

The Surveys Commissioned by METI

**Survey for Adaptability of IC Tags (RFID)
Among ASEAN Countries**

**Survey Report
(Executive Summary)**

March 2005



Electronic Commerce Promotion Council of Japan

JIPDEC

Electronic Commerce Promotion Center

This report is a result of the Project for Strengthening the Asian Industrial Infrastructure for FY 2004; Survey for Adaptability of IC Tags (RFID) among ASEAN Countries, which Japan's Ministry of Economy, Trade and Industry (METI) commissioned the JIPDEC to conduct, in cooperation with the Electronic Commerce Promotion Council of Japan (ECOM), as a contract project for FY 2004.

1. Overview of the Surveys

1.1 Objectives of the Surveys:

The objectives of the surveys are to promote understandings of RFIDs in terms of technology and their implementations, and to utilize the findings towards establishing the electronic trade systems between ASEAN countries and Japan in the future.

The followings are the focal points of the surveys;

- 1) Acknowledging the current status and issues as the result of implementing the EDI systems in the trading procedures between Japan and ASEAN countries,
- 2) Measuring feasibilities of implementing RFIDs

1.2 Outlines of the Surveys and Studies

- ① Surveys of the current trading related systems among ASEAN countries
- ② Production of the report based on the above surveys
- ③ Promotion of understanding of RFID technologies and their implementations

1.3 Countries Participating in the Surveys

The countries participating in the surveys are the following seven countries among the total 10 ASEAN countries. Those are Singapore, Malaysia, Indonesia, Vietnam, Myanmar, Thailand, and Cambodia

1.4 Time Schedule

Table 1 - 1. The Survey Schedule

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
Preliminary survey (in Japan)	←————→					
Field survey (relevant organizations)			←————→			
Seminars			←————→			
Making of report					←————→	

1.5 Staff Members

Table 1 - 2. The Survey Team

Responsibility	Affiliation	Name
Survey planning	Deputy Secretary General, Electronic Commerce Promotion Council of Japan	Akira ENOMOTO
Administration	Research Director, Electronic Commerce Promotion Council of Japan	Hisanao SUGAMATA
Project Leader	Research Director, Electronic Commerce Promotion Council of Japan	Masakazu FUJITA
Researcher	Research Fellow, Mitsubishi Research Institute, Inc.	Poh Soon LIM, Ph.D.

1.6 The Survey Itinerary

The researches and the seminars were conducted since November of 2004 to promote understandings of RFID at each Governmental (trade and RFID related) Agencies, Customs, Port Authorities, FAAs, EDI Service Providers, Product Codes Councils(e.g.; EAN) in the following seven countries which are; Singapore(11/28-12/1), Malaysia (12/1-12/2, 12/12-12/15), Indonesia (12/15-12/17), Vietnam (2005/1/16-1/19), Myanmar (1/19-1/21), Thailand (1/30-2/1, 2/3-2/4), and Cambodia (2/1-2/3).

1.7 Holding of Seminars

Table 1 - 3. Outline of Seminars

	Date and Time	Content of Seminar	Presenter* (titles are omitted)	Number of Participants
Malaysia	Dec 13, 2004 14:00–16:30	Introduction of RFID	Masakazu Fujita, ECOM	Approx. 50
		Japanese Initiatives in RFID Promotion	Sakuraba Akiyoshi, METI	
		Case Studies of RFID Tags Application	Poh Soon Lim, MRI	
Indonesia	Dec 16, 2004 13:00–15:00	Introduction of RFID	Masakazu Fujita, ECOM	Approx. 40
		Japanese Initiatives in RFID Promotion	Masakazu Fujita, ECOM	
		Case Studies of RFID Tags Application	Poh Soon Lim, MRI	
Vietnam	Jan 18, 2005 8:30–12:00	Introduction of RFID	Masakazu Fujita, ECOM	Approx. 50
		Japanese Initiatives in RFID Promotion	Masakazu Fujita, ECOM	
		Research on RFID in Vietnam	Tran Van Tuan, Vietnam Electronics Information Automation Institute	
		Case Studies of RFID Tags Application	Poh Soon Lim, MRI	
Myanmar	Jan 21, 2005 13:00–16:00	Introduction of RFID	Masakazu Fujita, ECOM	Approx. 50
		Japanese Initiatives in RFID Promotion	Mitsuhiro Yokota, METI	
		Myanmar's e-government plan	Tin Win Aung, e-National Task Force	
		Case Studies of RFID Tags Application	Poh Soon Lim, MRI	
Cambodia	Feb 2, 2005 14:00–17:30	Japanese Initiatives in RFID Promotion	Mitsuhiro Yokota, METI	Approx. 90
		Introduction of RFID	Masakazu Fujita, ECOM	
		Case Studies of RFID Tags Application	Poh Soon Lim, MRI	

Notes: * ECOM: Electronic Commerce Promotion Council of Japan, METI: Ministry of Economy, Trade and Industry, MRI: Mitsubishi Research Institute, Inc.;

The seminar scheduled to be held in Thailand was postponed due to unforeseen difficulties in that country.

2. Current Status of Trade-Related Procedures EDI in ASEAN Countries

This chapter will first summarize the current status and plans for trade- and port-procedures EDI, and then will analyze questionnaire answers collected from seminar participants regarding abstract problems.

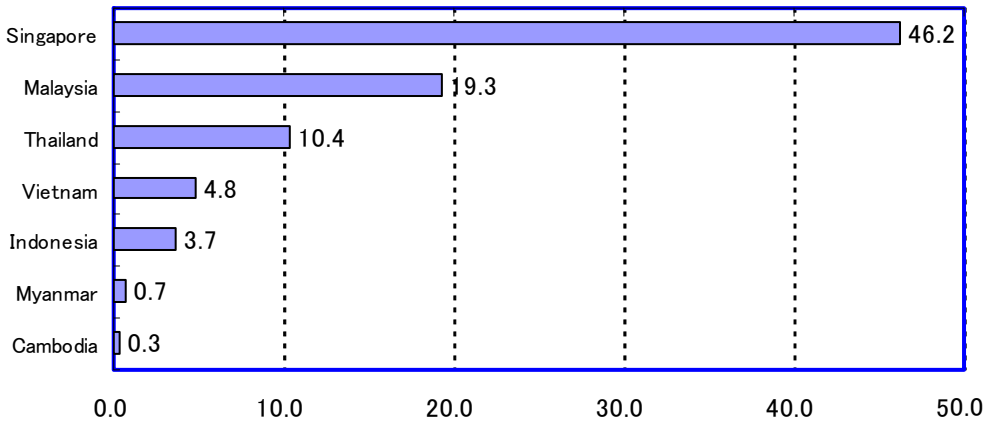
2.1 Current Status of Information Communication Infrastructures

The current situation of information communication infrastructure in ASEAN countries will be described based on information gathered via a survey conducted by the International Telecommunication Union (ITU) and by a questionnaire survey of participants in seminars held in connection with this survey. As a general trend, Singapore and Malaysia are the most advanced in building of information communication infrastructures, with Thailand following them, while Indonesia, Vietnam, Myanmar, and Cambodia remain less advanced.

