

The 6th Asian Forum for Information Technology (AFIT)
Thematic Session Report

"Enhancement of Logistics Efficiency and Use of RFID in Supply Chain in Asia"

31st January 2008

Center of the International Cooperation for Computerization (CICC)

Next Generation Electronic Commerce Promotion Council of Japan (ECOM)

Preface and Acknowledgements

This survey report concerns the current status quo of Asian regional logistics and the findings thereof, as compiled by the Center of International Cooperation for Computerization (CICC) and the Next Generation Electronic Commerce Promotion Council of Japan (ECOM), with reference to the discussion among the members of the AFIT (Asian Forum for Information Technology).

CICC is a public organization which supports the computerization of developing countries/areas. We have been actively engaged in delivering many support programs to concur to the expectations and specific needs of Asian economies and have also actively developed and promoted related tasks. These include human resource development, a joint development program to resolve technical challenges common in the Asian region, the provision of opportunities for information exchange on IT and so forth. AFIT is a network of IT policy practitioners and experts from 19 Asian countries/areas, initiated and coordinated by CICC. The AFIT members have been engaged in sharing and discussing problems to be resolved for computerization in Asia, and exchanging views on potential solutions.

Amid the rapid progress of globalization, the Asian region is making its presence felt worldwide as an attractive business market, production base and investment destination. In particular, the trend toward reinforcing corporate competitiveness via global sourcing, including component procurement, product assembly and the shipment thereof requires Asia to improve its logistics efficiency. With this in mind, CICC, together with ECOM, have decided to launch the AFIT Thematic Session regarding logistics efficiency improvement using IT.

The Session commenced with online discussion from June 2006, followed by face-to-face meetings at the AFIT Plenary Conference. During the Session, logistical and RFID experts from Asian countries/areas, alongside IT policy practitioners, discussed and studied issues and solutions, particularly those concerning RFID utilization for logistics efficiency improvement.

We trust this report will be beneficial for readers and will contribute in promoting regional computerization and economic development.

Finally, we would like to express our sincere appreciation to AFIT members, experts, and committed supporters who dedicated their time and shared their knowledge to this report.

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4. “The AFIT -From Today to the Future”

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Presentation materials of the Thematic Session in 6th AFIT

1. “Hibiki Project & Secure RFID Project”
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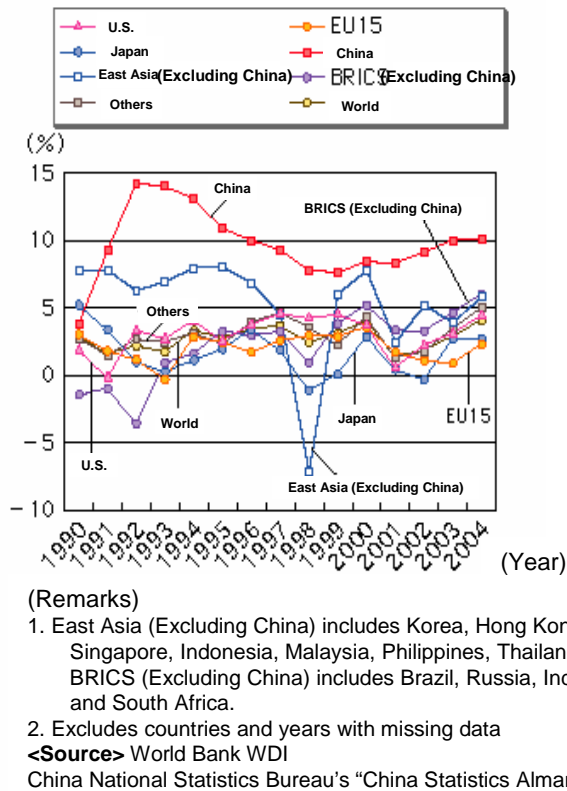
“Enhancement of Logistics Efficiency and Use of RFID in Supply Chain in Asia”

1. Background and current situation

1) Background

Since the 1990's, the international economy has continued to grow stably at an average of about 3.1%. In particular, the East Asian countries and regions have shown remarkable high growth ratio.

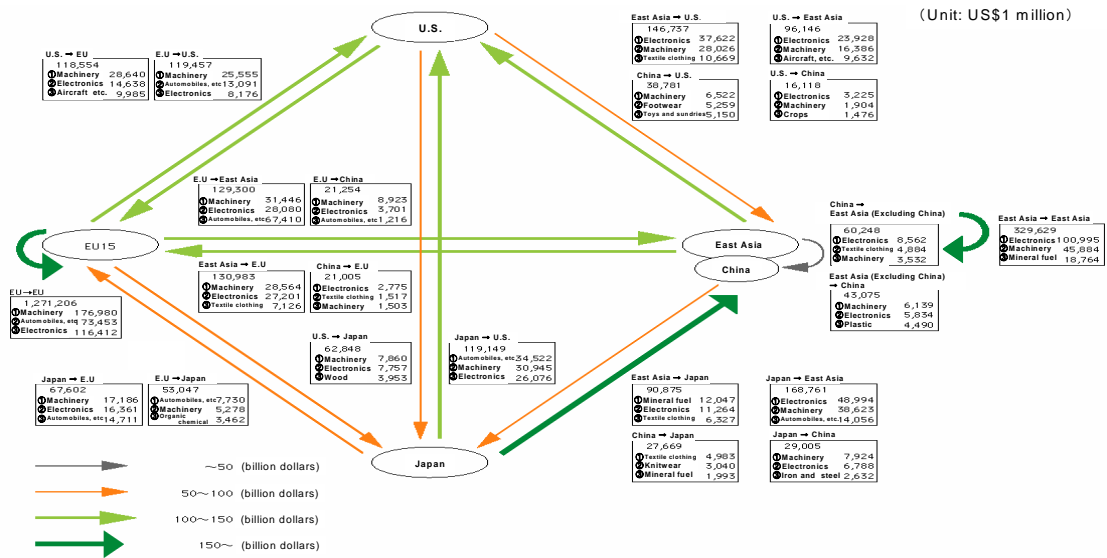
Figure 1. GDP Growth by Country and Region



As economic globalization progresses, East Asia is increasingly growing in presence. Its growth has been remarkable as a “world growth center”, “production base”, “market”, and “place to invest in”.

In terms of trade, the global share of exports and imports of these countries and regions is expanding, increasing its presence in international trade. This can be attributed to East Asia's important role in international division of labor as a “world factory”, thus increasing exports and imports of parts, etc., increasing exports of final products to Japan, the U.S., and Europe which are the final markets, as well as increasing its appeal as a emerging market of final products as a result of rising income level, leading to increased imports from other regions as well.

