โลกยุค 4.0

กอบศักดิ์ ภูตระกูล
21 มีนาคม 2562
โลกกำลังเปลี่ยนแปลงอย่างรวดเร็ว จากเทคโนโลยีสมัยใหม่

• เปิดโอกาส

• สร้างความท้าทาย ความเสี่ยง
Timeline: famous inventors

Leonardo da Vinci
1452 - 1519
- Drawing of Flying Machine
- Leading artist and intellectual of the Italian Renaissance

Benjamin Franklin
1706 - 1790
- Lightning Rod, Electricity
- Drafted the Declaration of Independence and the Constitution of the United States

Alexander Graham Bell
1844 - 1922
- Father of telephone
- Held > 18 patents

Thomas Edison
1847 - 1931
- Electric Light Bulb and Photograph
- >1,000 patents

Steve Jobs
1955 - 2011
- IPhone & iPad
- 170 Million iPads sold (Oct '13)
- > 400 Million iPhone sold
- PageRank algorithm

Larry Page
Over 40,000 search queries every second
3.5 billion searches daily
1.2 trillion searches per year

Source: http://www.biography.com/people
Clayton Christensen innovation model: Disruptive Technology

Disruptive Innovation
- Transform complicated and costly to simpler, cheaper product

Sustainable Innovation
- Replace old products with new products
- LED TV instead of black and white

Efficiency Innovation
- Reduce cost of making and distributing existing products
- Example: Toyota Just-in-time manufacturing
The fear of cannibalizing sales of existing products is often cited as a reason why established firms delay the introduction of new technologies.

1975
1980
1985
1990

IBM
Seagate
Toshiba

14-inch drive
Mainframe market

5.25-inch drive
Desktop PC market

2.5-inch drive
Notebook market

Quantum

8-inch drive
Minicomputer market

3.5-inch drive
Portable market

Case study: History of disk drive industry

Hard Disk Capacity (MB)

Year


A 14-inch drive technology
Demand in mainframe market

B 8-inch drive technology
Demand in minicomputer market

C 5.25-inch drive technology
Demand in desktop PC market

D 2.5-inch drive technology
Demand in portables market

E 2.5-inch drive technology
Demand in notebooks market
TIMELINE OF APPLE RELEASES

Apple released its hotly anticipated followup to last year’s iPad, the iPad2.

Jan. 2010 The iPad, a touch-screen tablet media device is launched

Mar. 2 2011 Apple announces the iPad2 $352.00 (1830 GMT)

2007 First iPhone launch

2006 Macbook Pro and new iMac becomes first Apple computers to use Intel chips

2005 First iPod introduced. Mac OS X launches

1998 First iMac, an all-in-one computer, reminiscent of the Macintosh, introduced

1994 First Power Macintosh introduced

1991 First Powerbook released, Mac OS 7 introduced

1984 Macintosh, all-in-one PC launches

1985 Steve Jobs leaves Apple after being forced out by board

1989 Macintosh Portable released

1980 Apple launches IPO $3.59

100

250

300

(Weekly close)

50

'80

'85

'90

'95

'00

'05

'10

Source: Apple Inc.; Credit: Reuters
# History of financial innovations

<table>
<thead>
<tr>
<th>9000 BC onwards</th>
<th>5000 BC onwards</th>
<th>4000 – 2500 BC</th>
<th>2500 BC</th>
<th>1000 BC</th>
<th>700 – 600 BC</th>
<th>321 – 185 BC</th>
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</thead>
<tbody>
<tr>
<td>Medium of exchange</td>
<td>Shell Money</td>
<td>Credit – Mesopotamian tablets record ancient loans and interest paid</td>
<td>Insurance – Babylonian goods transport insurance</td>
<td>Metal Money and Coins – Early Chinese “tool money” and primitive coins</td>
<td>Modern coinage – Coinage takes modern form in Lydia, western Turkey</td>
<td>Bills of exchange – Early bills of exchange, promissory notes, Mauryan Empire, India</td>
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<tr>
<th>806 - 1023</th>
<th>14th – 15th century</th>
<th>1602</th>
<th>1609</th>
<th>1688</th>
<th>1710</th>
<th>1773</th>
<th>18th century</th>
<th>1874</th>
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<tr>
<td>Federal Reserve System</td>
<td>Secondary Mortgage market – Fannie Mae</td>
<td>Hedge funds – Alfred Winslow Jones</td>
<td>Credit Card – Diners club, Bank of America</td>
<td>ATMs operational</td>
<td>Debit Card</td>
<td>POS Terminal</td>
<td>ACH</td>
<td>CHIPS - same day settlement</td>
<td>Basel I</td>
<td>Online payment service</td>
</tr>
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Source: Rethinking Financial Innovation, World Economic Forum (p.16 – 23)
History of financial innovations

