disruptive

ดร.ธนาวิชญ์ จินดาประดิษฐ์

Direction – Sustainable Development Goals

กระทรวงพลังงาน
MINISTRY OF ENERGY

แนวโยบาย Energy 4.0

กระทรวงพลังงาน MINISTRY OF ENERGY

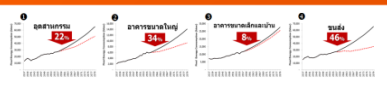
เป้าหมายของ Energy 4.0

สถานะปัจจุบัน

- ปี 2554 ปล่อย CO_2 305.52 ล้านตัน/ปี
- EI — Energy Intensity 8.20 Ktoe/ พันล้านบาท ในปี 2559
- พึ่งพาพลังงานฟอสซิล ~1.3 ล้านบาร์เรล/วัน
- ราคาสะท้อนต้นทุน/ มีการแข่งขัน
- สร้างรายได้ชุมชนแล้ว กว่า 1,500 ตำบล/ 3,500 โครงการ ทั่วประเทศ

มาตรการสำคัญ

ภาคการผลิตไฟฟ้า ลดลง 24 ล้านตัน/ปี | ภาคพลังงานในครัวเรือน ลดลง 4 ล้านตัน/ปี | ภาคพลังงานในอาคาร ลดลง 1 ล้านตัน/ปี | ภาคพลังงานอุตสาหกรรม ลดลง 41 ล้านตัน/ปี | ภาคขนส่ง ลดลง 41 ล้านตัน/ปี | ปลูกป่า



EE ลดไฟฟ้า 8.9 หมื่นล้านหน่วย
ลดดีเซล 50 ล้านลิตร/วัน
ลดเบนซิน 30 ล้านลิตร/วัน
ลดก๊าซธรรมชาติ 900 ล.ลบ.ฟุต/วัน

RE – เอทานอล 11 ลล./วัน
ไบโอดีเซล 14 ลล./วัน
ไฟฟ้า 19,634 MW

เปิดการแข่งขันเสรี
กลไกตลาด
ไม่มีการอุดหนุนราคา

RE- พื้นที่ปลูกปาล์ม 10.20 ล้านไร่
พื้นที่ปลูกมันสำปะหลัง 8.5 ล้านไร่
พื้นที่ปลูกอ้อย 16 ล้านไร่

- จัดทำแผนพลังงานชุมชนให้ครอบคลุมทุกตำบลทั่วประเทศ
- ขยายผล RE และ EE ในชุมชน
- ร่วมมือคณะทำงานสานพลังประชารัฐ + สภาอุตฯ ต่อยอดผลิตภัณฑ์

เป้าหมายปี 2579

- ปี 2573 ปล่อย CO_2 ลดลงตามข้อผูกพัน COP21 (ลดลง 111 ล้านตัน/ปี จาก BAU 555 ล้านตัน/ปี)
- Energy Intensity ลดลง 30% >> 5.98 ktoe/ พันล้านบาท ในปี 2579
- ลดการพึ่งพาพลังงานฟอสซิลลง ~ 1 ล้านบาร์เรล/วัน (BAU 3.66 ล้านบาร์เรล/วัน)
- ราคาตลาด + แข่งขันเสรี
- ขยายผลด้านพลังงานใน 7,800 ตำบล/ชุมชน ทั่วประเทศ

9

นวัตกรรม ขนส่ง

ยานยนต์ไฟฟ้า 1.2 ล้านคัน
ลดการใช้น้ำมัน 3.6 ลล./วัน

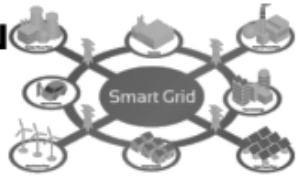
Charging stations

Battery

- Next Generation เชื้อเพลิงชีวภาพ
- Bio-Economy

4

นวัตกรรม ไฟฟ้า



- Micro Grid
- SMART Energy Management
- SMART Grid

- Energy Storage System
- SPP Hybrid Firm/VSPP Firm
- Next Generation of Renewable

นวัตกรรม ความร้อน

เทคโนโลยีสนับสนุนการใช้พลังงานทดแทนผลิตความร้อน

Renewable Heat Incentive

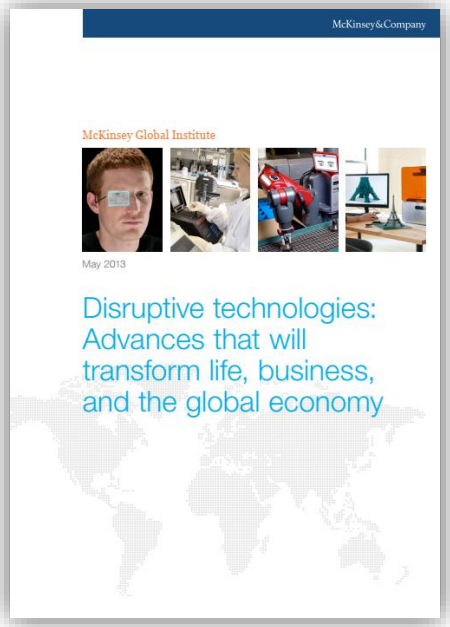
Definition - What does *Disruptive Technology* mean?

Disruptive technology refers to any enhanced or completely new technology that replaces and disrupts an existing technology, rendering it obsolete. It is designed to succeed similar technology that is already in use.

Disruptive technology applies to hardware, software, networks and combined technologies.

ที่มา : Technopedia

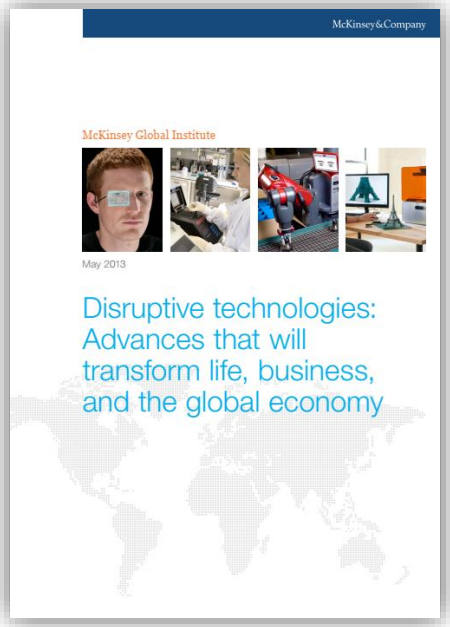
Impact of Disruptive Technologies



McKinsey Global Institute ได้ประเมินอีกด้วยว่า การใช้เทคโนโลยีทั้ง 12 ประเภทดังกล่าว จะสามารถทำให้เกิดผลกระทบทางเศรษฐกิจ มูลค่ารวมประมาณ 14 – 33 ล้านล้านเหรียญสหรัฐฯ ต่อปี ในปี 2025 ซึ่งการประเมินดังกล่าวไม่ใช่แค่เพียงการคาดเดา แต่เป็นการวิเคราะห์เชิงลึก จากการใช้งานที่สำคัญ และสามารถสร้างมูลค่าได้ได้หลายๆ แนวทาง รวมทั้งความต้องการส่วนเกินของผู้บริโภค ซึ่งเป็นผลมาจากผลิตภัณฑ์ที่ดีขึ้น มีราคาถูกลง สิ่งแวดล้อมที่สะอาดมากขึ้น และดีต่อสุขภาพมากขึ้น

ที่มา : McKinsey Global Institute, May 2013.

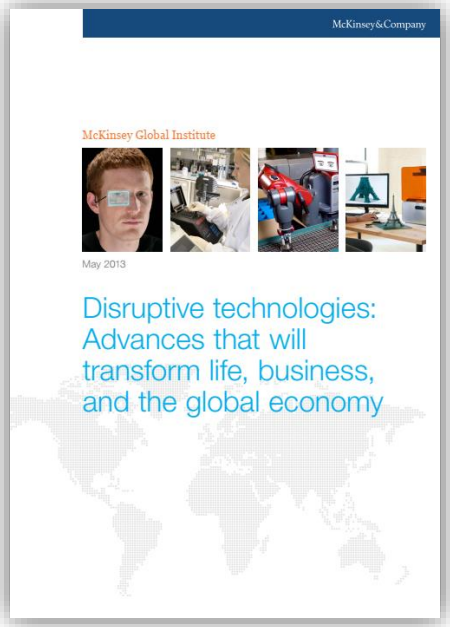
12 Disruptive Technologies



Mobile Internet	Increasingly inexpensive and capable mobile computing devices and Internet connectivity
Automation of knowledge work	Intelligent software systems that can perform knowledge work tasks involving unstructured commands and subtle judgments
The Internet of Things	Networks of low-cost sensors and actuators for data collection, monitoring, decision making, and process optimization
Cloud technology	Use of computer hardware and software resources delivered over a network or the Internet, often as a service
Advanced robotics	Increasingly capable robots with enhanced senses, dexterity, and intelligence used to automate tasks or augment humans
Autonomous and near-autonomous vehicles	Vehicles that can navigate and operate with reduced or no human intervention

ที่มา : McKinsey Global Institute, May 2013.

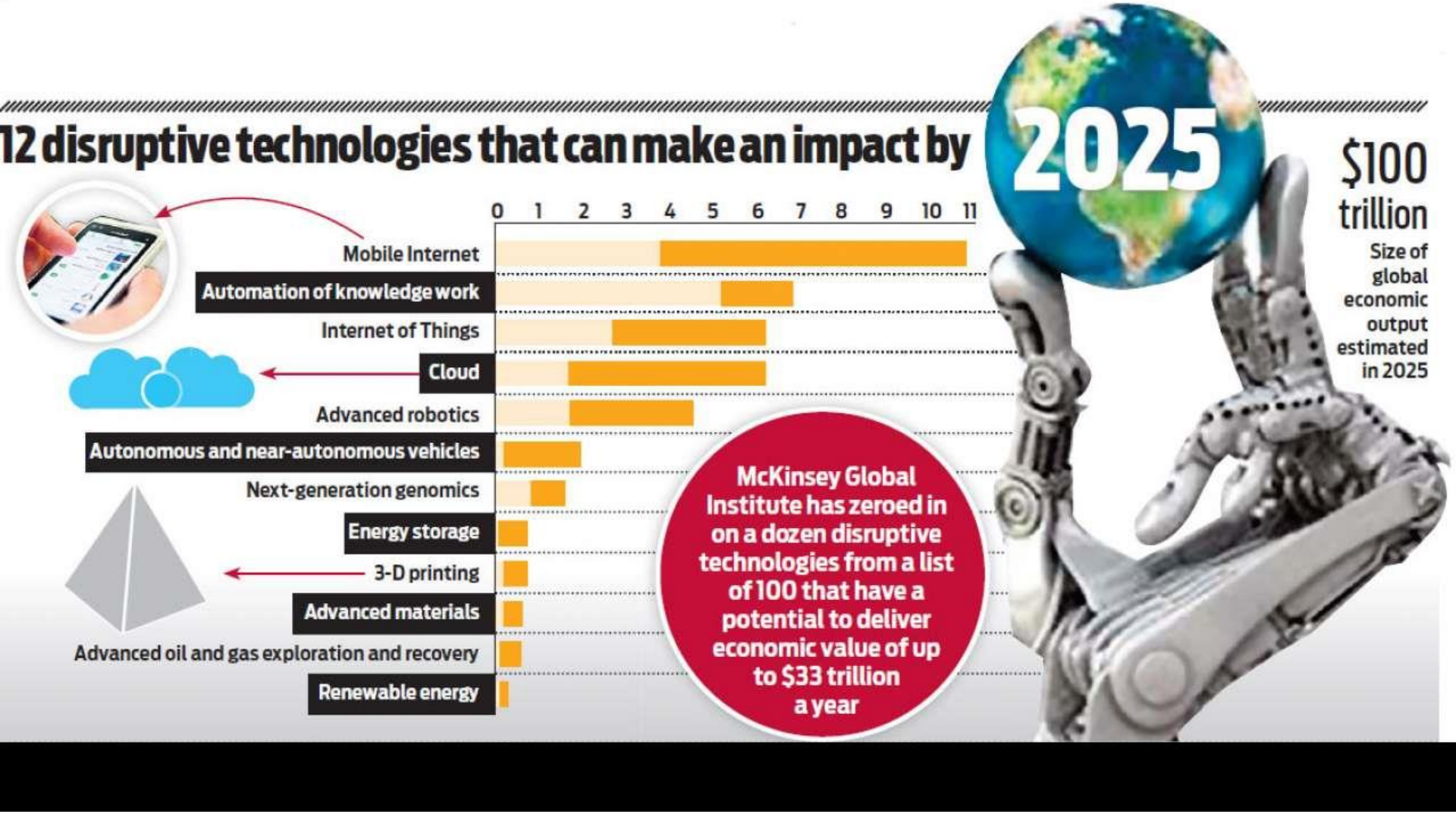
12 Disruptive Technologies



Next-generation genomics	Fast, low-cost gene sequencing, advanced big data analytics, and synthetic biology ("writing" DNA)
Energy storage	Devices or systems that store energy for later use, including batteries
3D printing	Additive manufacturing techniques to create objects by printing layers of material based on digital models
Advanced materials	Materials designed to have superior characteristics (e.g., strength, weight, conductivity) or functionality
Advanced oil and gas exploration and recovery	Exploration and recovery techniques that make extraction of unconventional oil and gas economical
Renewable energy	Generation of electricity from renewable sources with reduced harmful climate impact

ที่มา : McKinsey Global Institute, May 2013.

12 Disruptive Technologies



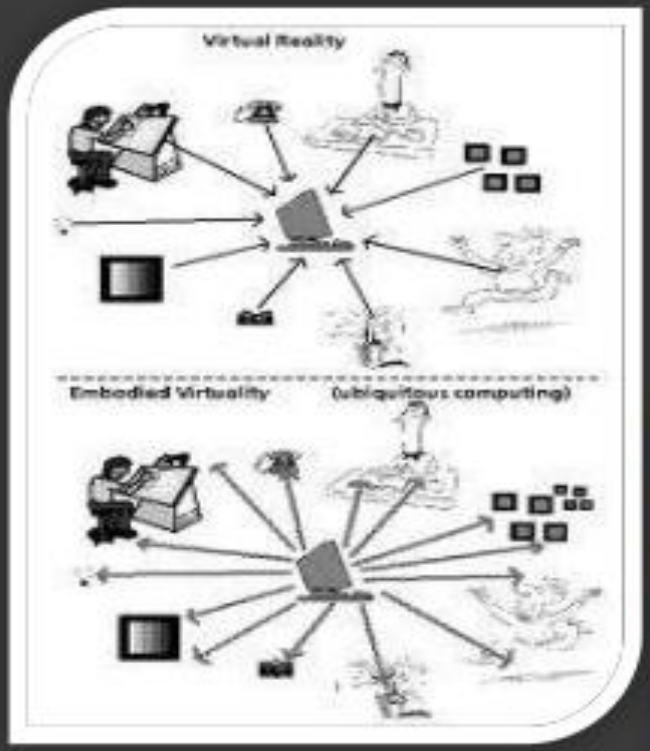
ที่มา : McKinsey Global Institute, May 2013.

