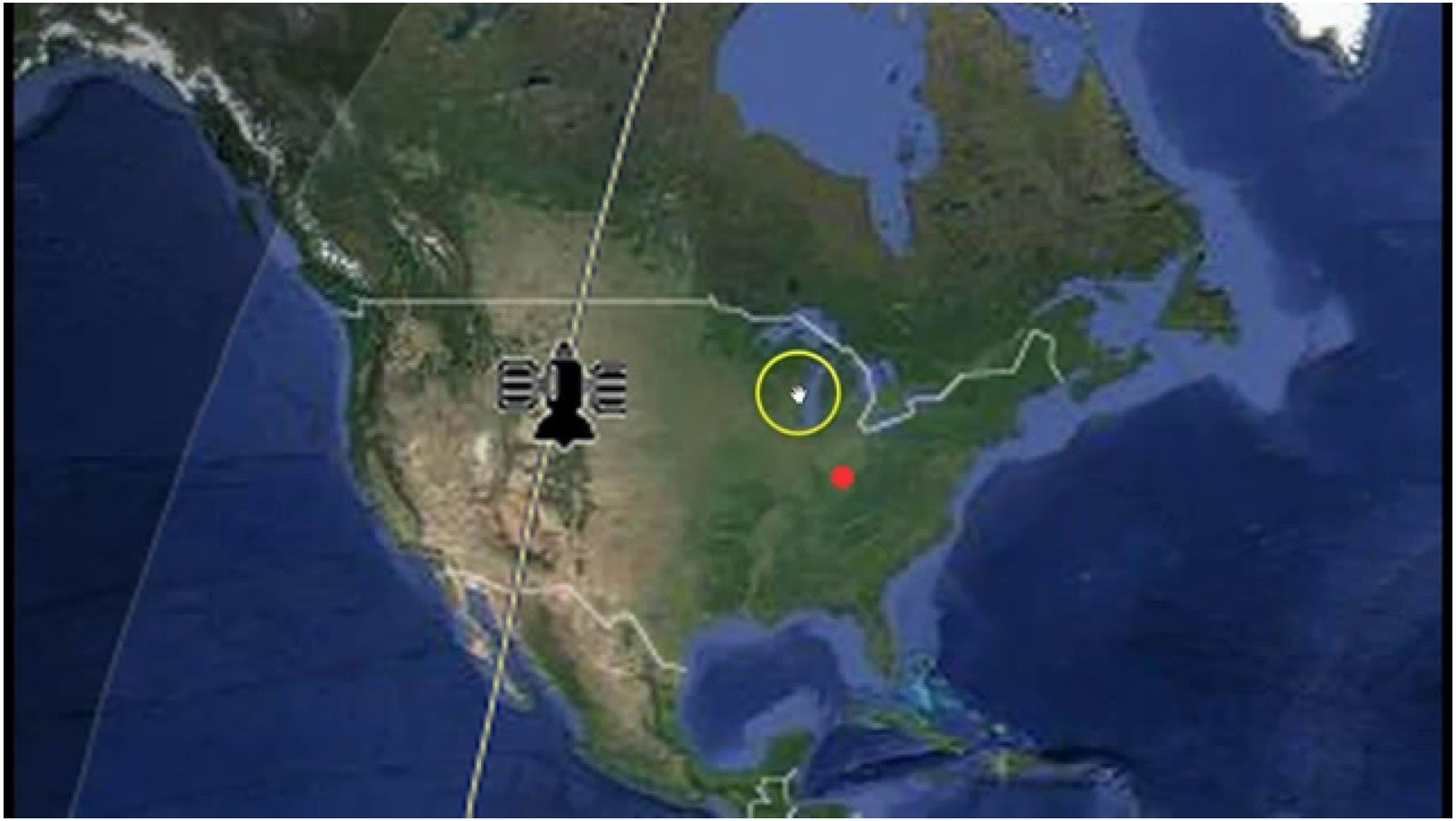
On Tuesday, June 14th, 2016 NATO announced that **if a NATO member country becomes the victim of a cyber attack by persons in a non-NATO country such as Russia or China, then NATO's Article V "collective defense" provision requires each NATO member country to join that NATO member country if it decides to strike back against the attacking country**.

http://www.telegraph.co.uk/news/2016/09/05/barack-obama-warns-of-cold-war-style-cyber-arms-race-with-russia/

DOMAIN: SPACE

"*Shining Star*" Wed Feb 10, 2016 12:24pm EST ***(EMP)?***

North Korea satellite in stable orbit but not seen transmitting: US sources



DOMAIN: SPACE

A Quantum Leap for China

Little fanfare in the West, this is being hailed in the East as perhaps the greatest scientific invention in 50 years.

China just launched a first of its kind, supposed "**unhackable satellite**" into space potentially capable of **quantum communications** this past week.

… And there are rumours that Russia helped provide IP for the project in exchange for joint usage.

Space warfare "milliseconds"

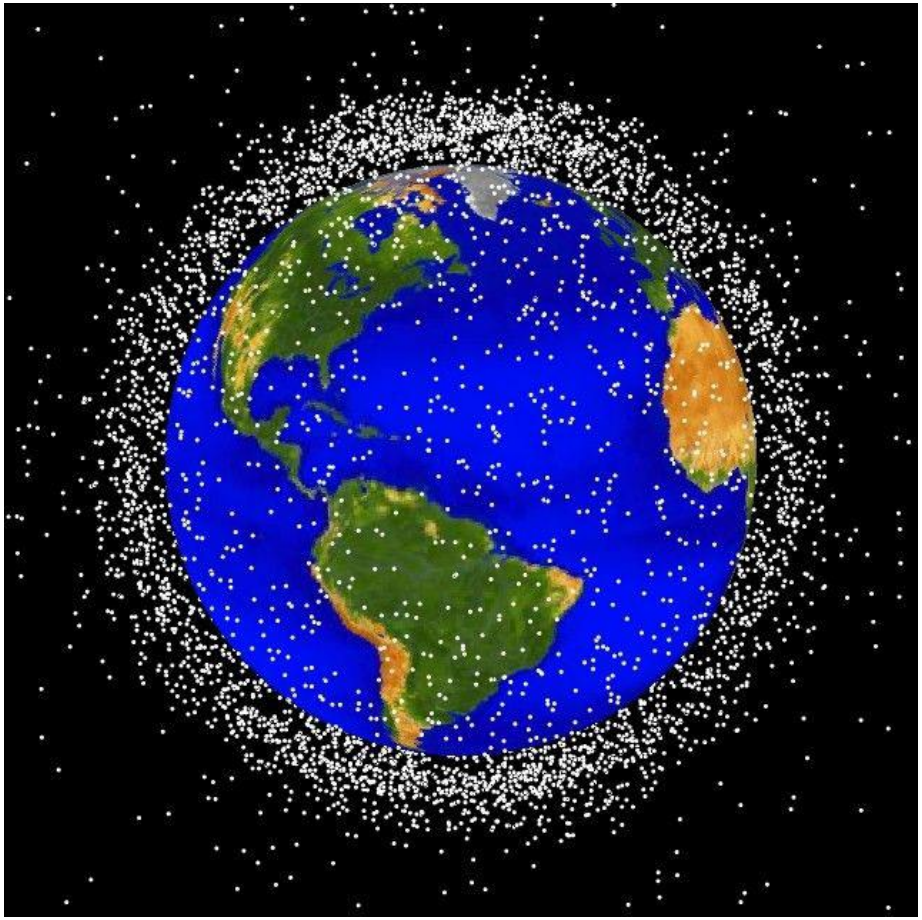
Don't think China's enemies in the South-China Sea conflict, who are largely American allies and elsewhere,
are not watching in dismay
as Russia and now China step into
the Middle East, South and East China Sea, Global Vehicle Currency, Cyber Warfare and Space

– within ALL Domains of War -

with an air of confidence
not seen in at least 30 years.

DOMAIN: SPACE

Space-Junk. An Interesting Aside



Stretch …

Through The Looking Glass: The Internet of Things

DRAFT For class discussions only

Terrance P. Power (Wharton Fellow)

On Line Book (Amazon) Available Spring 2016

"Strategic leadership demands reflective and critical thinking about how organizations can exploit the opportunities and mitigate the damage presented by this emerging new digital age realty".

TODAY'S CHAT …

Part One
- What is the Internet of Things (IoT)?
- Examples of IoT technology emerging in selected industry ecosystems (macro level)

Part Two
- New Zero Marginal Cost Society (Rifkin, 2014)
- Collaborative Commons
- New mental models and "new" industy emerging sector and industry business models.

Part Three
- The importance of YOU to adopt the role of a futurist: "Be a dreamer reflecting on where the new opportunities will take your organizations".

Part Four (macro level)
- What will be the impact of this New Zero Marginal Cost Society (Rifkin, 2014) on the nation's social, economic and political fabric?

PART ONE: INTERNET OF THINGS

PART ONE:

What is the Internet of Things?

"IoT describes an interconnected global village where people, animals and objects with unique computer **"identifiers"** will seamlessly transfer and receive data with or without human or human internet interactions over the global internet network."

(Indeed, given the realities of the future connectivity one might appropriately identify IoT as "the Internet of Everything"! (IoE)

Exponential Growth

By 2020 it has been stated that more than 30 billion devices will connect us to the IoE.

Gartner projects that the Internet of Things will bring a total economic **value-add** of $**1.9 trillion by 2020, close to Canada's today's GNP (silent as to the (IOE) cost!)**

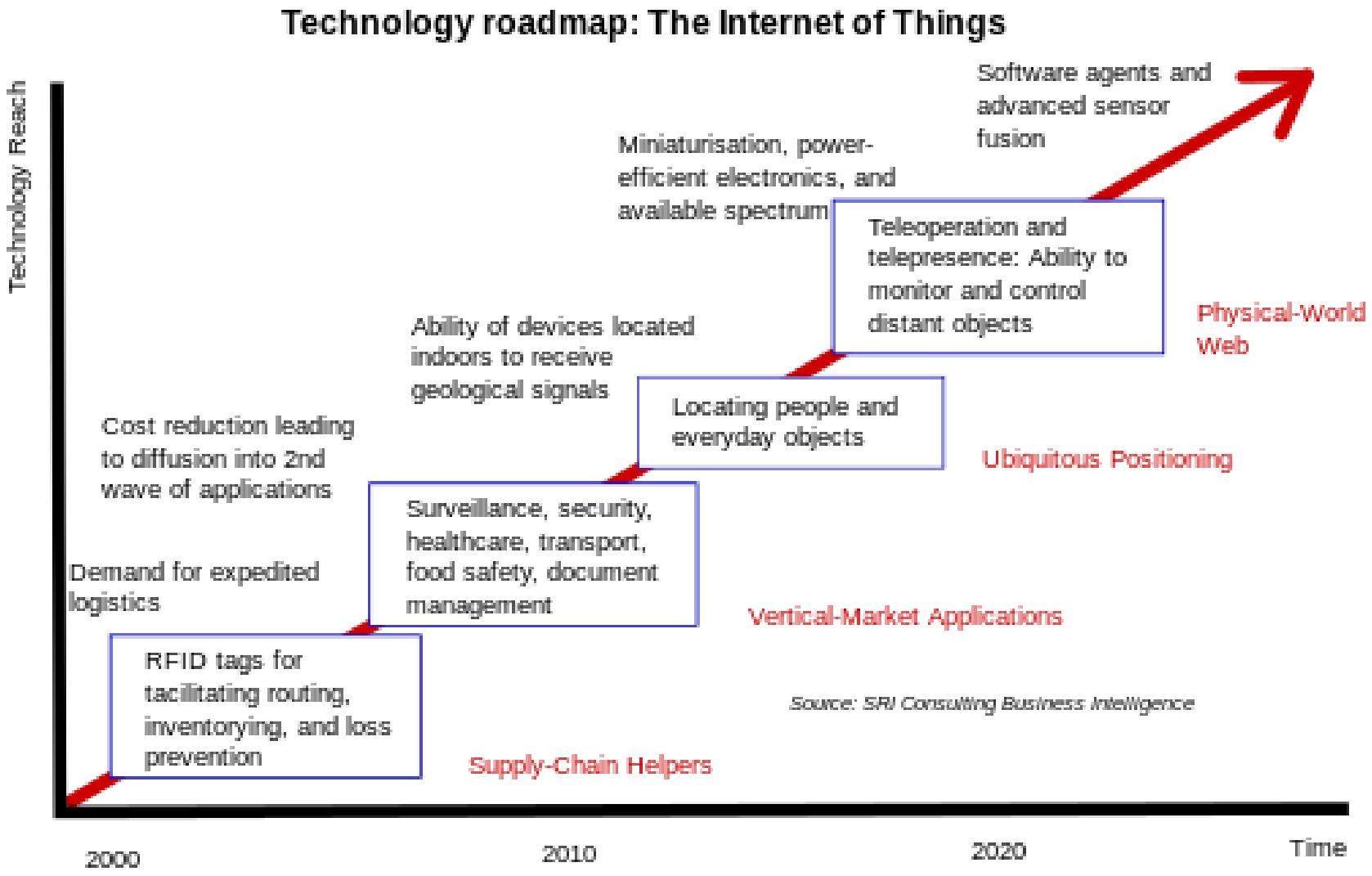
See more at: https://kemptechnologies.com/white-papers/designing-application-centric-network-19-trillion-internet-things-economy/#sthash.Q6QAa9iH.dpuf

The "Looking Glass" is well underway…

- The transformational shift is well underway driven in large part by the Cloud and wearable technology.

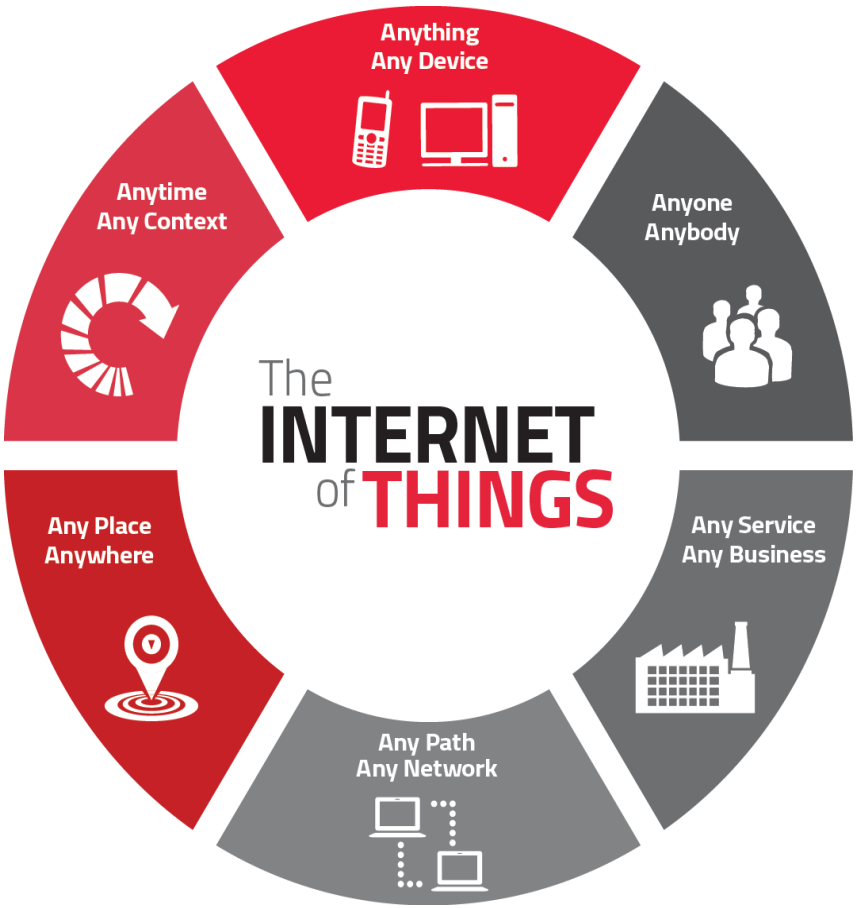
- Nations for example … The U.K. Government **allocated £40,000,000 in their 2015 budget to stimulate IoE research** ,with the expectation it would lead to leading edge emerging innovative technology.