Figure 2. Global Trade Trends (FY1994)

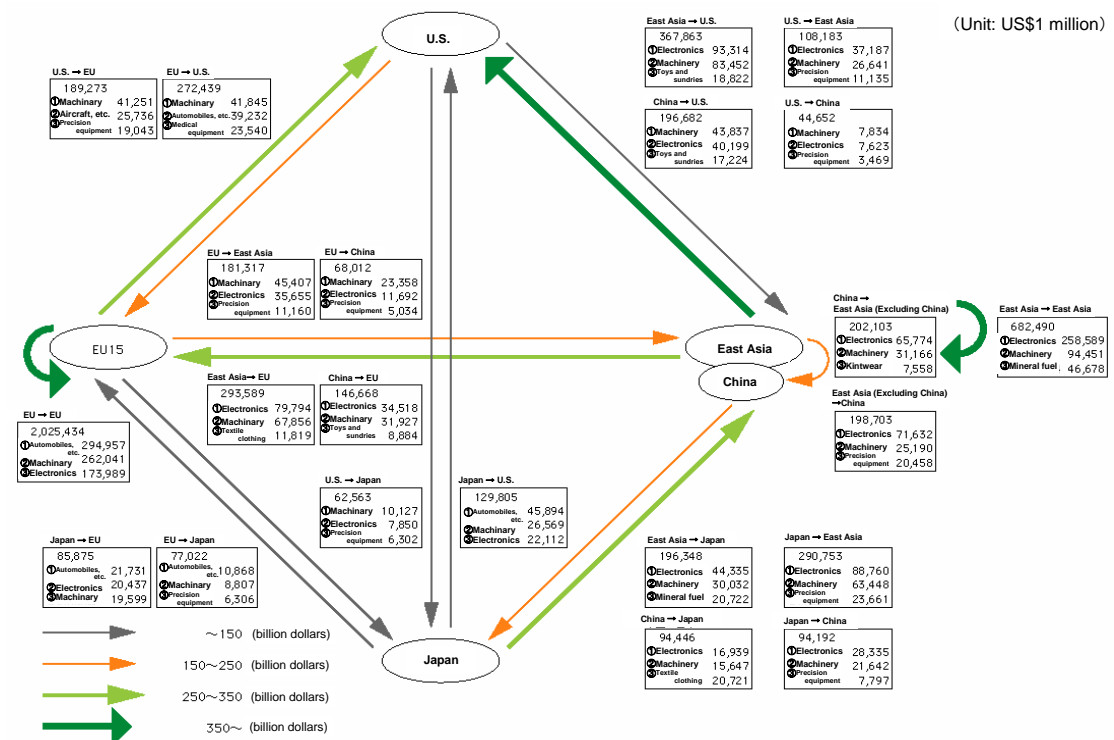


(Remarks)

1. East Asia consists of the nine countries NEs, ASEAN4, and China (Hong Kong not included in China), and EU consists of 15 countries throughout the whole period
 2. Based on 1994 import country side statistics (CIF price import), but calculated as follows for convenience for EU15 and East Asia due to data restrictions.
- *Japan-EU15, Japan-East Asia, Japan-China are 1994 Japan side statistics.
 *Japan-EU15, U.S.-East Asia, U.S.-China are 1994 U.S. side statistics.
 *EU15-East Asia is 1997 EU15 side statistics, EU15-China is 1995 China side statistics.
 *EU15-East Asia is 1997 EU15 side statistics, EU15-China is 1995 China side statistics.
 *EU15-EU15 is statistics of each country of 1997 (However, Belgium and Luxembourg are 1989 statistics). East Asia-East Asia is statistics of each country of 1997.
 *Multiplied by 1.1 time for convenience in the above, when estimating the import amount of the other country from the export amount.

(Source) Compiled from Global Trade Information Services Inc. "World Trade Atlas"

Figure 3. Global Trade Trends(2004)

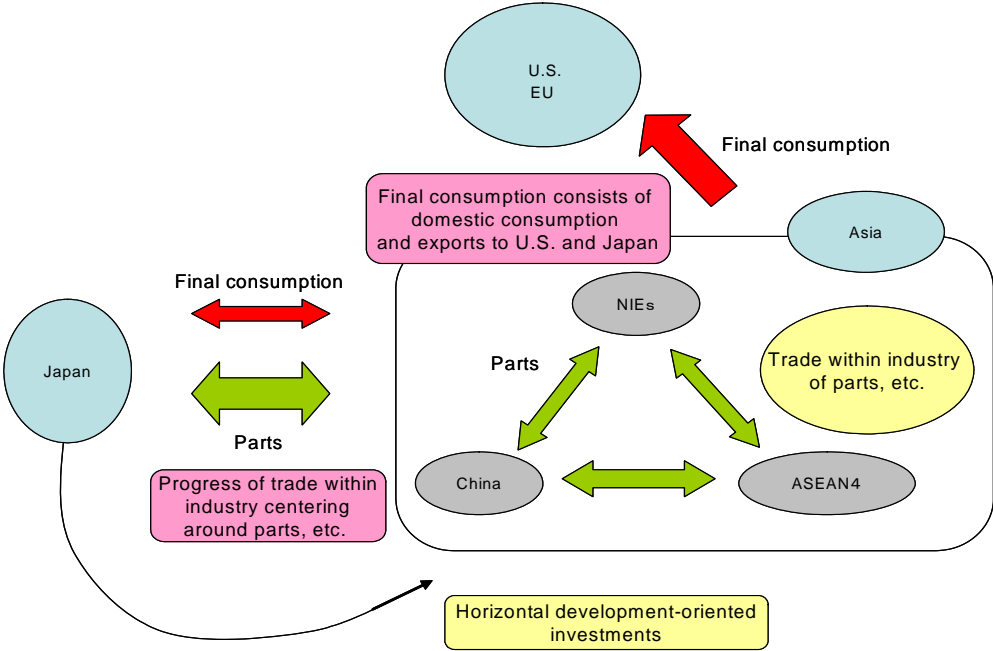


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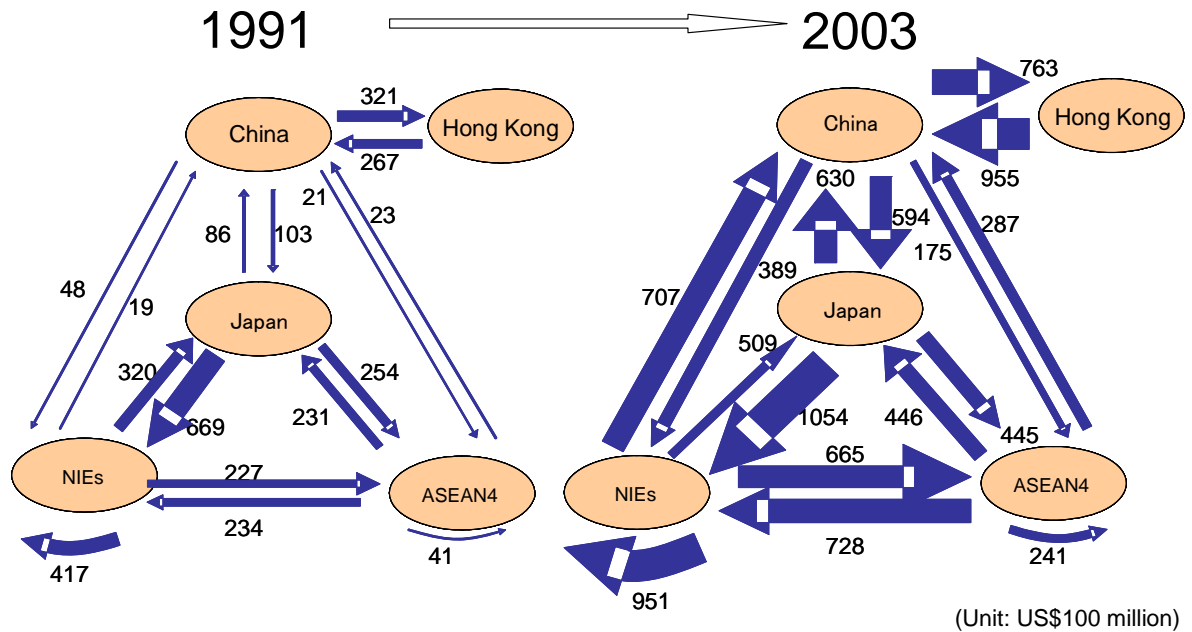
(Source) Compiled from Global Trade Information Services Inc. "World Trade Atlas"

