Asia-Pacific
Economic Cooperation

Assessment Report

on Paperless Trading of APEC Economies

APEC Electronic Commerce Business Alliance

APEC Electronic Commerce Steering Group

September 2005

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Executive Summary

In order to accelerate the process of APEC trade liberalization and take advantage of information technology and E-Commerce, the leaders of the Asia-Pacific Economic Cooperation (APEC) member economies approved the "APEC Blueprint for Action on Electronic Commerce" at the meeting in Kuala Lumpur, Malaysia in 1998. An action plan was formulated to promote E-Commerce. It has been consented to that paperless trading shall be realized by 2005 among developed economies and by 2010 among developing economies. It is expected that a flawless paperless trading environment will be achieved in the whole region by 2020.

To achieve the mid term goal of paperless trading, an APEC Ministerial Meeting in November 2004, formally approved a project to assess the extent of paperless trading in APEC economies. There are two elements to the project: a 2005 APEC Symposium on Assessment and Benchmark of Paperless Trading and "APEC Assessment Report on Paperless Trading" (hereinafter referred to as "Assessment Report").

The objective of the Assessment Report is to define the standards of assessment, then to evaluate the achievements of paperless trading and share the experiences among the economies via case study research and analysis. Thus, we hope to overcome any obstacle and develop a new strategy to promote paperless trading within the region. Initially it is crucial that an efficient assessment methodology be determined. There are a number of existing assessment norms for e-commerce, but they cover a very broad spectrum and there are only a few systems that link e-commerce and paperless trading together. Since paperless trading is essentially the transference of paper documents to electronic documents and is a specialized area, the existing norms of assessment would not apply. Therefore, it is essential that we establish new ones from the point view of application.

APEC paperless trading emphasizes more on the chain of international trade, mainly involving the elements of customs declaration, government administration, logistics, international settlements, etc. It is based on the efficiency to assess the status of paperless trading. Currently, there are some intrinsic difficulties in analyzing the efficiency in a quantitative manner. Whereas some aspects of efficiency in the chain can be quantified, some can't. Meanwhile, even though some economies of APEC submit an individual or collective action plan, measurable norms and statistical rules haven't been established. APEC's members can hardly provide detailed, comparative statistics. On the other hand, the different levels of needs for paperless trading among APEC economies have compounded these difficulties, just in line with many economists' point of view that this task is very challenging.

However, aside from the existing difficulties, the status of paperless trading is assessed in an objective manner based on exchanged ideas via workshop, videoconference,

research etc. To solve the problems indicated above, we have set up a series of assessment indexes, and five different levels on assessing the realization level of paperless trading in the region.

There is never one solution to fit all challenges. Nevertheless, a thorough assessment and analysis on paperless trading is a good start. Apart from this, other modules shall be encouraged to be discussed and exercised among APEC economies, so that a more scientific, simplified and widely applicable assessment methodology can be found.

To achieve the goals of paperless trading, there is more work to be done, including the cooperation of governments, private enterprises and academic institutions. On the basis of the existing index for e-commerce, a new assessment index and statistics system on paperless trading shall be formulated. Meanwhile, the economies of APEC, particularly research institutions, shall communicate and cooperate more in order to improve the current assessment methodology and advance the process of APEC's paperless trading.

In the end, we will summarize some proposals for paperless trading development based on the current status and in accordance with the need for paperless trading in 2010.

- New adjusted development strategies via *"APEC Paperless Trading Digital Bridge Program"* to achieve the goal of APEC Paperless Trading in 2010 shall be determined;
- In order to accelerate the paperless trading process in developing economies, an incremental module shall be adopted to improve the application level in most developing economies;
- Implementation capability is the main obstacle in paperless trading development, therefore the focus shall be on capability building, environmental improvement and application exercises in developing economies;
- Transform the "None Mechanism" module into mechanism creativity. Set up a cooperation system among economies for which the application of paperless trading is at the same level. Reform the organizational structure, administration and operational practices and turn them on to a track of mechanism and bring them under control;
- It is crucial to accelerate the process of trade liberalization and trade convenience among APEC economies to reduce the obstacles of paperless trading based on the cooperation of economics and technology;
- Continue to strengthen the importance of the role of government. Government support means creating a better environment for paperless trading, particularly policy support for those small- and medium-sized enterprises in developing economies;
- Listen to private organizations, and value highly their role in paperless trading and encourage their participation;
- It is the premise to consolidate and maximize the resources of paperless trading. Therefore, cooperation among APEC members shall be strengthened;

- The governments of the members shall strengthen standardization and call for more practice of international standards in regards to paperless trading;
- Perfect the norms of assessment standards, set up statistical systems of paperless trading, pay attention to the original data collection, analyze the efficiency & benefits, and formulate a long term assessment system.

Introduction

Asia-Pacific Economic Cooperation (APEC) is an important forum for economic Cooperation. Its objective is to promote bilateral trade liberalization, investment and economic growth. Since its foundation, a significant contribution has been devoted to the economic and investment liberalization and cooperation in the region. It has become an important tie to link the economies and areas along the two banks of the Pacific.

In order to accelerate the process of APEC trade liberalization and take the advantage of information technology and E-Commerce, the leaders of the Asia-Pacific Economic Cooperation (APEC) member economies approved the "APEC Blueprint for Action on Electronic Commerce" at the meeting in Kuala Lumpur, Malaysia in 1998. An action plan was formulated to promote E-Commerce. It is consented that paperless trading shall be realized in 2005 among developed economies and in 2010 among developing economies. It is expected that flawless paperless trading environment will be achieved in the whole region by the year 2020.

In recent years, APEC economies have been actively developing paperless trading and promoting the realization of trade facilitation. This has been listed as a very important task for the E-Commerce Steering Group (ECSG) of APEC. In October 2001, the 13th Ministerial Meeting of APEC approved the foundation of APEC E-Commerce Business Alliance. The alliance works towards strengthening the cooperation between governments and enterprises in the field of e-commerce, and for decreasing the disparities in the application exercises of e-commerce among the economies to achieve the paperless trading goals that APEC set in 1998. As one of the initiators, China International Electronic Commerce Center acts as the Chairman of the alliance. The secretariat is the permanent organization located in the China International Electronic Commerce Center.

In order to assess the overall status of paperless trading in the Asian-Pacific region, the members proposed starting a project to assess paperless trading since 1998. The proposal has been well received and approved by the APEC Ministerial Meeting in November 2004.

There are two parts involved with the project – the 2005 APEC Symposium on Assessment and Benchmark of Paperless Trading and the "APEC Assessment Report on Paperless Trading", or simply Assessment Report. The objective of the report is to research and analyze the status of APEC paperless trading development, summarize the achievements, share the experiences, overcome gaps and propose new strategies for the development of paperless trading.

This report consists three parts in total: Assessment Standard and Results of Paperless Trading Assessment, the Development Status and Analysis of APEC Paperless Trading,

and Proposals on APEC Paperless Trading Development. In the first part, the realization level of paperless trading has been analyzed and assessed from the following four aspects: the basic concept and determination of research focus, assessment methodology and standard, assessment result of paperless trading and analysis on the result of paperless trading assessment. In the second part, the development status of paperless trading in member economies has been analyzed from two aspects of paperless trading application environment and paperless trading application level. The third part proposes suggestions for the development of paperless trading from strategy and implementation point of view.

Considering the difficulties of the collection of statistical data and information, we have adopted the methodology based on case studies, detailed analysis on particulars and experts' experiences to interpret the development status of paperless trading.

During the production process of the report, we have had great support from a number of the government officials and industrial leaders. Sincere appreciation goes to those organizations and personnel who have supported this project, including Ministry of Commerce, P.R. China, the Secretariat of APEC, the secretariat of APEC E-Commerce Business Alliance, China International Electronic Commerce Center, University of International Business & Economy (UIBE), Beijing Cofutune Information Technology Ltd., Tradelink in Hong Kong, China, RosettaNet China, and the APEC contact points in Hong Kong, China, Australia, Thailand, Viet Nam, etc. Some opinions and suggestions from Mr. P.M. Kam of Axway and Ms. Emily Chung of Tradelink, Mr. Ross Wilkinson of Bolero, Professor Jianzheng Yang of University of Shanghai for Science and Technology (USST), Professor Jinchen of UIBE, Mr. Steven Yeo and Mr. Bin Luo of RosettaNet were very valuable. Acknowledgements also go to the experts and staff members who put great effort to make every success of this project: Senior Engineer Mr. Junsheng Liu, Senior Engineer Fudong Zhan, Professor Jian Wang, Professor Binzheng Gong, Ms. Ping Feng, Ms. Ying Zhao and Ms. Jianling Shi.

