

## 1. Introduction

Since 1998, METI has estimated the size of the e-commerce market, in a cooperative project with ECOM, a private group to promote e-commerce, and Accenture, a consulting company. This estimate is based on information from interview surveys and micro-data from industry sources. However, as e-commerce activities spread to a wide variety of types of industry, there is the possibility that this method will no longer yield accurate results. Moreover, the IT Basic Law, which mainly promotes various policies designed to build an advanced information communications network society, was put into effect in 2000, includes a clear emphasis of the importance of IT statistics to develop plans for IT policies.

With these conditions as background, METI has launched a survey on e-commerce for all industrial sectors on Japan, as an official statistics. Specifically, survey items designed to gain an understanding of the size of the e-commerce market were added to the 2000 version of the ICT Workplace Survey, which is an annual survey for grasping ‘informatization’ of Japanese firms in terms of IT systems investments and network applications.

The amount of transaction for both B2B and B2C e-commerce were surveyed, based on the OECD definition for “electronic transaction”, including all dealings that make use of computer networks; and for “Internet transaction”, referring only to dealings that make use of the Internet. The results has just published in this April, but since this was the first survey of its kind, this survey does not achieve to make it clear the amount of e-commerce in Japan because the respondent rate is inadequate. We are aware of problems with data quality, especially for the amount of Internet transaction, due to

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<sup>1</sup> This paper is based on the experience when the author had worked for METI’s Research and Statistics Department until March 2002, and prepared for OECD expert group meeting on “Definition and Measuring Electronic Commerce”, Stockholm, 24 April 2002 Views expressed in this paper are authors’ and do not reflect those of his organizations.

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some confusions among survey respondents about its definition. METI is planning to conduct this survey this year, again, but its questionnaire will be revised based on the experience of the first survey.

In this paper I will discuss the lessons we have learned from the first survey, and the future directions of e-commerce survey in the ICT Workplace Survey. It is hoped that Japanese experience will be useful for discussions on OECD's definition of e-commerce to make internationally comparable statistics on the size of e-commerce.

## **2. EC estimates: collaborative research by METI, ECOM, and the NTT Data Institute of Management Consulting**

In terms of the e-commerce market size estimates, METI has an experience of joint research with ECOM (E-Commerce Promotion Council of Japan) and Accenture from 1998. This research is based on micro information from industry experts and corporate interviews. The results of the fourth survey in 2001, a joint study with E-COM and NTT Data Institute of Management Consulting, instead of Accenture, were announced in February 2002, and the estimated market size of e-commerce in Japan is 34 trillion yen for B2B and 1.5 trillion yen for B2C EC. Moreover, in that survey the market size forecast in five years is also conducted, and it is predicted that in 2006, B2B will have grown to an estimated 125 trillion yen, and B2C to an estimated 16 trillion yen.

For this research, the definition and the scope of e-commerce are carefully designed, based on various individual examples of B2B and B2C e-commerce, in order to make an integrated estimate of complicated dealings, which differ among companies and among types of business. The followings are some concrete specifications used for the research.

- The scope of e-commerce refers to electronic commerce which uses Internet technology (TCP/IP), and it is irrelevant whether or not the transaction is done via public Internet circuits. Accordingly, traditional-style VAN-EDIs with individually specific communication protocols are not included, but IP-VPNs based on TCP/IP are included, even though they are using propriety networks. In this regards, METI, ECOM and NTT study's definition is almost same as the OECD's narrow definition of EC.
- Even if the actual placing and receiving of orders, and acts related to contracts, are not carried out via the Internet, if communications that were carried out via the Internet contribute to the closing of an agreement, they fall under the scope covered.

(ex. B2C e-commerce for automobiles and real estates)

- As for the flow of the money included in the amount e-commerce transaction, only for the charges for the goods and services that resulted from dealings on the Internet are included, but the cost of advertising to advertising agencies (operators) and the service fees or commissions paid to settlement services and authentication services, are not included. In addition, in case that B2B transactions are handled by intermediary services, only intermediation service fees are counted for intermediary agents to get rid of duplication of the transaction amount of those goods and services. Furthermore, as for financial services, only commissions for those services are included. Details of the scope of e-commerce transaction are provided in Fig. 1.