2.1.1 Current Status of Information Communication Infrastructures

(1) Fixed-Line Phone Penetration

Figure 2 - 1. Fixed-Line Phones Subscriber per 100 Inhabitants

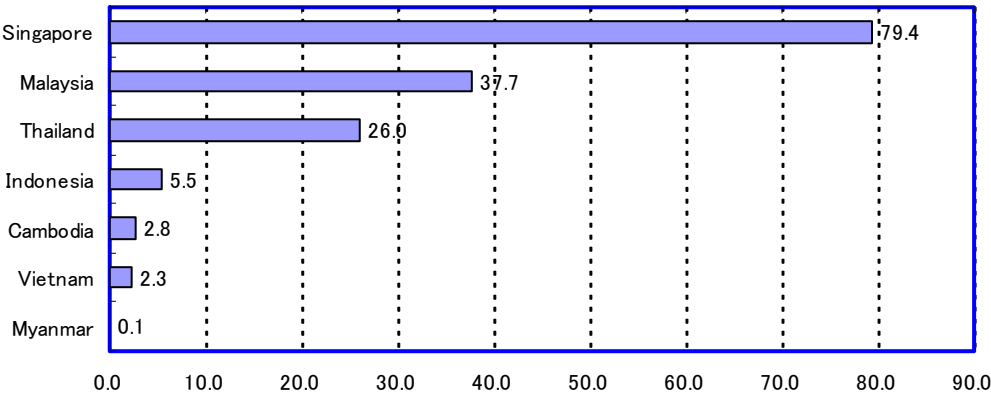


For reference: The penetration in Japan is 47.7 per 100 inhabitants.

Source: ITU (2003)

(2) Mobile Phone Penetration

Figure 2 - 2. Mobile Phone Subscriber per 100 Inhabitants

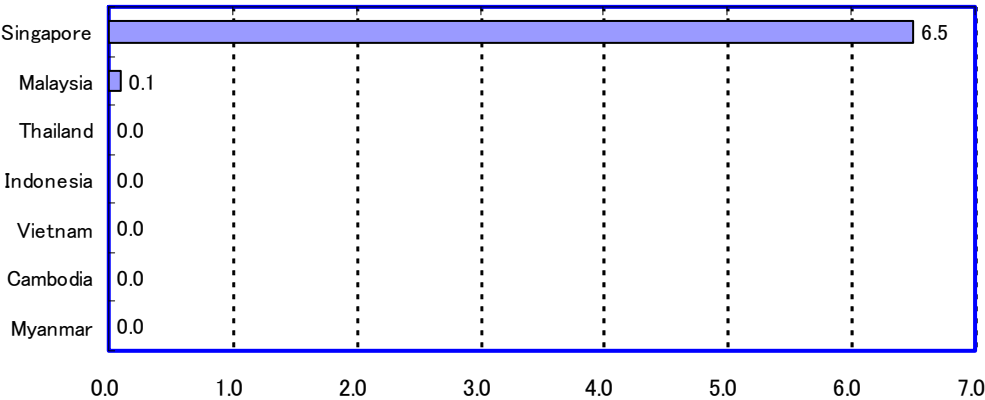


For reference: The penetration in Japan is 63.7 per 100 inhabitants.

Source: ITU (2003)

(3) Broadband Penetration

Figure 2 - 3. Broadband Users per 100 Inhabitants

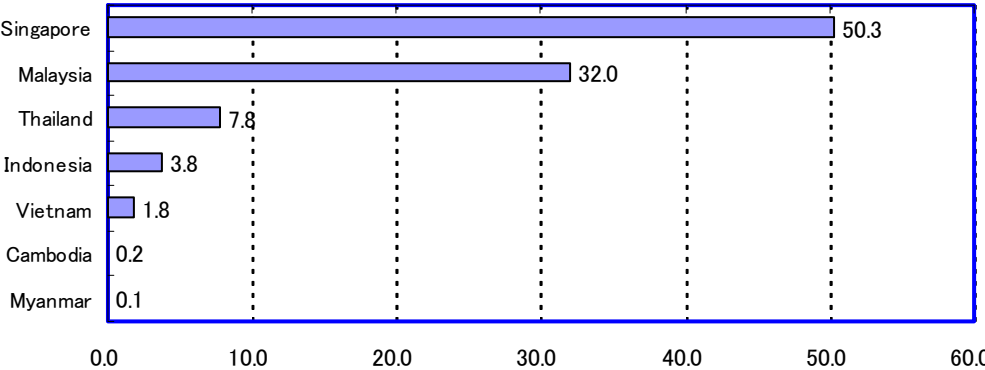


For reference: The number in Japan is 6.2 per 100 inhabitants.

Source: ITU (2003)

(4) Internet Users

Figure 2 - 4. Internet Users per 100 Inhabitants



For reference: The number in Japan is 54.5 per 100 inhabitants.

Source: ITU (2003)

2.2 Current Status and Issues for Trade- and Port-related EDI

The current status of implementation regarding trade- and port-EDI systems shows that Singapore and Malaysia constitute an advanced group, followed by Thailand, Indonesia and other countries.

In order to facilitate trade and port procedures within the region, it is important to standardize the Trade- and Port-Procedures including EDI.

With this in mind, an ASEAN-wide initiative to promote efficiency of trade services, called the ASEAN Single Window, was proposed in October 2003 and agreed to by the ASEAN governments. As an organization to put this initiative into effect, a taskforce consisting of ministry representatives from member countries was launched in January 2004; this taskforce is currently working. One can assume that in the future, when measures to facilitate intra-regional trade procedures between Japan and ASEAN are being advanced, it will be necessary to maintain close linkage with the ASEAN Single Window Initiative.

2.2.1 Summary of the Current Status of Trade- and Port-related EDI in the ASEAN Countries

The current status and future plans of trade- and port-related procedures EDI in the seven surveyed countries are as follows:

