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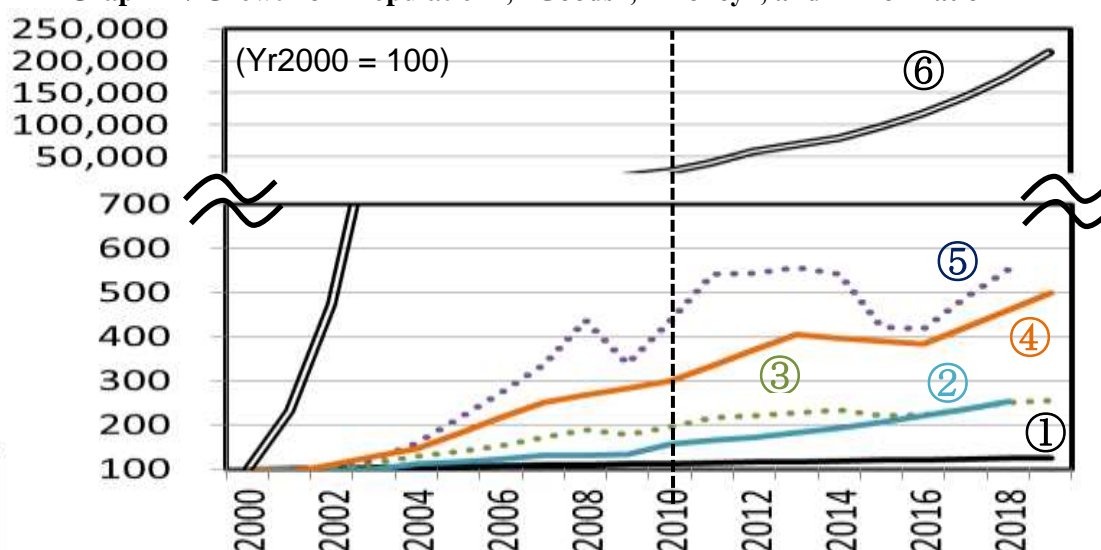
Will BigTech Continue to Make Progress? (Looking Back on the 2010s)

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The “2010s” will end in about two weeks with the end of “2019”. How will future generations summarize this decade? Key words to explain global trends may be “National Particularism (“Me First” Doctrine)”, “Anti-immigration”, “European Debt Crisis”, “Brexit”, “Arab Spring”, “US-China Frictions”, etc. And in Japan, “Great East Japan Earthquake (3.11)”, “Fukushima Nuclear Plant Accident”, “Abenomics”, etc. are among the candidates. But, I would also like to recommend the word “BigTech”.

Graph 1 is a graph of changes in the numbers of people, goods, money, and information in the world since 2000. Since the end of the Cold War in the early 1990s, regulations have been relaxed, free competition has been promoted, and communication technology has been established. They encouraged a quick development of so-called “Globalization”. The figure confirms that various things have come and go more and more freely and vigorously across countries and regions. Above all, it can be seen that the “Flow of Information” has grown dramatically.

Graph 1 : Growth of “Population”, “Goods”, “Money”, and “Information”



(Numbers are linked to “Table 2” on the next page)

Table 2 : Growth Rate Change (Index)

| | | | | | Growth Rate | | |
|-------------------------------|-------|--------|--------|---------|----------------|----------------|----------------|
| (Colored are figures of 2018) | | | | | 2000 → 2010 | 2010 → 2019 | 2000 → 2019 |
| (Year 2000=100) | 2005 | 2010 | 2015 | 2019 | | | |
| ① World Population | 106.5 | 113.2 | 120.1 | 125.5 | +13.2% | +10.9% | +25.5% |
| ② Air Transport | 117.7 | 157.0 | 207.1 | 252.8 | +57.0% | +61.0% | +152.8% |
| ③ World Nominal GDP | 140.5 | 195.1 | 220.9 | 255.8 | +95.1% | +31.1% | +155.8% |
| ④ Foreign Exchange Turnover | 181.4 | 300.4 | 390.3 | 498.3 | +200.4% | +65.9% | +398.3% |
| ⑤ World Exports | 215.5 | 436.6 | 422.1 | 553.1 | +336.6% | +26.7% | +453.1% |
| ⑥ World Information Traffic | 2,396 | 26,779 | 96,373 | 213,370 | +26,678.7% | +696.8% | +213,270.1% |

(Source: “Graph 1” and “Table 2” both based on various materials¹⁾)

The trend of “Digitalization” (that has continued) since the end of the 20th century is roughly divided into “1990s-2000s” and “2010s”. In the former phase (first step), “Digitalization” was promoted to convert analog data into digital data to increase the added value of existing businesses and products and improve business efficiency. In the latter phase (second step), it further evolved, and “Digital Transformation (“DX”)” emerged, in which life, labor, and company management are fundamentally transformed by new values and services created by utilizing digital data. (Table 3)

Table 3 : “Digitalization” and “Digital Transformation (“DX”)”

