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## **Competition in the Provision of Cloud Computing Services – Note by Japan**

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## Japan

### 1. Overview

1. In the cloud service sector, while the market continues to expand, some service providers that have established a solid presence. These cloud service providers are now becoming important players who provide the foundation of business activities for a number of enterprises, by engaging in digital platform business, either directly or through their group companies, that provides “opportunities” of services to third parties by utilizing information and communication technologies, and data. They are providing a wide range of services, ranging from infrastructures as the foundation of information system to applications, as well as data analysis service or platform of IoT/AI in cloud service business.

2. The Japan Fair Trade Commission (JFTC) conducted a market study in the field of the cloud services and, in June 2022, published a report on its findings. This market study was conducted through interview-based survey with businesses such as cloud service providers (including AWS, Microsoft, and Google, which are increasingly gaining market share in the IaaS and PaaS markets), companies that provide solutions or implementation support for end-users by leveraging cloud service providers' offerings, third-party software vendors, and businesses that use cloud services as customers.

3. The report revealed the actual state of transactions and competitive conditions surrounding digital platform providers in this field, including the following points:

- In the cloud service market, factors such as economies of scale, economies of scope, a wide range of services offered, and indirect network effects contribute to market share concentration. It is considered that the market concentration will likely continue to increase around the three major companies—AWS, Microsoft, and Google—that are already deploying large-scale cloud service businesses and expanding various services utilizing information and communication technologies and data as digital platform providers.
- Once a specific cloud service is chosen, transitioning to other cloud services or on-premises systems is generally difficult. For competition in the cloud service market to function effectively, it is crucial that users can sufficiently evaluate and determine the transaction terms, including the specific content of the services, in advance to make appropriate choices.

4. Furthermore, this contribution paper introduces the following case as an example of a violation of the Antimonopoly Act (AMA) related to cloud services, in addition to the summary of the market study:

- A company (MC Data Plus Inc. (hereinafter referred to as “MC Data Plus”) providing services to streamline operations by exchanging labor safety documents via the cloud refused to provide employee information without reasonable justification, citing personal information protection, thereby preventing users from switching to alternative services. The JFTC issued a cease and desist order in December 2024.

## 2. Report on Trade Practices in Cloud Service Sector

5. In June 2022, the Japan Fair Trade Commission published a report on the actual status of the cloud service sector. The summary is as follows:

### 2.1. Targets and Methods

#### 2.1.1. Cloud Services Subject to the Survey

6. The market study mainly targets “IaaS” (Infrastructure as a Service) that only provides infrastructure and “PaaS” (Platform as a Service) that provides from operation systems (OSs) up to various functions (middleware) (for example, database) required to operate application software (App) via a network in addition to infrastructure resources, among the classifications of the cloud services by service model (hereinafter “cloud service” primarily refers to IaaS and PaaS and their service providers, unless otherwise stated.).

7. Additionally, the market study also refers to the group of services called “SaaS” (Software as a Service) that provides Apps via a network as one of the types of the cloud services as required.

#### 2.1.2. Methods

8. The market study included interview-based survey with:

- cloud service providers (CSPs), including AWS, Microsoft, and Google (hereinafter referred to as the "Three CSPs"), which have been increasing their market shares in the IaaS and PaaS markets year by year, as well as 22 other CSPs.
- 33 implementation support providers, which use CSP's services to offer solutions and services to customers.
- 6 third-party software vendors.
- 18 businesses utilizing cloud services as customer (CSCs).

9. Additionally, a questionnaire-based survey was conducted targeting users of IaaS, PaaS, and SaaS (limited to services providing groupware functionalities and CRM functionalities) within the cloud services, with responses collected from approximately 1,500 companies. Furthermore, the JFTC held opinion exchange sessions with academic experts and other professionals with expertise in the cloud services and had discussions with foreign regulatory authorities, including the Netherlands Authority for Consumers and Markets, the French Competition Authority, and the European Commission's Directorate-General for Communications Networks, Content and Technology.

10. Moreover, during the course of this survey, the JFTC issued report orders<sup>1</sup> based on Article 40 of the AMA.