Table 2 - 1. Current Status of Trade- and Port-EDI in ASEAN Countries

	Current Status of Trade- and Port-EDI	Future Plans, etc.
Singapore	<ul style="list-style-type: none"> TradeNet is used as the trade-EDI system. TradeNet is connected online to PortNet (port-EDI system) and allows users, including shipping companies, to report trade procedures via PortNet. 	<ul style="list-style-type: none"> A port and shipping e-community in the B2B (business to business) sector to enable real-time transactions between customers and ports is planned (a port and shipping community is formed and operated through an electronic network).
Malaysia	Dagang Net (trade- and port-EDI system) is operating. As in Singapore, shipping company users can report trade procedures, too.	<ul style="list-style-type: none"> Launch of Web-based MyPort (trade- and port-procedures EDI system) and expansion of e-Logistics (electronic distribution system) are planned.
Indonesia	<ul style="list-style-type: none"> EDI Indonesia offers trade-EDI service, and users can exchange data by using EDI with the customs agency, consumption tax agency and banks through EDI Indonesia. 	<ul style="list-style-type: none"> An Internet-based customs system will be operating in 2007.
Vietnam	<ul style="list-style-type: none"> No EDI system is used in trade and port, and all procedures are conducted manually. 	<ul style="list-style-type: none"> Customs clearance is scheduled to be automated by 2010 with financial help from the World Bank. As part of this plan, a demonstration experiment for export and import declarations via the use of EDI will be conducted in Ho Chi Minh and other places. (May 2005)
Myanmar	<ul style="list-style-type: none"> No EDI system is used in trade and port, and all procedures are conducted manually. 	<ul style="list-style-type: none"> Dragon Net proposed access to the customs bureau via application service providers (ASPs). The Myanmar ICT Development Center (MICTDC) will establish an EDI provider.
Thailand	<ul style="list-style-type: none"> A trade-procedures EDI system through CAT and TradeSiam is operating. Users connect to the Customs Department via an EDI service provider, CAT, and TradeSiam 	<ul style="list-style-type: none"> An e-Port (electronic port system) demonstration experiment is being conducted. e-Logistics will be started. An e-Free Zone (electronic free-trade system) demonstration experiments is being conducted. The Single Window Initiative up to 2007 is being promoted.
Cambodia	<ul style="list-style-type: none"> No EDI system is used in trade and port, and all procedures are conducted manually. 	<ul style="list-style-type: none"> A project to automate customs clearance procedures will be implemented with financial help from the World Bank. JICA will also cooperate, focusing on the building of a crisis-management system within the customs clearance system.

Source: Created based on the results of hearings and various materials obtained.

2.2.2 Issues for Further Promotion of EDI in the Trade-Sector

In the questionnaire survey of seminar participants, who were asked to answer the following questions about problems in promoting EDI in the trade related procedures, high scores of more than 4.0 on average were obtained for all 10 items, which reflects the high interest of participants from various countries.

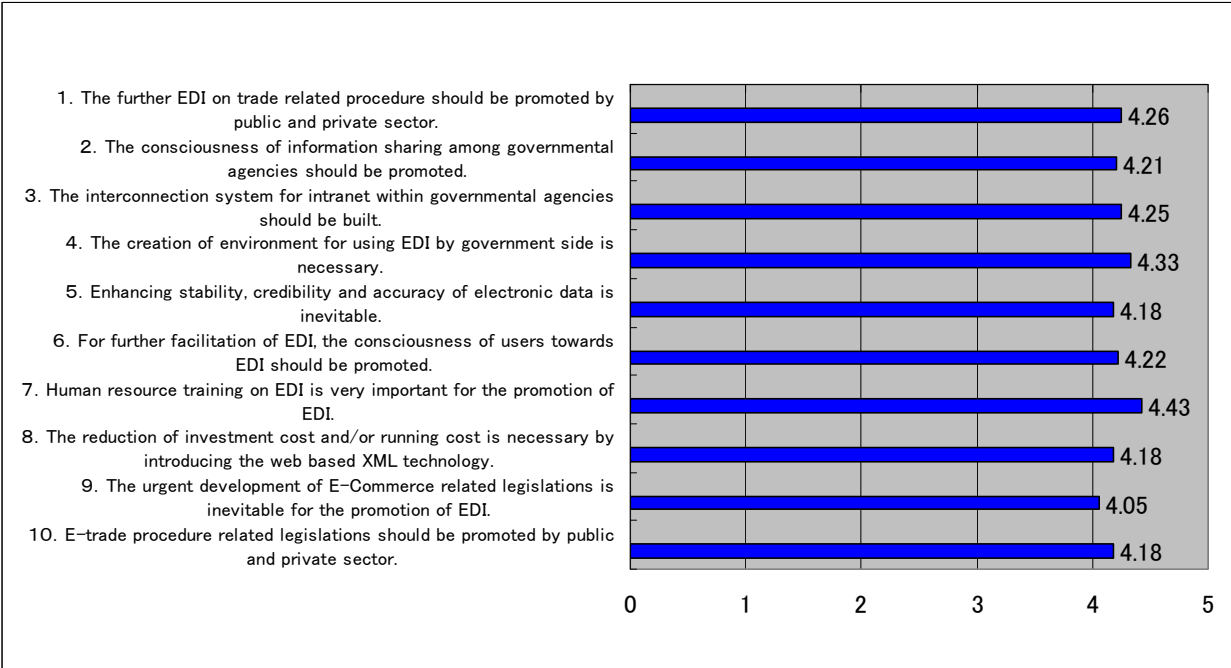
For items 1–4, regarding the environment required for introducing EDI, the results demonstrate the necessity of developing an environment favoring the use of EDI by public and private sectors, within governments, among governments, and by governments.

In addition, the opinions of the users who care about the security of electronic data itself also are strong.

For the items regarding users' attitudes, the results demonstrate the need to raise users' awareness, to develop qualified EDI personnel, and to reduce the introduction costs.

The results also indicate that relevant legislation for promoting computerization (laws equivalent to Japan's Electronic Ledger Preservation Law, Subcontract Law, Document Lumping Law, e-Document Law, Electronic Signature Law, Radio Law, etc.) also is insufficient, suggesting the need for immediate development of relevant legislation to promote digitization.

Figure 2 - 5. Issues for Further Promoting EDI in the Trade-Sector



Note: n =165

Source: Created based on the results of questionnaire surveys of seminar participants

3. Current Status of Application of RFID in ASEAN Countries

This chapter will first make clear the current status of digitization in the distribution sector in ASEAN countries, and then will describe the current status of RFID application, including pilot projects and demonstration experiments. Finally, the applicability of RFID in ASEAN countries will be considered, focusing on the results of a questionnaire survey of seminar participants as well as on the points discussed in the seminars.

3.1 Current Status of Digitization in the Distribution Sector

Table 3 - 1. Current Status of Digitization in Distribution Sectors of ASEAN Countries (1)