Figure 4. Labor Division in Asia



(Source) Ministry of Economy, Trade, and Industry

Figure 5. Trade Increasing Status in Asia



(Note) Source: IMF DOT. All export data (FCB). ASEAN4 is Philippines, Indonesia, Malaysia, Thailand

Reference: Recent Trade Status between ASEAN Member Countries

(Unit: US\$ million)

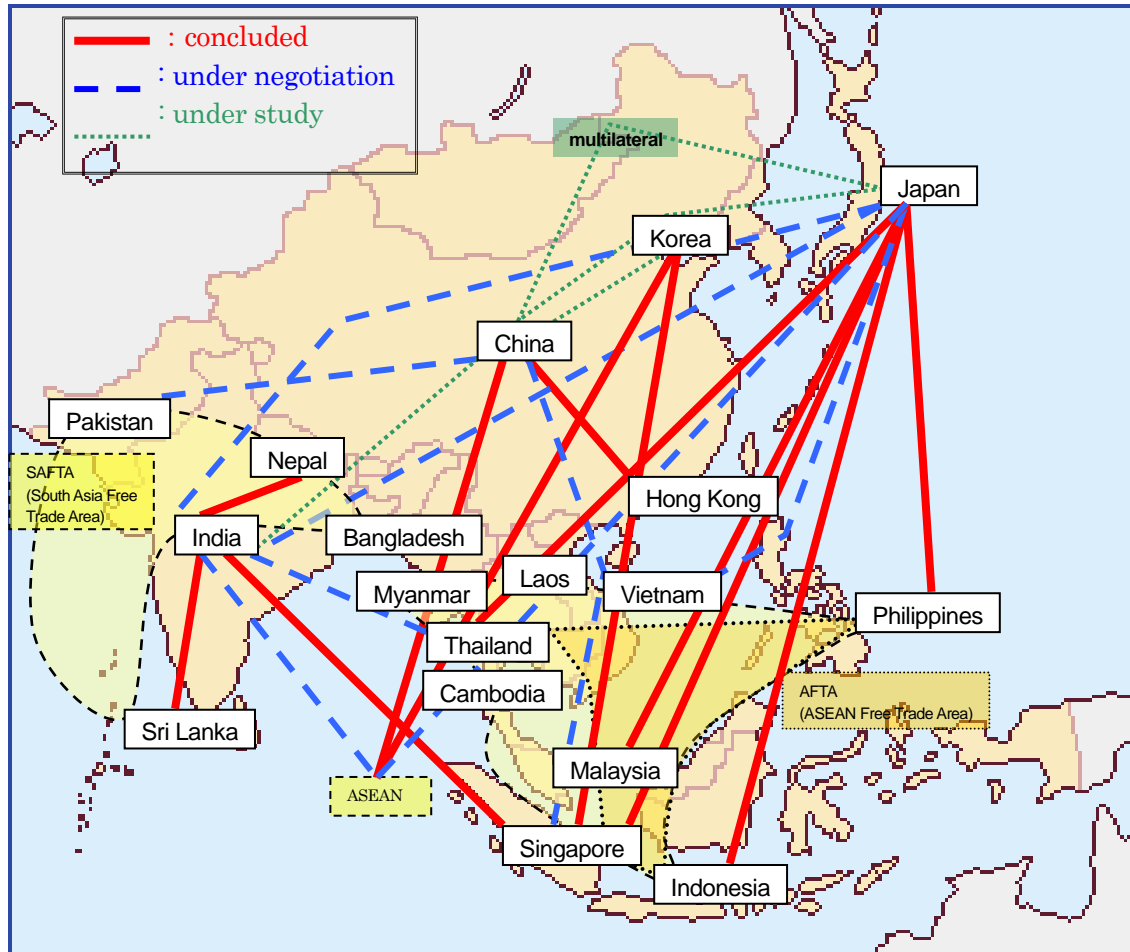
Export	Import	ASEAN Member Countries										Other	
		Thailand	Singapore	Malaysia	Indonesia	Philippines	Cambodia	Lao PDR	Viet Nam	Myanmar	Brunei	China	Japan
ASEAN Member Countries	Thailand		7,425	5,676	3,959	2,045	909	765	2,348	697	68	9,104	15,030
	Singapore	9,405		30,392	22,112	4,185	303	40	4,420	597	496	19,749	12,537
	Malaysia	7,585	22,009		3,322	1,974	109	6	1,160	246	353	9,303	13,181
	Indonesia	2,246	7,837	3,431		1,419	94	2	678	78	39	6,662	18,049
	Philippines	1,169	2,705	2,451	476		8	1	312	9	9	4,076	7,109
	Cambodia	8	26	23	1	2		3	32	0	0	8	19
	Lao PDR	225	1	13	0	0	0		95	-	0	26	8
	Viet Nam	780	1,809	949	469	829	536	67		12	-	2,961	4,411
	Myanmar	1,100	137	75	56	8	-	1	5		-	476	81
	Brunei	349	132	71	316	1	0	0	0	0		205	1,910
Other	China	5,802	12,688	8,086	6,256	4,269	452	101	4,260	938	48		73,509
	Japan	22,601	18,545	12,608	9,297	9,117	79	20	3,610	92	105	80,340	

(Note) Source: ASEAN Logistics Network Map, JETRO 2007

World Trade Atlas 2005 (Thailand, Singapore, Malaysia, Indonesia, Philippines and Viet Nam), Import/Export Statistics 2002 (Cambodia), Ministry of Finance Trade Statistics 2005 (Japan) Annual Statistics 2002-03 (Myanmar), Brunei Annual Statistics 2004 (Brunei), China Annual Statistics 2004 (China)

Amidst this environment, economic tie-ups between countries and regions are progressing, and in East Asia, FTA and EPA are gradually being concluded. Furthermore, there are also moves for “East Asia economic integration” aiming at the construction of a more efficient and mature wide market economy bloc.

Figure 6. Economic Tie-Up in East Asia



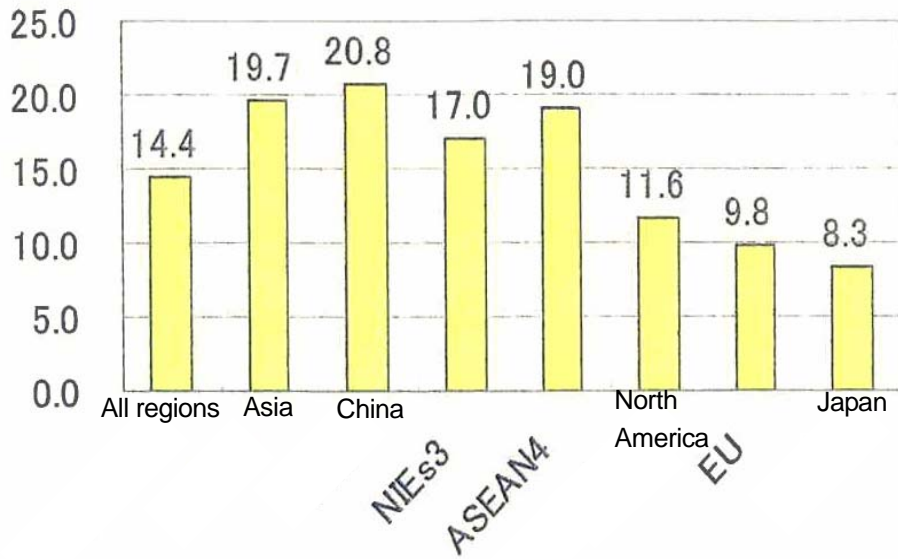
(as of August 2007)

Given this situation, enterprises, which are playing main role for leading economic activities, have started to plan strategies on where to locate their base of corporate activities from a global perspective aiming at optimum supply chain design. To these enterprises embarking on global economic activities, the enhancement of logistics efficiency of supply chain management (SCM), which will allow prompt and efficient delivery of products onto the sales market from production bases, impacts international competitive strength.