Digital Technologies

Opportunities and Outcomes Development, employment, manufacturing, agriculture, health, cities, finance, absolute "decoupling", governance, participation, education, citizen science, environmental monitoring, resource efficiency, global data sharing, social networking and collaboration

ที่มา : https://disruptionhub.com/five-stage-tech-disruption/

UBIQUITOUS COMPUTING



"The most profound technologies are those that disappear. They wave themselves in the fabric of everyday life until they are indistinguishable from it"

Mark Weiner, *The Computer for the 21st Century*, 1991

Ubiquitous computing (Ubicomp) is a term coined by Mark Weiser in 1988 to describe the third generation of computers (after mainframes and desktop PCs) that are completely integrated into everyday objects and activities.

Pervasive (Ubiquitous) Computing Vision

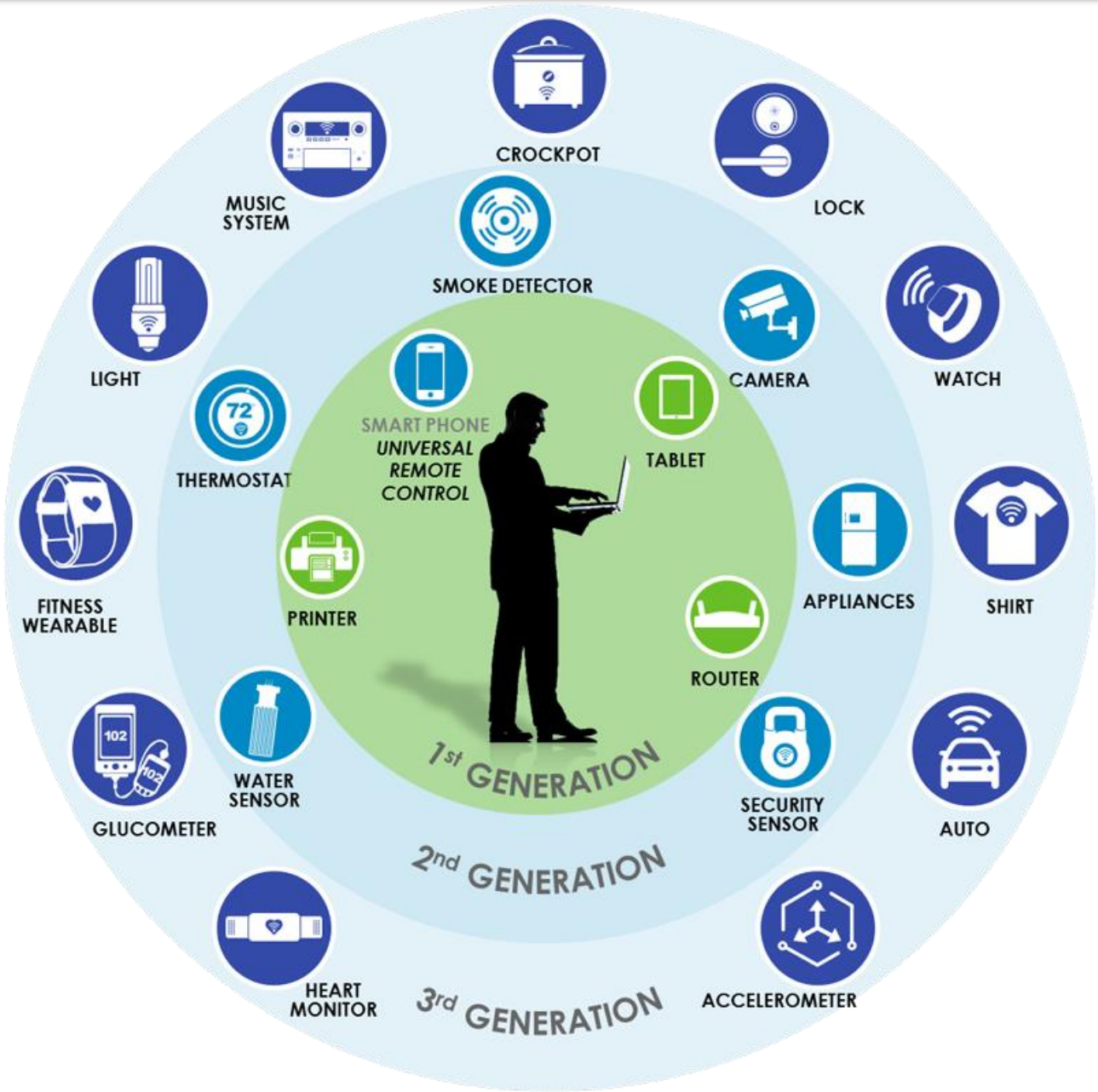
"In the 21st century the technology revolution will move into the everyday, the small and the invisible…"

"The most profound technologies are those that disappear. They weave themselves into the fabrics of everyday life until they are indistinguishable from it."

Mark Weiser (1952 –1999), XEROX PARC

- Small, cheap, mobile processors and sensors
  - in almost all everyday objects
  - on your body ("wearable computing")
  - embedded in environment ("ambient intelligence")

Ubiquitous


CROCKPOT
MUSIC SYSTEM
LOCK
SMOKE DETECTOR
LIGHT
CAMERA
WATCH
THERMOSTAT
SMART PHONE
UNIVERSAL REMOTE CONTROL
TABLET
FITNESS WEARABLE
PRINTER
APPLIANCES
SHIRT
ROUTER
WATER SENSOR
SECURITY SENSOR
AUTO
GLUCOMETER
1st GENERATION
2nd GENERATION
HEART MONITOR
3rd GENERATION
ACCELEROMETER

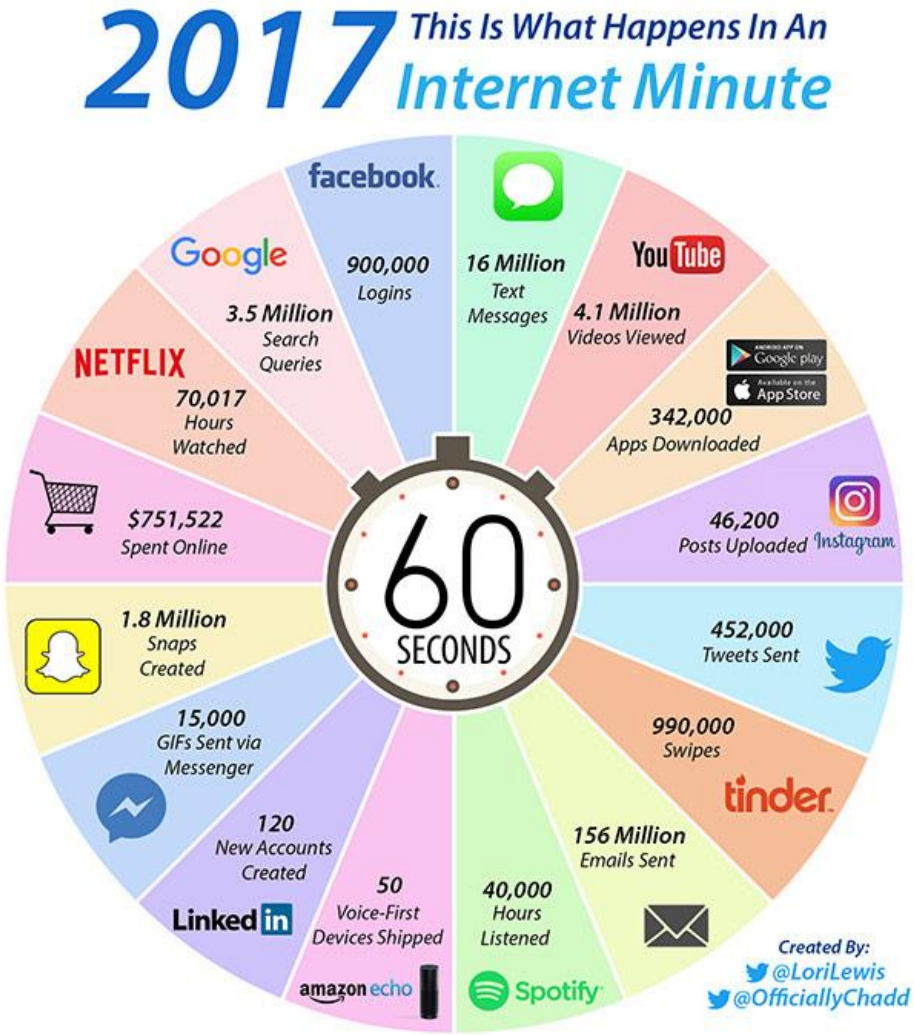
Big Data

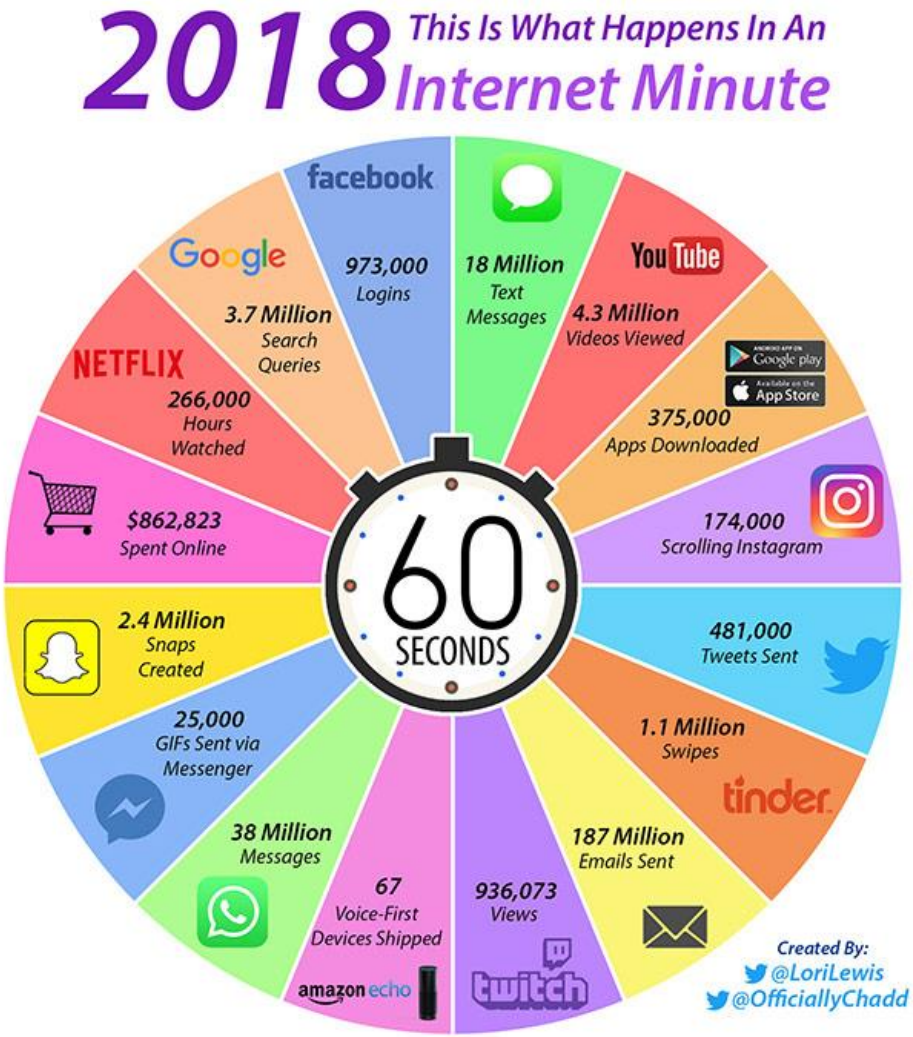
ข้อมูลที่มีปริมาณมหาศาล (Volume) อยู่ในรูปแบบที่หลากหลาย (Variety) และเปลี่ยนแปลงอย่างรวดเร็ว (Velocity) สามารถนำมาใช้วิเคราะห์สังเคราะห์สนับสนุนการวางแผน การตัดสินใจ และตอบสนองความต้องการในการยกระดับคุณภาพชีวิต

Big Data Application

การใช้ประโยชน์จาก Big Data นั้นจะเกี่ยวข้องกับการวิเคราะห์ข้อมูลเพื่อการวางแผนและการตัดสินใจที่ซับซ้อนยิ่งขึ้น สามารถตอบสนองความต้องการรายบุคคลได้แม่นยำมากขึ้น และการเชื่อมโยงข้อมูลจะเป็นอัตโนมัติอย่างสมบูรณ์ยิ่งขึ้น ไม่ได้อาศัยการนำเข้าข้อมูลจากบุคคลแต่เพียงอย่างเดียว แต่จะมีการเชื่อมโยงข้อมูลกับอุปกรณ์ และ Applications ต่างๆในชีวิตประจำวัน

Big Data – Internet Minute





ที่มา : https://jacobsmedia.com/wait-internet-minute/, April 9, 2018.

Big Data – Commercial Value

Internet companies

Selected, 2013

	Total value of transactions, $bn	Active users, m	Spending per second, $	Market value* per user, $	Average spending per user, $
Alibaba† (China)	269	279	9,368	602	1,061
amazon (United States)	116	244	3,691	614	477
ebay (United States)	88	128	2,775	504	684
JD.COM 京东 (China)	21	47	656		
Rakuten (Japan)	16	90	521		

Sources: Company and press reports;
The Economist estimates

ที่มา : http://cdn.static-economist.com/sites/default/files/20140920_GDC111.png

Big Data – In depth Analysis

worldometers

WORLD POPULATION	GOVERNMENT & ECONOMICS	HEALTH
7,510,150,275 Current World Population	**$ 9,770,197,198** Public Healthcare expenditure today	**5,649,003** Communicable disease deaths this year
61,251,329 Births this year	**$ 8,510,008,452** Public Education expenditure today	**3,307,604** Deaths of children under 5 this year
326,023 Births today	**$ 4,083,719,238** Public Military expenditure today	**18,281,030** Abortions this year
25,319,869 Deaths this year	**33,268,083** Cars produced this year	**134,500** Deaths of mothers during birth this year
134,770 Deaths today	**63,274,313**	**39,086,288**
35,931,460 Net populatio		DS this year