Begs the question: **Where is Canada?**
A **nation's** competitiveness depends on the capacity of its industry to innovate and upgrade. Recall Porter's Competitive Advantage of Nations Model!



https://www.abiresearch.com/press/more-than-30-billion-devices-will-wirelessly-conne/

Business Benefits



- Consumer data to develop targeted marketing
- Real time data analytics - anywhere, anytime
- Remote diagnostics and upgrades for deployed products
- Retail industries can evolve to service based models
- Low cost, easy accessibility technology
- Connects data directly to control systems
- Improves customer relationships

Emerging Technological Opportunities <u>selected</u> Industry Sectors

Let us look briefly at a number of industries …

Agriculture

By the year 2050 it is estimated that the global population will **exceed 9 billion people, necessitating a 70% food production increase over 2005 levels.**

Agriculture Industry: SMART FARMING

Agriculture Industry: Smart Phones

- Environmental monitoring **applications** to assist in more accurately monitoring **air and water quality**; concurrently the **soil conditions to include accurate PH readings**; and real time **atmospheric** conditions. This real time data and analytics will enable cost efficiencies and greater productivity.

- Monitoring of **wildlife** to include those predators to farm animals and those that destroy cops will enhance the industries bottom lines.

- Farm animals increasingly will be "**fitted" with biochip** transponders. The ability to **track 'the life**' during and 'the products' **afterwards** all contribute to stronger sustainability for this industry. ***Cows … sensor collar … Robotics***

The World's Largest Indoor Vertical Farm Is Being Built

http://gizmodo.com/the-worlds-largest-indoor-vertical-farm-is-being-built-1717140120

A former steel factory in Newark, New Jersey began its transformation into a new life as a vertical farm that will feed hundreds of thousands of **people—it will grow up to two million pounds of kale, arugula and romaine lettuce per year when it's finished.**

- Tall towers of LED-lit aeroponic trays to grow herbs and leafy greens.
- 75 times more productive than a traditional outdoor farm would be per square-foot.
- No pesticides.
- Uses 95 % less water
- Solar robotics > SMART tech > few workers

Edible Wrappers Could Replace Plastic

- A new film made of milk proteins is 500 times better than plastic at keeping oxygen away from food **and you can eat it.**
- 10.5 tons of plastic waste
- Rollout next year

Source: American Chemical Society (USA Dept. of Agriculture)

http://www.cnn.com/videos/tv/2016/09/12/edible-wrappers-could-replace-plastic.american-chemical-society

Automobile Industry (Snitch Mobiles)

- **"Mobile offices"?**
  Apple (2019)
  Google (cars - Sensors)

- **Ownership.** We only use our cars 4% of the time. Do we share? Sales drop!

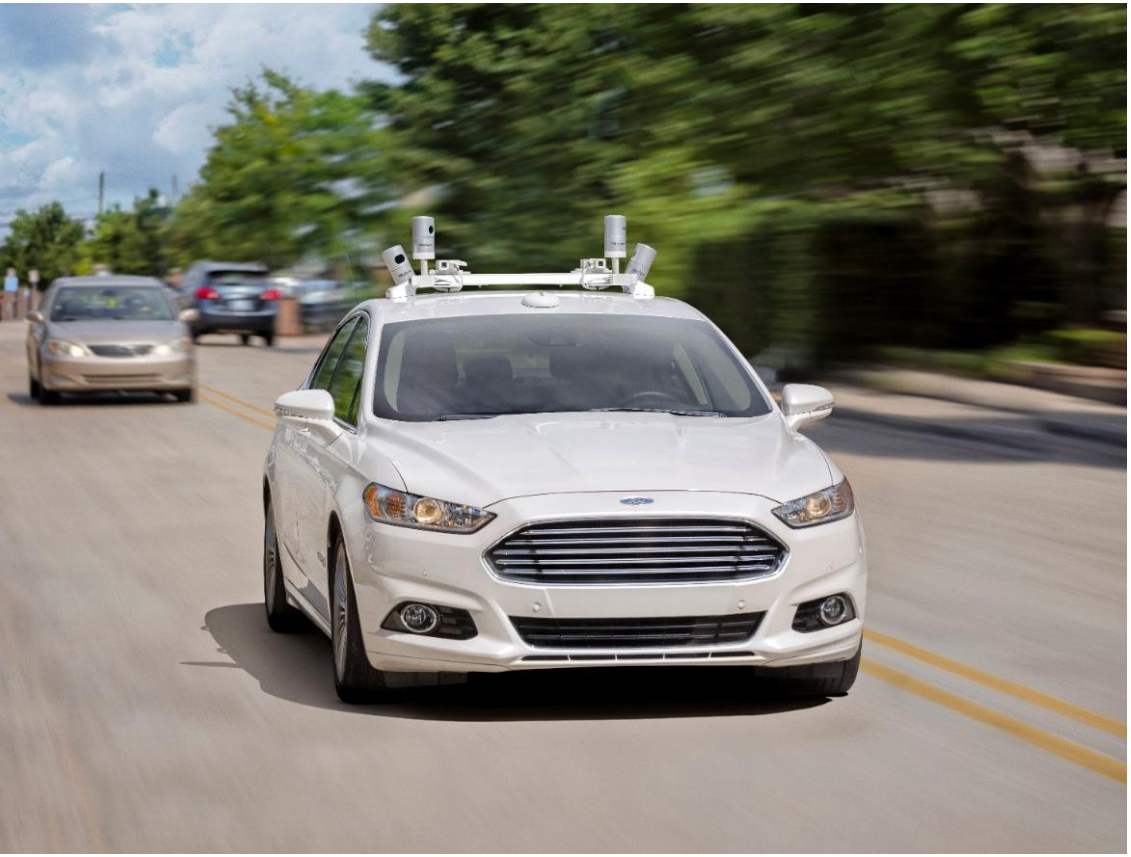
- **Google co-founder Larry Page is secretly building flying cars** (Businessweek reports that Page has personally invested in two aviation start-ups)

Companies with permits to test driverless cars

As of September 4, 2015, DMV has issued Autonomous Vehicle Testing Permits to the following entities in California:

Source: California DMV

Ford targets fully autonomous vehicle for ride sharing in 2011; invests in new tech companies and doubles Silicon Valley team



https://media.ford.com/content/fordmedia/fna/us/en/news/2016/08/16/ford-targets-fully-autonomous-vehicle-for-ride-sharing-in-2021.html

Taxi Industry

- Uber
- Drone cars (mobile offices)
- Pods (Japan, China, Europe)
- This is Google)

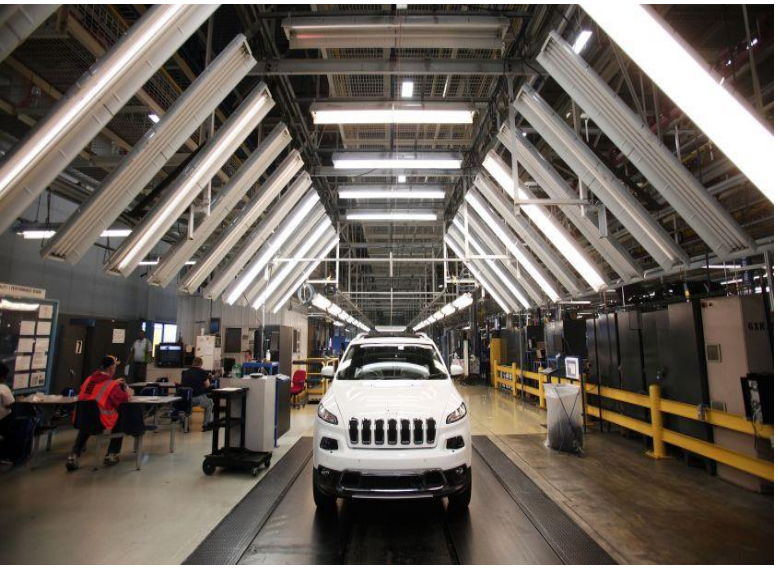
Implications

Business - Will Uber adopt..

- Workers?
- Insurance”
- Auto sales?
- 3D printing? (open source)

(A base-model 3D printed car could sell for about $18,000 once production ramps up, according to Rogers.)

Automobiles …



Security

Hacker carjackers are able to break into hundreds of thousands of vehicles on the road right now. (Fortune)

http://fortune.com/2015/07/21/car-hackers-jeep-hack/

Computer-controlled devices in automobiles such as brakes, engine, locks, hood and truck releases, horn, heat, and dashboard have been shown to be vulnerable to attackers who have access to the onboard network.

Watch if you have time: Wired Magazine

http://www.ocregister.com/articles/security-676229-cars-vehicles.html

- In July, a pair of well-intentioned hackers took control of the Jeep as a Wired magazine reporter **drove the vehicle 70 mph**, 10 miles away. The hackers ran the vehicle's air conditioning, radio, windshield wipers, brakes and steering – all via laptop, by infiltrating the vehicle's Internet-connected infotainment system.

- In response, on July 16, Fiat Chrysler posted an urgent security patch on its website, and recalled 1.4 million of its 2013 to 2015 model year vehicles to install the protective software. National Highway Traffic Safety Administration launched an investigation of Harman Kardon, maker of the Jeep UConnect system and similar systems for other automakers.

- For the auto industry, the hack, the recall and NHTSA's investigation offer a glimpse of **a potential future for the so-called connected car**.

So what? CIA, military, police, aircraft applications?

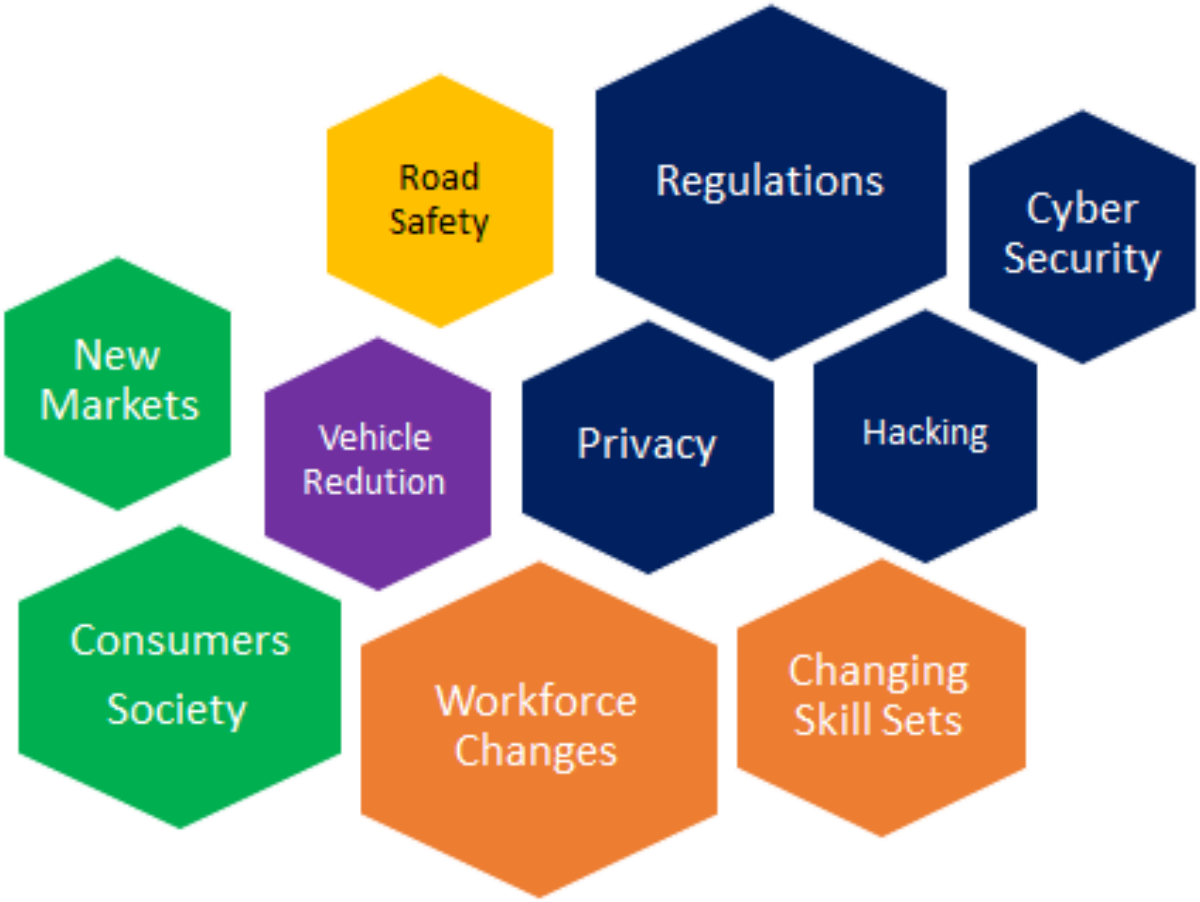
Driverless trucks are coming to Alberta's mining operations. June 2015, Suncor Energy Inc. confirmed that it has entered a 5-year agreement with a Japanese manufacturer of autonomous vehicles. The company has already agreed to buy 175 driverless trucks, and a spokesperson says it plans to replace its entire fleet by the end of the decade.

Local union members are concerned that the technology could lead to the loss of hundreds of jobs.

- Autonomous trucks have been in use in Australian mining operations for several years.
- Suncor has proven: Save **fuel** and **maintenance** costs, save on **labour** … north of $100,000 a year/driver.

Suncor Energy Inc.
http://www.cbc.ca/radio/day6/episode-238-charleston-s-ame-church-the-blob-summer-books-driverless-trucks-more-1.3119902/will-suncor-s-driverless-trucks-put-alberta-truck-drivers-out-of-work-1.3119963

Transformational
Ripple Effects of Driverless Technology.



Banking

Banking Industry:
What is your 'experience' with your bank?

- **Branchless banks are gaining acceptance.** 1 in 4 customers would consider a branchless digital bank; particularly true among younger customers

- **Banking is viewed as transactional, not relationship-driven.** Nearly ¾ of US customers — two thirds in Canada — consider their banking relationship merely transactional. **Begs the question: why do we need banks?** I can apply to a mortgage brokerage service on line. Doesn't matter to me who grants the mortgage…

- **Customers not getting actionable advice.** Fewer than ½ of bank customers believe that their bank provides them with actionable advice. But loyalty is fading away … Robo Advisors … IBM Watson.

So What?

Banking Industry continued …

Bank 'challenges':

- More demanding customers
- Fewer branches
- Increased cyber risks in the market place, and
- "Fend off" leading social networks and search engines from claiming market share.

Digital Banking: Apple, Google and Facebook

- The banking sector: Apple, Google and Face book. Canadian banks are taking this threat seriously and spending millions to develop competing **mobile/e-wallets.**

- New models are being introduced via technological advances. The biggest challenges will be protection of **personal privacy and adhering to regulatory requirements***.*

- This will further **reduce the use of actual cash** in our economy and electronically monitoring all transactions.

- The ability of a government, via regulatory agencies, to **maximize tax collection** is the ultimate trump card in any economic dialogue for the right to expand business practices.

- Will you agree "**smiling**" as you are pressured to change your privacy rights regarding banking information, *"… **sign me up for a chip implant, with full GPS tracking abilities, and the quick scan function at the check-out counter so I don't have to pull out my wallet".***

Who will be better at democratizing banking? Traditional banks responding to threats from tech companies or the tech companies themselves?

- Apple, Facebook, Google and others are experimenting to **re-create the banking "wheel":** Targeting **"under banked"** customers that the banks have ignored … don't have enough money!

- Banking completely **commoditized through electronics**. 1000s banks in the US and 15 in Canada**. Do you really care about the logo** of the provider of your mortgage?

- **All banking products will be available through brokers**, either human or electronic agents, and these people will be paid by the banks directly. The consumer will never have to pay fees again and the banks will bid for your business in a highly competitive international market.

