

Section 8 Trends in the data center market and cloud services market

1. Data centers

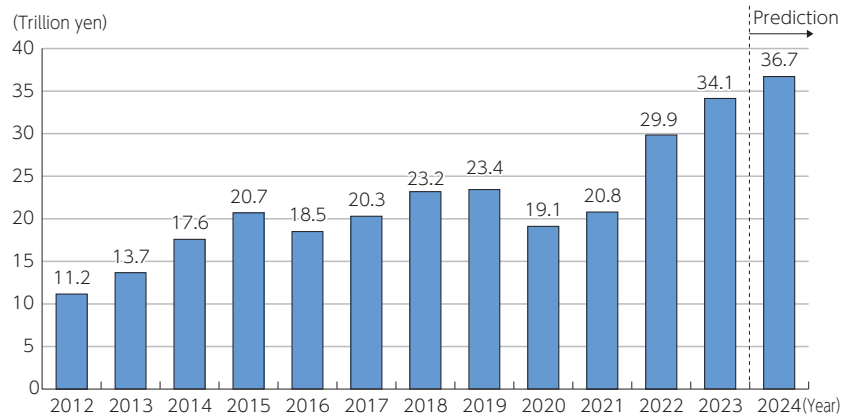
The number of data centers worldwide is overwhelmingly high in the U.S., with 5,381 as of March 2024. Even when combining the total number of data centers in European countries (Germany, the UK, France, the Netherlands, Italy, Poland, and Spain), it amounts to approximately 2,100, highlighting the concentration in the U.S. Japan has 219 data centers, which is less than 5% of the number in the U.S.

The global market size (expenditure) for data center

systems, which saw a decline in 2020 due to construction delays and supply chain disruptions caused by the COVID-19 pandemic, has been on an increasing trend since then. It is expected to reach 34.1 trillion yen in 2023 (a 14.4% increase from the previous year) and expand to 36.7 trillion yen in 2024 (**Figure 2-1-8-1**).

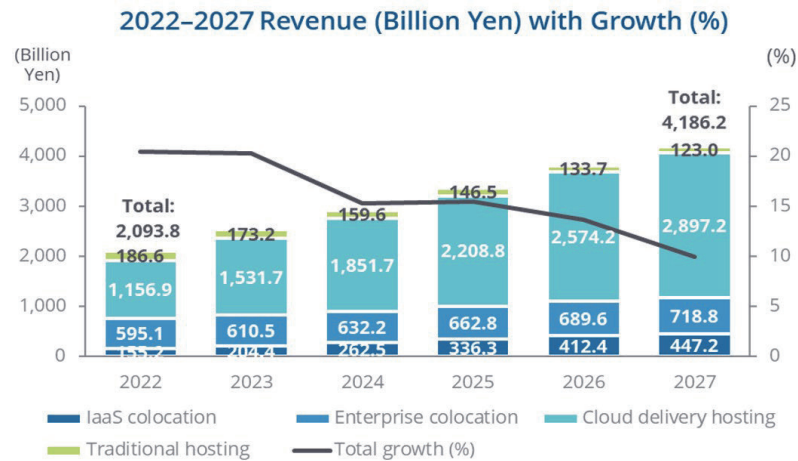
The market size (sales) for data center services in Japan was 2.0938 trillion yen in 2022 and is projected to reach 4.1862 trillion yen by 2027 (**Figure 2-1-8-2**).

Figure 2-1-8-1 Changes and forecast in the size of the global data center systems market (expenditure)



(Source) Gartner (cited from Statista)¹

Figure 2-1-8-2 Changes and forecast in the size of the Japan's data center services market (sales)



(Source) IDC Japan, July 2023 "Domestic Data Center Service Market Prediction 2023-2027" (JPJ49897923)



Figure (related data) Share of global large-scale data center market by region (data capacity)
 Source: Synergy "Virginia Still Has More Hyperscale Data Center Capacity Than Either Europe or China"
 URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r06/html/datashu.html#f00277>
 (Data collection)