Part I. Analysis of Assessment on Paperless Trading

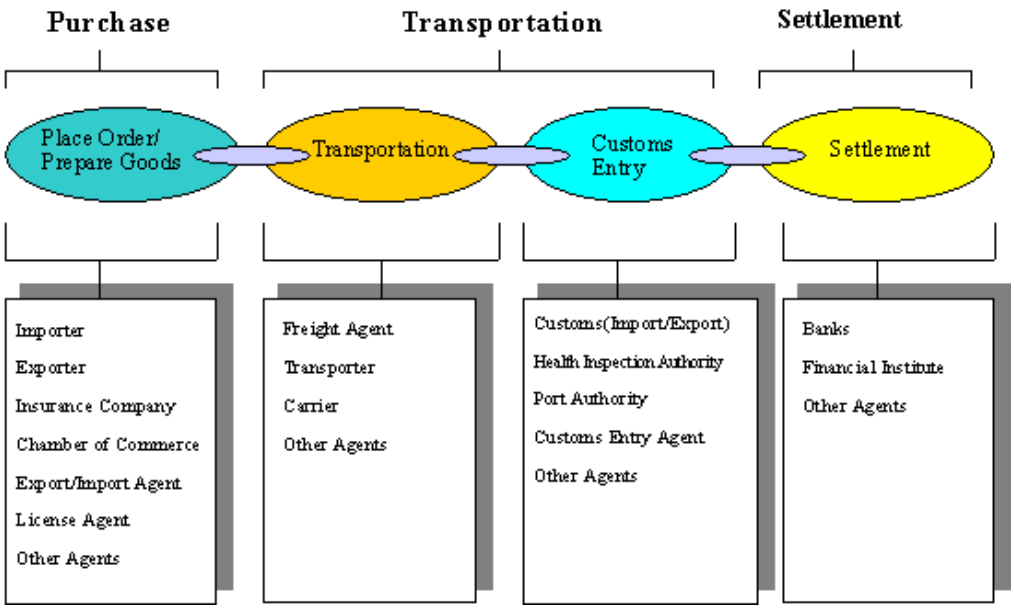
1.1 Basic Concept of Paperless Trading & the Determination of Research Focus

1.1.1 The Basic Concept of Paperless Trading

To assess the status of paperless trading is very much depending on how we definite and understand what paperless trading is about. It is our point of view that E-Commerce is a widesense concept stated in *APEC Blueprint for Action on Electronic Commerce*. In accordance with the explanation of "E-commerce Demonstration Act of United Nations International Trade Committee", Widesense of e-commerce refers to the business activities utilizing data information, which means the information produced, transmitted or stored via electronic, optical or other similar ways. In order to recognize and understand e-commerce and paperless trading more easily, we could regard a widesense e-commerce as e-business. E-business includes e-commerce, and paperless trading (or e-trade).

Usually, the chain starts when an order is placed, then transportation, custom clearance and paying bills in the end. The entire chain involves not only logistics, financial process, and information circulation, but also concerns multiple parties and working sectors. In accordance with the different goods and different ways of delivery, there are many different process and payment varieties, which heighten the complexity of the trade. (As shown in Fig 1.1.)

Fig. 1.1 Chain of International Trade



In the above process, some aspects are directly related to markets, and some are not (like customs and government). However, these non-market aspects play a very important role in the process, the efficiency of government administration and legislation impact on market efficiency directly.

With some market aspects, such as transportation, which is not a governmental task, sometimes governments will still set up some standards, rules and regulations to coordinate for administration purposes. Therefore, without government participation in building a better public service environment, the development of paperless trading will be restrained.

It can be said that paperless trading is a combination of electronic commerce, and E-government in the process of international trade. (As shown in Fig. 1.2) It is with the means of technologies and methods, particular utilizing IT technology to accomplish the revolution of transferring from paper documents to electronic documents during the performance of contract, to increase trade efficiency and reducing trade costs.

Fig. 1.2 Paperless Trading Relationship

The characteristics of paperless trading and e-commerce:

Paperless trading and e-commerce are economic activities both utilizing IT means. In order to understand paperless trading and e-commerce better, a characteristic table is given in the report as following:

Table 1.1 Table of Characteristics of Paperless Trading & e-Commerce

	e-Commerce	Paperless Trading	Notes
Non-market elements		★	Paperless trading cares more about legislative environment,

			trade regulations, standards, security, simplification of process and collaboration etc. none market elements.
Market elements	★		E-commerce cares more about trade behaviors. It includes price, turnover, time and clients etc elements.
Public service element in the chain of international trade		★	Paperless trading cares more about customs clearance, government administration, transportation, account settlement etc. public service elements in the chain of international trade.
Enterprises supplier chain elements	★		E-commerce cares more about purchasing, producing, and sales etc. elements.
Trade Efficiency		★	Paperless trading cares more about decreasing trade complexity, increasing trade efficiency, increasing trade opportunities, and decreasing trade cost.
Profit Maximization	★		E-commerce cares more about increasing the corn competency, expanding market occupancy, increase economic benefit.
Whole trade procedure	★		E-commerce concerns the digitalization of the whole procedure in pre, middle and post trade.
The enforcement process of contract		★	Paperless trading mainly involves the digitalization of documents generated in the process from the endorsement of contract to trade settlement.
Structured and None structured information	★		Information transmitted via E-commerce can be standard or none standard.
Structured information		★	Paperless trading transmitted mainly standard documents.
Resource consolidation		★	The effectiveness of paperless trading mainly embodies on

			resources consolidation and information sharing between trade participants.
Work timing	★		Simultaneously with purchasing, producing, and sales.
B2B/B2C/C2C	★		Application mainly in B2B/B2C/C2C e-commerce
B2B/B2G/G2G		★	Paperless trading cares more about application in B2B/B2G/G2G

(Note: ★ means attention paid more to e-commerce or paperless trading.)

From the point of view of paperless trading characteristics, its attention paid more to public environment and application to the chain of trade. It mainly involves customs clearance, government administration, international transportation, international settlement, as well as innovation of document transaction systems via IT means, to achieve the goals of resources consolidation, information sharing, and efficiency improvement and cost reduction.

1.1.2 Paperless Trading & Ecological Environment

There is not yet a unified and recognized definition of paperless trading. Considering the needs of assessing the current development status of paperless trading in APEC, we define "Paperless Trading", based on report analysis and conclusion of the facts, as:

"Paperless Trading" is the activity of exchanging data through electronic means. It means all parties in the chain of trade (suppliers, buyers, customs, administrators institutes, banks, logistic companies, etc.) utilize information technology and realize standard business data exchange and processes among participants, to accomplish the whole processes of contract of trading.

Based on the object of services, paperless trading can be classified as one of the following:

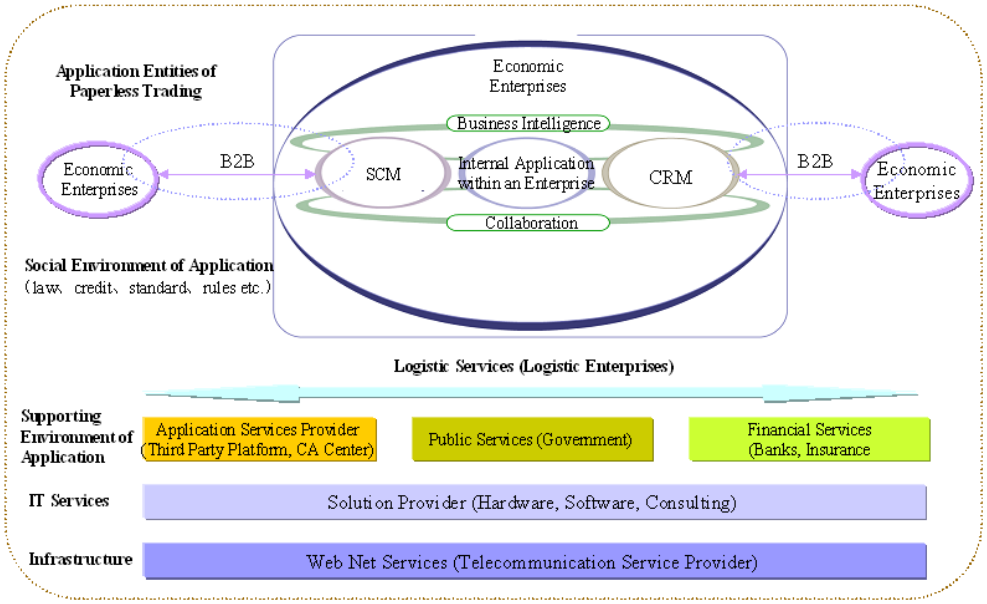
--Business-to-Business, B-to-B, or B2B;

--Business-to-Government, B-to-G;

--Government-to-Government, G-to-G.

The key classification is B2B. B2G/G2G application is for public services. Please refer to the following Figure 1.3 for the ecological environment of APEC paperless trading.

Fig. 1.3 Paperless Trading Ecological Environment



In the ecological environment of paperless trading, business entities need other entities in the chain of trade to provide relevant services in order to accomplish the activities of trade.

Web Services:
Mainly refers to basic infrastructures built by telecommunication services providers

IT Services:
Mainly refers to information services built by the solution providers (hardware, software, consultancy, etc)

Services for Application Environment:
Public services organized by governmental organizations, such as tariffs in the circulation area of trade, commodity inspections, customs clearance; financial services provided by banks and insurance companies; relevant services by application service providers, such as CA centers to issue certificates and identity verification; data exchange services provided by a third party platform (such as traditional EDI centers), etc.

Logistic Services:
Services provided on transportation, storage, loading, packaging, circulation, processing, allocation, information processing, etc. in order to transport goods from various spaces and in different times.

It still requires certain legislation, standards, trade regulations and trade conventions to ensure that business entities can accomplish trade activities on credit (payment capability, and willingness to pay), even in a virtual electronic commerce environment.

Therefore, legislative systems, standard systems, credit systems and trade regulations compose a marketing mechanism for the ecological environment of paperless trading.

1.1.3 The Focus of This Report

This report will be focused on the chain of international trade, with an emphasis on the elements of paperless trading environment building, customs clearance, government administration, international transportation, and international settlements. An assessment standard system on APEC paperless trading is formulated based on research and analysis. It is with this standard system that the application environment, facilitation status and application efficiency will be able to be analyzed. The result of assessment on paperless trading therefore will assist us to develop new strategies.

1.2 The Assessment Methodology & Standards

To assess the status of paperless trading, a scientific and objective research methodology is adopted.

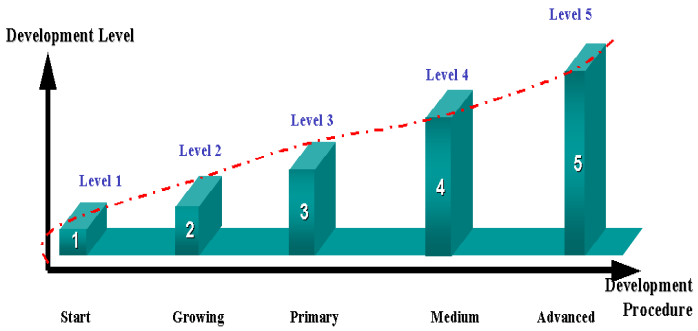
1.2.1 General Methodology

Taking the modern transferring revolution from using paper documents to electronic documents in international trade as core, and the application of paperless trading as main line, the realization level of paperless trading, readiness index and level of development as standard, the reports assesses paperless trading application from the aspects of application environment, level of application, efficiency of application.