- **A consumer will essentially put out an electronic RFP and thousands of banks will bid on it.**

Banking New Business Models

- Banks should embrace these changes two ways, **by building stronger brands, and by expanding their technology footprint**. Brereton and Kennedy (2014)

- Banking new business models will migrate away from 'bricks and mortar' to IoE channels. This shift in their business models will be **difficult to implement.**

- **Job loss** of full-time employees is inevitable and not favourable from a brand or media perspective – **savings**.

- Reallocating resources to technology will **increase revenue**

The race is on for a gold-backed Bitcoin Bank

https://www.sprottmoney.com/blog/the-race-is-on-for-a-gold-backed-bitcoin.html

There's a new cryptocurrency coming to the market. http://www.businessinsider.com/hayek-cryptocurrency-backed-by-gold-2015-5)

Transformation of internet:

Information, Communication NOW Digital Trust

- According to **the Financial Times, the UK Royal Mint has been in talks since this summer to issue its own physical gold bitcoins.** The intention to make the physical coins with 500 pounds worth of gold. This would ensure that if the price of bitcoins were to collapse, then the gold coin itself would still hold its melt value.

- Another Model: a coin "**valued at 1 gram of gold at the day's market price, [and] will serve as a more secure store of value than Bitcoin,"** according to the press release. **It will be called the Hayek**, "after the Nobel-winning Austrian economist Friedrich Hayek."

- One use case for the Hayek coin **is an alternative payment system for people in developing countries with volatile currencies.** They could pay each other with the equivalent value of gold, if they each had Hayek coin wallets.

- **If there is a massive distributed denial of service attack on the modern financial system**. Bitcoin and other cryptocurrencies …. There's a decentralized system of confirming that a payment has been made, so systemic failure is (almost) theoretically impossible.

- WASHINGTON – **A new digital currency backed by gold is billing itself as a more compliant, liquid and ultimately reliable store of value than decentralized systems such as bitcoin.**

- CMO Inc., doing business as COEPTIS, has **beta tested its digital currency platform and now is** expanding its membership to the **invitation-only** platform.

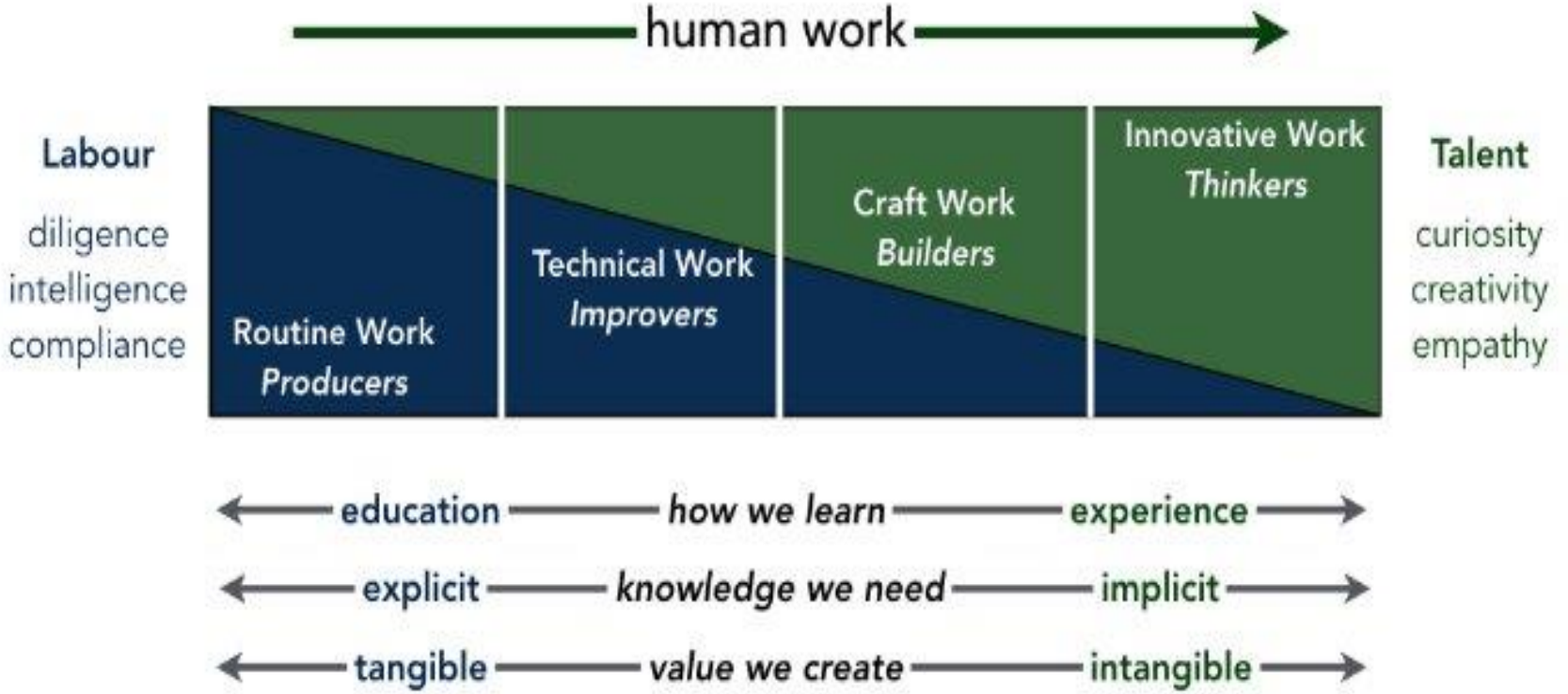
- COEPTIS issues its own digital currency, calling it Global Standard Gold (AUG), which is backed by **physical gold and held in a trust account**. The digital currency is issued after a licensed financial institution, acting similarly to a primary dealer, acquires the gold on the open market and deposits it in the trust. The **institution then notifies** COEPTIS, which issues the proprietary currency.

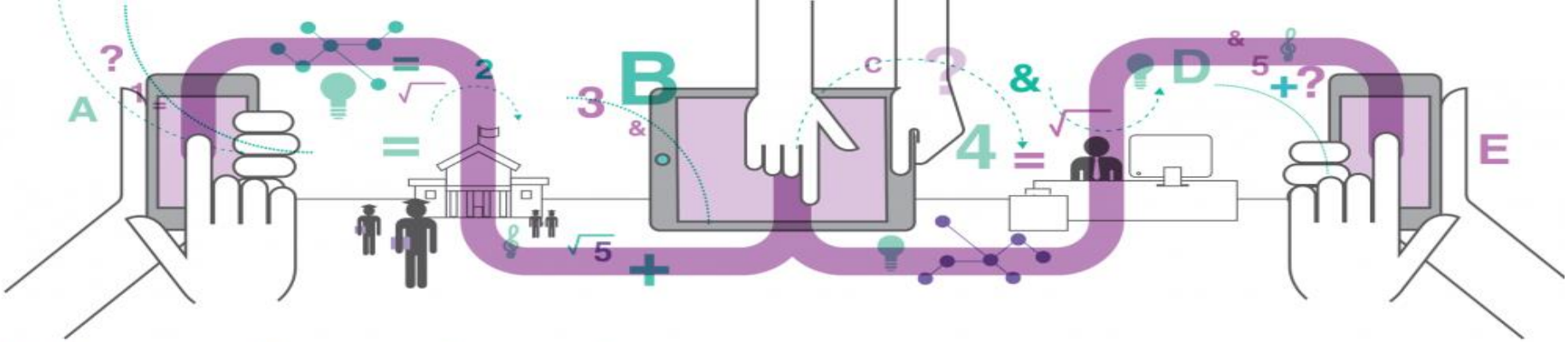
- The currency is meant to bridge the gap between physical and digital currencies. Because it is **backed by gold and held in a trust**, in theory it can be liquidated at market value at any time.

Education

work & jobs Jarche.com

human work is rapidly shifting right, as automation eats routine and technical work





Mapping the future: The future of education

- Moocs are transforming education in both quality and scale.
- Moocs have changed education by increasing access.
- Moocs make education borderless, gender, race, class and bank account-blind.
- Up to now, quality education – and in some cases, any higher education at all – has been the privilege of the few. ***Moocs have changed that. Anyone with an internet connection can have access***_. . . many in under-served, developing countries

Education

- MOOCs can **exploit virtual-reality** based education. Rather than learning through books, students could experience first-hand the realities of what they are studying: "Why read about coral reefs when you can swim through one in your own home" (Carter 2016 p.2).

- Imagine, if through virtual reality, a student could **witness the effects of climate change, or the impact of a tsunami?**

- Possible outcome: providing a real world simulation could diminish human apathetic tendencies as students may be provoked to instigate change **if they can be a 'witness' to world issues.**

Wharton Puts First-Year MBA Courses Online for Freehttp://www.bloomberg.com/bw/articles/2013-09-13/wharton-puts-first-year-mba-courses-online-for-free

"Getting a Wharton MBA involves taking off from work for **two years, moving to Philadelphia, and spending about $200,000 on tuition and expenses.** Now, with the addition of three new courses on the online learning platform Coursera, you can get much of the course content for free.

"While you won't get the full Wharton on-campus experience—or an internship, career services, or alumni network, for that matter—the **new courses in financial accounting, marketing, and corporate finance duplicate much of what you would learn during your first year at the elite business school**, says Don Huesman, managing director of the innovation group at Wharton."

New Business Model for the Education Industry

Education systems abandon standardized (routine) curriculum and adopt IoE to provide unique experiences for each student. … **develop curiosity, creativity, and empathy** in every student.

- Massive Online Education – Moocs taking local knowledge global
- University "Browsers"?
- Portfolio of offerings – content has to align with factor endowment needs
- VR
- IoE Instructors: Robots can do the boilerplate materials.

New Business Model for the Education Industry

Common core education standards are useless for this IoE world of work. So are standard academic disciplines, as well as standard job competencies.

These are all for machines, not humans.

Education

- 20 years ago if you wanted to get an MBA, your only choices would have been to **quit work for 2 years, or to spend 4 - 5 years taking evening classes**.

- ***RRU set the pace! (Harnessing new Tech and Mental Models) BLUE OCEAN***

- ***Need to do it again***. Daily competition is getting fiercer.

HOUSING

Building And Housing Industry (digital electrical meters)

- IoE devices can be **used to monitor and control the mechanical, electrical and electronic systems used in various types of buildings** (e.g., public and private, industrial, institutions, or residential - to control lighting, heating, ventilation, air conditioning, appliances, communication systems, entertainment and home security devices to improve convenience, comfort, energy efficiency, and security

- Homes and Appliances optimize energy consumption as a whole. It is expected that IoT devices will be integrated into all forms of energy consuming devices (switches, power outlets, bulbs, televisions, etc.) **and be able to communicate with the utility supply company in order to effectively balance power generation and energy usage.** Such devices would also offer the opportunity for users to **remotely control their devices**, or centrally manage them via a cloud based interface, and enable advanced functions like scheduling (e.g., remotely powering on or off heating systems, controlling ovens, changing lighting conditions etc.).[42]

Low Cost Housing

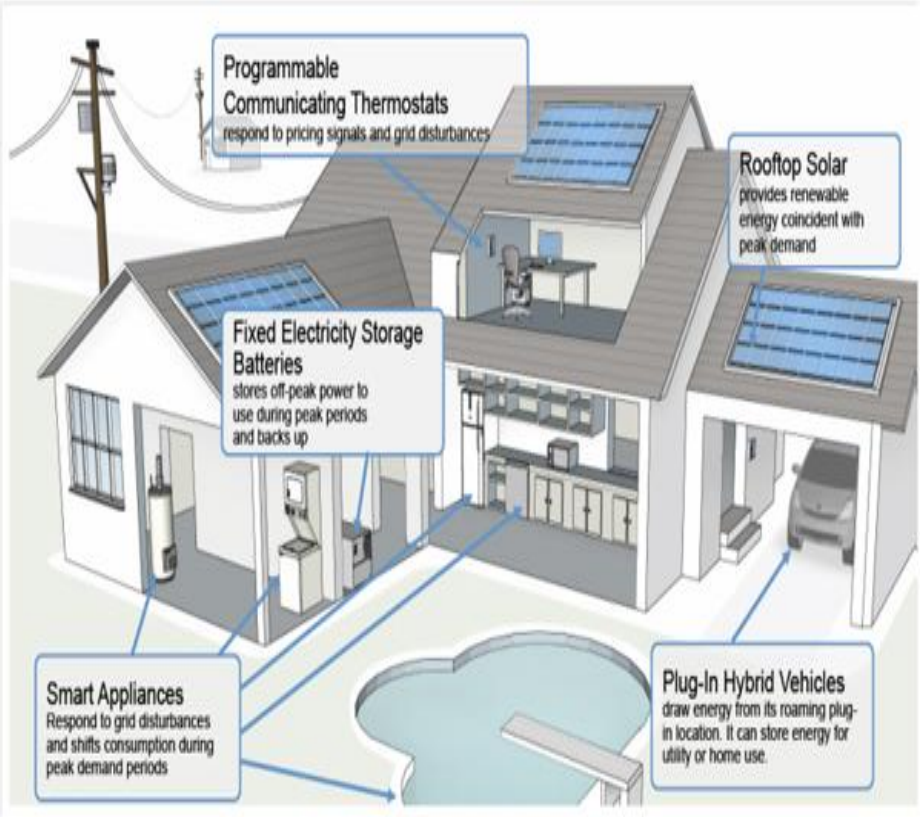
WinSun's 150(L) x 10(W) x 6.6(H) m gigantic 3D printer is capable of printing entire building within hours.

The 'ink' it used is based on high-grade cement and glass fiber. Like traditional 3D printers, the system carefully spills out those materials layer by layer, consistently building upward.

What will happen to labours?

HousingTechnology
Moving Forward: Considerations

Transitioning the "Connected" home to the "Smart" home



Building for Smart Homes

Infrastructure Demands

Real Estate

- **Virtual and Augmented Reality**.. Come to the office and view half a dozen homes.. Saves time travel.. Less with the RE Agents..(Sotheby's Toronto Today)
- Game and training videos
- This session.. I could host you as we travel through a session of emerging issues..
- Google creating SMART neighbourhoods.. Security, traffic, police and fire stations, and self-monitoring systems within a five block radius if a fire is detected..

Insurance industry:
Old business models under attack...

- **Disparate markets**: Auto, OEM's, home security, and cable and mobile providers. Insurance firms will compete across traditional boundaries.

- **New value propositions** — Leads to **greater net revenues** because of enriched holistic connections, influence of their customers (e.g. seniors) and **reduction in workers**.

- **Rates** to fall 60% drone cars (fewer accidents) and other verticals.

Inter-modal Transportation

Smart traffic control, smart parking, electronic tolls, logistic and fleet management, vehicle control, and safety and road assistance.

For example.. New York Waterways connect all their vessels and monitor them live 24/7.

… and ‘the list’ goes on …

Intelligent Transportation Systems (ITS)

Monitor road conditions in real-time, leveraged by intermodal transportation networks to optimize logistics.

- Availability of wireless networks in conjunction with sensor based tracking allows for interfacing that provides **immediate updates regarding unplanned transit issues affecting logistics.**

- Sensor tracking provides the ability to respond immediately to **changing weather, road, sea, or airport conditions to reroute shipments** in transit to mitigate the impact of unplanned natural impediments to delivery.

The Actros autonomous truck by Mercedes-Benz drives on the public motorway A8 in Denkendorf near Stuttgart, Germany, Friday, Oct. 2, 2015. The world's first series-production of the autonomous truck, Actros is equipped with the Highway Pilot system for driving on public roads. (AP Photo/Matthias Schrader)

By ***embedding smart sensors into parking spaces*** they could "minimize traffic congestion, reduce carbon emissions and eliminate labor inefficiencies associated with parking enforcement" (Lopez Research, 2014).

Not just cars … all cruise-assisting intermodal transportation systems . Consider … trucks, boats, heavy equipment, trains, planes , ***DRONE Hybrid Air Vehicles***

Manufacturing Industry

The IoE intelligent systems enable:

- Rapid manufacturing of new products (in '**black manufacturing plants**')
- Dynamic response to product demands, and
- Real-time optimization of manufacturing production and supply chain networks , **by networking machinery, sensors and control systems together**. (AI/ Robotics)

Asset Management … predictive maintenance, statistical evaluation, and measurements to maximize reliability. **Recall we discussed IoE for robotic Smart farms**.