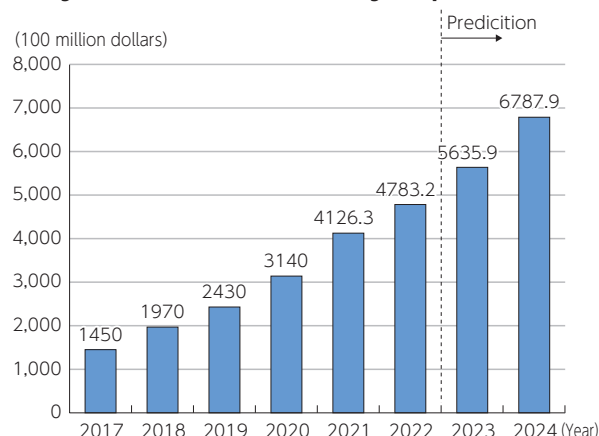
¹ <https://www.statista.com/statistics/268938/global-it-spending-by-segment/>

2. Cloud services

The global expenditure on public cloud services is expected to increase to 563.6 billion dollars in 2023 (**Figure 2-1-8-3**). This is attributed to the essential nature of cloud services in conducting business operations and the widespread adoption of new technologies, particularly AI. Regarding AI, its application across various industries is anticipated, but effective implementation will require customization (algorithms, costs, sovereignty, privacy, sustainability, etc.), making the use of cloud services crucial. The share of international expenditure on cloud infrastructure services² continues to be dominated

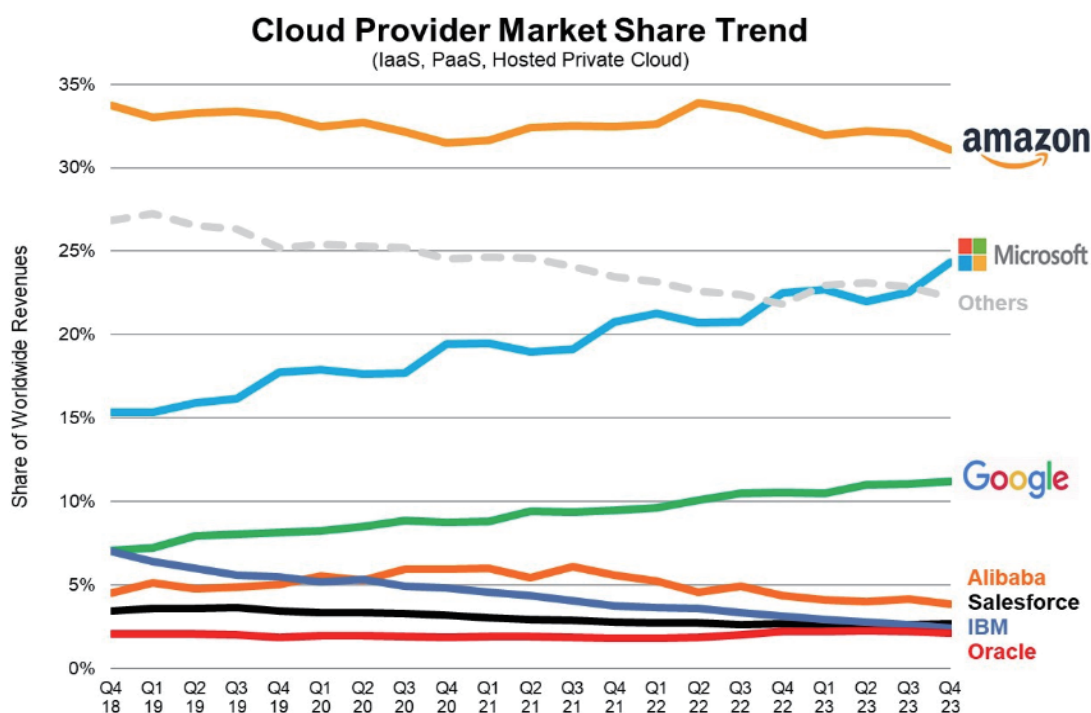
by Amazon, Microsoft, and Google, in that order, collectively accounting for nearly 70% of the market. As of the fourth quarter of 2023, Amazon held approximately 31%, Microsoft 24%, and Google 11%, with the expansion of Microsoft and Google's market share being particularly notable in recent years (**Figure 2-1-8-4**). The market continues to be toward oligopolization, and it is considered important for cloud providers outside the top three to focus on specific areas or seek collaboration with major players to gain market share.

