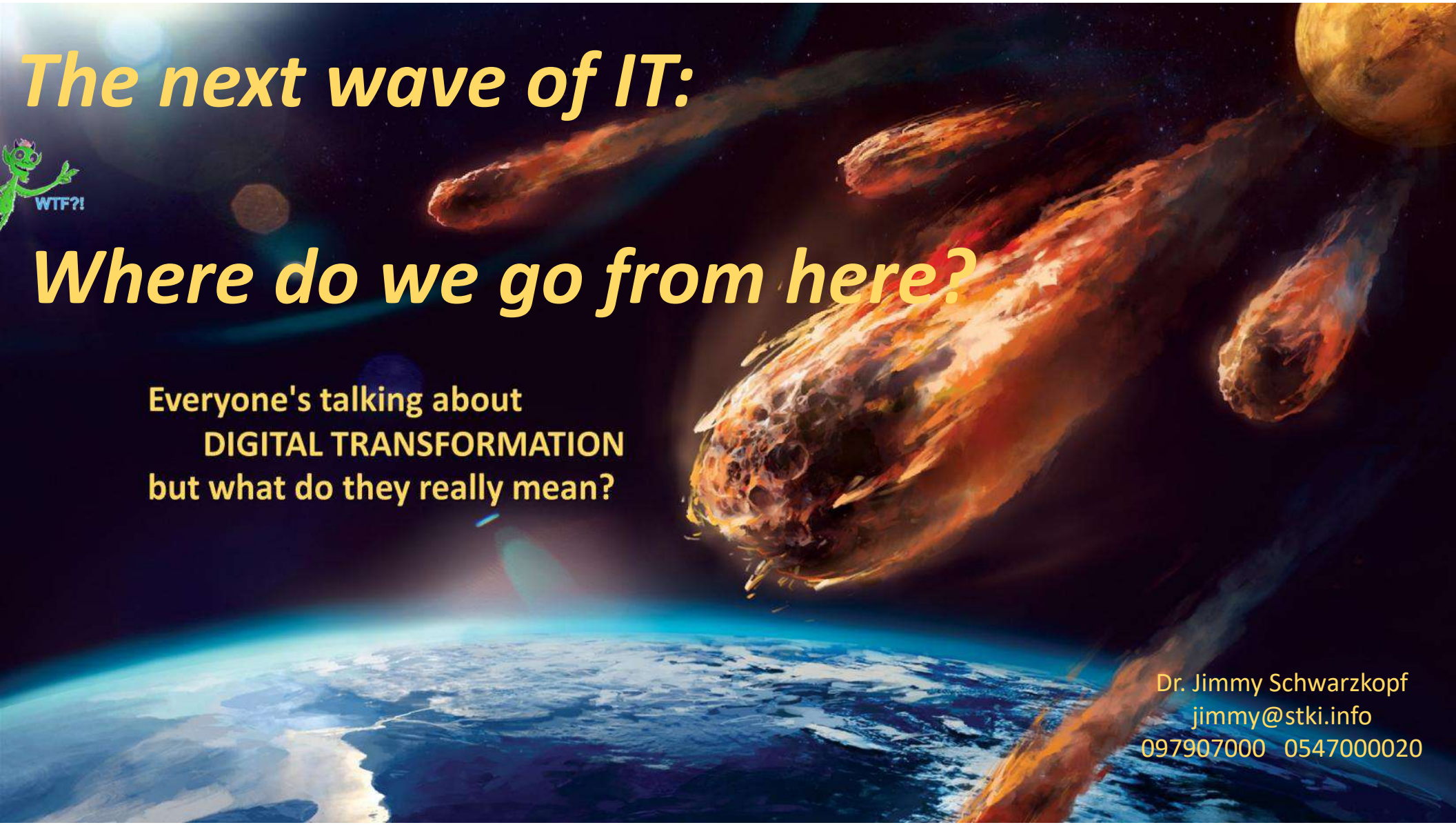
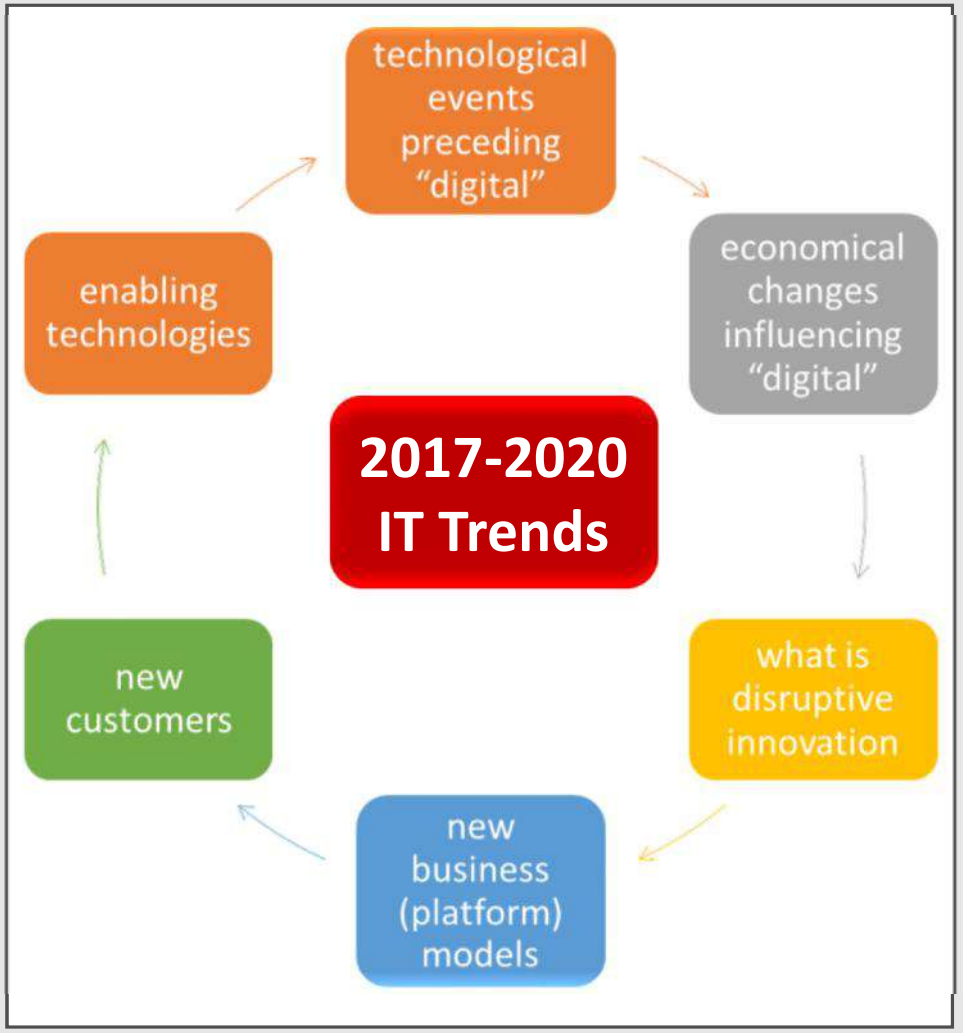


Dr. Jimmy Schwarzkopf
jimmy@stki.info
097907000 0547000020

The next wave of IT:

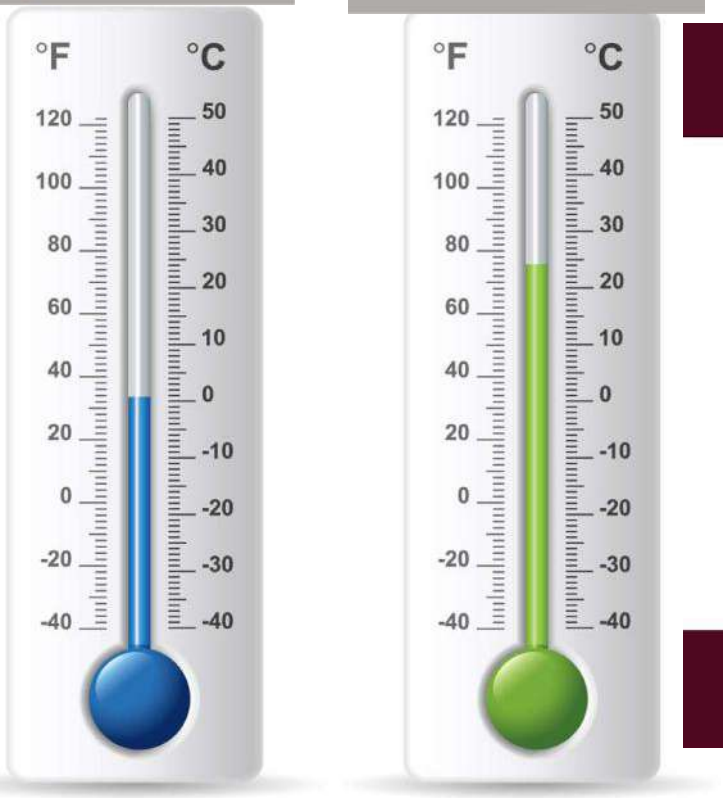
Where do we go from here?

Everyone's talking about
DIGITAL TRANSFORMATION
but what do they really mean?



Up to 2007

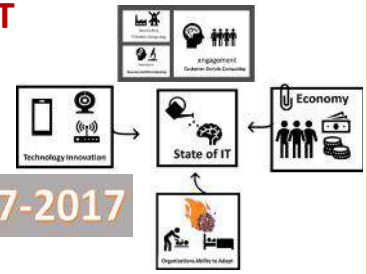
2007-2017



In order to plan your future wisely, it is necessary that you understand and appreciate your past

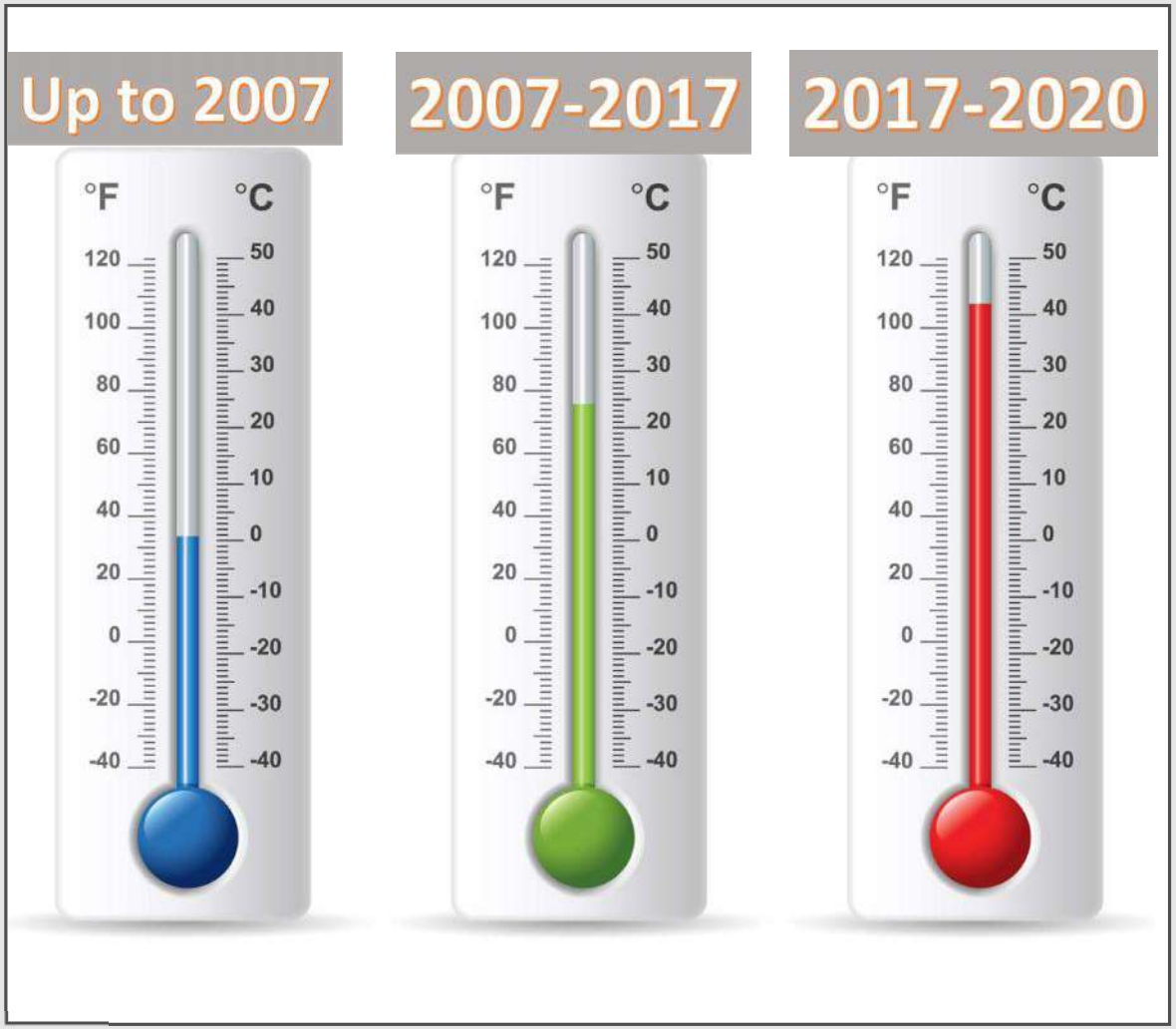
Up to 2007

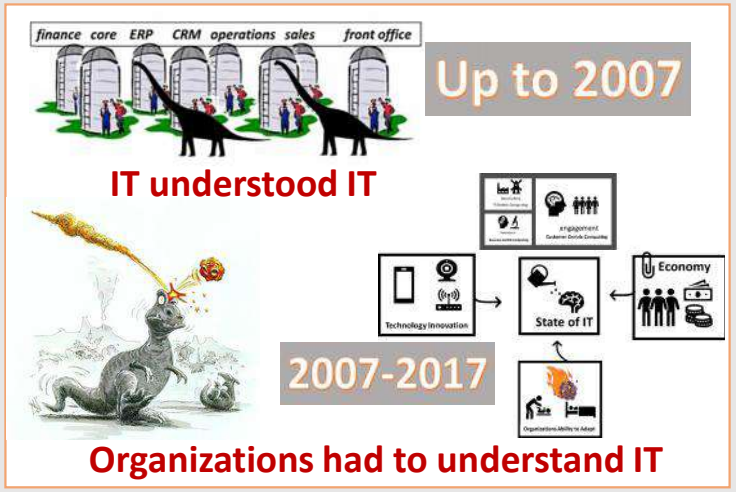
IT understood IT

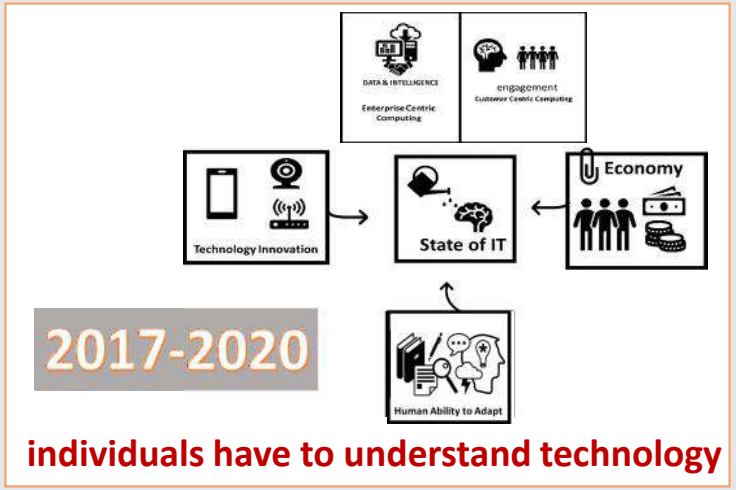


2007-2017

Organizations had to understand IT







Digital technologies (enablers) and IT

Resource becomes so **cheap** and **abundant** that **wasting** it to ***create something completely different*** makes sense

Up to 2007 Computing

Integrated circuits and eventually the computer on a chip (Moore's law) at lower and lower prices. More and more sophisticated software was written and the **software/VAS industries were born**

Mini computers and PCs disrupted the mainframe industry

2007-2017 Communication

The telecoms bust had unintended consequences: the "low price" of usage of long distance cables, mobile tech, data usage and the internet.

The internet and mobile disrupted everything.

From 2017 Memory & storage

With cost per terabyte in free fall, the response is to accumulate more data. Using also the internet and cheap power we have now:

Big Data, cloud, Blockchain, AI, VR

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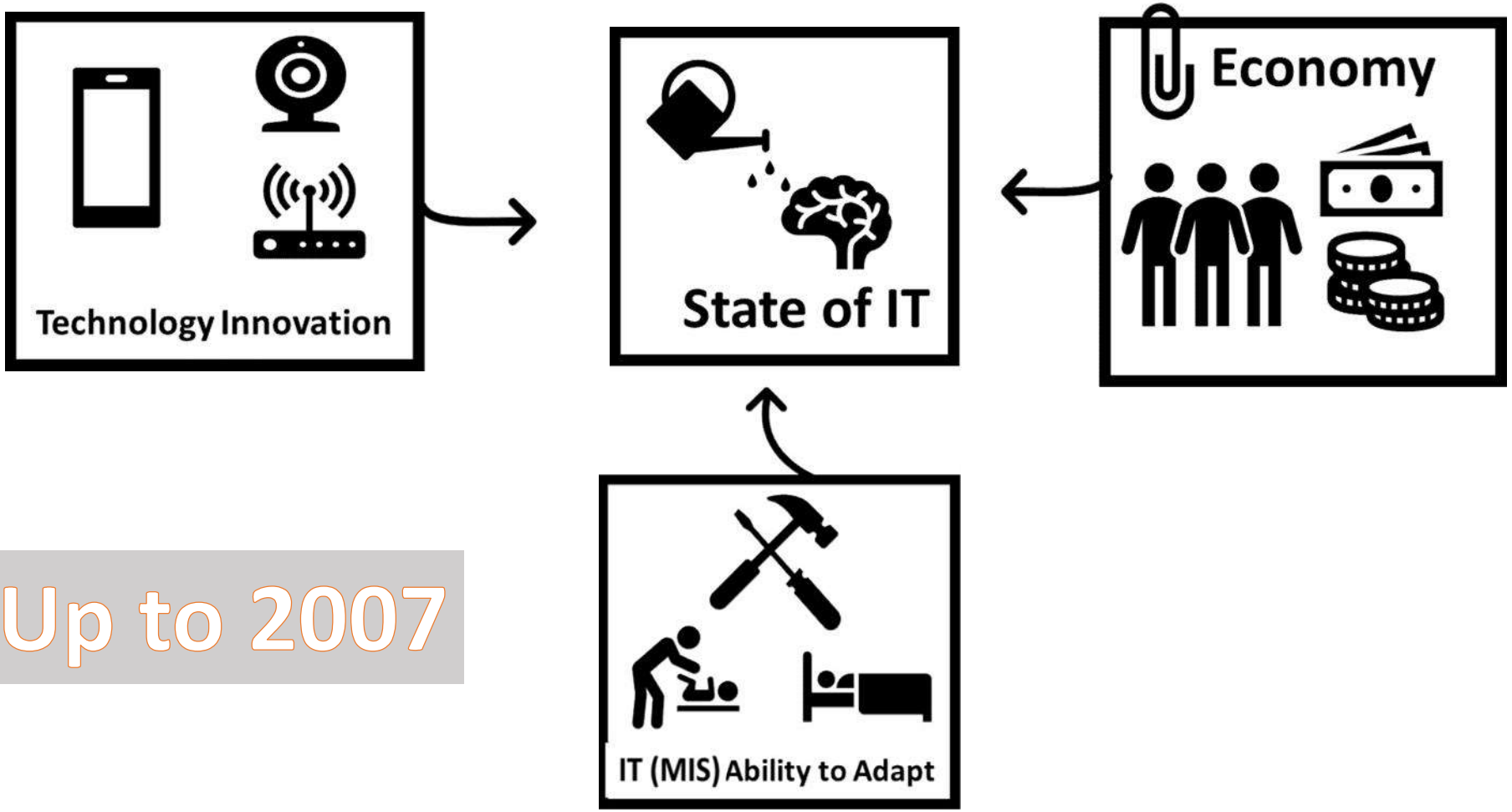
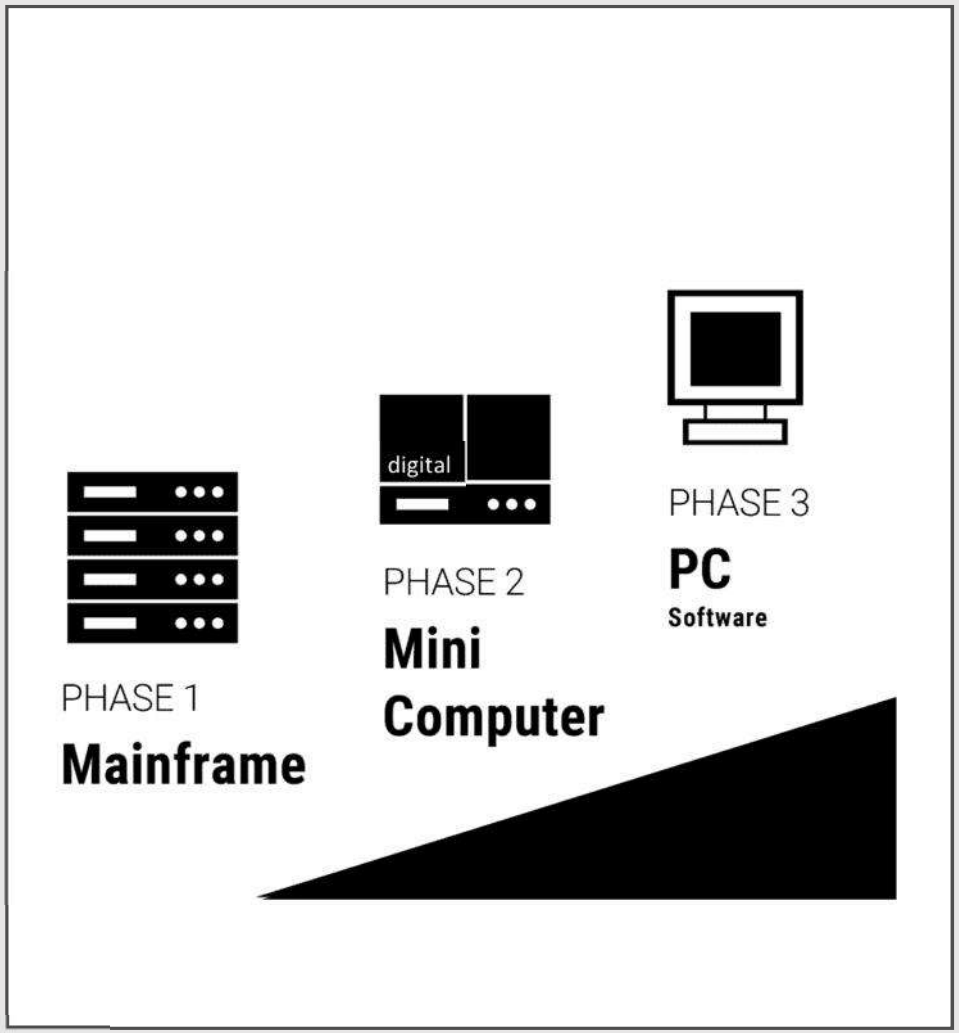
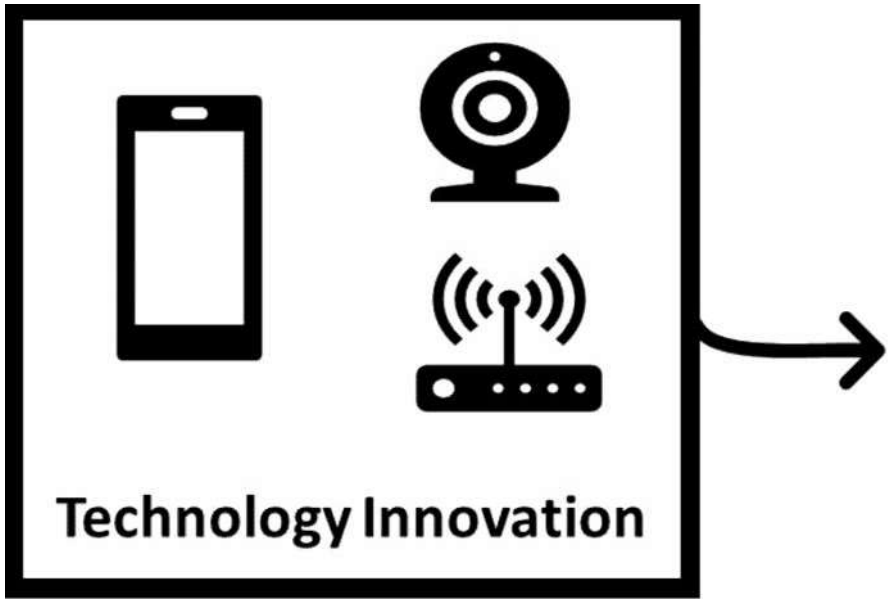


Up to 2007



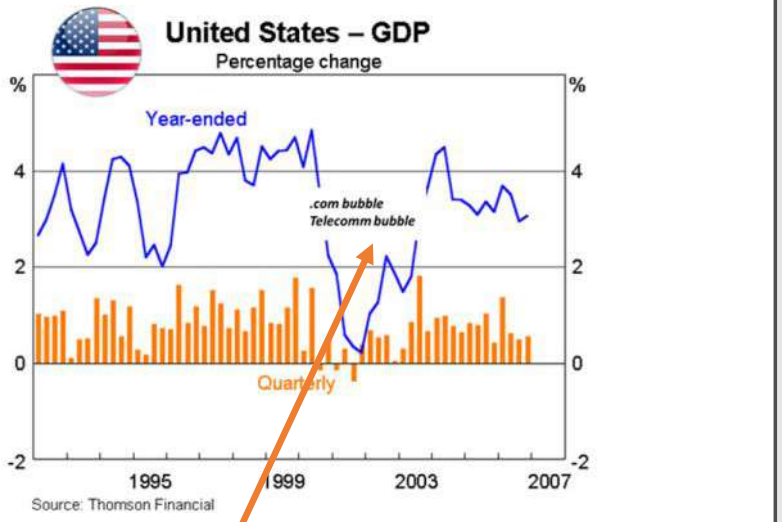
Up to 2007



Up to 2007

PCs & Minis
Ethernet
Magnetic tape/disks
DNS management
Cobol, Fortran, Java
World Wide Web (WWW)
HTML
SOFTWARE INDUSTRY
VAS INDUSTRY

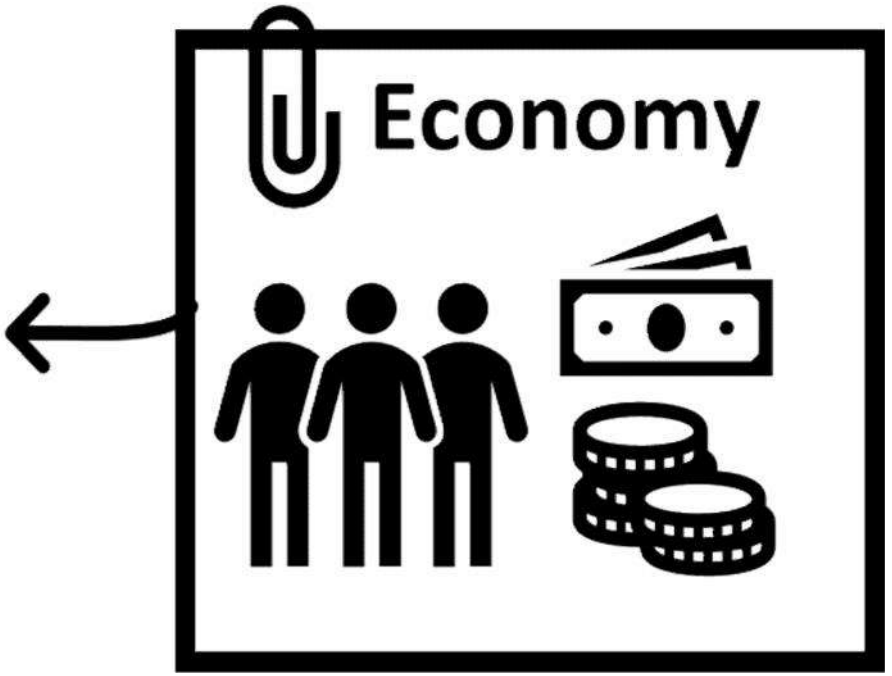
Netscape
Google Search
Skype
Amazon
Paypal
Hotmail
X-box
YAHOO
Industries based on the INTERNET