IoE Smart industrial management systems integrate with the SMART GRID: **real-time energy optimization**. (Measurements, automated controls, plant optimization, health and safety management, and other functions are provided by a large number of networked sensors).

See
https://www.google.ca/search?q=robotic+manufacturing&espv=2&biw=1600&bih=839&tbm=isch&imgil=VgJxGI4N4X1JaM%253A%253Buv8SrWMLsUR7HM%253Bhttp%25253A%25252F%25252Fwww.theoldrobots.org%25252Fmanufacture.html&source=iu&pf=m&fir=VgJxGI4N4X1JaM%253A%252Cuv8SrWMLsUR7HM%252C_&usg=__5lVJ9ajpfyehg_OpruWIhkg9THg%3D&ved=0CEUQyjdqFQoTCM6qsML2rsgCFcYpiAodti8B6A&ei=Yk8UVs7xC8bToAS234TADg#imgrc=VgJxGI4N4X1JaM%3A&usg=__5lVJ9ajpfyehg_OpruWIhkg9THg%3D

Factory Automation with industrial robots for palletizing food products like bread and toast at a bakery in Germany

Amazon Toronto today 25%

Robotics

- Other industries **including healthcare, shipping and logistics, food services, retail, hospitality**, and more are starting to also use robots. For example, **hospitals are using robots to assist in surgery**, retail stores are testing **robots to take inventory**, and **warehouses are using robots help sort packages.**

- We expect enterprise robotic shipments to nearly **triple between 2015-2021**.

- Manufacturing will continue to be the top adopter of robots. A recent **Boston Consulting Group (BCG) survey found 44% of US manufacturers and 66% of German manufacturers plan to install autonomous robots and assistance systems within the next five years.**

- **Rising wages** around the world are just one of the key reasons enterprises are beginning to leverage robotics.

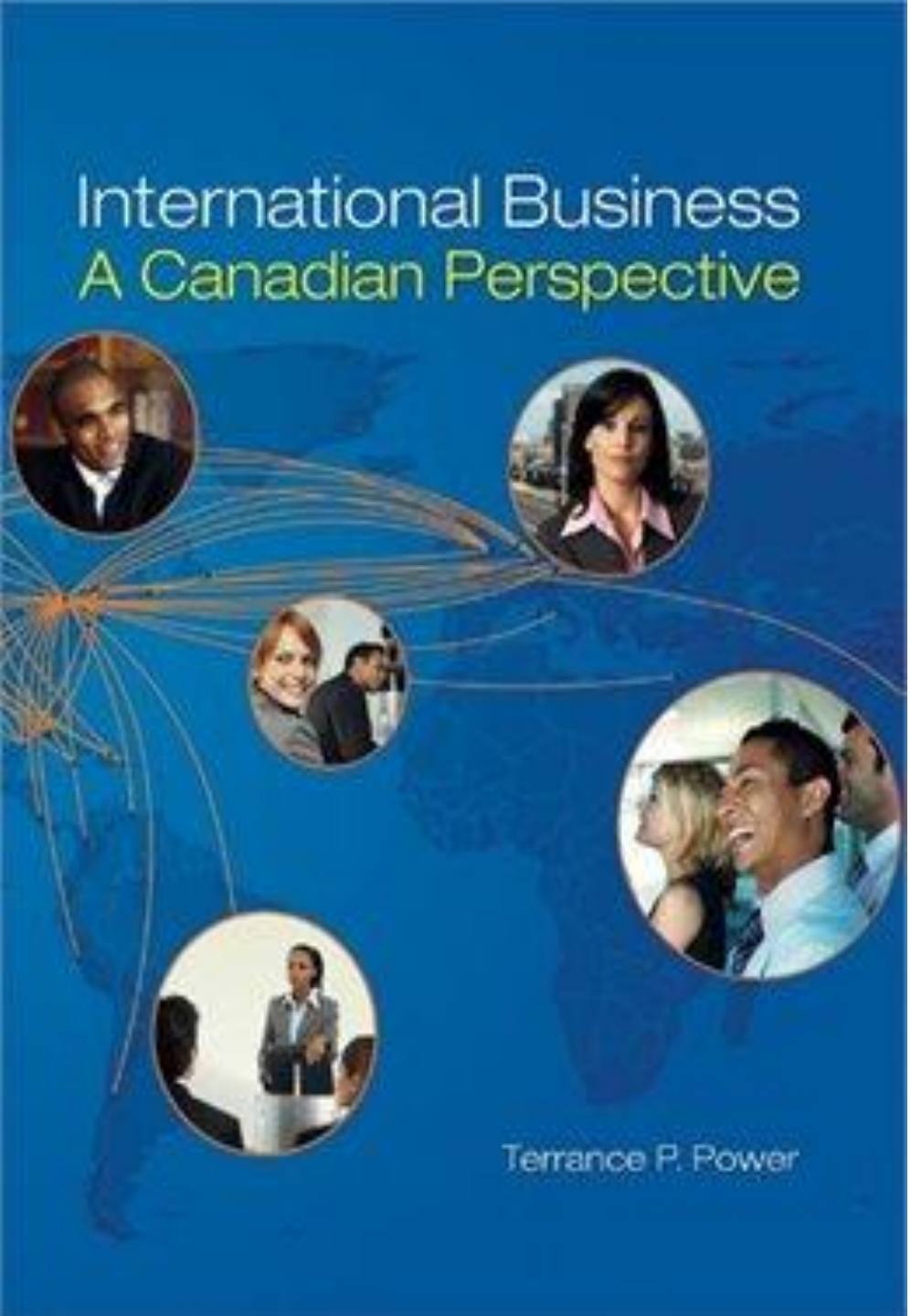
- **Robots have the potential to displace jobs** ... they might take some labour intensive jobs … potential to create new jobs for working on robots.(Source BI Intelligence)

The Media – Publishing Industry

The Internet of Everything is **disrupting** the media-publishing industry.

The new and emerging innovation initiatives are introducing **a new era of economic growth** and challenge to those who are late adopters.

Increasingly embedded intelligence is collected … **analytics** levers the data … the data generated enables the media (e.g. advertising) and **publishers to enable personalizing their products / services specifically for the individual.**



Text Books…

No longer the model …

Media …

- The IoE enables data capture and the targeting of specific consumers. It has been said: ***If you want to communicate with the common man use the common man's language –*** enter the social media. Note the embedded intelligence **collects, and undertakes analytics, to enable it to lever the data.**

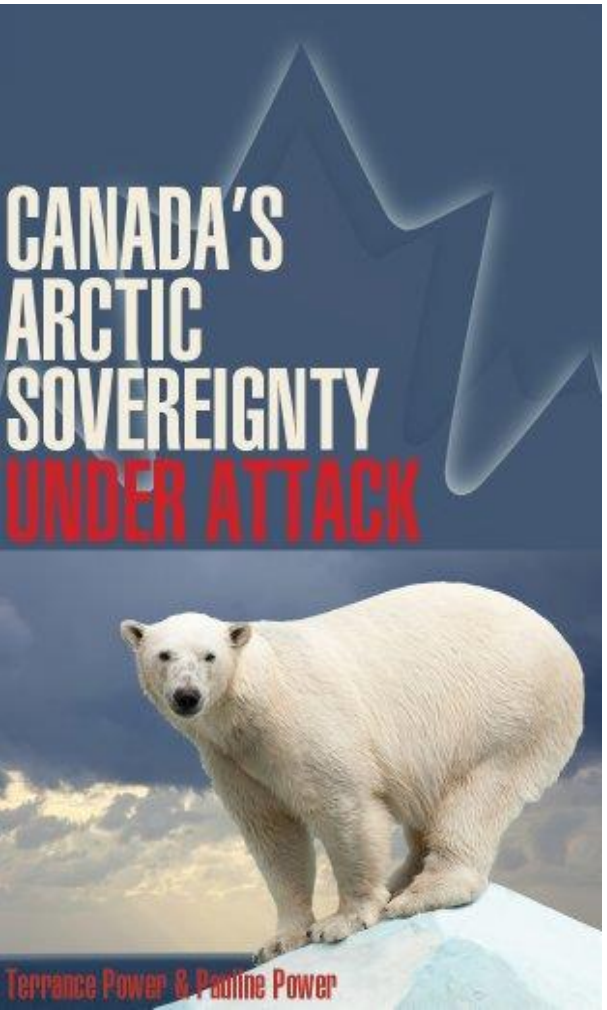
- Few millennials get their news from the daily papers! On demand on-line movies, Apple TV, Netflix, news, shows all available without advertising.

- **So what does this mean to the traditional media business models** such as newspapers, magazines, cable television, or television shows? Clearly the Henry Ford model loses it business efficacy.

- The resulting wealth of data generated enables new innovative business models that media needs to exploit by personalizing their product / services for the individual. **Speed is of the essence!**

Digital Self-Publishing

"**Canada's Arctic Sovereignty: Under Attack**"
(Canadian - American Interdependence: Under Attack Book 1) Kindle Edition
by Terrance Power , Pauline Power



- The advent of the Internet, open source software, e-commerce has made it **relatively easy and inexpensive** to digitally self-publish a work, edging towards **a zero marginal cost publishing society.**
- Consumer access to low cost, quality content **has eroded the traditional publisher's market position**, forcing them to change their business models in order to remain competitive.
- Decreasing margins will force traditional publishers to further evolve their **businesses to offer products for all authors or risk no longer being industry relevant**.
- Society will benefit as a result of this evolution due to the **wide range of low cost and diverse content available**.
- This influx of content, **however, is creating new issues of discoverability and increased competition**.

Publishing – Social Media – Political – Education

- Popularity of e-readers and downloading books from the internet has forced not only the **publishing industry to re-think their business model**, but also **writers to reinvent and re-negotiate how they earn compensation**.

- The power of groups like **Wiki leaks to disrupt governments and social institutions**. Can be viewed as **either serving or disrupting society.**

- Social media can facilitate the best and the worst of humanity. --- Arab Spring movements --- unprecedented.

- Political --- 4th estate advertising --- Trump 10 million

- IoE devices can be used to enable remote health monitoring and emergency notification systems. ---
- Health monitoring devices can range from blood pressure and heart rate monitors to advanced devices capable of monitoring specialized implants, such as pacemakers or advanced hearing aids.

Nanotechnology Industry

5 out of this world nanotechnologies driving future IoE.

http://www.cbronline.com/news/internet-of-things/smart-technology/5-out-of-this-world-nanotechnologies-driving-future-iot-4671393

- **Nanotubes**- incorporation in **portable electronics to help in fighting against cancer, and creating artificial muscles.**
- **Stretchable electronics** - can **bend and allow for multiple IoE applications** not only in the mobile phone space, but also in the retail and healthcare sectors.
- **Bleeding plastic** -a bleeding plastic with self-healing capabilities **that could put an end to nearly everything getting broken**, including cars, airplanes or everyday devices.
- **Nano-nodes** -placed inside someone's body would communicate to a nano-router. All the nano-routers placed in the body then communicate to a **nano-micro interface via nano-links.** Once the information reaches the nano-micro interface, this will **communicate with the "outside" world** to a gateway and that gateway links to the internet. Once the data reaches the internet, it could be **sent to a GP to track a health problem or given for research proposes.**
- **Nanoantennas** - help power wearables, smarten up buildings or keep lights on.

Pills, Jaws and Ears

A wireless pill bottle that alerts patients when they have to take their meds and keeps track of their usage and dosage.

- **3 D Printing**

- In a world first, the US Food and Drug Administration has given the go-ahead for a **3D-printed pill to be produced.**
- The FDA has previously approved **medical devices** - including prosthetics - that have been 3D printed.

- The new **drug**, dubbed Spritam, was developed by Aprecia Pharmaceuticals to control seizures brought on by epilepsy. The company said that it planned to develop other medications using its 3D platform.

Futuristic Innovations around the world

3D Printing of Body Parts

3D printers are becoming increasingly popular and advanced, allowing artists and craftsmen to be creative and productive.

First human organ, made from live human tissue, to be printed in 2014

3D printer used to reconstruct a patient's face

UK

NETHERLANDS

US

3D printed jawbone transplanted.

Image credit: http://www.designnews.com

- Canadian company CardioComm Solutions Inc. produces personal ECG devices to monitor heart health (Attfield, 2015, para 4). These devices connect patients with real time access to health information.

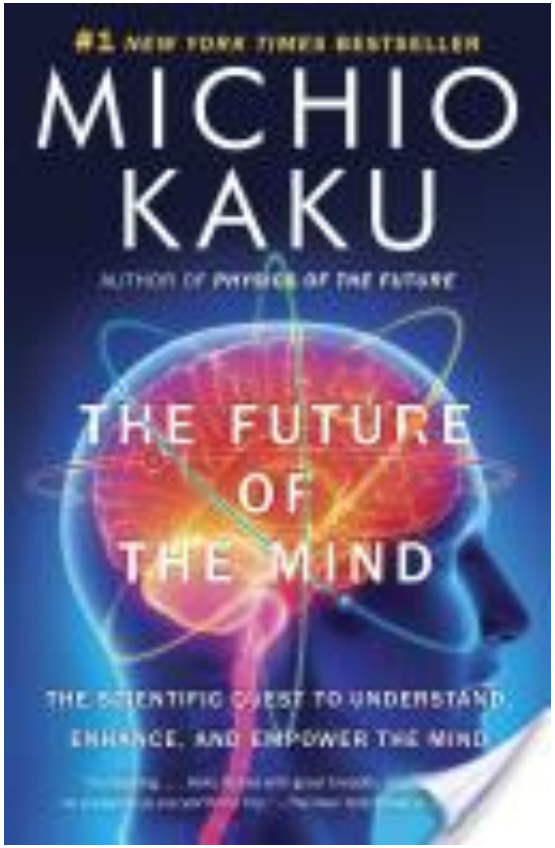
- AdhereTech's wireless pill bottle was developed to assist patients in adhering to their prescription medication ("AdhereTech", n.d., para. 1). In addition to sending data to physicians from a small wireless chip, the smart pill bottle alerts patients by call or text when they are scheduled to take their medicine (Lawler, 2014, para. 5).

- Propeller Health, USA. A system to increase the patient and physician understanding of asthma and COPD – remotely monitors patient use while software analyses trends and provides regular feedback to the physician through a digital health platform.

Human Genome Sequencing

Human genome sequencing combined with IoT-MD has the potential for broad impact. Genome sequencing is **the understanding and mapping of human DNA nucleotides of our individual genetic makeup.**

Artificial Intelligence …



Soon able to upload our brains to a computer, neuron for neuron..

Send your thoughts and emotions on a “brain-net”.

Control computers with our minds..

Push the limits of mortality

Military Industry

- The Royal Navy (RN) successfully conducted a test flight of a 3D-printed drone. A three kilogram, 1.5-metre-wingspan, propeller-driven drone.
- Lasers
- “Camouflage personnel and equipment” http://brainwithideas.com/us-army-invisible-camouflage-future-invisible-technology/

USS Zumwalt (DDG 1000) – First of 3

- Smaller crew (130)
- Integrated power system, which can send electricity to the electric drive motors or weapons
- 2x 6.1-inch (150 mm) guns --- will fire a specially designed "guided" artillery shell some 63 nautical miles (117 km; 72 mi)
- New 30/ 150-kilowatt laser weapon system

The debate over using artificial intelligence to control lethal weapons in warfare is more complex than it seems. (MIT http://www.technologyreview.com/news/539876/military-robots-armed-but-how-dangerous/)

Military Robots: Armed, but How Dangerous?

"It will soon be possible to equip unmanned drones like the Taranis with AI systems capable of engaging targets without human intervention BAE System."

Stuart Russell, professor of computer science at the University of California, Berkeley, highlighted **the ethical decision faced by the artificial intelligence (AI) and robotics communities** about whether to oppose or support the development of such systems.