Figure 2-1-8-3 Changes and forecast in the size of the global public cloud service market (sales)



(Source) Gartner (cited from Statista)³

Figure 2-1-8-4 Changes of global market share of cloud infra service



(Source) Synergy⁴ "Cloud Market Gets its Mojo Back; AI Helps Push Q4 Increase in Cloud Spending to New Highs"

² Total of IaaS, PaaS and hosted private cloud.

³ <https://www.statista.com/statistics/273818/global-revenue-generated-with-cloud-computing-since-2009/>

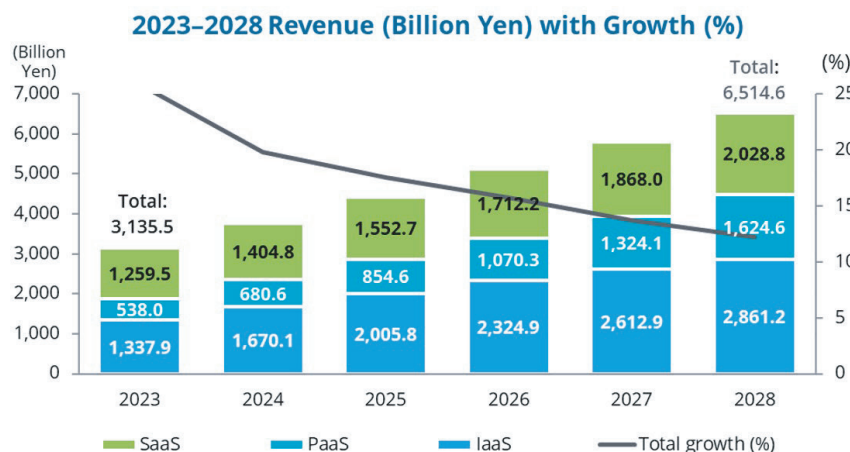
⁴ <https://www.srgresearch.com/articles/cloud-market-gets-its-mojo-back-q4-increase-in-cloud-spending-reaches-new-highs>

The Japanese public cloud services market⁵ is expected to achieve significant growth, reaching 3.1355 trillion yen in 2023, a 25.8% increase compared to the previous year (**Figure 2-1-8-5**).

Additionally, in Japan's PaaS and IaaS markets, the high utilization rates of major cloud services (AWS by

Amazon, Azure by Microsoft, and GCP by Google) are particularly notable. Specifically, AWS accounts for more than half of the companies using PaaS/IaaS, showing an increase of over 10 percentage points compared to the previous year.

Figure 2-1-8-5 Changes and forecast in the size of the public cloud service market in Japan (expenditure)



(Source) IDC Japan, February 2024 "Domestic Public Cloud Service Market Prediction 2024-2028" (JPJ50706624)⁶



Figure (related data) Use rate of AWS, Azure, GCP in PaaS/IaaS users

Source: MM Research Institute, Ltd. "Research Survey on Demand Trend of Domestic Cloud Services" (as of June 2022)
 URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r06/html/datashu.html#f00281>
 (Data collection)

3. Edge computing

The global edge computing market size (expenditure) is projected to expand to 232 billion dollars in 2024 and further to 350 billion dollars by 2027 (**Figure 2-1-8-6**).

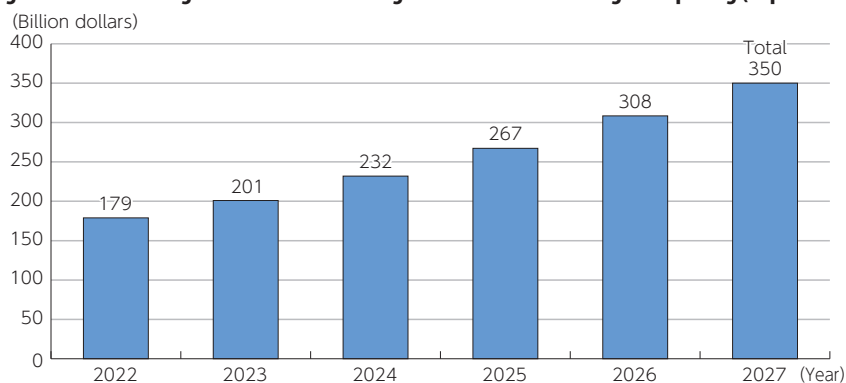
In Japan, the edge computing market size (expenditure) is estimated to reach 1.6 trillion yen in 2024 and is expected to grow to 2.3 trillion yen by 2027 (**Figure 2-1-8-7**).