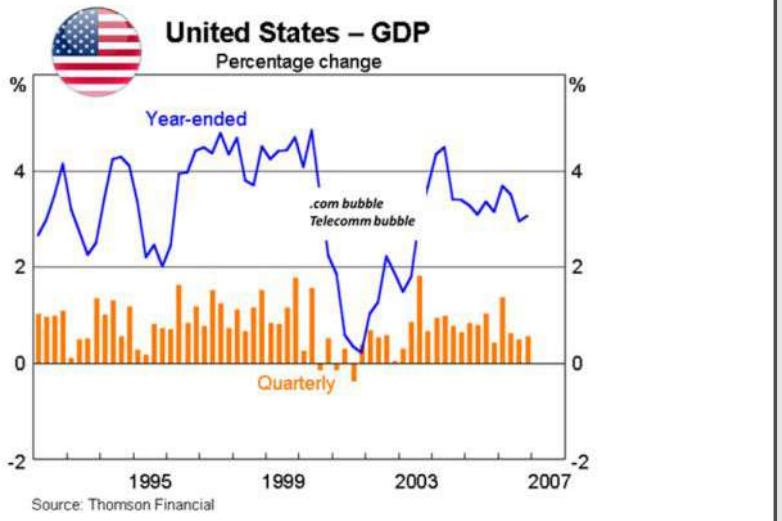


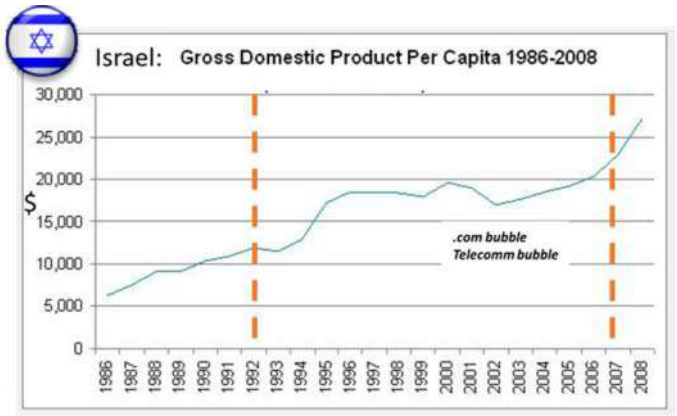
"TELECOMS BUST"

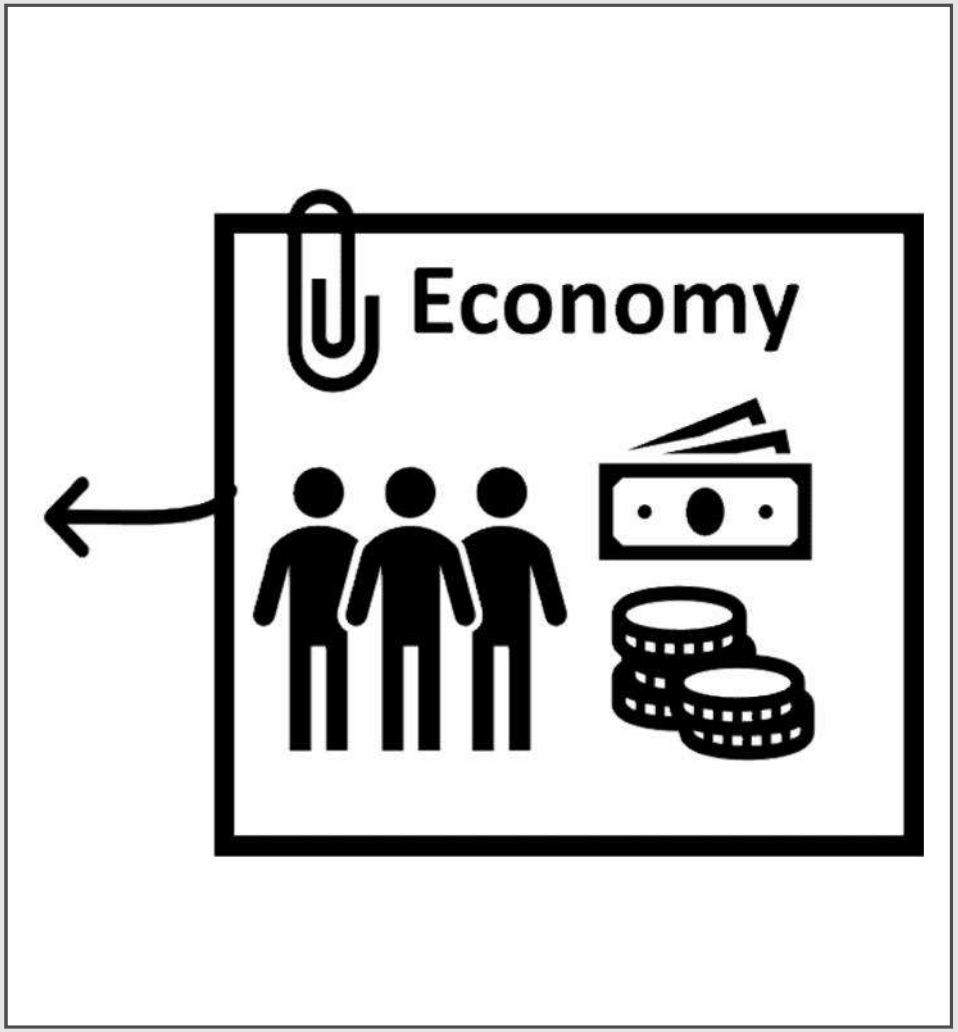
- **10X bigger** than the dotcom crash.
- Qualifies as the **largest bubble** in history.
- Firms defaulted on **debts of over $1 trillion**.
- **23** companies went bankrupt (**WorldCom** largest bankruptcy in USA history).
- **600,000** people lost their jobs.

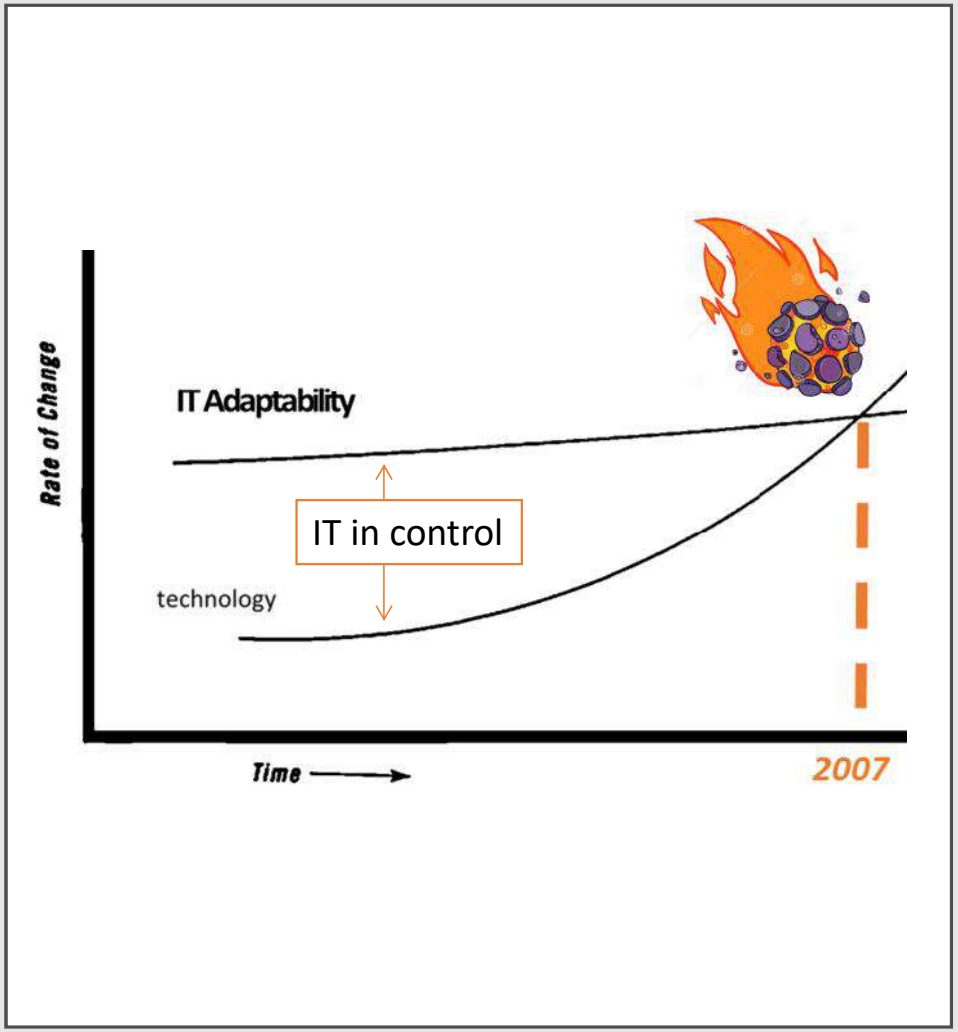
After 2007 we had winners > ***we got nearly "free" internet***

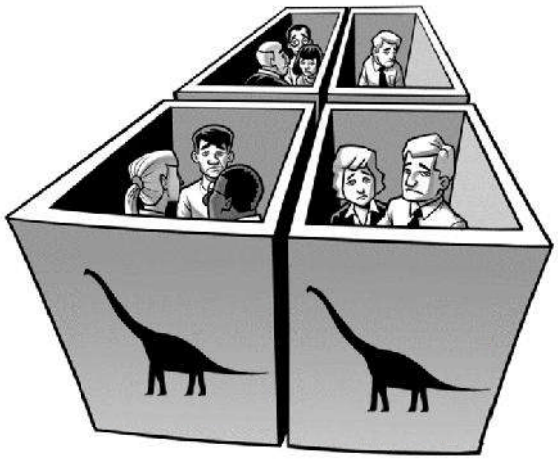




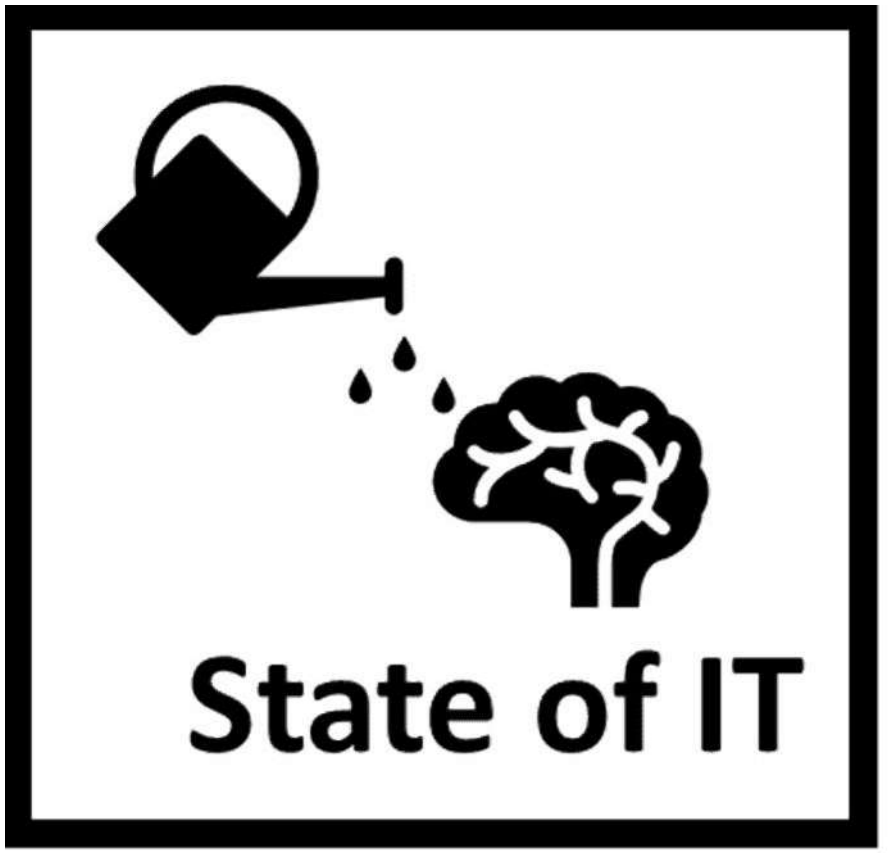


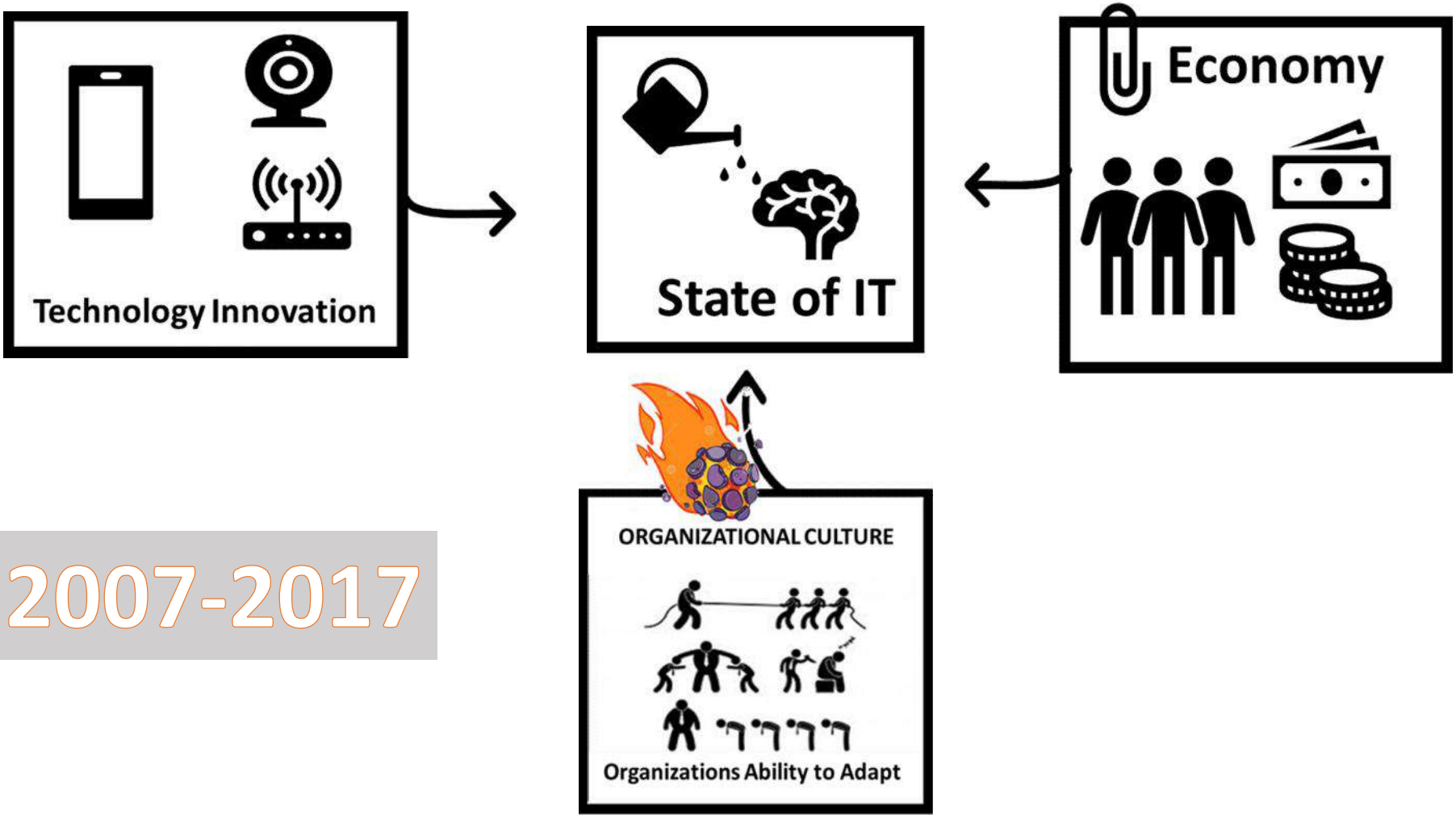




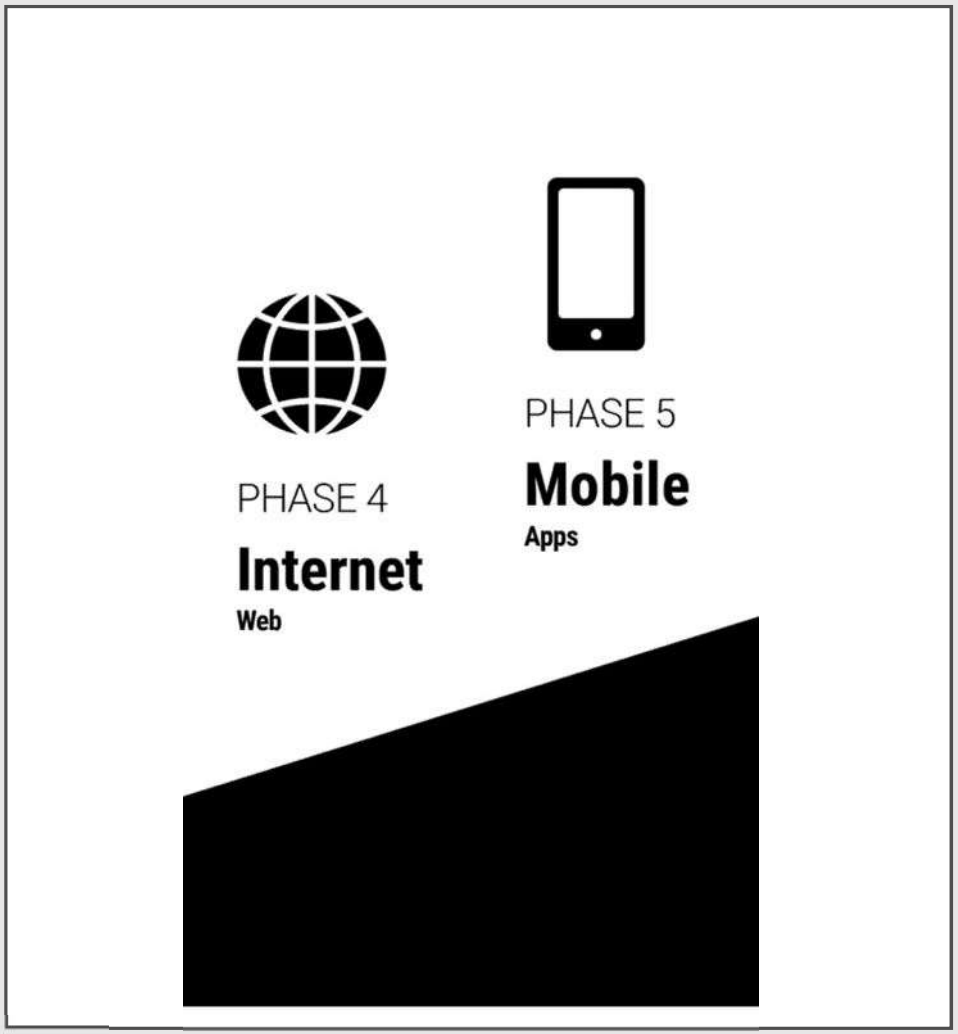


IT before 2007

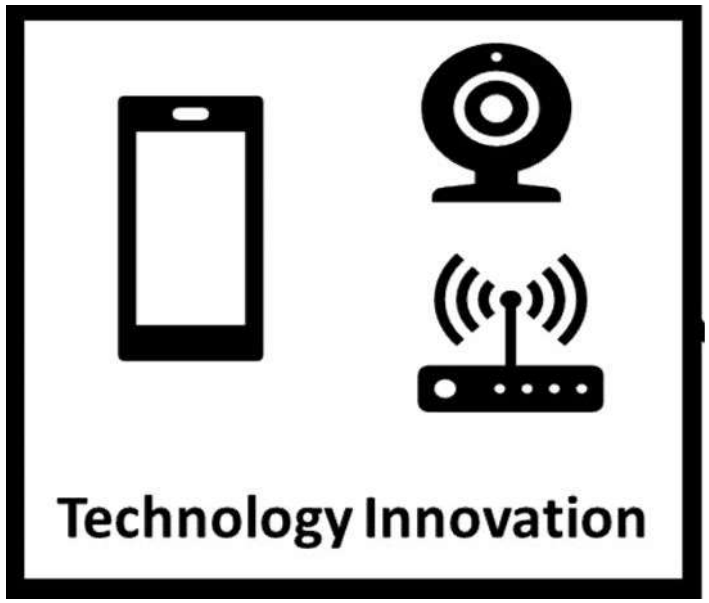




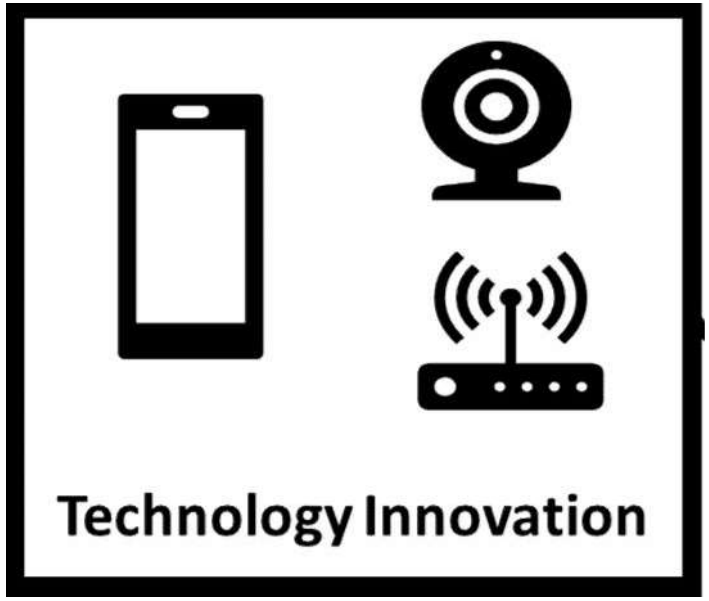
2007-2017



2007-2017



2007



2007

iPhone iOS
iTunes Ecosystem
Facebook
Twitter
Google's Android OS
Amazon's Kindle
Airbnb
Uber
Waze (FreeMap Israel)
Nintendo's Wii

Hadoop
GitHub
IBM starts work WATSON
Google buys YouTube
Microsoft Office 2007
AT&T's Software Defined Networks
Intel's high-k/metal based chips
(give Moore's law another shot)
Internet has over 1 Billion users
DNA sequencing costs under $1K

SaaS Industry
(free and paid by loss of privacy)

THE WALL STREET JOURNAL.

MONDAY, SEPTEMBER 15, 2008 · VOL. CCLII NO. 64

LEHMAN BROTHERS ▼94.4%

Merrill Lynch ▼68.2%

AIG ▼79.2%

Crisis on Wall Street as Lehman Totters, Merrill Is Sold, AIG Seeks to Raise Cash

Fed Will Expand Its Lending Arsenal in a Bid to Calm Markets; Moves Cap a Momentous Weekend for American Finance