4,464,920,271

Google searches today

Big Data – Commercial Value

think with Google™

CONSUMERS SEARCH FOR A VARIETY OF LOCAL INFORMATION

SMARTPHONE

Business hours

Directions to local store

Local store address

COMPUTER/TABLET

Availability of product at local store

Business hours

Local store address

think with Google

Food Trends 2016

Food With a Function

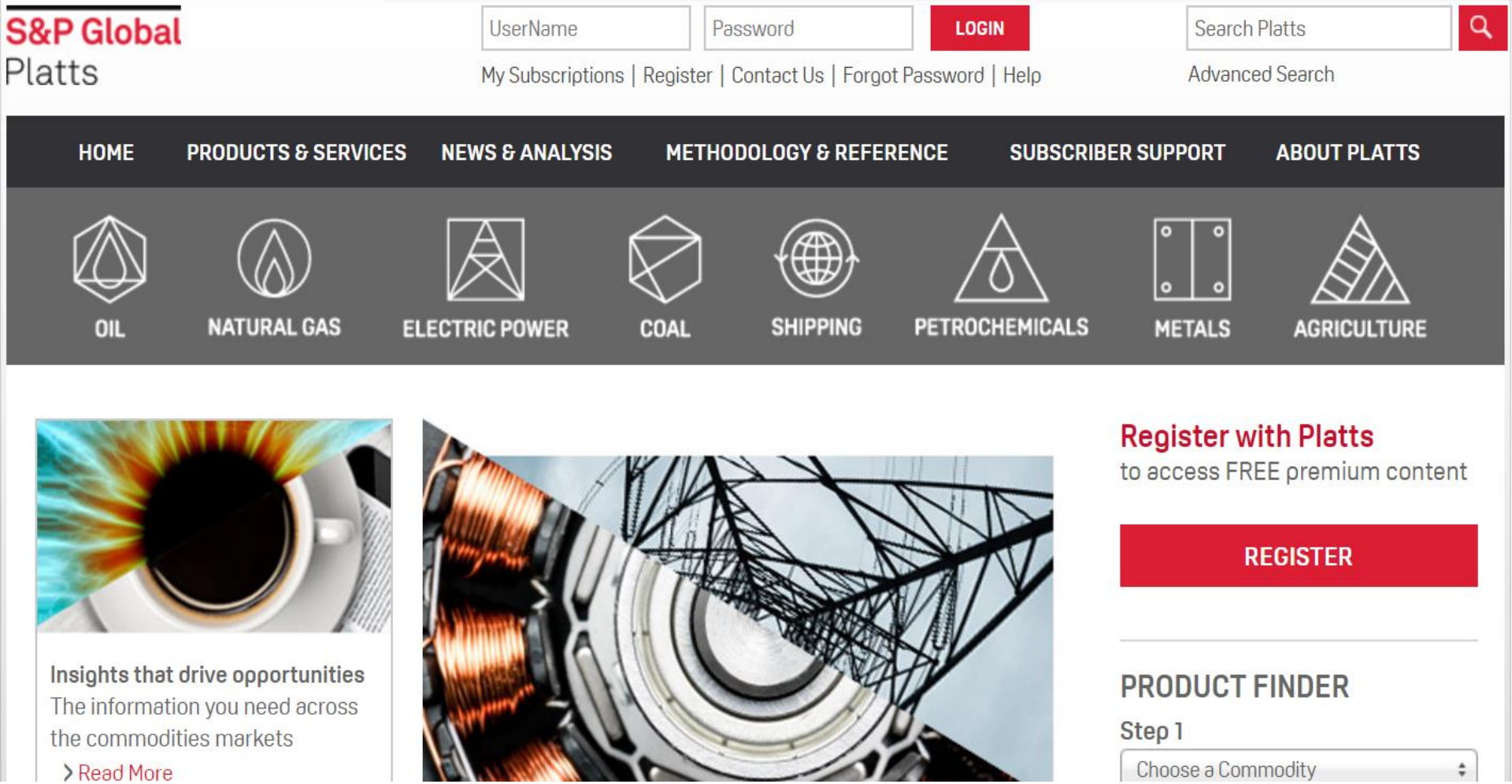
Traveling Through Taste

Experimenting With Pork

Bite-Sized Snacks

The Pasta Comeback

Big Data – In depth Analysis



การเข้าถึงข้อมูล ข่าวสาร และการวิเคราะห์ข้อมูลเชิงลึก เป็นเรื่องสำคัญมากในการบริหารจัดการในอนาคต โดยเฉพาะข้อมูลของสินค้าหรือวัตถุดิบที่มีการเปลี่ยนแปลงตลอดเวลาหรือมีความไม่แน่นอนสูง จะต้องยิ่งให้ความสำคัญเพื่อนำมาลดความเสี่ยงที่อาจจะเกิดขึ้นได้ในอนาคต

The Automation Of Knowledge Work: Rise Of The Machines

BIDNESS ETC

Technological advancements, superfast processors, and more effective sensors have made it easier for computers to replace humans, even in roles where decision making or problem solving is required e.g. doctors.

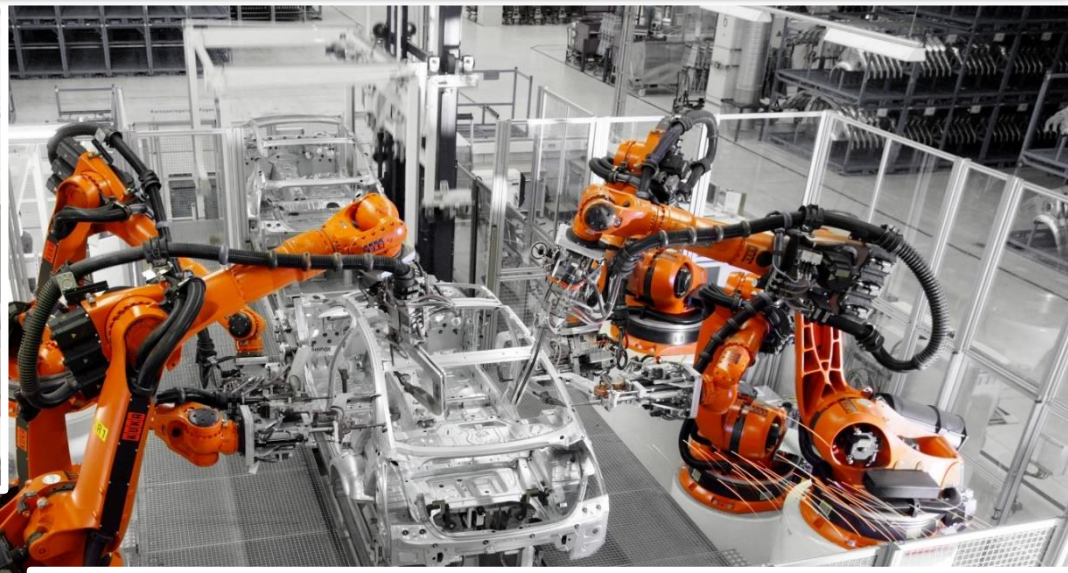
Knowledge work automation can have an impact of up to $7 trillion on many industries.

According to McKinsey, the tasks performed by knowledge work automation tools and systems will equal the output of about 110-140 million full-time employees.

Productivity will improve but the distribution of resources around the world can worsen, and the wealth gap can widen.

Developed countries will benefit by investing in the technology, while underdeveloped economies will become more dependent on developed countries.

Rise of the Bots



Opportunities of machine learning

Rise of the Bots

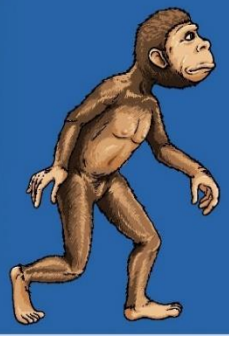
ERROR

Purely reactive

Assumes last year's or last month's demand value will occur again this month

60%

40%



Fits a forecast curve through historical demand quantities

Incorporates seasonality, trend data, and moving averages

Is often done in Excel

50%

50%

Statistically predicts monthly or weekly demand patterns

30%

70%

Hierarchy and causal effects are incorporated into the forecast

Becomes a nightmare to manage in Excel

15%

85%

Leverages more granular and downstream data to get a cleaner demand signal and reduce volatility and bullwhip effect

Includes techniques that are usually associated with short-term demand sensing to dramatically increase long-term accuracy

10%

90%

Takes advantage of extended and even big data to further increase accuracy

Relies on powerful models to consider demand drivers such as promotional details, new product introductions, social media, etc.

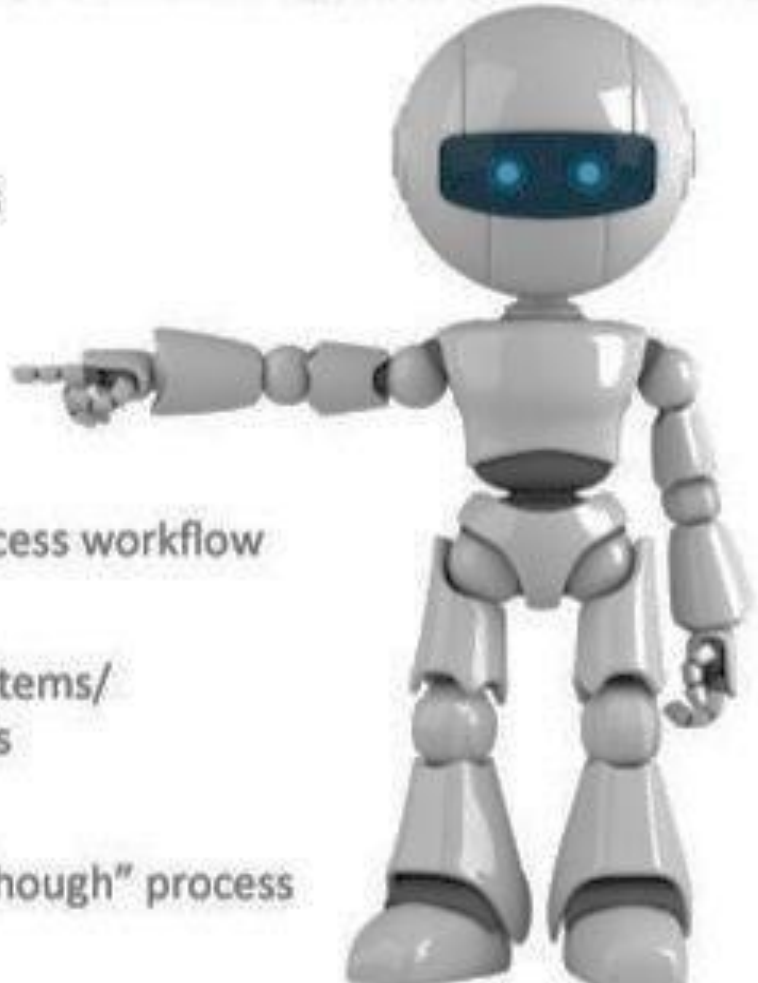
ACCURACY

Why is Robotic Automation Relevant?

What's a Human to Do? Use Robots to Get Smarter.

What are the current or potential impacts of the following process automation attributes on your business?

- 21% Better manage repeatable tasks
- 21% Reduce error rates
- 19% Improve standardization of process workflow
- 14% Reduce reliance on multiple systems/ screens to complete the process
- 11% Create a frictionless, "straight-though" process



Robotic Process Automation - RPA

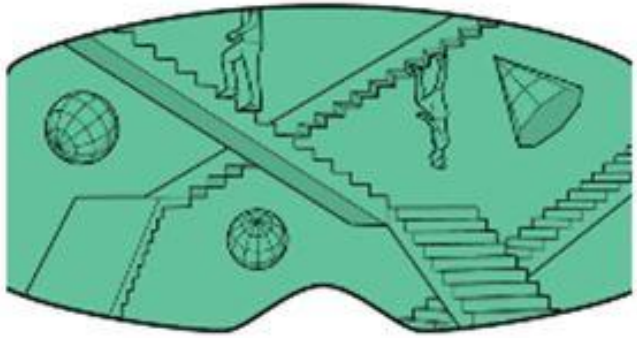
How RDA can influence efficiency?

kleptika

	no impact	low	somewhat	important	significant	very high
	○○○○○	●○○○○	●●○○○	●●●○○	●●●●○	●●●●●

	HEALTHCARE	INSURANCE	UTILITIES	BANKS	TELECOMS	MANUFACTURING
Targeted processes	- reporting auto-mation - claim & billing - reconciliation	- enrollment - claim processing	- account opening - billing - claim manage-ment	- account ope-ning - card activation - fraud claims	- service-desk - ordering process - reporting - enrollment	- billing
Contact Center	●●●○○	●●●●●	●●○○○	●●●●●	●●●●○	●●●○○
Finance & Accounting	●●●●●	●●●●●	●●●●○	●●●●●	●●●●●	●●●●●
Procure-ment	●●○○○	●○○○○	●●○○○	●●○○○	●●●●○	●●●●○
Human Resources	●●●●●	●○○○○	●●○○○	●●○○○	●○○○○	●●○○○

All about reality – VR AR MR XR

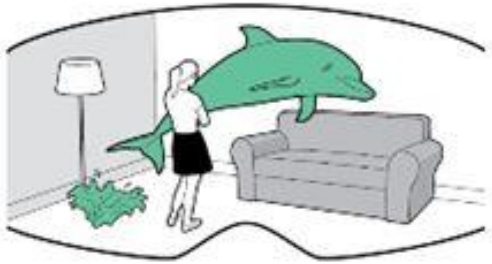


Virtual Reality

VR places the user in another location entirely. Whether that location is computer-generated or captured by video, it entirely occludes the user's natural surroundings.

Augmented Reality

In augmented reality—like Google Glass or the Yelp app's Monocle feature on mobile devices—the visible natural world is overlaid with a layer of digital content.

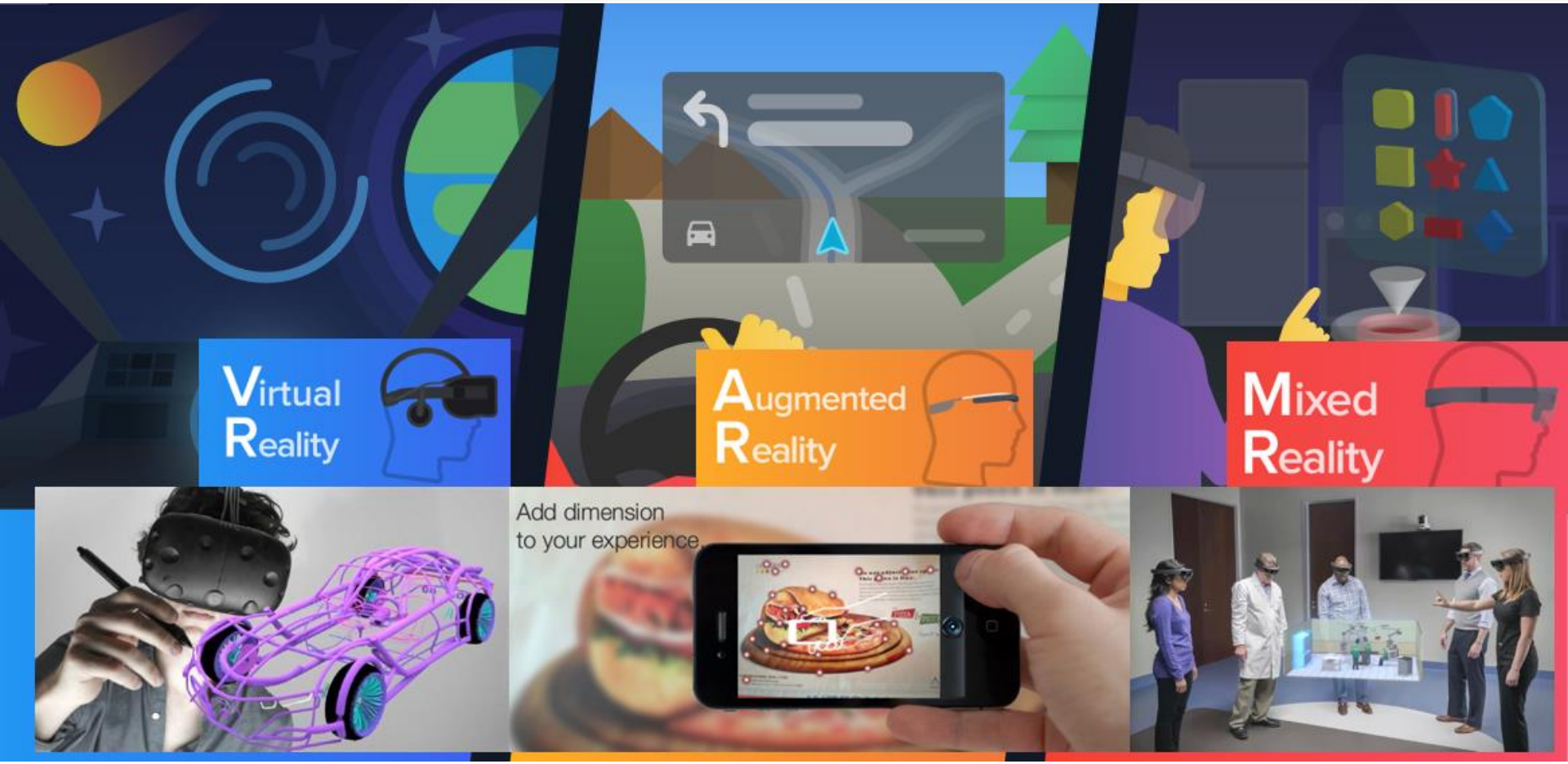


Mixed Reality

In technologies like Magic Leap's, virtual objects are integrated into—and responsive to—the natural world. A virtual ball under your desk, for example, would be blocked from view unless you bent down to look at it. In theory, MR could become VR in a dark room.