"LAWS could violate fundamental principles of human dignity **by allowing machines to choose whom to kill**," Russell said. "For example, they might be tasked to eliminate **anyone exhibiting 'threatening beha**viour'.

… Dragon fly drones…. next

Thought you would smile…
Yes, Dragon Fly drones and many other insects

http://www.activistpost.com/2014/02/dragonfly-worlds-smallest-autonomous.html

Dragonfly: World's Smallest Autonomous Drone Takes Flight

While DARPA and their contractors have been working on *true* **nano surveillance** with biological components, it is the modeling of insects that is currently being released to the public.

- U.S. Army Gen. Robert Cone generated headlines and raised my eyebrows in 2014 when he proposed Robots would replace a quarter of the country’s combat soldiers by 2030.

- Robots and drones would make up the loss.

"British Navy Warship Tests a 3-D-Printed Drone at Sea" MIT Review, 22 July 2015

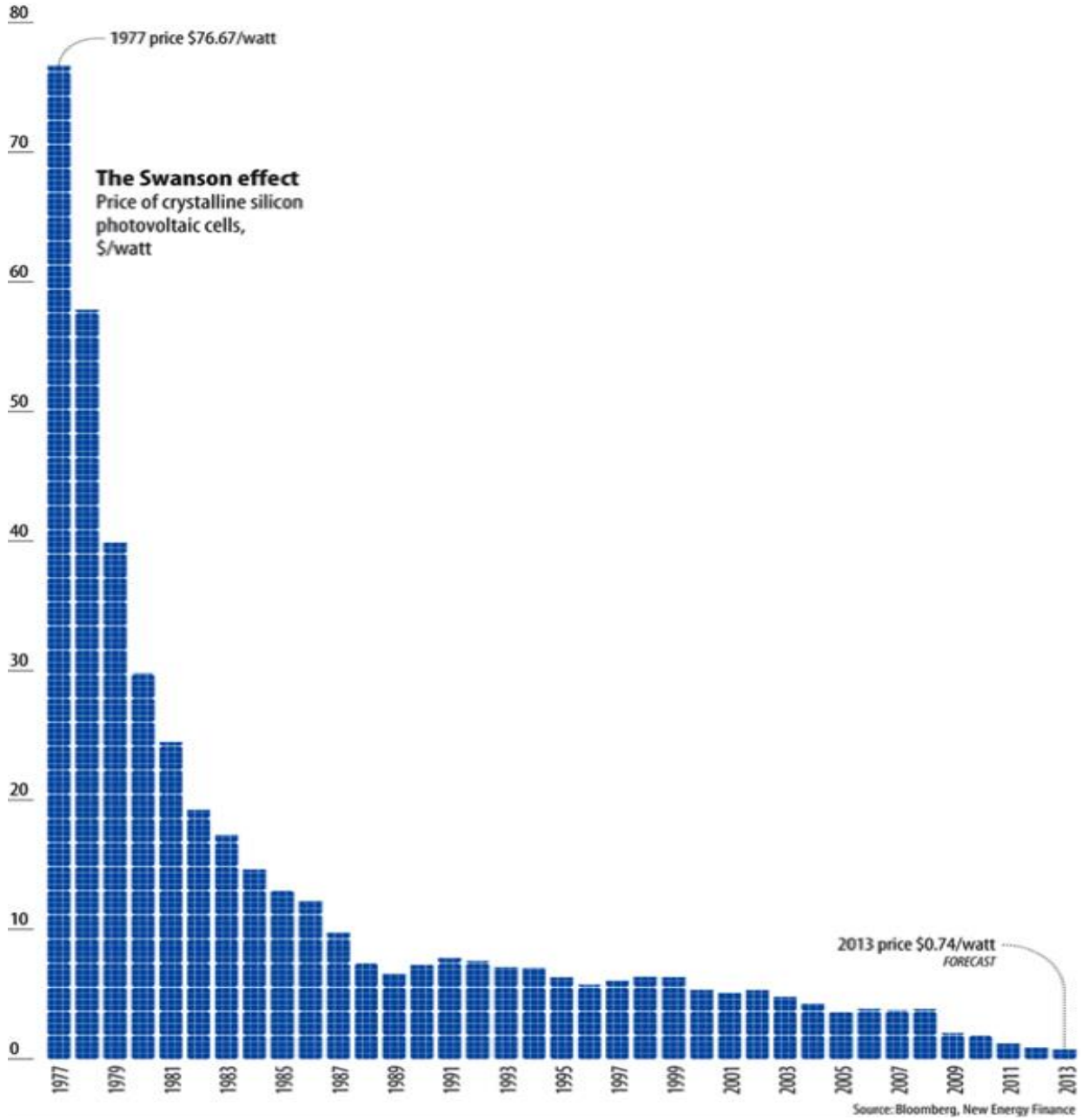
- The three kilogram, 1.5-metre-wingspan, propeller-driven drone was launched from a catapult onboard the RN frigate HMS *Mersey* and autonomously flew between a few preprogrammed waypoints for five minutes before being piloted to a beach landing.
- Cost a few thousand dollars.

Oil and Gas Industry vs. Alternative Energy

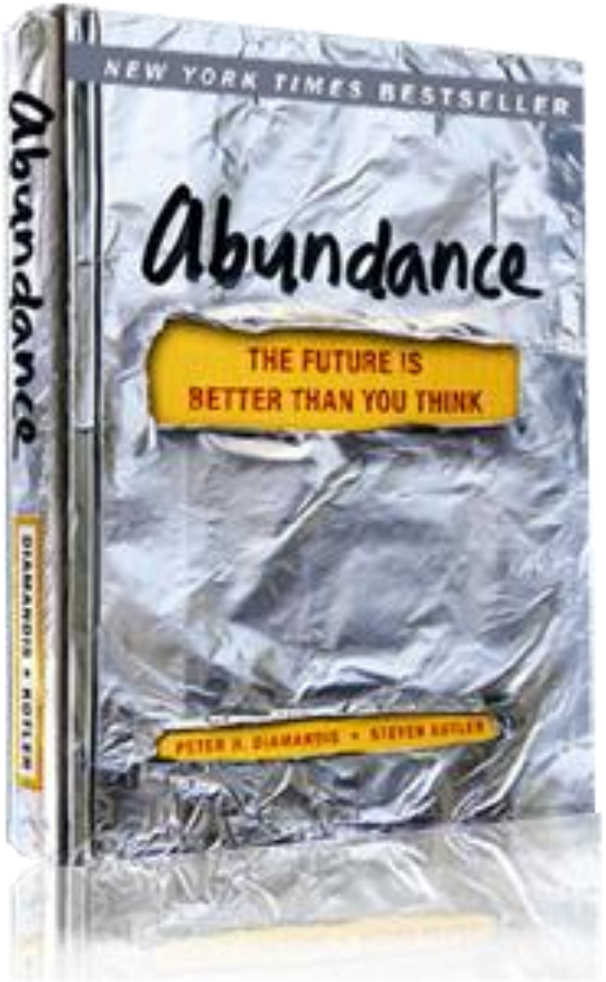
In 88 minutes, 470 exajoules of energy from the sun hits the Earth's surface, as much energy as humanity consumes in a year.

"If humanity could capture 1 part in 1,000 (*one-tenth of one percent)* of the solar energy striking the Earth – just one part in one thousand – we could **have access to six times as much energy** as we consume in all forms today".

PHD Ventures, 800 Corporate Pointe, Suite 350, Culver City, CA 90230

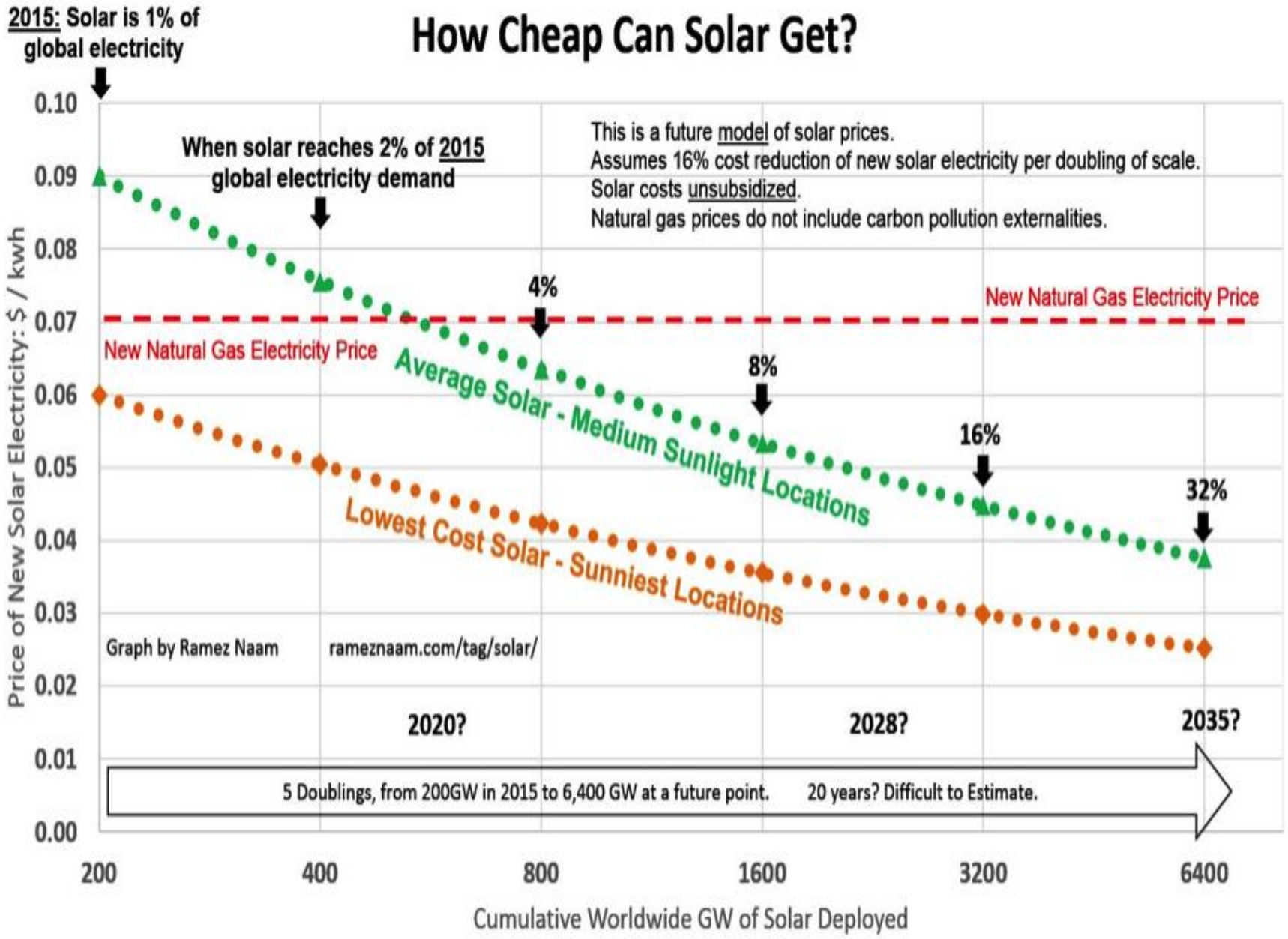

80
70
60
50
40
30
20
10
0
1977 price $76.67/watt
The Swanson effect
Price of crystalline silicon photovoltaic cells, $/watt
2013 price $0.74/watt
FORECAST
1977
1979
1981
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
Source: Bloomberg, New Energy Finance

Abundant cheap energy for everyone on the planet.



- Over the last 30 years, solar module prices have dropped by a factor of 100.
- Critically -- a new solar price record was set in Chile just a few weeks ago (Summer 2016) **at $0.0291 per kWh – 58 percent less than the price of natural gas from a new plant!**

Note: "The solar slides" were built from this site.. http://diamandis.com/


How Cheap Can Solar Get?
2015: Solar is 1% of global electricity
When solar reaches 2% of 2015 global electricity demand
This is a future model of solar prices.
Assumes 16% cost reduction of new solar electricity per doubling of scale.
Solar costs unsubsidized.
Natural gas prices do not include carbon pollution externalities.
4%
8%
16%
32%
New Natural Gas Electricity Price
New Natural Gas Electricity Price
Average Solar - Medium Sunlight Locations
Lowest Cost Solar - Sunniest Locations
Graph by Ramez Naam
rameznaam.com/tag/solar/
2020?
2028?
2035?
5 Doublings, from 200GW in 2015 to 6,400 GW at a future point.
20 years? Difficult to Estimate.
Price of New Solar Electricity: $ / kwh
0.10
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
200
400
800
1600
3200
6400
Cumulative Worldwide GW of Solar Deployed

Five trends shaping the future of battery technology and energy storage:

- **Lithium-ion Technology**: Lithium-ion batteries have been seeing rapidly declining prices for more than 20 years, dropping in price for consumer electronic uses by 90 percent between 1990 and 2005, and continuing to drop since then. This price reduction is coupled with an 11x increase in battery storage capacity per $100 since 2000.

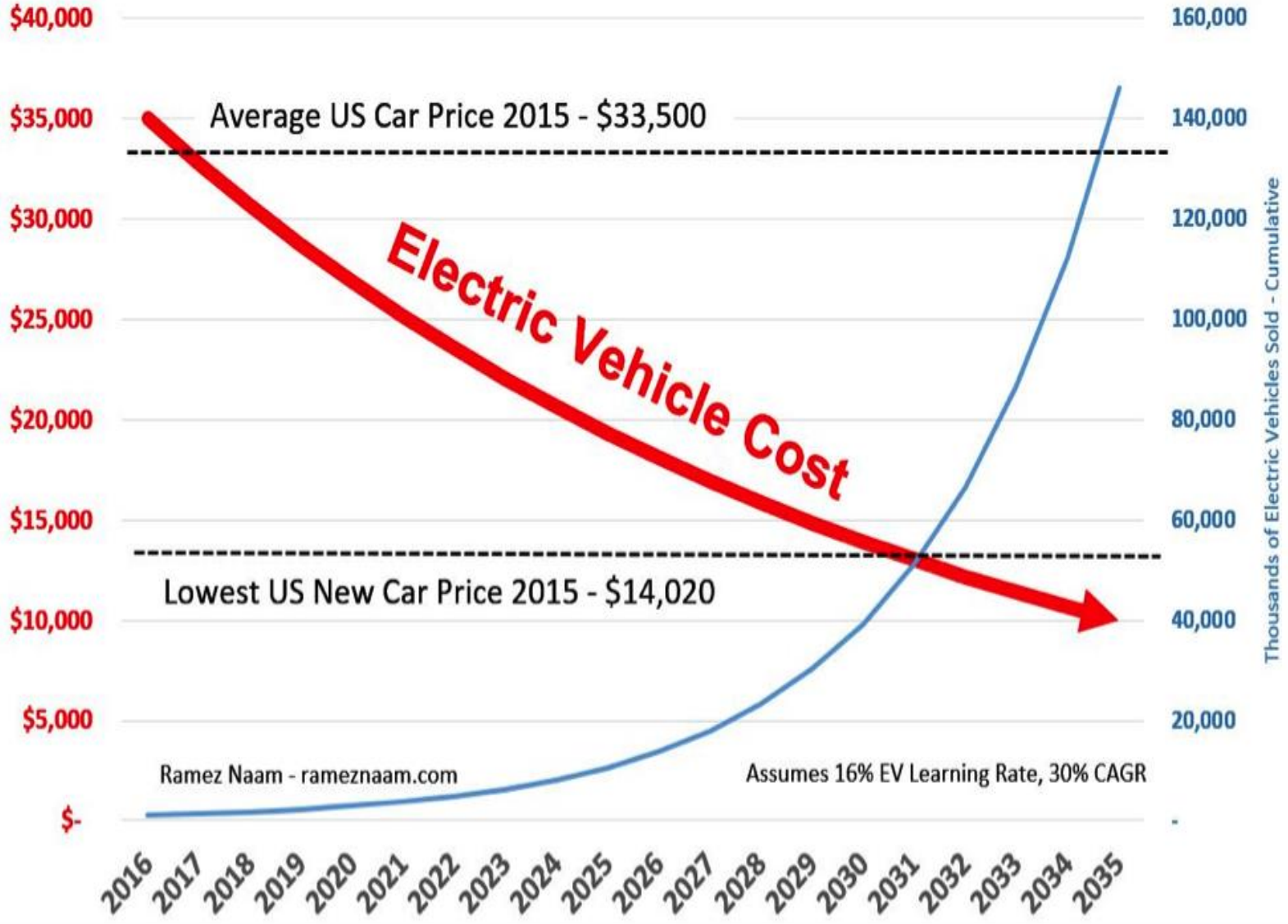
- **Scaled Production**: The rollout of Tesla's Gigafactory makes $100 per kwh lithium-ion batteries in electric vehicles possible by 2020. This price point would yield an **astonishing $0.11 per kWh** electricity storage -- or, in other words, allow you to fill up the equivalent of a tank of gas for $9.35.