1) Current situation of logistics in Asia

As described above, in order to maintain and reinforce the competitive strength of enterprises supporting economic growth, there is a need to establish and reinforce the functions of strategic logistics infrastructures based on the global progress of optimum labor division systems, etc. with Asia. The current situation of logistics in Asia is as follows.

Figure 7. Comparison of Distribution Related Cost Percentages (2004)



Source) Compiled from METI 's "Overseas Business Activities Basic Survey ", Japan Institute of Logistics Systems ' "2004 Logistics Cost Survey"

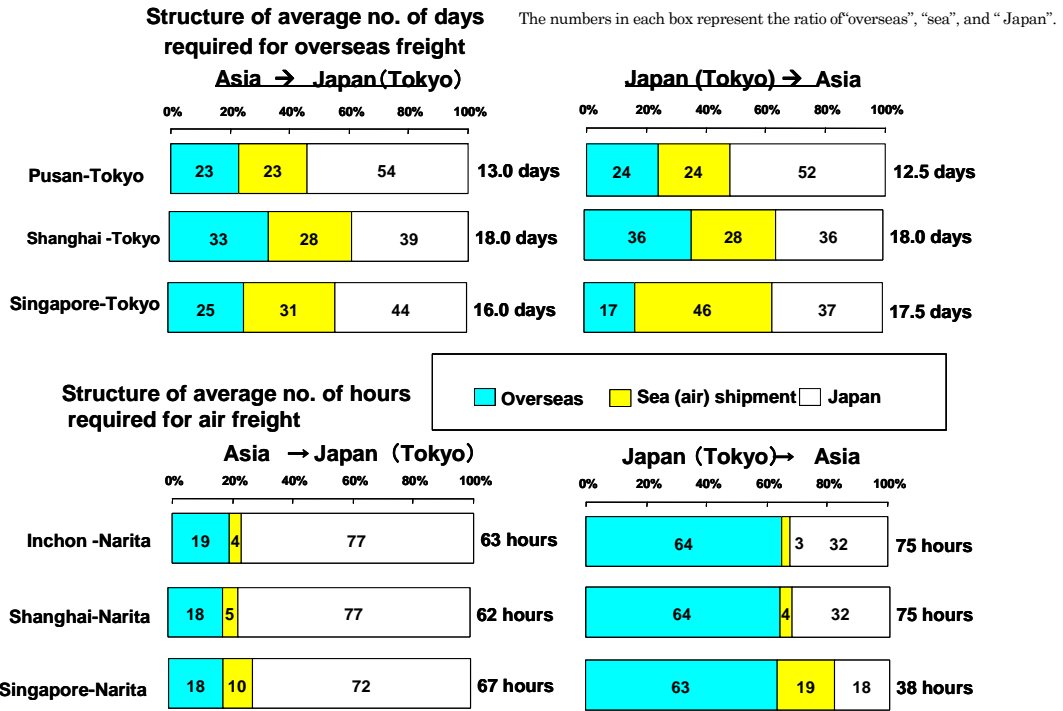
Figure 8. Time Required for Customs Document Clearance/Approval in Each Country

	Air	Sea
Germany	1-2 days	1-2 days
France	2 working days	2 working days
Italy	2 days	2 days
Austria	1 day	1 day
Belgium	0.5 working day	0.5 working day
U.S.	5 working days	15 working days
Canada	1 day (if all documents available)	1 day (if all documents available)
Japan	2 days	5 days
China	2-3 days	3-4 days
Hong Kong	1-2 working days	2-3 working days
Taiwan	3 days	5 days
Singapore	2-3 working days	2-3 working days
Thailand	7 days before show day	14 days before show day
Malaysia	1-2 days	3 days
Indonesia	2-4 working days after flight arrival (direct shipment)	2-4 working days after vessel discharge
Philippines	4 working days	3 working days
Vietnam	5 working days	7 working days
India	7-10 days	6-10 days

(Source) Compiled from IELA website.

Note) This table should be modified depends on regulations and procedures such as safety standards certification. Some country requires 7-10 days for it

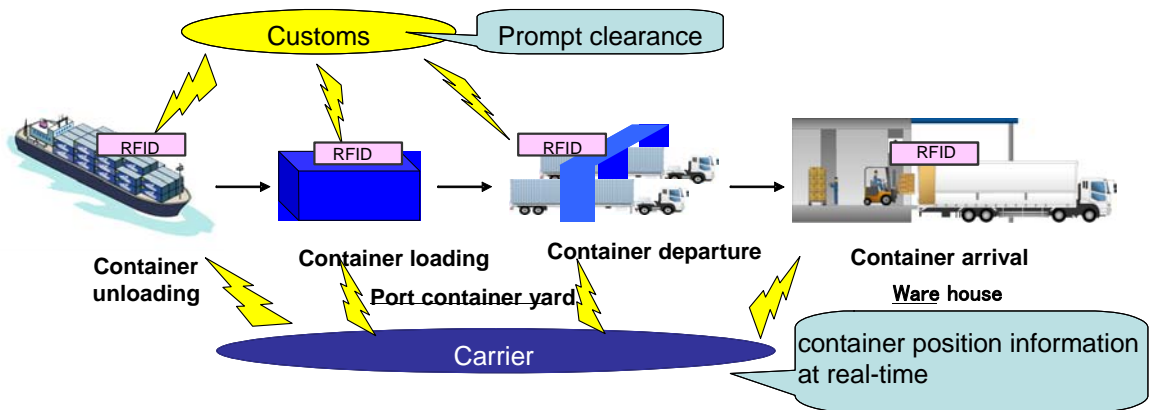
Figure 9. Structure of Average No. of Days Required for Sea Freight/Air Freight



Source: Survey of Transportation Costs in Major Asian Countries and Transportation Costs between Japan and Various Countries (2001 METI Commissioned Survey)

In this situation, there is a need to further reduce logistics costs, as well as further shorten the time required for cargo transportation such as customs procedures, and RFID system will be one of the powerful tools to resolve these issues as shown below.

Figure 10. Use of RFID system in International Logistics



This chart shows only some portion of supply chain. Regarding management at the individual item/package/pallet/container/transportation means (tracks, ships, flights) level in the entire supply chain (supplier, manufacturer, distributor (wholesaler), retailer, consumer, etc.) the use of RFID technology should be effective for enhancing the efficiency of work related to logistics.

2. Positioning of RFID in Logistics Efficiency Enhancement
(Barcode/2D code/RFID comparison)

Generally conventional barcodes are used as a means of identification for managing flow of goods. Since 10 years ago, two-dimensional codes (2D code) have also become increasingly popular. And with technological progress, RFID tags are attracting considerable attention recently.

The following compares the barcode/2D code/RFID.

	Item	Barcode	2D code	RFID
1	Reading distance	Several centimeters	Several centimeters	To several meters
2	Information volume	Up to 60 characters	Up to 4000 characters	No restrictions
3	Reading	Sequential/Stationary reading	Sequential/Stationary reading	Collective/can read while moving
4	Data addition	No	No	Yes
5	Reading in box	No	No	Yes (Not for metallic box)
6	Environment resistance	Not resistant to dirt	Not resistant to dirt	Resistant to dirt
7	Cost (By goods)	Label/printing costs (0.2~5 yen)	Label/printing costs (0.2~5 yen)	About 50 yen (Price expected to drop in future)
8	R/W cost	10K~200K yen	10K~200K yen	50K~300K yen (Price expected to drop in future)
9	Track record	30 years (Very large assets)	10 years (Large assets)	1 to 2 years (small assets)
10	Data attribute	Alphanumeric special characters	Alphanumeric special characters, multilingual	Alphanumeric special characters, multilingual
11	Code system	By industry	By industry	Shared use between industries and countries expected
12	Legal restrictions in radio wave use	None	None	Yes
13	Application to security control	No	No	Yes

As shown above, RFID has numerous advantages such as can be read all RFIDs at once, data can be added, data can be read in boxes, supports multi languages, and potentials for sharing RFID between multiple industries and countries, etc., and are expected to make a significant contribution to supply chain, especially to the enhancement of efficiency in international logistics.