Applying such details specifications to METI-ECOM-NTT study is possible because it is based on interview surveys for major players of e-commerce. Furthermore, the EC activities still concentrates on a few sectors, such as electronics and automobile industry, so that the approach relying on micro information on selected sectors is feasible.<sup>3</sup>

### **3. E-Commerce Survey in METI's ICT Workplace Survey**

#### *(1) Expansion of METI's ICT Workplace Survey in 2001*

In order to grasp the state of “informatization” of Japanese firms, METI conducts the annual ICT Workplace Survey. The survey items in this survey cover everything from conditions of the costs of information processing of different types, such as hardware, software, and information processing services, penetration of computers for workplace, and conditions of use of information processing networks, etc. As part of the plan to augment IT statistics in Japan, from the 2001 survey on, the firms covered by the IT Workplace Survey have been expanded, and the survey forms have been reviewed and new surveys on the market size of e-commerce have been introduced.

The survey respondents until 2000 survey was about 5,000 companies, taken from the Computer User Yearbook, which is published by a private organization. From 2001 survey METI has expanded the coverage of respondents to 9,000 companies, and also survey samples are drawn from the list of companies in the Basic Survey of Business Structure and Activities, METI's enterprise census survey, with stratified random sampling method. Through this, it has become possible to link the firm data of the Basic

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<sup>3</sup> Refer to Fig. 2 for the size of EC market by goods and services in METI-ECOM-NTT study..

Survey of Business Structure and Activities, which covers a wide area of corporate activities such as overseas projects, R&D and business performance with the data from ICT Workplace Survey to facilitate advanced analyses.

Also, the following survey items have been newly added: “conditions of use of information processing systems by type of work,” and a survey related to e-commerce. The latter comprises a survey on the uses of e-commerce for each category of B2B buying and selling, and B2C, and on the amount of transaction involved, by the type of goods and services. Moreover, METI conducted surveys for both “broad” and “narrow” definition of e-commerce by OECD. A survey sheet for 2001 ICT Workplace Survey is provided as an appendix of this paper.

*(2) Lessons from ICT workplace survey on e-commerce transactions*

To collect data with enough quality as an official statistics, METI specified the definitions of both electronic transaction and Internet transaction in survey sheet, as well as providing a separate manual with detail description on the scope of e-commerce transactions. However, as is the case for new survey, there was a certain amount of confusion for respondents in terms of what should be included in e-commerce. METI-ECOM-NTT study is conducted with an extremely detailed definition of e-commerce, but this is possible because the data is obtained mostly through the interview survey. In contrast, the ICT Workplace Survey is a statistical survey conducted by mail, so perhaps it is inevitable that some degree of confusion arises concerning complex features of e-commerce transactions. The followings are some lessons from ICT workplace survey for measuring e-commerce transactions though a statistical survey.

i) Transactions though information network using Internet technology

The difference between the broad definition (electronic network) and narrow definition (Internet transaction) by OECD is whether transactions are processed over Internet. However, falling right on the boundary area, here are VPNs (Virtual Private Networks), which make use of Internet technology (TCP/IP), but are based on propriety network such as IP provider network.

Up until now, Japanese corporations have constructed EDIs using private lines by industry, with major corporations taking the lead, and encouraged more efficient use of dealings in parts and products. Recently, however, there is a growing trend to move towards IP-VPNs, which are less costly and are flexible in network

modification. There are various different types of network using internet protocol, such as those which use private lines based of internet protocol, IP-VPN(Virtual Private Network) which is closed network based of internet protocol provided by network career, Internet VPN which make use of the open internet by way of Internet providers, and those which use the open internet as it is. Nevertheless, it is a fact that there are not so many companies which make use of Internet EDIs using the open Internet, because of concerns about security and uncertainty of network speed.

For the ICT Workplace Survey, since the OECD definition on Internet transaction, i.e. “transaction made via the Internet” was used, the result was that many B2B/ECs that make use of propriety IP network with TCP/IP protocol are not included in the Internet transaction. For example, Japanese automobile manufacturers have built up a network with parts manufacturers called JNX. The JNX is a VPN that uses a private network, so it is counted in electronic transactions but not in Internet transactions, by the definition of “transaction made via the Internet”. As a result, while automobile industry is one of major sector for B2B e-commerce in the METI-ECOM-NTT survey, the result of ICT Workplace Survey shows almost zero for B2B Internet transactions in automobile sector.