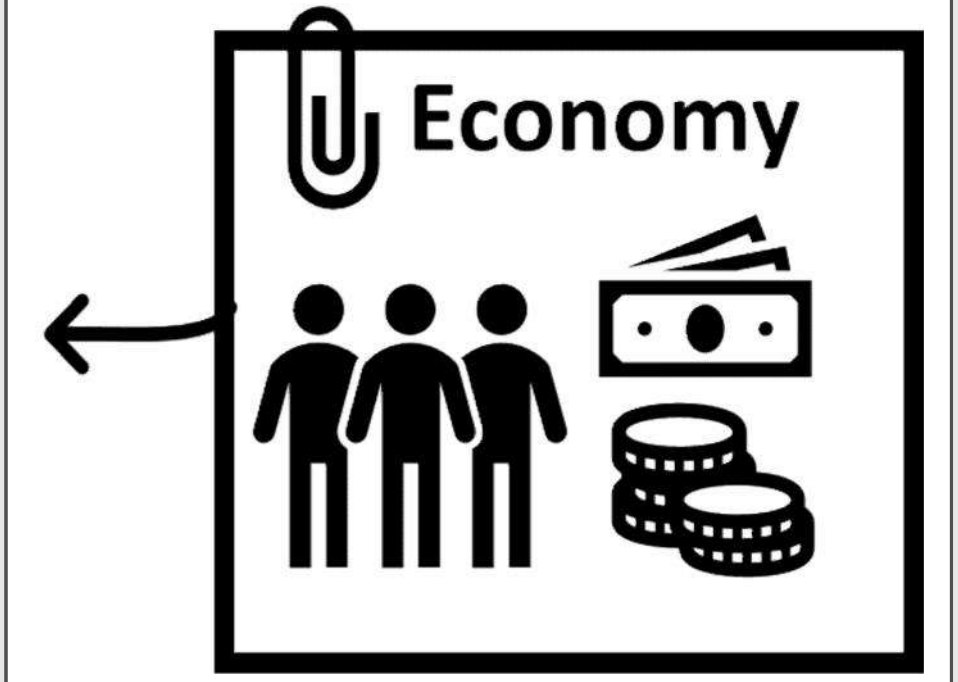
What's News—

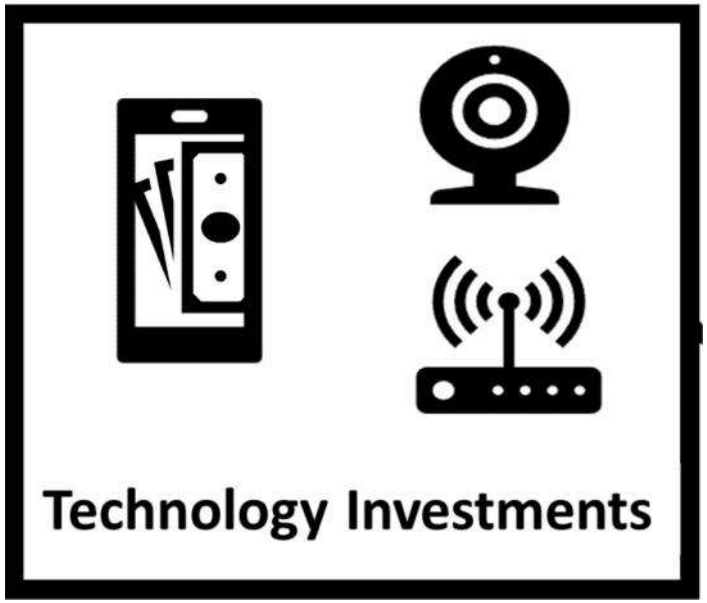
Business & Finance

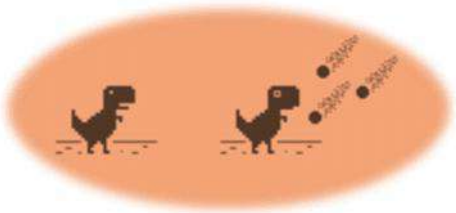
World-Wide

Ultimatum By Paulson Sparked Frantic End

Bank of America to Buy Merrill





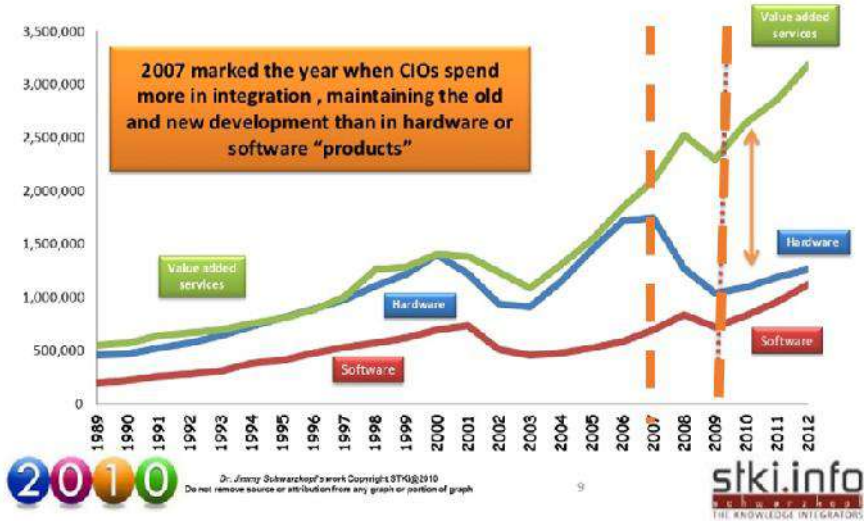


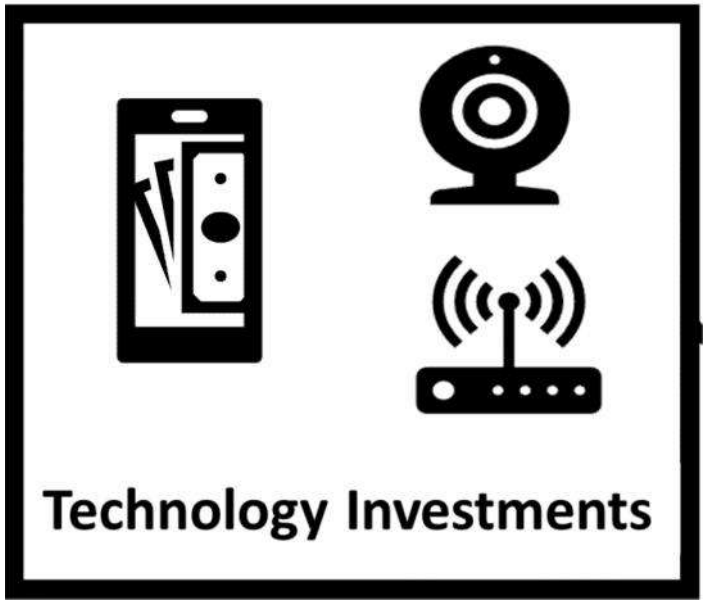
RECOVERY STARTS IN 2012-2013

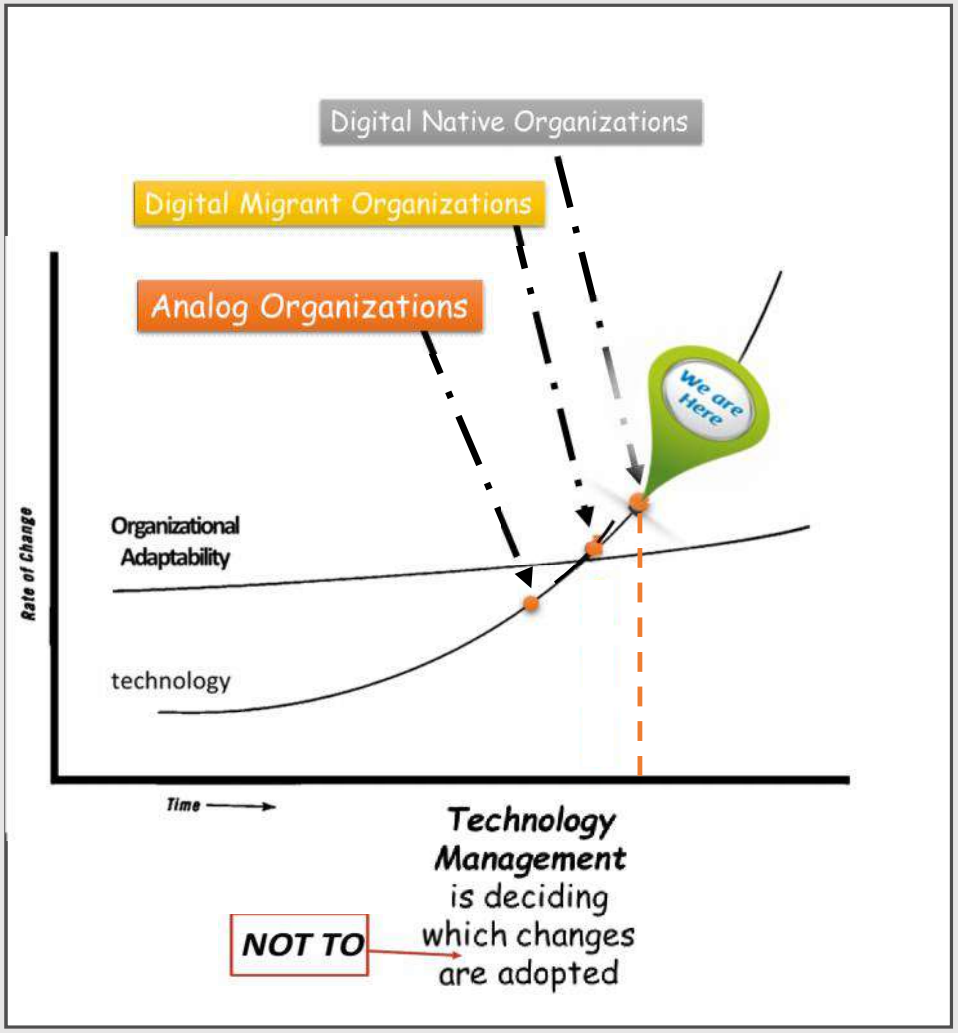
IT rate of change

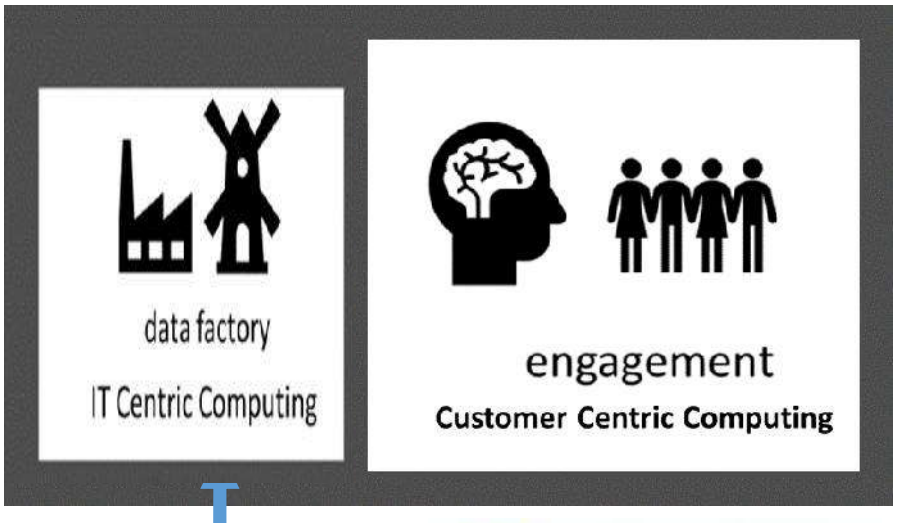
HURTING ORGANIZATIONS ABILITY TO ADAPT

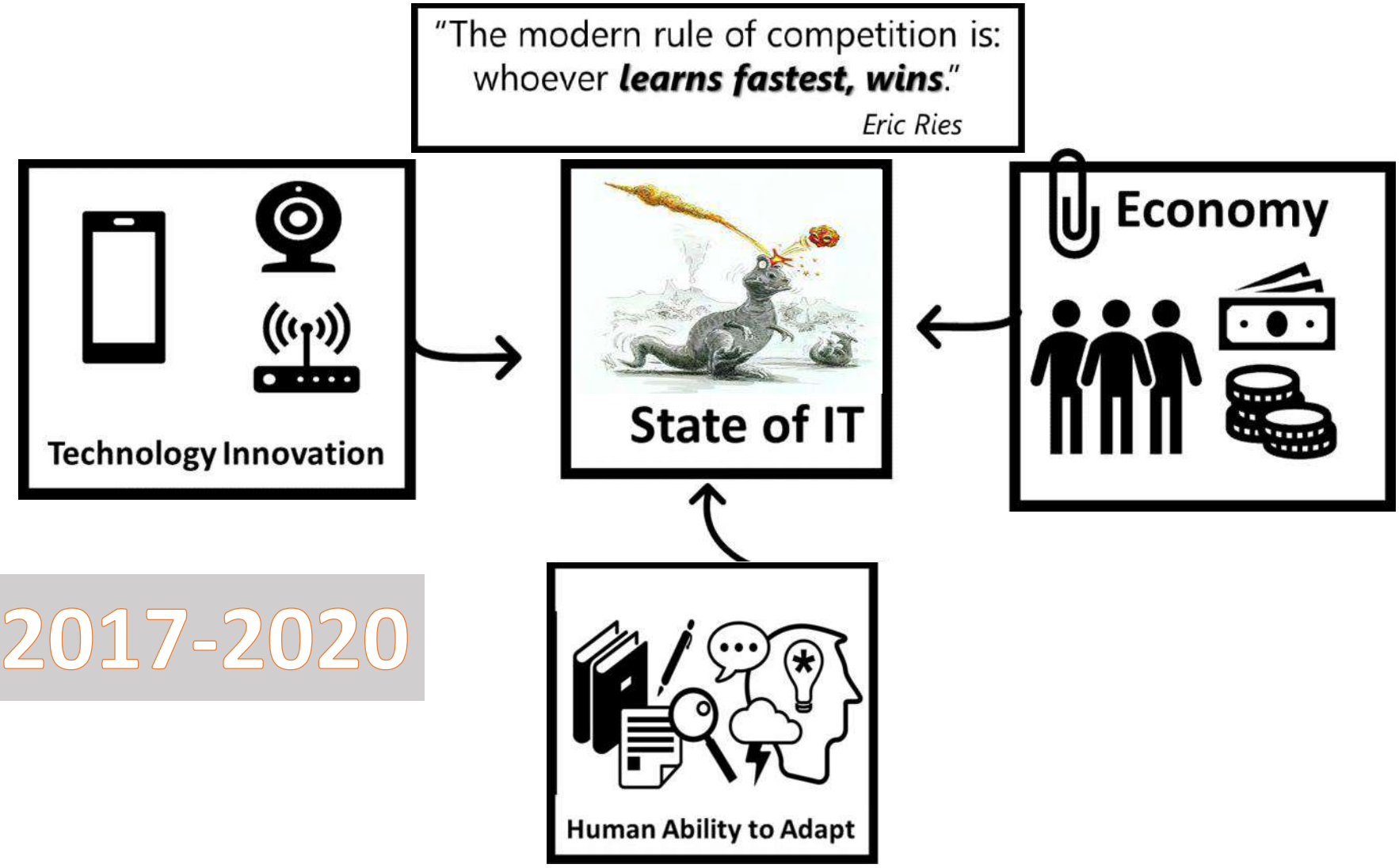
IT Markets in Israel ($K USD)

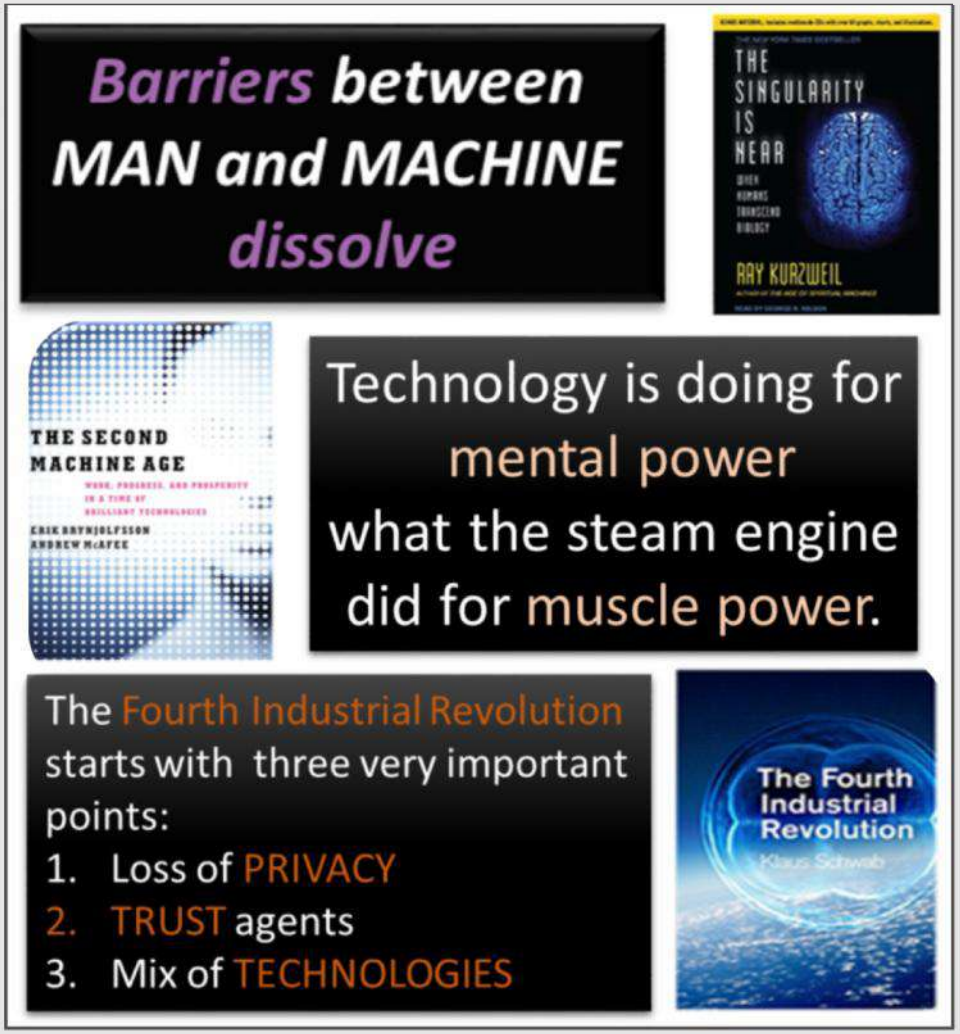


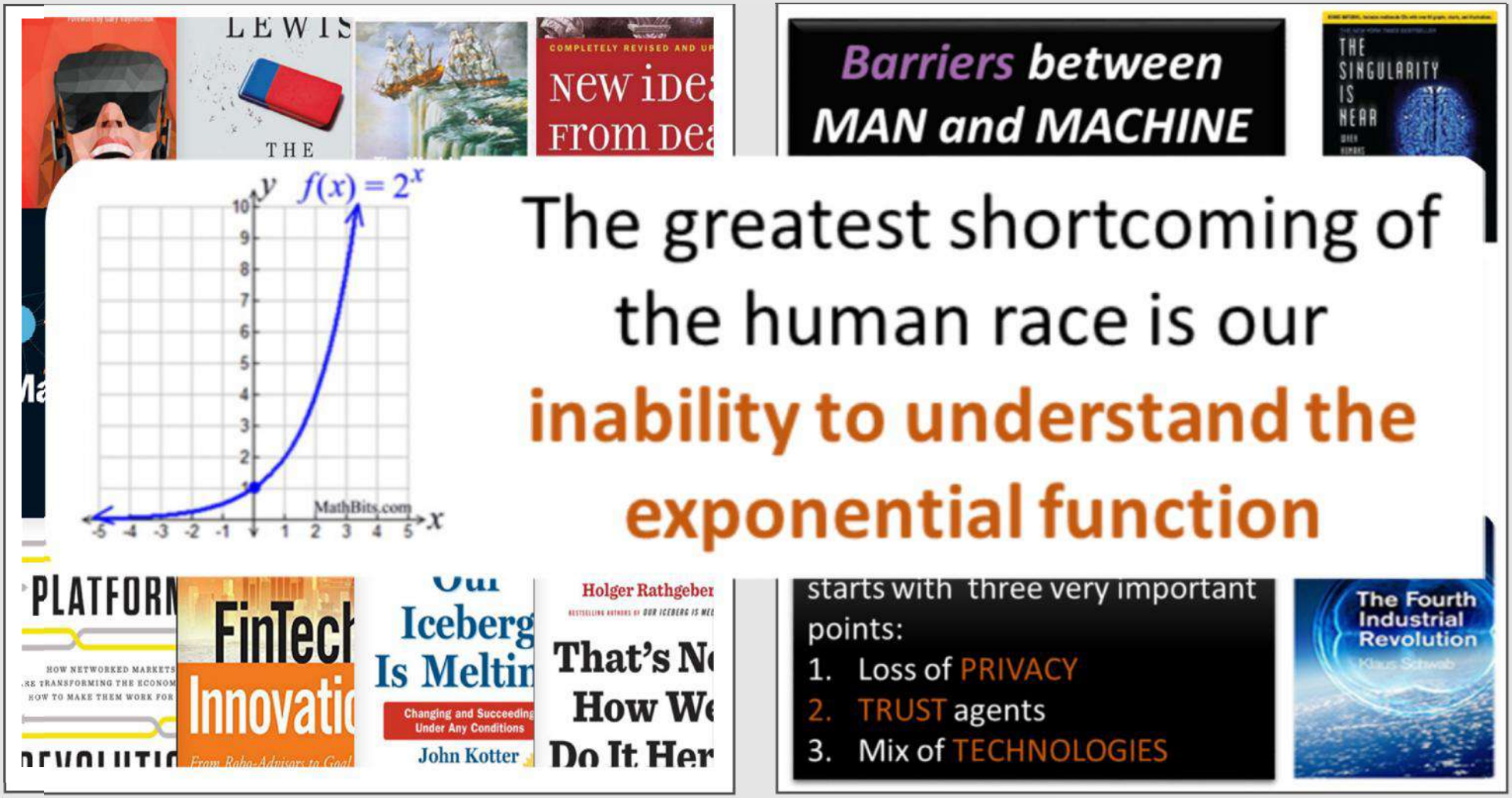


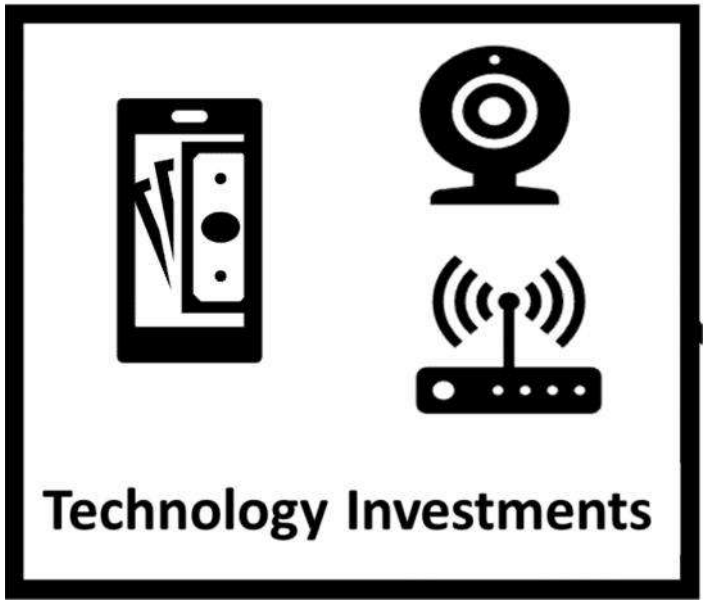


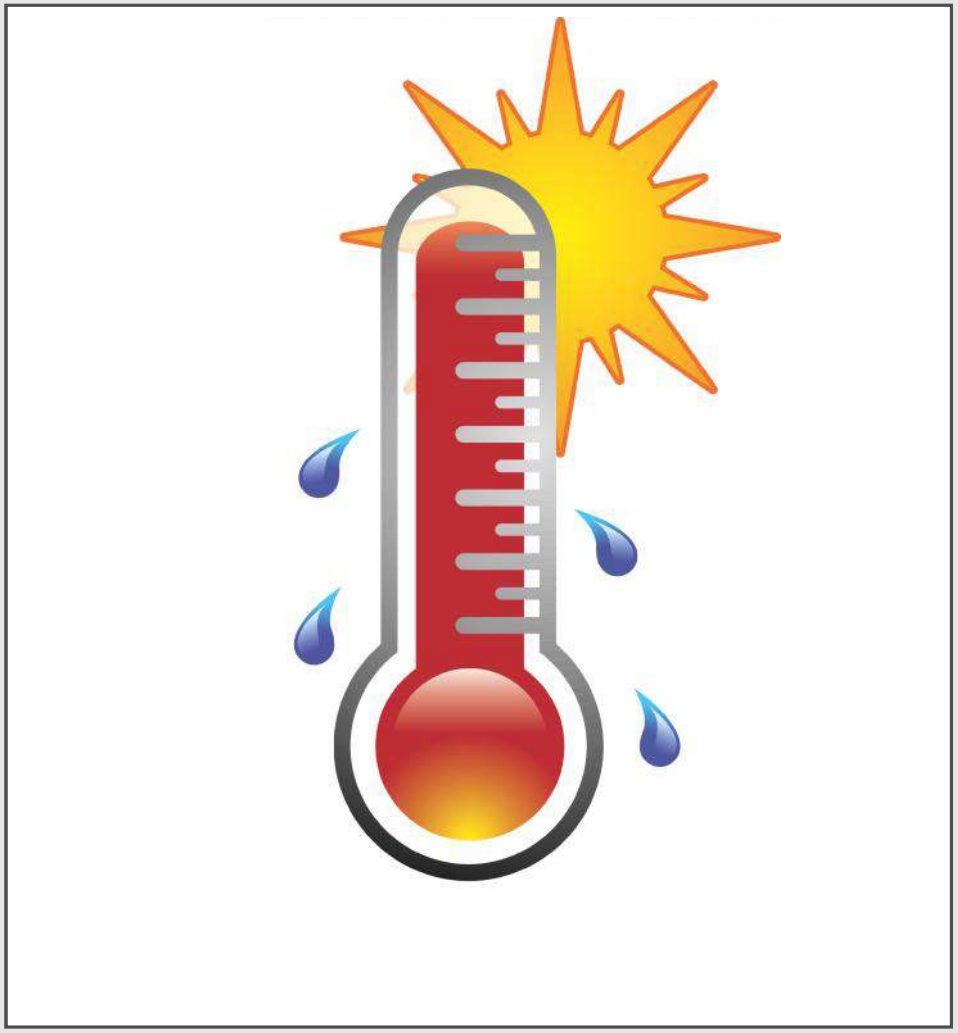








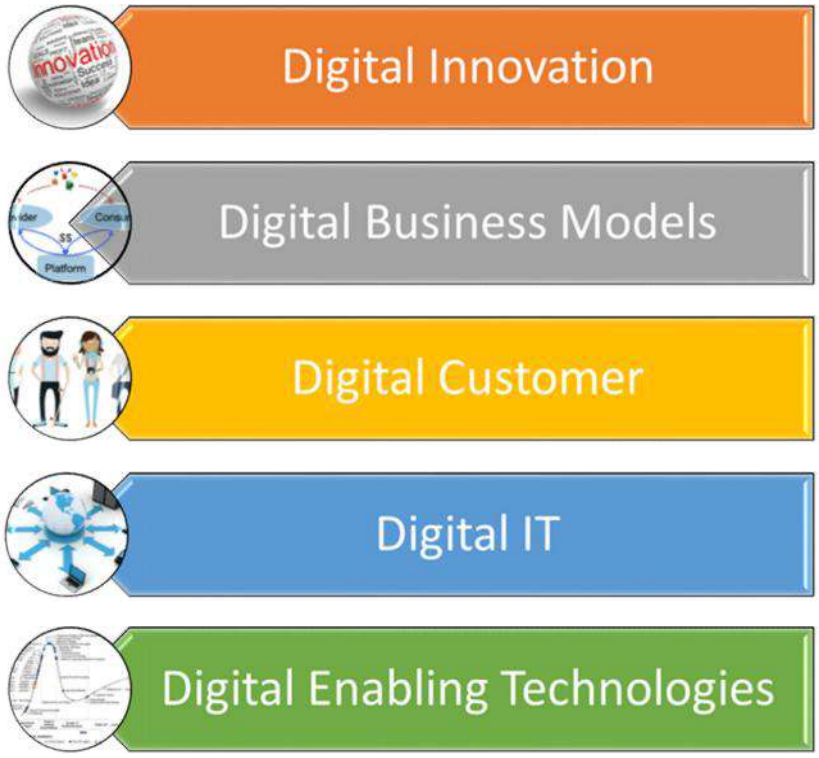


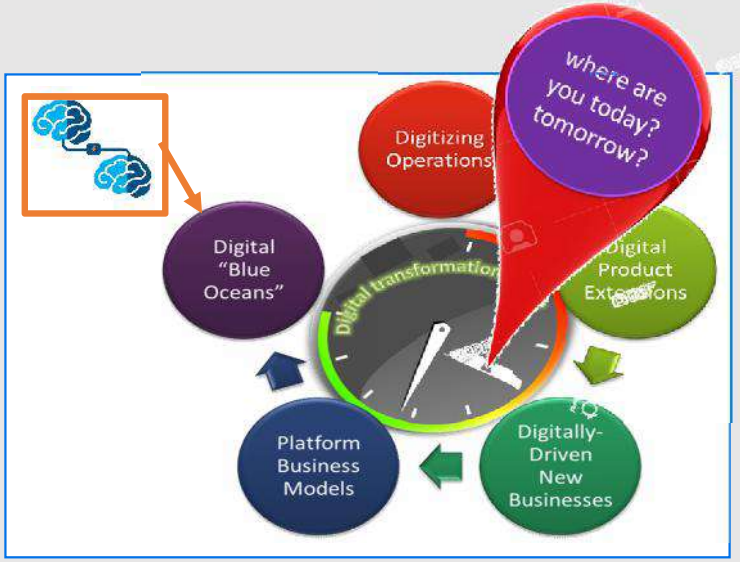


everybody is "digital"
everybody is "disrupting"
and everybody has a
"CDO-innovation manager"
Chief Digital Officer

But are they doing digital "DISRUPTIVE" innovation ?

Five Pillars of Digital Disruptive Innovation

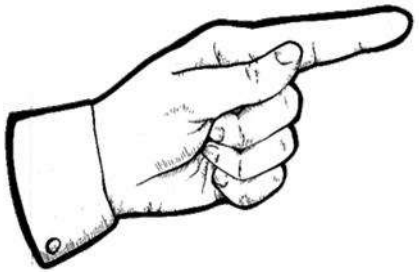




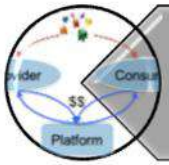
PLANNING

THE POST-DIGITAL AGE IS HERE

DIGITAL IS NOT A "NEW MEDIA" ANYMORE, AND IS AN ACCEPTED COMPONENT IN MARKETING. THE BEST WORK IN THIS POST-DIGITAL AGE BLENDS DIGITAL WITH PHYSICAL ELEMENTS, WRITES JEREMY NICHOLAS.



