

Official Statistical Surveys on ICT in Japan and Measuring E-Commerce

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Abstract

Taking into account development of ICT in recent years, a lot of countries are dealing with preparation of statistics on ICT.

In Japan, the Basic Law on Formation of an Advanced Information and Telecommunications Network Society (Basic Law on IT) was enforced on January 6, 2001, in which the Government is obliged to prepare official statistics related to ICT.

In Japan, at least 25 kinds of official statistical surveys including questions related to ICT have been conducted in the past five years. In addition, at least seven kinds or more of official statistical surveys including new questions related to ICT will be conducted in fiscal year 2001 onward. Their main purpose, survey items and survey methods are various and different respectively.

And the Statistical Industrial Classification for Japan (JSIC) is under deliberation of the Statistics Council for reviewing it in response to the change of economy and society including the development of ICT.

The Working Party on Indicators for the Information Society of OECD has been working for several years in order to prepare internationally comparable and statistically measurable ICT indicators and related ICT statistics.

In this paper, an overview of the present situation of Japanese official statistical surveys related to ICT is given with some analysis. In addition, some problems are raised which, I think, should be considered from the viewpoints of the necessity and measurability and so on for the appropriate preparation of ICT indicators and e-commerce-related statistics.

"IT; Information Technology" and "ICT; Information and Communication Technology" are often used without any distinction. "ICT" is used in this paper except the case "IT" is used as a proper noun. as it is considered almost of same as "IT".

The views expressed herein are those of the author, and are not necessarily those of the Statistical Standards Department or any other Japanese government ministries.

I Introduction

1. The development of ICT in recent years is sometimes called the new Industrial Revolution, and the speed of its development is extremely rapid. ICT also spreads widely and influences deeply not only economic activities of businesses, households and governments but also various areas of people's daily life. On this account the preparation of official statistics related to ICT has been an urgent matter for national statistical offices of many countries and the needs of ICT statistics extends over various fields, too.

2. In Japan, the Basic Law on Formation of an Advanced Information and Telecommunications Network Society was enforced on January 6, 2001, which obliges the government to work out a basic strategy to promote the formation of advance IT network society.¹ And the Law also obliges the government in its article 14 to compile statistics and other documents concerning an advanced IT network society and to publish them on the Internet and by using other appropriate means.

3. In Japan, the decentralized statistical system is adopted based on the idea that, while basic and common statistical surveys such as the Population Census are conducted by the Statistical Survey Department of Statistics Bureau, Ministry of Public Management, Home Affairs, Posts and Telecommunications (MPHPT), other statistical surveys necessary for the policy making of the each ministries and agencies are conducted by themselves within their jurisdiction. Under this system, statistics related to ICT are also developed and prepared by them within their jurisdiction.

II Overview of Official Statistical Surveys related ICT in Japan

4. There are three methods to prepare ICT statistics and related data as follows.

¹ The "E-Japan Strategy" was established by Japanese Government in January 2001.

- i) Using existing administrative data,
- ii) Adding questions on ICT to existing statistical surveys / censuses or improving them,
- iii) Planning and conducting new surveys/censuses on ICT.

In my country, some data on enterprises supplying telecommunication services such as the number of telecommunication companies, the situation of their management and facilities/machinery, the number of their subscribers are available in the administrative data. And also the data on import and export of ICT related products are available in the data of the custom services.

5. In Japan, at least 25 kinds of official statistical surveys containing questions related to ICT have been conducted in the past five years and at least 7 kinds or more of official statistical surveys related to ICT are scheduled to be conducted from fiscal year 2001 onwards. The main purpose, survey items, coverage, survey unit and other survey methods of these 32 statistical surveys are various and different respectively.