	Overview of EAN Organization ¹	Current Status of Use of Bar Codes	Recent Trends
Singapore	<ul style="list-style-type: none"> ➤ The Singapore Article Number Council (SANC) is an official representative organization for implementing the EPCglobal (Electronic Product Code), and it currently is implementing projects for RFID, e-business, and frozen-food chains. 	<ul style="list-style-type: none"> ➤ Foreign major retailers and hypermarkets (large general discount stores) are using bar codes. 	<ul style="list-style-type: none"> ➤ In the future, SANC will promote RFID in combination with the European Article Number (EAN) 128 series of bar codes. ➤ SANC has hosted the "Seminar on EPCglobal & RFID" (the headquarters of EPCglobal dispatches instructors and promotes awareness-raising activities on RFID and public relations activities for EPCglobal in ASEAN countries).
Malaysia	<ul style="list-style-type: none"> ➤ EAN Malaysia is a subordinate body of EPCglobal. ➤ Activities focus on bar codes, and RFID-related activities have not active begun. ➤ EAN Malaysia has approximately 3,800 member companies, about 70% of which are small- or medium-size companies. In terms of type of business, about two-thirds are food companies or grocery companies. The enrollment fee is 750 ringgit, and the annual membership fee is 500–1,500 ringgit (depending on the amount of a company's capitalization). 	<ul style="list-style-type: none"> ➤ Some 80%–90% of the companies in the hypermarket industry, about use bar codes; but such use have not spread among micro retailers. ➤ The obstacle to introducing bar codes is that it is very difficult to change all business processes as bar codes are introduced. ➤ EAN Malaysia is conducting awareness-raising activities and training regarding bar codes and RFID. 	<ul style="list-style-type: none"> ➤ EAN Malaysia has held an RFID seminar (dealing with EPCglobal, an overview of RFID, RFID technology, and examples of RFID; as in Singapore, the seminar is one of the awareness-raising and public relations activities carried out by the headquarters of EPCglobal).
Indonesia	<ul style="list-style-type: none"> ➤ EAN Indonesia was established in 1992; it has approximately 2,600 member companies, about 70% of which are small- or medium-size companies. In terms of the type of business, 55% are in manufacturing, 29% are in the domestic industry, 12% are in distribution, and the remainder is in other types of business. The enrollment fee is one million rupiah (about ¥12,000), and annual membership fee is 650,000 rupiah (about ¥7,000), regardless of the size of a company. 	<ul style="list-style-type: none"> ➤ The reason why companies have adopted bar codes is to respond to suppliers' requests. ➤ Within the country, there are about 60 retailers of middle-standing or higher and a total of 2,400 shops. ➤ Current situation as to the introduction of POS systems: some 15%–20% of the total retailers have introduced POS systems, but they are used for the purpose of easier entry of product information, not for inventory management, logistics, or SCM. 	<ul style="list-style-type: none"> ➤ EAN Indonesia has proposed to the government (1) consultation concerning the introduction of bar codes on pilgrims going to Mecca and (2) consultation concerning the introduction of bar codes on cash-containing cases on cash-transport cars going from the printing bureau to the central bank and then to branches.

Source: Created based on the results of hearings and materials obtained.

¹. EAN changed its name to GS1 in January 2005.

Table 3 - 2. Current Status of Digitization in the Distribution Sector in ASEAN Countries (2)

	Overview of EAN Organization	Current Status of Use of Bar Codes	Recent Trends
Vietnam	<ul style="list-style-type: none"> ➤ EAN Vietnam was founded in 1995; it has approximately 3,500 member companies. The breakdown of member companies shows that most of them are manufacturers, except for five retailers and some trade companies. 	<ul style="list-style-type: none"> ➤ In Vietnam, the use of bar codes has not spread widely. In Hanoi, 50–60 companies use bar codes, and even in Ho Chi Minh City, only 70–80 companies use them. ➤ Except for global mass merchandisers, only a small number of retailers use bar codes. 	<ul style="list-style-type: none"> ➤ In 2004, IBM and ECR in Thailand co-hosted,) with EAN Vietnam, a seminar on RFID (basics of RFID.
Thailand	<ul style="list-style-type: none"> ➤ EAN Thailand has approximately 7,000 member companies, about 70% of which are manufacturers of consumer products or foods; the remaining 30% are pharmaceutical manufacturers. The organization's major functions are holding seminars and training courses on the spread of bar codes, issuing industry journals, and so on. ➤ EAN Thailand is scheduled to change its name to GS1 Thailand in April 2005. ➤ In Thailand, the use of bar codes has been promoted for 15 years, but it has not spread widely. In the most recent 3 years, however, about 1,000 companies per year have begun use of bar codes, and their use has rapidly spread. 	<ul style="list-style-type: none"> ➤ It has taken about 15 years for bar code use to spread in Thailand. Recently, major retailers have begun to use bar codes. ➤ The Thai retail industry consists of approximately 300 companies, and approximately 5,000 shops have adopted POS systems. Major retailers such as TECOS and TOPS apply bar codes to SCM, but many other manufacturers use bar codes only to comply with requests from retailers they supply. ➤ Customs agents and shipping companies use EAN Thailand's Global Location Number (GLN) in EDI messages in order to identify companies and offices. ➤ One member company uses EPCglobal product codes when exporting products to Europe. 	<ul style="list-style-type: none"> ➤ Under the leadership of EAN Thailand, experts were dispatched from the headquarters of EPCglobal to hold a seminar on RFID on December 17, 2004; about 300 people participated (as in Singapore, this was also organized for the purpose of raising awareness of RFID and for public relations activities for EPCglobal).
Myanmar	<ul style="list-style-type: none"> ➤ No EAN organization 	<ul style="list-style-type: none"> ➤ In Myanmar, a nine-digit product-code system is used only by major retailers, including City Mart, but its use has not spread. 	<ul style="list-style-type: none"> ➤ As part of e-government efforts, discussions have been held regarding e-visa, e-passport, e-procurement, and so on.
Cambodia	<ul style="list-style-type: none"> ➤ No EAN organization. 	<ul style="list-style-type: none"> ➤ Bar codes have not been introduced. 	<ul style="list-style-type: none"> ➤ Eagerness to introduce RFID, not bar codes.

Source: Created based on the results of hearings and materials obtained.

3.2 Current Status of RFID Application

3.2.1 Recent Moves regarding RFID in Seven ASEAN Countries

(1) Singapore

In May 2004, the Infocomm Development Authority of Singapore (IDA) announced its RFID Development Strategy. The authority will invest S\$10 million (about ¥630 million) to apply RFID technology in developing supply-chain clusters. The following three measures will be implemented:

- ① Coordinating globally applicable allocation of radio waves
- ② Implementing capacity building for developing new intellectual property (IP)
- ③ Adopting a collaborative system for promoting the adoption of RFID technology in major industries² (CFC: Call For Collaboration)

Several months ago, IDA called on ASEAN+3+India for the following collaborative projects concerning RFID:

- ① Sharing information on radio-wave allocation, implementation guidelines, and technical specifications.
- ② Coordinating radio-wave allocation; training supply-chain and logistics specialists
- ③ Developing guidelines for security and privacy relating to the application of RFID

An overview of RFID in Singapore is presented in Table 3-3, which includes a large number of examples of introduction activities.