- **Flow Batteries**: Flow batteries are just starting to come to market and have been proven in the lab to operate for 5,000 charge cycles or more. This is a 10x improvement over standard consumer lithium-ion batteries.

- **Compressed Air Storage**: Companies like LightSail Energy are creating physical components rated for 10,000+ charge cycles.

- **Time of Use Arbitrage**: The U.S./ Cad is increasingly going to time-of-use charges for electricity. Right now that means charging consumers a low rate in the middle of the night (when demand is low) and a high rate in the afternoon and early evening (when demand is at its peak, often twice as high as the middle of the night).

Cost of 200 mile range EV



Retail

RETAIL

Retail traffic is down 7%

47% of customers research online before buying

Online sales will comprise 9.5% of retail sales by 2019

70%of consumers are guided by consumer opinions

iS

41% of shoppers want to be identified by their phones

61% of shoppers want their history tracked for ease of future purchasing

CHANGING

Here are six examples of how IoE is already changing the retail landscape forever:

1. **Home replenishment** - Press a button ordered for online delivery > smart egg trays.
2. **Virtual reality.** Viewing - Make order decisions remotely.
3. **Wireless sensing and tracking-** In-store sensors such as Bluetooth beacons can track smartphones throughout the store and record path-to-purchase data that can later be used to optimize store layouts. Apple Pay.
4. **Home hubs**. Using these hubs, consumers can control their lights, HVAC, curtains, closed-loop cameras and such with a single smartphone app.
5. **Health data mining-** People can monitor their exercise, weight, and even how long they brush their teeth with devices connected to the Internet. Analytics mine the data for patterns and provide suggestions for improvement.
6. **Combining public and private data sources.** sprinkler that uses weather and soil information to determine the perfect amount of water to dispense for plants and grass, thereby saving as much as 90% on water bills.

Old News

Using RFID tags, retailers can expect 99% inventory accuracy, a 50% reduction in out-of-stocks, a 70% reduction in shrinkage, and sales lifts in the 2% to 7% range.

Retail

- The threat of traditional new retailers is low. For traditional retailers, relying on a chain of stores is expensive, and with only an 8% net margin in 2012 (Strategis, 2015). These thin returns, coupled with the capital required to lease retail locations and build a supply chain, will limit the entrance of new competitors. Even some traditional foreign competitors like Target have chosen to withdraw from the Canadian market rather than remain (CBC, 2015).

- The store of tomorrow is less about being transactional and **more about the experience . . .”**

Consumers …

- Intelligent Shopping Systems. **Monitor specific users**' purchasing habits … by tracking their mobile phones. … users could receive special offers on their favorite products, location of items and photo and details..

- Healthy Living Devices. Connected scales or wearable hearing monitors, more and more **end-to-end health monitoring antenatal and chronic patients,** helping one manage health vitals and recurring medication requirements. Distinct advantages are **cost-effectiveness and personalization** for chronic patients. Doctors can monitor the health of their patients on their smartphones

- City Apps, Downloads, Smartphones. Sensors that enable services like **parking search**, **environmental monitoring**, **digital city agenda** among others.

… Again the so what's?? Less labour for one.

- Cognitive systems like IBM's Watson are already being used in retail (Mercier, 2015).
- Watson can answer questions posed in natural language, and serve as an intelligent product finder for customers based on their past purchases and interests.
- Analytics

Imagine … Law firms… Tourism … Teaching… Retail directions in store …. Others … **BUT… JOBS?**

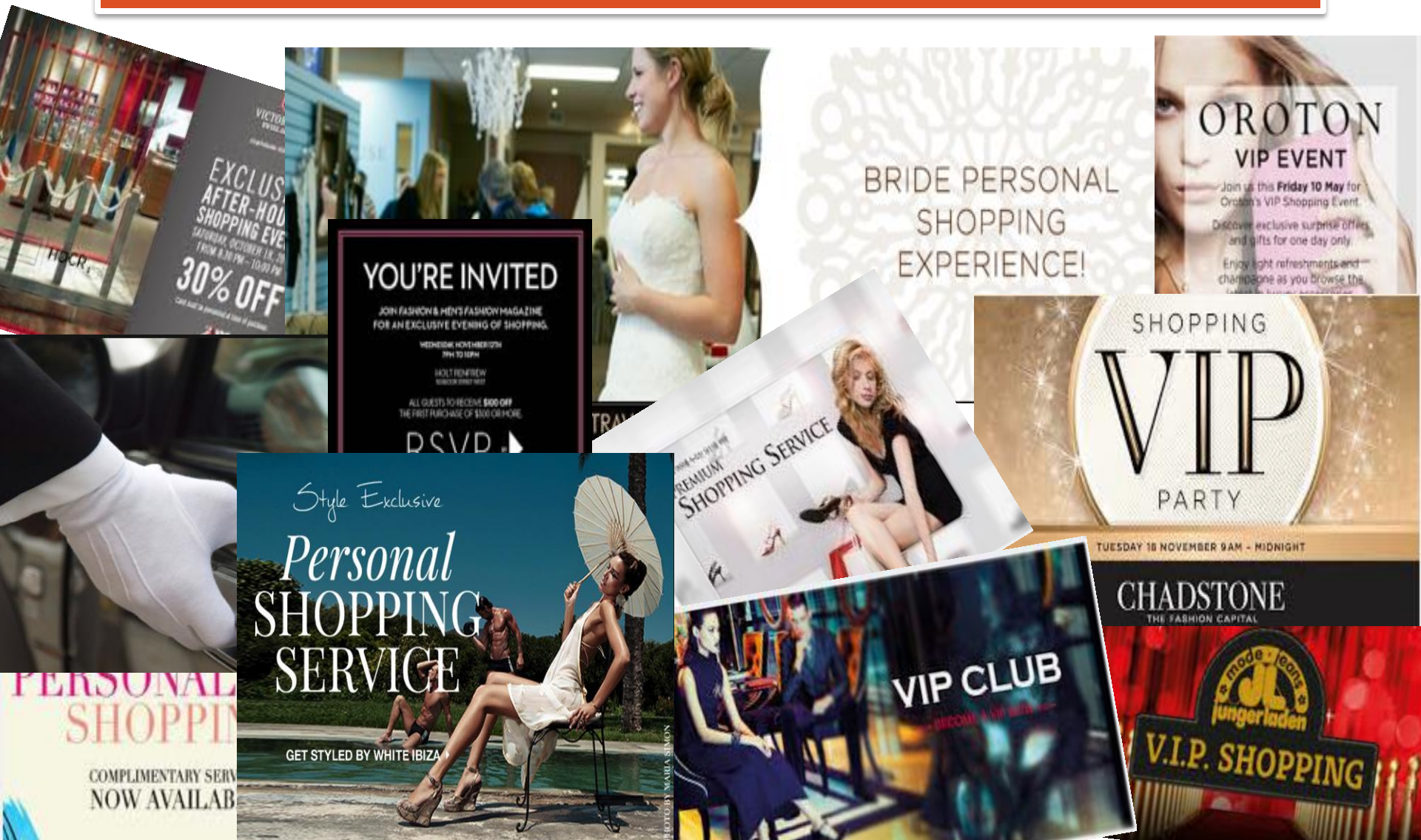
https://youtu.be/MceJYhVD_xY

Must see..
https://www.youtube.com/watch?v=NJwD68LaNro

Retail Supply Chain

Figure 2: Omni-channel Retail Supply Chain

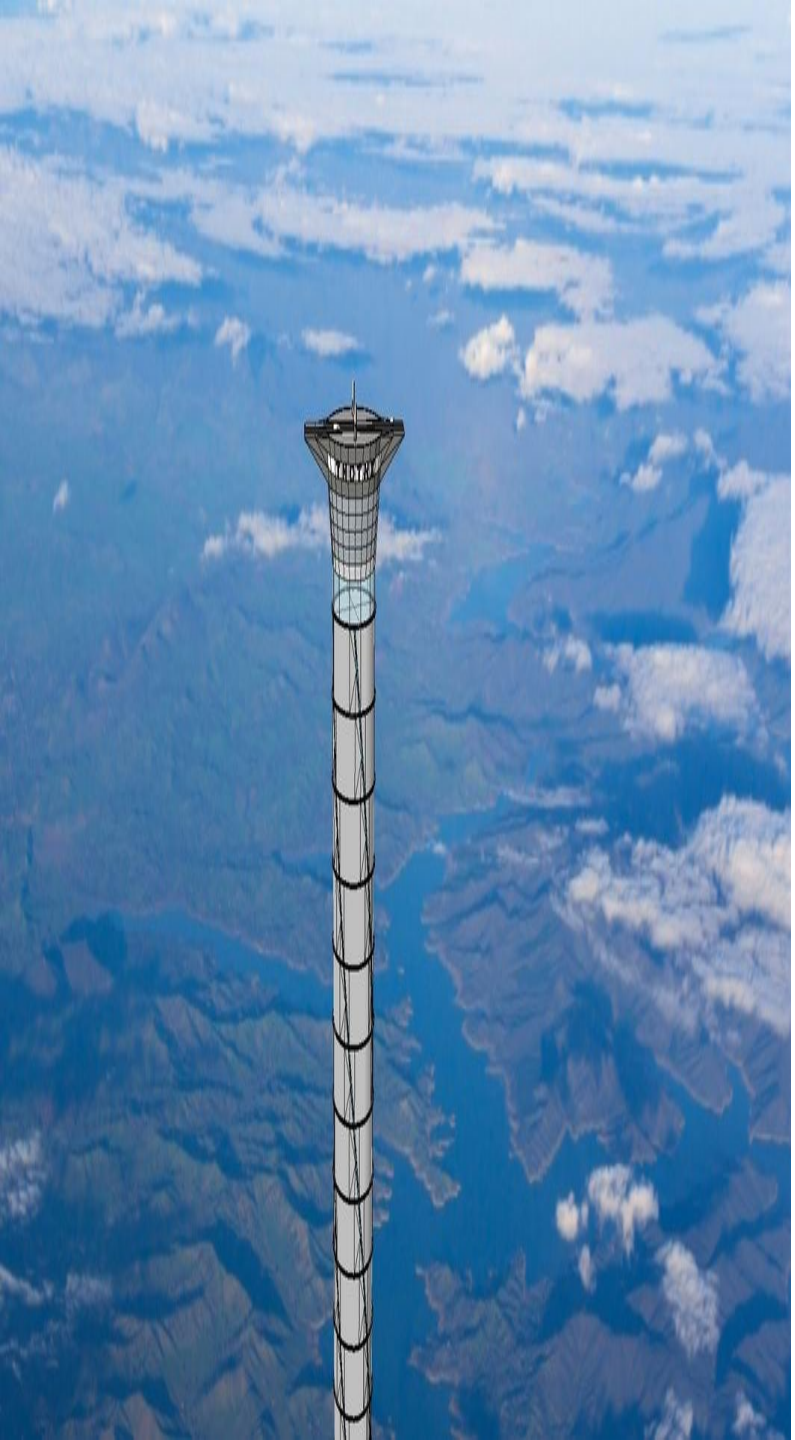
Consumers want to feel special – provide a VIP experience



Summary

Canadian retailers should become omnichannel to mitigate the risks and maximize the opportunities of changing consumer behaviour.

The should create intimate experiences, explore targeted marketing and exploit big data.



Space Industry
Canadian Firm Patents Inflatable Space Elevator

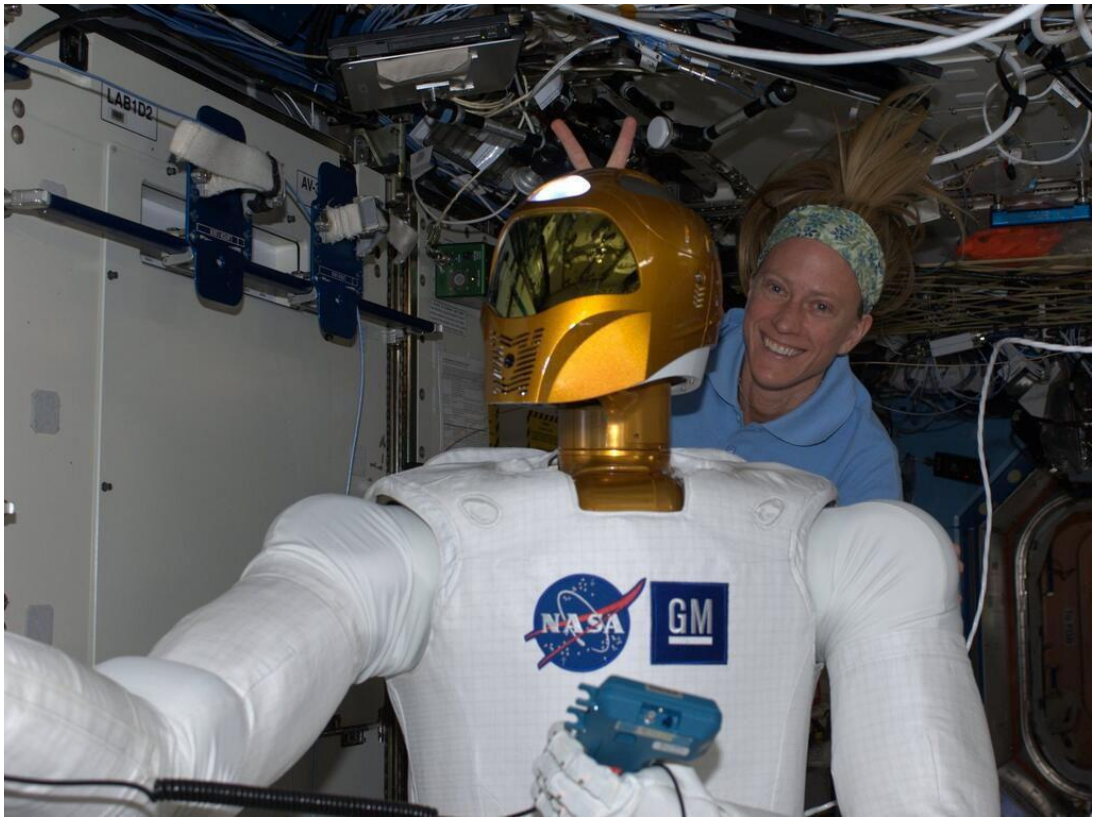
- Canadian space firm Thoth Technology **has received a US patent for an elevator** to take spacecraft and astronauts at least part way into space.

- If it's ever built, the 20 km (12.4 mi) high Thothx inflatable space tower holds the promise of **reducing launch costs by 30 percent in terms of fuel, and may even replace some classes of satellites.**

http://www.techinsider.io/: SpaceX reusable booster program

Tesla Motors Showcase New Innovation for Space and Beyond

NASA's Robot Astronaut Inspiring Tech Advances Here on Earth – Performs Telemedicine



Laser Robotics Space Travel

NASA’s Laser-Powered Spaceship Could Travel To Mars In 72 Hours --- A Man in a month!