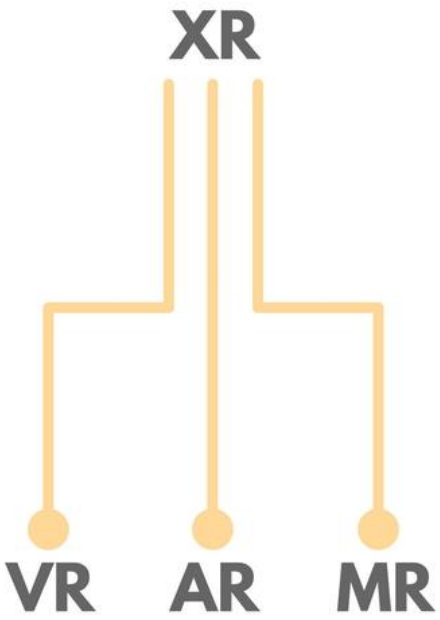
ที่มา : http://www.cloud4every1.com/2018/01/10/just-a-simple-post/

All about reality – VR AR MR XR



ที่มา : http://www.arreverie.com/blogs/ar-vr-mr-arreverie/

Extended Reality



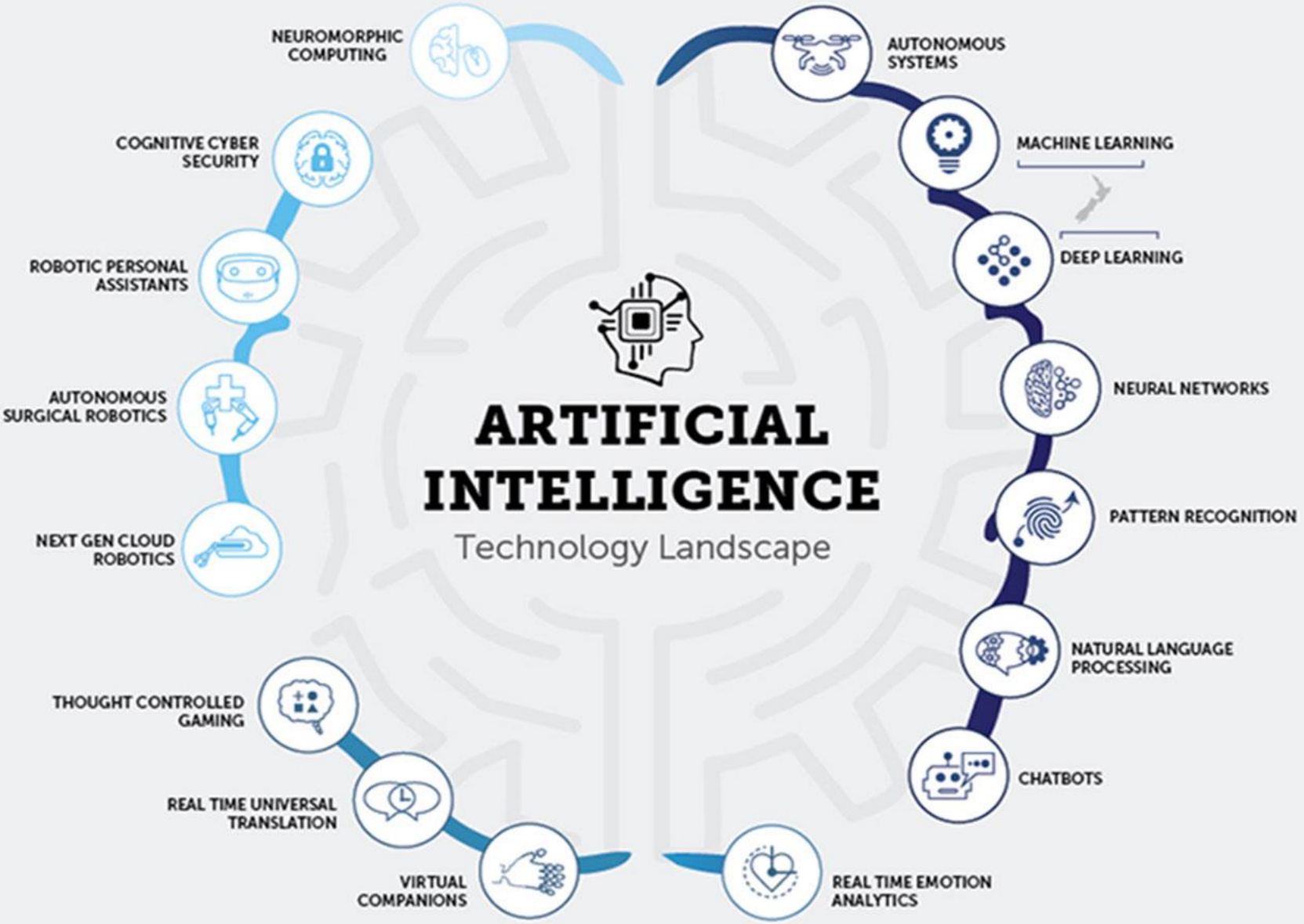
Extended reality (XR) is a term referring to all real-and-virtual combined environments and human-machine interactions generated by computer technology and wearables. It includes representative forms such as augmented reality (AR), augmented virtuality (AV) and virtual reality(VR).

ที่มา : http://www.arreverie.com/blogs/ar-vr-mr-arreverie/

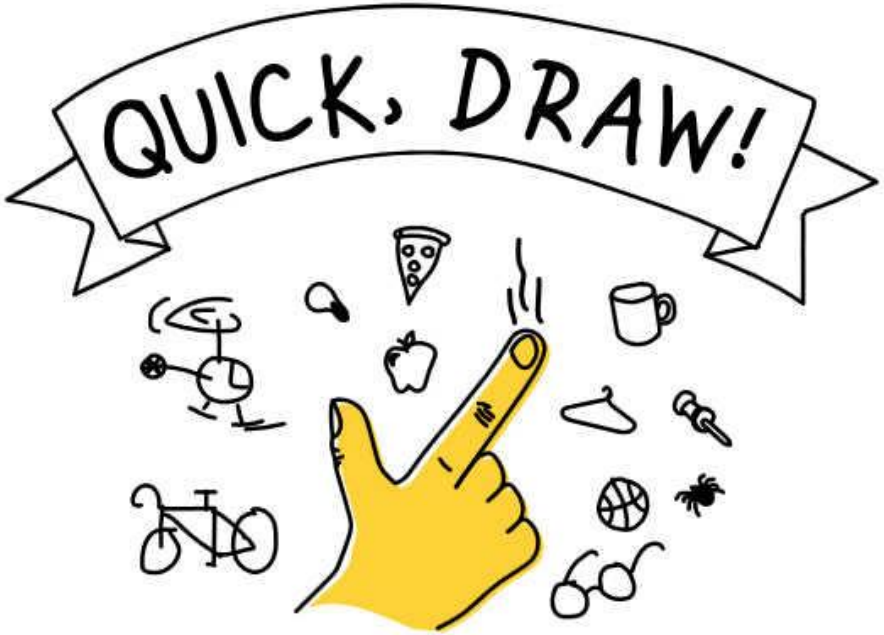
Internet of Things (IoT)

1. Smart Home
2. Wearables
3. Smart City
4. Smart grid
5. Industrial internet
6. Connected car
7. Connected Health
8. Smart retail
9. Smart supply chain
10. Smart farming

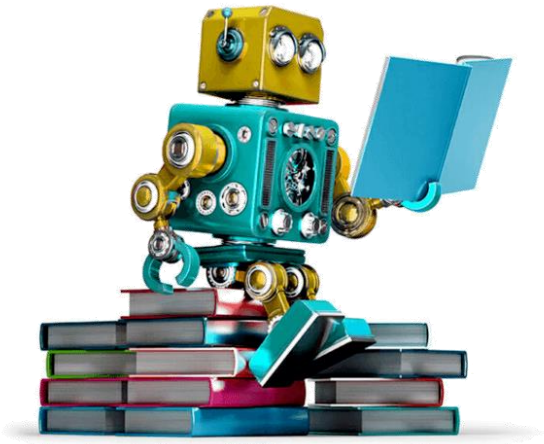
Artificial Intelligence



Artificial Intelligence – Machine Learning



Can a neural network learn to recognize doodles?
See how well it does with your drawings and help teach it, just by playing.



Let's Draw!

Artificial Intelligence – Machine Learning

ARTIFICIAL INTELLIGENCE

Early artificial intelligence stirs excitement.

MACHINE LEARNING

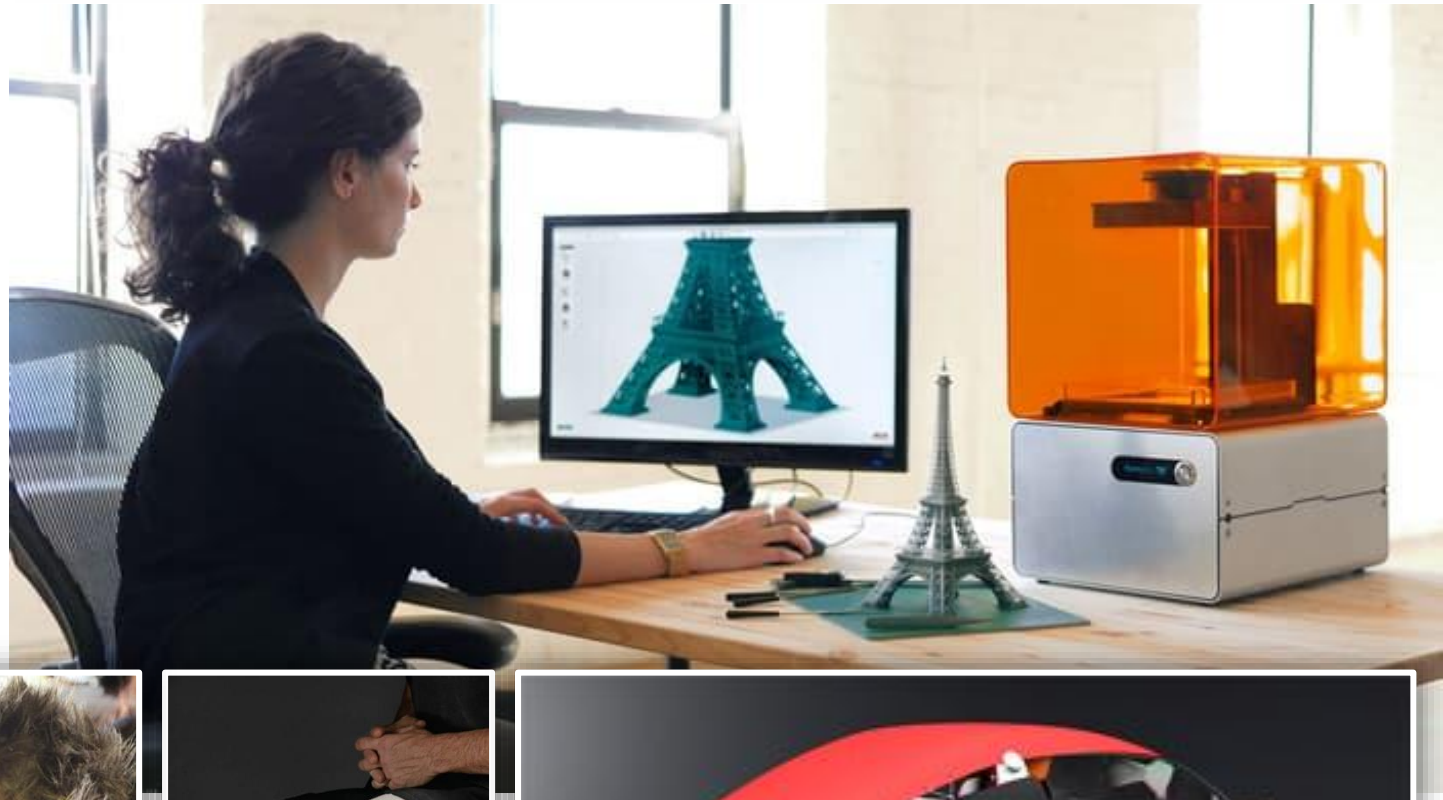
Machine learning begins to flourish.

DEEP LEARNING

Deep learning breakthroughs drive AI boom.