Currently, RFID is more expensive than barcodes and 2D code, and this is because it was just introduced. But with its spread, costs are expected to drop sharply, and by the reuse of the tags themselves, actual cost reduction can be achieved.

As RFID uses radio wave, it may be subject to restrictions of the frequency band used based on the conditions of each country, but this should also be resolved as countries are currently in the midst of establishing the required environment.

At present, RFID is still in the midst of being introduced and there are only few cases of actual use. Readers/writers equipments are not popular in the market. In addition, as cost of RFID is still high, barcodes and 2D code are still mainly used in logistics. However, it should be advisable to consider the aggressive introduction of RFID as a new technology to be introduced for enhancing logistics efficiency between enterprises, supply chains, and countries, given the above advantages, convenience, and flexibility of RFID.

Hibiki Project was National R&D Project conducted by METI in Japan.

Industries would like to make high-quality & low cost products using RFID. RFID will be available not only SCM but also parts quality management, production control / lifecycle management, and Recycle / Reuse etc,

There were three objectives in Hibiki Project, 1st objectives is to Develop low price RFID tag, 2nd objectives is to Supply RFID tag Stably, and 3rd objectives is to Develop the RFID tag which can be used all over the world Inexpensive RFID Tag with fundamental feature is essential for making the market bigger and for its prevalence.

3. Efforts of Countries and International Organizations Involved in Supply Chain, Logistics, and RFID

Item		Cambodia	China	Hong Kong	India	Indonesia (2006)	Japan	South Korea	Malaysia	Myanmar	Pakistan	PHILIPPINES	Singapore	Sri Lanka	Thailand	Vietnam
IT infrastructure	Fixed telephone ownership rate	0.28% (Source: CIA, the world Fact book) (2006)	28.00%	95.69% (Source: Household fixed line penetration rate (May 2007) http://www.ofta.gov.hk/en/dataset/key_stat.html) (Please note that this is the "household penetration rate" which is not exactly the same as the requested item defining as the number per 100 persons as indicated in the description at the bottom of the spreadsheet.)	39734219 Subscribers as on August 2007 which is approx 3.97%	12,772,300 (5.73%)	46.00%	92.00%	4,350,000 OR 15.9%	0.97% (538,350)	4.40%	7.76 (2005)	98.00%	9.55%	14.1% (2006)	18.86% (2005)
	Cellular phone ownership rate	7.6% (Source: CIA, the world Fact book) (2006)	32.70%	138.5% (Source: Mobile subscriber penetration rate (May 2007) http://www.ofta.gov.hk/en/dataset/key_stat.html)	201286738 Subscribers as on (August 2007) which is approx 20.128%	46,910,000 (21.06%)	71.50%	100.00%	21,219,000 OR 78.2%	0.48% (266,400)	40.64%	41.3 (2005)	111.20%	27.26%	64.7% (2006)	26.19% (2006)
	No. of PCs owned	0.23% (Source: WDI)	53,000,000	71.7% (Source: Percentage of households with personal computer (PC) at home amongst all households in Hong Kong (2006) http://www.info.gov.hk/digital21/eng/statistics/download/itsurveysummary2006.pdf) (Please note that this is the "household penetration rate" which is not exactly the same as the requested item defining as the number per 100 persons as indicated in the description at the bottom of the spreadsheet.)	6341451 Sales for the fiscal year 2006-2007, 5046558 sales for the fiscal year 2005-2006	3,022,000 (1.36%)	69,200,000	80% of household	60% of Household	490,000	Not available	4.5 (2005)	78% of household	1,444,000	3,716,000 (2005)	n/a
	Internet dissemination rate (user)	0.3% (Source: ITUD) (2006)	10.00%	67.1% (Source: Percentage of households with PC at home amongst all households in Hong Kong (2006) http://www.info.gov.hk/digital21/eng/statistics/download/itsurveysummary2006.pdf) (Please note that this is the "household penetration rate" which is not exactly the same as the requested item defining as the number per 100 persons as indicated in the description at the bottom of the spreadsheet.)	42,000,000 users from a total population of 1,129,667,528 which is 3.7 %	Approx. 16,000,000 (7.18%)	50.20%	Household broadband penetration 30%	11,586,000 OR 14.2%	2.00%	1.62%	7.9(2005)	Household broadband penetration 70.6%	1.75%	11.03% (2005)	20.00%
Human Resource	IT human resource	73.6% (Age 15 and over)	Sufficient	The total manpower in the IT sector, excluding data entry operators, was 64 473 in April 2006 (Source: http://www.vtc.edu.hk/vtc/web/template/text.jsp?fldr_id=2297 (2006 Manpower Survey Report))	2367000 Human Resources in IT and ITES Sector which is about 0.2 % of total population	n.a.	920,000 (2002)	119,700	n/a	8000 from Government University, 3000 from Private Education (Yearly)	75,000	119,700	Presently 35000 IT workers	n.a.	n/a	
	Logistics service human resource	NA	Insufficient		Insufficient in the present times. Government initiatives in progress	Unasufficient	Sufficient	100,000	n/a	Insufficient		100,000		Not sufficient in various areas (further detail will be provided later)	In Sufficient	
EDI dissemination rate (B2B transaction amount)		There is no number to be recorded yet. However, there are few private entities have adopted EDI mode in the business. In Cambodia, the modern telecommunication modes/channels are considered as very new and unknown/irreversible.	B2B(2006): 20.8 trillion RMB		B2B e-Commerce: Rs. 40000 Core in the year 2003-2004	n.a.	B2B-EC(2006): 231 trillion yen (EC rate: 19.8 %)	NA	n/a	TEDI (Pilot project of e-Government)		NA	Not Available	n.a.	n/a	
Legal systems	Trade procedures / computerization	Recommendation received by M.C. towards Greater Mekong Subregion (GMS) countries develop standard information databases on their trade facilitation measures and policies, and make available via electronic means to the business communities in other GMS member countries'		Not available	NA	Under discussion.	NACCS	Trade Exchange	Trade Exchange	already started	Ministry of Commerce / EGD	Government's Electronic Payment and Collection System(EPCS) .	Trade Exchange	Electronic Transactions Act No. 19 of 2006 and Rules & Regulations under the Customs Ordinance requiring formalities to be carried out by electronic methods. Computerisations under the e-Government Policy framework	Electronic Transaction Law	Ministry of Trade and Industries, VCCI
	e-Signature Law	National ICT development Authority of Cambodia (NIDA) has draft already the National ICT Policy which covered six core components. ICT policy material can be found in www.nida.gov.kh Ministry of Posts and Telecommunications of Cambodia (MPTC) has drafted the National Telecommunications Law that is now in the proceeding of Inter ministerial review.	e-Signature Law of PRC	Electronics Transactions Ordinance (ETO) http://www.hkii.org/hk/legis/en/ord/553/	THE ELECTRONIC COMMERCE SUPPORT ACT, 1998	None	Electronic Signature Act	Electronic Transaction Act	Electronic Transaction Act	Electronic Transition Law	Electronic Transaction Ordinance 2002	e-Commerce Act(RA 8792)	Electronic Transaction Act	Electronic Transactions Act No. 19 of 2006	n.a.	n/a
	e-Documentation Law	National ICT development Authority of Cambodia (NIDA) has draft already the National ICT Policy which covered six core components. ICT policy material can be found in www.nida.gov.kh Ministry of Posts and Telecommunications of Cambodia (MPTC) has drafted the National Telecommunications Law that is now in the proceeding of Inter ministerial review.	No	Electronics Transactions Ordinance (ETO)	NA	None	Electronic Document Act	Computer Misuse Act	Computer Misuse Act	Electronic Transition Law	Electronic Transaction Ordinance 2002	Consumer Act (RA 7394), Automated Fingerprint Identification System (AFIS)	Computer Misuse Act	Electronic Transactions Act No. 19 of 2006	Electronic Transaction Law	n/a
	e-Data Exchange Law	National ICT development Authority of Cambodia (NIDA) has draft already the National ICT Policy which covered six core components. ICT policy material can be found in www.nida.gov.kh Ministry of Posts and Telecommunications of Cambodia (MPTC) has drafted the National Telecommunications Law that is now in the proceeding of Inter ministerial review.	No	Not available	THE ELECTRONIC COMMERCE SUPPORT ACT, 1998	None	EDI Promotion Act	Electronic Transaction Act	Electronic Transaction Act	Electronic Transition Law	Electronic Transaction Ordinance 2002	Electronic Filing and Payment System (EPPS)	Electronic Transaction Act	Data Protection Code of Practice (Draft)	n.a.	n/a