Networks with propriety network with a TCP/IP base are called “extranets”, which have a high degree of compatibility with the Internet, and it is possible for clients also to utilize them via a Windows-based personal computer. In that sense, they are completely different from the old-style EDIs, which used their own protocols, for which there was the need to set up special terminals, and it is recommended that this kind of network transaction are treated as an Internet transaction for the next survey.

ii) E-commerce for which contract or settlement is not made via Internet

In regard to the scope of e-commerce of this survey, there is no need for delivery or settlement to be carried out via networks, but at the same time its manual says that pre-purchase surveys, estimates, reservations, negotiating conditions, etc. of goods and services, not leading to actual purchases, should be omitted from e-commerce. That is, just advertising product on the web is not counted as e-commerce transaction. There are efficient retrieval systems for these products in Internet, however, as is often the case with B2C e-commerce for automobile and real estate, these products are used by potential customers to gather product information and

compare with other products. But in most cases, customers reach final conclusion on purchasing by face-to-face for such expensive products. It is discussed that whether METI has to include such transactions exceptionally or not.

For the METI-ECOM-NTT study, if a respondent can identify purchases with substantial pre-purchase Internet base activities out of total sales amount for automobile and real estate, such transactions are allowed to be included in e-commerce, because such transactions share substantial portions of the total amount of B2C e-commerce.

iii) Treatment of financial transaction

As is discussed in OECD's expert meetings and WPIIS meetings, there is a great conceptual difficulty in e-commerce transactions for financial services. For example, when consumer loan is placed via the Internet, this counts as B2C/EC, but whether using the size of the loan or only commission as the amount of this e-commerce makes a substantial difference. In this case, since the service called financing is provided online, the fee or commission involved should be counted as money resulting from e-commerce. METI put such guideline for counting financial services explicitly in its survey manual, but survey results shows that there still appears to have been some confusion among survey respondents.

iv) Survey for Cyber-Malls

In terms of B2C e-commerce, so-called cyber mall, whereby a shopping mall is opened on the Internet and provides services such as account settlement and consultations on web design, plays an active role, and it is efficient to grasp the size of B2C e-commerce via an organizer of such mall. In most cases, the commission for opening a shop in a cyber mall is proportional to the amount of actual sales in this shop, so that the amount of EC transactions in all shops in the mall can be observed by its owner. In addition, these fees or commissions collected by cyber-malls fall under money arising from e-commerce, as well.

Examples of cyber malls in Japan are those run by information service and research companies such as Recruit and Nomura Research Institute, which can be included in the sample base of ICT Workplace Survey (ICTWS), but there is also an independent type such as that run by Rakuten, one of most successful net-ventures in Japan, which are not surveyed by ICTWS. For the METI-ECOM-NTT study, large-scale cyber-malls including net venture type ones are picked up on ad-hoc

base, and surveyed for estimating the B2C market size. However, we need to consider what to do with the sample design when treating them by an official statistical survey. In addition, if we decided to survey cyber malls for B2C EC transactions, we need to clearly indicate on the survey forms the fact that money from e-commerce arising from cyber-malls should not be included in the reporting form to get rid of duplication of data.

#### **4. Implications for future survey**

The survey on e-commerce which was conducted in the 2000 ICT Workplace Survey represented the first ever attempt in Japan to survey the market scale using both the broad definition or electronic transaction, and the narrow definition or Internet transaction by OECD. Because it was the first survey of its kind, the above-mentioned problems came clearly to light. METI plans to continue with this survey this year, but will first try to resolve various problems, as follows;