1.2.2 Development Level

There are five classifications in regards to development level of APEC paperless trading: (As shown on Fig 1.4)

Fig. 1.4 Development Level of Paperless Trading



Level 5: Advanced Level

Regulatory Environment:

-A comprehensive act has been set for electronic signatures and electronic trading. There are almost no of legislative impediments in trading after a long period of practice;

-Enjoys high level of trade liberalization. Average customs taxes are approaching zero. There are few restrictions apart from customs taxes;

-A comprehensive plan of development for paperless trading has been formulated, and it creates a good regulatory, legislative environment. Governments vigorously support in organization, coordination and capital investment.

Technical Environment:

-Having formulated a standard system for paperless trading. The standard system is widely applicable;

-A cross boarder CA system has been set.

Application Level:

-Application of paperless trading covers all areas of customs clearance, government administration, transportation and payments;

-The trade participants have realized the consolidation of resources of paperless trading and practice application of paperless trading cross some borders;

-Over 85% of trade documents can be transmitted via electronic means.

Application Efficiency:

-The application efficiency is obvious;

-Trade costs and expenses have been widely decreased in economies;

-Operation time has been significantly reduced;

-The process of trading has been significantly simplified and improved.

Level 4: Medium Level

Regulatory Environment:

-A comprehensive act has been set for electronic signature and electronic trading. There are only a few legislation impediments in trading;

-Enjoys high level of trade liberalization. Average custom tax is under 5%. There are a few restrictions apart from customs taxes;

-A comprehensive plan of development for paperless trading has been formulated, and it creates a good regulatory, legislative environment. Governments support organization, coordination and capital investment at a certain level.

Technical Environment:

-Having formulated a standard system for paperless trading, the standard system is applicable in a certain area;
-A CA system has been set in the economy itself.

Application Level:

-Application of paperless trading covers most of customs clearance, government administration, transportation and payments;
-The trade participants have realized the consolidation of resources of paperless trading in most aspects of the chain;
-Over 70% of trade documents can be transmitted via electronic means.

Application Efficiency:

-The application efficiency is obvious;
-Trade costs and expenses have been widely decreased in most areas;
-Operation time has been obviously reduced;
-The process of trading has been partly simplified and improved.

Level 3: Primary Level

Regulatory Environment:

-An integrated act has been set for electronic signatures and electronic trading and the implementation process has been started. There are a few legislation impediments in trading;
-Enjoys average level of trade liberalization. Average customs tariff is under 6%-8%. There are some restrictions apart from customs tariff;
-A basic plan of development for paperless trading has been formulated, and it creates a basic regulatory, legislative environment.

Technical Environment:

-Having formulated a standard system for paperless trading, the standard system is applicable in a certain area;
-A CA system has been set in number of industries and areas.

Application Level:

-Application of paperless trading covers major areas of customs clearances, government administration, transportation and payments;
-The trade participants have realized the consolidation of resources of paperless trading in major aspects of the chain;
-Over 50% of trade documents can be transmitted via electronic means.

Application Efficiency:

-The application module works;
-Trade costs, expenses have been partly decreased in some areas;
-Operation time has been reduced to a certain level;

-Part of the process of trading has been simplified and improved.

Level 2: Growing Level

Regulatory Environment:

-The legislation and regulation is not comprehensive. There have only been a few actions toward electronic signature and electronic trading. There are a number of legislation impediments in trading;

-The level of trade liberalization is quite low. Average customs tax is under 9%-12%. There are number of restrictions apart from customs taxes;

-Governments are working on plans and regulations for the development of paperless trading.

Technical Environment:

- The standard of paperless trading is applicable in some areas;

-A CA system has been set in some of industries and areas.

Application Level:

-Application of paperless trading practices in a few areas of custom clearance, governmental administration, transportation and payments;

-A few trade participants have realized the consolidation of resources of paperless trading;

-Over 20% of trade documents can be transmitted via electronic means.

Application Efficiency:

-The application module is average;

-Trade costs and expenses have been hardly decreased;

-Operation time has been reduced comparatively;

-Simplification of the process of trading has been partly realized in some individual areas.

Level 1: Start Level

Regulatory Environment:

-The legislation and regulation are under discussion. There are many legislation impediments in trading;

-The level of trade liberalization is quite low. Average customs tariff is above 12%. There are many restrictions apart from customs tariff;

-Governments have not developed plans and regulations for the development of paperless trading.

Technical Environment:

- The standard of paperless trading is applicable in a few areas;

-A CA system has been under construction;

Application Level:

-Application of paperless trading practices only in a few areas of customs clearance, government administration, transportation and payments;
-Paperless trading has limited applicability in internal departments;
-Less than 20% of trade documents can be transmitted via electronic means.

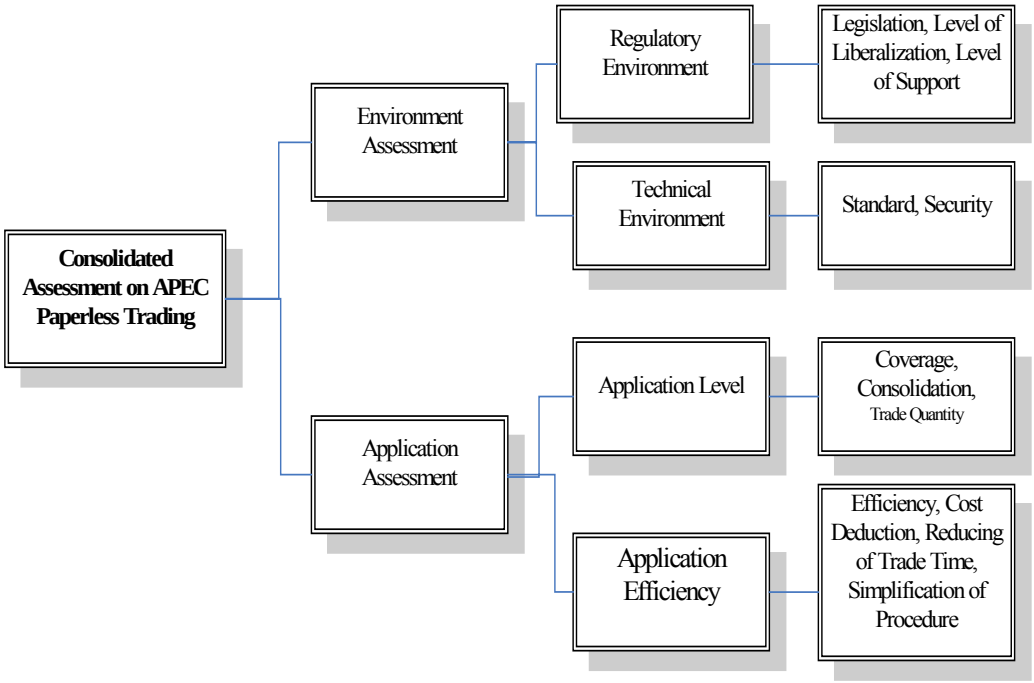
Application Efficiency:

-The application module has not been formed;
-Trade costs and expenses have not been decreased;
-Operation time has not been reduced;
-Simplification of the process of trading has not been started.

1.2.3 Assessment Index

In order to assess the status of paperless trading development in APEC region in a comprehensive and objective manner, this report focuses on the characteristics of paperless trading and the key elements, in reference to APEC E-Commerce Readiness Assessment index system.The following assessment index for APEC paperless trading is proposed:

Fig. 1.5 Tier of Index Indicator for Assessment of Paperless Trading



As the above diagram indicates, the framework for assessing current realization of paperless trading contains three levels:

First Level:

- To assess the general level of the realization of paperless trading;
- To evaluate the general level of realization of paperless trading after first assessing environments and applications (the two first level indexes).

Second Level:

- As the "essential part" of the realization of paperless trading, the second level divides the first two level indexes into four essential sub-indexes according to the core elements of paperless trading.

Third Level:

- The judgement on the level of paperless trading realization is further divided into a third level of indexes based on four " second-level" indexes. It is assessed and distinguished separately.

1.2.4 Parse of Indexes

Assessment on Environment:

1) Regulatory Environment

Legislation Level: refers to relevant actions, regulations and favorable policies approved by governments for the development of paperless trading;

Trade Liberalization Level: refers to the level of trade liberalization caused by decreasing customs taxes and tariffs;

Support Level: refers to government support level in promoting paperless trading.

2) Technical Environment

Regulated. Standardization: refers to the level of standardization transmitting and processing electronic documents;

Safety & Security: refers to the level of services and the environment building during electronic certificate transmission and processing.

Application Assessment:

1) Application Level

Coverage Rate: refers to the application wideness in customs clearance, government administration, transportation, and account settlements during the paperless trading process;

Integration Level: refers to the shared level of resources among participants in trading (technology, standards, services, certificates, information processing, etc.), such as the level of "single window" services for paperless trading among the economies;

Trading Quantity: refers to the number of documents completed by electronic transmission.

2) Application Efficiency

Module Efficiency: refers to the efficiency of the application module and the development in paperless trading;

Costs & Expenses Reduction Rate %: refers to the reduction level of costs and expenses when using paperless trading compared with costs and expenses when using traditional trading. Such reduced costs and expenses are derived from reductions in the process of bills and transmission, customs clearances, storage, certificates, port affairs, goods inspections, banks, agency fees, etc.;

Efficiency on Time Reduction: refers to the level of convenience in paperless trading. If the process of administration, customs clearance, transportation, and account settlements are done online, it will reduce the processing time;

Acceleration of the Process of Simplification: refers to the driving role of paperless trading to simplify trading processes, realize better business procedures, and improve trading efficiency.