Major use cases include smart factories, remote control of machinery and robots, high-definition video transmission, virtual space services via AR/VR, autonomous driving, gaming, and the metaverse. Given the low latency benefits of edge computing, it is anticipated to be widely used in remote operations within industries such as manufacturing and construction.

While edge computing offers advantages like reduced latency, it also has limitations in terms of scale and processing capacity, which can lead to increased costs. Therefore, it is common to use edge computing selectively rather than for all applications. This suggests that edge computing is not a replacement for the cloud but rather a new application of cloud utilization. Consequently, the spread of edge computing is expected to promote new uses of cloud services. The domestic edge AI product and service market (revenue) in Japan is projected to reach 15 billion yen in FY2023. It is expected to grow at an annual rate of 27.4%, reaching a scale of 37 billion yen by FY2027.

⁵ Cloud services that specialize in IT-related functions provided to a wide range of users without special regulations or restrictions.

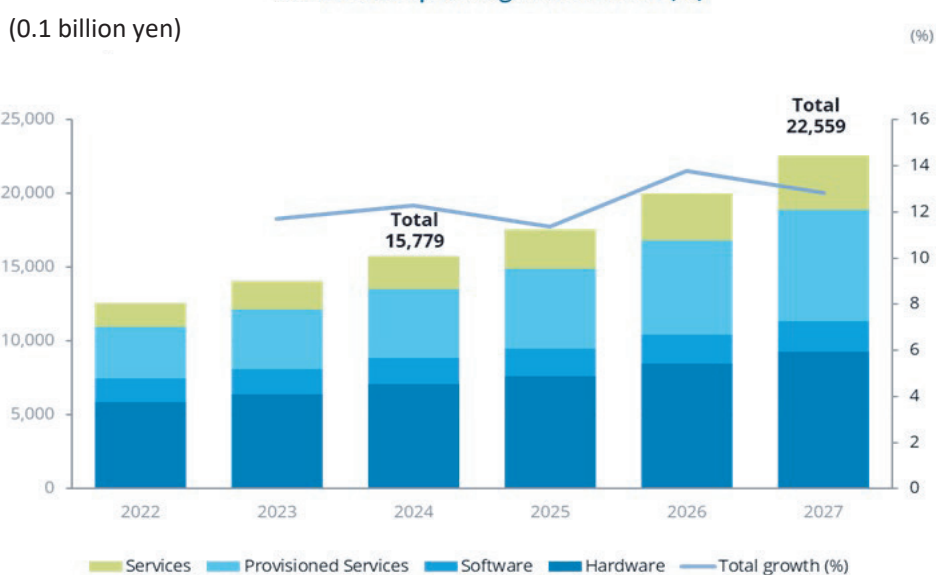
⁶ <https://www.idc.com/getdoc.jsp?containerId=prJPJ49684222>

Figure 2-1-8-6 Changes and forecast in the global market size of edge computing (expenditure)

(Source) IDC Worldwide Edge Spending Guide - Forecast 2024 | Feb (V1 2024)⁷

Figure 2-1-8-7 Changes and forecast in the market size of edge computing in Japan (expenditure)

2022~2027 Spending with Growth (%)



(Source) IDC "Investment in Edge Computing in the Domestic Market is Predicted to Reach 1.6 trillion yen in 2024 ~the Forecast for the Domestic Edge Infrastructure Market is Announced~" (March 22, 2024)⁸

**Figure (related data) Changes and forecast in the market size of the Japanese edge AI solutions**

Source: Deloitte Tohmatsu MIC Research Institute "Reality and Future Prospects of Edge AI Computing Market in FY2023 (ver.3)" (February 7, 2024)

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r06/html/datashu.html#f00287>
(Data collection)

⁷ <https://www.idc.com/getdoc.jsp?containerId=prUS51960324>

⁸ <https://www.idc.com/getdoc.jsp?containerId=prJPJ51979224>