【First Step】 1990s - 2000s

Digitalization

<Example>

| Application | OLD (Analog) | ⇒ | NEW (Digital) |
|-----------------------|------------------------|---|-------------------------------|
| Photos | Camera with Films | ⇒ | Digital Camera & Smart Phones |
| Processing Technology | Mold | | 3D Printer |
| Recording / Music | Record (Analog Signal) | | mp3 / mp4 (Digital Signal) |
| Transmission | Letter | | E-mail |

【Second Step】 2010s

Digital Transformation, "DX"

<Example>

| | | |
|---|------------------|---|
| Image Data Taken By a Satellite or Drone | ⇒ | Used to Check Crop Condition and Pesticide Application Status |
| Location Information Collected by Smartphone Apps | + E-mail Service | ⇒ Realize Efficient Taxi Dispatch |

(Source: Various Materials)

¹ ① World Population : United Nations, “World Population Prospects (The 2017 Revision)”

② Air Transport : World Bank, WDI “WD Air Transport, Passengers Carried”

③ World Nominal GDP : IMF, “World Economic Outlook Database (October 2019)”

④ Foreign Exchange : BIS, “Triennial Central Bank Survey (2019) / Foreign Exchange Turnover”

⑤ World Exports : World Bank, WDI “DL Merchandise Exports”

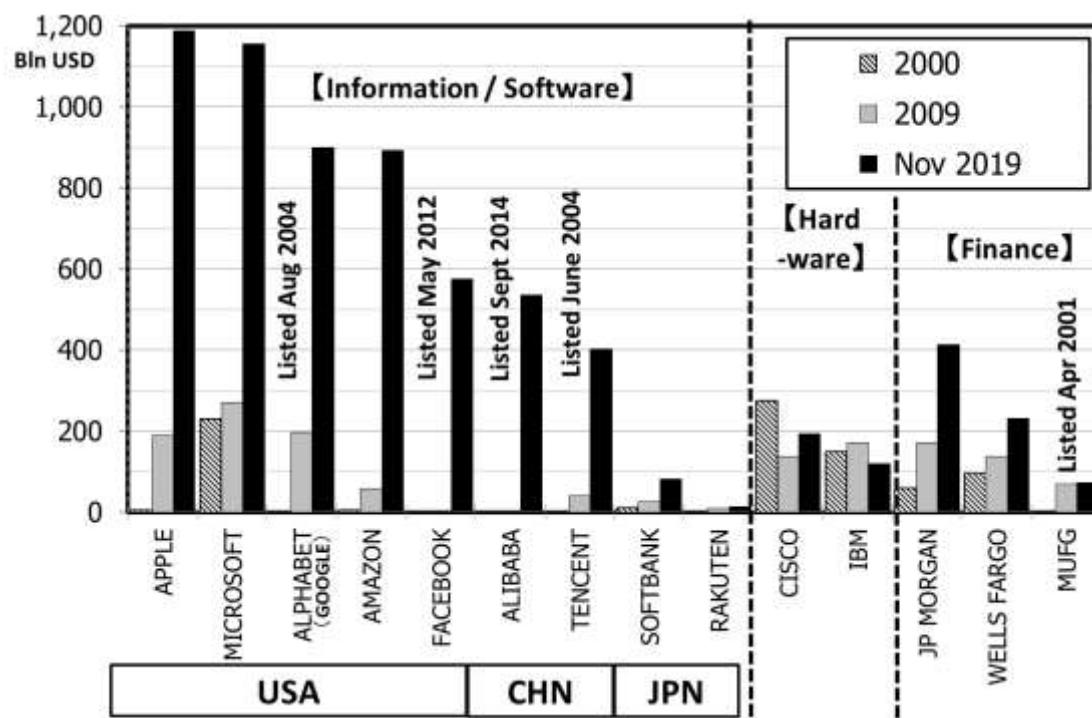
⑥ World Information Traffic : Cisco VNI “Global IP Traffic”

The advance of digitalization is largely due to advances in computer development (small size, high performance, electric power saving) and the development of computer / communication technologies such as “Cloud”, “Big Data”, “AI”, and “High-Speed Communication”. Utilizing these devices and technologies, it has become possible to improve production efficiency, refine demand forecasts, and efficiently operate supply chains including business partners.

Under such circumstances, BigTech companies quickly realized that collecting and accumulating such digital information would become a future source of revenue, pioneered platform business. They have built a business model that provides customers with comprehensive and seamless services such as sales, logistics, information services, and finance by simply accessing them, and have expanded their own economic zone (enclosure of customers).