Item		Cambodia	China	Hong Kong	India	Indonesia (2006)	Japan	South Korea	Malaysia	Myanmar	Pakistan	PHILIPPINES	Singapore	Sri Lanka	Thailand	Vietnam
Legal systems	Law and regulations related to logistics	Overseen by Ministry of Commerce	Many national laws and ministry regulations, but we need to supplement new laws and regulation to build up a high effective logistics system.	Not available		Licenses by both the Minister of Transportation and Minister of Finance are required.	Licenses by the Minister of land, infrastructure and transportation is required.	Transportation of Chemicals	Ministry of Transport		Ministry of Communication		Transportation of chemicals - National Environment Agency	Multiplicity of Laws, including English and Roman-Dutch Law (Civil Law) principles. Land ownership and Leasing of property are governed by Statutory law.	Road haulage operators registered with and licensed by the Department of Land Transport	Forwarders have to work with legal local Agent who is responsible for settling Taxes with the Government.
	Law and regulations related to bonded warehouse	None	None	Dutiable Commodities Ordinance	Part of EXIM (Export & Import) Policy for the years 2004-2009 has rules pertaining to Bonded Warehouse	None	None	Regulation of Poisoned or dangerous materials	Royal Customs Malaysia	Custom Act	Ministry of Finance and Revenue		Singapore Customs	Customs Ordinance and regulations made under the Ordinance	Customs regulation	JV operated. Cargo is 1 year maximum allowed to be stored in the Bonded WH.
	Ratification of FAL Treaty and modified SOLAS Treaty	N/A	Ratified	Not available	Ratified	None	Ratified	N/A	n/a				SFA-DDA-487 DFA AND DOTC-PCG FORGE CLOSER LINKS TO FULLY IMPLEMENT INTERNATIONAL SECURITY MEASURES FOR SHIPS AND PORTS	NA	n.a.	n/a
Government promotion policies and initiatives on logistics	Law on the management of quality and safety of products and services. Law on the adoption of the Agreement between the government of Cambodia and the government of Malaysia on the Promotion and Protection of Investments. There is also the same thing done with the government of Thailand on the Promotion and Protection of Investment	Establish logistics industry park: Establish logistics information platform: Cooperation and harmonization between different logistics industry.	To support the "Logistics Hong Kong" initiative, the Chief Executive announced in his Policy Address 2005 the setting up of two new institutions: the Steering Committee on Logistics Development (LOGSDCOM) and the Hong Kong Logistics Development Council (LOGSDOUNCIL). Chaired by the Financial Secretary, the LOGSDCOM was formed in November 2005 to provide the policy advice for and to accelerate logistics development. The LOGSDOUNCIL (http://www.logistics.gov.hk) was formed in December 2005. The LOGSDOUNCIL is a committee appointed by the Financial Secretary, with 40 members from the public and private sectors. It has a symbiotic relationship with LOGSDCOM and implements the policies set by LOGSDCOM. It also provides a forum for the public and private sectors to discuss and to initiate matters concerning "Logistics Hong Kong" and to carry out joint projects between the public and	Introducing policy measures to represent to the railways to endow a favored preferential treatment to cement on par with coal and petroleum products Promoting cement specific inland waterways and encouraging development of inland ports and handling facilities dedicated to cement Identifying major / minor ports that would be able to support the requirements of cement exports from major clusters Removing the restrictions on cementing port based cement handling facilities	n.a.	n.a.	12%	n/a	N/A	n.a	NA	NA	E-business capabilities - e-collaboration projects, RosettaNet, Trade Exchange, RFID, CPFR, Infrastructure projects like Logistics Parks	Governed by the Procedures established under the respective services (Sri Lanka Administrative Service, Sri Lanka Customs Service etc)	Establishment of the National Logistics Committee Development of national logistics strategies covering five strategic areas: Business logistics improvements, transport & logistics network optimization, logistics services internationalization, trade facilitation enhancement, and capacity building	Calling for more Foreign Investments on new Port Terminals like Thi Vai, Cai Mep, Hutchinson, PSA, DP Port...JV with 51% of Foreign Owned Forwarder Company is now allowed. Custom Declaration is partly done by electronic system.
Logistics cost/GDP ratio	NA	18.3% (2006)			n.a.	n.a.	12%	n/a	N/A	n.a	NA	NA	Transport Expenditure/ Output: Rs. 201,354 million + Cargo handling, storage and warehousing cost Rs. 201,354 million = Rs. 228,653 million (GDP Rs.2,484,191 million (source: Central Bank Annual Report 2006, 1 US\$ = 113.8 LKR as at September 13, 2007)	23.9% (2006)	n/a	
Current situation and issues on logistics, especially the cross boarder transportation issues	ASEAN Single Window (ASW) designated to accelerate the custom clearance programme for any single transaction to 30 minutes from current 3-4 days via the agreement's implementation by 2012 at Cambodia. A World Bank supported project will be implemented for automate custom clearance.	Lead time reduction: Cost reduction: Improvement in Service Quality: Efficiency improvement of logistics:	Lead time reduction: Cost reduction: Improvement in Service Quality: Efficiency improvement of logistics:	Cost Reduction Road Transport is not very well organized Frequent Stoppage of vehicles Overloading Taxation Infrastructure Bottlenecks Human Resource Management		Lead time reduction (Shortening of lead time from entering port to receiving freight, efficiency improvement in localional management of freight and man-hour of inspection, personal identification by seven access control and so forth.) Cost reduction (Improvement in Service Quality Enhancement of security (transability) Efficiency improvement of logistics (Management of inspecting goods and efficiency improvement of frontline works such as warehouse operation) Possibility for utilizing RFID to tighten security. Easeless of tracking (Traceability)	Anti-Chemical ACT such as REACH, Adoption of RFID, customs such as UCR	Lead time and cost reduction, Single window and Green lane	We have a plan to make the Project of Transit Trade Logistic System using RFID technology	Law and Order situation in neighboring Afghanistan is not satisfactory Gawards Star port is under development phase. Having this one of the few sea ports with natural depth in operation, Pakistan can become a hub for sea transportation. Political relation with bordering India	Faster clearance, improving efficiency, supply chain security, Traceability, cost factor	Lead time & cost reduction through Single Window Entry and Single Stop Inspection	Most cargo will be shipped on Feeders out of Vietnam to connect the Mother Vessels in Singapore, Port Kelang, HongKong...Airfreight to be transited in some transit-joints in Sin, Sel, Hkg, Bkk, Mnl, Kul, Tpe,....			
Expectations toward applying RFID for logistic management	NA	Lead time reduction: Cost reduction: Improvement in Service Quality: Efficiency improvement of logistics:	Lead time reduction: Cost reduction: Improvement in Service Quality: Efficiency improvement of logistics:	Cost Reduction Lead Time Reduction Efficient control of inbound traffic		Lead time reduction (Shortening of lead time from entering port to receiving freight, efficiency improvement in localional management of freight and man-hour of inspection, personal identification by seven access control and so forth.) Cost reduction (Improvement in Service Quality Enhancement of security (transability) Efficiency improvement of logistics (Management of inspecting goods and efficiency improvement of frontline works such as warehouse operation) Possibility for utilizing RFID to tighten security. Easeless of tracking (Traceability)	Improvement in visibility of inventory, efficiency improvement, cost improvement	Total visibility and security improvement in value chain. Cost, lead time, efficiency improvement	Plan to use RFID in Transport Logistic Management (Study phase)	RFID is not much used in logistic management so far. However it is likely to be used extensively, as the IT and telecom infrastructure in the country is improving	Improvement in visibility of inventory, efficiency improvement, cost improvement	Streamlined process Trackability & Traceability Less data entry				
No. of days required for customs (Air freight)	3-4 days	1-2Days		1-2 days with custom clearance	2 days		1 hr	n/a	2 to 3 days	3-4 days	1 hr	1-2 days (provided all requirements have been met)	n.a.	1-2days		
No. of days required for customs (Sea freight)	3-4 days	4-7Days		3-8 days with clearance	5 days		1 hr	n/a	3 to 7 days	7 days	1 hr	1-2 days (provided all requirements have been met)	n.a.	2-3days		
No. of days required for customs (Track freight)	NA	1-3Days			n.a.		30 mins	n/a	1 to 2 days	n.a	30 mins	Not applicable	n.a.	n.a		
No. of days required for other procedures including the procedure at bonded warehouse	NA				n.a.		30 mins	n/a		n.a	30 mins		n.a.	2-4days		
Product code registration organization	Retail		GS1 China		GS1 India is promoted by the Ministry of Commerce and includes the following representatives: Ministry of Commerce, Government of India, APEDA (Agricultural & Processed Food products Export Development Authority), ASSOCHAM (Associated Chambers of Commerce and Industry of India), BIS (Bureau of Indian Standards), CII (Confederation of Indian Industry), FICCI (Federation of Indian Chambers of Commerce and Industry), FTRE (Federation of Indian Export Organisations), Spice Board, IMC (Indian Merchant Chamber), IIP (Indian Institute of Packaging)	Distribution Systems Research Institute (DSRI)	GS1	GS1	Myanmar Custom Department, Ministry of Finance		GS1	HS Codes - Sri Lanka Customs, Barcodes - The Ceylon Chamber of Commerce	GS1 Thailand	GS1 VIETNAM		
	Manufacturing	automobile	Manufacture	Automotive Component Manufacturers Association of India (ACMA)		Japan Automobile Manufacturers Association, Inc. (JAMA) Japan Auto Parts Industries Association (JAPIA)	GS1	GS1	Myanmar Custom Department, Ministry of Finance		Pakistan Automotive Manufacturers Association (PAMA) Pakistan Automobile Spare Parts Importers Association	GS1	Registrar of Motor Vehicles	GS1 Thailand	N/A	
		electric & electronics	Manufacture	ELCINA Electronic Industries Association of India		Japan Electronics and Information Technology Industries Association (JEITA)	GS1	GS1	Myanmar Custom Department, Ministry of Finance		Pakistan Electrical & Electronic merchants Association Engineering Components & Machinery Manf. Association of Pakistan Pakistan Electronic Manf. Association Pakistan Electric Fan Manf. Association	GS1	HS Codes - Sri Lanka Customs, Barcodes - The Ceylon Chamber of Commerce	GS1 Thailand	N/A	
	Others					Association for Electric Home Appliances (AEHA)	GS1	GS1				GS1	GS1 Thailand	GS1 VIETNAM		