Dividing these surveys according to the survey target, 21 are surveys for enterprise/establishment, 7 are those for household/individual and 5 are those for government, school, etc.²

6. Statistical surveys and survey items for enterprise/establishment are divided into some types as follows.

- i) Statistical surveys on the state of specific ICT related industries such as electronic communication business or information service business,
- ii) Statistical surveys on production of ICT facilities/equipments such as the Manufacturing Census,
- iii) Statistical surveys on investment in plant and equipment related to ICT or possession of ICT facilities/equipments by various enterprises/establishments,
- iv) Statistical surveys on the use of ICT facilities/equipments in various enterprises/establishments,
- v) Statistical surveys on the introduction of e-commerce in various enterprises/establishments,
- vi) Statistical surveys on the situation of information processing in various business processes and effects of introduction of ICT/e-commerce in various enterprises/establishments

7. Statistical surveys and their survey items for household/individual are divided into some types as follows.

- i) Statistical surveys on the possession of ICT facilities and the use of PC/the Internet by households/individuals,
- ii) Statistical surveys on the purchases of telecommunication facilities such as PC, mobile phone and the expenditure for their use such as telecommunication charge by households/individuals,
- iii) Statistical surveys on time, purpose, place etc., for which households/individuals use PC or the Internet,

8. Statistical surveys and their survey items for the government or other public entities are divided into some types into as follows.

- i) Statistical surveys on installation of ICT facilities/equipments, especially main computers and their related works and systems, the number of related operators, installation of LAN systems etc., in the government, public corporations and so on.
- ii) Statistical surveys on installation of PC and software in schools, practical use of PC by teacher etc.,
- iii) Statistical surveys on installation of computer in the university libraries, establishment of the homepage and digitization of information about the book collection etc.

9. In most cases, ICT related questions are added in the existing statistical surveys as a part of each survey. But there are several statistical surveys in which most part of questions are consisted of those related to ICT such as the possession of ICT facilities/equipments, their use and other related matters to enterprise/establishment, household/individual, and government organizations or public entities. Main examples that consist of ICT related questions are as follows.

i) Statistical surveys to enterprise/establishment that consist of ICT related questions.

a) Questionnaire for Enterprises in the Communication Usage Trend Survey

The Information and Communication Policy Bureau of MPHPT carries out this survey annually as a nation wide sample survey to 3,000 enterprises with more than 100 regular employees except those belonging to agriculture, forestry, fisheries, mining industries, civil service and others of JSIC.

Main survey items are the state of establishment of telecommunication network, the use of the Internet, e-mail and EDI, security measures, cost for communication network etc. The Survey is conducted on the end of November and its results are usually released in next March.

b) Questionnaire for Establishments in the Communication Usage Trend Survey

² One of these 32 surveys consists of three types of questionnaires for enterprise, establishment and household.

The Information and Communication Policy Bureau of MPHPT carries out this survey annually as a nation wide sample survey to 5,600 establishments with more than 5 regular employees except those belonging to postal services and telecommunication industries of JSIC.

Main survey items are the state of possession of ICT facilities/equipments, the use of the Internet, cost for communications etc.. The Survey is conducted on the end of November and its results are usually released in next March.

c) Survey on ICT Workplaces

The Ministry of Economy, Trade and Industry (METI) carries out this survey annually to listed 5,000 enterprises using computer.

Main survey items are cost for ICT works and its prospect, ICT operators, possession of computer, PC and ICT network, operation of LAN and its application for business, self-development of software, state of outsourcing. The Survey is conducted on the end of June and its confirmed results are usually released in next April.

d) Questionnaire concerning Corporate Activities

The Economic and Social Research Institute (ESRI) of the Cabinet Office carries out this survey annually to 2,270 enterprises except banking and insurance business which listed in Japanese the three big stock exchange markets namely in Tokyo, Osaka and Nagoya.

Main survey items in the survey are questions on business environment and on fundamental management policies including the results of investment in plant and equipment in the past three years and prospect in the coming three years, prospect of exchange rate, overseas production etc.. And other questions related to enterprise's action are selected every year in accordance with a selected supplementary theme. In the survey conducted January 2001, the corporate activities related to ICT were investigated as follows. Survey results were published just in May 2001 in Japanese.

Main survey items in January 2001 were as follows.

ICT investment (results and plans, contents, areas and business processes, purpose, effects, barriers and measures to them)

The new management techniques brought into enterprise's management by ICT (results and plans of the introduction of information clearinghouse system using ICT for the inside use and for the joint use with the outside, results and plans for introducing e-commerce (BtoB/BtoC), effects of its introduction.)