Assessment Methodology

A comprehensive assessment methodology has been adopted. It is based on the knowledge, experiences and judgment of APEC paperless trading experts, by means of assessment indexes and weights, to analyze the development status of paperless trading, therefore to evaluate the level of the realization of paperless trading and to set an accurate, quantified ranking.

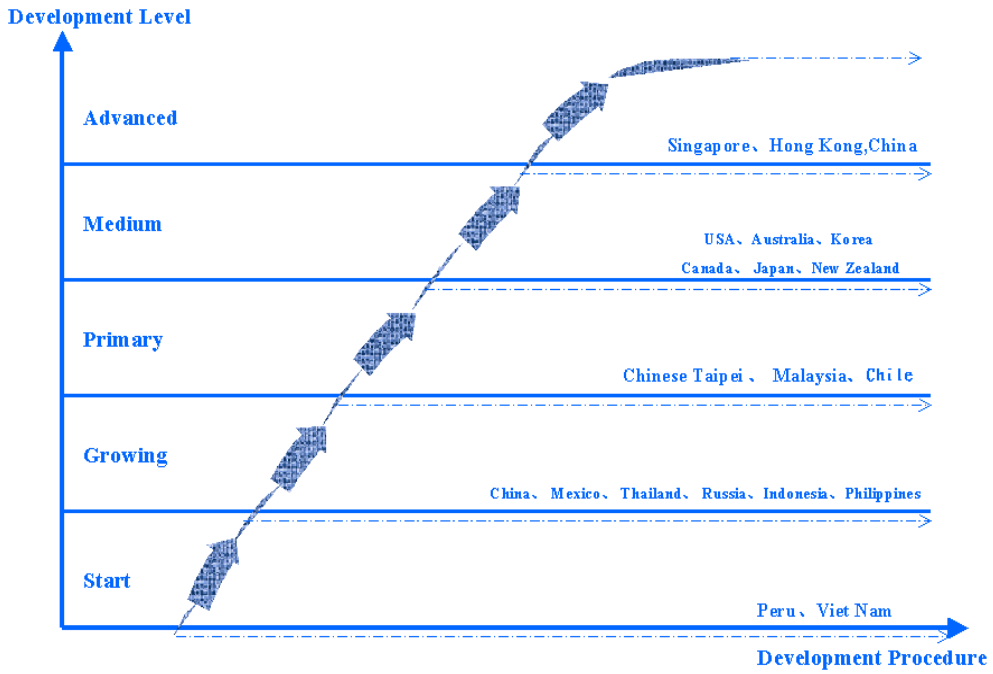
1.3 Results of the Assessment on Paperless Trading

The realization level of paperless trading is mainly assessed comprehensively from the secondary indexes such as the regulatory environment, the technical environment, the application level, and the application efficiency. We divided the realization status into five levels. The assessment levels start from low to high and are classified as follows: start, growing, primary, medium and advanced. Based on information we collected from economies, in accordance with the three level indexes indicated above, the realization level of paperless trading is scored as following:

1.3.1 Regulatory Environment Analysis

The regulatory environment of paperless trading among economies mainly refers to the wider humanity environment, and it also refers to the work done by governments in promoting paperless trading. The indexes mainly reflect aspects including legislation status, trade liberalization, and governmental support. Most APEC economies attach importance to the creation of a regulatory environment for paperless trading, and are making great efforts to facilitate an environment for the full application of paperless trading. The Status of the regulatory environment of paperless trading among APEC economies after assessment is as follows.

Fig. 1.6 Policy Environment of Paperless Trading in APEC Economies



Advanced Level: Hong Kong, China & Singapore

The characteristics of these economies: high level of trade liberalization, the legislation system is completed, there are few legislative impediments, a comprehensive system on certificates of paperless trading and document standards is widely applied, and government support is strong.

Medium Level: The United States of America; Australia; Korea; Canada; Japan & New Zealand

The characteristics of these economies: high level of trade liberalization, (average customs tax is under 5%); legislative system is almost completed (certain actions toward electronic trading, electronic signatures, and privacy protection) and widely

applied, there are a few legislative impediments; a comprehensive development plan has been set by the governments, they enjoy a fine regulatory and legislative environment, and the support in the areas of organization, coordination and capital.

Primary Level: Chinese Taipei; Malaysia & Chile

A comprehensive legislation and regulation system on electronic signature, electronic trading has been set in these economies. Execution is in process. There are only a few legislative impediments in paperless trading. Trade liberalization is average. Average Customs tariff is reduced to between 6% and 8%, tariff restriction is average. Governments have formulated a basic development plan in order to promote paperless trading in the economies. They also created a basic regulatory and legislative environment.

Growing Level: China, Mexico; Thailand; Russia; Indonesia & Philippines

The regulatory and legislative system is not completed in these economies. There are some relevant regulations on electronic signature. There are a number of legislative impediments in paperless trading. The level of trade liberalization is low. The average customs tax is between 9% and 12%. There are a number of tariff impediments. Governments are working on a development plan and relevant regulation on paperless trading.

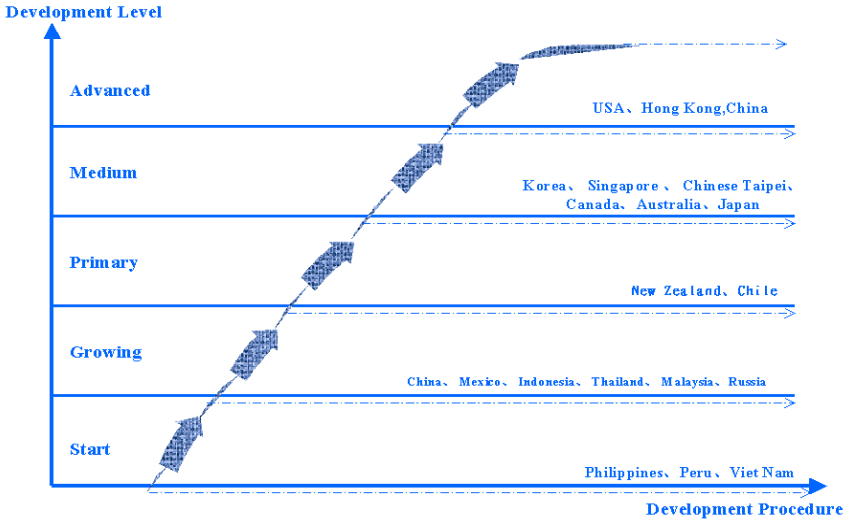
Start Level: Peru & Viet Nam

The legislative and regulatory acts are under construction in these economies. There are quite number of legislative obstacle in paperless trading. The level of trade liberalization is low. The average customs tax is over 12%. There are quite a number of tariff impediments. Governments haven’t produced a development plan or regulations on paperless trading.

1.3.2 Technical Environment Analysis

The technical environment in paperless trading does not refer to a purely technical environment, but refers to a relevant business technical environment. It is mainly reflected in a standardized system and CA services. Technology dynamically changes with each passing day in paperless trading. Standardization is the key that determines whether paperless trading can be applied efficiently while commercial data and certificates are transmitted. After Assessment, the technical environment of paperless trading is as follows:

Fig. 1.7 Technical Environment of Paperless Trading in APEC Economies



Advanced Level: The United States of America & Hong Kong, China

The standard systems on paperless trading have been set up in these economies. Relevant standards have been widely applied. A cross border CA system has been set up.

Medium Level: Korea; Singapore; Chinese Taipei; Canada; Australia & Japan

A basic standard system on paperless trading has been set up in these economies. Relevant standards have been applied in some areas. A national CA service system has been set up.

Primary Level: New Zealand & Chile

A comparative standard system in paperless trading has been set in these economies. Relevant standards have been applied. A CA service system has been set in some parts of the trading process and in some industries.

Growing Level: China; Mexico; Indonesia; Thailand; Malaysia & Russia

The standard system on paperless trading is applied in some areas in the economies. A CA services system has been set in some industries and areas.

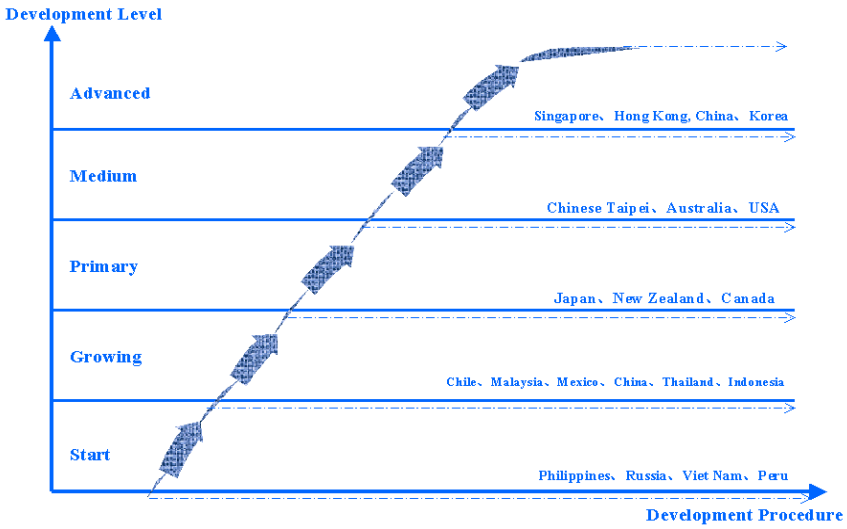
Start Level: Philippines; Peru; &Viet Nam

The standard system has been applied only in a few areas in paperless trading. A CA services system is under construction.