	Item	Cambodia	China	Hong Kong	India	Indonesia (2006)	Japan	South Korea	Malaysia	Myanmar	Pakistan	PHILIPPINES	Singapore	Sri Lanka	Thailand	Vietnam
RFID-Related	Radio Law RFID frequency band allocation (ISO based- ISO/IEC18000)	NA	125/134kHz 13.56MHz 433MHz 840-845MHz 920-925MHz 2.45MHz 5.8GHz	865-868MHz, 920-925MHz	865-867 MHz UHF	Not allocated yet.	128KHz 13.56MHz, 433MHz, 865 MHz, 2.45GHz	908.5MHz ~ 914MHz	919-923 MHz	Plan to use 925MHz as the ASEAN Standardization (Not confirmed yet)		Public Telecomm. Policy Act of the Philippines: Regulation of Radio Stations and Radio Communications in the Philippine Islands	866 - 869 MHz, 920 - 925 MHz, 13.56MHz, 433MHz, 2 wattserp	13.56 MHz, 868-869 MHz, 920-924 MHz	920-925 MHz	13.553 - 13.567 MHz, 433.05 - 434.79 MHz, 866 - 868 MHz, 920 - 925 MHz
	Governing ministry	NIDA & MPT could be principal entities to govern the RFID related if there is available one	Ministry of Information Industry	Office of the Telecommunications Authority (OFTA)	Wireless Planning & Coordination Wing, Ministry of Communications and Information Technology, Department of Telecommunications	Ministry of Communication and Information Technology	Ministry of Internal Affairs and Communications	MIC(Ministry of Communication)	Malaysian Communications and Multimedia Commission	Will be Ministry of Communication, Post and Telegraph	Ministry of Information Technology	National Telecommunications Commission (NTC)	Infocomm Development Authority	Telecommunications Regulatory Commission of Sri Lanka (TRCSL), established under the Telecommunications Act of 1991	National Telecommunications Commission	Vietnam Radio Frequency Directorate - Ministry of Communication
	Related project name (Outline of each project is described on separate sheet)	NA	Railway carriage management; Parcels management in Post; Pets management; The 2nd Generation ID card.		pilot level testing for proof of concept Textile Industry Automation with RFID Pharmaceuticals has started the use for expensive drugs Intelligent Shops and Libraries Perpals are being carried out to integrate RFID by the Railways and Airways to track their respective coaches	n.a.	Pilot tests MET/IMC/MLT/MAFF: use of RFID for ASEAN automobile containers, use of RFID in Japan-China-Korea supply chain, futuristic shop, electric and electronics industry traceability, pharmaceutical industry RFID, Defense Agency supply services RFID, etc.		PERODUA AUTOMOTIVE CENTRE USES OF RFID TO IMPROVE PRODUCTIVITY IN ASSEMBLY PROCESSES	e-meter bill (Pilot project) using of RFID Technology.		LHT Holdings, the largest pallet leasing company has piloted EPC Global RFID Tags on their pallets for leasing. This has facilitate SMEs companies to tag their products for RFID warehouse management. Havelock Packed (HP) worked with Cold Storage to develop and implement an automated tracking system for cases and pallets using RFID. YCH Group implemented a project to track liquor products at bonded warehouse.		n.a.	Not starting yet	

*Note Description of each item

<General>

IT infrastructure

- Fixed telephone ownership rate: No. installed per 100 people (Units/100 people)
- Cellular phone ownership rate: No. installed per (Units/100 people)
- PC ownership rate: No. installed per 100 people (Units/100 people)
- Internet dissemination rate: No. of Internet users per 100 people (Users/100 people)

Human resources

- IT human resources: Sufficient or not (If insufficient, which area, number, etc.)
- Logistics service human resources: Sufficient or not (If insufficient, which area, number, etc.)