Effects on enterprise organization by introducing ICT (necessity of organization reform, establishment of specified sections for ICT strategy, practical use of email, results and plans of organization reform, results and plans on the change of employment)

ii) Statistical surveys to household/individual that consist of ICT related questions.

a) Questionnaire for Households in the Communication Usage Trend Survey

The Information and Communication Policy Bureau of MPHPT conducts this survey annually as a nation wide sample survey to 6,400 households.

Main survey items are the possession of ICT facilities, use of the Internet, cost of telecommunication services, etc. The Survey is conducted in November and its results are usually released in next March.

iii) Statistical surveys to government organizations and other public entities that consist of ICT related questions

a) Basic Survey on the Progress of Government IT Use ³

The Administrative Management Bureau of MPHPT carries out this survey annually to all organizations of the central government.

Main survey items are installation of ICT facilities/equipments, installation of computers and their works and systems, the state of related operators, etc..

The Survey is conducted as of April 1 and its results are usually released in November.

b) Basic Survey on the Progress of IT Use in Public Corporations ³

The Administrative Management Bureau of MPHPT carries out this survey annually to all public corporations according to the survey above mentioned.

c) Survey on Information Education in Public School

The Ministry of Education, Culture, Sports, Science and Technology (MEXT) carries out the survey annually to all public elementary schools, all public junior high schools and all public senior high schools.

Main survey items are questions concerning installation of PC and software, use of the Internet, and

³ Both surveys were reconstructed in April 2001 according to the reorganization of the central government conducted in this January. Data on ICT use of local public entities are collected as administrative data by the Local Administration Bureau of MPHPT.

practical use of PC by teachers. The Survey is conducted in March and May and the results are usually published in September.

10. New surveys including ICT related questions to be conducted from fiscal year 2001 onward are as follows.

i) Surveys for enterprise/establishment

a) Establishment and Enterprise Census 2001

The Census is conducted every five years by the Statistical Survey Department of the Statistics Bureau, MPHPT with the aim to clarify the industrial structure of the country as well as to provide the basic statistical framework for sample surveys on establishments and enterprises. It covers all establishments with a little exception (un-incorporated establishments belonging to agriculture, etc. of JSIC). The Census to be held this October will ask enterprises about use of e-commerce, its type (BtoB/BtoC), its contents (sending orders, receiving orders, delivery of goods and service after sales). The Census will provide data that users can make analysis by region, industry and size of establishment. Its results will be released in July 2002.

b) Report of Incorporated Enterprises Statistics

The Ministry of Finance carries out this survey quarterly as a nation wide sample survey to about 26,000 enterprises with an aim to gather financial data and other related data. Since April 2001 the sum of purchased software as assets is added as a new survey item.

c) Census of Commerce

METI carries out the Census every five years with the aim to clarify the actual condition of domestic trade. Its coverage is all establishments running wholesale and retail trade. A supplementary census is conducted two years after the Census. The next Census to be conducted in June 2002 will investigate e-commerce including annual merchandise sales and purchases over networks, and over the Internet etc.

d) Survey on Private Enterprise Economy

The Statistical Survey Department carries out the Survey monthly as a sample survey to 2,800 private enterprises running manufacturing, wholesale, retail trade, restaurant and services, in order to gather data about their management. In the forthcoming Survey, usage of PC, Internet connection, etc. will be added as new questions.⁴

e) Basic Survey of Commercial and Manufacturing Structure and Activity

METI carries out the Survey every five years as a nation wide sample survey to 30,000 small and medium size enterprises with establishments belonging to manufacturing, wholesale, retail trade and restaurant in order to gather data for their structure and activity. The forthcoming Survey in June 2002 will newly investigate usage of PC, computer and network. The next survey will be conducted in June 2002.

ii) Surveys for households/individuals

a) Survey on Household Consumption Condition

The Survey to be launched from this October by the Statistical Survey Department will inquire about 30,000 households of the purchases of expensive and infrequently purchased goods and services and consumption for ICT, which supplements the Family Income and Expenditure Survey initiated in 1954 covering about 8,000 households monthly. The Survey will collect data on purchasing and ownership of ICT related goods and services and usage of the Internet, which will present the trend of ICT use in a timely manner.

b) Survey on Time Use and Leisure Activities

The Survey covering about 100,000 households is conducted every five years by the Statistical Survey Department with the aim to clarify the distribution of time spent for daily activities of people as well as their activities during spare time. The forthcoming Survey in October 2001 will be conducted with new questions about the use of the Internet. The Survey will ask to about 200,000 individuals of the inquired households such questions as purpose, frequency and place of accessing to the Internet. The results will produce data needed for extensive analysis on ICT use by individual attributes (sex, age, region, occupation, etc.) and by household attribute (type, income, etc.). It will be the first practical material for the evaluation of ICT usage by Japanese people, including the evaluation of the state of digital divide. The results will be released in September 2002.

