The current situation and challenges in big-data use in services
　A case study in an　urban development　

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Abstract

In order to achieve enhancing the value and productivity in service industries, data usage is a key issue. It might be even more effective if data is shared and utilized among different companies and organizations. A data platform that enables different companies and organizations utilizing the shared data could contribute to their businesses and services even more. This paper presents a result of the authors' survey on the feasibility of creating such a mechanism. In enabling the mechanism mentioned above, effective utilization of data is substantial. The paper first presents a survey on the existing relevant works in developing and utilizing such data platform. Then we present our case study on data and usage in an urban development, where some interviews for companies are carried out. Based on the results, we discuss the feasibility and challenges in enabling data common possession and application in services.

1　INTRODUCTION

In order to enhance the productivity of the Japanese economy, supporting the productivity in Japanese service industries is one of the most important issues. Moreover, it also can be considered that the productivity enhancement in service industries leads to regional vitalizations, since they say that the service industry has strong regionality.

Data usage which is called 'big data' has recently received attention in various fields. It is expected that the value and productivity enhancement can be produced by dealing with comprehensively the big data consisting of various types of data. Moreover, it will become effective if data is shared and utilized among different companies and organizations.

The data usage has been spread even in service industries. However, its effective practical use has not been sufficiently presented, and hence it has been required that the environment with respect to data usage and application is established.

This paper deals with the topics about data usage in services. At first, the current situation of data usage and application is presented based on the existing relevant works and our case study. In the case study, interviews for some companies which are related to urban developments are carried out. Moreover, the issues about data usage which are clarified from the interviews are shown, where it will be also described what kind of data is needed to enhance service productivities by the data use. Finally, based on the current situation and the issue, we discuss the feasibility and challenges in enabling data common possession and application in services.

2　A REVIEW: DATA USE IN SERVICE INDUSTRY

Big data is becoming the basis of competition for individual companies. The use of data supports companies to enhance productivity and create value for both companies and their customers. Big data is used to support companies for their corporate management, decision-making, marketing, service development, and so on. In marketing, for example, big data can help companies to find insight into questions such as how their service category is performing as a whole and who are the customers that purchase competitive services. Also big data allows ever-narrower segmentation of customers and thus much more precisely tailored services can be developed and provided to the customers.

One of the most significant potential to generate value from big data could come from combining separate pools of data [1]. Sharing and co-using data from different sources and different original owners can create even greater value than in the case that data is collected and used by individual companies or organizations. There are at least two directions for sharing data. One direction is to share the data of customers. To deepen the insights of consumers, companies need not only to deepen the insights on consumers' preferences and purchase/ consumption behaviours on their providing services but also to understand preferences and behaviours on the other companies' providing services and products. It is effective for companies to share the insights on　consumers.

The other direction of data-sharing is share of the data of companies, or service providers. It is effective to share their data to compare the companies, to share the best practices, and to help companies to know their own strength, weak points, and distinct features when compared with other companies. Such comparison or 'benchmarking' can also help enhancing productivity of companies. Some of the existing tools and frameworks related to benchmarking are:

- Balanced scorecard
- 7S (McKinsey 7S framework)
- Benchmarking [2]

To conduct benchmarking, collecting data and business indices from different companies is necessary. But since there is a limit for individual companies to collect such data, public organizations conduct or support the

activities. The following are some of the benchmarking activities.

- APQC (American Productivity & Quality Center) benchmarking
- SPRING Singapore's performance benchmarking

Although companies and governments understand the power of big data to deliver higher productivity and better value for consumers, there exist barriers for them to promote data usages. To understand the obstacles as well as the opportunities of data usage in service sector, it is effective to investigate the current situations of and challenges on data usage through case studies.