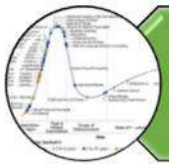
Digital Innovation



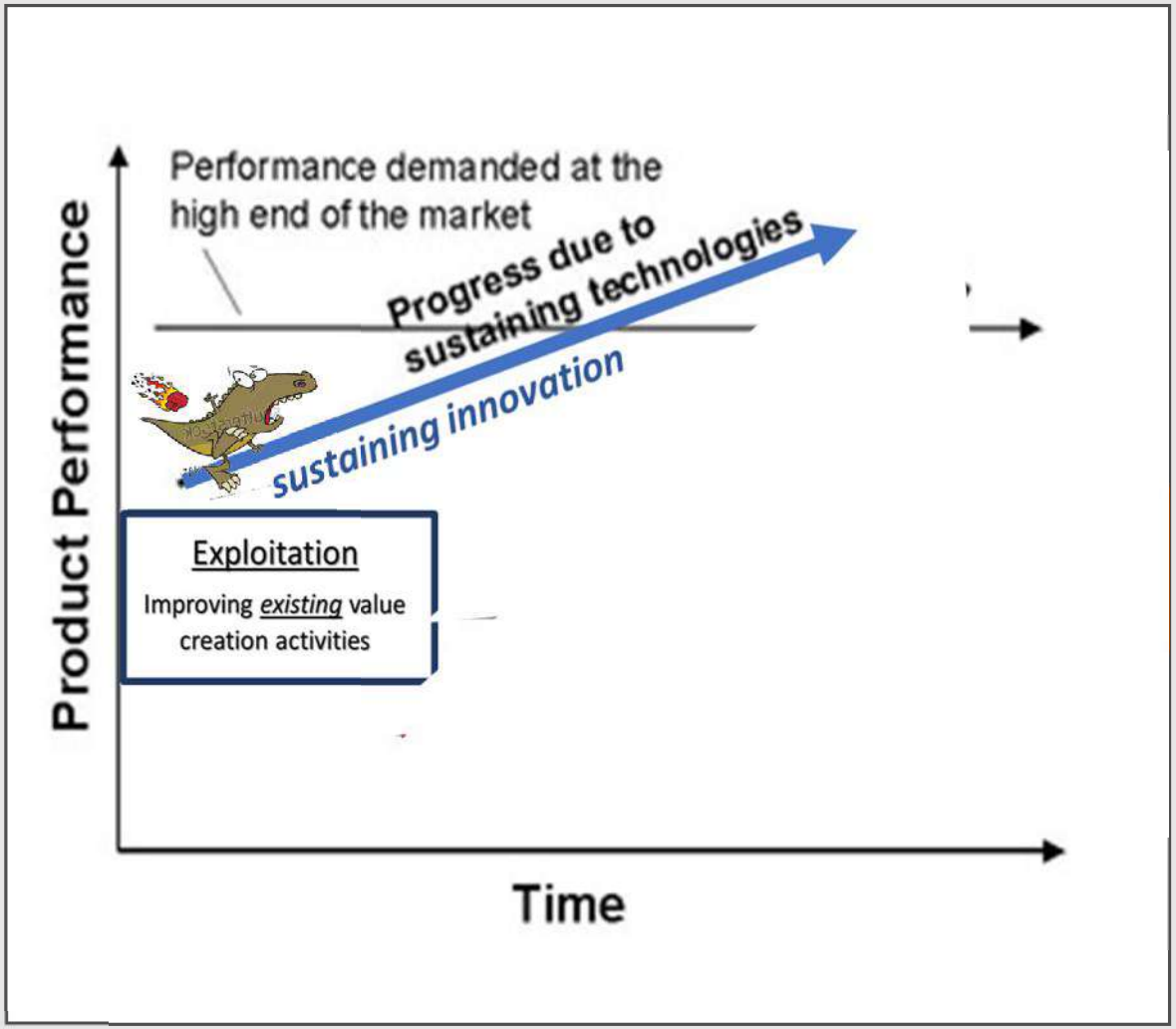
Digital Business Models

Digital Customer

Digital IT



Digital Enabling Technologies

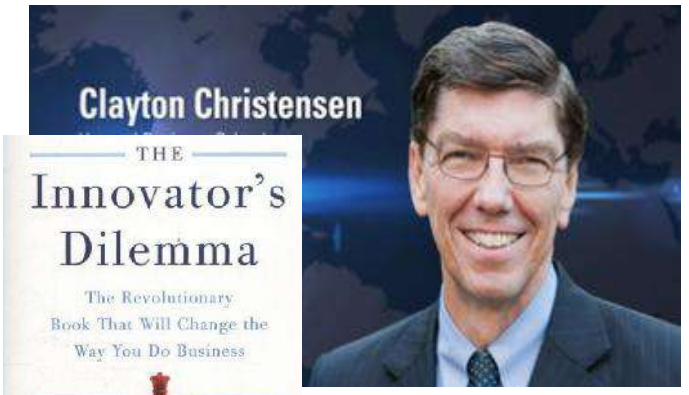


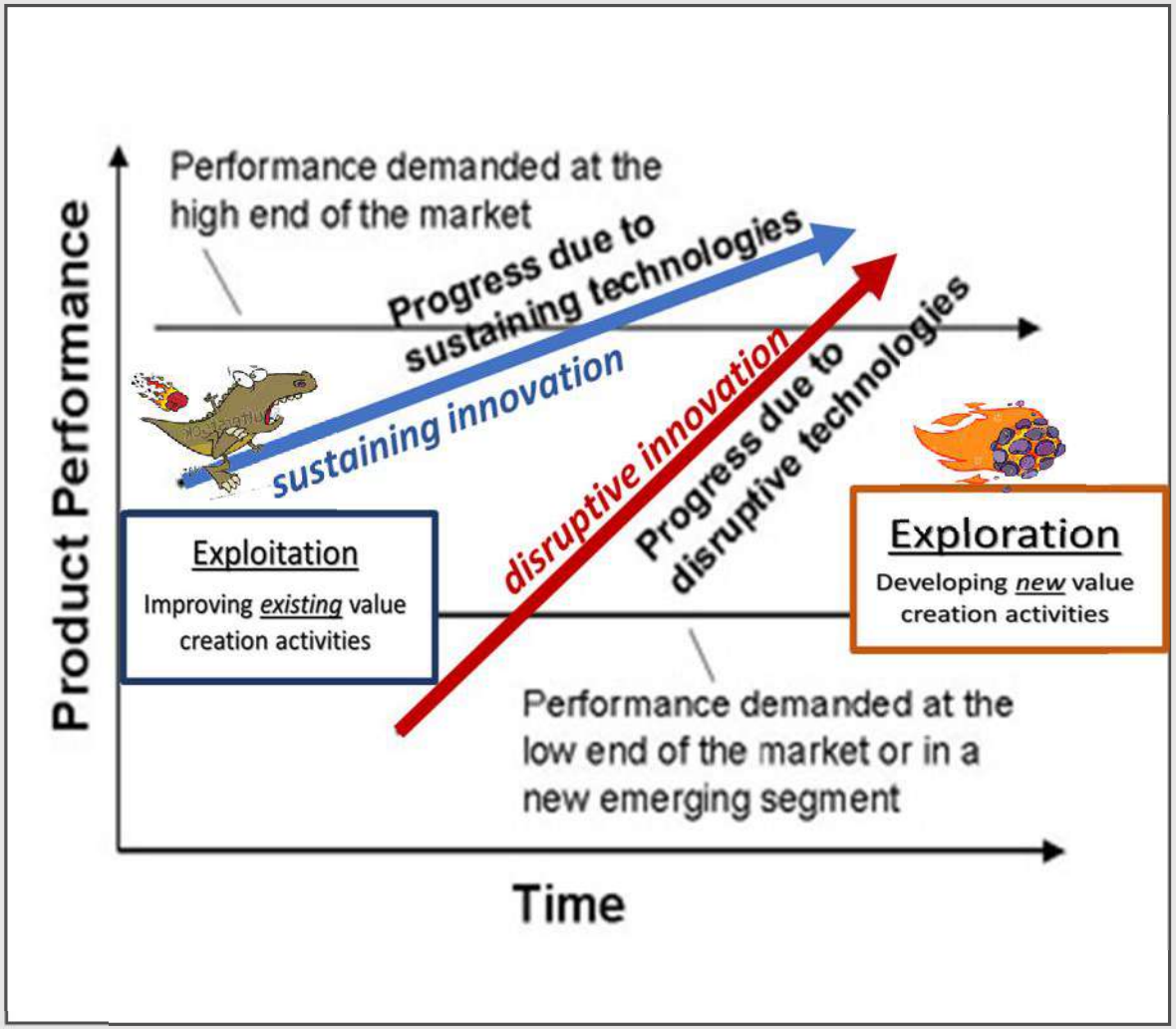
How do I know when it is "simply"

"sustaining innovation"

or it is

"disruptive innovation"





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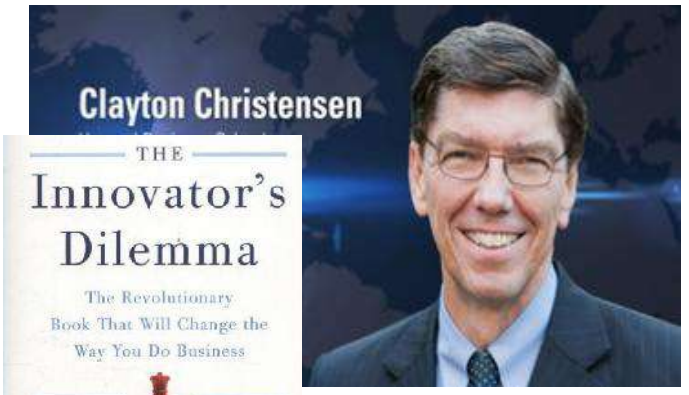
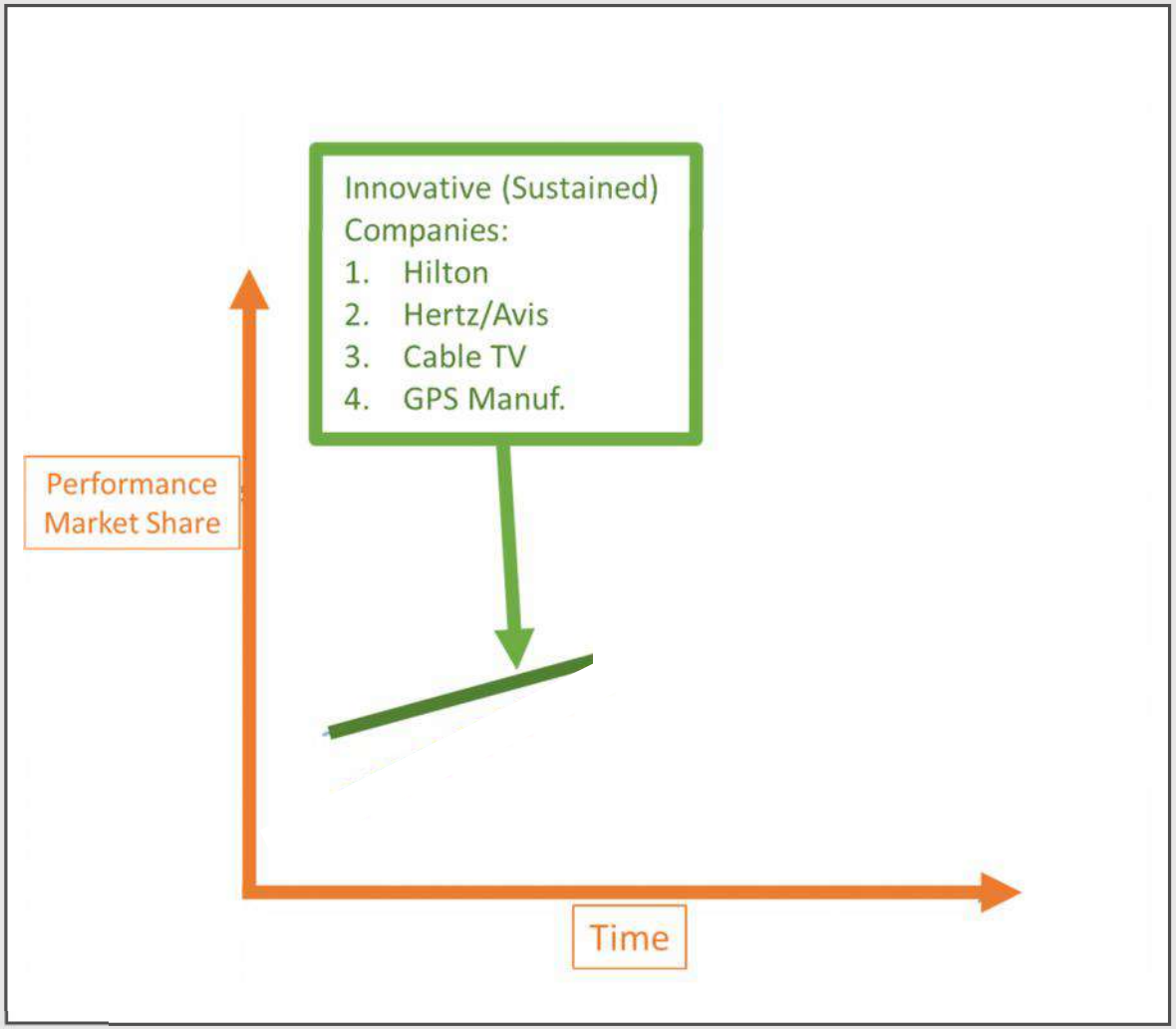
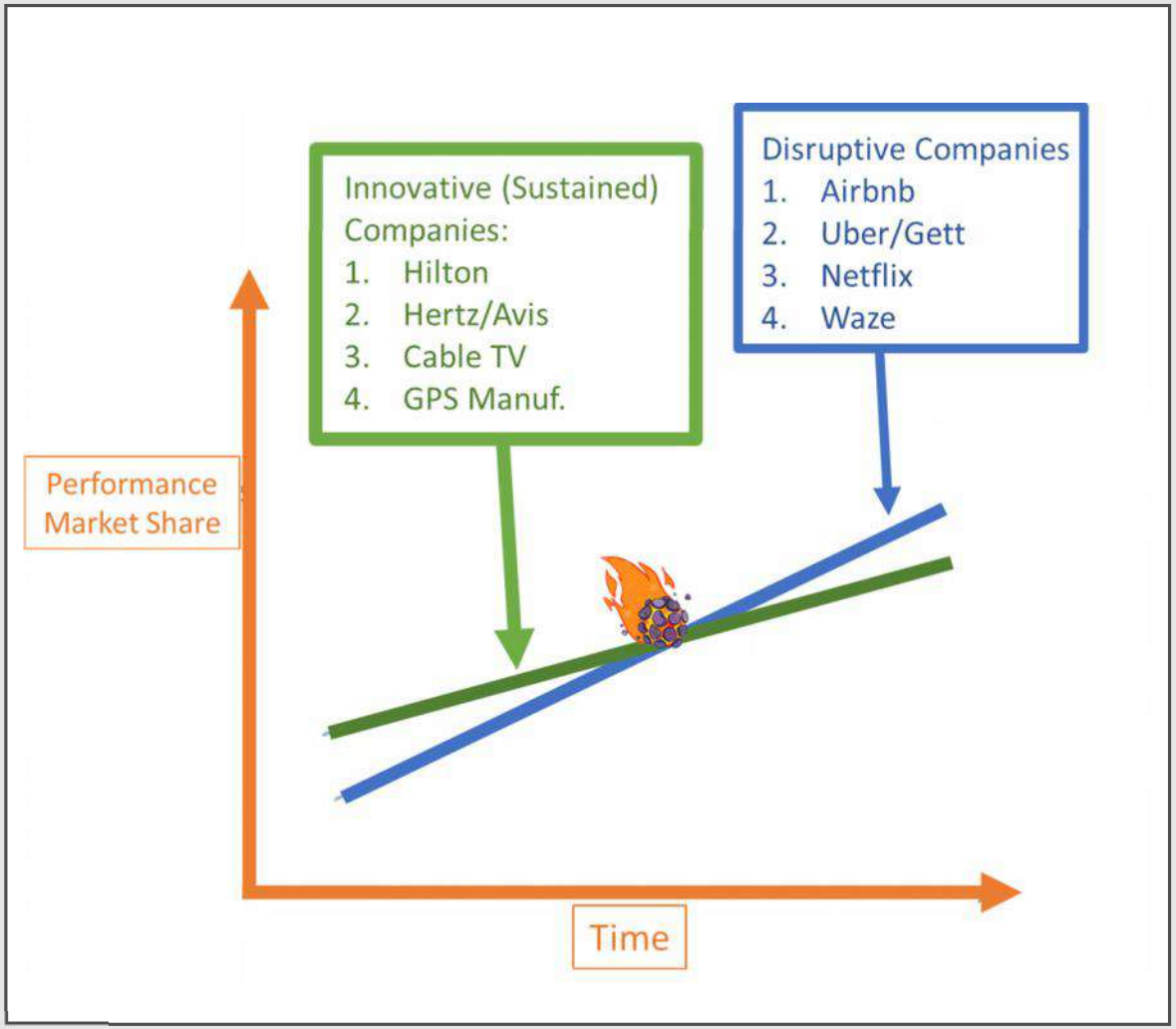




COMPETITIVE ADVANTAGE
requires
DISRUPTIVE INNOVATION
not only on the
product *but also in the way a company* ***servers its customers and its employees***



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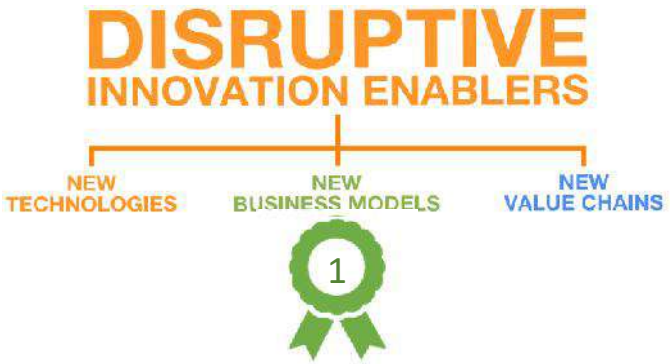
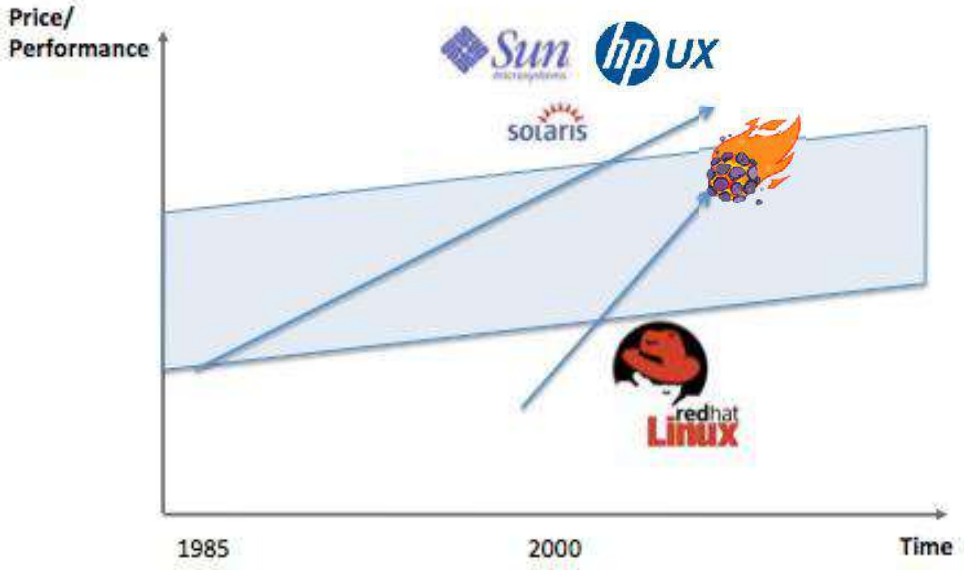
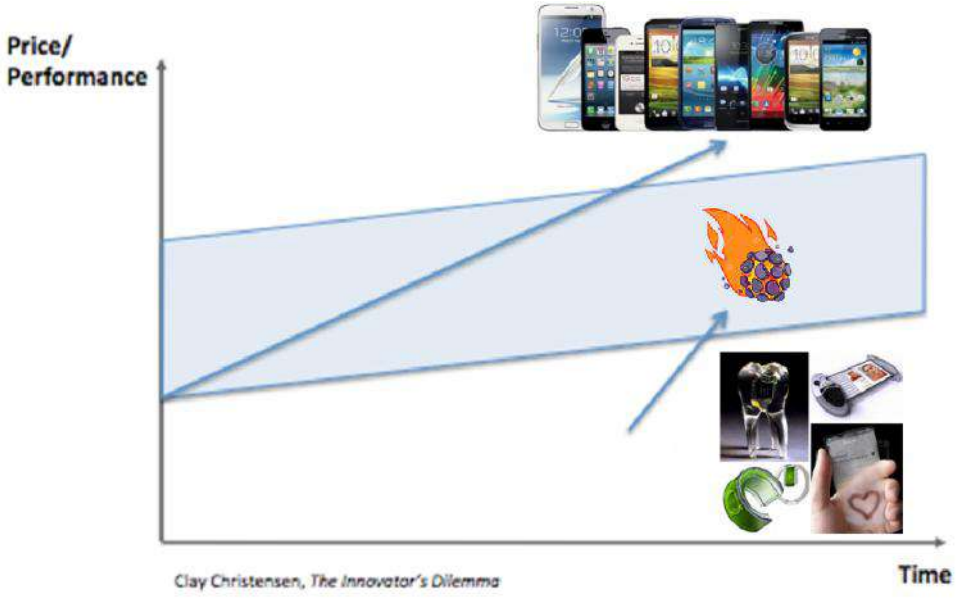
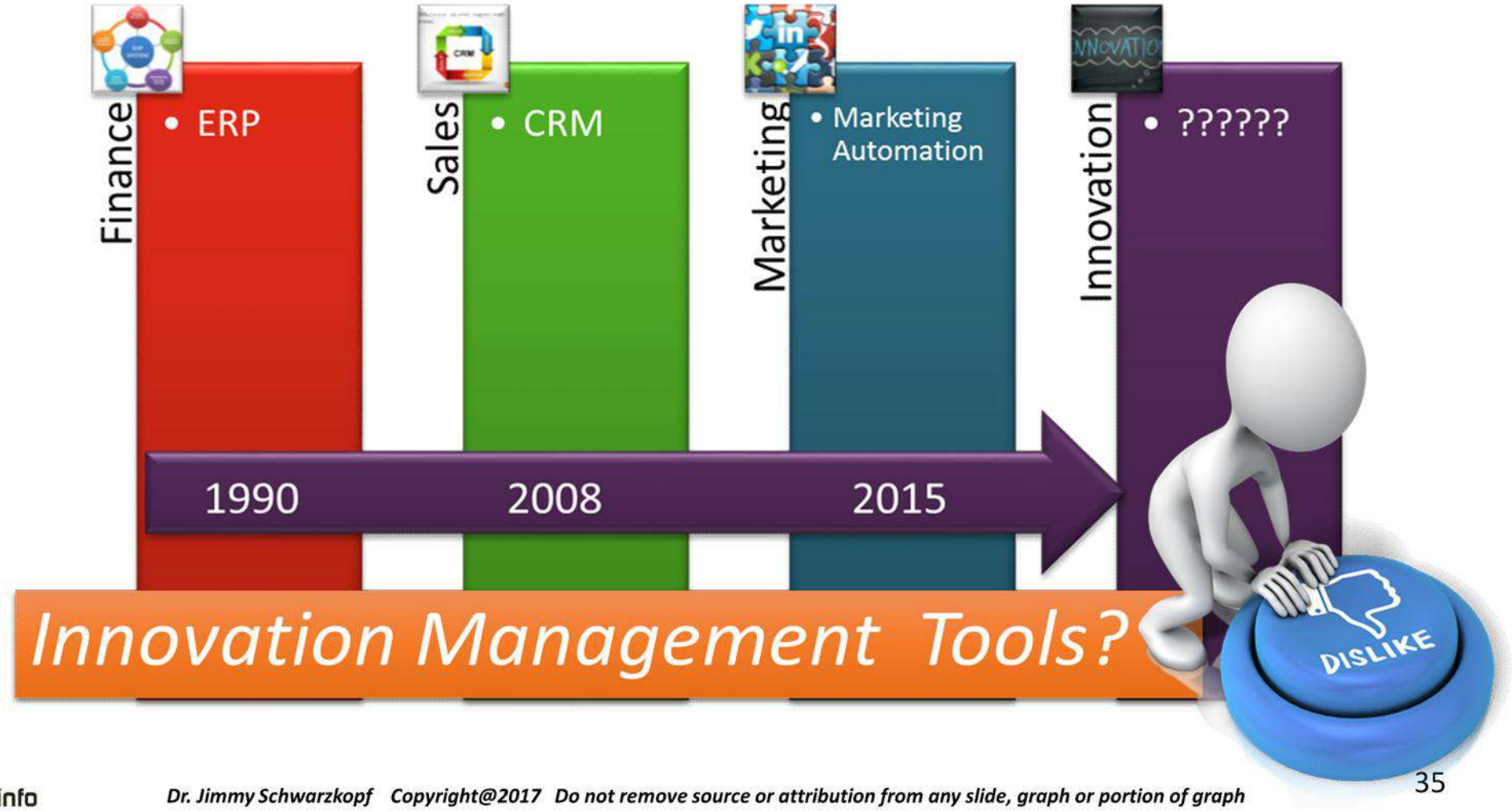


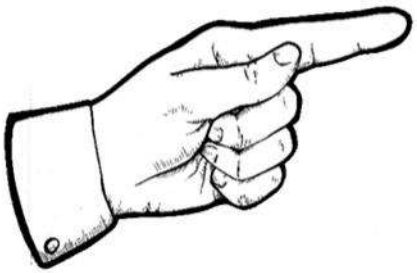
Examples of “software” disruptive innovation