11. Questions on e-commerce except possession of ICT facilities/equipments, their use, namely questions on conducting e-commerce, barriers of e-commerce, sum of sales and purchase via the Internet etc. are asked in some surveys as follows. But, most of them are scheduled to be conducted from fiscal year 2001

⁴ The survey period and number of respondents will be improved in next year.

onward. Therefore, at this stage there are few surveys with these survey items except Questionnaire concerning Corporate Activities.

i) Survey for enterprises/establishments

a) Questionnaire concerning Corporate Activities (ESRI, January 2001)

Please see the above explanation and survey items in para.9) as for the main survey items related to e-commerce.

b) Establishment and Enterprise Census 2001 (Statistical Survey Department, October 2001)

Main survey items related to e-commerce are the use of e-commerce, its type (BtoB/BtoC) and contents of e-commerce (sending orders, receiving orders, delivery of goods and service after sales).

c) Basic Survey of Business Structure and Activities (METI, June 2001)

This is an annual sample survey carried out by METI with the aim to obtain the basic business information needed for formulating its industrial policies. The coverage of this survey is enterprises with establishments running mining, manufacturing, wholesale and retail trade.

Main survey items related to e-commerce added in the 2001 survey are the use of e-commerce, type of e-commerce (BtoB, BtoC and BtoG) and kinds of economic activities performed over networks, outsourcing of data processing, etc. Its preliminary report will be released in next March.

d) Census of Commerce (METI, June 2002)

Main survey items related to e-commerce are the use of e-commerce, annual amount of merchandise purchases and sales and those over electronic networks, and over the Internet etc..

e) Survey on ICT Workplaces (METI, as of end of June, the results will be released next April)

Main survey items related to e-commerce are the use of information systems in e-commerce processes for BtoB and BtoC, amount of sales and purchases of BtoB e-commerce, amount of sales of BtoC e-commerce, amount of purchases and sales of high rank items in BtoB e-commerce by electronic network/the Internet, and amount of sales of high ranked items in BtoC by electronic network/ the Internet.

ii) Survey for households/individuals

a) Survey on Household Consumption Condition (to be launched from this October by the Statistical Survey Department)

Main survey items related to e-commerce are the possession of facilities/equipments for the Internet, telecommunication means for the Internet, use of the Internet and its purpose, use of e-commerce, amount of e-commerce purchases in a month.

b) Survey on Time Use and Leisure Activities (Statistical Survey Department, October, 2001)

Main survey items related to e-commerce are contents, frequency, place and purpose of the Internet use, frequency, place and purpose of e-commerce such as shopping, banking, ticket reservation or purchase, stock exchange etc.

III Revising statistical standards corresponding to the development of ICT

12. Although developing new surveys on ICT is important, it is also important to revise statistical standards such as industrial classification, products classifications corresponding to the development of ICT and economic and social changes caused by it in order to make existing statistical surveys more analytical vehicles for ICT development.

Now, in my country, the plan to revise the Statistical Industrial Classification of Japan has been deliberated in the Statistics Council of MPHPT, and it will be finalized in the spring of next year.

The change plans corresponding to development of ICT as follows are now in consideration.

i) Establishing "Information and Communication Industry" as the Division (the first digit),

ii) Reconstructing the Major Group (the second digit) "telecommunication" under the Division,

iii) Reviewing the system of the Group (the third digit) "Manufacturing of electric facilities / equipments" and dividing "Manufacturing of electronic calculator and its accessories" in it into detail industries.

IV Introduction and Usage of ICT in Japan.