- **9000 BC onwards**: Medium of exchange
- **5000 BC onwards**: Credit - Mesopotamian tablets record ancient loans and interest paid
- **4000 – 2500 BC**: Insurance - Babylonian goods transport insurance
- **2500 BC**: Metal Money and Coins - Early Chinese "tool money" and primitive coins
- **1000 BC**: Modern coinage - Coinage takes modern form in Lydia, western Turkey
- **700 – 600 BC**: Bills of exchange - Early bills of exchange, promissory notes, Mauryan Empire, India
- **321 – 185 BC**: Credit - Mesopotamian tablets record ancient loans and interest paid
- **500 – 250 BC**: Insurance - Babylonian goods transport insurance
- **250 BC**: Metal Money and Coins - Early Chinese "tool money" and primitive coins
- **100 BC**: Modern coinage - Coinage takes modern form in Lydia, western Turkey
- **70 BC**: Bills of exchange - Early bills of exchange, promissory notes, Mauryan Empire, India
- **100 – 0 BC**: Credit - Mesopotamian tablets record ancient loans and interest paid
- **0 – 50 BC**: Insurance - Babylonian goods transport insurance
- **50 – 25 BC**: Metal Money and Coins - Early Chinese "tool money" and primitive coins
- **25 BC**: Modern coinage - Coinage takes modern form in Lydia, western Turkey
- **10 BC**: Bills of exchange - Early bills of exchange, promissory notes, Mauryan Empire, India
- **1 AD**: Credit - Mesopotamian tablets record ancient loans and interest paid
- **10 – 50 AD**: Insurance - Babylonian goods transport insurance
- **50 – 100 AD**: Metal Money and Coins - Early Chinese "tool money" and primitive coins
- **100 – 200 AD**: Modern coinage - Coinage takes modern form in Lydia, western Turkey
- **200 – 300 AD**: Bills of exchange - Early bills of exchange, promissory notes, Mauryan Empire, India

- **1600s**: Standardized currency - Issued by Amsterdam Exchange (Wisselbank)
- **1700s**: Check clearing house
- **18th century**: Options - First call options on some Dutch stocks
- **1874**: Standardized futures exchange
- **1913**: Federal Reserve System
- **1938**: Secondary Mortgage market - Fannie Mae
- **1949**: Hedge funds - Alfred Winslow Jones
- **1950s**: Credit Card - Diners club, Bank of America
- **1960s**: ATMs operational
- **1972**: Debit Card
- **1973**: POS Terminal
- **1974**: ACH
- **1981**: CHIPS - same day settlement
- **1988**: Basel I
- **1999**: Online payment service

Source: Rethinking Financial Innovation, World Economic Forum
History of financial innovations

- **9000 BC onwards**
  - Medium of exchange

- **5000 BC onwards**
  - Shell Money

- **4000 – 2500 BC**
  - Credit – Mesopotamian tablets record ancient loans and interest paid

- **2500 BC**
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- **700 – 600 BC**
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- **321 – 185 BC**
  - Bills of exchange – Early bills of exchange, promissory notes, Mauryan Empire, India

- **806 - 1023**
  - Representative money – Banknotes and paper money

- **14th – 15th century**
  - Publicly listed stock – Dutch East India Comp. on Amsterdam Stock Exchange

- **1602**
  - Standardized currency – Issued by Amsterdam Exchange (Wisselbank)

- **1609**
  - Insurance brokerage – Edward Lloyd’s London coffee house

- **1688**
  - Futures – Japanese rice futures market

- **1710**
  - Check clearing house

- **1773**
  - Options – First call options on some Dutch stocks

- **18th century**
  - Standardized futures exchange

- **1913**
  - Federal Reserve System

- **1938**
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- **1949**
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Source: Rethinking Financial Innovation, World Economic Forum
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- **806 - 1023 BC**: Representative money - Banknotes and paper money appear in China
- **1913**: Federal Reserve System
- **1938**: Secondary Mortgage market - Fannie Mae
- **1972**: Credit Card - Diners club, Bank of America
- **1974**: ACH
- **1999**: Basel I
- **1981**: CHIPS - same day settlement
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Source: Rethinking Financial Innovation, World Economic Forum
3. BitCoin
Alipay, Alibaba, Ali Credit
Alipay, Alibaba, Ali Credit
Alipay, Alibaba, Ali Credit
โลกใหม่ของ AI
Sesame Credit

Alipay, Alibaba, Ali Credit
Alibaba’s AI for Hangzhou Traffic Control
Alibaba’s AI for Hangzhou Traffic Control
Social Surveillance
Alibaba’s AI for Hangzhou Traffic Control
Alibaba’s AI for Hangzhou Traffic Control
Alibaba’s AI for Hangzhou Traffic Control
Hangzhou has about two million vehicles, of which nine thousand buses, covering a total of 600 lines, involving a lot of intersections, about 50,000 roads, 80,000 crossroads.
Applications for Traffics