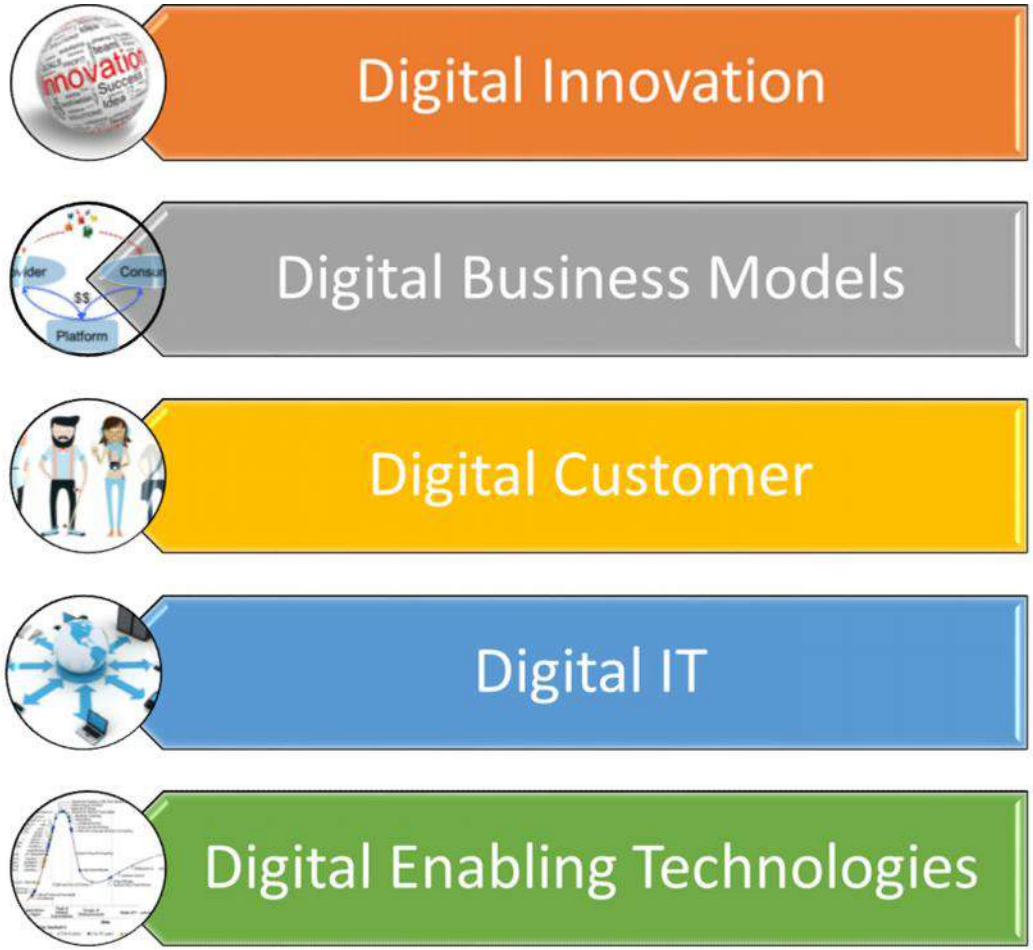




We have to learn to manage INNOVATION



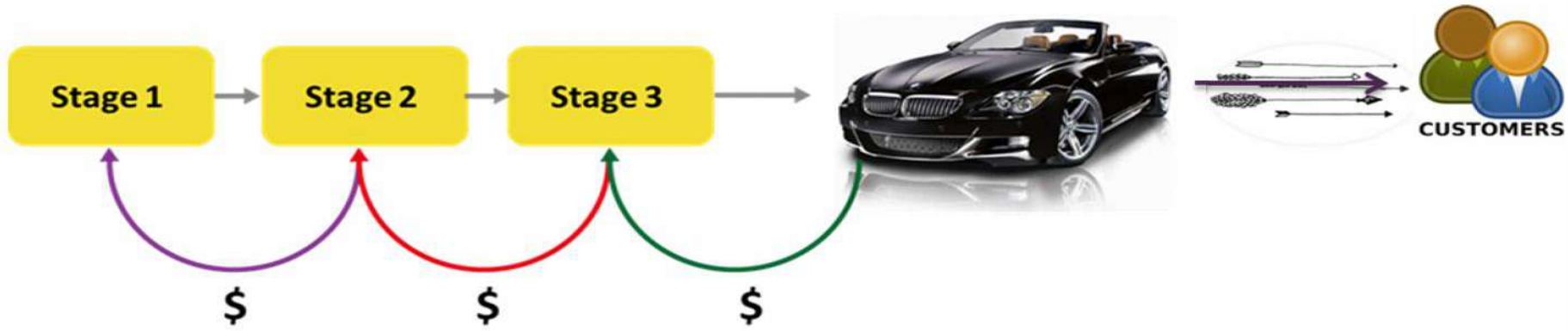




Traditional Pipeline Business Model

RAW MAT'LS	PRODUCTION	ASSEMBLY	DISTRIBUTION
Source Content	Edit/ Curate	Create Bundles	Multiple channels

Elements of value exchange



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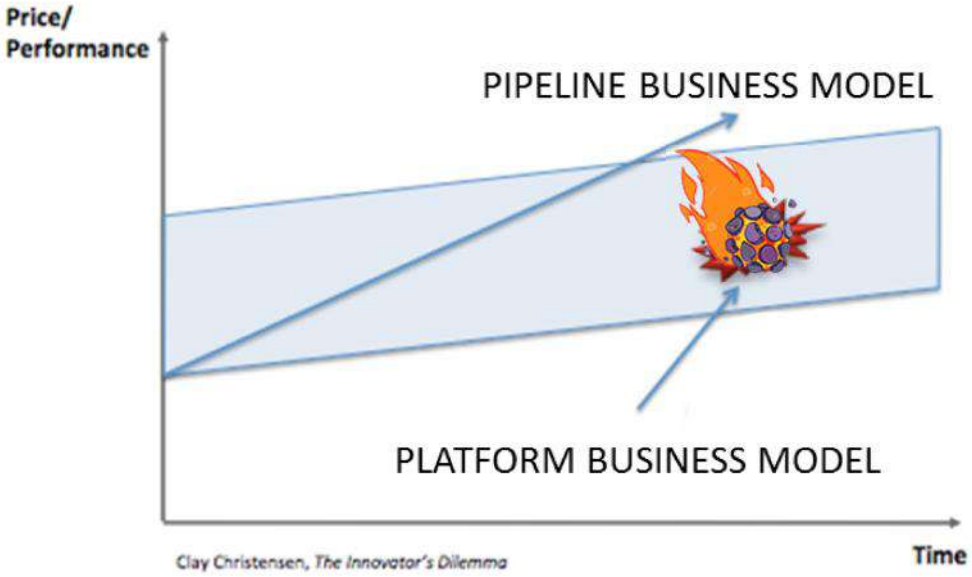
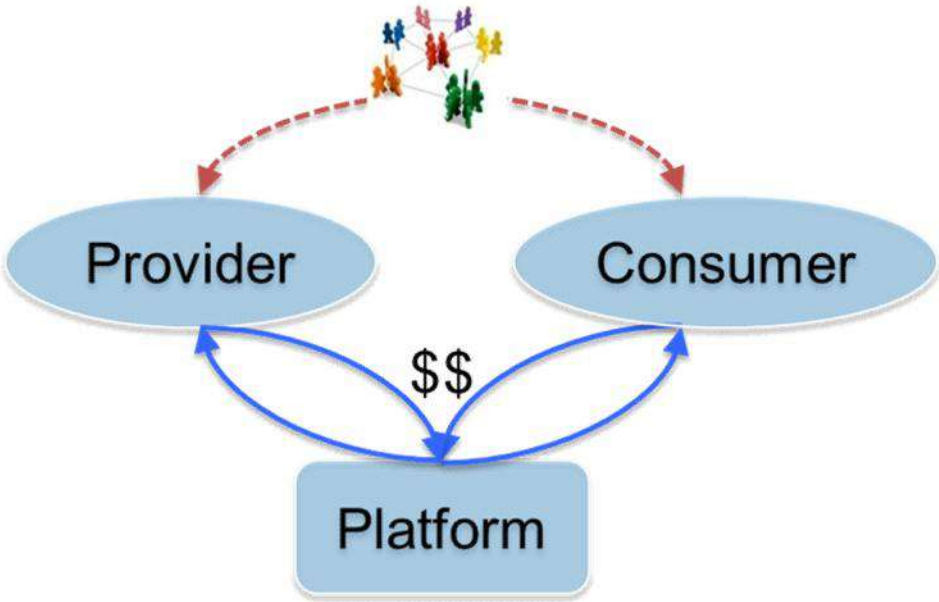


New business model: platform



Platform business is an ***ecosystem***, which brings together the ***producers and consumers*** in ***high value interactions and informative exchanges***

product 

"Products have features. Platforms have communities"

Why platforms beat pipelines every time ?

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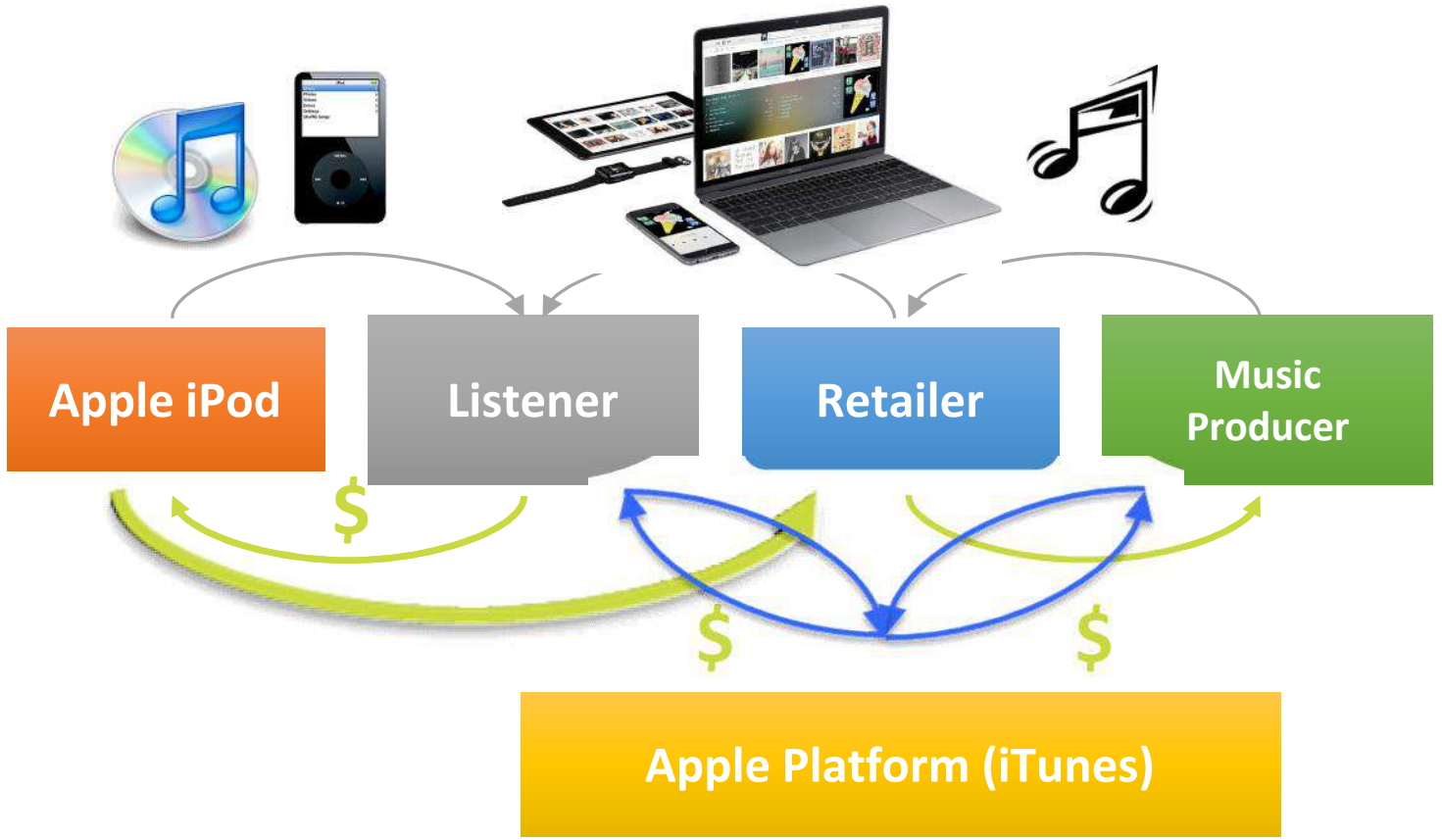
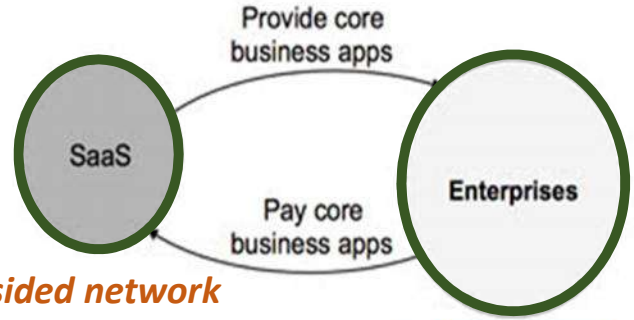
Apple iPod (product) transformed into iTunes (platform)



Mark Andreessen
Venture Capitalist,
Netscape Founder,
Board HP, eBay

A platform is a system that can be... ***adapted to countless*** needs and niches that the platform's original ***developers could not possibly have contemplated...***"

Still a Product (Pipeline Business Model)



Product: one sided network

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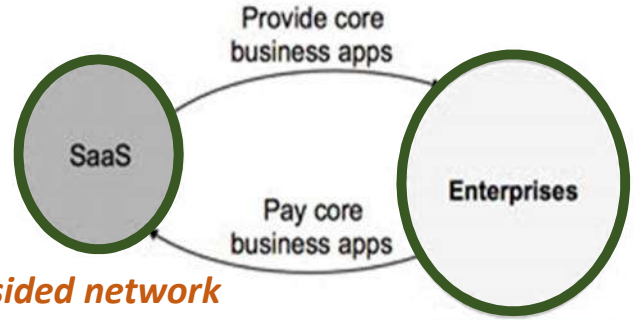

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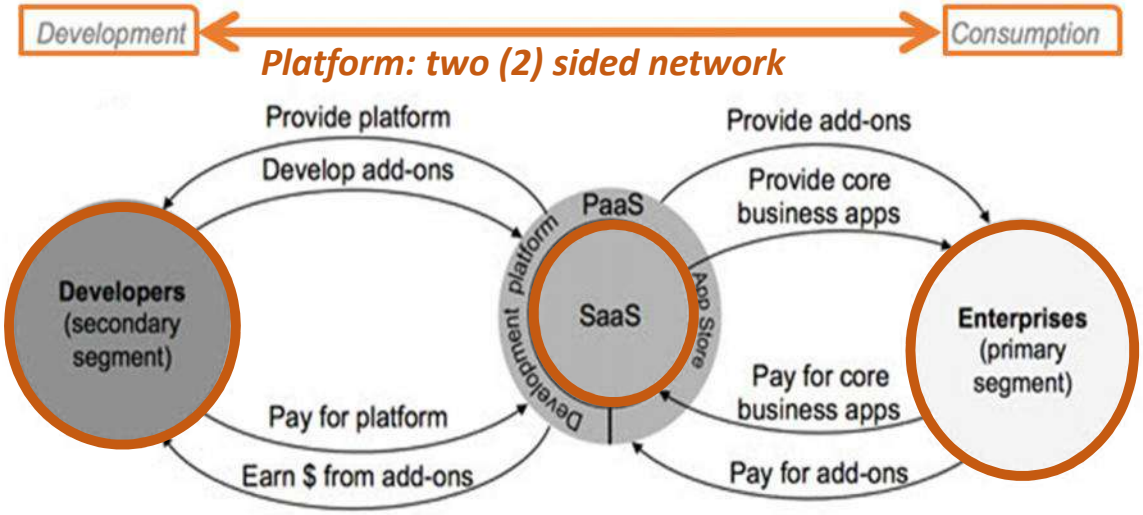
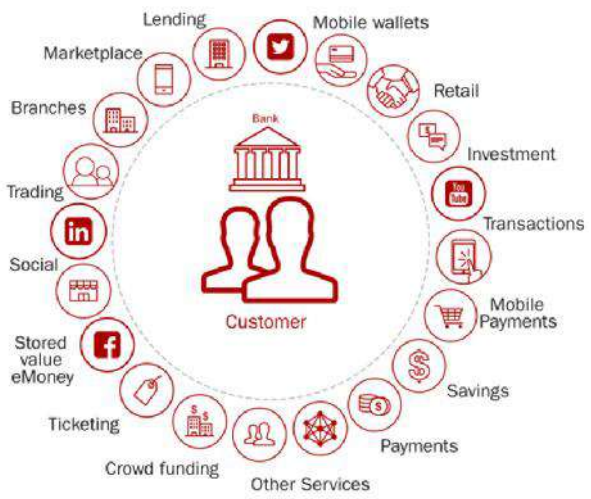


Platform Business model



Bank as a platform.
Transparency as an asset.

The Open Bank Project is an **open source API and App store** for banks that empowers financial institutions to securely and rapidly enhance their digital offerings **using an ecosystem of 3rd party apps and services**.

100s of applications use the Open Bank Project API

https://openbankproject.com/apps/

OPENBANKPROJECT

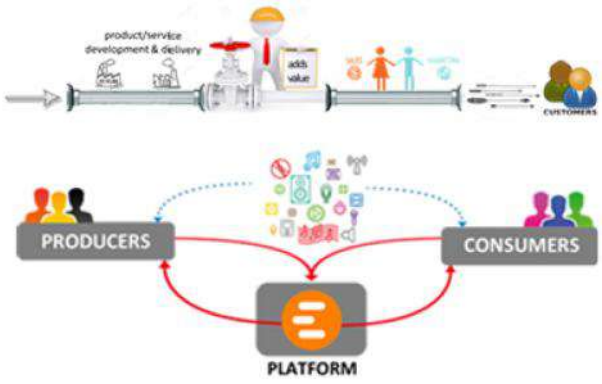
should

"digital disruptive companies" have a BAR MITZVAH MOMENT:

attention shifts away from measures of growth (number of users, etc)

to more operating substance (how users are being monetized).

Hybrid Economic Business Models



Traditional Economic Business Models

Digital Economic Business Models

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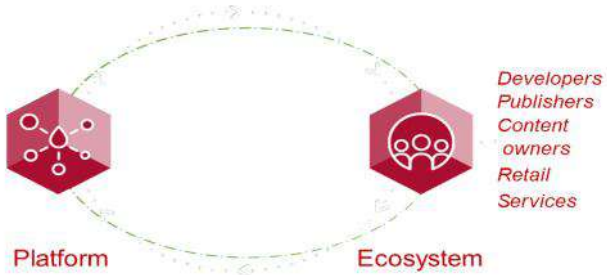
Traditional Value--
Chain Business Models

"old economy theories" work because

Value creation is linear and one-way

Platform--
Driven Business Models



"new economy theories" work because

Value creation is two-way and continuous

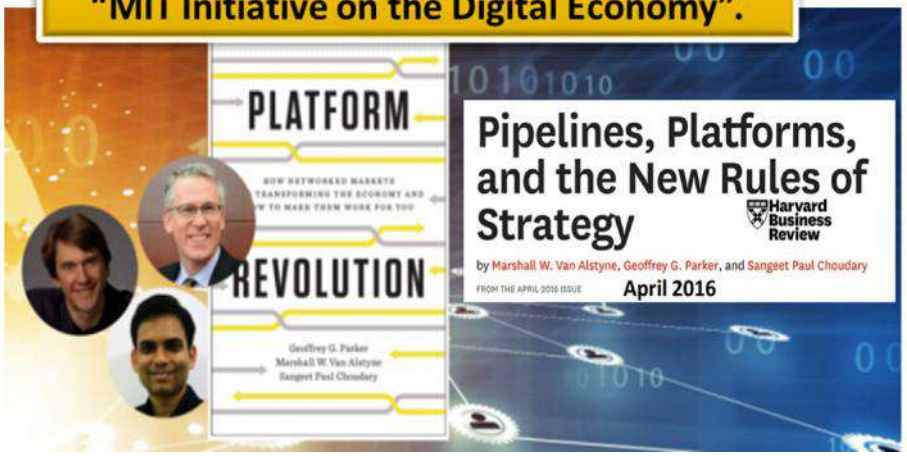
The Sveriges Riksbank Prize in Economic sciences in Memory of Alfred Nobel 2014

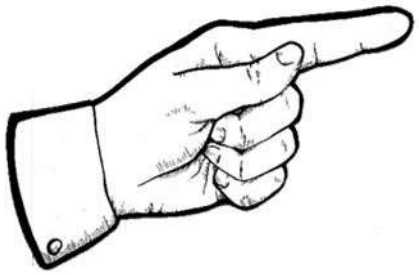
Jean Tirole

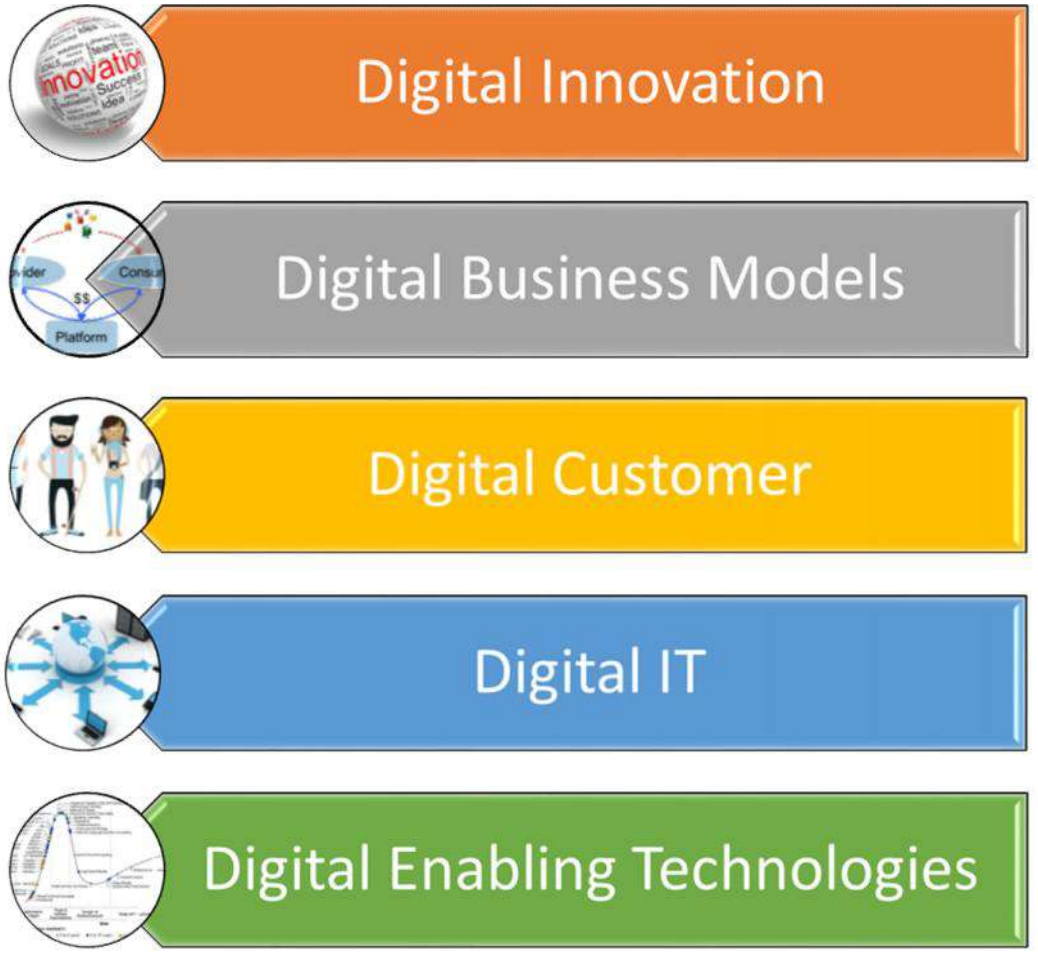
"for his work on antitrust regulation, market power & **two-sided platforms**"

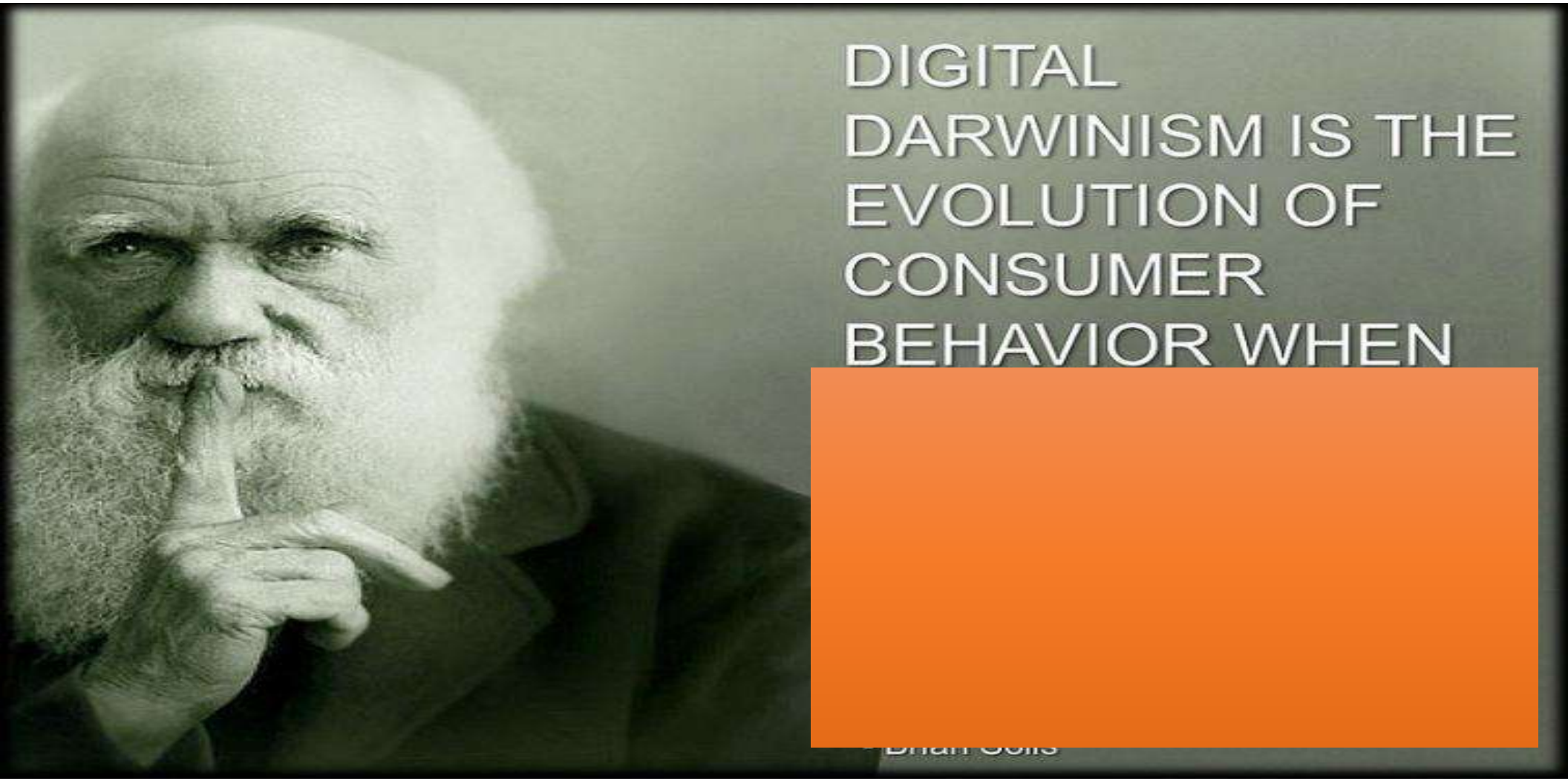
[while teaching at MIT]

Platform Manifesto by the "MIT Initiative on the Digital Economy".