1.3.3 Level of Application

The level of application refers to various aspects of commercial data and certificates transmitted in paperless trading in the economies, such as customs clearance, government administration, transportation, and payments. The level of application is mainly reflected on the indexes of the coverage of paperless trading, integration level, and the level of realization of electronic transmission. After assessment, the status of level of application is as follows:

Fig. 1.8 Application Level of Paperless Trading in APEC Economies



Advanced Level: Singapore; Hong Kong, China & Korea

Paperless trading is being exercised in every area, such as customs clearance, government administration, transportation, and payments. Participants in trading have realized resource consolidation on electronic bill transmission, and have also realized cross border paperless trading in some areas. More than 85% of trade bills have been electronically transmitted.

Medium Level: Chinese Taipei; Australia & The United States of America

Paperless trading is being exercised in most of areas, such as customs clearance, government administration, transportation, and payments. Participants in trading have realized resource consolidation on electronic bill transmission in most parts of the trade chain. More than 70% of trade bills have been electronically transmitted.

Primary Level: Japan; New Zealand & Canada

Paperless trading is being exercised in major areas, such as customs clearance, government administration, transportation, and payments. Participants in trading have realized resource consolidation on electronic bill transmission in major parts of the trade chain. More than 50% of trade bills have been electronically transmitted.

Growing Level: Chile; Malaysia; Mexico; China; Thailand & Indonesia

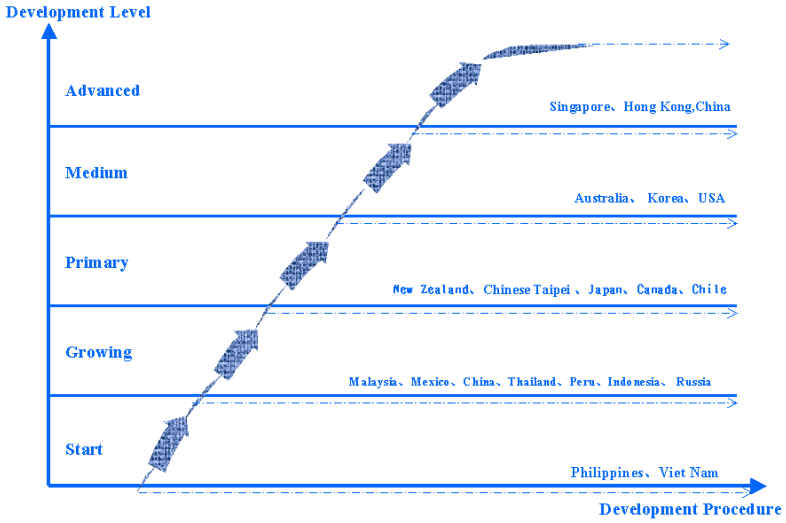
Paperless trading is being exercised in a few areas, such as customs clearance, government administration, transportation, and payments. Some participants in trading have realized resource consolidation on electronic bill transmission. More than 20% of trade documents have been electronically transmitted.

Start Level: Philippines; Russia; Viet Nam & Peru
Paperless trading is being exercised in some individual areas, such as customs clearance, government administration, transportation, and payments. Electronic documents can be transmitted only in some internal departments. Less than 20% of trade documents have been electronically transmitted.

1.3.4 Application Efficiency

Application efficiency is reflected mainly in the indexes of efficiency, trade costs and expenses reduction, processing time reduction, and process simplification and supremacy. The Status of application efficiency among member economies after assessment is as follows:

Fig. 1.9 Application Efficiency of Paperless Trading in APEC Economies



Advanced Level: Singapore & Hong Kong, China

The efficiency of the application module is significant in these economies. The costs and expenses have been reduced widely among the economies. Processing time has been obviously reduced. Processing simplification and supremacy have been realized comprehensively among the economies.

Medium Level: Australia; Korea & the United States of America

The efficiency of the application module is obvious in these economies. The costs and expenses have been reduced in some areas among the economies. Processing time has been obviously reduced. Trade flow has been partially simplified and optimized among member economies.

Primary Level: New Zealand; Chinese Taipei; Japan; Canada & Chile

The application module is efficient in these economies. The costs and expenses have been reduced in a few areas among the economies. Processing time has been reduced to a certain level. Trade flow has been partially simplified and optimized among member economies.

Growing Level: Malaysia; Mexico; China; Thailand; Peru; Indonesia & Russia

The efficiency of the application module is average in these economies. Costs and expenses have been reduced insignificantly. Processing time has been reduced comparatively. Trade flow has been partially simplified and optimized among member economies.

Start Level: Philippines & Viet Nam

The application module has not been efficient in these economies. Costs and expenses have not been effectively reduced. Processing time has stayed the same. Trade flow has not been simplified and optimized among member economies.

1.3.5 Consolidated Assessment Results

In order to assess the status of paperless trading among APEC economies, we divided the process of realizing paperless trading into five stages: start stage, growing stage, primary stage, medium stage, and advanced stage. In our view the realization of paperless trading is a developing process. Some economies are at a higher level of paperless trading, but some are only at the starting stage. In light of the fact that the assessment on the general status of the realization of paperless trading is not absolute, to adopt a comprehensive methodology on the assessment of paperless trading is a must. The realization of paperless trading does not only reflect on various environmental building, including basic construction, legislation, and regulatory support, but also the level of standardization, as well as the application level of paperless trading.

The preparation process of paperless trading is reflected mainly in the start stage and the growing stage. The characteristics of them are: a certain level of support is given for the development of paperless trading among the economies. A basic paperless trading environment has been built, as well as many application modules. But in these economies, the consolidated efficiency on paperless trading is not obvious, nor is integration effective. Therefore our view is that these economies are still in the process

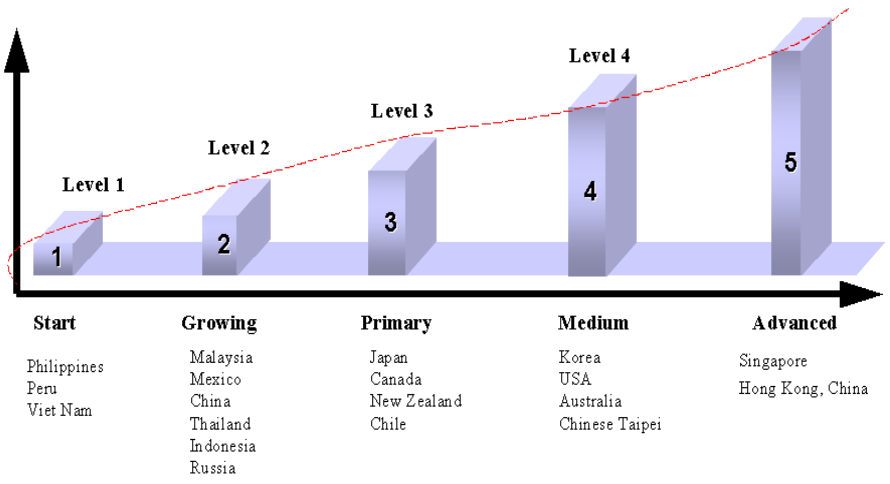
of implementing paperless trading, and paperless trading has not in fact been realized. These economies include Malaysia; Mexico; China; Thailand; Indonesia; Russia; Philippines; Peru and Viet Nam. But the development level is different among each individual economy listed above.

With some other economies, the economic development level is higher and the level of trade liberalization is relatively higher. The application of paperless trading has been reflected in business-to-business, business-to-government, and the relevant sections of the trade chain. The legislative environment for paperless trading has almost been completed. The standard for commercial data transmission has been set. There are few impediments in paperless trading. Apart from this, business and government are fully enjoying the benefits and advantages of paperless trading. These economies have moved from the growing period into a realization period of paperless trading. These economies include Singapore; Hong Kong, China; Korea; the United States of America; Australia; Chinese Taipei; Japan; Canada; New Zealand and Chile.

There is significant consolidated efficiency reflected on paperless trading in some economies like Singapore and Hong Kong, China. In our view, they have entered into an advanced level of paperless trading. Even though some of the consolidated efficiencies are not obvious, but the environment and application aspects have been created or built completely. The application levels of enterprises in these economies are very high. In our view some economies have come into a medium period of paperless trading. These economies include Korea; the United States of America; Australia and Chinese Taipei. Other economies, such as Japan; Canada; New Zealand and Chile have achieved significant progress in environment building, level of application and level of efficiency. In our view, they have come into a realization period of paperless trading.

Based on the above assessment, the comprehensive status of the realization of paperless trading is as follows:

Fig. 1.10 Realization Stage of Paperless Trading in APEC Economies



Advanced Stage:	Singapore and Hong Kong, China
Medium Stage:	Korea; the United States of America; Australia and Chinese Taipei
Primary Stage:	Japan; Canada; New Zealand and Chile
Growing Stage:	Malaysia; Mexico; China; Thailand; Indonesia and Russia
Start Stage:	Philippines; Peru and Viet Nam

The above assessment is a result based on the material collected. There were some difficulties in possessing relevant materials in some economies, such as Papua New Guinea and Brunei. Therefore they are not included in the results of our assessment.

1.4 Analysis on the Results of the Assessment of Paperless Trading

1.4.1 Analysis on Application Module

The application module refers to the supremacy and creativity of the business module, technical proposal, organization administration and services, as well as the efficiency on different application modules. It also refers to the adaptability of the economic and social development level in the economy.

The application of paperless trading involves many segments in the chain of international trade, such as reaching a deal, delivery, payment, administration, and customs clearance. The application modules are multiple, diversified and are trying to probe from various angles.

We can investigate the application modules of paperless trading from different points of view:

From contents of trading, the application module can be divided into two kinds: an application on exchanging goods and an application on services. The application on exchanging goods emphasizes exchanging ownership of goods, such as the delivery of goods, account settlements, administration, passage of goods, etc. The application on services emphasizes the provision of services, and the scope of application differs from that of the traditional purchasing of goods. The driving point is to facilitate services. As a matter of fact, the creativity of paperless trading mainly focuses on services of trade. The web cannot replace any actual account settlement, but can improve the way services and the content of services are provided, and can even change the traditional content of trade or method of services. When the service trade is more developed, then the applications driven by services will be more sophisticated and popular. Wireless business module is a new direction in APEC paperless trading development, and enjoys a huge potential.