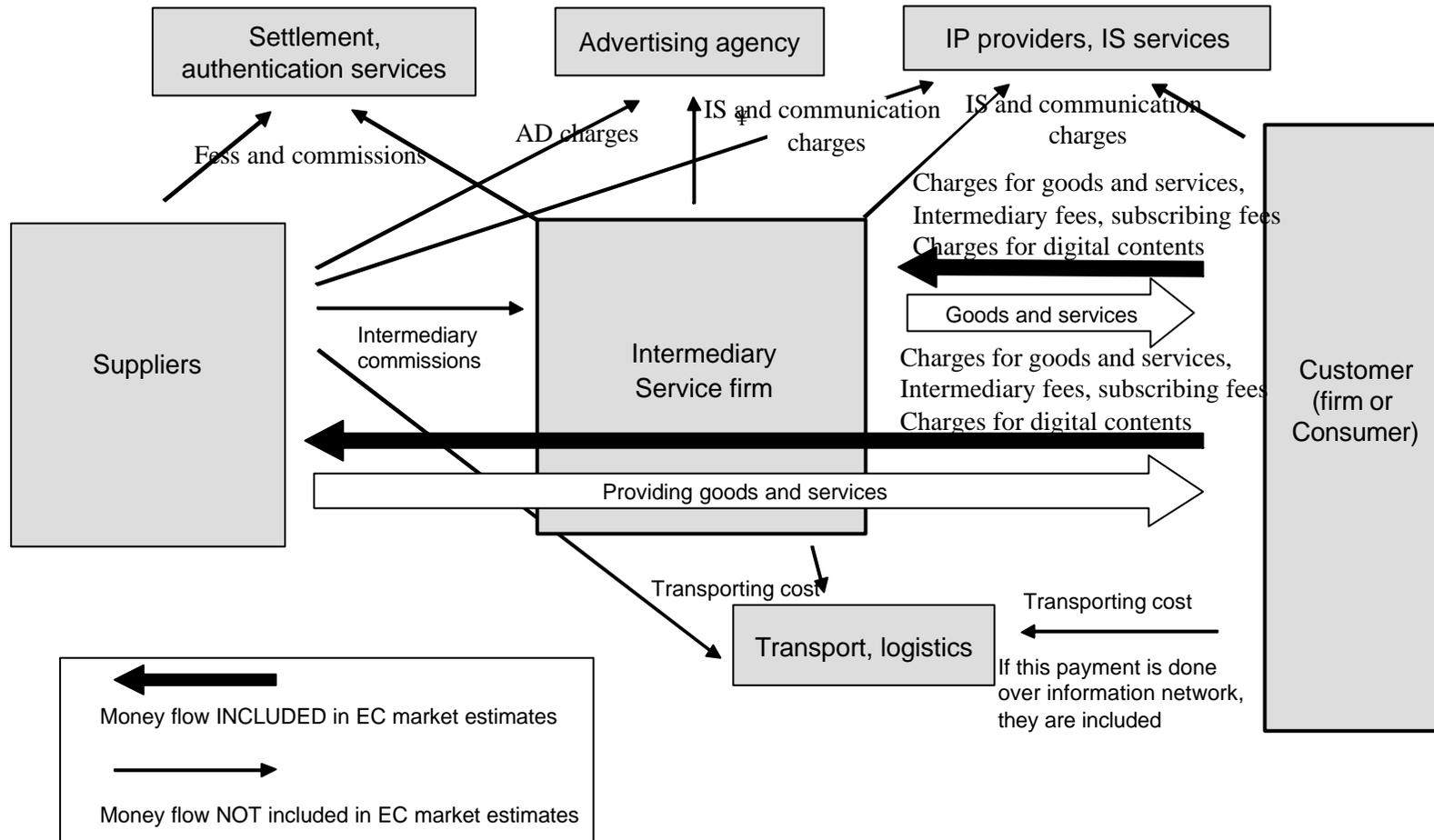
- Review of survey form: it is appropriate to review the survey form in order to promote the respondent rate; definition adopts not two types but one, delete the forms to question item-code. In addition, in order to lead EC utilizing rate, the company which does not conduct e-commerce also respond the form of “total business turnover” about every category (BtoB purchase, BtoB sale and BtoC sale). Moreover, METI plans to revise the survey form, by which e-commerce is being conducted or not for each firm. This helps to distinguish between whether or not a blank area for e-commerce transaction amount questions means “no e-commerce” or “don’t know the amount of EC transactions”.
- Clarification of the scope of transactions to be included in e-commerce: Corresponding to problems with EC for automobiles, real estate and financial services, it would be better to clarify what to be included in the amount of EC transaction with concrete examples. Such description will be included in the survey manual for the next survey.

In terms of TCP/IP base transactions via propriety networks, it would be better to be included in internet transactions, since it is substantially different from traditional EDI with a specific communication protocol. However, it would be difficult to collect good quality data since survey respondents may not well understand the technical specifications to distinguish IP-VPNs and Internet EDIs. Final decision at METI has not made yet, but one idea is that the ICT Workplace Survey will concentrate on collecting data for electronic transactions including traditional EDI as well, and METI-ECOM-NTT study will be used for estimating the amount of Internet

transactions.

