Section 6 Trends of Services and Applications

1. Platform trends

(1) Market trends

In terms of market capitalization of the major players of the global ICT market, GAFAM⁶⁶ occupy the top positions. In July 2021, the total of GAFA's market capitaliza-

tion exceeded the total of all Japanese stocks. Market capitalization of the top 15 companies sharply increased from 408.1724 trillion yen in 2017 to 1,586.8443 trillion yen⁶⁷ in 2022 (**Figure 3-6-1-1**).

Figure 3-6-1-1 Changes in the top 15 companies in terms of market capitalization in the global ICT market

| <u>2017</u> | | | | |
|-----------------|---------------------------------|---------|---|--|
| Company name | Major business | Country | Market capitalization (100 million dollars) | |
| Apple | Hardware, software, services | US | 8,010 | |
| Alphabet/Google | Search engine | US | 6,800 | |
| Amazon.com | e-commerce | US | 4,760 | |
| Facebook | SNS | US | 4,410 | |
| Tencent | SNS | China | 3,350 | |
| Alibaba | e-commerce | China | 3,140 | |
| Priceline Group | Online booking | US | 920 | |
| Uber | Mobility | US | 700 | |
| Netflix | Media | US | 700 | |
| Baidu China | Search engine | China | 660 | |
| Salesforce | Cloud service | US | 650 | |
| Paypal | Payment | US | 610 | |
| Ant Financial | Payment | China | 600 | |
| JD.com | e-commerce | China | 580 | |
| Didi Kuaidi | Mobility | China | 500 | |

| 2022 | | | | |
|--|---------------------------------|---------|---|--|
| Company name | Major business | Country | Market capitalization (100 million dollars) | |
| Apple | Hardware, software, services | US | 28,282 | |
| Microsoft | Cloud service | US | 23,584 | |
| Alphabet/Google | Search engine | US | 18,215 | |
| Amazon.com | Cloud service, e-commerce | US | 16,353 | |
| Meta Platforms /Facebook | SNS | US | 9,267 | |
| NVIDIA | Semiconductor | US | 6,817 | |
| Taiwan Semiconductor Manufacturing | Semiconductor | Taiwan | 5,946 | |
| Tencent | SNS | China | 5,465 | |
| Visa | Payment | US | 4,588 | |
| Samsung Electronics | Hardware | Korea | 4,473 | |
| Mastercard | Payment | US | 3,637 | |
| Alibaba | e-commerce | China | 3,589 | |
| Walt Disney | Media | US | 2,811 | |
| Cisco Systems | Hardware, security | US | 2,578 | |
| Broadcom | Hardware, semiconductor | US | 2,557 | |

(Source) For 2017, MIC (2018) "Current State and Challenges of Platform Services "68; for 2022, Wright

Investors' Service, Inc⁶⁹ (as of January 14, 2022)

In comparison with the 2020 sales⁷⁰ of the biggest platformers of Japan, the United States and China, Amazon's sales were largest (41.2214 trillion yen), increasing 5.2 fold from its sales in 2013 (**Figure 3-6-1-2**). Alibaba (7.8924 trillion yen) of China grew 13.3 fold compared

with 2013. By contrast, Japanese companies are smaller and do not bear comparison in terms of growth: 5.1 fold of LINE, 2.7 fold of Yahoo, 2.6 fold of Rakuten and 1.1 fold of Sony.

- ⁶⁷ Converted to yen using the average exchange rate of January 2022.
- 68 https://www.soumu.go.jp/maincontent/000579804.pdf
- 69 https://startup-db.com/magazine/category/research/marketcap-global-2022
- ⁷⁰ Sales of Japanese and Chinese companies were converted to dollar by using average rate of the respective year.

⁶⁶ Google, Amazon, Facebook, Apple and Microsoft



Figure 3-6-1-2 Sales of platformers of Japan, the US and China

*Sales of 2019 for LINE

(Source) Prepared from Statista data

(2) Trends of platformer regulation in Japan and abroad

In recent years, in order to ensure fair competition environment in the market, there are moves to strengthen regulations on huge platformers who are increasing market power.

Also in recent years, there is a challenge of distribution of illegal/harmful information including slander and disinformation through social media, etc. To address this situation, Japan and other countries are taking various measures including consideration of new regulations on platformers and promotion of their voluntary responses.⁷¹

2. Social media

As of January 2022, the monthly number of active Facebook users was approximately 2.9 billion, the larg-

est number in the world, followed by video-based social media YouTube and WhatsApp.

Figure 3-6-2-1 Monthly number of active users of major social media in the world (January 2022)



(Source) Statista (We Are Social; Hootsuite; DataReportal)72

⁷¹ For detail of the initiatives in Japan, see Chapter 2, Section 2 and Chapter 4, Section 2.