Table 3 - 3. Overview of RFID status in Singapore

Radio regulation and frequency allocation	➤ Since November 2, 2004, UHF 923-925 MHz and 433 MHz have been opened; these are expected to use mostly in the future (no license for 0.5 watts, but up to 2 watt requires to obtain licenses).
Examples of introduction	<ul style="list-style-type: none"> ➤ Airbus establishes Singapore as a maintenance center for equipment and requires all component suppliers to put RFIDs on their components. ➤ Applications of RFID in ports include an electronic-seals demonstration experiment (Phase 1) conducted by a U.S. vendor two years ago, in which shipping companies, third-party logistics (3PL), and goods owners participated. Phase 2 is scheduled to start in 2005, but a specific date has not been decided upon at this time. ➤ In 2000, the technical division of the Civil Aviation Authority of Singapore (CAAS) conducted an RFID demonstration experiment on baggage handling, but the results showed high costs as a problem at this time. ➤ Kim Hiap Lee Co (Pte) Ltd., a subsidiary of the major wooden pallet manufacturer LHT Holdings in Singapore, plans to use RFID to manage pallets to be lent to customers such as Calsberg and Fraser & Neave.
Sectors in which RFID is expected to be introduced in the future	<ul style="list-style-type: none"> ➤ RFID will be introduced into the manufacturing, distribution, retail, aviation, pharmaceutical, and food industries. ➤ The Maritime and Port Authority of Singapore (MPA) regards distribution, container seals, and so on as promising fields for the introduction of RFID. ➤ For an application area, RFID will be applied to trace containers for security purposes. Moreover, application of EPC with the use of RFID is expected to automate warehousing. ➤ Airbus and HP have introduced RFID as an extension of systems in their home countries, and major retailers and grocery manufacturers have expressed a high interest in the introduction of RFID. ➤ Baggage, boarding card, and air freight are conceivable, but CAAS has no concrete plan.
Obstacles to the introduction of RFID	<ul style="list-style-type: none"> ➤ The largest barrier to the introduction of RFID at this time is its cost. ➤ The accuracy of RFID as a possible obstacle to its introduction is currently being tested. ➤ Because air-freight handling currently being managed with the use of bar codes causes few mistakes, no advantages to introducing RFID have been found.
Major vendors, etc.	➤ Matrix, Omron, Hitachi, Renaissance Rosett, UFK, IBM, Microsoft, SAP, SmarTech (Singapore), Toppan, Phillips, Infineon

Source: Created based on the results of hearings.

² For details, see

<http://www.ida.gov.sg/idaweb/media/infopage.jsp?infopagecategory=infocommindustry.mr:media&versionid=4&infopageid=I3088>.

(2) Malaysia

In the Ninth Malaysia Plan (2006–2010), the Malaysian government has three priority strategy areas:

- ① RFID
- ② Sensors
- ③ IPv6 (Internet Protocol version 6)

Activities relating to the introduction of RFID in Malaysia are summarized as follows.

Table 3 - 4. Overview of RFID status in Malaysia

Radio regulation and frequency allocation	<ul style="list-style-type: none"> ➤ The Malaysian Communication and Multimedia Commission (MCMC), which is under the control of the Ministry of Energy, Water and Communication (MEWC), have authority over these matters. ➤ UHF 860 MHz (1W) and 433 MHz have been opened, but 920 MHz is under discussion; all of them can be used in Europe. Also, 2.45 GHz is available.
Examples of introduction	<ul style="list-style-type: none"> ➤ Under the Eighth Malaysia Plan, a project for each citizen to have an ID in the form of an IC card (MyCard) was implemented. The use of ETC as an electronic payment system for toll-expressways, parking, and the RLT (monorail) also is spreading. ➤ At Port Klang, PIL (shipping company in Singapore) conducted a pilot test using electronic seals (from Savi) from late 2002 through early 2003. In connection with a system to track cold-storage containers among Australia, Malaysia, and Hong-Kong, an antenna was installed at a gate to record in RFID data from temperature sensors within containers. In spite of the technological success of the system, problems of cost remain. ➤ Teras Technology has implemented a tracking system for bed sheets at hospitals. ➤ Malaysia Airports Technologies Sdn Bhd once conducted a baggage-handling demonstration (not yet for freight). ➤ At this time, the government is not conducting any demonstration experiments.
Sectors in which introduction is expected in the future	<ul style="list-style-type: none"> ➤ The application of RFID for distribution activities is expected to start in foreign companies as many European and U.S. major companies enter the Malaysian economy.
Obstacles to the introduction of RFID	<ul style="list-style-type: none"> ➤ RFID demonstration experiments for tracing containers have been conducted, but there are many problems relating to standardization, cost bearing, and technology. So the introduction of RFID should be considered carefully.
Major vendors, etc.	<ul style="list-style-type: none"> ➤ Mr. Kong at FEC Malaysia, an MM chip developing company, was interviewed. MM chips are being promoted as a project of the Office of the Prime Minister.

Source: Created based on the results of hearings.

(3) Indonesia

RFID in Indonesia has no radio wave allocated and has no concrete introduction examples at this time.

Table 3 - 5. Overview of RFID status in Indonesia

Radio regulation and frequency allocation	<ul style="list-style-type: none"> ➤ Allocation of a radio frequency bandwidth for RFID has not yet been made.
Examples of introduction	<ul style="list-style-type: none"> ➤ Some companies have introduced RFID to prevent theft, but there is no evidence of its success within companies. ➤ Book management at the national library is being considered as an RFID demonstration experiment. EAN Indonesia has just begun to consider the application of RFID and has no concrete projects at this time.

Sectors in which introduction is expected in the future	<ul style="list-style-type: none"> ➤ The use of RFID for Electronic Toll Collection (ETC), public buses, and MRT (train) is possible. ➤ Pilot projects for introducing RFID in the automobile industry, in which Japanese companies are deeply involved, is possible.
Obstacles to the introduction of RFID	<ul style="list-style-type: none"> ➤ Experiments to demonstrate the effects of introducing RFID are necessary, so that RFID can spread.
Major vendors, etc.	<ul style="list-style-type: none"> ➤ None

Source: Created based on the results of hearings.

(4) Vietnam

In Vietnam, a two-dimensional code system has been adopted for national ID cards, and EAN Vietnam and other organizations have begun discussing the introduction of RFID.

Table 3 - 6. Overview of RFID status in Vietnam

Radio regulation and frequency allocation	<ul style="list-style-type: none"> ➤ EAN Vietnam and the Vietnam Radio Regulatory Authority held a meeting concerning frequencies to be allocated for RFID. The Vietnam Radio Regulatory Authority agreed to consider the frequencies that EAN Vietnam would propose. Based on RFID experiences in ASEAN countries, EAN Vietnam is deciding the UHF frequencies to be used for RFID. ➤ EAN Vietnam proposes to the Ministry of Science and Technology the frequencies to be used for RFID. After approval, the Ministry of Science and Technology's proposal is sent to the Ministry of Post and Telecommunication, which decides the frequencies to be used.
Examples of introduction	<ul style="list-style-type: none"> ➤ Since 2002, the Ministry of Science and Technology has conducted research and surveys on RFID and bar codes. ➤ In accordance with the demands of European countries, traceability for marine products will be implemented in 2005, under the initiative of the Ministry of Fishery. ➤ In Vietnam, in cooperation with Denso and Marubeni, a QR code (two-dimensional code system) has been adopted for the national ID system, and this system is now being tested. The results of this testing will be presented to the government, which is expected to approve the system within this year. After comparison of the QR code and RFID, the QR code was adopted due to its cost, use environment, and ease of use. The QR code enables the encoding of facial photos, fingerprints, and Chinese characters. Even if as much as 30% is damaged, the data can be read.
Sectors in which introduction is expected in the future	<ul style="list-style-type: none"> ➤ Because SC is a sector likely to gain large advantages by introducing RFID, EAN Vietnam will encourage its member companies to use RFID in the supply chain management (SCM) sector beginning in 2005 and 2006. ➤ EAN Vietnam will call for companies to apply for RFID demonstration experiments this year, and it will conduct those demonstration experiments next year. At this time, only Nestle Vietnam has indicated an intention to apply.
Obstacles to the introduction of RFID	<ul style="list-style-type: none"> ➤ A trade- and port-procedures EDI system has not yet been introduced, the IT infrastructure is undeveloped, and there is low awareness of RFID.
Major vendors, etc.	<ul style="list-style-type: none"> ➤ None

Source: Created based on the results of hearings.