EDI dissemination rate: B2B transaction amount using EDI

Legal systems

- Trade procedures/computerization: Whether there are laws and regulations on computerization of trade procedures (name)
- e-Signature Law: Whether there are laws and regulations legally authorizing e-signature (name)
- e-documentation Law: Whether there are laws and regulations legally authorizing e-documentation (name)
- e-Data Exchange Law: Whether there are EDI related laws and regulations (name)

<Logistics related>

<RFID-Related>

Radio law / RFID frequency band allocation: Frequency band allocated to RFID in compliance with ISO/IEC18000

Governing ministry: Ministry overseeing use of RFID (indicated frequency band)

Related project name (Outline of each project to be described on other sheet)

*Other

All the information of this survey is based on the report provided by AFIT participants from each country/region, and CICC has not independently verified the accuracy of the information.

4. The 6th AFIT Thematic Session Summary

In order to maintain and reinforce the competitive strength of enterprises supporting economic growth in the Asian Region, their logistics efficiency must be reinforced and increased in the supply chain both domestically and internationally.

To improve the logistic efficiency in the supply chain utilizing RFID, we should acknowledge the following points:

1. Effectiveness of RFID implementation

-There are many reasons for companies and industries to implement RFID in their business. For the manufacturing industry, RFID may be a very effective tool for managing the diversities of manufacturing processes, products and/or components. Reducing the inventories of products and/or components is a matter of concern for manufacturing companies who are pursuing logistics efficiency. To reduce inventories, it is important that production planning and logistics planning are consolidated, and RFID implementation should be considered from a unified aspect.

-The U.S. Department of Defense (DOD)'s case is a successful model of RFID utilization for logistic efficiency. The report published by DOD shows that RFID will provide a lot of value for improvement of logistics efficiency. According to the report, 36 days were required to distribute goods to 400 sites in 36 countries in 1997, but in 2007, by utilizing RFID, they succeeded in shortening this to 5 days. They have saved 31 days of inventories and reduced the cost amount of 2 trillion JPY (17 billion USD).

-In the area of businesses beyond the companies, industries and countries, the needs for secure RFID are increasing. RFID is expected to provide a security function that will avoid unauthorized access and assure integrity of data. Wide diffusion of secure RFID will help us transmit necessary information securely so that various socio-economic arenas benefit from its utilization. In particular, the traceability of products in life cycle management is becoming important. RFID is expected as an important data carrier for enhancing the traceability of products. When attempting to utilize RFID effectively throughout products' life cycles, RFID should be secured against unauthorized reading and altering the tag information. We can share the information of the Secured RFID products and the several POC (Proof of Concept) projects in various industries in Japan.

2. Cost Concerns in Applying the RFID System

-The cost of applying the RFID system to logistics is still high due to the following cost components:

- (1) Hardware – reader/writer and tags
- (2) Middleware
- (3) Application
- (4) System integration
- (5) Operational cost (e.g. Source tagging cost)

-One of the solutions for cost issues might be SaaS (Software as a Service) utilization. Using open source software is another option to reduce the implementation cost, especially for Small Medium Enterprise (SME) segments of industries for Asian Countries.

-Since the cost of applying the RFID system to logistics is still high, a concrete business target such as Business Process Innovation / Improvement should come prior to the implementation of RFID. We should carefully study the cost for investment, integration and so forth. This will enable the company to review and improve its process flow and thus have the necessary data to build a strong business model / ROI for the project.

- Despite the appreciable benefit gained by its implementation, RFID is not the only solution for logistics efficiency in the supply chain. We should also be aware that we cannot deal with RFID before unifying the Product ID Code. There are various data carriers (e.g. RFID, 2D Symbol and Barcode) that have favorable characteristics. By using them in combination to supplement each other, we gain increased benefit from its utilization efficiently and effectively.

- We should note that applying a successful model for RFID implementation will not always be successful, since there should be careful consideration when applying the same model for different sizes of companies and different scales of operation.

3. Necessity of Raising Awareness

- Awareness must be raised. Some companies are not aware of the benefit of RFID utilization yet and RFID has not been promoted sufficiently. Information on both technical (RFID) and logistics management practice should be shared and disseminated. Information sharing on successful model cases of RFID utilization is also worth pursuing. It is good for us to share and disseminate information among/from AFIT members.

- There should be some guidelines and/or manual to which companies can refer in order to decide on RFID implementation.

-More pilot projects should be performed by appropriate organizations in each country. Best practices of RFID implementation should be shared.

-CoE (Center of Excellence) of each country should be defined and mutual cooperation should be realized for further enlightenment. MANGA, websites, or videos may be good tools for this dissemination.

-The gathered information through the 6th AFIT Thematic Session shall be updated by appropriate organizations and shall be shared from here on.

4. Necessity of Human Resource Development

-CoE (Center of Excellence) of each country should be defined and more training should be conducted to foster logistic experts and RFID utilization experts.

5. Necessity of Standardization

-The technology for normalization/harmonization is already there and we should make efforts towards its implementation.

-Seamless cross-border trade procedure is mandatory for logistics efficiency. There are many

issues to be tackled such as unification of the product ID code in the implementation of the ASEAN Single Window (ASW) and the issue still lies even at the level of National Single Window (NSW). However, utilization of RFID could be one of the solutions for implementing ASW or even "Asian" Single Window.

-It is important to build consensus among the Asian region to standardize data structures, message formats and so forth. Database and data format differ by country and therefore, normalization / harmonization is necessary. For example, Korea and Thailand are using ebXML in their data structure. The consensus for standardization can be reported to the ASW Steering Committee, and then as the next step, there should be technical discussion among experts for standardization. We could have one or two standards as a result of discussion.

6. Other Considerations

-Nowadays, logistics efficiency is not just for the business efforts of companies for their own benefit but is also regarded as an approach to global environment conservation (such as abating global warming and curbing climate change.) Companies should implement environment-friendly logistics projects / green supply chain. "Life Cycle Management" is important for logistics. The "MOTTAINAI" ("Do not waste" = 4R = Reduce, Reuse, Recycle and Repair) concept could also be used when reviewing logistics efficiency projects.

- The flow of trade (i.e. procurement, shipping, payment) and logistics should be consolidated to improve the logistics efficiency in the supply chain. Single window systems have been developed in Asian countries to facilitate the complicated trade processes in/between countries. In the near future, single window systems will integrate with logistics management systems that utilize RFID as a data carrier in order to enhance logistics efficiency.

- We had guest participants from the Workshop of Future Logistics Cooperation by ASEAN + 3 (China/Japan/Korea), which was proposed in 2006 AEM + 3 (ASEAN Economic Ministers Meeting with the Economic Ministers of China, Japan and the Republic of Korea) and was hosted by METI (Ministry of Economy, Trade and Industry), in the 6th AFIT Thematic Session on 22nd and 23rd October 2007. We discussed and exchanged opinions on logistics efficiency in the supply chain in Asia. We hope that the outcome of the 6th AFIT will contribute to logistics efficiency improvement in the Asian region.