1950's 1960's 1970's 1980's 1990's 2000's 2010's

3-D Printing



Energy Innovation – Smart Grid

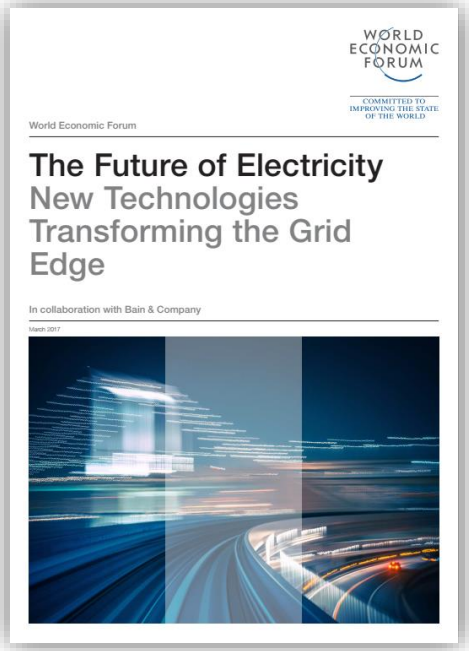
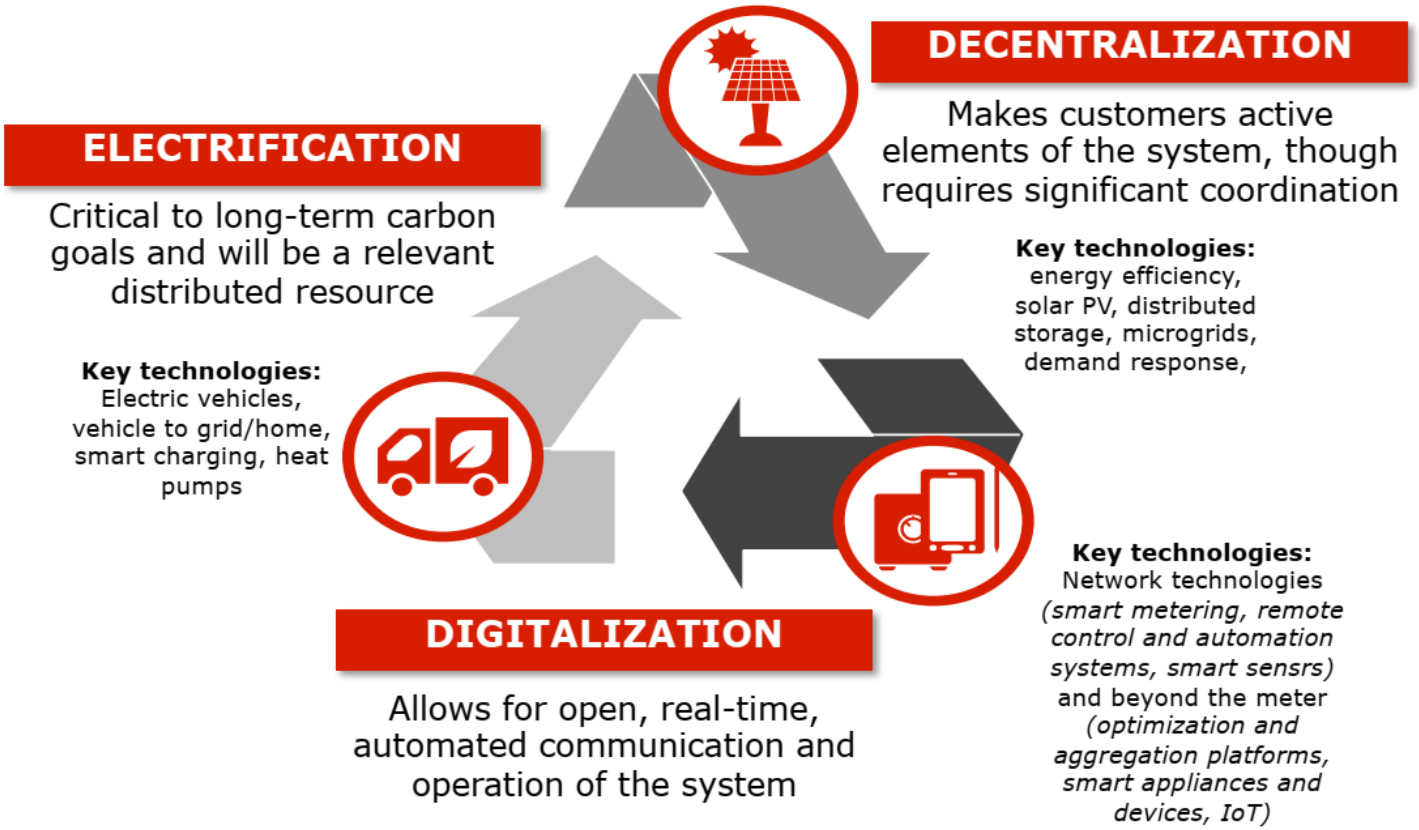


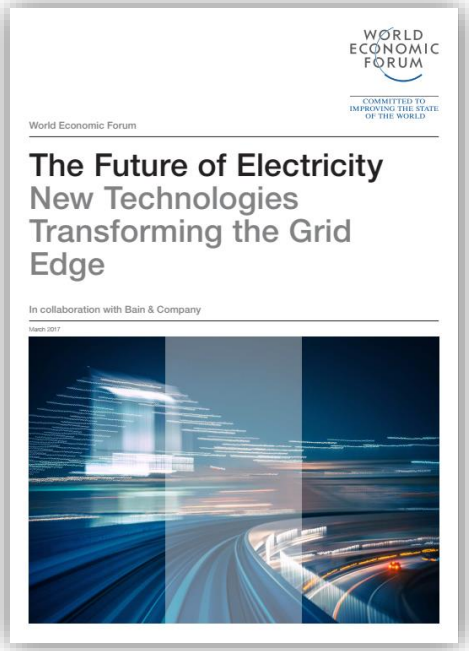
Figure 1: Three trends of the grid edge transformation

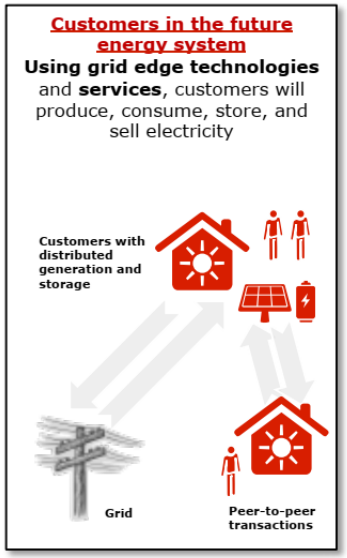


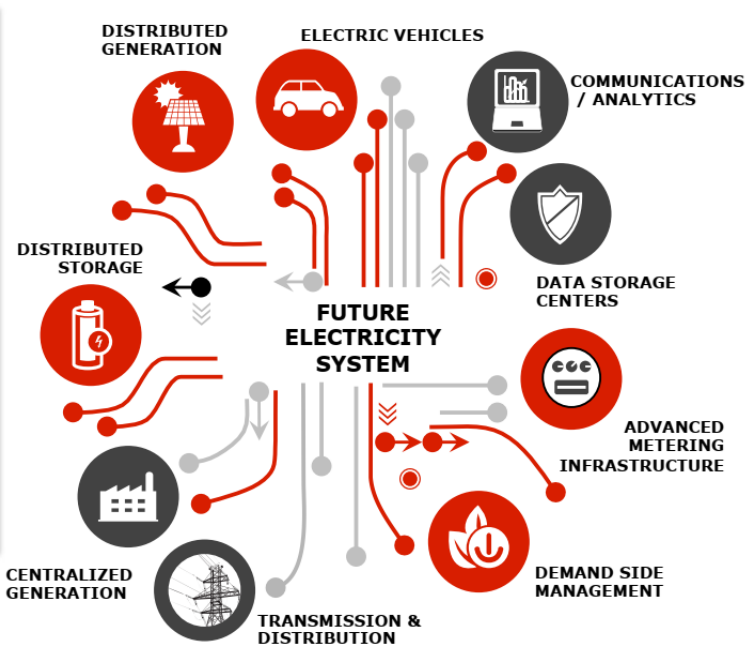
The electricity system is in the midst of a transformation, as technology and innovation disrupt traditional models from generation to beyond the meter. Three trends in particular are converging to produce game-changing disruptions:

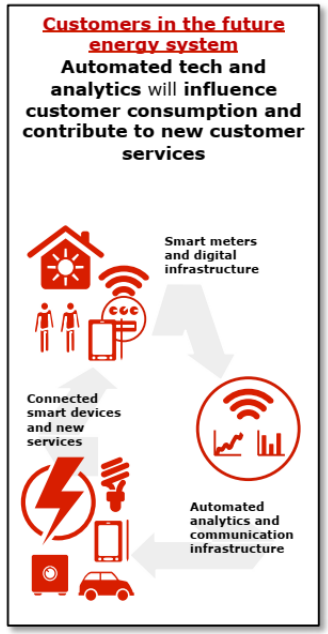
- **Electrification** of large sectors of the economy such as transport and heating
- **Decentralization**, spurred by the sharp decrease in costs of distributed energy resources (DERs) like distributed storage, distributed generation, demand flexibility and energy efficiency
- **Digitalization** of both the grid, with smart metering, smart sensors, automation and other digital network technologies, and beyond the meter, with the advent of the Internet of Things (IoT) and a surge of power-consuming connected devices