(5) Myanmar

Table 3 - 7. Overview of RFID status in Myanmar

Radio regulation and frequency allocation	<ul style="list-style-type: none"> ➤ UHF 915-935 MHz is not being used, and thus it could be allocated for RFID. ➤ Myanmar has no radio regulations, but RFID regulations will be developed.
Example of introduction	<ul style="list-style-type: none"> ➤ As an RFID pilot project, an e-meter for electric power use is being planned.
Sectors in which introduction is expected in the future	<ul style="list-style-type: none"> ➤ Logistics sector
Obstacles to the introduction of RFID	<ul style="list-style-type: none"> ➤ The IT infrastructure is undeveloped, a trade- and port-procedures EDI system has not yet been introduced, and appropriate human resources are lacking.
Major vendors, etc.	<ul style="list-style-type: none"> ➤ RFID is being considered as part of economic cooperation between Japan and ASEAN countries. ➤ The Myanmar Posts and Telecommunications has not conducted surveys and research on RFID, but an RFID survey group has been set up in the Asia-Pacific Telecommunity (APT), which has 32 member countries, and which is discussing RFID. ➤ Standardization is a responsibility of the Ministry of Science and Technology.

Source: Created based on the results of hearings.

(6) Thailand

Table 3 - 8. Overview of RFID status in Thailand

Radio regulation and frequency allocation	<ul style="list-style-type: none"> ➤ The National Telecommunications Commission (NTC) has been established to decide on allocation of radio waves for RFID.
Examples of introduction	<ul style="list-style-type: none"> ➤ In cooperation with the Customs Department, a demonstration experiment regarding an "e-Free Zone" in which electronic seals will be used to control the movement of containers in warehouses among three domestic free zones will start in January 2005 and will be completed over the next two years. ➤ The e-Port Initiative and is an electronic port initiative that uses RFID and that is aimed at increasing efficiency and ensuring the security of customs services. In December 2004, NECTEC, the Customs Departments, and the Port Authority of Thailand (PAT) signed an MOU regarding the e-Port Initiative. As part of the e-Port Initiative, Kelly Logistics Warehouse has started an electronic-seals pilot test at Laem Chabang Port. ➤ A pilot project to apply RFID for the movement of products from manufacturers' warehouses to distribution centers (DCs) has been planned. One Japanese company (Lion), one European company, and three local companies — five companies in total — have expressed interest, but due to issues regarding cost bearing, not much progress has been made. ➤ The National Food Institute will use EAN 128 codes to affect the traceability of shrimp and chickens. ➤ The Ministry of Commerce (MOC) held an e-Logistics seminar for importers and exporters. The e-Logistics Initiative, involving the use of e-Manifests, e-Insurance, e-Bills of Lading (B/L), and e-Packing Lists, will be started in April 2005 with the collaboration of the MOC, the Ministry of Industry (MOI), and the Customs Department. ➤ The new Bangkok airport will use RFID to manage baggage. SMARTCard and ETC also will be introduced. There also is an initiative to use RFID to manage the transport of lumber from Myanmar to Thailand.
Sectors in which introduction is expected in the future	<ul style="list-style-type: none"> ➤ The logistic sector and the marine distribution sector are among those that are promising.
Obstacles to the introduction of RFID	<ul style="list-style-type: none"> ➤ Awareness-raising activities and education and training for private users and governmental organizations are very important. ➤ There is an initiative that, under the leadership of the Ministry of Science and Technology (MS&T), RFID is put on plastic cases containing shrimps and chicken to realize traceability of these foods. There are no technological problems, but problems remain as to how to manage the 30,000 producers and who should bears which costs.
Major vendors, etc.	<ul style="list-style-type: none"> ➤ TIFFA EDI Services: EDI service provider ➤ EPC: solutions provider ➤ Identify: manufacturer of electronic seals (local company)

(7) Cambodia

No RFID demonstration experiments have been conducted in Cambodia, and moreover, bar codes are not used. At the invitation of the Ministry of Commerce of Cambodia, about 90 concerned people, from the minister of commerce down, participated in a seminar on RFID; as a result of this, the level of interest in RFID is high.

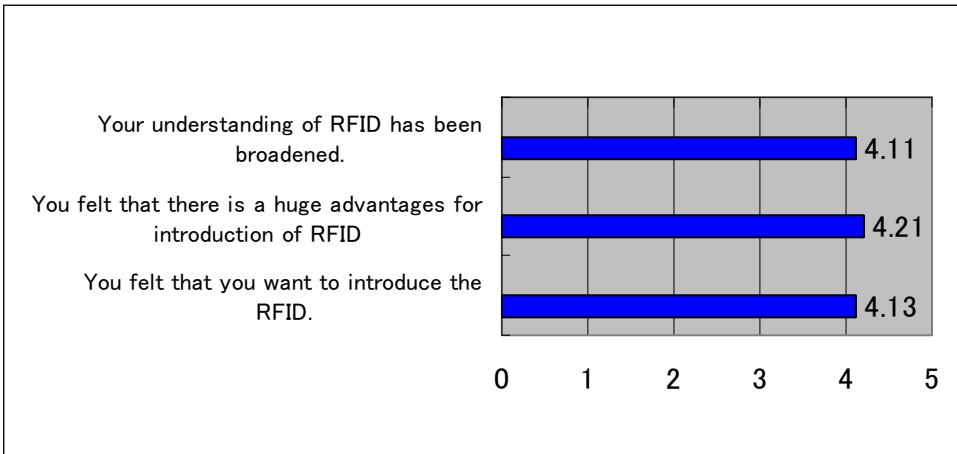
3.3 Applicability of RFID

Based on the aforementioned current status of RFID application and development of IT infrastructures, the following will describe the applicability of RFID in the future.

First, as the figure below shows, the questionnaire survey of seminar participants has revealed (1) that the seminars deepened the participants' understanding of RFID, (2) the advantages of introducing RFID, and (3) the very high needs for introduction of RFID.