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<sup>1</sup> The AMA grants the JFTC the authority to conduct investigations necessary for cases, such as on-site inspections and reporting orders (Article 47). Additionally, Article 40 of the AMA stipulates that when necessary for the execution of its duties, the JFTC may order businesses or their employees to appear or require the submission of necessary reports, information, or materials for fact-finding survey.

## 2.2. Overview of Cloud Service Market

### 2.2.1. History

11. In the late 2000s, besides speeding up CPU processing, the development of technologies such as virtualization<sup>2</sup> and decentralized processing led to the appearance of cloud services. The server environment assigned through virtualization shall assign performance and memory capacities of CPU respectively like the physical server and each enables OS and Apps to operate. The new aspect of the cloud services is that it provides an independent virtual environment for each CSC through virtualization of physical server, unlike hosting services<sup>3</sup> in which one physical server is shared by multiple customers.

12. In hosting services, basically, pre-packaged subscription plans tailored for expected usages or services are provided, and customers cannot install Apps freely to the rental server. On the other hand, with the cloud services, CSCs can construct the server freely within a virtual environment, including installation of Apps, etc. Furthermore, in hosting services, while the specification is fixed according to the plan selected when making a contract, the cloud service enables them to increase and decrease the necessary amount of resources easily as required. Thus, the cloud services have the characteristics of high flexibility of customization and for increase and decrease in the amount of resources for CSCs.

13. Initially, cloud services provided basic functions such as computing, storage, and application development and operation environments. Today, as the services have become increasingly complicated and highly functional, the number of services has dramatically increased accordingly. In this respect, according to the explanations by CSPs, in accordance with development of technologies related to cloud computing, it appears that CSPs have created more specialized services, including data analysis, IoT, machine learning, AI, block chain and quantum computing.

### 2.2.2. Benefits of Cloud Services

14. With cloud services, CSCs don't need to procure hardware, etc. by themselves, and they can select the amount of functions they want to use at any time and they can easily expand and reduce such amount. It is advantageous for CSCs because they can reduce not only the initial costs but also the waste of resources in cases of fluctuating usage. Furthermore, it is pointed out that there is an advantage that cloud services can construct systems swiftly.

15. While it takes a long time for the companies in the case of on premises or data center services (hereinafter referred to as "On-Premises") and they need to procure and arrange resources by themselves, in the case of cloud services, it is possible to swiftly get to work on system construction as CSCs only need to start the use of prepared computing resources by CSPs. Moreover, in the case of the design for cloud services (especially IaaS), on the assumption that the necessary functions would be selected out of the prepared ones

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<sup>2</sup> Virtualization refers to a mechanism that logically divide the resources of hardware, including servers. For example, in the case of server virtualization, it enables multiple server environments from a single physical server or the consolidation of resources from multiple physical servers into a single server environment.

<sup>3</sup> Hosting service refers to services where a provider rents out resources such as racks, space, power supplies within a data center, as well as entire or partial server regions and network equipment owned by the provider, to customers. Additionally, the service includes operational support, such as system monitoring.

and then combined them, it is said that the system can be constructed swiftly by developing a specific pattern of the design related to infrastructure.

16. This means that development, construction and modification can be performed swiftly and flexibly to meet on-site needs and would give an advantage for the rapidly changing digital society surrounding the business.

17. In addition, with regard to cloud services, since maintenance and operation are performed by CSPs, it becomes possible for CSCs to assign the human resource of their own companies who were previously assigned to such maintenance and operation to significant efforts closer to their own business issues.

18. Furthermore, CSPs have promoted efforts to adopt the configuration to provide against failure by utilizing disaster resilient datacenter and making use of specialty as the providers. In some cases, cloud services may be assessed superior to On-Premises in regard to availability and reliability depending on the providers that CSCs use.

### ***2.2.3. Market Share Trends***

19. The total market share of the top three CSPs in the IaaS and PaaS markets increased from approximately 40-50% in 2011 to 60-70% in FY2020, indicating growing market concentration. The combined market share of the Three CSPs grew sharply from about 5-10% in 2011 to 60-70% in FY2020, suggesting that the market concentration in Japan's cloud service market is driven by the expanding market share of the Three CSPs.