BY **REUTERS** ON 02/24/16 AT 11:09 AM

http://www.ibtimes.com/nasas-laser-powered-spaceship-could-travel-mars-72-hours-2321550

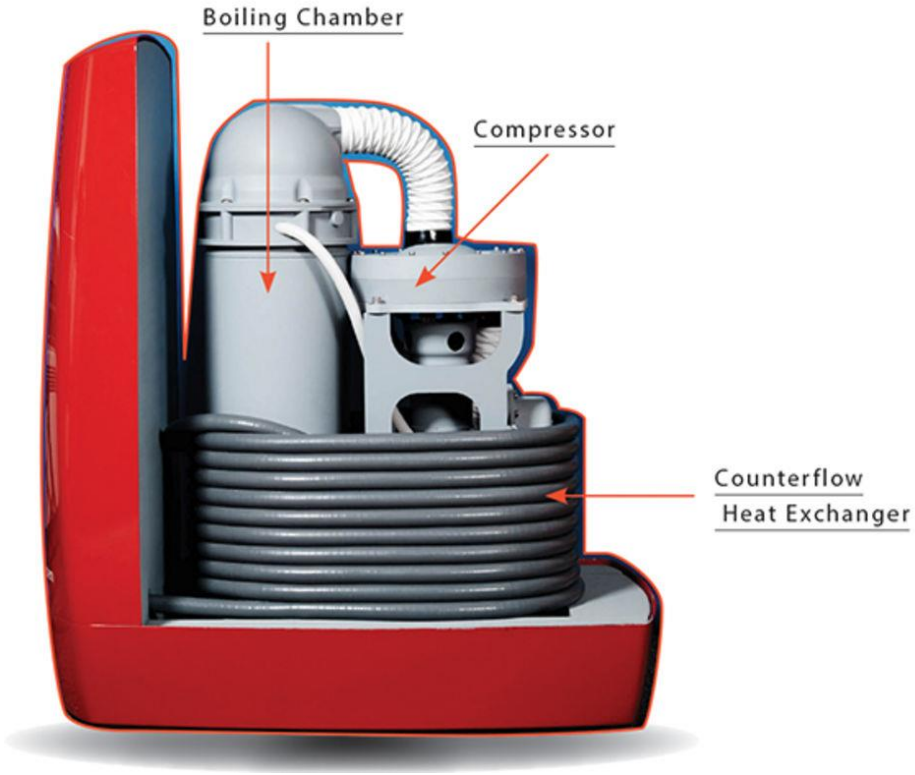
Waste Removal …

No more 18-ton garbage trucks rumbling down the city's rutted roads or noise of the compactor, with traffic backing up behind it.

Today, the noise of garbage collection is the jet-engine roar of a 1,000-horsepower vacuum buried within land …pneumatic tubes buried beneath our feet will do the dirty work, silently sucking garbage from our buildings at 60 miles per hour.

…. So What?

Water "Slingshot"



"PURE GENIUS: HOW DEAN KAMEN'S INVENTION COULD BRING CLEAN WATER TO MILLIONS. HE JUST NEEDS TO GET IT TO THEM".

By Tom Foster June 16, 2014

http://www.popsci.com/article/science/pure-genius-how-dean-kamens-invention-could-bring-clean-water-millions

Strategist ..

FIRST…Get your values straight …. the rest is a matter detail…

The Strategist in the IoE ecosystem must work in ‘a medium’ which his eyes cannot see …

… which his/her best deductive powers cannot always fathom,

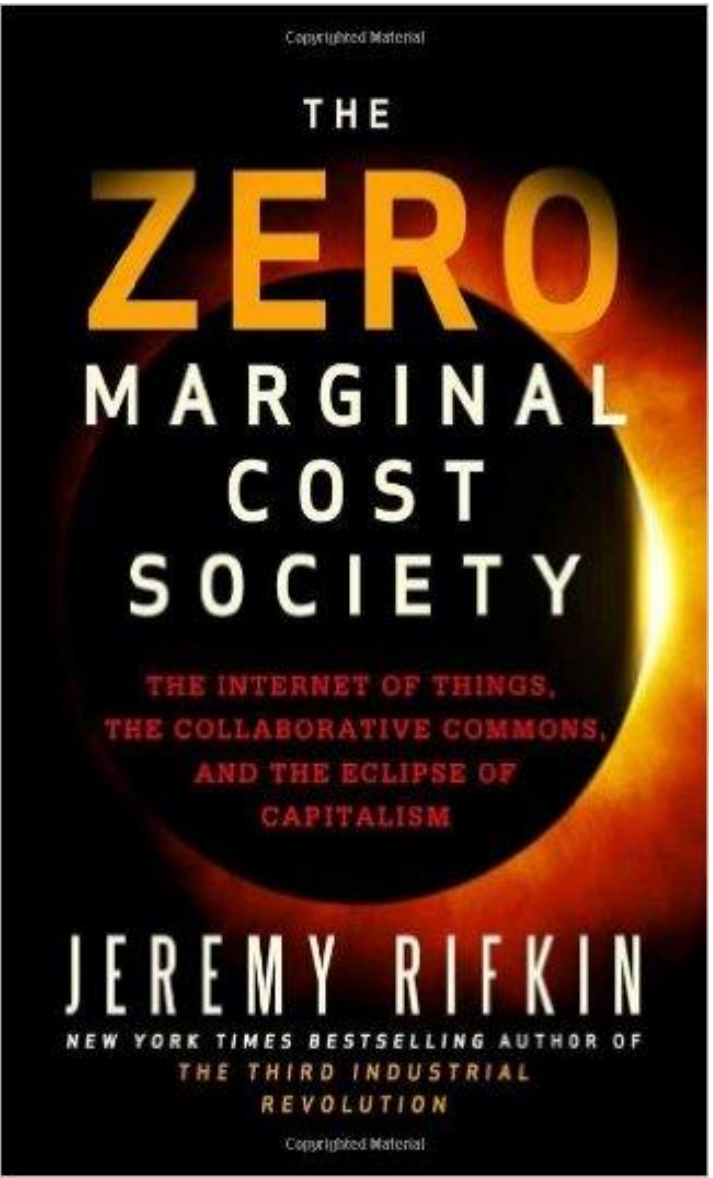
… and because of constant changes he /she cannot really become familiar …

Adapted from Clausewitz

<u>BUT FIRST</u>…

Get your values straight. The rest is a matter detail.

PART TWO: ZERO MARGINAL COST



Let us know look "*briefly*" at the macro level…

- What will be the impact of this "***new zero marginal cost society***"?

- Social, economic and political fabric. (Rifkin, 2014).

What is a Zero Marginal Cost Society?

- Energy Costs Fall
- AI Drones
- Publishing, Education, Food, Alternative Energy
- Collaborative Commons
- Online delivery

BUT first, not a problem but *a challenge*:

We need to understand the impact of the emerging Zero Marginal Cost Society on PEST Factors …Yes! BUT also on Capitalism as we know it!

- Business models will be disrupted with growing frequency in all industries and sectors.

- Hybrid Economy 'Tension' … (Two Economic Systems: part Capitalism and part a Collective Commons)

Will Capitalism survive?

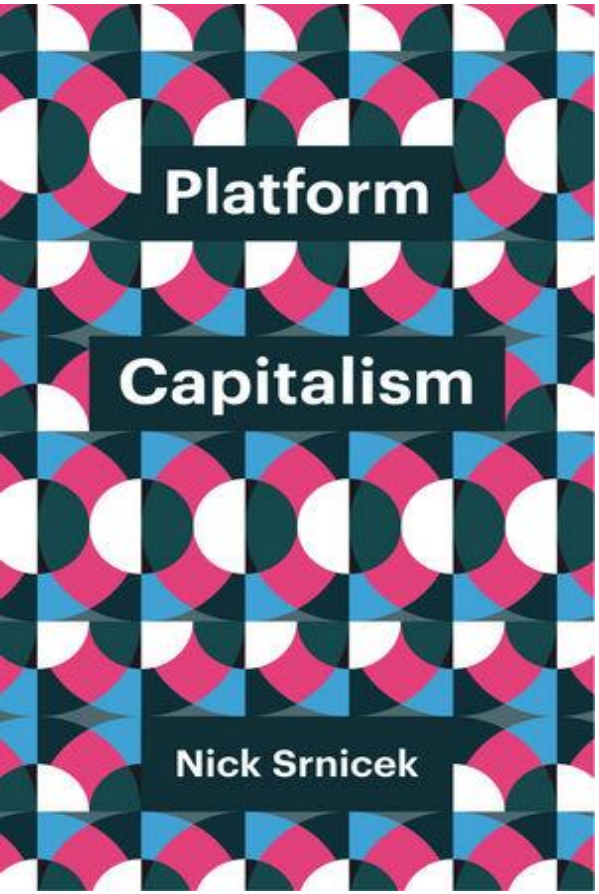
Will Capitalism survive as the globe approaches extreme productivity?

- Spanning 10 Generations, Capitalism is now in **decline** … by 2050 the Collaborative Commons will take the pole position.
- An economy based on '**abundance**' rather than 'scarcity' (newspapers) growing exponentially.
- **Collaborativism** rather than socialism /capitalism (peer to per networks - crowd funding)
- Energy 25 years from now will be **almost free** … Harvesting renewal energy (recall steam Engine Watt 1769- Oil starts to replace about 1820. Now renewable dist. green energy internet.)

The good news is that humans can do certain things better than machines can, even artificially intelligent ones.

‘Talent’, based on *curiosity, creativity, and empathy*.

Machines are better at what has been traditionally called ‘Labour’, based on diligence, intelligence, and compliance.



- For the past century, the job was the way we redistributed wealth and protected workers from the negative aspects of early capitalism. As the information economy disappears, **we need to re-think our concepts of work, income, employment, and most importantly, education**. If we do not find ways to help citizens lead productive lives, **our society will face increasing destabilization. (GAI?)**

- **The old jobs are not coming back**. There will no longer be high paying jobs for **routine physical or cognitive work.** In addition, the new world of work, particularly "**platform capitalism**", requires fewer people and creates fewer jobs.

Zero Marginal Cost Society

- We are **witnessing capitalism being 'reset' to accommodate the realities this brave new world** driven in large part by the Internet of Everything that will result in massive unemployment.

- Only countries that are **based on knowledge** will survive as will the workers... **the masses will have to be taken care** of just as the Romans did prior to the Vandals and Visigoths and 472 AD.

- **Middle-class continues to shrink and the standard of living of 80% of Canadians will stagnate and indeed fall;** Canadians must be "hungry" and drive innovation and entrepreneurship .. Decision Makers must strip away bureaucracy and impediments.

- If we do nothing.... we will be faced with **our own Arab Spring**. Mass unemployment of folk, particularly between ages 19 and 25. Unemployed with high student loans and without 'a dream'. This particular demographic segment is quickly moving towards a tipping point that we must be concerned about...

The challenge for Strategist is to make all work more human.

Companies are nothing but organized human beings. Financial capital, like money, is a commonly agreed-upon fiction. As a society, we can create new stories about capital. **Businesses can take the lead by experimenting with new work models to show others the way**.

If we do not do these things ... a polarized labour market and dystopian vision … the robots may prevail.

Can’t just be a guaranteed annual income! OR can it?

Key thought …

Offshoring and outsourcing are temporary conditions until all routine labour gets replaced by software and machines. Balance of Trade.. China.. **Cheap labour will become the problem**.

We are on the cusp of being a digitally networked and computer-driven society and it seems we are throwing away the only thing that will enable people to have a valued role in it. These are all for machines, not humans.

The future of human work is **complex, creative, and unique. This is where we must reposition. This is where RRU must go!**

So what is the problem?

- Most embrace the IoE promises of this third revolution; **but that would be a mistake**.

  Like the little brown furry things released as the lid was lifted on Pandora's Box we too find that once open we can't get them back in the box. We must live with the consequences.

- What are they?

Problems:
Data Privacy, Data Security,
Data Sovereignty and Data Censorship.

- **Within knowledge management** the topic of data privacy increasingly becomes an essential consideration.

- How do we determine **what data can be shared** with third parties? **Stored information** gathered by governments and businesses in digital form is subject to the laws of the nation. How do we **protect a nation's data sovereignty**? How do we protect encroachment of our **civil liberties?**


Macy's
AMERICAS LEADING
DEPARTMENT STORE
STATE
The Rose of Stamboul
CENTURY THEATRE
ORPHANS of the STORM
See this great D.W. GRIFFITH PICTURE TO-DAY
APOLLO

PART THREE: THE FUTURIST

For IoE strategic leadership we must adopt the role of a futurist …

Business models will be disrupted with growing frequency in all industries and sectors.

… *How will yours …?*

Problem
Seismic disruption to traditional business models

- Old strategic management concepts, notions and models increasingly no longer align with today's reality.

- Today managers and leaders need to seek out and adopt new management models in order to accommodate the emerging challenges in their global disruptive ecosystem.

- **These new models must accommodate open innovation in the collaborative commons**.
  (Unfortunately, today many business schools continue to teach dated strategic management concepts and models.)

The reality today, of course, is that developed nations like Canada and the United States are over 75 percent service-based economies. Regretfully, today's strategic management practitioners continue to focus on how to manufacture widgets more efficiently and effectively.

Frederick Winslow Taylor in 1890…

"**Hardly a competent workman can be found who does not devote a considerable amount of time to studying just how slowly he can work and still convince his employer that he is going at a good pace.**"(Taylor, 1903)" … "**Brutally speaking, a scheme does not ask any initiative of any man. We do not care for his initiative**".

Old Mental Models

- Alfred Sloan, decades later in the 1920s, also an engineer, was responsible for the outstanding growth of General Motors to the preeminent position in the early 1990s.

- His teaching also in large measure focused on the industrial age challenges of manufacturing "widgets". **This focus of the employee as a cog in the manufacturing process peaked in the 1960s and 1970s** with strategic management practitioners like Peter Drucker and Marvin Bower.

These concepts, notions and models crafted between 1880 and 1970 **addressed the challenges of the revolutionary economic change** introduced, between 1750 and 1850, by the industrial revolution.

They still represent the core teaching of business schools. Specifically, **training continues to focus on very explicit manufacturing problems.**

- **How does management get the workers and plant infrastructure to replicate perfectly, as advocated by Deming;**
- **increase the scale of operations; and**
- **continually grow efficiently?**

- Let me hasten to add, this is not to say that these old, 20th century mental models are obsolete, only that as strategists we need to review them critically for their relevance. Today's reality is a predominantly knowledge-based service nation, globalization technology, democratization of workers and other shaping factors **all in a sea of the IoE.**

- If this is true, what are the new strategic notions, concepts and models for the 21st century? How can you differentiate yourself?

Let me share a story that might help … (Paddy)

PART FOUR: IMPACT

What will be the impact of this New Zero Marginal Cost Society (Rifkin, 2014) on the nation's social, economic and political fabric?

Problems
Data Privacy, Data Security,
Data Sovereignty and Data Censorship.

- **Within knowledge management** the topic of data privacy increasingly becomes an essential consideration.

- How do we determine **what data can be shared** with third parties? **Stored information** gathered by governments and businesses in digital form is subject to the laws of the nation. How do we **protect a nation's data sovereignty**? How do we protect encroachment of our **civil liberties?**

Privacy, Autonomy and Control

- Today governments and businesses **actively** seek to build data dossiers on all.

- Strong words-I intended them to be. We are in an Orwellian world. The **IoE exacerbates this unrelenting attack on our civil liberties.** The IoE's Trojan horses will continue to strip away the last vestiges of individuality and privacy as **we willingly surrender them** to enjoy the connectivity offered by the IoE *consumer* conveniences.

- We have **little input** into the collection of this almost perfect behavioral data, and its uses are equally troubling. In most cases we are not allowed to see the data and **validate its accuracy**. (Medical records, no fly lists). It takes little effort for **government to find cover** in the Freedom of Information Acts to deflect citizen's enquiries.

Caveat: You are being watched. There is no place to hide

- Many Internet-connected appliances can already "***spy on people in their own homes***" including televisions, kitchen appliances, cameras, and thermostats.[134]Computer-controlled devices in automobiles such as brakes, engine, locks, hood and truck releases, horn, heat, and dashboard have been shown to be vulnerable to attackers who have access to the onboard network.