Taking active questions and answers in seminars into consideration, one can say that ASEAN countries have eagerness to apply RFID as a policy tool. As will be described later, however, many problems for the application of RFID remain. Based on this, one can assume that the application in Singapore, Malaysia, and Thailand, in which especially IT infrastructure and EDI systems are comparatively developed, will go ahead.

Figure 3 - 1. Reasons for Introducing RFID



Note: n = 165

Source: Created based on the results of questionnaire surveys of seminar participants.

4. Summary

4.1 Evaluation Summary of Survey on Applicability of IC Tags (RFID) in Seven ASEAN Countries

Evaluation item* Country** Population (10k: 2003) GDP (billion US\$: 2003)	Development of IT Infrastructure	Development of Relevant Legislative System	Development of Trade-Procedures EDI System	Development of Port-Procedures EDI system	Frequencies allocated to RFID	Presence of EAN Organization	Examples of Introduction of RFID and RFID Demonstration Experiments
Singapore 420 87.0	◎	○	◎ (TradeNet)	◎ (PortNet)	866–869 MHz, 923–925 MHz	Yes	<ul style="list-style-type: none"> Examples of introduction: electronic toll-collection, national library, arowana, parking-fee collection, tracking of healthcare practitioners Demonstration experiment of electronic seals at PSA
Malaysia 2,517 94.9	◎	○	◎ (Dagang Net)	◎ (Dagang Net)	433 MHz, 860 MHz; 920 MHz under discussion	Yes	<ul style="list-style-type: none"> Start of application of expressway toll-collection system (Touch&Go) to parking and monorail (LRT) Introduced national ID cards (MyCard) using IC tags Demonstration experiment of bed-linen tracking at hospitals Demonstration experiment of use of electronic seals at Port Klang Developing MM chip (a project of the Office of the Prime Minister)
Indonesia 21,509 182.4	○~△	△	○ (EDI Indonesia)	△ (EDI Indonesia)	Under discussion	Yes	<ul style="list-style-type: none"> None (The introduction of a fee-collection system for expressways, public buses, subways, and the national library will be possible in the future.)
Vietnam 8,138 34.9	○~△	△	△	△	Under discussion	Yes	<ul style="list-style-type: none"> National ID cards using two-dimensional codes have been introduced. (The Ministry of Fishery will implement a marine-products traceability system this year.) (EAN Vietnam is inviting companies to participate in demonstration experiments.)
Myanmar 4,962 7.1	△	△	△	△	915–935 MHz not used	No	<ul style="list-style-type: none"> None (An RFID demonstration experiment regarding an e-Meter for automatic measurement of electric power use is being planned)
Thailand 6,253 126.5	○	△	○ (TradeSiam, CAT)	○ (TradeSiam, CAT)	Under discussion	Yes	<ul style="list-style-type: none"> Demonstration experiments of electronic seals have begun in the e-Free Zone (January 2005), ad in the e-Port (December 2004). National ID cards using IC tags will be introduced. The e-Logistics Initiative will start in April 2005. (EAN Thailand is inviting companies to participate in demonstration experiments.)
Cambodia 1,414 3.4	△	△	△	△	849–870 MHz not used	No	<ul style="list-style-type: none"> None (The Ministry of Commerce has a strong intention to conduct an RFID demonstration experiment at Sihanoukville.)

Note: * Infrastructure (IT, usable frequency, legislative system, EDI system, EAN organization, introduction and demonstration experiment examples), counterparts, and whether IC tags (RFID) are needed by Japanese companies are regarded as evaluation axes.

** Arranged in order of counties visited in the field survey. *** Overall evaluation refers to the applicability of RFID between Japan and the ASEAN country.

4.1 Summary of Issues

Summary of Issues relating to Trade- and Port-Procedures EDI and the Introduction of RFID

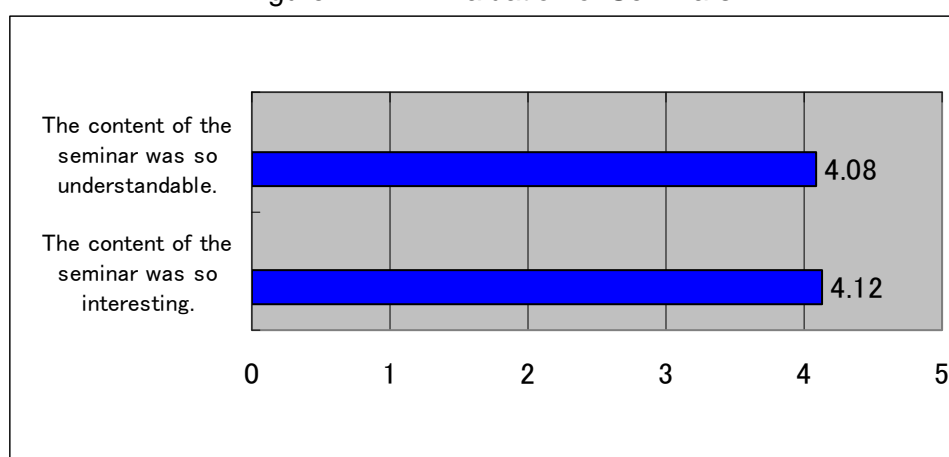
		Issues
Problems relating to trade-procedures EDI	Infrastructure	<ul style="list-style-type: none"> • Undeveloped IT infrastructure • Electric-power shortage
	Administrative procedures	<ul style="list-style-type: none"> • Trade- and port-procedures EDI system has not yet been introduced. Many ministries and agencies have not shown progress on digitization. • Governmental organizations have not made progress on deregulation. • Time required for customs procedures. • Lack of clarity in administrative procedures • Import and export regulations (collection of export taxes, time for obtaining export license, ban on dollar settlement, use of multiple exchange rates)
	Legislative system	<ul style="list-style-type: none"> • Undeveloped legislation concerning e-commerce (laws equivalent to Japan's Electronic Ledger Preservation Law, Subcontract Law, Document Lumping Law, e-Document Law, Electronic Signature Law, Radio Law, etc.)
	Operation	<ul style="list-style-type: none"> • Lack of qualified IT personnel and low awareness on EDI • Low IT literary
Problems relating to RFID	Infrastructure	<ul style="list-style-type: none"> • Undeveloped IT infrastructure
	Legislative system	<ul style="list-style-type: none"> • Frequencies have not allocated to RFID
	Operation	<ul style="list-style-type: none"> • High introduction cost • Low awareness on RFID • Shortage of RFID personnel
	Technology	<ul style="list-style-type: none"> • Low technology level of domestic hardware manufactures • Lack of standardization

Source: Created based on the results of hearings.

4.2 Results of seminars

In this fiscal year, seminars were held in five countries: Malaysia, Indonesia, Vietnam, Myanmar, and Cambodia. After the completion of the seminars, questionnaire surveys of participants were administered. The results of those surveys show that the content of the seminars was highly valued as being easy to understand (4.08 on a 5-point scale) and interesting (4.12); based on this; one can say that RFID awareness among the seminar participants was increased and the spread of RFID in ASEAN countries has been promoted to some extent.