- ptt สถานีบริการรฟท.
- ประเภทรถจักรยาน
- สถานีเป่าบ้าน

**RECOMMENDED**
- ที่พักและโรงแรม
- 300 สถานีห้องเสียบ โดย ทร.กร.
- Wongual
- NOSTRA Guide

**SPECIAL EVENT**
- สิ่มสภาพ
Smart City Solution for Public Safety
Smart City Solution for Public Safety
Smart City Solution for Public Safety

I'm receiving live images from the Ajax Fan Shop.
Smart City Solution for Public Safety
China seeks glimpse of citizens’ future with crime-predicting AI

Companies and police develop technology to stop criminals before they act
AI Assisted Cancer Detection

Image Analysis

Hand-Crafted Features → Machine Learning → Deep Learning

Digital Pathology

Big Data Convergence

Radiology → Histology → Omics
AI Assisted Cancer Detection

Diagnosis by AI

7.5% incorrect
92.5% correct
AI Assisted Cancer Detection

Diagnosis by Human

96.6% correct

3.4% incorrect
AI Assisted Cancer Detection

Diagnosis by Human + AI

99.5% correct

.5% incorrect

Twitter-monitoring system detects riots far quicker than police reports

Events from the London riots in 2011 could be automatically detected over an hour quicker than they were reported to the police

Date: June 26, 2017
Source: Cardiff University
Summary: Social media can be an invaluable source of information for police when managing major disruptive events, new research has shown.

How Police Are Watching You on Social Media

George Joseph  Dec 14, 2016

Documents from Chicago’s Cook County Sheriff’s Office reveal the undercover techniques law enforcement uses to monitor—and manipulate—social media users.
Social Media Monitoring
โลกใหม่ของหุ่นยนต์
นโยบายส่งเสริมหุ่นยนต์
นโยบายส่งเสริม หุ่นยนต์

เพื่อการส่งเสริม ‘หุ่นยนต์/ระบบอัตโนมัติ’

ลดภาระเงินได้นิติบุคคลในส่วนบิโภค 50% ที่น้ำหนักยนต์มากใช้

เป้าหมายการลงทุน

d้วยเงินลงทุนใหม่เปรียบ 12,000 ล้านบาท
d้วยปีละลงทุนชีพพ่ายแสนหุ่นยนต์ 200,000 ล้านบาท
d้วยหุ่นยนต์โรงงาน 50%
d้วยเทคโนโลยีหุ่นยนต์ 10 ปีไทยจะมีเทคโนโลยีหุ่นยนต์เอง

ตั้งเป้าลงทุนใหม่เปรียบ 12,000 ล้านบาท
d้วยปีละ 5 ปีลงทุนชีพพ่ายแสนหุ่นยนต์ 200,000 ล้านบาท
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Medical Hub
Medical Hub
Yaskawa
Amazon Warehouse

https://www.youtube.com/watch?v=hhGad3juAGg

https://www.youtube.com/watch?v=urWtIOVhg_4
โลกใหม่ของ IOT
Smart Devices
โลกใหม่ของ VR
Hold the World
Hold the World
Hold the World

https://www.youtube.com/watch?v=MvENGM3mbkk
WHAT’S ON:
VIRTUAL REALITY: CARRIBERRIE

An exhilarating journey of First Nations dance and song takes you to some of Australia's most breathtaking locations.

Dancer: Francis Williams
Photographer: Joshua Flavell © Carriberrie PTY LTD
New Applications of VR
New Applications of VR

New Applications of VR
New Applications of VR

The Kremer Collection VR Museum

https://www.viveport.com/apps/d01d8992-a3af-4800-a1ee-5be383435f69
Start up Policy
นโยบายส่งเสริม New Start Up
New Start Up
New Start Up

Thailand Health Tech Startup Ecosystem

Service Search
- ZeekDoc
- Optimize Care
- U Care
- Health at Home
- ITAAM
- Care

HIS/EMR/EHR
- TheVCGroup
- BLOCK M.D.
- SMART HEALTH CARE
- PharmaSafe
- GetFIT

Personal Health & Fitness
- Be Healthy Be Rewarded

Big Data & AI
- NUDMOR
- Alzheimer's

TeleHealth
- ooCa
- ARINCARE
- See Doctor Now
- vita boost

Clinic/Pharmacy Management System
- MCS
- Remote Care

Remote Monitoring
- TQLD
- UTU

Doctor Network
- THAI REFER
- VET SIDE
- chiilwi

35 Health Tech Startups
$10.5 M investment
Source: Health Tech Startup Thailand, July 2017
www.facebook.com/HealthTechThailand

ERP / Unified Communication
- Stone Lab
- Hatch

Funding
- Ruck Dee

Insurance / Finance
- TQLD
- UTU

Communication Aid
- MediTech
- Brain Dynamic
หน่วยต่อภาคการศึกษาและห้องสมุดสำหรับเด็กไทย