- Cyber Attacks. Watch live 'hack attacks' : http://map.norsecorp.com/

- The U.S. National Intelligence Council in an unclassified report maintains that it would be hard to deny "access to networks of sensors and remotely-controlled objects by enemies of the United States, criminals, and mischief makers… Your business and personal data is at risk."

The Challenge for you…

How do we mitigate the damage sustained by failure to provide for data privacy, data security, data sovereignty and data censorship?

Remember … ***if you didn't pay for the product, you ARE the product***.

So what are some of the National Implications?

Economic

- Banking (Digitally banking – Bail in Regime – Apple pay and others)

- The European Union and other jurisdictions are test driving "**negative interest rates**" and their depositors have no other options given they are about to move to a digital banking system (demise of cash).

- Recall 'the condition' of global currencies. Especially the US Dollar as the global vehicle currency.

- GNP's fall - profits shrink - access to ownership over owning - automation, robotics, AI all replace 10s of millions of workers.

Social

- The family unit under stress as unemployment rises due to adoption of IoE innovation.
- Constant Orwellian surveillance.. Yes we are safe BUT we have ‘the large boot of government on our face’.
- New values ... Quality of life … Civil liberties gone.
- Bank of Nova Scotia, which announced plans last November to cut about 1,500 jobs across the bank’s domestic and international operations, recently indicated the cuts would be “deeper” (Shecter, 2015).

Political

- Growth of extreme political views … Communism or fascism
- It would be reasonable to expect significant turbulence to states current political systems **as unemployed and under employed citizens** demand a resetting of the equity in political decision outcomes.
- The trajectory widens between the rich and poor.
- If so anticipate an acceleration in the "command and control" of nations at the cost of our civil liberties.

Some closing thoughts and recommendations…

Closing Thoughts...
As Strategists you must adapt to this realty

We are at a strategic inflection point, a node where power and strategic advantage are joined at this particular point in time.

A caveat: for those who do not like change . . *You will like irrelevance even less...*

Recall Churchill's observation prior to World War II. "**The era of procrastination, of half-measures, of soothing and baffled expedience, of delays, is coming to a close. In its place we are entering a period of consequences."** (Churchill, 12 November 1936)

Are you ready to step through the looking glass? If you do there will be no turning back …

This is not your forefathers` marketplace

- **Uber** -- the world's largest taxi company **owns no vehicles;**
- **Facebook** -- the world's most popular media owner **creates no content**;
- **Alibaba** -- the most valuable retailer **has no inventory**; and
- **AirBNB** -- the world's largest accommodation provider **owns no real estate**.

Internal – You need to:

- **Research and Inventory** best IoE security practices.
- **Revisit your overall business strategy** to exploit the latest IoE.
- Identify their **new ecosystem partners**, consider joining a partner's platform or develop your own.
- IoE start ups to create necessary momentum and learning. Should identify **one or two 'low hanging fruit' applications** that can be quickly implemented.

External - You need to …

- You need to encourage (**lobby**) Canada's decision makers to increase investment in digital infrastructure (e.g. embedded sensors, broadband connectivity) so your industry can take advantage of the **leapfrogging potential of the IoE** and thereby accelerating regional economic development.

- Your industry, governments and academia need to **collaborate on long-term R&D** to solve fundamental technology challenges related to security, interoperability and management of systemic risks.

- You need to encourage (lobby) Canada's decision makers to implement **new training programmes and policy incentives to mitigate job displacement and retool the unemployed for IoE high-demand job categories.**

As Strategists and Colleagues I leave you with this caveat…

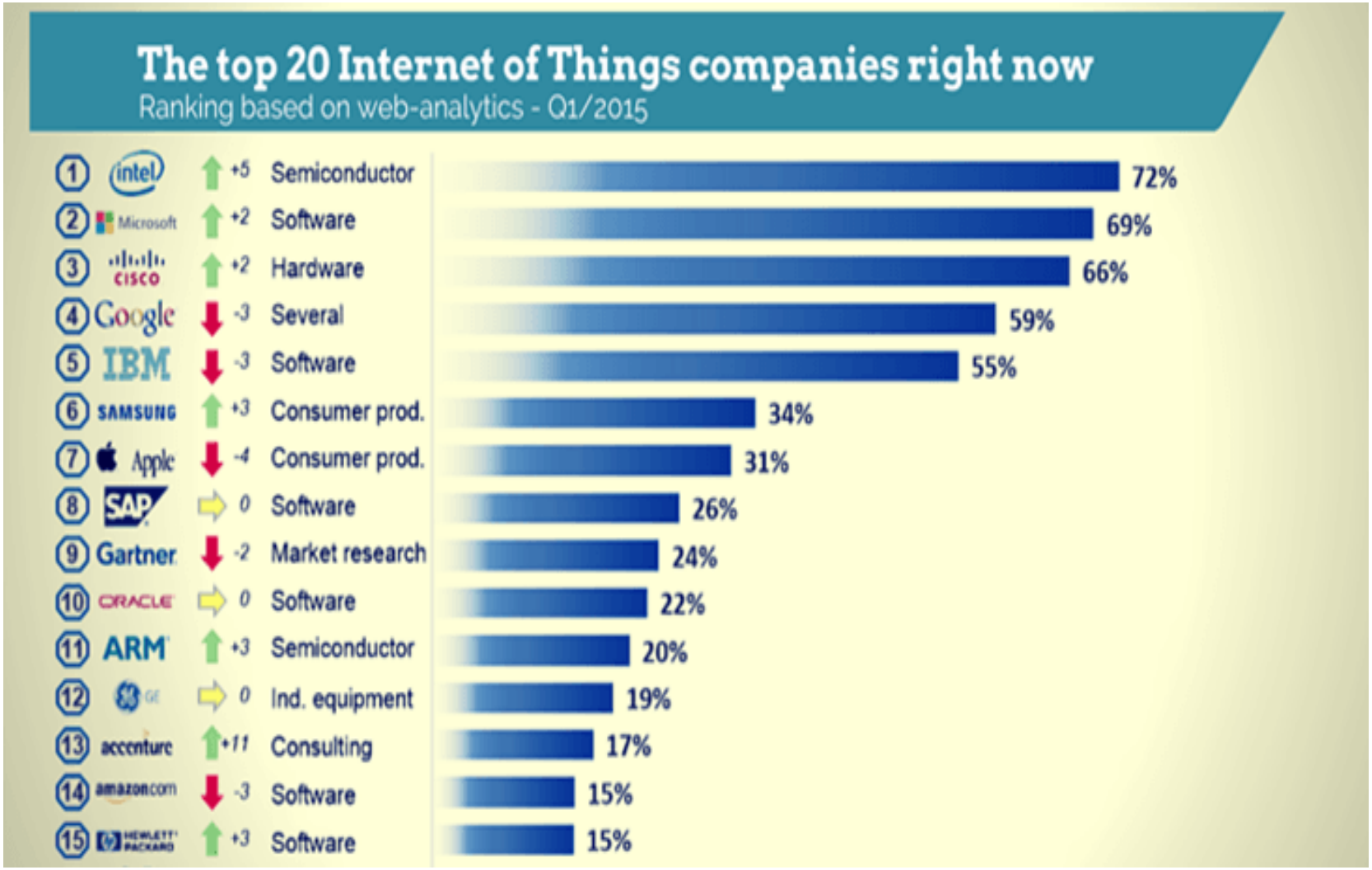
"Strategies and the organizational theory of the Industrial Revolution will be a disaster if adopted in this new industrial age."

Break

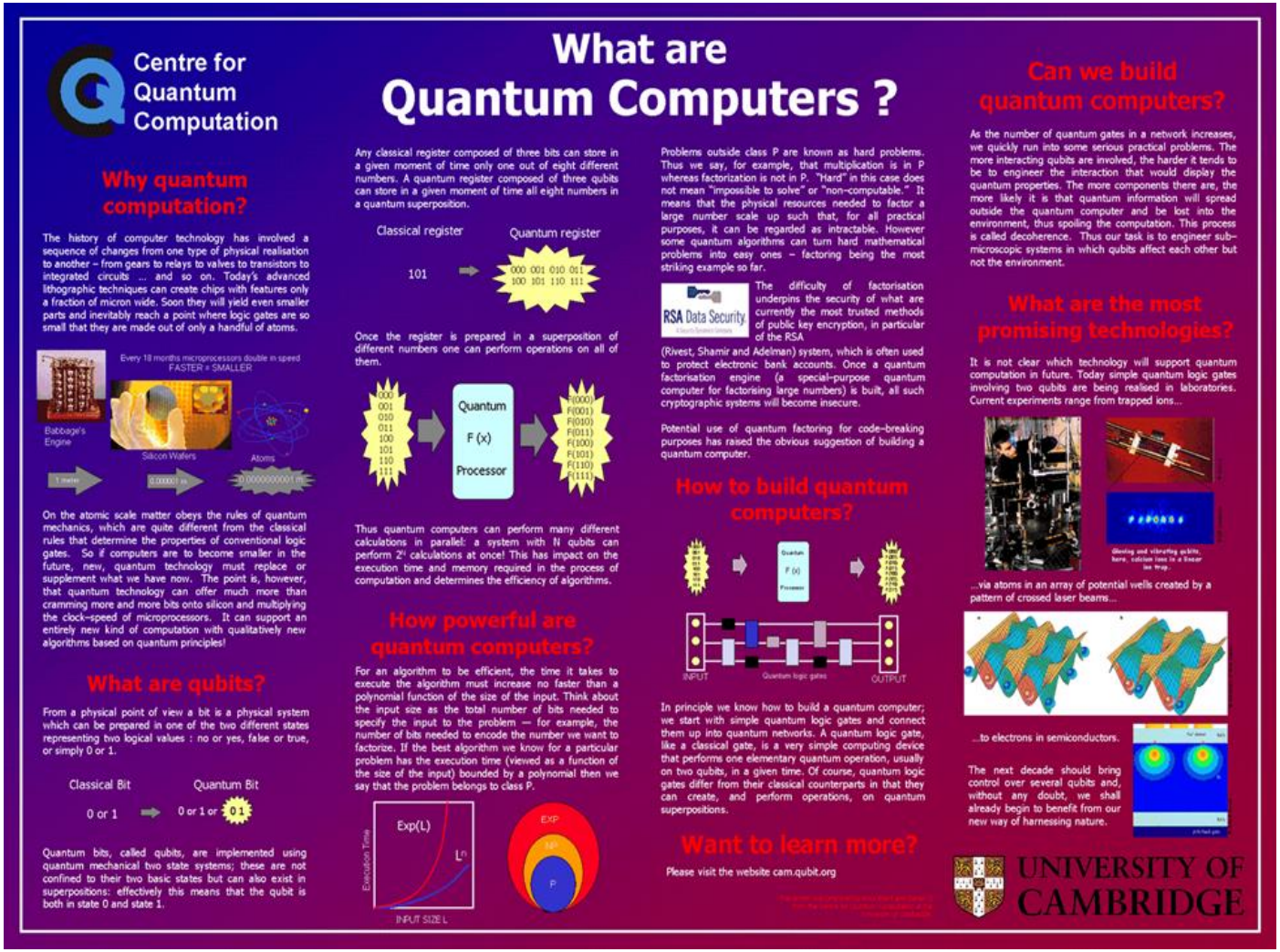
Spare slides

https://www.abiresearch.com/press/more-than-30-billion-devices-will-wirelessly-conne/

Most are struggling - Moore's Law (based on silicon) starts to meet its 'ends days'.. Will Gallium be the saviour? Will it disrupt the semiconductor industry?

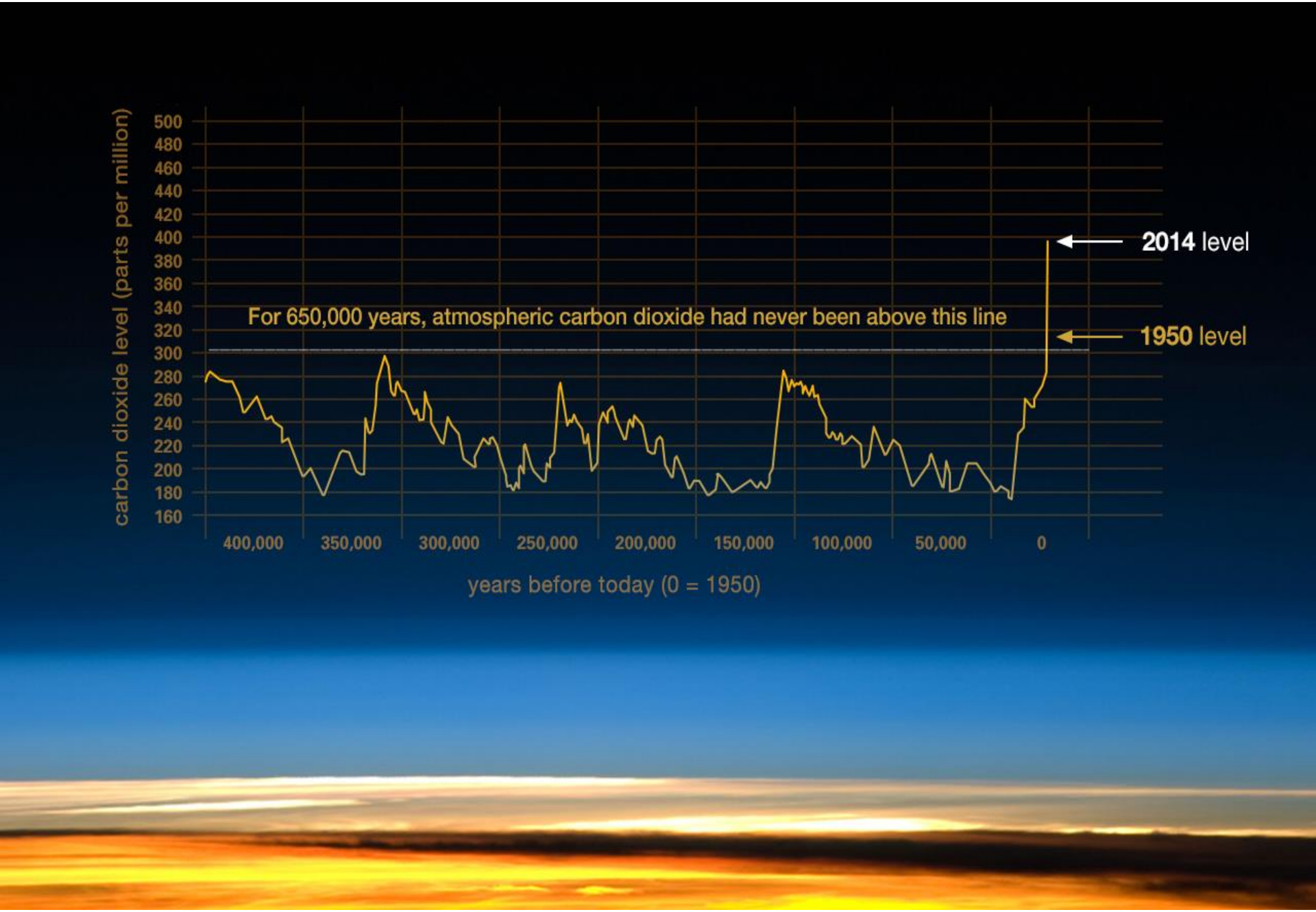


Quantum Computers
Artificial Intelligence



“Factories in the field”

Last summer on the highways and back roads of the Central and Sacramento Valleys


carbon dioxide level (parts per million)
500
480
460
440
420
400
380
360
340
320
300
280
260
240
220
200
180
160
For 650,000 years, atmospheric carbon dioxide had never been above this line
2014 level
1950 level
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
years before today (0 = 1950)

Eight Principles of War

- Clear vision of the objective
- Understand how you're going to get there
- How do you maintain security
- How are you bringing into focus the concentration of your assets
- How will you lever your assets to gain the greatest economy of force
- How you enter the market
- How you maximize the element of surprise
- How you lever for synergy cooperation