From a technical point of view, the application module can be divided into three parts:

the dedicated application module, the open Internet application module and the wireless business application module. After analysis of these, a technical path and a realization path of paperless trading can be tracked. The dedicated application module is the first application module of paperless trading. Regardless of the development level of an economy (from developed economies like the Unites States of America or Japan to developing APEC economies like Singapore and Korea), the application of paperless trading has been applied to all through the dedicated application module.

The dedicated application module is developed based on the EDI standards. The techniques of commercial data transmission are realized mainly on the isolated corresponding EDI standard. The web infrastructure is relatively isolated. While the dedicated application module can prevent high coordination costs, it is very expensive itself to implement. Implementation includes setting up standards and massive work on infrastructure construction. The more recently developed open Internet application module has changed the landscape.

The more recently developed open Internet application module has broken away from original isolated information exchange systems. The widespread Internet facilitates commercial data exchange. Today, there are many applications of paperless trading that have transferred gradually onto global Internet. The wireless business module is progressing forward towards a more convenient system based on the open Internet module. The mobility of staff members cannot prevent the application of paperless trading. The wireless business module reflects the new creative direction of paperless trading and enjoys great future prospects.

In view of the application of paperless trading, application modules can be divided into the administrative module, customs clearance module, and cross border trading module. Some of the application modules of paperless trading are biased towards the administration module, such as Singapore's and Korea's; some are biased towards customs clearance, like Hong Kong, China's. Apart from this, some economies, including China, are exploring the cross border trading module. In the end, it is the goal of the paperless trading system to set a global system and exchange a platform among all APEC economies, and to realize commercial bills and commercial information transmission seamlessly. In developed economies, the normal transmission of trade bills across borders is conducted via internal web services systems within large-scale multinational companies. The multinational companies rely on their special strengths and let many small & medium-sized enterprises become appendages of their trade chain network. Until now, cross border trade has relied on the net services provided by value added service providers. It requires the coordination among governments in APEC economies, since cross border application needs standardization and a superior distribution system.

1.4.2 Analysis on Application Efficiency

The application efficiency of paperless trading refers to two aspects: efficiency and benefits. Efficiency refers to savings on costs, time, and expenses. Benefits refer to the realization of creativity and supremacy via a simplified business process. Specifically, the benefits brought to enterprises and society by paperless trading is reflected on the following aspects: opportunities, convenience, savings and efficiency.

Opportunity mainly refers to more trade opportunities brought by paperless trading via the chain of trade. It also reflects that technical means may bring more trade opportunities, and help to better maintain existing clients.

Convenience mainly refers to the process of simplification and convenience brought by paperless trading via the chain of trade. It reflects the level of convenience to enterprises during the trading process. It also can weigh the comprehensive efficiency of an economy.

Savings mainly refers to the time and cost reduction brought to participants by paperless trading. Savings is an important index on the application efficiency of paperless trading.

Efficiency mainly refers to the efficiency improvement brought to participants by paperless trading. This is reflected on operational efficiency within the chain of trade. In fact, it can be reflected on every index with each aspect of international trade.

We have listed the significant efficiency aspects in the diagram, which can be seen through each index. These aspects are mainly benefits most cared about by enterprises interested in trade. Since enterprises in the process of trading care most about how to get more trading opportunities with the lowest cost, it is obvious that the two major concerning aspects are: opportunity and savings. In relation to the segment of transportation, major goals pursued by enterprises are convenience and efficiency. Since there are many segments in transportation and the process is complicated, enterprises are pursuing more for conveniences and shortcuts. The same is true with customs clearance. Within the payment segment, more importance is weighed with savings on costs and improvements on efficiency. And with the administration segment, the efficiency of paperless trading is reflected on convenience and efficiency. With the value-added third party services, the efficiency of paperless trading is reflected on trade opportunities and savings.

Fig. 1.11 Relevant Elements of Paperless Trading

It is demonstrated from the material collected from member economies, paperless trading has brought various level of benefits to all economies.

With transportation, for example, up to the beginning of 2003, 78.5% of enterprises in Japan had carried out the EDI system. 36% of enterprises had adopted the EDI system on trial goods and transmission loading notices in the process of logistics. It has not only improved the efficiency on transportation, but also provided better services to clients.

In relation to customs, for example, the government of Singapore started promoting electronic customs clearance in the 1980s. More than 95% of import and export companies do their customs clearance by electronic means. The amount of users has increased from 260 in 1989 to 25,000 currently. The savings on customs has reached 40% to 60%. Considering the processing of 10 million customs declaration bills every year, more than 1 billion Singapore dollars (about 600 million US dollars) has been saved on paper administration.

Regarding government administrations, for example, the China Inspection and Quarantine Bureau has reduced the processing steps from 11 to 6 via web site. The period for processing a report on the inspection of goods, which are not required for inspection, was reduced from 1 to 2 days to only 1 hour.

1.4.3 Analysis on Development Module

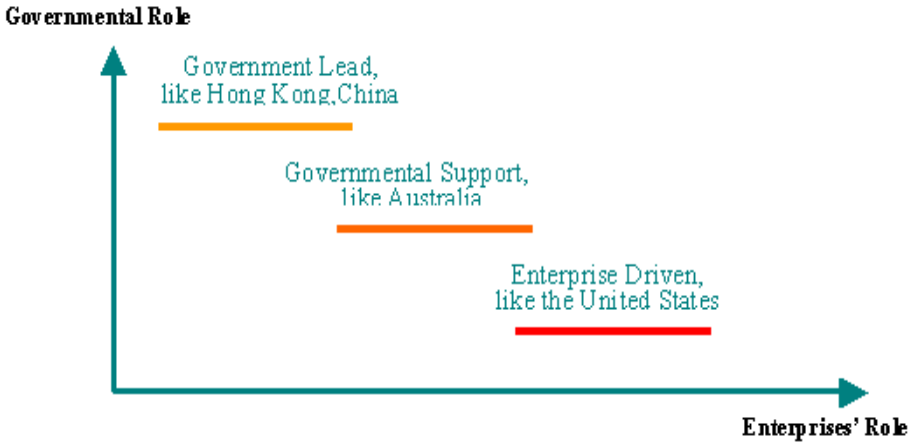
Since the start of EDI in the 1970s until the birth of the Internet in 1990s, modern information technology has permeated into every segment of business. Modern information technology is driven by via two paths. One is from the notion of enterprises, and another is from the notion of governments. Enterprises consider building their own competency, and building a value chain that can be kept under control. The basic strategy is to reduce costs, improve efficiency, and have different means of competition.

The governments have to consider national competence apart from macro control. The basic intention is to manipulate the environment for higher efficiency and lower costs, thus creating a better operational environment for its enterprises, to further obtain a national competency in the international market, and to benefit their enterprises and citizens.

The government of APEC member economies have realized more and more the benefits that information technology can bring to their societies， and therefore actively promote the implementation of paperless trading. But the level of development varies among different economies, and market structures are different, therefore regulations imposed by governments among member economies and areas are different. The application modules of paperless trading are also different. Some governments of economies play a leading role in promoting paperless trading implementation. Some governments emphasize more greatly the role of enterprises in regards to the application of paperless trading, and governments are to create a fine regulatory environment. APEC member economies The United States and Japan are setting macro policies and creating better regulatory environments to clear away trade impediments for enterprises. In some other economies, such as Australia; Singapore; Korea and Hong Kong, China, governments are playing a pioneering role in promoting paperless trading. Governments themselves buy shares of web trade service organizations, practice paperless trading with governmental administration documents, as well as authorize web trade service organizations to carry out the services of certificates, data exchanges and other applications of paperless trading.

We have divided the implementation modules of paperless trading in APEC economies into three kinds: government led, government supported and enterprise driven.

Fig. 1.12　Implementation Modules of Paperless Trading



1. Government-Led

“Government-led” refers to the leading role that governments play in the application of

paperless trading. Normally governments set up web trade service organizations, which enjoy a close relationship with them, either taking a controlling share or taking a bigger percentage of shares, such as TradeLink in Hong Kong, China, in which the government owns 40% of shares. The Chinese International Electronic Commerce Center is a totally state funded service organization. Korean KTNET is a value-added service organization funded totally by the Korean Trade Association. The financial department of the Chinese Taipei holds 40% of TradeVan shares.

2. Government-Supported

"Government-supported" refers to the fact that governments have not participated in investment, but governments are important participants. Australian non-profit organization Tradegate's members include government departments and industrial associations. The Australian government does not interfere with the promotion on EDI customs clearance, but relies on promotion from relevant industrial associations.

3. Enterprises-Driven

"Enterprises-driven" refers to the fact that governments hardly participate in any specific paperless trading, but leave it up to enterprises or industries to promote paperless trading. For example, Japan's TEDI is funded by various trade related industries. The Unites States of America is in very similar situation that paperless trading is promoted by industrial association and large-scale company. Governments reduce interference and create dynamic working environment.

Even though governments play different roles in paperless trading, we can hardly define which module is better than the others. Based on our analysis, the government role in paperless trading is restrained by the following elements:

a. Enterprise Structure

In some developed economies, such as The United States of America and Japan, it is large-scale companies that play an important role in economics. The companies themselves have tried to utilize information technology to transmit commercial bills within internal departments or from company to company in the 1970s and 1980s last century. The development of EDI emphasizes that commercial data exchange move from enterprises to cross-border trade. These large-scale companies have widely applied electronic commercial data exchange internally. They have also taken advantage and obliged their trading partners to apply paperless trading, by transmitting orders and certificate bills such as invoices. The position of large-scale companies is getting stronger, and companies are getting more motivated to promote paperless trading. For example, American corporation Wal-Mart has been building its comparative global chain of supply by use of its global electronic orders and logistical information systems. In economies where there are many small- and medium-sized companies, there are no

pioneering roles of large-scale companies; therefore they rely more on governments to promote paperless trading, such as newly developing economies Hong Kong, China; Singapore and Chinese Taipei. These economies have governments with the power to let small and medium-sized companies benefit from paperless trading.