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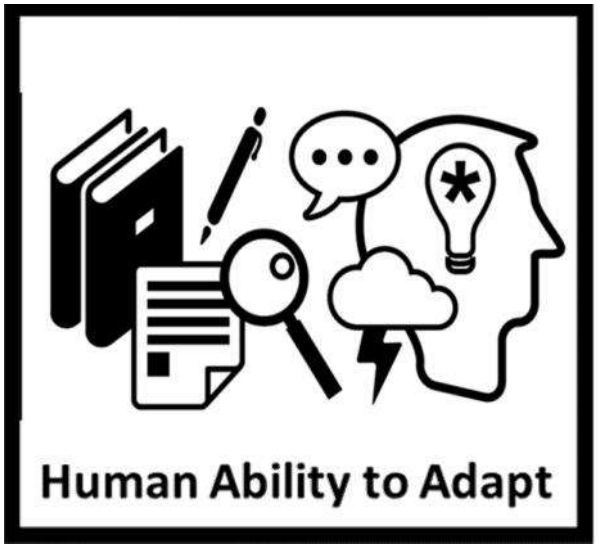
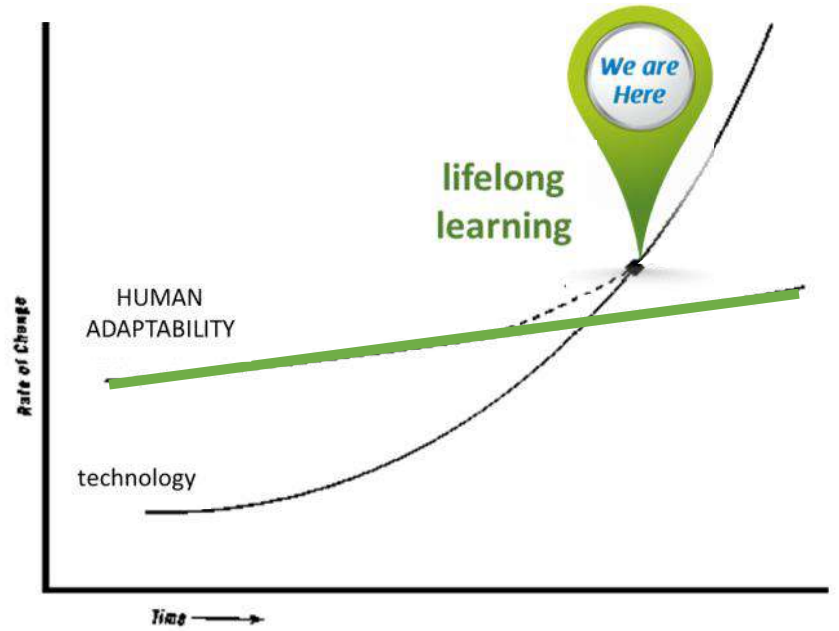
gap between expertise for the jobs of yesterday and tomorrow is widening.

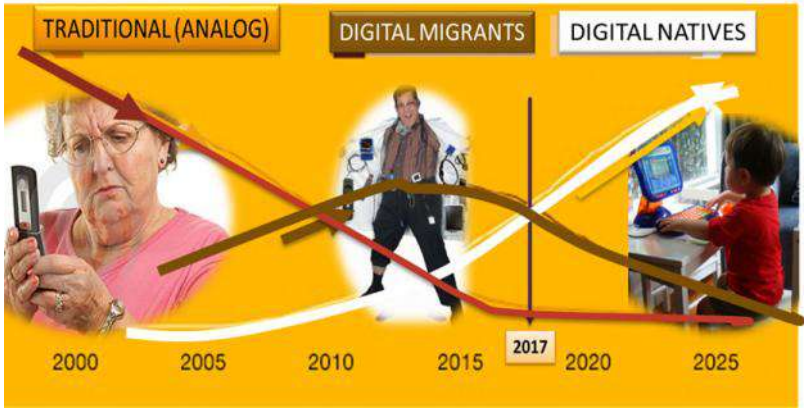
People will specialize in tasks that computers need humans to complete.

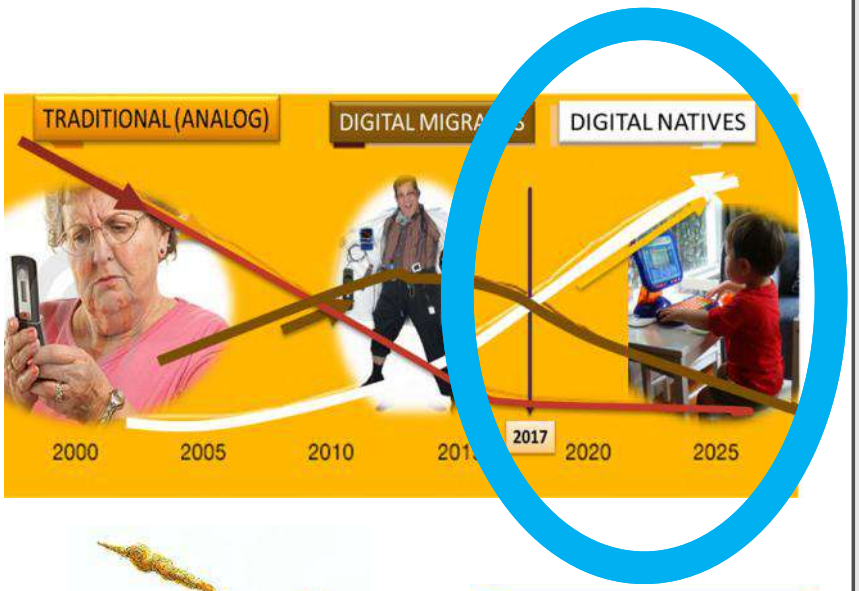
Workplace education becomes a constant.

Everyone becomes students again.







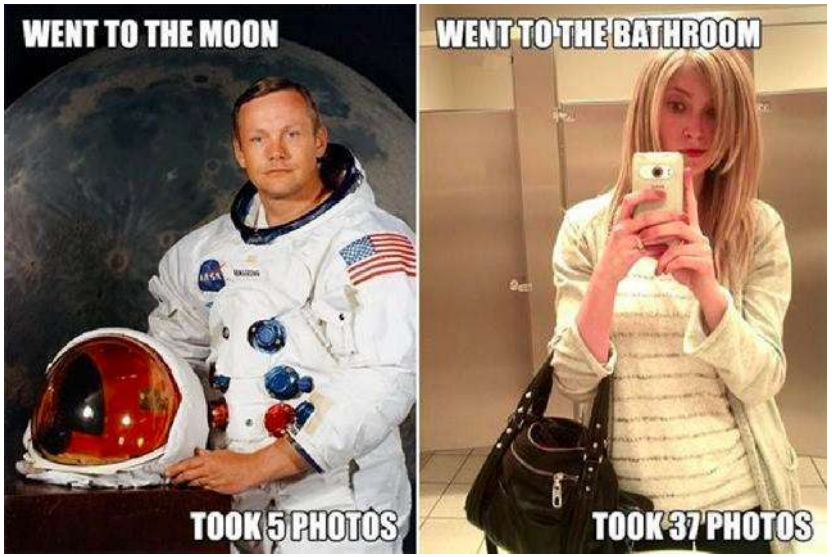


new economic enablers

new customer behavior

trust in "central authorities is broken"

Definition of paralysis (2017)



GLOBALIZATION

Hyperconnected Economics
- people and devices

On-demand Economics
- Share excess by individuals

Crowd Sourcing Economy
- Crowds do rankings, filtering, etc.

Experience Economy
- Experiences & magic moments influence client services

GIG Economics
- Independent contractors; freelancers

Transaction costs outside are lower than inside the firm
- Prof Coase economics

UPGRADING	life is a series of endless UPGRADES
COGNIFYING	useful IQ (AI) embedded in dumb/inert things
COPYING	digital runs on freely copied content
SCREEN PUZZELS	audiences assemble real-time their version of truth
ACCESSING	content rental store (borrow what we need)
SHARING	communally produced / share friendly copyright
FILTERING	infinite way to filter(gatekeepers, friends, etc.)
REMIXING	most new technologies derive from combining existing ones
IMMERSING	virtual, augmented and mixed realities
TRACKING	building a quantified self by self measurement
TRUSTING	higher level of communities that allow for reputation status

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"MILLENIAL" movements **"don't trust"** existing ***centralized trust architectures*** where a **centralized authority** (for example a central bank) act as trusted party

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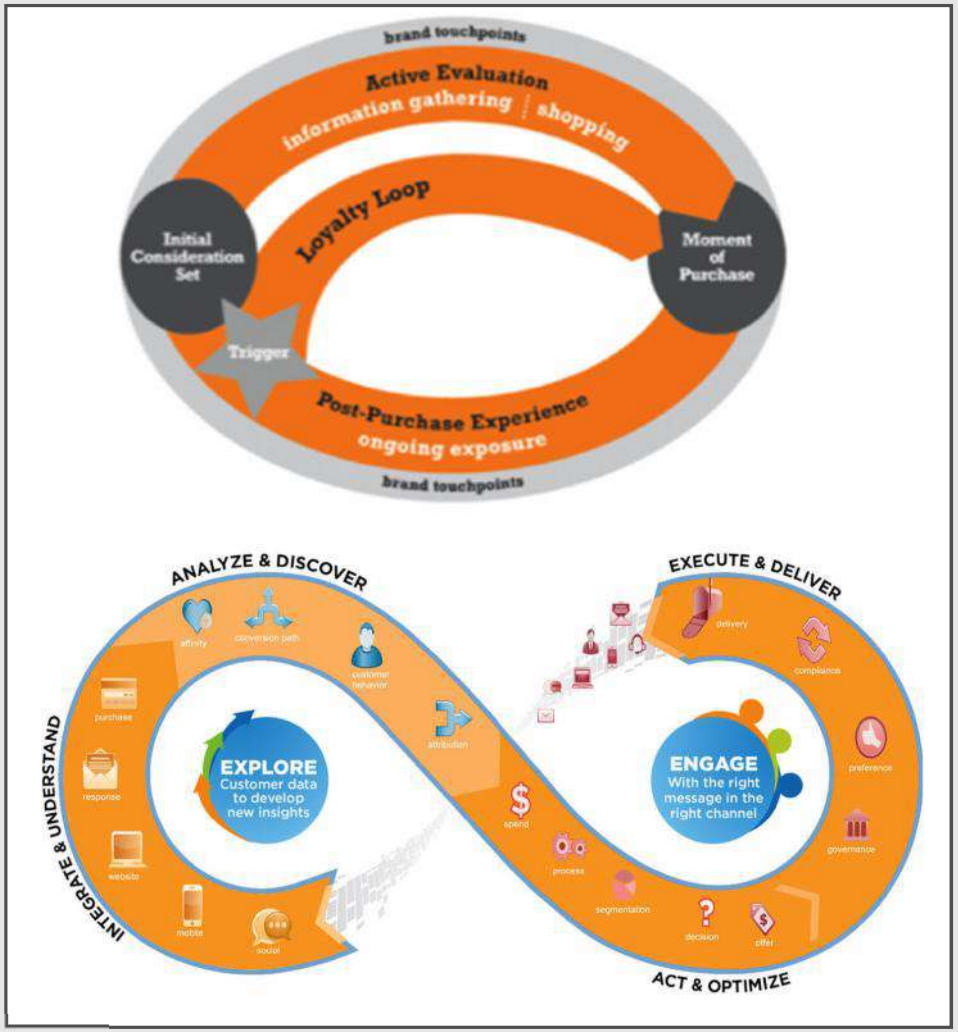
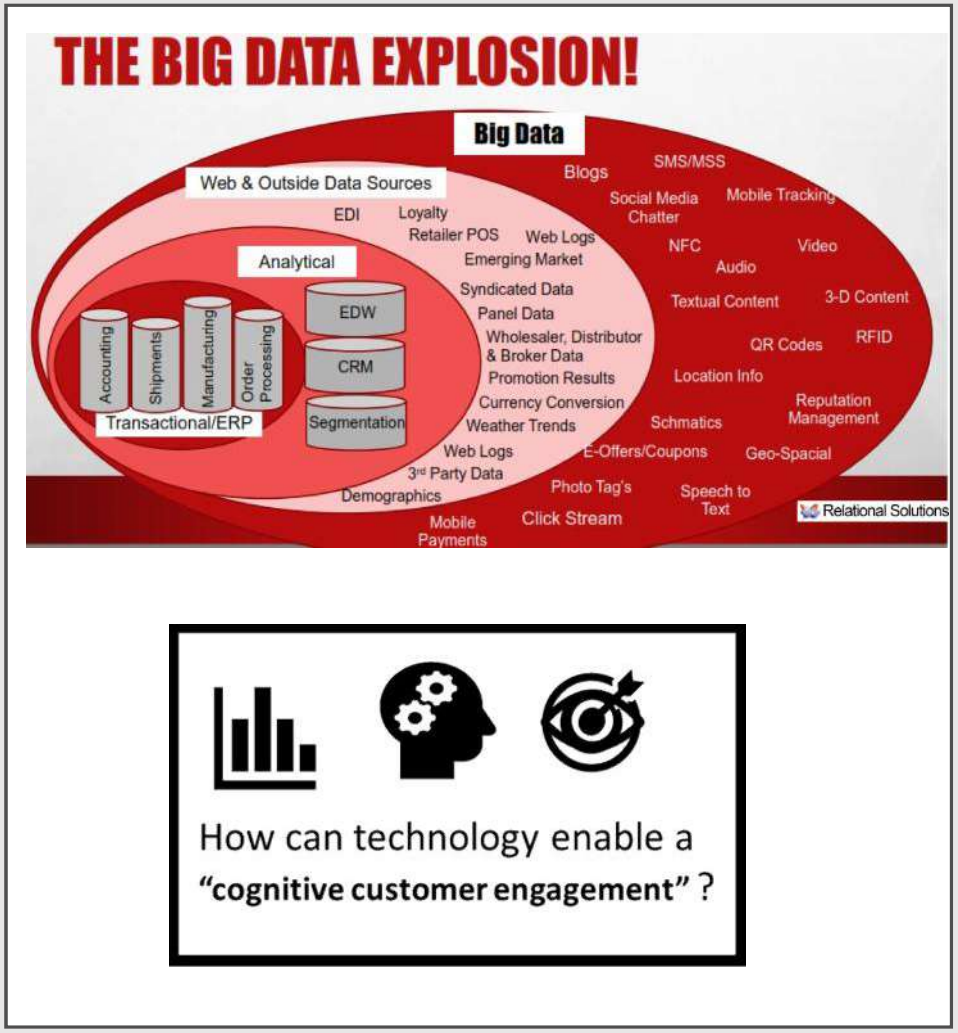
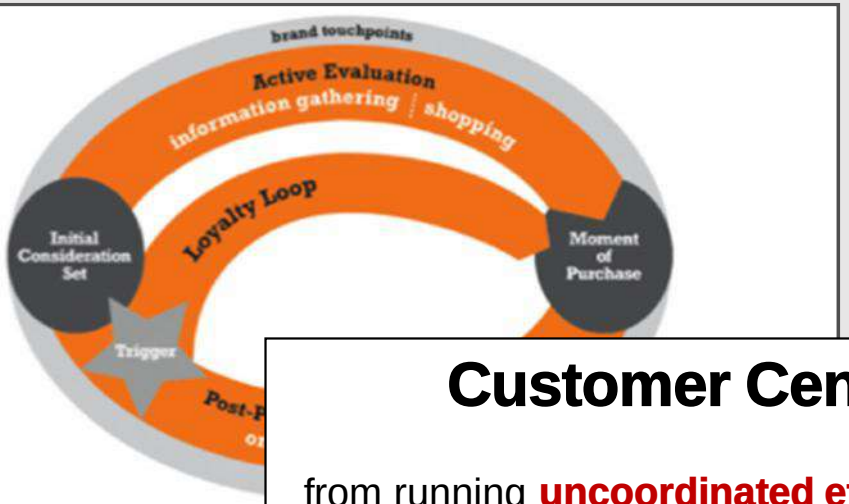
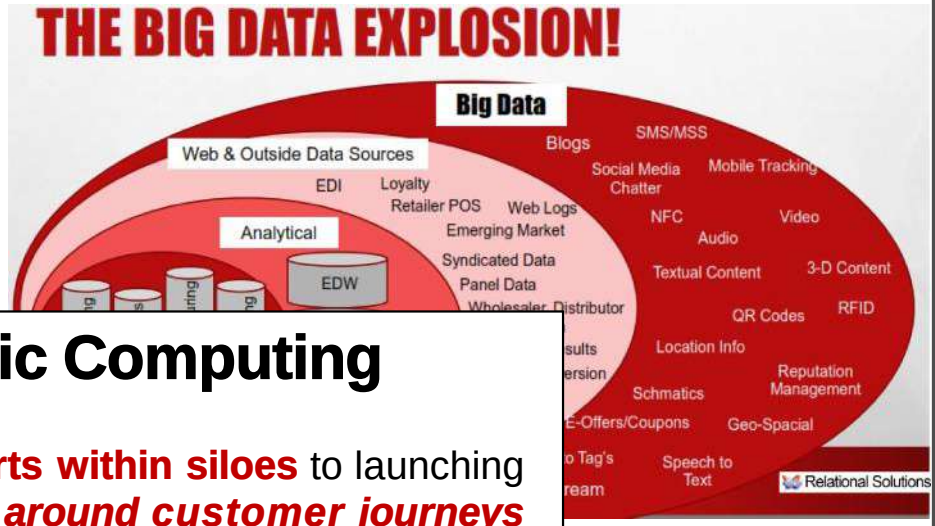
New technologies like
blockchain
will create a new kind of
trust architecture





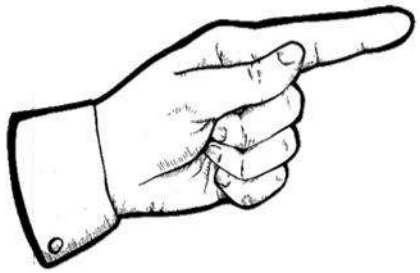
How can technology enable a **"cognitive customer engagement"** ?

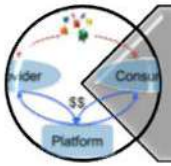


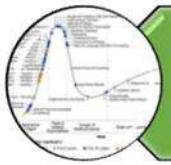


Customer Centric Computing

from running **uncoordinated efforts within siloes** to launching ***integrated programs organized around customer journeys***







Examples of the "great" disruption (unbundling)

Examples 2 of the "great" disruption (unbundling)

Welcome to the "great" disruption the "unbundling" of everything

Examples 3 of the "great" disruption (unbundling)

Examples 4 of the "great" disruption (unbundling)

Examples of the "great" disruption (unbundling)

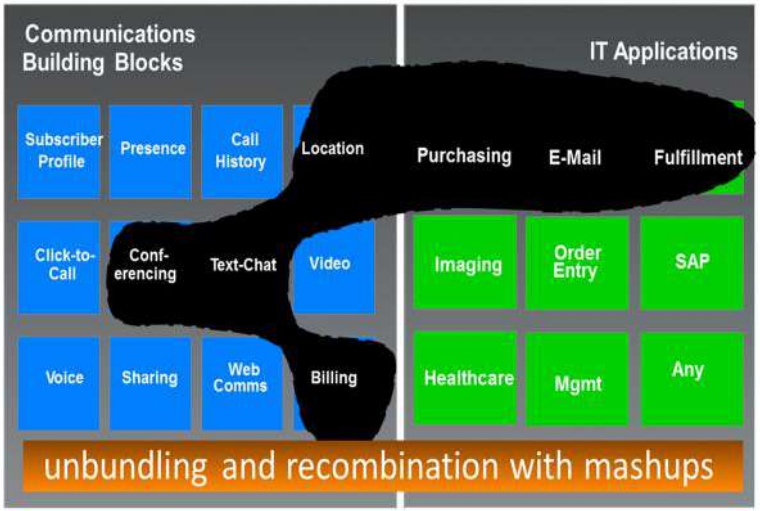
Examples 2 of the "great" disruption (unbundling)

Welcome to the "great" disruption
the "unbundling" of everything

Examples 3 of the "great" disruption (unbundling)

Examples 4 of the "great" disruption (unbundling)

Welcome to the "great" disruption
the "mashup" of everything



A "mashup" is a technique used by "modern" IT that includes teams, data, applications, and technologies from two or more sources to create new services.

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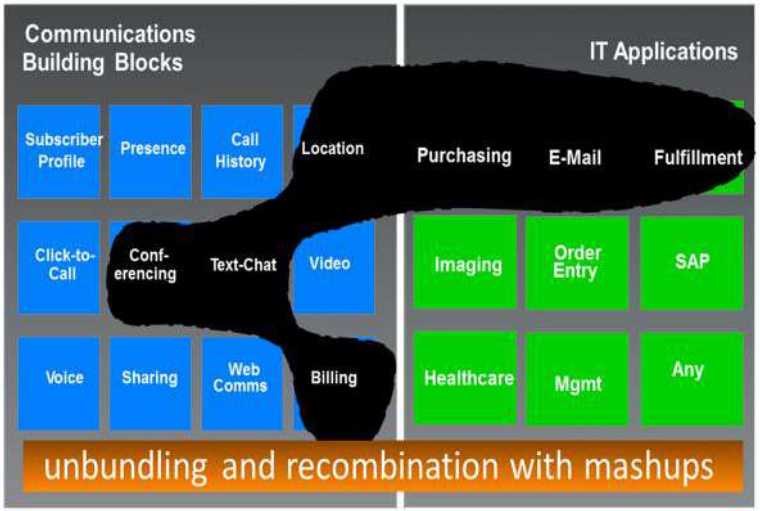

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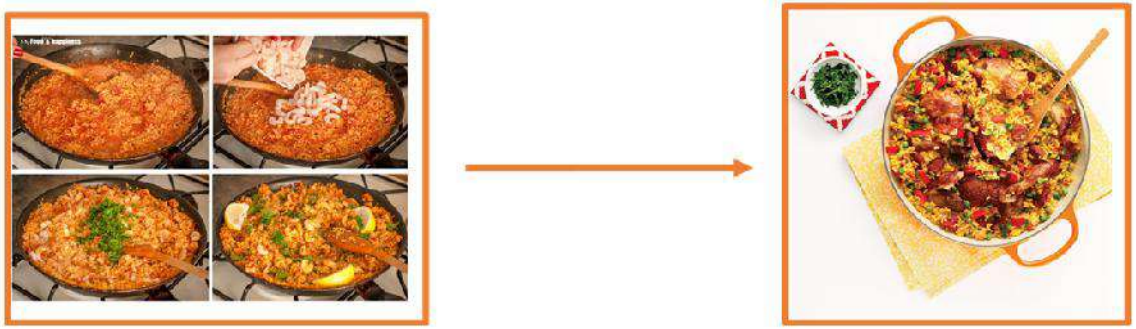

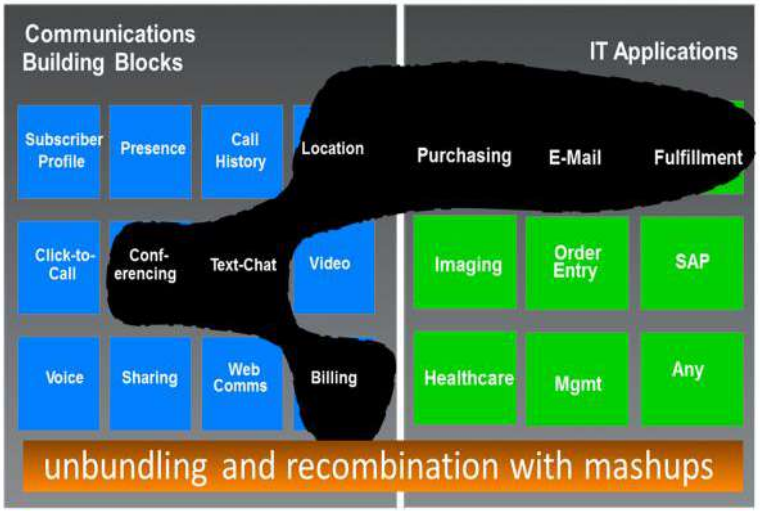

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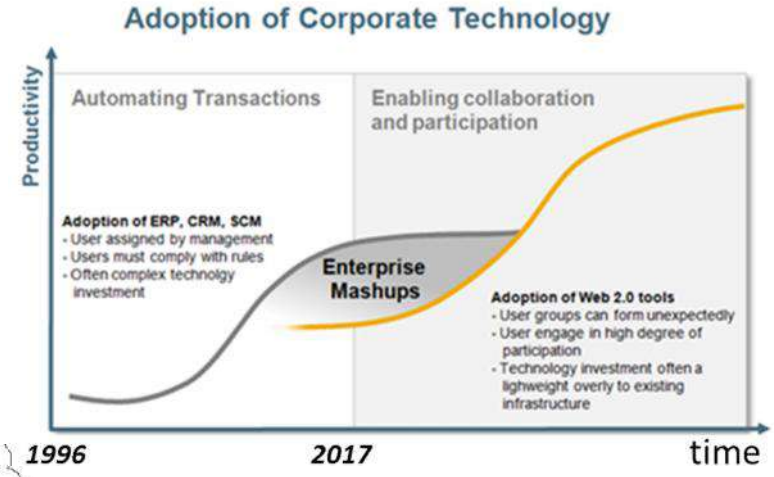

To the users , mashups should provide the right solutions at the right speed in this "digital transformation" world

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Era of Postmodern ERP (called the MASHUP)

and what it means for your business ?

It's ***difficult to create an innovative workplace*** if a company's employees are using ***tools designed in the 1980s***.