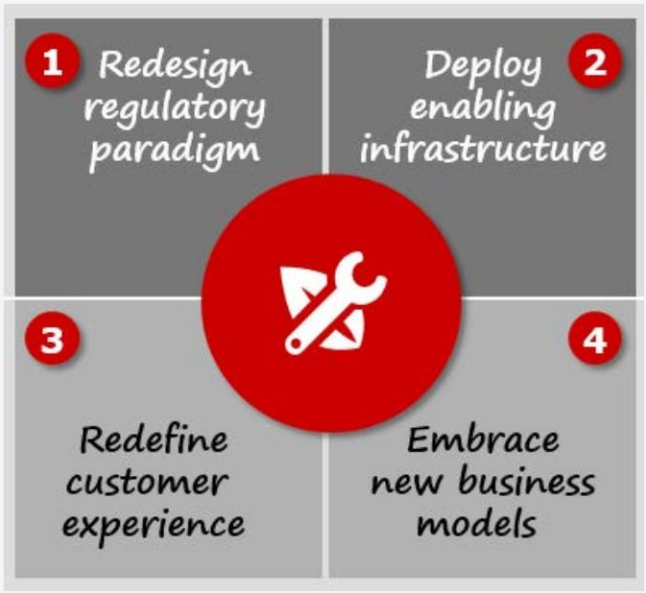
Energy Innovation – Smart Grid

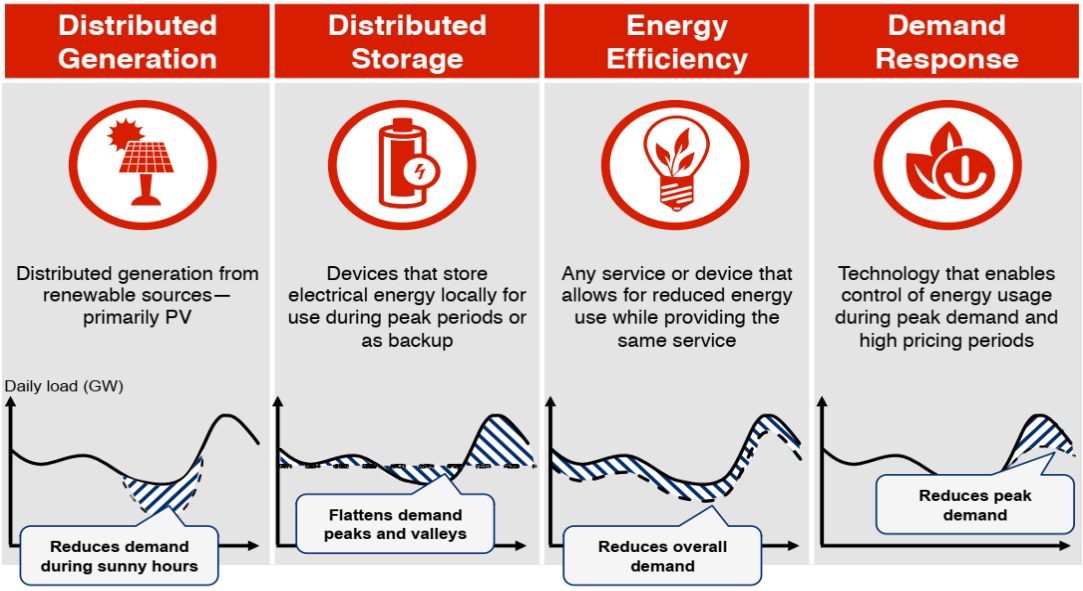




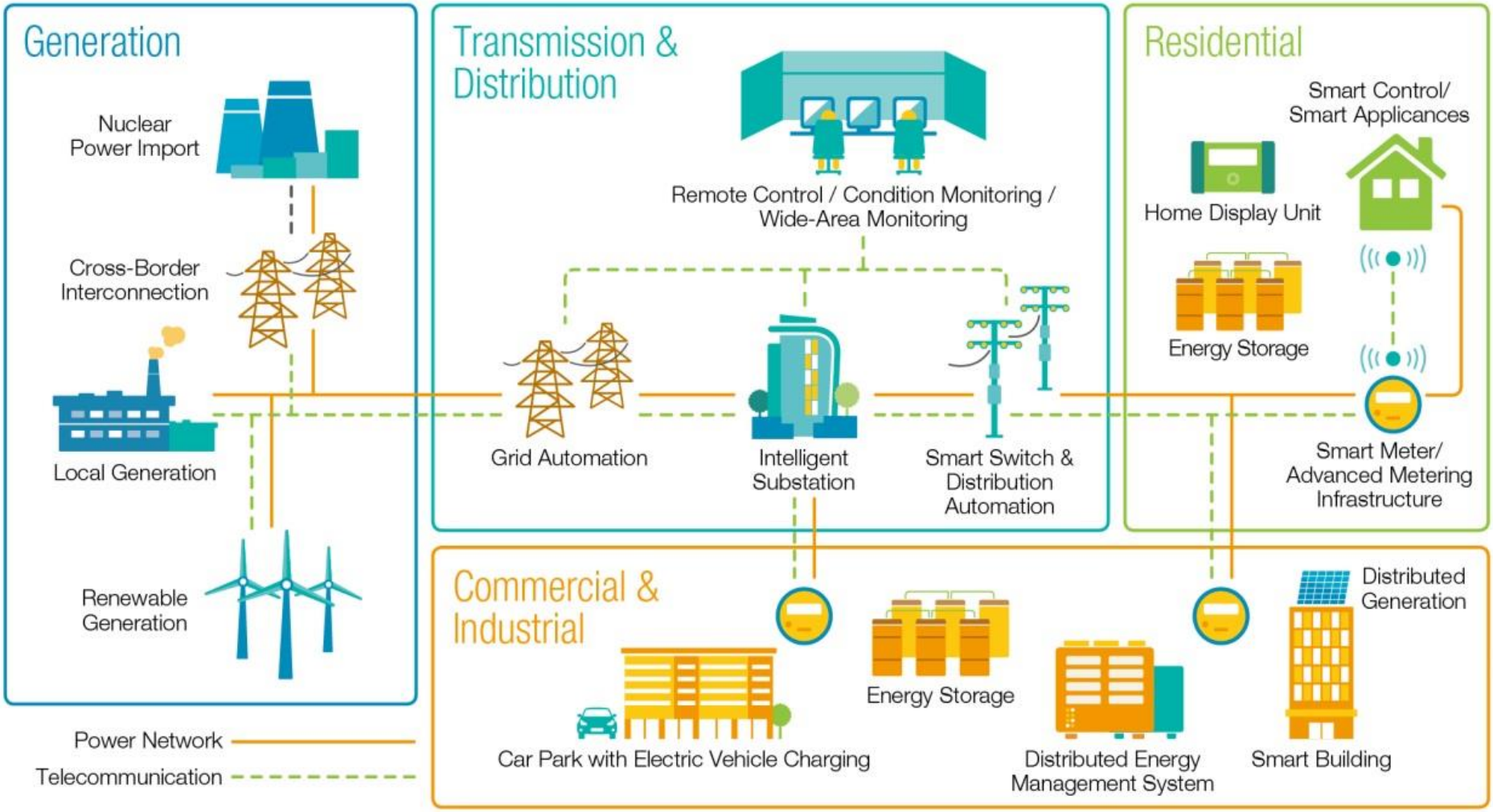




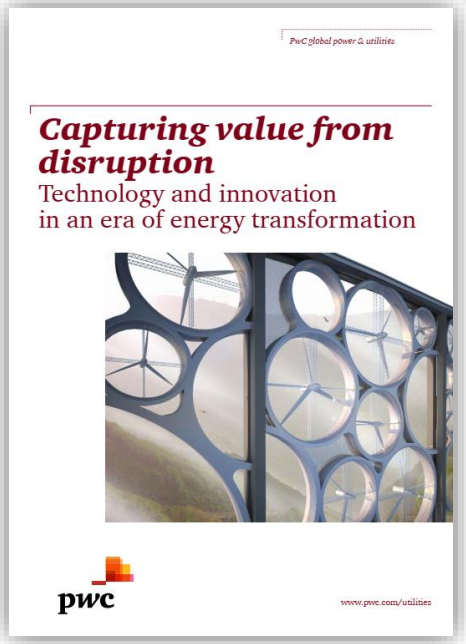


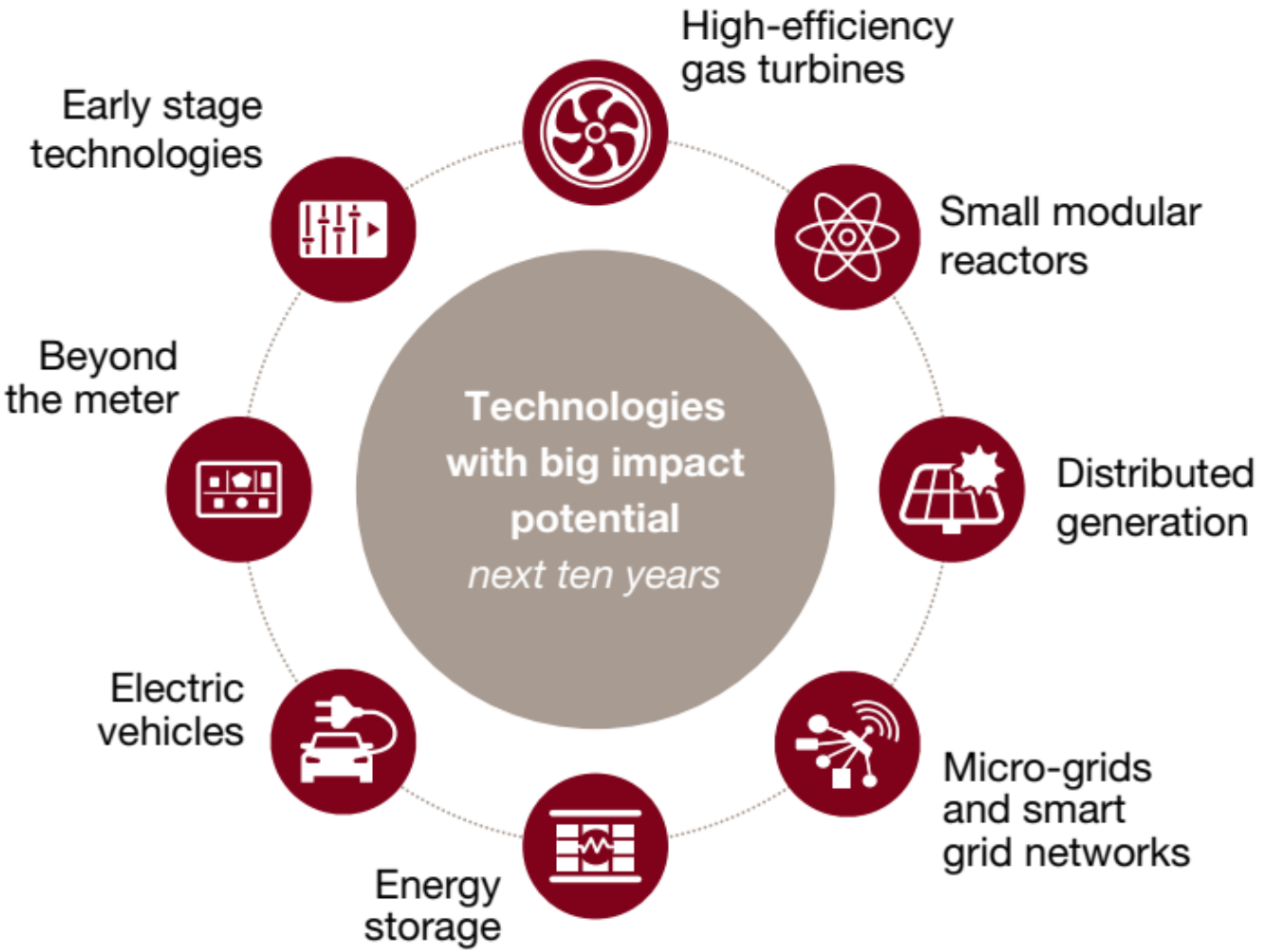


Energy Innovation – Smart Grid



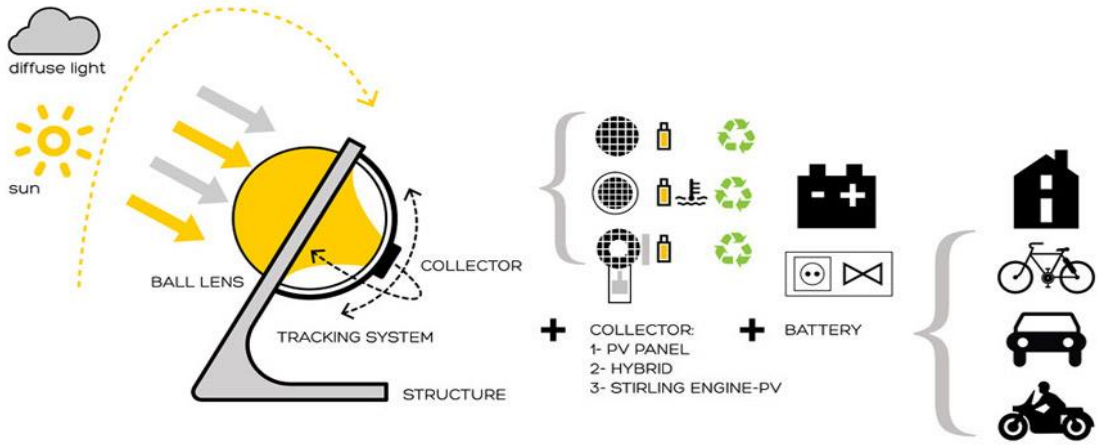
Energy Innovation





Energy Innovation

German Architect Andre Broessel believes he has a solution that can “squeeze more juice out of the sun”, even during the night hours and in low-light regions. His company Rawlemon has created a spherical sun power generator prototype called the beta.ray. His technology will combine spherical geometry principles with a dual axis tracking system, allowing twice the yield of a conventional solar panel in a much smaller surface area.



Energy Innovation – Wind Lenses

The wind lens is a modification on the wind turbine created by Professor Ohya from the Kyushu University as an attempt to be more efficient in production of electricity and less invasive to both humans and nature. While still in progress, the wind lens has a few changes in design which have led to impacts on how wind energy can be used and harnessed while changing how it impacts the world around us.

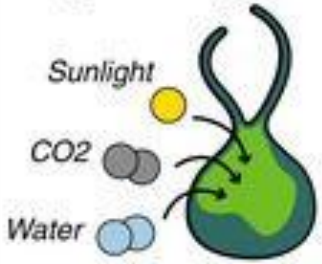
Energy Innovation –Algae Fuel

Biodiesel from algae

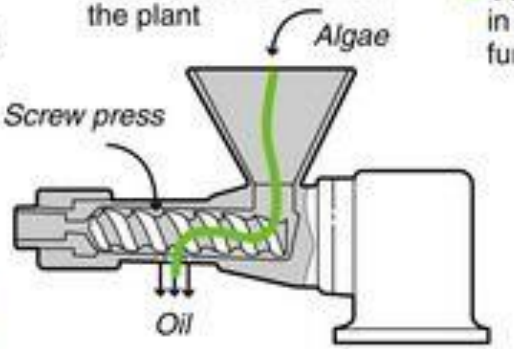
High oil prices and advances in biotech over the past decade have refueled the algae biofuel race.

The process

1 **After initial growth, algae is deprived of nutrients to produce a greater oil yield**



2 **Extraction of oil**
A press produces 70-75% of the oils from the plant



3 **Solvents used to separate sugar from oil;** solvents then evaporate

4 **Oil is ready**
Can be used as oil directly in diesel engines or refined further into fuel

Yield of various plant oils

(Gallons per hectare)

Soy	118
Safflower	206
Sunflower	251
Castor	373
Coconut	605
Palm	1,572
Algae	26,417

About algae

- Among the fastest growing plants; about 50% of their weight is oil
- Contains no sulfur; non toxic; highly biodegradable
- Algae fuel is also known as algal fuel or oilgae

Source: oilgae.com, MCT Photo Service
Graphic: Scott Bell

ที่มา : The 2010-2020 World Outlook for BioFuels, Wilson Jordão Filho, 2010.

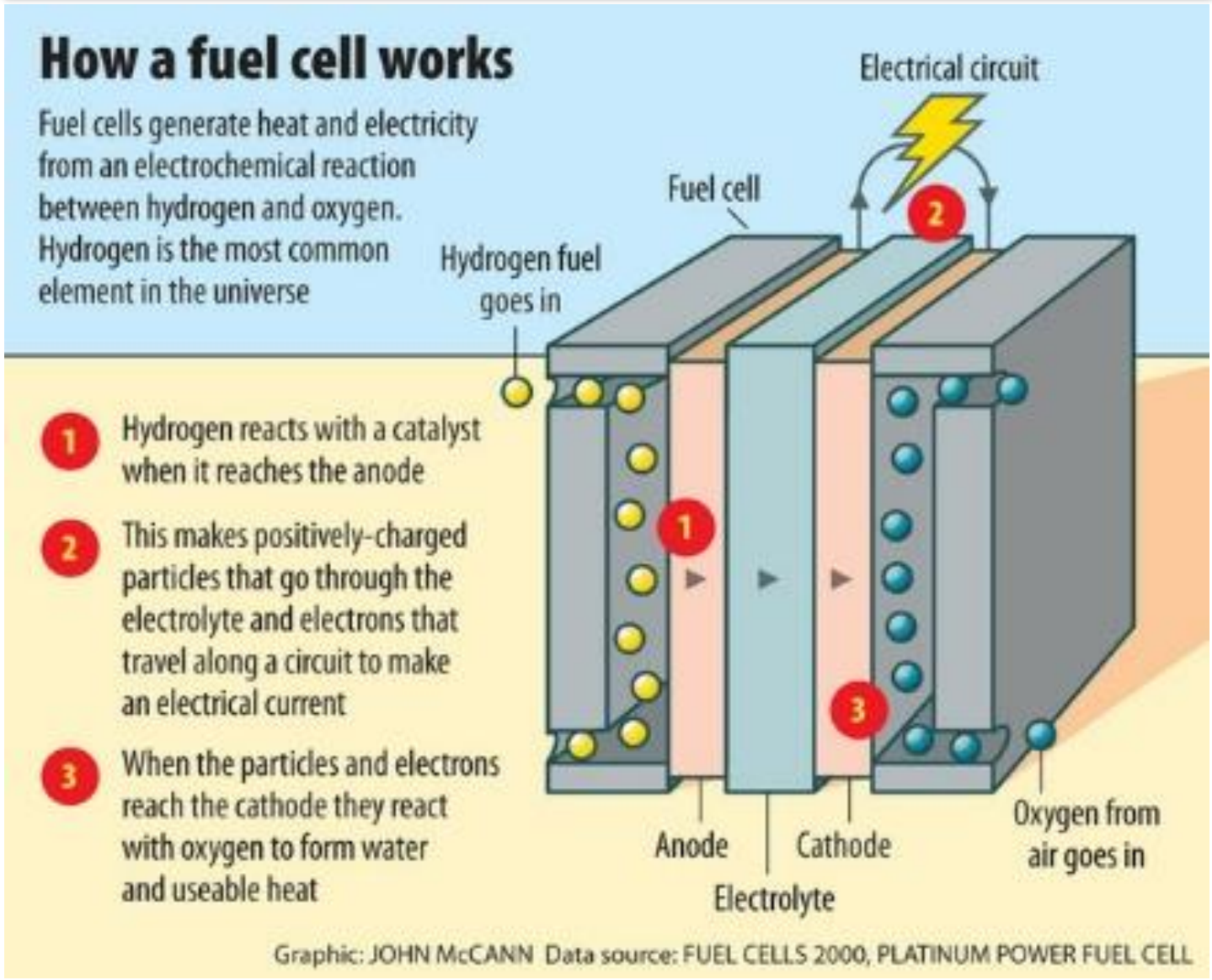
Energy Innovation –Algae Fuel

Influx_Studio Wants to Turn Chicago's Marina City Into an Algae-Producing CO2-Scrubbing Powerhouse

ที่มา : https://inhabitat.com/influx_studio-wants-to-turn-chicagos-marina-city-into-an-algae-producing-co2-scrubbing-powerhouse/

Energy Innovation – Fuel Cell

A fuel cell is a device that converts chemical potential energy (energy stored in molecular bonds) into electrical energy. A PEM (Proton Exchange Membrane) cell uses hydrogen gas (H_2) and oxygen gas (O_2) as fuel. The products of the reaction in the cell are water, electricity, and heat.

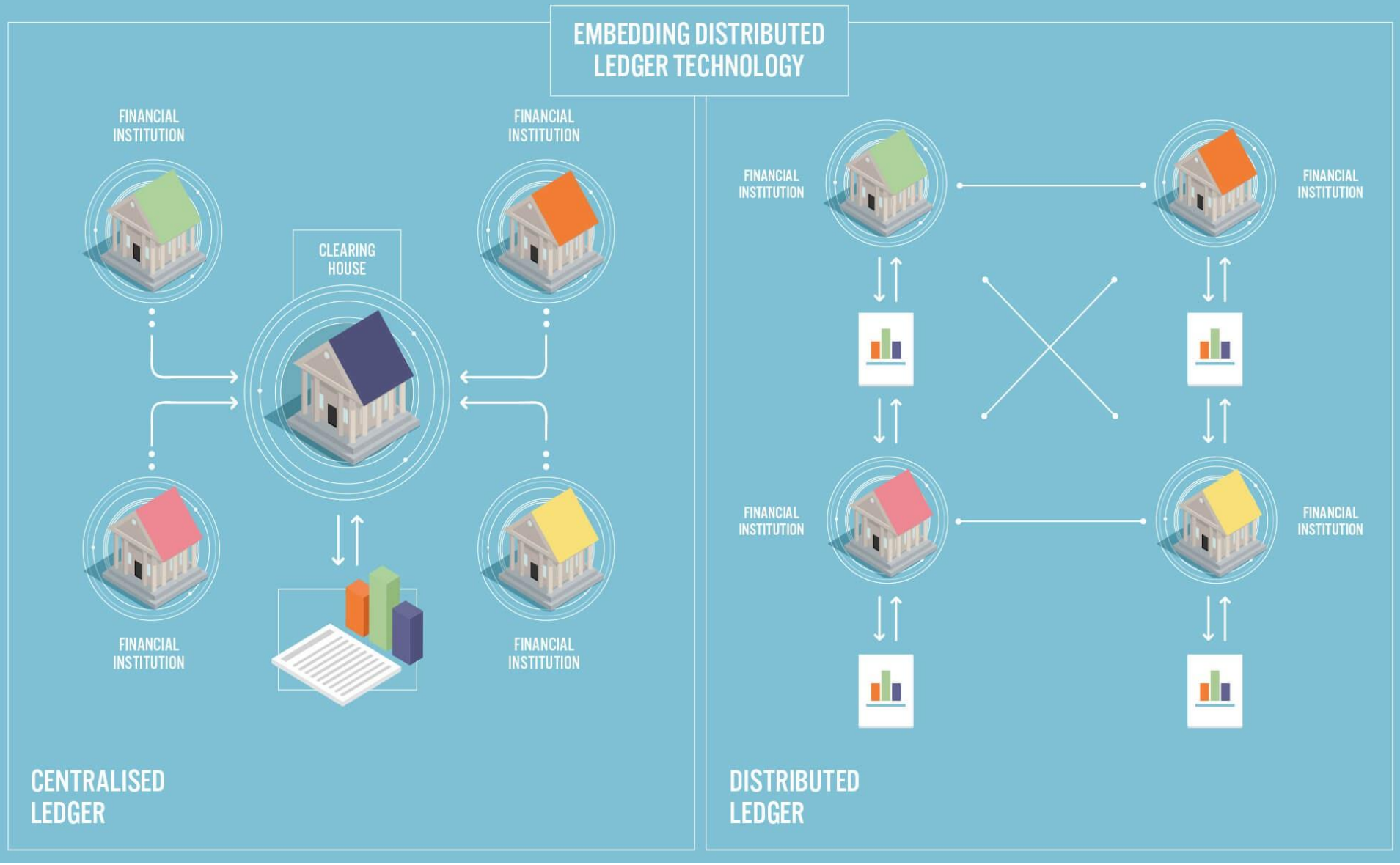


Energy Innovation – Road Charging

ROAD CHARGING

Equipment installed beneath the road surface could soon be wirelessly charging EV vehicles as they travel along UK motorways.