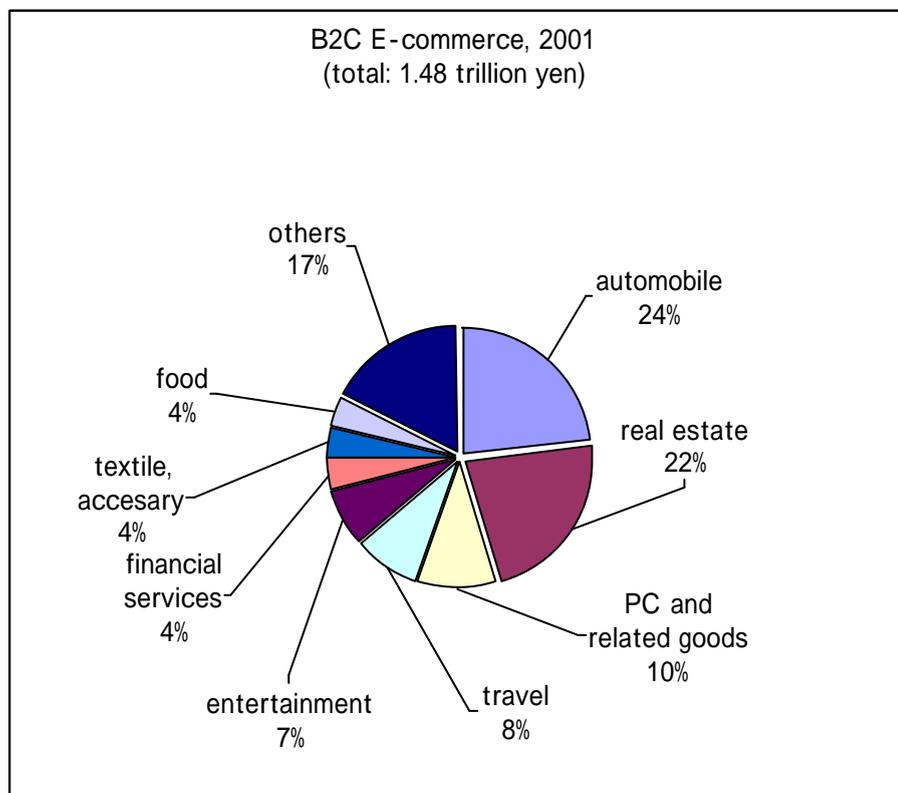
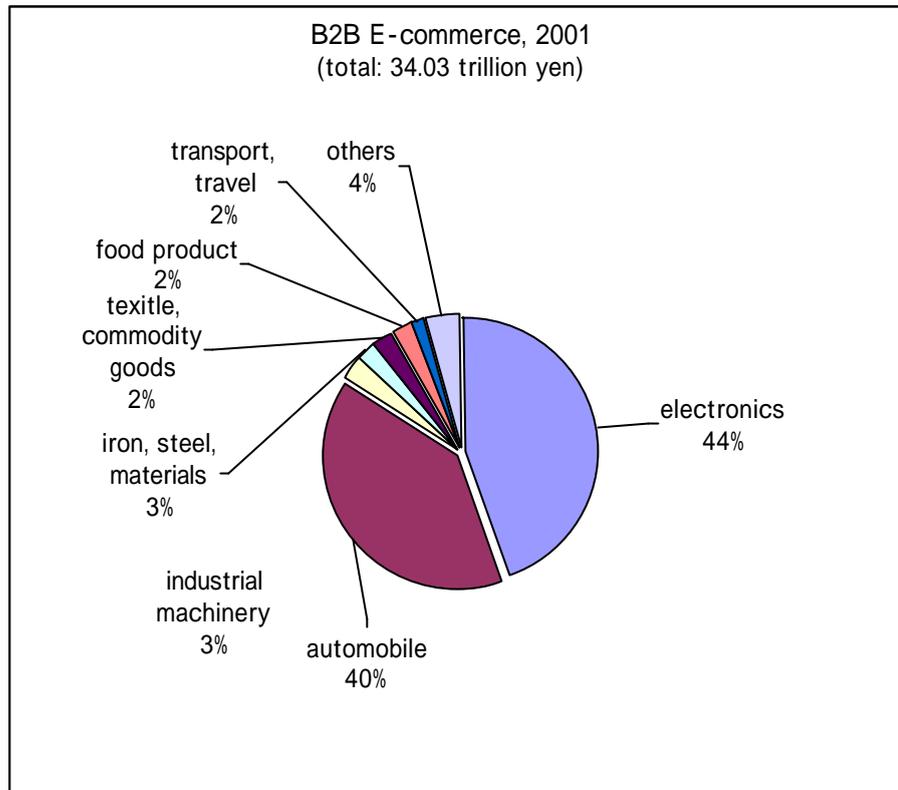
In addition, in a long term, sample base will be revised, based on the information collected by the Census for Enterprise and Establishment, taken place in July 2001, since this survey will provides a complete picture of Japanese enterprises. In conclusion, the field of e-commerce is an area in which there are dramatic changes, from both the technological and the business model aspects. In the field of statistics also, we need to develop flexible responses that reflect reality.

Fig. 1 Transactions included in EC market size in METI-ECOM-NTT study



(source) NTT Data Institute of Management Consulting

Fig 2 E-commerce market size by segments



Source: METI-ECOM-NTT study, 2001

Fig 3. Traditiona EDI, IP-VPN and Internet VPN