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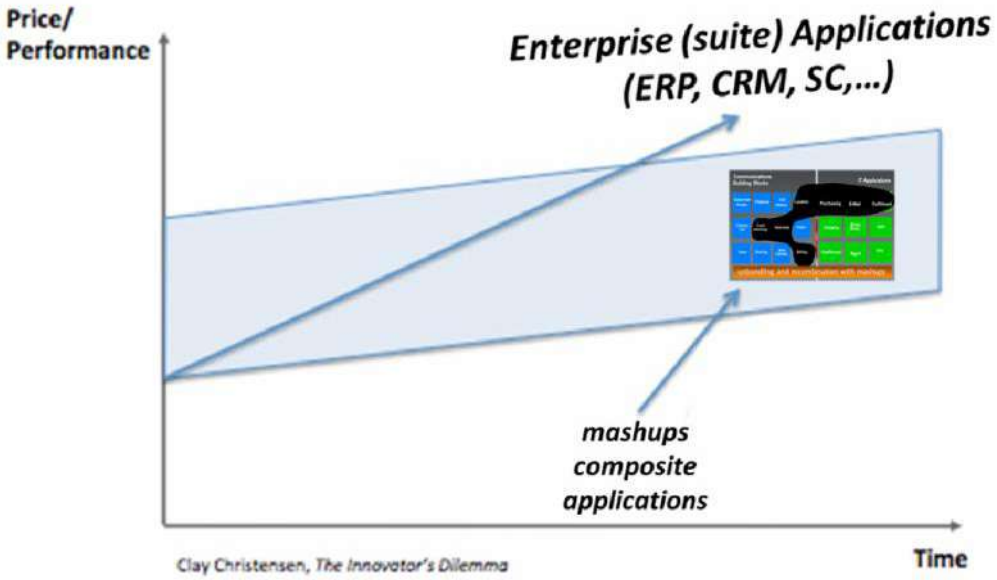
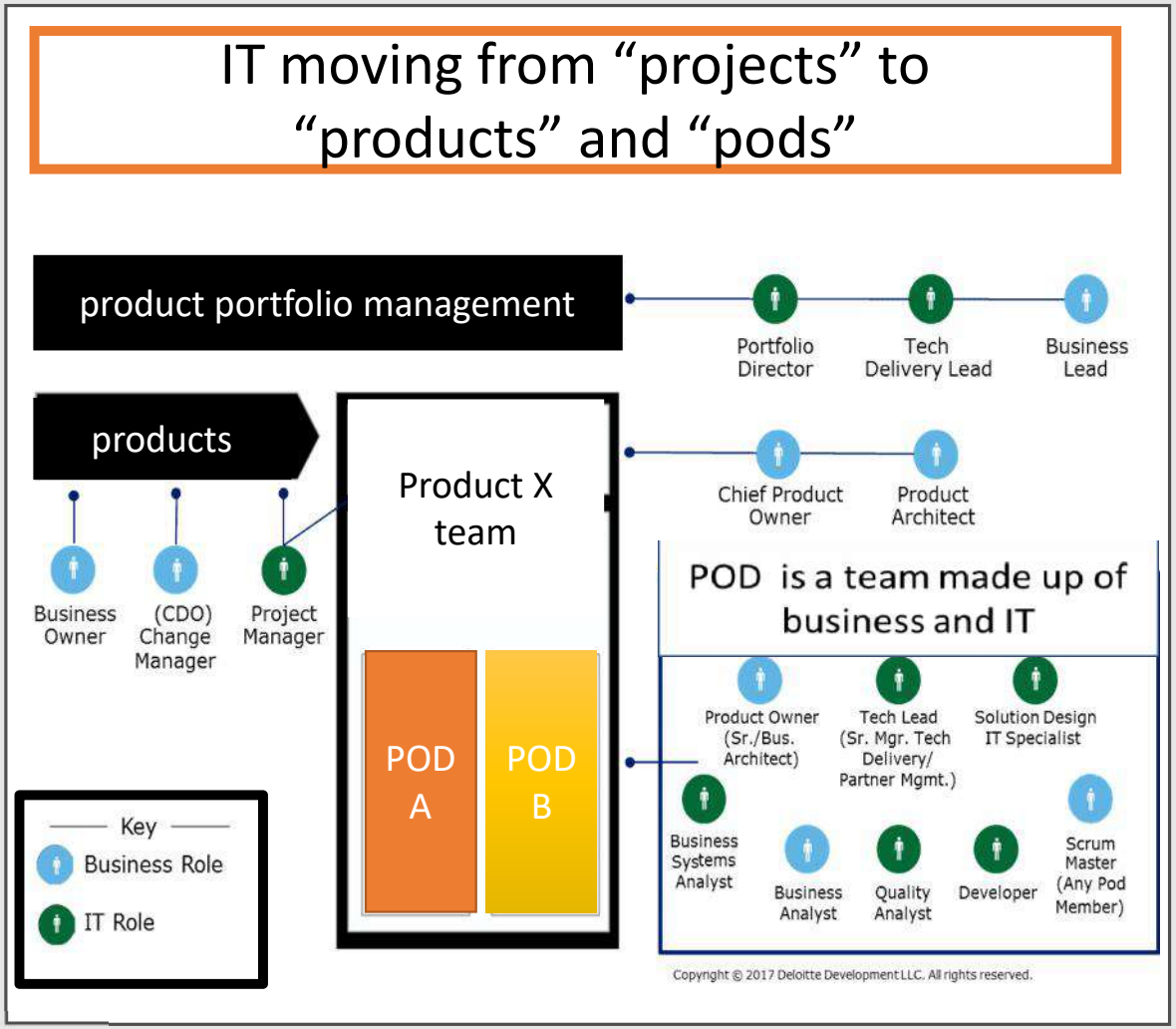
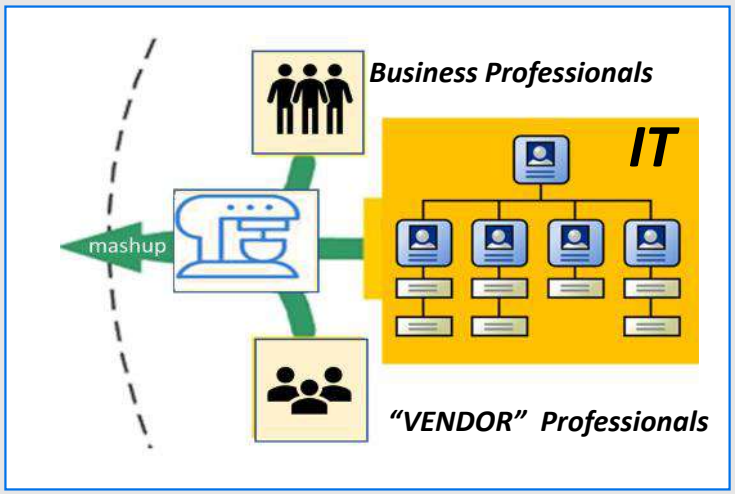


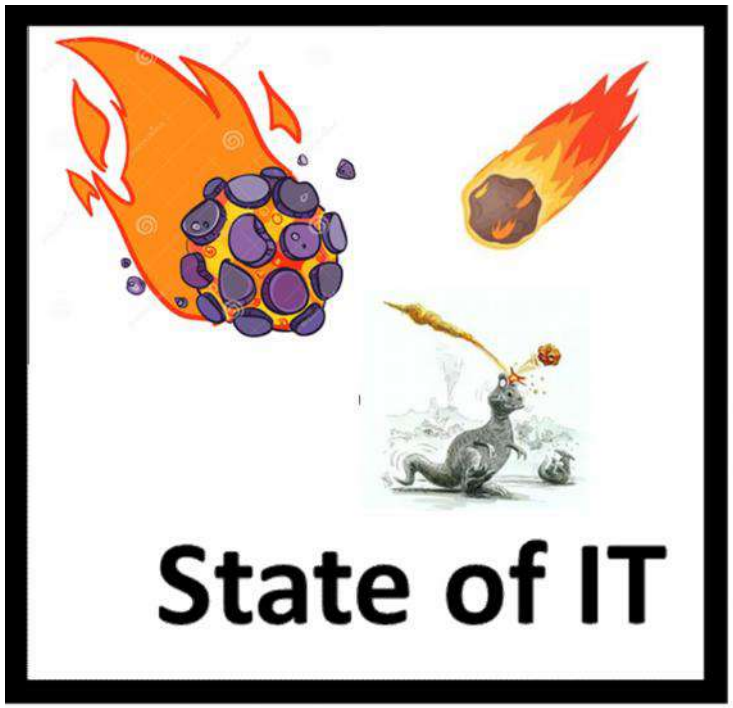
Composite (mashups) Applications include

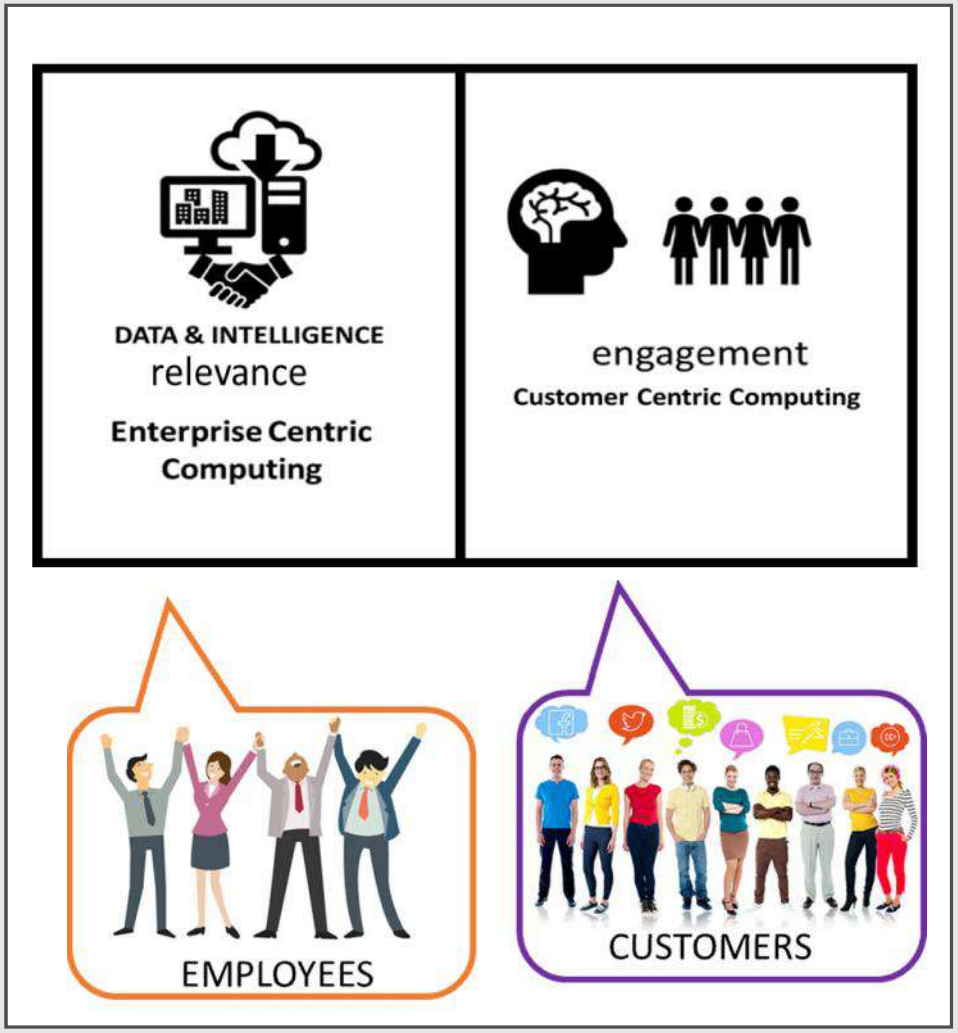
- ***Using a cloud deployment of best-of-breed application*** instead of *one of the existing applications*
- ***Using multiple ERP suites*** *from different vendors,.*
- *Foregoing an ERP suite altogether and* ***using only best-of-breed applications****.*

IT moving from "projects" to "products" and "pods"

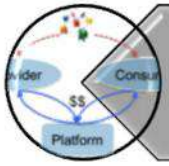








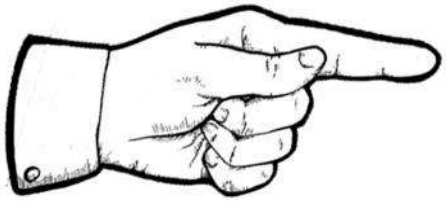
Digital Innovation

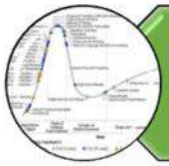


Digital Business Models

Digital Customer

Digital IT





Digital Enabling Technologies

Digital technologies (enablers) and IT

Resource becomes so **cheap** and **abundant** that **wasting** it to ***create something completely different*** makes sense

Up to 2007 Computing

Integrated circuits and eventually the computer on a chip (Moore's law) at lower and lower prices. More and more sophisticated software was written and the software/VAS industries were born

Mini computers and PCs disrupted the mainframe industry

2007-2017 Communication

The telecoms bust had unintended consequences: the "low price" of usage of long distance cables, mobile tech, data usage and the internet.

The internet and mobile disrupted everything.

From 2017 Memory & storage

With cost per terabyte in free fall, the response is to accumulate more data. Using also the internet and cheap power we have now:

Big Data, cloud, Blockchain, AI, VR

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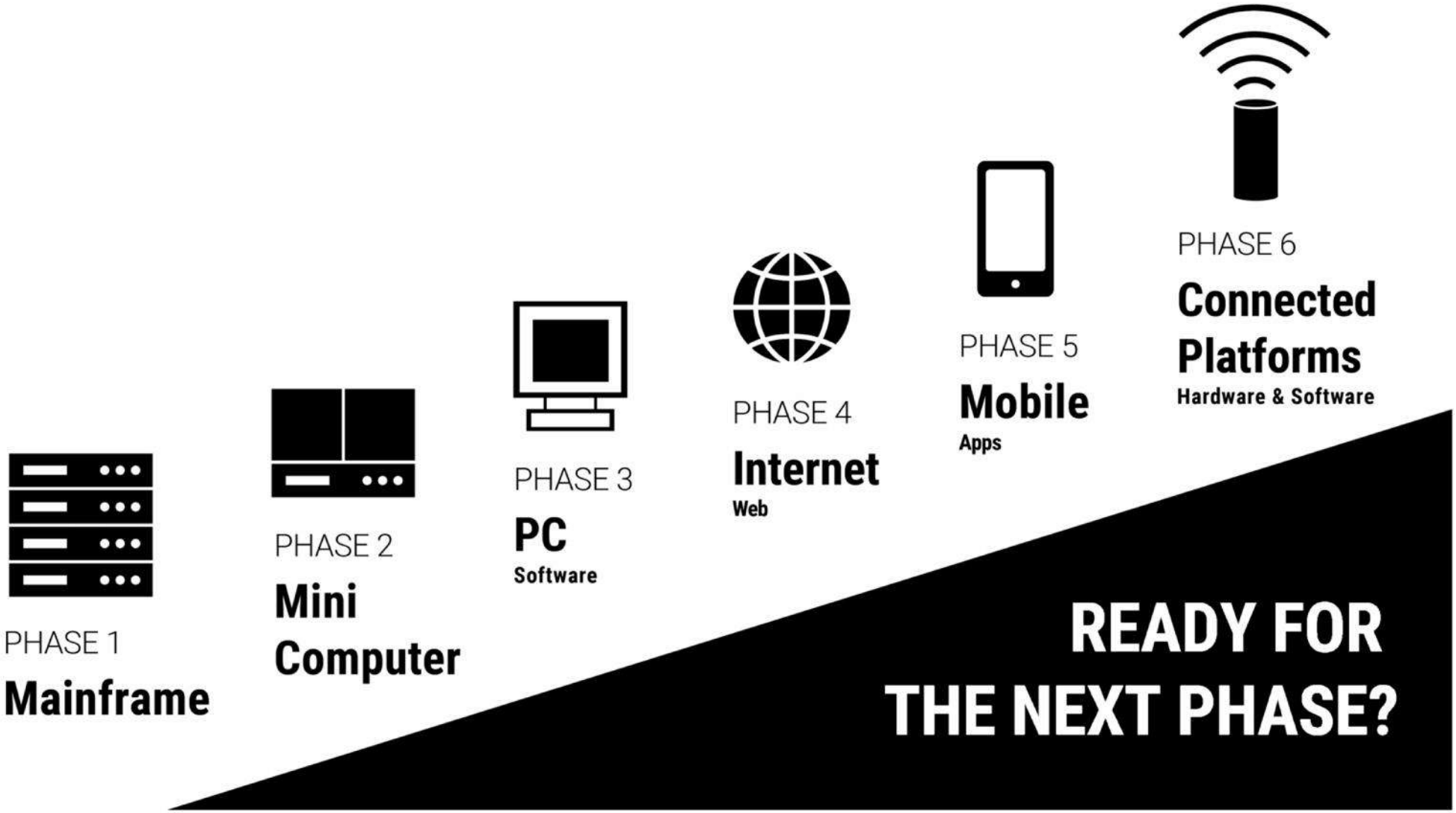
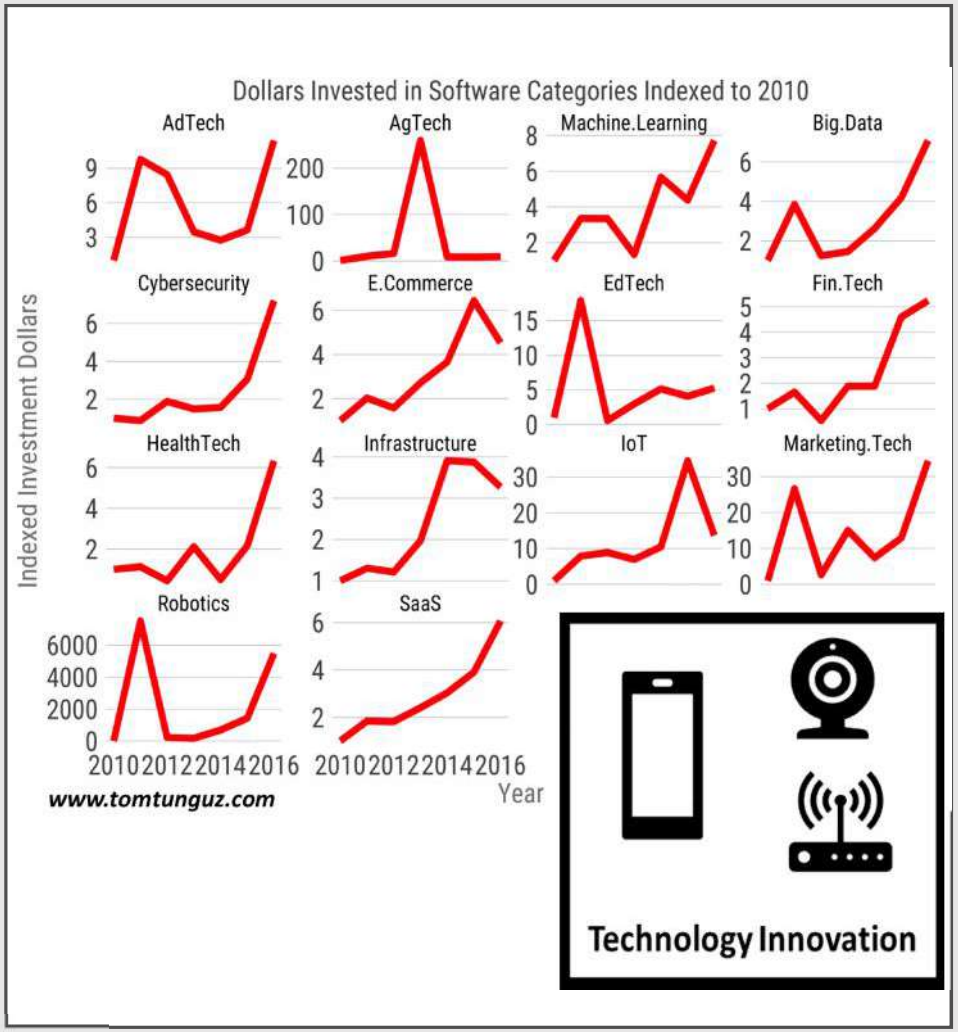
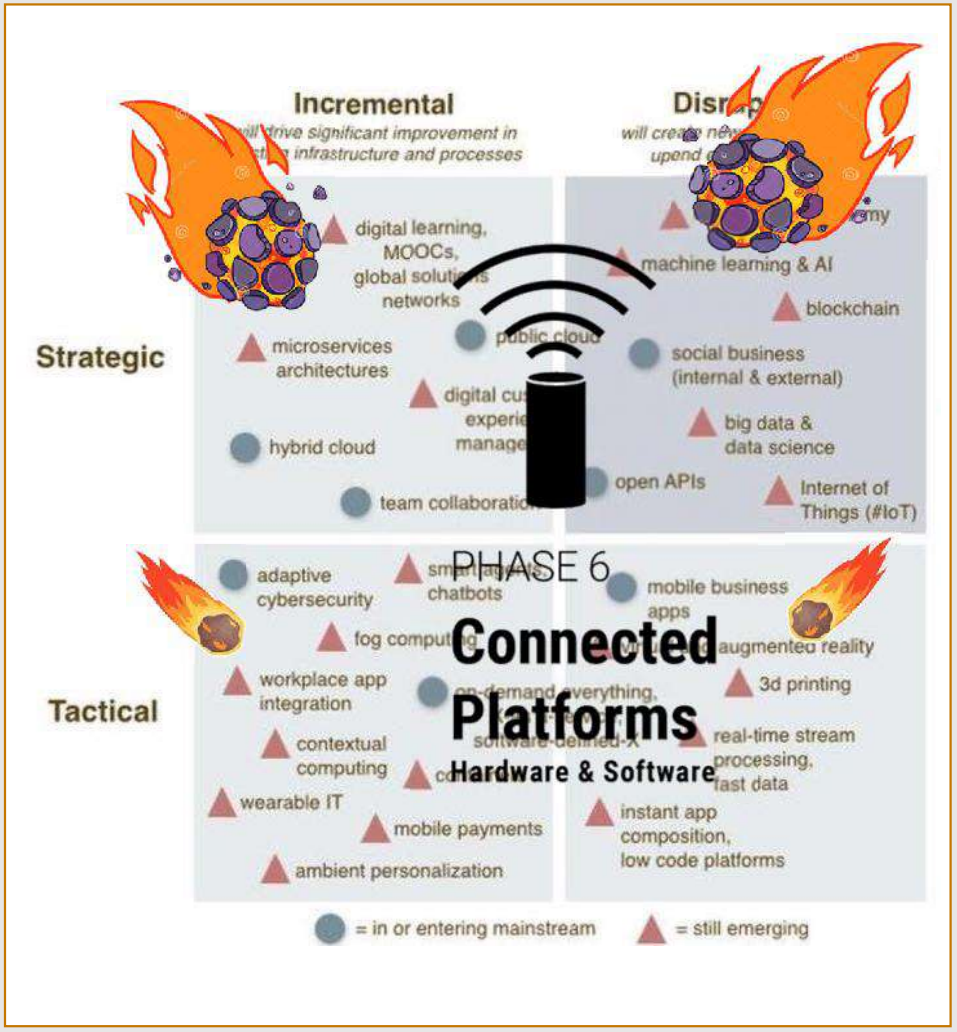






THREE DIMENSIONS OF IT CHANGE:
PROCESSES, DATA, ORGANIZATION

Process and Decision Automation

DIGITAL GLUE (enables mashups)
- API
  - Strategy
  - Management
  - Architectures

Customer Service
- Voice Interface
- Messaging
- Artificial Intelligence
- ChatBots

Automate development & delivery
- Demand Management
- Build Automation
- Test Automation
- Continuous Integration
- Continuous Delivery

Data, Analytics and IT Architecture

BRAIN (everything gets smarts)
- Applied Machine Learning
- Cognitive Computing
- Algorithms & Simulation

Foundation Services
- Cloud Services
- BPaaS, IaaS, PaaS, SaaS

Real Time Knowledge (no more guessing)
- Sensors
- IoT software
- Wearables
- E-payments

Immersive Technologies
- Virtual Reality
- Augmented Reality
- Mixed Reality

Organization and Operating Model

Community Code Accelerators and use of the "commons"
- Open Source
- GitHub

Trust Engine & Smart Contracts
- Trust Ecosystems
- Blockchain-based Systems

Portability of Software (fast development +run time ops)
- Microframeworks
- Containers

An **IMPENDING EVENT** is something that elevates the technology solution from a **'nice-to-have'** into a **'need-to-have'.**

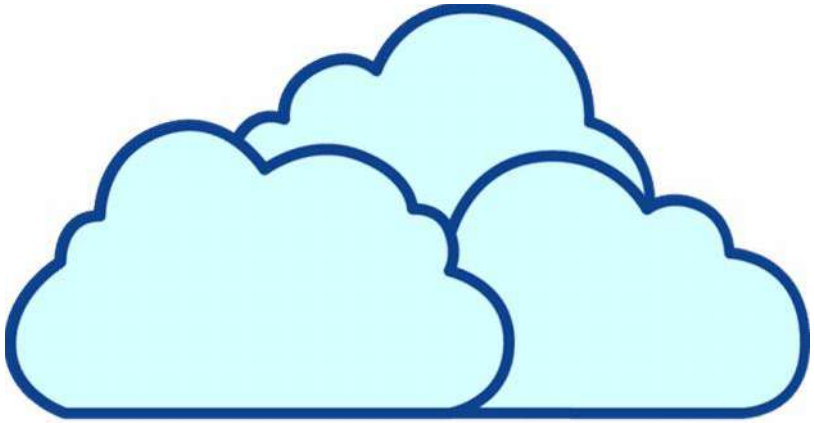
WHY PRIORITIZE ? why adopt (a technology) as a very **important project in 2017-18** (projects or goals)

Foundation Services

- Cloud Services
- BPaaS, IaaS, PaaS, SaaS

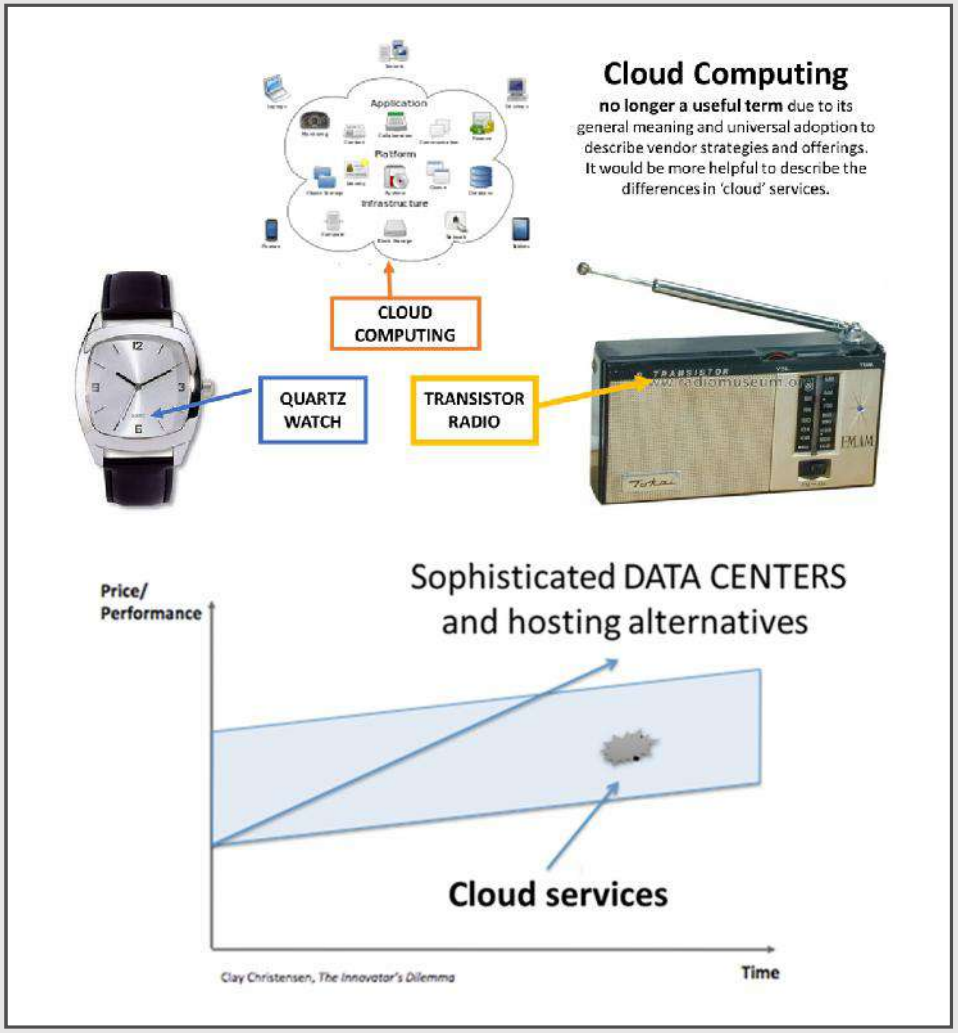
Availability (today) of flexible, scalable delivery services ***without incurring large startup costs or technical legacy*** associated with IT architecture and code maintenance.