Fin Tech – Distributed Ledger Technology



ที่มา : https://codeburst.io/distributed-ledger-technology-fundamentals-you-must-know-2d0f82628258

HOW BLOCKCHAIN WORKS

"A Blockchain is a cloud based database shared by every participant in a given system, in the case of this exemplar, its a currency trade. The Blockchain contains the complete transaction of the cryptocurrency or other record keeping in other applications. Think of it as a cloud based peer to peer ledger."

1. **Alice** wants to **send** money to **Ben**

2. The first **Block** is created online and represents **the transaction**

3. This Block is **broadcast** to every party in the network

4. Those in the network approve the **transaction** and validate it

5. The Block is then added to the Chain which provides a permanent, nonrepudiable and **transparent record of the transaction**

6. **Ben receives** the money from **Alice**

MENU CNBC

BITCOIN

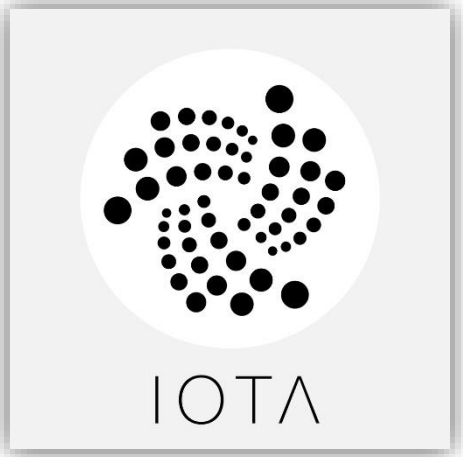
Bitcoin swoons 10% after news of South Korea crypto exchange hack, leading a broad cryptocurrency selloff

- Coinrail, a relatively small South Korean cryptocurrency exchange, tweeted over the weekend that it was hacked, according to Google Translate.
- Bitcoin fell more than 10 percent to a low of $6,647.33, its lowest since April 9, according to CoinDesk's bitcoin price index.
- The decline followed a report on Friday from The Wall Street Journal that U.S. regulators are investigating potential price manipulation at four major cryptocurrency exchanges.

Evelyn Cheng | @chengevelyn

Published 8:09 PM ET Sun, 10 June 2018 | Updated 19 Hours Ago

Fin Tech – IOTA



OTA is an open source cryptocurrency founded in 2015 by Anders Sønstebø and Serguei Popov. It runs on a system called "The Tangle", a form of directed acyclic graph (DAG) applied to a distributed ledger protocol. IOTA allows for free transactions on a decentralized network without the need for miners, blocks and chains. IOTA therefore significantly diverges from bitcoin and other blockchain based cryptocurrencies.

5 Stages of Disruption

D/SRUPTION

disruptionhub.com

THE FIVE STAGES OF DISRUPTION

1

THE KODAK MOMENT

Kodak was fatally slow in recognising the camera market's rapid switch to digital. The killing blow was the rapid wholesale destruction of its consumables business - film. Declining camera sales hastened the end but it was this collapse of film and processing that finished them off.

2

INTERNET INFRASTRUCTURE

From the late '90s, huge sums of money poured into building internet infrastructure but by the late noughties, the market was wondering where the revenues (let alone the profits) were. The answer was such a resounding "don't know" that the bubble burst and market valuations were massively reduced. Disruption had been disrupted.

3

DISRUPTIVE BUSINESS MODELS

In itself, Uber's technology is not particularly innovative. However, the company's 'zero marginal cost' benefit allows a 'delivery for everything' model with no noticeable incremental costs to itself, allowing other businesses such as restaurant booking services to add Uber to the package. It's horizontal integration with no marginal cost, and technology + zero marginal cost = scaleable disruption.

4

IOT AND ARTIFICIAL INTELLIGENCE

The Internet of Things will soon provide an end-to-end view of a product, from manufacture and distribution through to retail and use. At the very least, this'll save costs by matching production to consumption and reducing needless transport. Data analysis by artificial intelligence will also spot patterns invisible to humans, enhancing consumer engagement.

5

THE ADOPTION CURVE

Adoption curves are becoming steeper. Ten years ago, virtual reality had virtually no users before Oculus Rift interested people in the technology but not its $300 price tag. Spotting the opportunity, Google widely launched Google Cardboard, a $5 box that turns a smartphone into a VR headset, paving the way for a more profitable Google product down the line.

These same five principles can be seen happening across numerous business sectors. Value and profit become entrenched in the data sets held by the industry leaders, moving revenue away from where it's traditionally been made. Such a profound shift can and does create social change as AI has and will continue to create unemployment in previously 'safe' sectors.

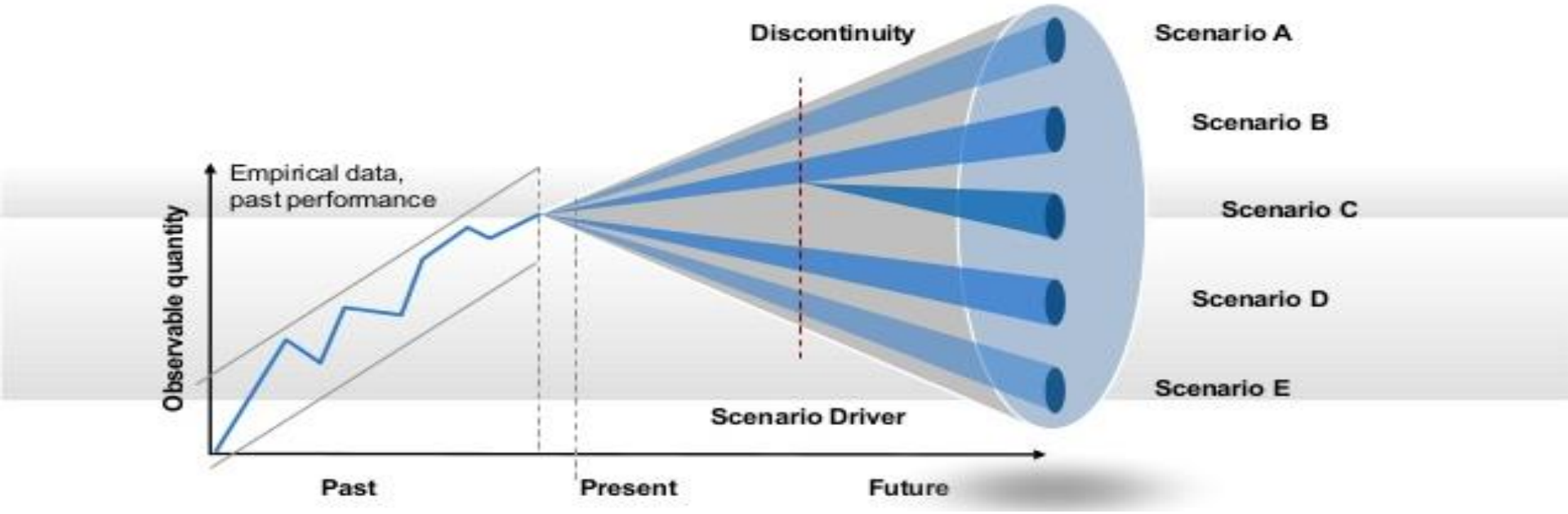
THE DISRUPTION OF DISRUPTION ISN'T OVER YET...

disruptionhub.com

ที่มา : https://disruptionhub.com/five-stage-tech-disruption/

Scenario Analysis

Visions, utopias and future plans



เหตุการณ์ในอดีตช่วยให้เราสามารถคาดเดาหรือพยากรณ์แนวโน้มที่อาจจะเกิดขึ้นได้ในระยะสั้นๆ และทำให้เราทราบถึงว่ามีปัจจัยอะไรบ้างที่เป็นตัวขับเคลื่อนสำคัญของเหตุการณ์ที่จะเกิดขึ้นในอนาคต อย่างไรก็ดีในระยะปานกลางหรือระยะยาว เราอาจจะไม่สามารถพยากรณ์ได้ว่าอะไรจะเกิดขึ้นได้อย่างแน่นอนนัก แต่เราก็พอจะสามารถคาดเดาอย่างมีระบบได้ว่าน่าจะเกิดอะไรขึ้นได้บ้างในอนาคต

Scenario Analysis

Future Lab

สำรวจอนาคต

Future Scanning:
ติดตาม คาดการณ์แนวโน้มและความผันผวนของโลกและไทยในทุกมิติ

- Trend Analysis
- Trend Monitoring
- Trend Projection
- Model and Simulation
- Consulting Experts
- Polling
- Delphi
- Brainstorming

Scenario Planning:
จัดทำฉากทัศน์อนาคตของไทยและในวาระที่สำคัญ

- Weak Signal
- Driving Force
- Forecasting and Backcasting
- Future Wild Cards
- Scenario Building

Future Consultation:
ขับเคลื่อนให้องค์กรต่าง ๆ พร้อมรับอนาคต

- Workshop
- Coaching
- Training
- Conferences
- Publications

ตัวอย่างหน่วยงานในต่างประเทศ

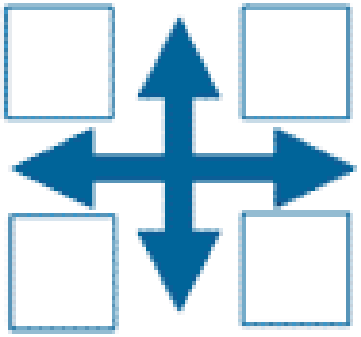
- Sweden: Council on the Future, Minister of the Futures
- Singapore: Centre for Strategic Futures
- Korea: Ministry of Science, ICT and Futures Planning
- UAE: Ministry of Cabinet Affairs and Future

Scenario Analysis

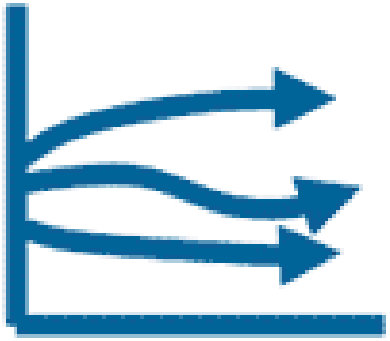
Identify Driving Forces

Identify Critical Uncertainties

Develop Plausible Scenarios



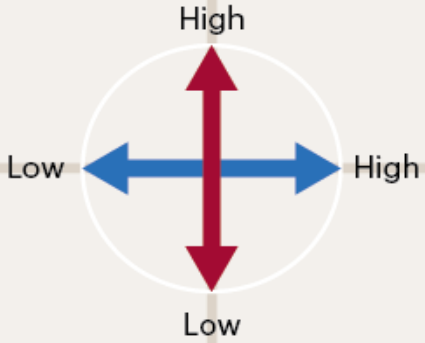
Discuss Implications & Paths



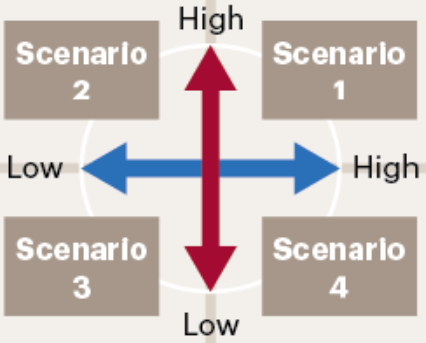
1. Identify potential drivers

2. Select two key drivers

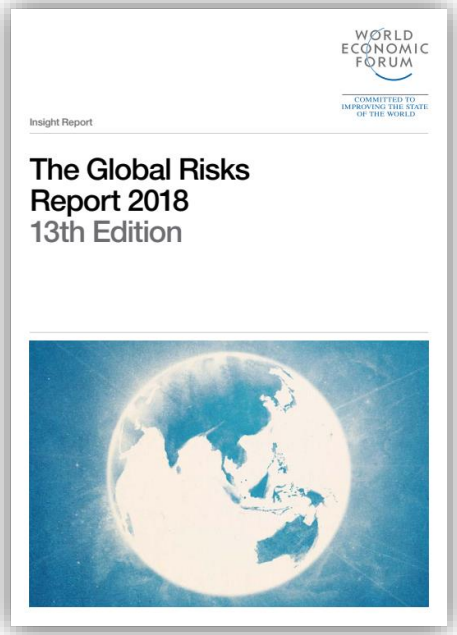
3. Define polar outcomes



4. Create scenarios based on interactions



Global Risks



Top 10 risks in terms of Likelihood

1. Extreme weather events
2. Natural disasters
3. Cyberattacks
4. Data fraud or theft
5. Failure of climate-change mitigation and adaptation
6. Large-scale involuntary migration
7. Man-made environmental disasters
8. Terrorist attacks
9. Illicit trade
10. Asset bubbles in a major economy