20. Additionally, Japan's market size grew from approximately 44 billion yen in FY2011 to about 542 billion yen in FY2022.

## ***2.3. Characteristics of the Cloud Service Market***

### ***2.3.1. Transition from On-premises to Cloud Services***

21. Amid the overall expansion of the market for information processing systems, switching from on-premises to cloud services has been proceeded. The questionnaire results also show that the proportion of the businesses that experienced switching from on-premises to IaaS or PaaS in the past decade is 58.2% of the respondents, from which it is found that a majority of the businesses that use cloud services have experienced the switching from on-premises.

22. The proportion of the businesses who answered that they would switch to on-premises due to 5 to 10% price raise of the cloud services is 4%. That is, approximately 96% of the CSCs answered that they would continue the use of cloud services despite the price rise of 5 to 10%.

23. Thus, from the viewpoint of substitutability from the customers of cloud services, it is supposed that there is little possibility of switching from the cloud services to on-premises due to small but significant and non-transitory increase in price, namely that the cloud services are highly likely to have different markets from on-premises.

### ***2.3.2. Economies of Scale***

24. According to the interviews with CSPs, they explained that economies of scale works upon providing cloud services. Factors contributing to this include that, as the scale of a business increases, it can reduce the procurement costs of hardware required to provide cloud services such as data centers and servers, electricity required to operate the hardware.

25. Additionally, once the basic design of a data center is established and software for the data center operations is automated, expansions can be carried out efficiently. The ability to efficiently distribute computing demand was also highlighted.

### ***2.3.3. Economies of Scope***

26. According to the interviews with market participants, it was pointed out that CSPs may have an advantage from a cost perspective by using their equipment and technologies used in their existing businesses other than cloud services in their cloud services business, which can generate synergistic effects, that is, economies of scope may function. In this regard, it is supposed that the digital platform businesses that deploy various services by using information communication technologies and data can demonstrate the superiority resulting from economies of scope by using the technologies that have been used in the existing business.

### ***2.3.4. Wide Range of Provided Services***

27. According to the interviews with CSPs, for cloud services, it is pointed out that it is important to have an ability to develop technologies that can provide a wide range of services and functions to meet diverse needs of CSCs in addition to differentiating each individual service. In particular, recently it is supposed that as digital transformation that create a new value has been promoted by making use of data and IT technologies, there are a large number of CSCs that choose the services where a wide range of tools for digital transformation is prepared. In this regard, from the market participants as well, it was pointed out that digital platform providers that deploy large-scale cloud services have excellent human resource and overwhelmingly quick development speed of services, and launch new cloud services one after another.

### ***2.3.5. Indirect Network Effects due to an Increase in Related Businesses***

28. In the transactions on cloud services, the ecosystem has been formed mainly focusing on the existing CSPs. There are a large number of businesses that conduct business based on the services on the premises of the CSPs including introduction support businesses that provide system integration services by making use of the services of the CSPs. There are also third-party software vendors that provide software used on the services of the said CSPs. As a result, it is assumed that indirect network effects function upon enhancement of such ecosystem.

### ***2.3.6. Tendency among CSCs toward Preferential Use of Services Provided by Current Providers***

29. According to the questionnaire-based survey, around 60% of CSCs (62.5% for IaaS, 63.7% for PaaS) answered “consider with priority” or “would rather consider with priority” of the same CSP’s services upon increasing the use of the cloud service. From this, it is found that CSCs tend to give a priority for consideration to the CSPs that they have already used upon increasing its use. This tendency is remarkable for the CSCs of the cloud services by the Three CSPs showing high proportion (69.3% for IaaS, and 74.0% for PaaS), which resulted in higher proportion compared to the CSCs of the services of the CSPs other than the Three CSPs (52.8% for IaaS and 53.4% for PaaS).