3 A CASE STUDY : THE CURRENT SITUATION OF DATA USAGE AND APPLICATION IN SERVICE FIELDS

In this section, we will show our understanding obtained from a case study. In the case study, we carried out an interview for the following companies;

1. Companies in the area of urban railroad lines
2. Retail companies
3. Companies dealt with open data
4. Companies related to regional vitalizations

In each interview, the current situation of data use, what kinds of data are used and needed, data use for local vitalizations, data sharing and common possession, and so on were the topics of interview. From the interviews, the following things can be grasped.

a. Mostly, it is considered that the data usage and application is important to enhance the productivity.

b. However, under the condition that there are some successful cases for data usage and good results can be expected, it is considered that the data usage and application might be spread.

c. People who has practical objectives, models, and hypotheses positively collects and utilizes data, even if they belong to smaller businesses.

d. From the viewpoint of supplying data, the data format should be unified so that the data can be utilized easily. Unless secondary use for the data is enabled easily, then the posture for the action of the data usage and application might be declined.

e. The usage method of comparing with different companies and organizations is available. There is such an opinion that the best practices of other companies are the good models which should be studied.

These are common opinions obtained from almost all companies. It can be considered from these opinions that the data usage and application is important, the data platform which can be handled by anyone should be made, but the method of handling the data is unfamiliar.

4 WHAT A DATA PLATFROM SHOULD BE: OUR VIEWPOINTS

In this section, some issues about data usage, which were obtained from the interviews, will be shown, and moreover, it will be shown what kind of data should be needed for data usage and applications, and finally, we describe about the feasibility in enabling data common possession and application.

4.1 Issues about the data usage and application

The following issues are typical examples obtained from the interviews.

a. In service industries, the data usage and application is not necessarily advanced because there are few resources for dealing with the data.

b. The management of privacy data and its risk demerit are the most serious disincentive in the case when the data usage and application is carried out.

c. It is an important issue how the information on data is notified to the users. The collected data is not just displayed, but it is also necessary to consider how to show the data.

4.2 What is the data which should be utilized?

We understood from the interviews that the following data should be utilized for enhancing the productivity of company.

a. *Consumer behavior data*
This data includes behavior histories, purchase places, the contents of purchase, and so on.

b. *Customer lifestyle data*
This data means that the lifestyle of the customer can be grasped to some extent.

c. *Psychological data*
This data means preference, sense of values, lifestyle, and so on, of people for each area.

d. *Local marketing data*
This data includes daily and weekly marketing data, marketing data for each item, and so on for each area.

e. *Customer feedback data*
This data includes customer's evaluation and complaint for various products and services.

f. Local community data
This data includes key person and his/her activity information at organizations, societies, and communities.

g. Local information data
This data is made by local inhabitants who live in each area.

h. Local administrative possession data
This data includes regulation change information, development program information, promotion support system information, population change information, and so on.

From the current situations and the issues about the data usage, it is confirmed that data platforms which enable service providers and users to achieve data common possession and application can be designed. However, in the data platform, the data including the data shown in 4.2 is not only just provided, but also it

will become important to show easy-to-use data and its data usages.

5   DISCUSSION AND CONCLUSIONS

This paper has presented the current situations of data usage and application based on the existing relevant works and our case study. From the results, as the feasibity of data common possesion and application, we have introduced a data platfrom, where in the case when the data usage in servicdes is carried out, it would be better that the data platfrom has the data shown in 4.2 and the method of using the data.

By constructing data platforms, it can be achieved that the data is shared and utilized among different companies and organizations, and then it is possible to compare with different companies, and hence it will become possible to perceive strong and weak points of a company. Namely, the idea of benchmarking can be carried out.

It might be considered that this mechanism can be introduced also into service industries. However, it is not easy to make benchmarking indices in the service industry, because the servce has the indeterminacy of users. The relation between service provider and user is clarified and the data representing the relation comes to collecte, and then the service benchmarking might be achieved. Designing the serve benchmarking is a challenging issue.

Fig. 1 shows the idea of benchmarking and data platform. In Fig.1, companies provide data, for example, corporate management data, the data is analyzed to easy-to-use data, the analysed data is accumulated in data platforms, and then the service benchmarking is carried out for a company, utilizing the data in the data platform. The results are fed back to the company through, for example, consultants, so that the productivity of the company is enhanced.

Designing such a mechanism will be treated as a future work.

6   REFERENCE

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Fig 1. Illustration of benchmarking and data platform