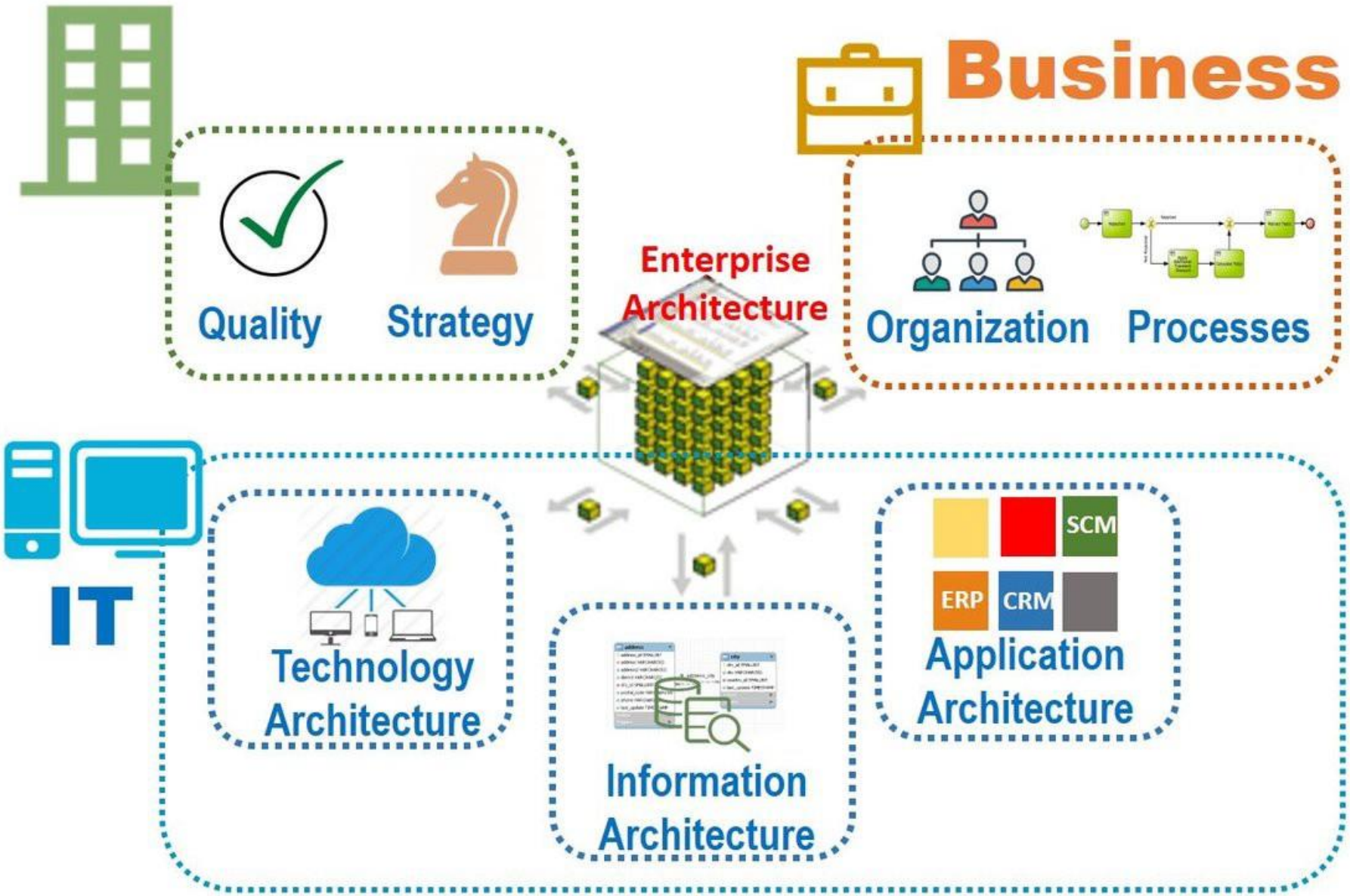
Top 10 risks in terms of Impact

1. Weapons of mass destruction
2. Extreme weather events
3. Natural disasters
4. Failure of climate-change mitigation and adaptation
5. Water crises
6. Cyberattacks
7. Food crises
8. Biodiversity loss and ecosystem collapse
9. Large-scale involuntary migration
10. Spread of infectious diseases

Top 5 Global Risks in Terms of Likelihood

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
1st	Asset price collapse	Asset price collapse	Asset price collapse	Storms and cyclones	Severe income disparity	Severe income disparity	Income disparity	Interstate conflict with regional consequences	Large-scale involuntary migration	Extreme weather events	Extreme weather events
2nd	Middle East instability	Slowing Chinese economy (<6%)	Slowing Chinese economy (<6%)	Flooding	Chronic fiscal imbalances	Chronic fiscal imbalances	Extreme weather events	Extreme weather events	Extreme weather events	Large-scale involuntary migration	Natural disasters
3rd	Failed and failing states	Chronic disease	Chronic disease	Corruption	Rising greenhouse gas emissions	Rising greenhouse gas emissions	Unemployment and underemployment	Failure of national governance	Failure of climate-change mitigation and adaptation	Major natural disasters	Cyberattacks
4th	Oil and gas price spike	Global governance gaps	Fiscal crises	Biodiversity loss	Cyber attacks	Water supply crises	Climate change	State collapse or crisis	Interstate conflict with regional consequences	Large-scale terrorist attacks	Data fraud or theft
5th	Chronic disease, developed world	Retrenchment from globalization (emerging)	Global governance gaps	Climate change	Water supply crises	Mismanagement of population ageing	Cyber attacks	High structural unemployment or underemployment	Major natural catastrophes	Massive incident of data fraud/theft	Failure of climate-change mitigation and adaptation

Enterprise Architecture



ที่มา : https://medium.com

Digital Transformation on Foundational Platforms

Legacy Enterprise IT


data center


waterfall


silos

IT as overhead


process-driven


operations

Focus on

- Automation of Business
- Operations and Functional Silos
- Legacy Business Models
- Discrete, Separate Touchpoints
- Systems of Record
- Irregular, Periodic Change
- Emphasis on Service Delivery
- Centralized IT


change platform and model

+


target IT platform(s) for transformation

+


change agents at center + edge

digital transformation

Digital Enterprise


cloud


agile + devops


ecosystem


IT for revenue


data-driven

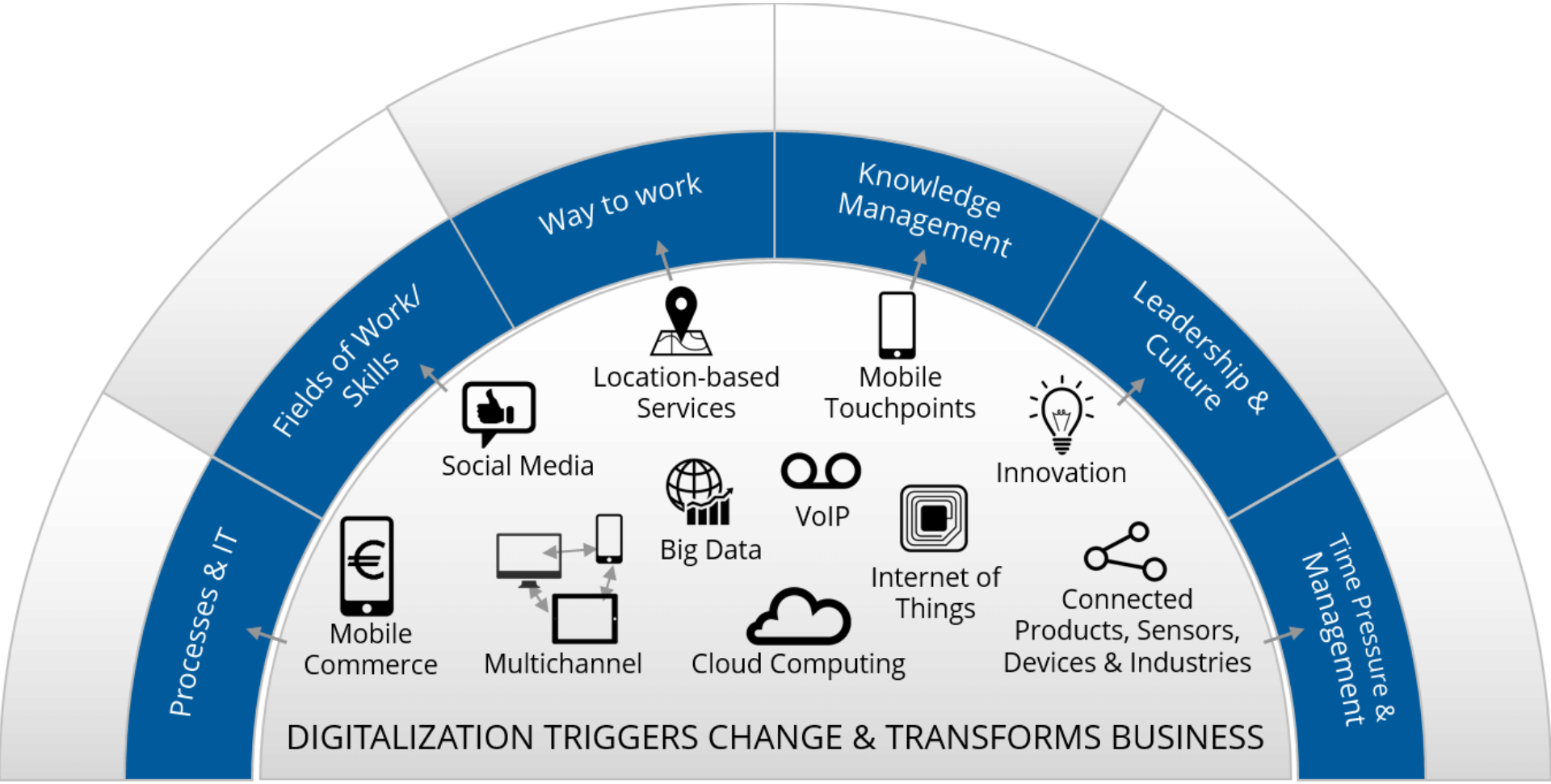

change processes

Focus on

- Digitization Transformation of Business
- Customers, Products, and Data
- Digital Business Models
- Seamless Omnichannel
- Systems of Engagement
- Continuous Everything
- Emphasis on Digital Experience
- Decentralized IT (everyone is in IT)

From http://zdnet.com/blog/hinchcliffe on ZDNet. by Dion Hinchcliffe

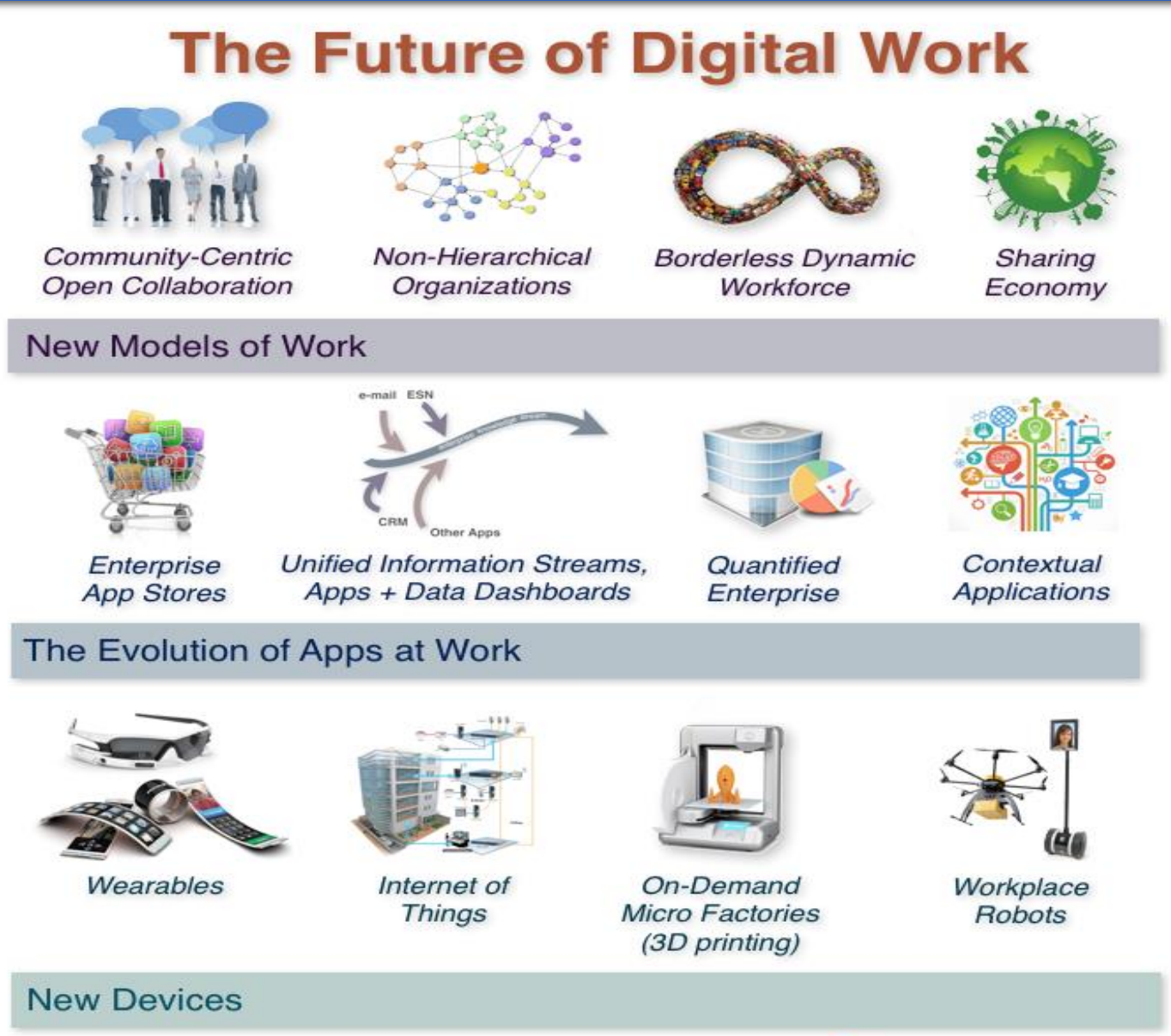
Digital Transformation



Digital Transformation คือการที่องค์กรจะต้องปรับเปลี่ยนและปรับปรุงองค์กรในหลากหลายมิติทั้งในเรื่องของการบริหารจัดการ กระบวนการทำงาน วิธีการทำงาน ความรู้ ทักษะ และวิธีการคิดวิเคราะห์ ตลอดจนการสร้างวัฒนธรรมในการใช้งานระบบสารสนเทศให้เกิดประโยชน์สูงสุด

Digital Work

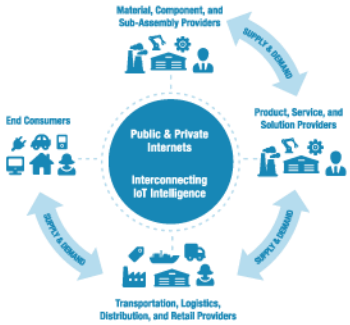
แนวคิดของการพัฒนาที่ทำงานให้เป็น Digital Workplace นั้นกำลังได้รับความสนใจ โดยที่รูปแบบการทำงานจะแตกต่างจากแต่เดิม มีการแบ่งปันข้อมูลกันมากขึ้น มีโครงสร้างขององค์กรน้อยลง (More flat) มีตอบสนองความต้องการที่ Real-time มากขึ้น และอัตโนมัติมากขึ้นกว่าเดิมมาก ซึ่งต้องอาศัยการประมวลผลข้อมูลที่มีประสิทธิภาพสูงมาก



DIGITAL TRANSFORMATION FRAMEWORK

STRATEGIC OBJECTIVES

Reimagining Business Process and Service Delivery

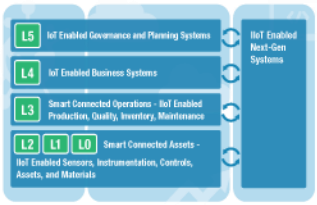


OPERATIONAL EXCELLENCE

Realigning People, Process, and Technology

OPERATIONAL ARCHITECTURE

Managing IT-OT Convergence and Next-Gen IIoT Technology



BUSINESS CASE DEVELOPMENT

Defining Immediate and Long Term ROI

COSTS	TOTAL	YEAR 1	YEAR 2	YEAR 3
HARDWARE				
SOFTWARE LICENSING				
THIRD PARTY SOFTWARE				
APPLICATION SOFTWARE				
DOCUMENTATION & TRAINING				
MAINTENANCE				
INSTALLATION				
INTEGRATION				
LEGACY DATA LOADING				
PROJECT MANAGEMENT				
SUPPORT				
TOTAL:				

SOLUTION SELECTION

Eliminating Bias and Finding Long Term Partners

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