72 https://www.statista.com/statistics/272014/global-social-networks-ranked-by-number-of-users/

3. EC

Total sales in the global EC market sharply increased in 2020 due to the COVID-19 pandemic and remained high at 542.0 trillion yen (19.5% increase year-on-year) in 2021. By country, China accounted for the largest part at

178.4 trillion yen followed by the United States at 101.7 trillion yen, Japan at 28.0 trillion yen, Germany at 17.2 trillion yen, the UK at 16.6 trillion yen and Korea at 13.7 trillion yen.

Related data

Changes and forecasts for the global EC market sales, Forecasts for the EC market sales by country (2022) Source: Statista (eMarketer), Statista, "Digital Market Outlook" URL: https://www.soumu.go.jp/johotsusintokei/whitepaper/eng/WP2022/data_collection.pdf#3-6-6 (Data Collection)

4. Electronic payment⁷³

Total global mobile transactions (mobile wallet) reached 214.4 trillion yen in 202074 and are expected to further expand as a result of infection control measures, issuance of coupons and points in response to the COV- ID-19 pandemic. By country, China has an overwhelming share followed by the United States. Japan is at the same level as some European countries.

Related data Changes and forecasts for transaction values of global mobile payment, Transaction values of mobile payment in each country (2020) Source: Statista, "Digital Payments report 2021", etc URL: https://www.soumu.go.jp/johotsusintokei/whitepaper/eng/WP2022/data_collection.pdf#3-6-8 (Data Collection)

5. Search services

In the global search engine market, Google's share is at over 85%, but is gradually decreasing in recent years and BING is slightly increasing its share. In Japan, Google has the top share both for personal computers and smartphones. Yahoo! has around a 20% share for smartphones.

Related data Changes in the global share of search engines, Search engine share in Japan (by terminal used) Source: Statista (StatCounter) URL: https://www.soumu.go.jp/johotsusintokei/whitepaper/eng/WP2022/data_collection.pdf#3-6-10 (Data Collection)

6. Video distribution, music distribution and e-books

In 2021, the global markets of video distribution, music distribution and e-books were14.1452 trillion yen in total (21.7% increase year-on-year) due to the spread of flat rate services and expansion of stay-at-home demand

during the COVID-19 pandemic (Figure 3-6-6-1). In Japan, the market was 1.0171 trillion yen (18.4% increase year-on-year) in total.

Changes and forecasts for the size of the global video distribution, music distribution and e-book markets Figure 3-6-6-1



(Source) Omdia, Statista "Digital Market Outlook"75

73 Payment method by sending/receiving electronic data rather than cash

- ⁷⁴ Because 2020 is the first year of the survey, there is no year-on-year comparison.
- 75 https://www.statista.com/forecasts/1294207/ebookmarket-revenue-worldwide

Each market also grew in 2021: the global video distribution market was 9.9310 trillion yen (24.5% increase from the previous year); the music distribution market was 2.4462 trillion yen (18.6% increase from the previous year); and the e-book market was 1.7680 trillion yen (11.5% increase from the previous year). The markets

grew in Japan as well: the video distribution market was 461.4 billion yen (19.0% increase from the previous year); the music distribution market was 89.5 billion yen (14.3% increase from the previous year); and the e-book market was 466.2 billion yen (18.6% increase from the previous year).

Related data Changes in the music distribution market in Japan, Changes in the e-book market in Japan Source: The Recording Industry Association of Japan, The All Japan Magazine and Book Publisher's and Editor's Association/The Research Institute for Publications, etc URL: https://www.soumu.go.jp/johotsusintokei/whitepaper/eng/WP2022/data_collection.pdf#3-6-14 (Data Collection)

7. Trends in the data center market

The number of large-scale data centers in the world continued to increase and reached around 700 at the end of the third quarter of 2021. Regarding the share of the global data center capacity, the United States account for nearly half at 49%, followed by Europe, Middle East and Africa (19%), China (15%) and Asia Pacific Region excluding China (13%).

The global market size (expenditure) of data center

systems was 23.7069 trillion yen (24.0% increase year-onyear) in 2021 (**Figure 3-6-7-1**). The sales temporarily decreased in 2020 due to the COVID-19 pandemic, but recovered to the level of 2019 in 2021. The market size (sales) of data center services in Japan was 1.7341 trillion yen (11.6% increase year-on-year) in 2021 (**Figure 3-6-7-2**).