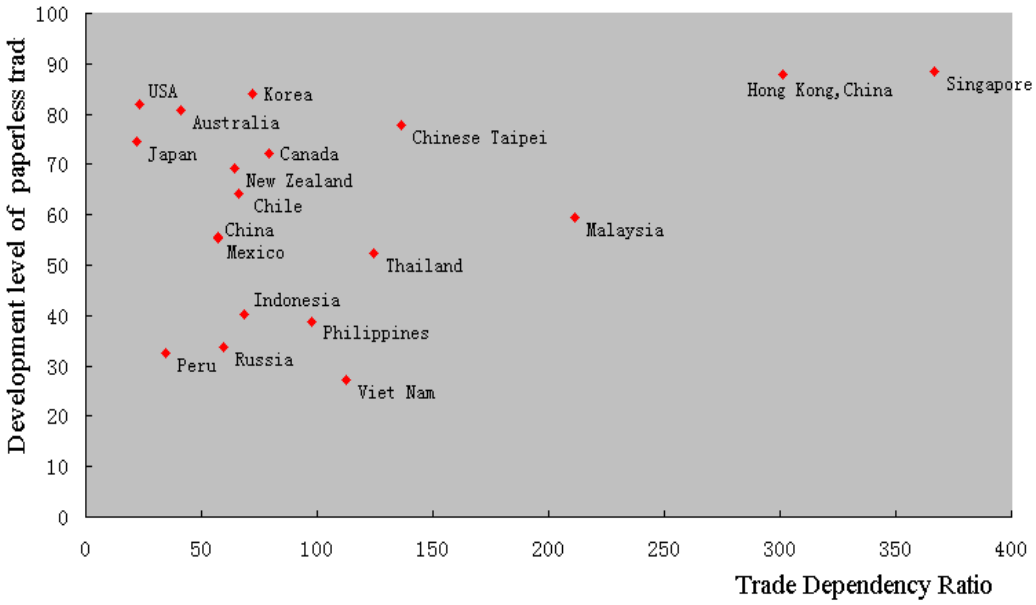
b. Market Structure

Developed economies are normally strong buyers in the international market place. For example, the United States of America ranks number one among major trading economies, and also ranks number one in APEC. This case is similar among other developed economies. Multinational companies have been influenced by globalization. Internal trading, which is driven by large-scale companies that requires supremacy on buying, producing and sales networking, have increased dramatically. There is even a company where the internal trade rate reached 90%. It is easier to realize paperless trading with internal trade, as there are fewer issues to coordinate. Multinational companies understand very well the possible benefits that could be brought about by paperless trading; therefore they have actively promoted web usage within internal and cross border offices. Today, there are global chains of supply systems in many multinational companies that are trying to maintain an advanced position in international market places. That requires the suppliers to provide goods in the most convenient way using the lowest possible costs. This has influenced other developing economies to implement paperless trading. For example, American buyers require that all of their suppliers have the ability of electronic data exchange. The need for logistics must also be transacted via electronic means. This has become a commercial convention of multinational companies.

c. National Competency

Web technology has become a basic infrastructure for global businesses as the Internet continues to gain popularity. Many newly developing economies are making efforts to implement paperless trading to increase their national competency. First of all, paperless trading can effectively reduce costs within whole societies, therefore improving the utilization ratio of resources. Secondly, governments that promote paperless trading can achieve efficiency. Pioneering governments can create convenience for enterprises in trade if those governments improve the paperless trading environment. Thirdly, governmental promotions on paperless trading can improve the efficiency of a whole nation. Some newly developing economies, such as Hong Kong, China; Singapore; Chinese Taipei and Malaysia depend on trade to a certain degree, therefore they are making great efforts to implement paperless trading to possess their own competencies. (As to the relationship between dependency and the development level of paperless trading, please refer to the following diagram.)

Fig. 1.13 Interrelationship between Dependency of Trade & Development Level of Paperless Trading



Source: WTO database 2001-2003

1.4.4 Analysis on Level of Integration

The benefits of paperless trading will have to be achieved by the integration of departments. Particularly, as the improvement of social information technology, enterprises' information systems are expanding; it requires a resources consolidation within the APEC economies.

There are two levels of integration: internal integration within each economy and cross border integration.

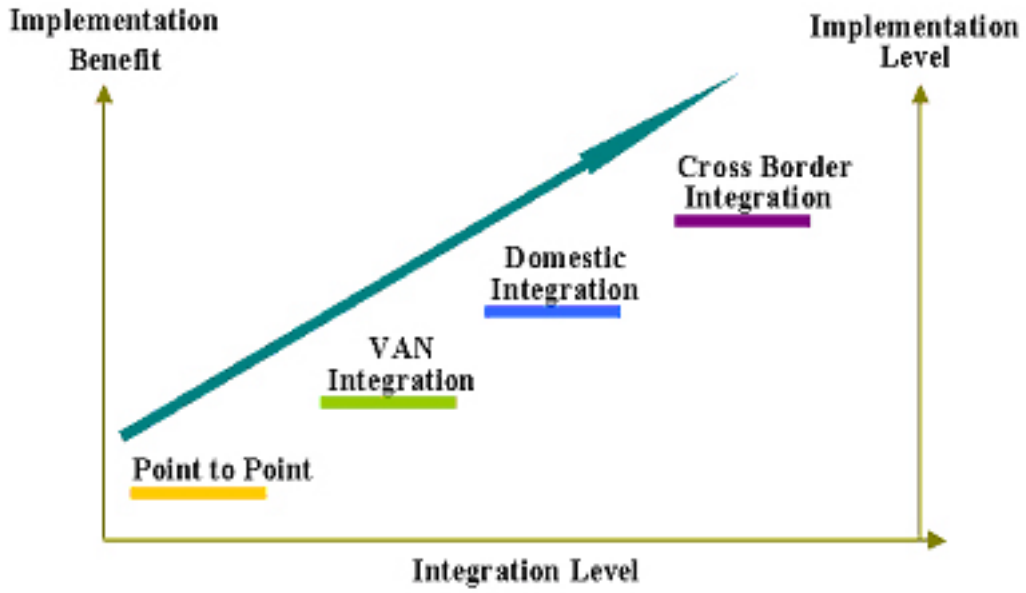
Internal Department Integration in Each Economy: It was in the 1960s of the twentieth century that commercial data exchange via computer between enterprises started. In the latter 1980s, as the infrastructure was improving along with the formulation of EDI standards, there appeared some value-added networks which specialized in providing data transaction services for business to government, and business to business. The appearance of value-added networks indicated that bilateral trade services on commercial data transactions between businesses to businesses and governments to businesses had become multilateral trade services, which were centered with operations of value-added networks. Value-added networks had become data transaction centers to provide services for data transaction and CA services between governments and businesses and between businesses and other businesses.

Value-added services in many economies started from governmental administration, such as customs clearance. For example, the Singapore government built a SNS (Singapore Net Services Company, now called Crimson Logic) at an early stage. SNS was created for electronic services on customs clearance.
Tradelink in Hong Kong, China started from its governmental administration. Paperless trading proceeded between governments and customs. This is based on two facts: one is that governments and customs are the key segments in the chain of international trade. Requirements regarding the standardization of data transactions are relatively easier. The second fact is that governments and customs, not providers, require commercial data. There are large quantities of original data existing in the information provided to governments and customs by business enterprises. This data has been used repeatedly. It improves data transaction efficiency when the integration of commercial data starts from governmental organizations and customs, as well as prevents errors and deletions while data entry is processed. But there is some integration starting from paperless trading application between businesses in some economies.

Therefore, there are two paths that exist among APEC member economies to consolidate and apply paperless trading. One path is one in which integration starts from government administrations and is then applies to national internal departments. A second path is one in which integration starts from industrial application and then applies to national internal departments. The first path refers to Singapore; Hong Kong, China; Korea, the second path refers to the United States of America and Japan.

The implementation of paperless trading is not only a one-department business, but it requires integration on many departments. The level of integration is directly relevant to the efficiency of paperless trading. It also reflects the application level of paperless trading.

Fig. 1.14 Relationship of Integration Level, Efficiency & Implementation Level



Cross Border Integration: It requires further promotion and effort to realize cross border integration on paperless trading among economies. Now, value-added networks are making great efforts to realize cross border integration on data transactions from economy to economy, from inner to outer. These are still at the attempt stage. The best cross border integration that we have seen is laid in the internal business departments and between industries, such as the international transportation industry and banking settlements. Now, the application based on businesses is in the internal departments of large multinational companies. Their companies are building up their own internal web solutions based on the Internet in order to plan their data transaction and exchange from the point of view of the chain of supply.

In terms of paperless trading resource integration, some economies have raised the following realization modules:

Stage 1. Develop paperless customs clearance systems;

Stage 2. Integrate electronic trade resources of customs, trade administration, Quarantine etc.

Stage 3. Expanding to business service areas (ports, airports etc.)

Stage 4. Intergrate logistic platforms, linking with customs, trade administration, enterprises and other service platforms to increase the macrocosm level of services;

Stage 5. Realize the integration of the logistic platforms to APEC other Information platforms.

The impediments of cross border integration come from two aspects: The first is standards. It refers to commercial bills and their agreed transaction standards. The second is cross border coordination. It refers to the coordination among governments. The role of governments in the member economies should start with overcoming these two impediments and creating an efficient trade environment. Even though there is the coordination organization PAA in APEC, it is much harder in cross border data transactions than in national integration. If these impediments exist in the long-term, the efficiency of paperless trading will not be brought into play.