Cloud services come with legitimate/serious ***cyber/security concerns*** but for numerous applications it makes ***no sense to ignore*** its value (ie: marketing automation)



Users have been frightened by:

1. Regulation Issues
2. Security Issues
3. Integration Issues



DIGITAL GLUE
(enables mashups)

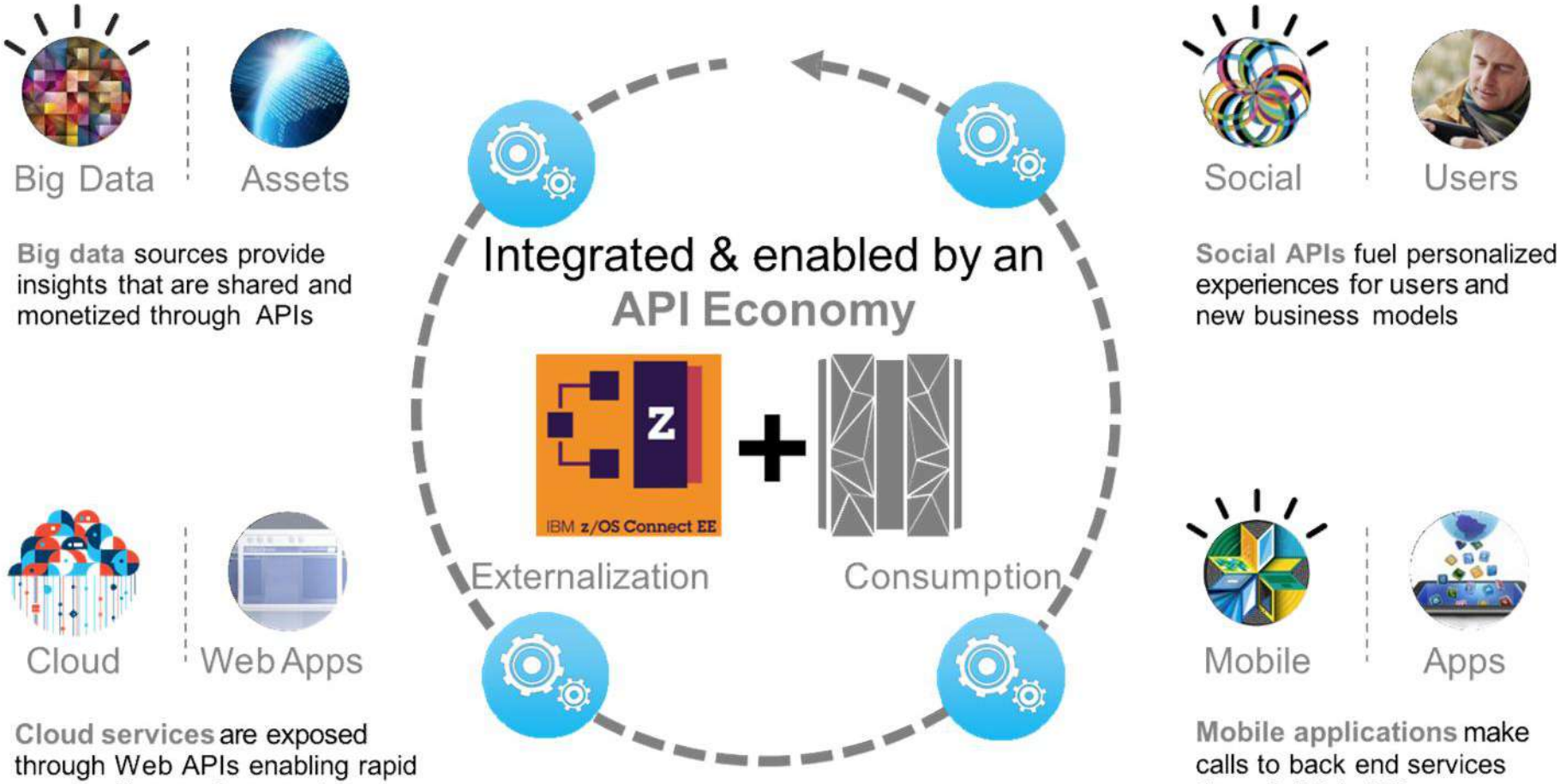
- API
  - Strategy
  - Management
  - Architectures

API management platforms finally:

1. They give organizations ***control over their APIs,*** how they are delivered, managed, and analyzed.
2. They enable capabilities such as ***API rate limiting and access control***, to name a few.

APIs TODAY mean…

1. ***New business models*** and revenue streams.
2. ***New distribution channels*** and extended reach.
3. ***Externalized R&D*** and fostered innovation.
4. ***Partnership*** development.
5. ***Security and control over who accesses*** your resources.
6. ***Organizational flexibility*** with internal APIs.



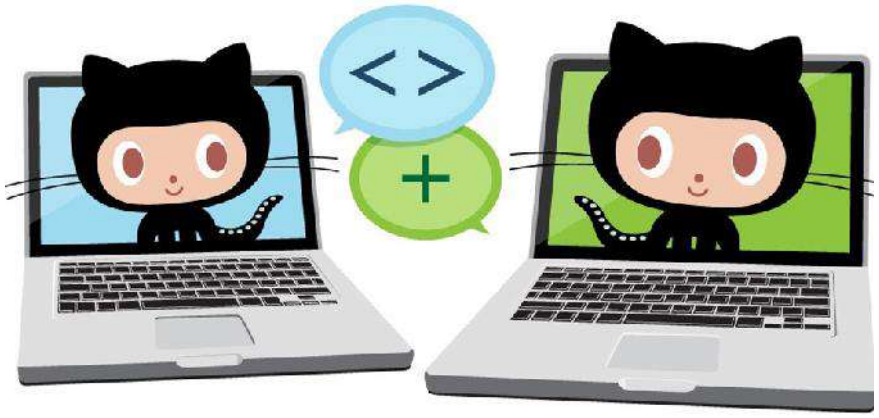
Community Code Accelerators and use of the "commons"

- Open Source
- GitHub

1. Open source is the ***engine of innovation***; powering technology like operating systems, cloud, big data or IoT

2. GitHub is used by 11+ million coders, 100,000+ teams in 52+ million repositories

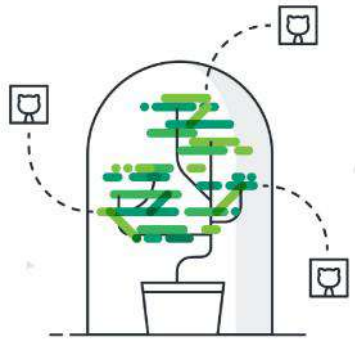
1. ***GitHub is a centralized source control***. Enabling teams and organizations to keep their source code maintained and controlled with version and other facilities such as release version.
2. NO sectors of the software industry will be invulnerable to ***disruption from OPEN SOURCE***
3. If software is eating the world, ***OPEN SOURCE Is eating the software world***



GitHub
is an open source development platform that every developer must care about

GitHub tools for working in collaboration (teams):

1. ACCESS RIGHTS
It allows certain access privileges to code for certain users
2. GITHUB FORK
It allows a user to create a copy of a repository on their account and computer
3. PULL REQUEST
It allows the developer to make the code repository better with the help of another developer's code
4. GITHUB ISSUES REPOSITORY
It allows users to keep track of bugs in the code, also used in keeping track of advancement needed in the code.



Automate development & delivery

- Demand Management
- Build Automation
- Test Automation
- Continuous Integration
- Continuous Delivery

Possible today (without human intervention):

1. ***Manage backlog*** of business requirements
2. ***Compile and build application***
3. ***Execute*** unit, integration, service ***tests***
4. ***Have*** a ***single source code repository***
5. ***Check in code*** into a shared repository which then ***triggers*** a build and ***test execution***
6. ***Continuous delivery*** through release automation

IT Departments are :

1. As the number of high-tech/startups grows and multinationals enter Israel the ***race is on for good workers***
2. Leveraging DevOps and autonomic platforms to ***overcome the traditional limitations of manual work and disjointed teams***

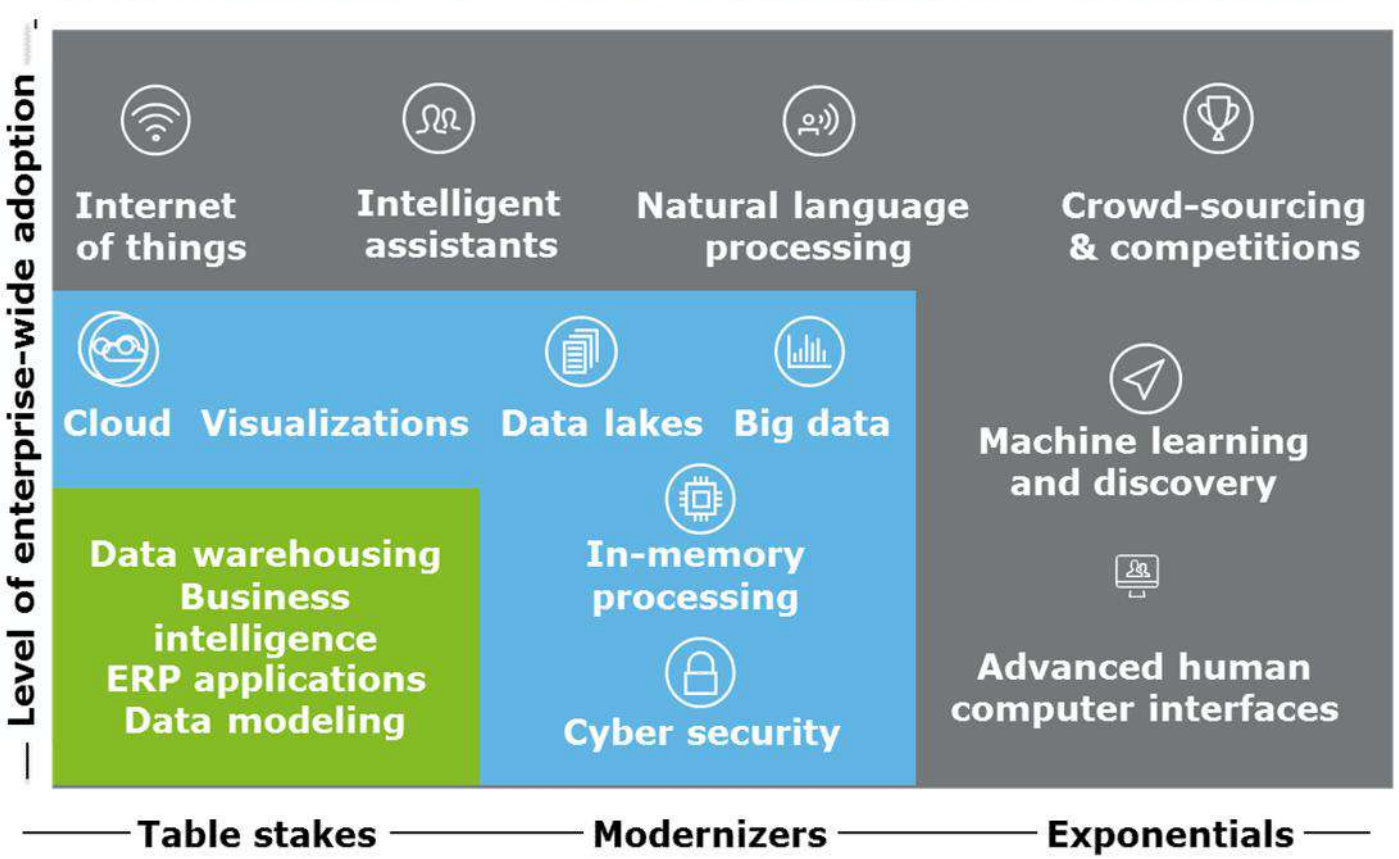
BRAIN (everything gets smarts)

- Applied Machine Learning
- Cognitive Computing
- Algorithms & Simulation

Today ***cognitive computing tools*** *(machine learning, natural language generation, speech recognition, computer vision, and artificial intelligence) :* ***simulate human cognitive skills,*** ***(****analyzing through mountains of data),to* ***automate insights and reporting in real time***.

Available today many tools: ***advanced analytical environment*** that enable enterprises to tap into the ***large volume of data in order*** to derive ***insights in real-time and compete*** in the digital world

Direction of the analytics market



Drivers & disruptors

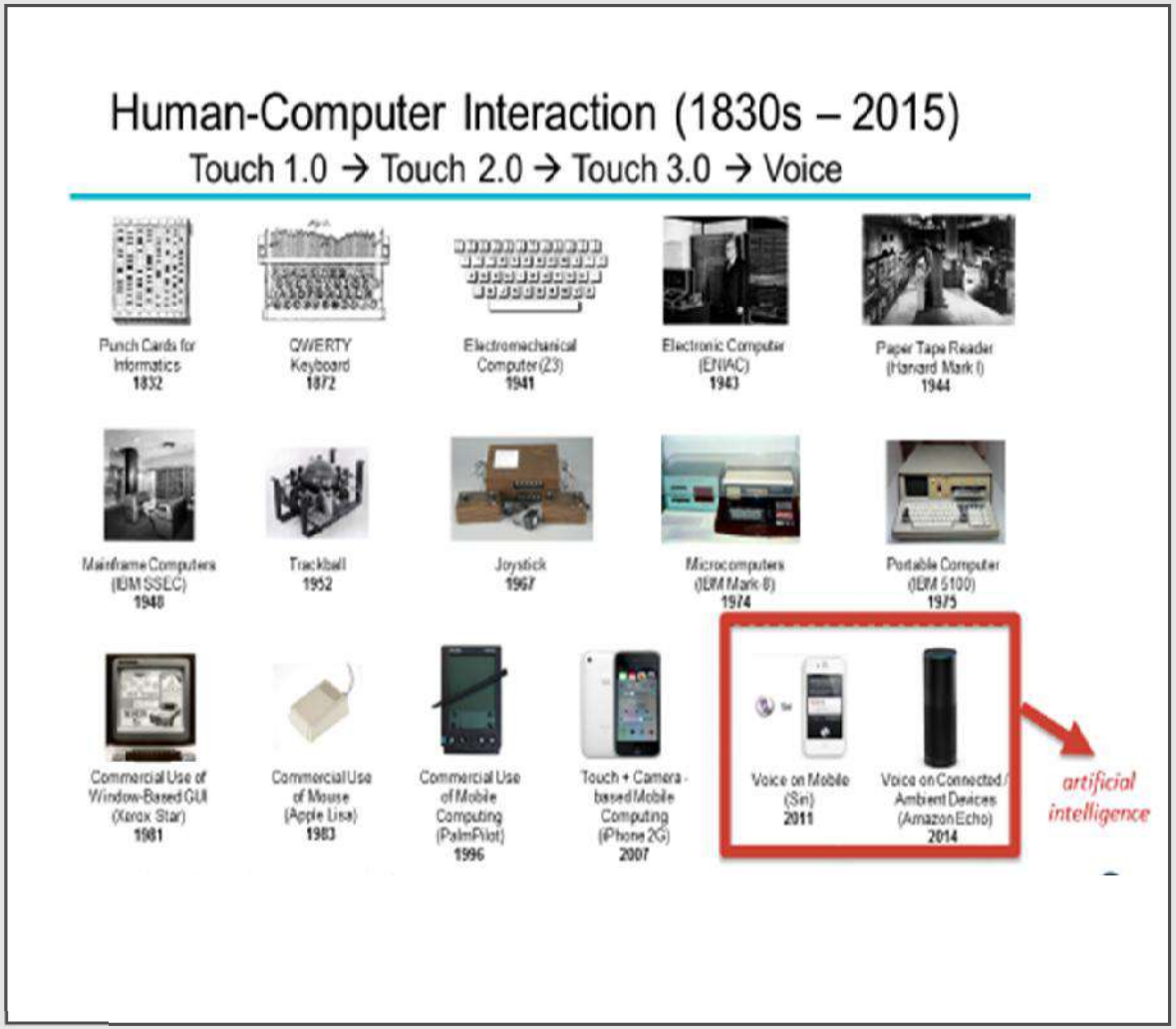
- Data proliferation
- New data sources
- Technology disruption

Customer Service

- Voice Interface
- Messaging
- Artificial Intelligence
- ChatBots

Natural language (NLP) science enables companies to read/hear/talk things like product catalogs, service requests, contracts and purchase orders – and to ***tackle them at high volumes without human intervention***.

NLP, AI and reactions will impact business by ***reducing the amount of typing for users*** Typing is not only ***time consuming but lends itself to spelling errors and command errors,*** which can add to a poor user experience.
Also the use of quick-reply buttons, persistent menus, reactions… improve the B2C and B2B chatbots interactions.



Real Time Knowledge (no more guessing)

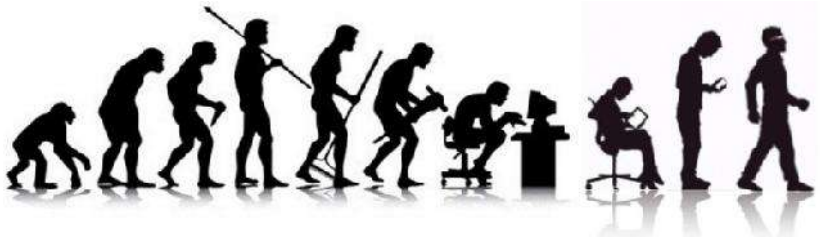
- Sensors
- IoT software
- Wearables
- E-payments

Implementing IoT with sensors that identify and track physical objects, crops, animals (even humans) has the potential to ***generate predictive information that in combination with data from outside sources*** (ie: satellite data on weather) can ***change industries*** like insurance, security, equipment maintenance, epayments, personal health, many many others .

Creating the IOT is still in early stages as a strategic information resource but NOT in the technologies available.

the internet of things is the nervous system but the soul is artificial intelligence

This means that the only thing stopping its avalanche is the business model innovation.



Entire ***industries will be re-imagined*** for a wearable/mobile-first, wearable/mobile-only, crowded with connected sensors in a ***world that is screen, location, context , intention-aware and overflowing with predictive personalized information*** from cloud-based big data (cognitive) data centers .

Immersive Technologies

- Virtual Reality
- Augmented Reality
- Mixed Reality

Virtual Reality (VR) a digital environment that replaces the user's real world.
Augmented Reality (AR) overlays digitally-created content into the user's real-world environment.
Mixed Reality (MR) is the convergence of virtual and real worlds used to create new environments where both digital and physical objects—and their data—can coexist and interact with one another.

Augmented and Virtual Reality are coming together to impact business and enterprise together.

Projections : use of VR/AR /MR

TELECOM
Telco client could **save $1 million per day** with efficiencies gained from digital reality training

LIVE EVENTS
By 2020, **28 million people annually** are expected to use VR to supplement or entirely replace their live event experience

MANUFACTURING
Manufacturing engineers are expected to generate **$1.5 billion in Digital Reality revenue** by 2020

VIDEO GAMES
70 million gamers are expected to **generate $7 billion in Digital Reality revenue** by 2020

RETAIL
By 2020, nearly **10 million shoppers are expected to use Digital Reality** to inform their decisions and purchasing habits

FINANCIAL SERVICES
From 2014 to 2016, there have been 225 Digital Reality venture capital **investments amounting to $3.5 billion**

EDUCATION
7 million US students will learn in school using VR by the year 2020

USA FEDERAL
The US Airforce expects to **save $400 million annually** by using Digital Reality flight simulators

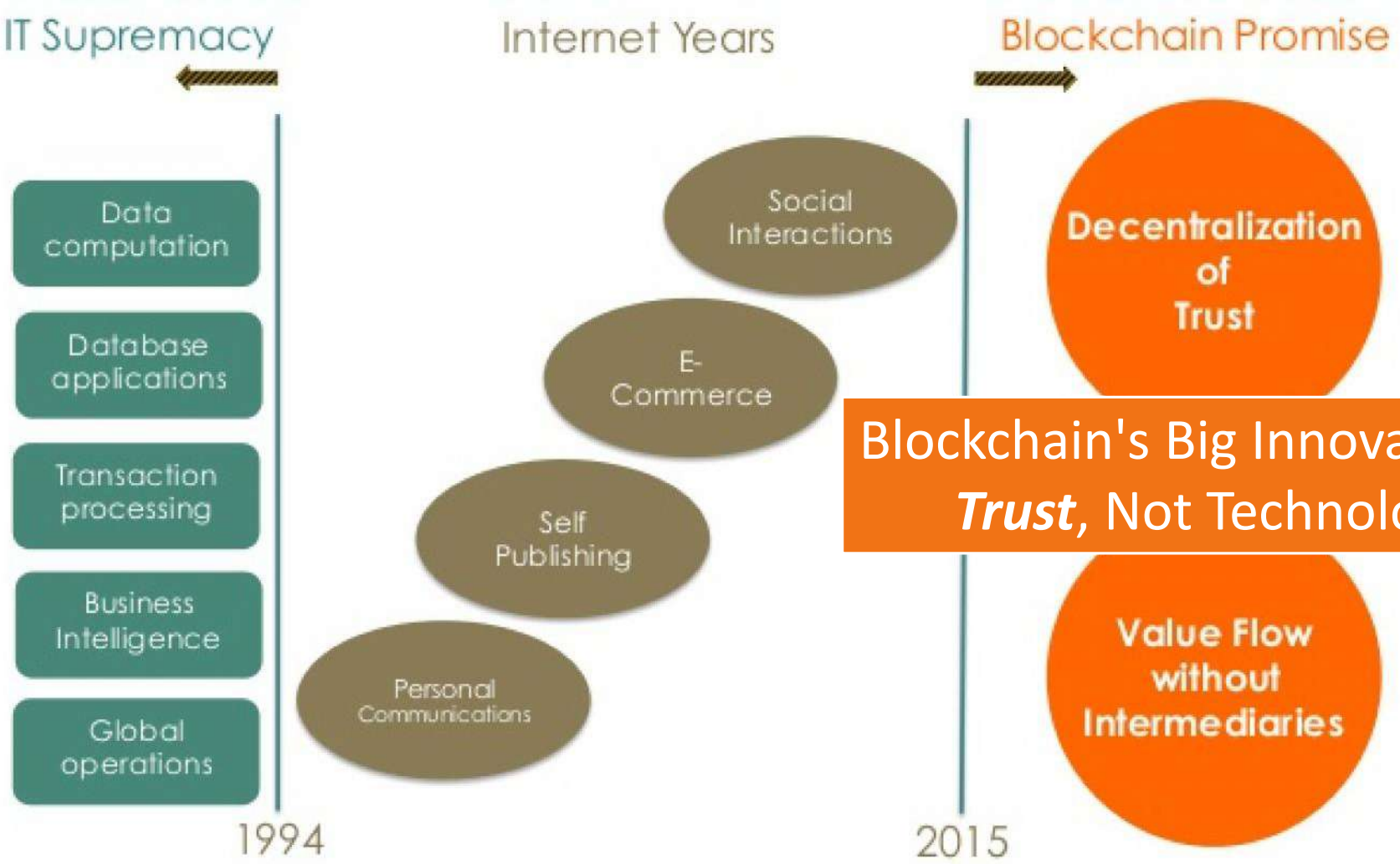
AUTOMOTIVE
In 2015, automaker released an **AR maintenance app compatible with over 40,000 US cars**

Trust Engine & Smart Contracts

- Trust Ecosystems
- Blockchain-based Systems

1. Blockchain offers the storage of immutable records of transaction data through distributed networks.
2. Blockchain retains the full history of transactions, which makes them verifiable and independently auditable.
3. Blockchain also enables peer-to-peer transfer of value, potentially eliminating the need for intermediaries.

1. Proof of effectiveness in Bitcoin
2. Reliable way to do financial transactions with no “central authority”
3. Experimentation and pilots in several projects in Israel:
    1. Financial services
    2. Government



Blockchain's Big Innovation is ***Trust***, Not Technology

stki.info

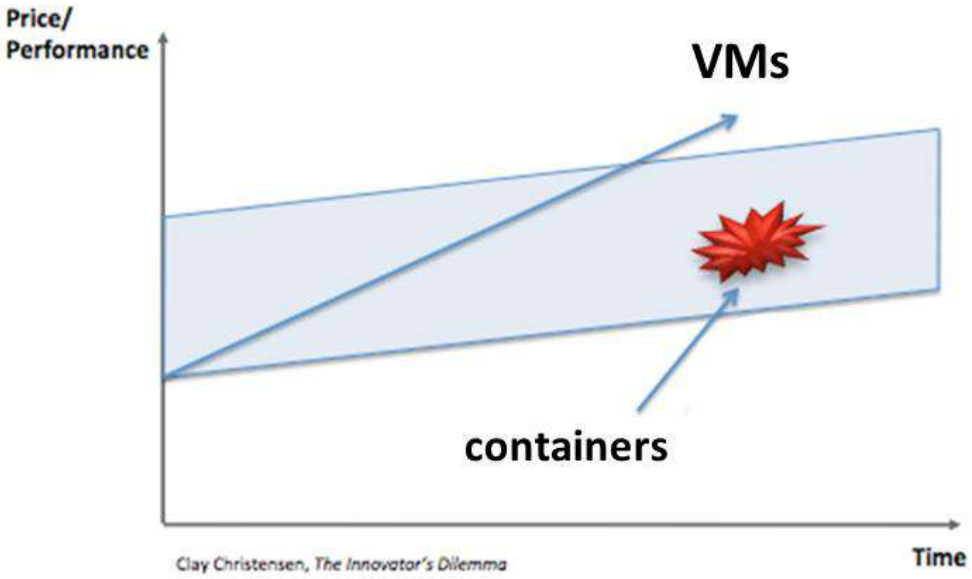
Portability of Software
(fast development +run time ops)

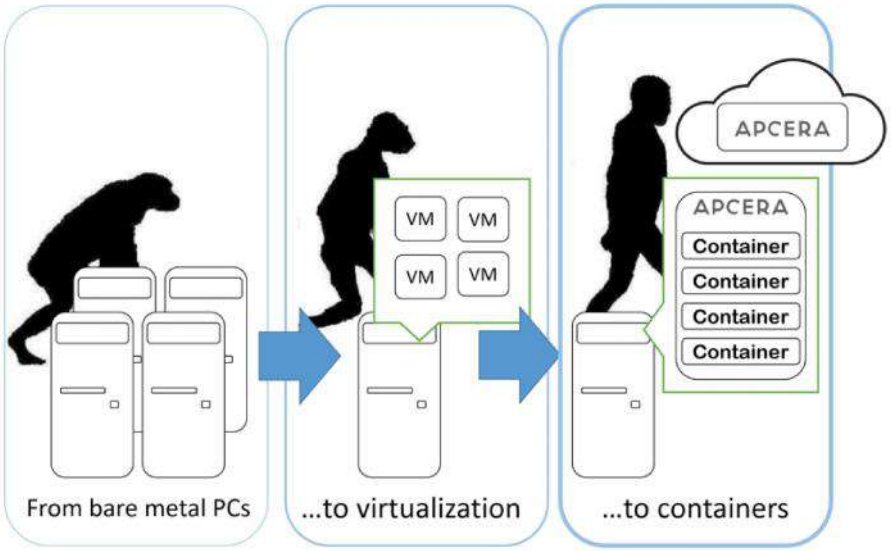
- Microframeworks
- Containers

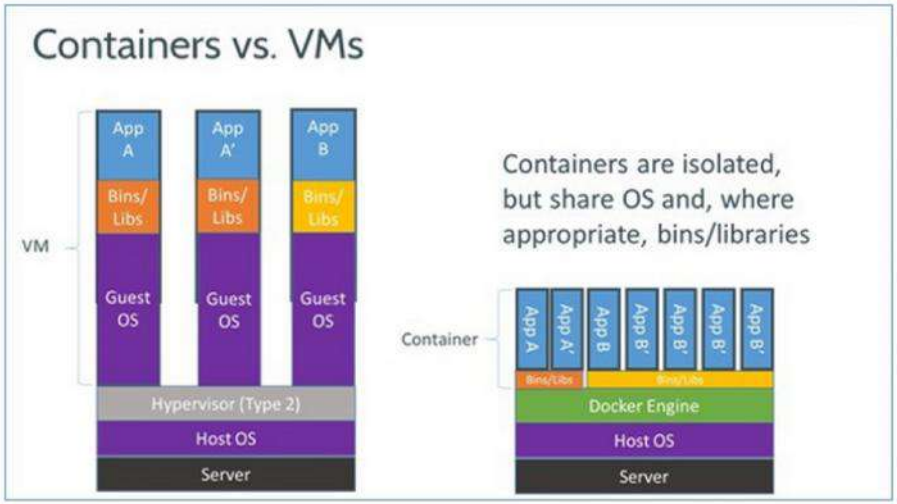
1. ***Containers enable:***
    1. faster and independent development, frictionless operations and native scale
    2. They are read-only components, developers can use container templates for faster results.
2. ***Microframeworks (stacks)*** used to write applications of any size in a consistent manner:
    1. webservices and applications
    2. REST APIs
    3. reduce the footprint and slowness of JAVA

Java's tradeoff for being a safe, rigorously tested, backwards compatible language is making some sacrifices around agility and streamlining.
CONTAINERS and ***MICROFRAMEWORKS*** fix it.

From VMs to CONTAINERS







IT will work with
datacenter-scale operating systems
working with orchestrated collections of
containers alongside serverless compute instances.

DATA & INTELLIGENCE

Enterprise Centric Computing

engagement

Customer Centric Computing