⁷⁶ https://www.statista.com/statistics/314596/total-data-center-systems-worldwide-spending-forecast/

77 https://www.idc.com/getdoc.jsp?containerId=prJPJ48272821

8. Trends in the cloud service market

The size of the global public cloud service market (sales) was 35.0315 trillion yen in 2020 (27.9% increase year-on-year) (**Figure 3-6-8-1**). Particularly, growth of

the PaaS market is significant. It is thought to have played an important role in corporate activities influenced by the COVID-19 pandemic.



Figure 3-6-8-1 Changes and forecasts for the size (sales) of the global public cloud service market⁷⁸



In the first half of 2021, the top five companies (Microsoft, Amazon, IBM, Salesforce and Google) accounted

for 48.1% of the market. Oligopoly has further progressed.

Related data
Market shares of the global public cloud service, Changes and forecasts for the market size (sales) of public cloud service in Japan
Source: Omdia, IDC Japan
URL: https://www.soumu.go.jp/johotsusintokei/whitepaper/eng/WP2022/data_collection.pdf#3-6-20 (Data Collection)

9. Al

(1) Market overview

The global sales of AI-related software are expected to increase 55.7% from 382.7 billion yen of 2021 to 595.7 billion yen in 2022.⁷⁹

Use cases and functions of AI include image/voice recognition and text mining. According to ITR survey, the sales of Japan's eight major AI markets (machine learning platform, time-series data analysis, search/exploration, translation, text mining/knowledge utilization, voice synthesis, voice recognition and image recognition) reached 51.3 billion yen (19.9% increase year-on-year) in fiscal 2020 and are expected to reach 120 billion yen in fiscal 2025 (**Figure 3-6-9-1**). By market segment, the machine learning platform that supports self-creation of an AI environment is expected to increase most.

⁷⁸ IaaS (Infrastructure as a Service) provides hardware and ICT infrastructure via the Internet.

CaaS (Cloud as a Service) provides services of other clouds on a cloud.

PaaS (Platform as a Service) provides platform to run applications via the Internet.

SaaS (Software as a Service) provides software packages via the internet.

79 https://www.statista.com/statistics/941835/artificial-intelligence-market-size-revenue-comparisons/



Figure 3-6-9-1 Changes and forecasts for the size of Japan's eight major AI markets

(2) Changes in key players

Key players in AI-related markets include businesses providing AI system /software and businesses providing AI chip sets such as NVIDIA. In recent years, there are new changes including entry by Microsoft, Google and other major platformers and entry from other business areas such as chip set manufacturing.

Most of the AI-related businesses have head offices in

the United States or Europe.

Investments in AI-related companies are increasingly active. According to "Artificial Intelligence Index Report 2022" that is a report published by Stanford University, the United States leads in the number of newly funded companies (299) in 2021, followed by China (119) (**Figure 3-6-9-2**).





(Source) Stanford University, "Artificial Intelligence Index Report 2022"81



Related data

Major Al-related enterprises in the world, Forecasts for the Al market in China (in terms of spending) Source: MIC (2022), "Survey Study on the Trends in the Market Environment Surrounding ICT", IDC's Worldwide Artificial Intelligence Spending Guide Taxonomy, 2022: Release V1, 2022 URL: https://www.soumu.go.jp/johotsusintokei/whitepaper/eng/WP2022/data_collection.pdf#3-6-27 (Data Collection)

⁸⁰ https://www.itr.co.jp/company/press/210826PR.html

⁸¹ https://aiindex.stanford.edu/wp-content/uploads/2022/03/2022-AI-Index-Report_Master.pdf

^{*}Sales of venders as converted on fiscal year base (Source) ITR, "ITR Market View: 2021 AI Market⁸⁰

10. Virtual space, etc.

Metaverse is a virtual space on the internet, where users operate their avatars to interact with other users. There are also experimental services such as product purchase in a virtual space. Thanks to the technology advancement and service development, sales of the global metaverse market reached 4.2640 trillion yen in 2021 and are expected to rapidly increase to 78.8705 trillion yen by 2030 (Figure 3-6-10-1). Beyond media and entertainment, the use of metaverse is expected in various fields including education and retail.

Figure 3-6-10-1 Changes and forecasts for the size (sales) of the global metaverse market



(Source) Statista (Grand View Research)82

Block chain is based on cryptographic, P2P, distributed consensus and other technologies. Its features include information sharing without risk of alteration, construction of a value distribution system and guarantee of value traceability. In recent years, new digital economic zones where independent users are directly connected without depending on a specific platform are about to be constructed on distributed networks based on block chain. This is called Web 3.0, a next-generation frontier following Web 1.0 that was led by e-mail and websites and Web 2.0 that was characterized by smartphone and social media. Non Fungible Token (NFT) that is a unique digital token issued on block chain is thought to spark powerful expansion of the digital economic zone in the era of Web 3.0.