30. Additionally, some CSPs may provide volume discounts or discounts based on the commitment of a certain amount of service use. Thus, it is assumed that such charge system could be the incentive to choose the service of a particular business provider as well as other factors. Furthermore, in general, as the terms and usability may differ significantly

depending on service providers, in the case where CSCs have already been provided the functions they require by the business provider, many of them are likely to choose the service of the said business provider.

## ***2.4. Assessment of Competitive Environment in Cloud Service Market***

### ***2.4.1. Potential Increase in Market Concentration***

31. While the whole market relating to information system has been expanding at present, as well as the growing transition from on-premises, the use of cloud services by businesses is on a rise. Under such market circumstances, it is supposed, as it is more important for CSPs to acquire new CSCs rather than to secure the existing CSCs, CSPs have some incentive to compete each other on the price and quality of the services for new CSCs. Actually, it is indicated that the prices of the cloud services are on a decline trend mainly for IaaS, and also, the types of services provided by the CSPs with the market top share are increasing each year, it is found that there is currently a certain level of competition on prices and quality.

32. On the other hand, a few businesses have high shares in the cloud service market. Taking into account the factors such as economies of scale, economies of scope, a broad range of services provided and indirect network effects contributing to the concentration of the market shares in the cloud service market, the degree of market concentration is highly likely to continue to increase mainly among the Three CSPs that have already provided large-scale cloud service businesses and deploy various kinds of services that utilize information communication technologies and data as digital platform businesses. Moreover, in cloud services, in general, the switching costs hinder the migration to other cloud services or on-premises by CSCs. In addition, the CSCs who have already used cloud services tend to prioritize adopting additional services from their current provider when expanding their use.

33. Based on the aforementioned, it is expected that the existing major CSPs are in an advantageous position to acquire new CSCs due to the economies of scale etc. After that, even in the phase where the number of new CSCs decreases as the market becomes mature, as active switching between services is not expected, the market is highly likely to change into a noncompetitive structure in the future. In addition, It is likely that the cloud services are also less susceptible to competitive pressure from adjacent service sectors. While the cloud service market has been expanding in the form of porting from on-premises, porting from cloud services to on-premises is less likely to be expected. Furthermore, the edge computing system<sup>4</sup> which is a much newer IT service compared to cloud has appeared and drawn attention, and this is not recognized as substitutable to the cloud service either.

34. Thus, in the case where the cloud service market changes into a noncompetitive structure and the competitive pressure from the adjacent service sectors does not work, there will be concern about negative effects, such as weakening of the competitive pressure on the existing CSPs, increased costs of cloud services, stagnation of quality improvement of cloud services such as security level, data processing speed and reading speed, and connectivity between functions and less transparent trade conditions for CSCs. Furthermore, as the competitive pressure on the existing CSPs weakens, there will also be

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<sup>4</sup> Edge computing refers to a technology that performs a portion of data processing at the edge of the network, such as on users' devices or computers located near those devices. For instance, in cases requiring real-time information processing with extremely large volumes of data, transferring the data to the cloud may result in network delays or disruptions. Edge computing helps compensate for such limitations of the cloud in situations where it may not be suitable.

concern about stagnation of providing new services by utilizing innovative technologies in the cloud service market.

35. Accordingly, it is important to ensure the environment where CSCs can choose the cloud services freely in order to prevent the negative effects of concern due to concentration of market share and implement quality improvement and cost reduction in the services through competition.

#### ***2.4.2. Asymmetry of Information***

36. In the cloud services, taking into account the fact that porting to other cloud services or on-premises is generally difficult once a particular cloud service is chosen, in order that the competition in cloud service market functions efficiently, it is essential to enable CSCs to assess and judge the details of trade terms sufficiently in advance and choose properly the cloud services. For that purpose, it is especially important to make the trade terms clear enough for CSCs before introducing cloud services.

37. According to the questionnaire results, the proportions of the respondents who answered, “some of the information obtained at the time of service selection was not sufficient, and it was necessary to purchase additional services or change to a higher level of services after implementation.” and “as the information obtained during service selection was not sufficient, there is some concern about the use of the service, although no special measure is currently taken.” are 9.4% and 9.0% for IaaS users respectively and 13.1% and 9.0% for PaaS users, respectively. Thus, it is found that there is asymmetry of information between CSPs and CSCs during service selection.