Figure 4 - 1. Evaluation of Seminars



Source: Created based on the results of questionnaire surveys from seminar participants.

Notes: The number of survey responses totaled 165: 30 (Malaysia), 28 (Singapore), 34 (Myanmar), 31 (Cambodia), 12 (Vietnam), and 30 (Indonesia). For evaluation, a 5-point scale was used.

4.3 Future Research Directions

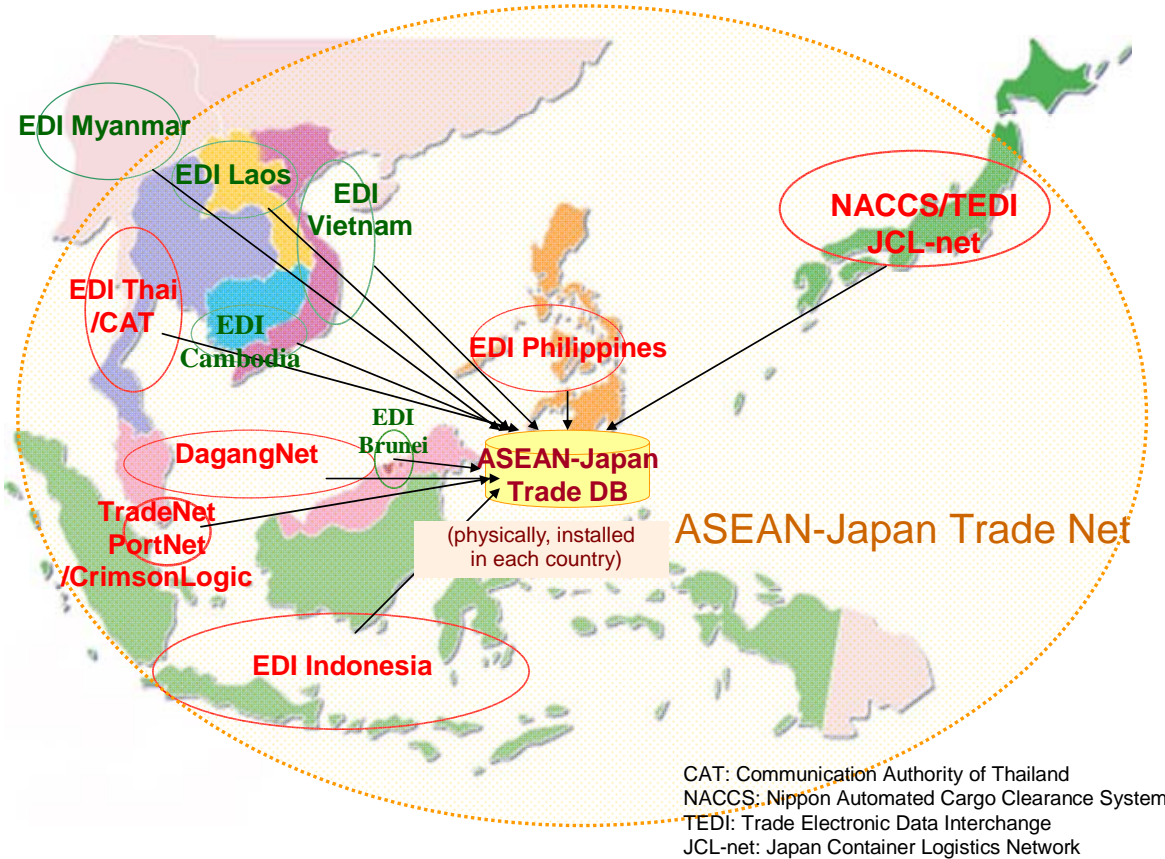
4.3.1 Proposed Future System to Facilitate Trade Services between Japan and ASEAN Countries

The survey concerning seven ASEAN countries and awareness-raising activities conducted through the seminars were successfully completed.

In the future, in order to invigorate BtoB trade in Japan and ASEAN region by facilitating the trade-related administration procedures as one of our survey’s objectives, it is practical to proceed with the following steps:

- **Simplification and standardization of the trade-related legislation, procedures, and necessary documents.**
- **Enables safe and smooth operation in the logistics.**
- **Deployment and utilization of information and communication technology infrastructures.**

Figure 4 - 2. Image of a Proposed Future System



Ultimately, as shown in the chart above, the concept of “ASEAN-Japan Trade Net Single Window System (tentative name)” could be created as the system organically combining the following four elements:

- (1) **EDI system (B2B2G)** to unify the procedures for the acceptance of applications and its processing.
- (2) **“ASEAN-Japan Trade Net”** to execute collaborative projects within the ASEAN region
- (3) **The logically-shared database (ASEAN-Japan Trade DB)** to materialize the logistics visibility traceability in order to improve customer service and strengthen security.
- (4) **RFID** for traceability of goods.

4.3.2 Plan for FY 2005

This survey has identified many problems relating to trade- and port-procedures EDI and to the introduction of RFID in ASEAN countries. Based on this, in FY 2005, with the above system concept in mind and aiming toward its introduction, it will be necessary to attempt to further identify problems and to flesh out the system concept.

(1) Survey and Seminars in the ASEAN Countries Not Included in This Survey

To expand the base of information concerning the current status of RFID in ASEAN countries, surveys and awareness-raising seminars will be conducted in the countries that were not included in this survey (Brunei, Laos, and The Philippines).

(2) Detail Surveys of Specific Countries and Sectors

In addition to the above, surveys of specific countries and sectors will be conducted to create an ultimate proposal for the system, so that the system concept to facilitate trade services between Japan and ASEAN by applying RFID can be fleshed out.

(3) Establishment of a Review Committee

Within Japan, a review committee consisting of representatives of relevant organizations and ministries will be established. This committee will be charged with identifying RFID-related problems in this country, reviewing countermeasures, confirming the direction of Japan's policies toward the ASEAN countries, reviewing the system concept, creating a concrete proposal for the system, reviewing demonstration experiments, drafting a detailed plan toward a next step, and so on.

(4) Strengthening collaboration with the efforts in ASEAN Countries

In order to facilitate coordination at the working level between Japan and ASEAN, it is important to link the above reviews within Japan with efforts in the ASEAN countries, including the ASEAN Single Window initiative.

Based on this, it is conceivable that the above-mentioned review committee will exchange information on a regular basis with comparable organizations in ASEAN countries (e.g., the ASEAN Single Window Taskforce).

It is also important to make reports concerning this project and to circulate them via existing channels between Japanese and ASEAN governments, such as the ASEAN Economic Ministers and the Minister of Economy Trade and Industry of Japan Consultations (AEM-METI), the ASEAN Senior Economic Officials–Ministry of Economy, Trade and Industry Consultations (SEOM-METI), and the ASEAN-Japan Committee on Comprehensive Economic Partnership (AJCCEP), and to discuss the future direction of RFID-related activities, so as to ensure active commitment from the ASEAN countries.