Their expansion is apparent from their market capitalization. Graph 4 shows the market capitalization of representative companies by industry (“information / software”, “hardware”, “financial institutions”) at three points of time (end of (year) 2000 / end of (year) 2009 / end of November 2019), and we can see that there was a big increase in BigTech companies in the 2010s. In the world market capitalization ranking (as of the end of November 2019), BigTech companies occupied 7 out of the top 10 companies. This is a big change from about 20 years ago (end of 2000) when companies in various industries were ranked in a more balanced manner. (Table 5)

Graph 4 : Market Capitalization of Representative Companies



(Source : Bloomberg)

Table 5 : Change of the World Market Capitalization Ranking (Unit : Bln USD)

| End of 2000 | | | | | End of 2009 | | | | | November 2019(※) | | | | |
|-------------|-------------|---------|---------------|------------|-------------|---|---------|-------------|------------|------------------|--------------------|---------|-------------|------------|
| | Company | Country | Industry | Market Cap | | Company | Country | Industry | Market Cap | | Company | Country | Industry | Market Cap |
| 1 | GE | USA | ELECTRICITY | 475 | 1 | PETRO CHINA | CHN | OIL | 353 | 1 | APPLE | USA | Information | 1,187 |
| 2 | EXXON MOBIL | USA | OIL | 302 | 2 | EXXON MOBIL | USA | OIL | 324 | 2 | MICROSOFT | USA | Software | 1,155 |
| 3 | Pfizer | USA | MEDICINE | 290 | 3 | MICROSOFT | USA | SOFTWARE | 271 | 3 | ALPHABET (GOOGLE) | USA | Information | 900 |
| 4 | CISCO | USA | HARDWARE | 275 | 4 | Industrial and Commercial Bank of China | CHN | FINANCE | 269 | 4 | AMAZON | USA | Information | 893 |
| 5 | CITI | USA | FINANCE | 257 | 5 | WALLMART | USA | RETAIL | 204 | 5 | FACEBOOK | USA | Information | 575 |
| 6 | WALLMART | USA | RETAIL | 237 | 6 | China Construction Bank | CHN | FINANCE | 201 | 6 | Berkshire Hathaway | USA | Insurance | 539 |
| 7 | VODAPHONE | UK | COMMUNICATION | 237 | 7 | BHP | AU/UK | MINING | 201 | 7 | ALIBABA | CHN | Information | 535 |
| 8 | MICROSOFT | USA | SOFTWARE | 231 | 8 | HSBC | HKG | FINANCE | 199 | 8 | JP MORGAN CHASE | USA | Finance | 413 |
| 9 | AIG | USA | INSURANCE | 228 | 9 | Petrobras | BRA | OIL | 199 | 9 | TENCENT | CHN | Information | 403 |
| 10 | MERCK | DE | CHEMICAL | 216 | 10 | ALPHABET (GOOGLE) | USA | INFORMATION | 197 | 10 | VISA | USA | Finance | 363 |

(※) Saudi Aramco (Saudi Arabia's national oil company) is listed on December 11th, 2019. Its market capitalization is said to be over \$ 2 trillion.

(Source : Bloomberg)

However, there is no guarantee that the existing BigTech companies can enjoy prosperity over the next 10 years. Looking at Table 2 on the second page, the increase rate of “Information” in the 2010s was clearly decelerating from that of the 2000s, although it still increased about eightfold over the previous decade, and overwhelmingly rapidly as compared to other items. The volume of information traffic is expected to continue to increase due to introduction of new technologies such as “5G” in the future, but its axis in the next generation seems to move toward leading the way in “providing services that match better the needs of users and society” utilizing collected and accumulated data.

In addition, it is anticipated that there will be some restrictions on the activities of BigTech companies in the future due to concerns about hindering fair competition² caused by biased information collection and growing need for appropriate use of data.³

² Taxes on international companies that provide consumption services are collected only in the countries where the headquarters and offices are located so far. But, currently introduction of a system (digital service tax) that collects and distributes tax revenues according to the sales in each country is being considered..

³ For example, the GDPR (General Data Protection Regulation) was enforced in the EU in May 2018, and strict handling of personal information and penalties for violations were established. On the other hand, there is a move to establish rules for promoting free distribution of data. A typical example is the “Digital Trade Agreement” between Japan and the US (to be implemented in January 2020).

**Table 6 : Resignation Time of the Founder / Co-Founder
(colored are founders who retired in the 2010s)**

| Company | Established | Main Founder / Co-Founder | Retired |
|--|-----------------------|----------------------------------|------------------|
| MICROSOFT | April 1975 | Bill Gates | Feb 2014 |
| | | Paul Allen | Nov 2000 |
| APPLE | April 1974 | Steve Jobs | Oct 2011 |
| | | Stephen Wozniak | Feb 1985 |
| AMAZON | July 1994 | Jeffrey Bezos | (Not Retired) |
| ALPHABET (Holding Company of GOOGLE etc) | Sept 1998 (GOOGLE) | Larry Page | Dec 2019 |
| | | Sergey Brin | Dec 2019 |
| FACEBOOK | Feb 2004 | Mark Zuckerberg | (Not Retired) |
| ALIBABA | April 1999 | Jack Ma | Sept 2019 |
| TENCENT | Nov 1998 | Pony Ma | (Not Retired) |

(Source : Various Materials)

It cannot be said that this change in the business environment is unrelated to the fact that the retirement of the founders of BigTech companies has become prominent in the 2010s. As companies grow and eventually reach maturity, BigTech companies have also grown and reached maturity phase and they are now in the midst of a change in the management from “Dream Speaker” founders to practitioners who can “Manage the Company Well”. (Table 6)

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