38. Furthermore, it can be seen that there are some problems of fairness and transparency regarding transactions between CSCs and CSPs, as it is found that there is a certain proportion of the CSCs that think that post-facto report is not sufficient regarding information and reoccurrence prevention on the failures, etc. that occurred as a part of CSPs’ responsibility even after implementation, and the CSCs that have concern about data management by CSPs.

39. In the case where sufficient information is not disclosed, it becomes difficult for CSCs to select the services properly based on their quality and competition may be distorted. In order to ensure a fair competitive environment in the cloud service sector, it is important to enable CSCs to select services through sufficient comparison of their quality in advance by eliminating asymmetry of information.

## **2.5. Perspectives from Competition Policy**

### ***2.5.1. Preventing Potential Adverse Effects of Market Share Concentration***

40. In order to continue to make competition function effectively in the cloud service market, it is important to develop an environment in which a wide variety of businesses provide services and CSCs can freely select cloud services as needed, and based on the characteristics of the cloud service market, specifically, it is necessary to develop a competition environment to ensure the following (i) and (ii).

(i) The contractual, technical, and economic constraints that CSCs face when switching are reduced as much as possible, such as that CSCs should be able to switch to other cloud services or port to their own on-premises option if they wish, and should not be required to bear excessive costs from the CSPs in doing so.

(ii) Interoperability of services between different providers should be ensured and CSCs should be able to use IT services and software from different providers in a single system

environment, regardless of format (cloud or on-premises), in response to changing circumstances such as their changing needs or the appearance of innovative services from new providers, with the minimum necessary contractual, technical and economic constraints faced by CSCs in doing so.

41. Realizing the competitive environment outlined in points (i) and (ii) requires collaborative efforts from both cloud providers and users.

### ***2.5.2. Ensuring Fairness and Transparency***

42. It is considered that there are some problems of fairness and transparency regarding transactions between CSPs and CSCs, as there seems to be asymmetry of information between CSPs and CSCs.

43. With regard to the services, like the cloud services, which it is not easy for users to switch once they have started using, it is especially important that appropriate information is provided to users before they start using the services and they can autonomously and rationally select services that are necessary. Additionally, the cloud service is the one where CSCs select necessary functions within the prepared ones, and combine and use in accordance with their own needs, and in some cases, it may be used by combining with IT services of different providers. In the case where information on the cloud services that are currently used is not appropriately provided, by reason of difficulty of specifying the causes in the occurrence of failures, it becomes more difficult to combine use of the services of different providers. From the viewpoint of not impeding CSCs' combining or expanding services, it is necessary that appropriate information on the contents of the service shall be provided even after the conclusion of the service and it is desirable that a system will be established to appropriately accept CSC's request for conclusion and negotiation.

## **2.6. Anticipated Competition-Restrictive Conduct**

44. The report highlights issues emerging from the market study, and presents perspectives from competition-restrictive conduct under the AMA for the purpose of preventing violations. Specifically, it categorizes conducts into:

1. Conduct that may adversely affect competition in the cloud service market,
2. Conduct that may adversely affect competition in other markets, and
3. Conduct that may disadvantage transaction partners.

45. The following examples are provided under these categories in the report, along with CSCs' comments, CSPs' explanations, and guidance on potential violations of the AMA or desirable approaches from the perspective from competition policy:

- Conduct affecting competition in the cloud service market: Setting data transfer fees, Integrating distinct functions traded independently, Preferential treatment in licensing for software used in cloud services, and Favoritism for exclusive partners.
- Conduct affecting competition in other markets: Imposing parity conditions on marketplace sellers, Using seller transaction data for marketing purposes in marketplaces, and Handling user data associated with cloud service use.
- Conduct potentially disadvantaging transaction partners: Transactions between CSPs and users, as well as between CSPs and partners.

46. Among these examples, this contribution paper introduces perspectives from the AMA on setting data transfer fees, and the integration of independently traded functions in below:

### *2.6.1. Setting of a Data Transfer Fee*

47. The terms and conditions of a business transaction shall basically be left to the autonomous judgment between transaction parties. Therefore, setting a high data transfer fee in itself would not necessarily be a problem under the AMA.