13. According to the results of the latest Communication Usage Trend Survey, 75% of households in my country have already possess ICT facilities / equipments (PHS, mobile phone, word processor, PC, facsimile, car navigation) in 2000, and more than 50% of them have already possess PC.

According to the results of Family Income and Expenditure Survey, average expenditure for ICT facilities/equipments and related services per a household in whole country in 2000 reached about 3.7 % of its total expenditure, a little over 140,000 yen.

According to the results of Questionnaire on Enterprise's Action conducted in this January by ESRI, most enterprises listed in the three big stock exchange markets, namely in Tokyo, Osaka and Nagoya have already introduced ICT tools.

And according to the results of the latest Communication Usage Trend Survey, 88% of enterprises with

more than 100 regular employees have already used e-mail.

In addition, according to the results of the latest Basic Survey on the Progress of Government IT Use, more than one PC per a person has been equipped in the offices of the central government. And the introduction of PC has been progressed in the local public entities.

Also LAN is being established rapidly not only in the business but also in the central government and in the local public entities.

Other various ICT indicators produced as the official statistics in Japan are shown in the booklet titled "IT indicators in Japan", which is prepared for IAOS Tokyo Satellite Meeting by the Statistical Training Institute of the MPHPT.⁵ It will be useful for the participants of this Meeting to understand the real situation of ICT use in Japanese society and the outline of ICT related indicators produced by official statistics in Japan.

V An Outline of studies and works in WPIIS of OECD

14. I participated in the forth meeting of Working Party on Indicators for Information Society (WPIIS)/OECD in April 2000 and its fifth meeting in April 2001. Based on my understanding, the contents and directions of its studies and works are as follows.

i) I recognize basically that the purpose of WPIIS is to develop internationally comparable and statistically measurable ICT indicators concerning economic sectors (business, household and government) and concerning readiness, intensity and impact of ICT.

ii) Following concrete works are now being tackled.

a) Defining goods and services for using ICT as "ICT Products" based on CPC.

Definition of ICT goods was decided already and the review on it has been continued. Using this definition for existing statistical surveys on production, circulation, employment, value added, etc. make it possible to collect data on them and make analysis about them.

b) Defining new products and new industries using ICT as "ICT Contents Products/Industry" based on CPC and ISIC

It is considered that using these definitions for existing statistical surveys and new surveys would make it possible to collect and analyze data on new products and new industries.

c) Defining e-commerce and developing model questionnaires for businesses and households/individuals in order to collect and analyze new basic data concerning the usage of ICT in businesses, households/individuals, governments, etc.

iii) There are two different basic ideas in measuring impact of ICT.

One is to grasp as widely as possible the ICT impact on business/business processes because the ICT impacts on economic activities are diverse and the Internet and other ICT have been actively used in various business fields and with various business processes.

Another is to develop indicators on e-commerce, especially the Internet e-commerce using World Wide Web.

The difference of these two ideas was the background of the adoption of two definitions, narrow one and broad one, by WPIIS/OECD.

iv) In the discussion of WPIIS/OECD, there are some views that the statistics on the use of ICT in the fields of medical services and educational services will be necessary in the new future as the use of ICT in these fields are expected to increase more and more. Also there are some views that the statistics on the labor market of ICT skilled workers such as the number of skilled workers/engineers, employment, and their migration crossing the border will be necessary as the human resource has a big effect on the development of economy.

It seems to me that the discussion and works of WPIIS/OECD will cover in due course the statistics/indicators on the economic and social impact of ICT, digital divide and so on.

VI Challenge for the Future

15. The efforts by WPIIS/OECD should be appreciated very much, and it is expected that the results of its deliberation will be announced formally as early as possible to the official statisticians concerned in the world.

I agree to the way WPIIS/OECD dealt with its related works based on the idea that international comparability and statistical measurability are especially important in developing ICT related official statistics. However, I think that there are some problems as follows to be considered more in WPIIS/OECD business and developing official statistics on ICT.

16. Lack of the recognition that the understanding of ICT is still not common on the side of the respondents

⁵ Please see also the paper titled "Overview of IT Statistics in Japan" by Mr. Furuta and Mr. Makita.

To be sure, new industries and businesses using ICT have been born, and ICT has been getting into daily life of people broadly and deeply.