48. However, the high data transfer fee at the time of output can make CSCs difficult to extract data accumulated in the cloud service and port it to other cloud services or on-premises, and consequently, it may make the CSCs difficult to switch to other cloud services or on-premises.

49. In this circumstance, setting an unfairly high data transfer fee by an influential CSP in the cloud services market shall be a problem under the AMA, if it causes a foreclosure effect (i.e., in the case that it will prevent CSCs from using cloud services provided by other CSPs, which may result in the exclusion of other CSPs or the decrease in trade opportunities for such other CSPs) (paragraph 14 of Unfair Trade Practices (Interference with a competitor's transactions) or Private Monopolization). Additionally, from the viewpoint of competition policy, even in the case where there is no problem under the AMA, it is desirable that the data transfer fee at the time of output should be reduced as much as possible, so as not to prevent CSCs from switching the cloud services.<sup>5</sup>

### *2.6.2. Integration of Different Functions That are Traded Independently*

50. Providing a service to the counterparty of a transaction by the combination of multiple functions with adding new values is one of the methods of technological innovation and sales promotion, and such conduct in itself would not necessarily be a problem under the AMA.

51. However, providing the service for CSCs by CSP( $\alpha$ ) with the integration of Functions (A) and (B) may cause situations in the market of Function (B) related services, such that existing competitors' business activities are impeded and/or entry barriers are raised, depending upon CSP( $\alpha$ )'s position in the market of the Function (A) related services and other factors.

52. Accordingly, in the case CSP( $\alpha$ ) is influential in the market of Function (A) related services, its integrating Function (B) into the Cloud Service (A) and providing it to CSCs as a new Cloud Service (A<sup>+</sup>) shall be a problem under the AMA, if such conducts cause foreclosure effect for the Cloud Service (B) market (paragraph 10 of Unfair Trade Practice (Tie-in Sales, etc.) or Private Monopolization).

53. Such foreclosure effects might be found in situations that existing competitors and/or new entrants may be eliminated or their trade opportunities may decrease, by raising competitors' costs thorough reducing transaction opportunities for the existing CSPs or new entrants in the market of Function (B), or by discouraging new entry or innovation.

54. In addition, the sales method to provide bundling multiple services to CSCs may cause similar effects. Thus, sales of bundling multiple services to CSCs shall be a problem under the AMA, if it causes the same effect as the above-mentioned.

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<sup>5</sup> At the time of the publication of this report, all three major providers, had set data transfer fees. However, these fees were subsequently abolished.

55. To enable other CSPs and software vendors to provide their services in a fair competitive environment and to allow users to select the services they need from a wide variety of services; it is desirable that each function and service shall be provided as an independent service under reasonable conditions so that users can individually select each function and service that is subject to function integration or bundling.

### 3. Cases Related to Cloud Services (Cease and Desist Order, December 24, 2024)

56. MC Data Plus operates a business providing cloud services for construction industry. Among its key services, the company provides a service that enables efficiency improvements by facilitating the exchange of labor safety documents between prime contractors (users) and subcontractors (users) via the internet.

57. To maintain the advantage of its services, MC Data Plus recognized the necessity of preventing employee information and other data registered in its services from being passed to competitors newly entering the market. Based on this recognition, MC Data Plus refused to provide employee information in a format that would allow users to switch to alternative services, thereby discouraging users from switching to competing services even though the information was registered by the users themselves. MC Data Plus cited reasons such as personal information protection, those of which are not justifiable.

58. The above conduct was deemed to violate the provision of the Article 19 (paragraph 14 of Unfair Trade Practices (Interference with a Competitor's Transactions)) of the AMA. Consequently, in December 2024, the JFTC issued a cease and desist order against MC Data Plus. The order required the company to cease its unjustified refusal to provide employee information in the format requested by users and to take corrective measures.

59. Currently, a lawsuit seeking to overturn the order is in progress at the Tokyo District Court.