However, the use of ICT in the business situation is not always common in the world at the stage even where the globalization is advancing, and ICT itself is in the process of evolution.

To develop new official statistics on new phenomenon, it is indispensable to promote common understanding of ICT on the side of respondents such as enterprises, households and individuals. Therefore, it should be recognized much more that it is difficult to conduct new statistical surveys and collect accurate data without their common understanding on ICT.

It seems to me that some statisticians and policy makers are eager to prepare statistics and indicators to cover the most advanced phenomenon on ICT such as ICT services and contents to hastily. However, actually, it is quite difficult to define ICT services and contents fully at this stage.

The measurability and common understanding of the subject matters on the side of the respondents are extremely important from viewpoints of conducting statistical surveys. Therefore, it seems more strategic manner at this stage to standardize basic and fundamental statistics on ICT than to develop new statistics on the most advanced phenomenon on ICT.

17. Revising International Statistical Standards

International statistical standards such as ISIC, CPC have played extremely important roles for the international comparability of statistics produced by countries.

If contents related to ICT were included in these statistical standards, it would be helpful enough for compiling and making analysis about data of ICT related matters in the existing statistical surveys about production, circulation, employment and so on.

However, as existing international statistical standards used for international comparison are not fully adjusted to the economical and social changes caused by the development of ICT in recent years, it seems that there are some limits for pushing forward with related works based on them.

In this sense, it is hoped that the development of ICT is fully taken into account in the ongoing revision work of ISIC by the international organizations and groups.

18. Significance of the Indicator on Amount of E-Commerce

Considering statistical survey on amount of e-commerce, it is rather appropriate and easier to make investigation into the business side about the amount of sales and purchases via WWW or the Internet according to the narrow definition of e-commerce adopted by WPIIS/OECD as the Nordic countries proposed in the draft of model questionnaire for business than to make investigation into the consumer side such as households individuals.

But, I am skeptical about the significance of the data on amount of e-commerce. Because I have never heard fully understandable explanation about necessity to know the increase or decrease of amount of e-commerce which is eventually a part of business viewing from an economical points and the usefulness of its analysis.

I also think the indicator on amount of e-commerce is insufficient for measuring and making analysis about the impact of ICT in enterprise/business, because ICT is used not only for e-commerce but also in various business processes and business management.

Although some surveys are scheduled to start for grasping amount of e-commerce in 2001 in my country, it is not so clear what purposes and analysis their results will be used for.

In the Communication White Paper titled "Information and Communications in Japan 2001" of my country,⁶ it is pointed out that there are products and services familiar with e-commerce and those not familiar with it.

Furthermore, I think it is indispensable for e-commerce that the reliability of goods and services, delivery of goods and services and payment for them, the protection of privacy are secured. Especially, in business, the construction of trust/confidence between companies is an important element for reaching contracts and expanding business by using e-commerce.

Whether e-commerce spreads more or less depends not only on the development of ICT but also on other various elements as mentioned above.

According to the result of Questionnaire on Enterprise's Action by ESRI published in this May, the first reason of introduction of ICT in the big size enterprises is to speed up their business process and management to reduce cost, and the main effects of the introduction of ICT are the intensification of competition, diversification of price. Effect on the increase of sales by e-commerce is relatively small.

Although I do not deny completely the necessity of collecting data on amount of e-commerce, I think

⁶ The outline of the White Paper will be introduced by Mr. Masafumi Maegawa in the Session 3 of this Meeting on August 31.

it is necessary for developing these kinds of statistics to promote more common understanding among statisticians about their significance and purpose.

19. Exchange of information and experience among countries

Preparation of statistics/indicators on ICT has been positively tackled in recent years not only in OECD member countries but also in many other countries including those in the Asia. And their contents cover various dimensions, fields as they are so in my country.

Therefore it is useful and necessary for promoting the development of ICT statistics/indicators internationally to exchange information and experience among countries more and more.

There are many developing countries where statistical resource is scarce.

It is also important for these countries to explore the way to utilize existing statistical surveys for the compilation and collection of the data on ICT/e-commerce, and also to make efforts to promote common understanding on the priority of the basic and fundamental ICT statistics to be prepared.