Based on our research, even though the integration of multinational companies has played an important role, there is a limitation within enterprises. Now there are still some impediments of data transaction that exist within APEC economies and administration departments. This is what we should be concerned about.

Part II Status of APEC Paperless Trading & Analysis

2.1 Application Environment

2.1.1 Regulatory Environment

The regulatory environment is the basic application environment that paperless trading relies on. Along with the fast development of e-commerce and paperless trading, some international organizations and many economies have in succession promulgated a series of acts on electronic commerce. Among them, the legislation of paperless trading mainly embodies these law systems. That legislation, which is in close relationship with paperless trading, is concerned with the following: electronic signature, electronic trading, the CA system, the web net trading security system and the relevant arbitration system.

Legislation of the International Organizations

International organizations attach much importance to the legislation of electronic commerce and paperless trading. In 1981, European economies introduced the first network trade data criteria, i.e. GTDI. In 1984, UNCITRAL submit the report of Legal problems of auto data processing, suggesting survey the legal requirements of relevant computer records and system and unclose the prelude of the international legislation on electronic commerce and paperless trading. In March 1990, the United Nations introduced UN/EDIFACT criteria and accepted by ISO as the international standard of ISO 9735. The introduction of UN/EDIFACT criteria unifies the criteria used in data transmission in international trade, and makes it possible to commit commerce activities worldwide. Afterward, UN made files such as UN administrative and commercial transportation electric data transmission rules, UNCID etc. In October 1993, UN international trade law committee electric transmission workgroup surveyed the Draft of unified rules on legal respects of electric data transmission and trade data communication methods in the 26th session and formed the legal foundation of international EDI.

In 1996, UN trade laws committee passed Electronic commerce demonstration law, which is the first legal frame of electronic commerce in the world. Numerous international experts of law make this demonstration law after many group discussions. It aims at providing the principles and frame of electronic commerce legislation for the administrative departments and the parliament of governments. It initiated in regulating the signing and effectiveness based on data documents, and became the model text when governments make their own electronic commerce laws. On September 17th, 1999, UN international trade laws committee electronic commerce workgroup issued

Electronic signature unified rules (draft), in order to solve the fundamental problem in the popularization and appliance of electronic trade—electronic signature and its security, reliability and authenticity. The draft put forward the concept of electric signature and intensified electronic signature, and regulated electronic signature, authentication certificate and authenticating organizations etc[1]. Afterward, assimilating the legal documents of some economies that are effective or being drafting, UN international trade laws committee modifies the draft. On January 24th, 2002, UN 56th session passed the UN international trade laws committee electronic signature demonstration law (Electronic signature demonstration law) [2]. This is another important law related with electronic commerce after the passing of Electronic Commerce demonstration law. This law tries to establish some kind of security mechanism through regulating the signature in electronic commerce activities, and promote the popularization of electronic commerce in international trade activities. After the session, UN international trade laws committee will switch the emphasis to the legislation on electronic contracts, and it has brought forward the general design of electronic contract legislation[3]

Other international organizations are active in participating in the exploration and making of electronic commerce legislation and the common principles of electronic commerce between economies. International Chamber of Commerce, Asia and Pacific Economic Corporation Organization and EU etc are the active propellant of the work.

In 1990, International Maritime Affairs committee passed CMI electronic bill of lading rules. Through the information security technologies, it makes it possible for the transmission of electric bill of lading as document of title.

GUIDEC, which was passed on November 6th, 1997 by ICC, attempts to balance different legal systems and provide a directive policy for electronic commerce and unify relevant terms. In 2002, International Chamber of Commerce made EUCP on the basis of ICC Documentary Letter of Credit unified convention (UCP 500), and went into effect on April 1st. Besides, the International Chamber of Commerce is making transaction rules such as Electronic trade and account settlement rules etc.

OECD issued 3 important documents in October 1998: OECD Electronic commerce action plan, Report of relevant international organizations and regional organizations: action and plan of electronic commerce, and Business circles global commerce action plan. They serve as the directive files of OECD in developing electronic commerce.

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[1] Draft Uniform Rules on Electronic Signatures, Article 2, A/CN.9/WG.IV/WP.82, United Nations Commission on International Trade law, Working Group on Electronic Commerce, Third-fifth Session, Vienna, 6-17, September, 1999. Please refer to the policies and regulations of information domestic and abroad—foreign electronic commerce part translated by Shanghai information office for Chinese text. Published by China legal system press, February 2001, first edition, page 72 to 98

[2] United Nations General Assembly Fifty-sixth Session. Model Law on Electronic Signatures of the United Nations Commission on International Trade Law. A/56/588, 24 January 2002

[3] United Nations Commission on International Trade Law, Working Group IV(Electronic Commerce), Thirty-ninth session. Legal aspects of electronic commerce—Electronic contracting: Provisions for a draft convention. A/CN.9/WG.IV/WP95, 11~15 March 2002

EU brought forward European suggestions on electronic commerce in 1997, published EU electronic signature legal frame directory and EU directions on protecting individuals in processing individual data and its free flow (or called EU privacy protection directions in 1998 and issued Digital signature unified rule draft in 1999. These regional organizations strive to coordinate the intra-relationship between each other through making electronic commerce policy, and try to expand the influence to the whole world.

In 2000, EU put the legislation of electronic commerce as an important take in starting European network economic development. It planed to complete the legislation of electronic commerce, including regulating copyright, long distance financial service, electronic bank and electronic commerce etc. Besides, it will discuss the legislation procedures of contract laws and solutions to network disputes etc in the Brussels-Rome treaty.

WTO members came to 3 agreements in 1997, establishing basis for the steady and orderly development of electronic commerce and information technology. These three agreements are Global basic telecom agreement, Information technology agreement and Open global financial service market agreement. Besides, WTO make scheme for the electronic commerce in trade. The scope of legislation being planed include mainly:

1) Revenue & Custom of Cross Border Transaction;
2) Electronic Payment;
3) Network Transaction Regulations;
4) Intellectual Property Protection;
5) Individual Privacy;
6) Security & Confidentiality;
7) Telecom Infrastructure;
8) Technical Standard;
9) Universal Service;
10) Labors;
11) Government Leading Role.

Besides, in order too fit the appliance an development of paperless trading, the world has made Report of the legal value of computer records, Electronic capital transmission demonstration law, UN administration, commerce and transportation electronic data exchanging rules, telecommunication trade data exchange unified rules and international digital guarantee commerce general rules etc.

Legislation of APEC Members

In the APEC electronic commerce action blue print, APEC urges each economic body to establish as soon as possible electronic commerce law frame and speed up the legislation in the field. In the recent years, each economic body government place

emphasis on the legislation of paperless trading, and promote the legislation of paperless trading according to the different level of economic development and paperless trading appliance (seeing table 2.1).

Table 2.1 Major Legislation on Paperless Trading of APEC Economies

	Members	Title of Legislation	Effective Date
Developed economies	The United States of America	Utah Digital Signatures Act	1995/1
		The Uniform Computer Information Transactions Act	1997
		A Framework for Global Electronic Commerce	1997/7
		Government Paperwork Elimination Act	1998
		The Uniform Electronic Transactions Act	1999
		The Electronic Signatures in Global and National Commerce Act	2000
	Australia	Electronic Transactions Act	1999/12
		The Corporations Act Amendment Bill	
	Canada	The Uniform Electronic Commerce Act	1999
		The Personal Information Protection and Electronic Documents Act	2000/6
	Japan	Improving Electronic Business Environment	1997/11
		Diet Information Network Society Bill	2000/11
		Law Concerning Electronic Signatures and Certification Services	2001/4
Newly industrializing economies	Hong Kong, China	Electronic Transaction Ordinance	2000/1
		Personal Date (Privacy) Ordinance	
	Chinese Taipei	Digital Signature Act	2001/10
		Customs Law (revised)	2004/5
	Korea	The Use and Protection of Credit Information Act	1995
		Electronic Transaction Basic Act	1999
		The Digital Signature Act	1999
		Cyber Trade Law	2001/3
		E-Trade law (revised)	2001/12

	Singapore	Electronic Transactions Act	1998/6
		Electronic Transactions (Certification Authority) Regulations	1999
		Security Guidelines for certification Authorities	1999/2
		Information Technology Security Guidelines	1999/9
Other Developing Economies	China	Contract Law (Regulations on Digital Documents)	1999/10
		Electronic Signature Act	2004/8
	Russia	Russian Information, Informationalization and Information Protection	1995
		Contract Law	1999
		Digital Signature Law	2002/3
	Malaysia	Digital Signature Act	1997
	Philippines	The Electronic Commerce Act	2000/6
	Mexico	Electronic Communication Act	2000/5
		An Act to Amend the Mexican Commercial Code - Electronic Signatures	2003
		An Act to Amend the Fiscal Code	2004/1
	Thailand	Data Protection Law	2001/7
		Electronic Transaction Law	2001/10
	Chile	Electronic Signature Act	2002/11
		Regulation on Electronic Signatures	2002/12

The developed economies are ahead of APEC members in the legislation of electronic commerce and paperless trading.

The United States of America is a leading country in electronic commerce. The United States of America declared NII scheme in January 1994, and issued A Framework for Global Electronic Commerce on July 1 1997, and thus formed The United States government systematic electronic commerce development policy and legislation program. National Conference of Commissioners of Uniform State Law, NCCUSL passed the Uniform Electronic Transactions Act in July 1997, which has been accepted by most states and became effective. On September 29th, 2000, National unified states legislation committee issued the Uniform Computer Information Transactions Act, and recommend that each state accept it. Besides, The United States also made the Electronic Signatures in Global and National Commerce Act. In the recent 10 years, US

have put forward a series of laws and files, establishing the legal frame of The United States electronic commerce development gradually, and consummate the legal system of paperless trading.

Australia issued Electronic Transactions Act in 1999, allowing individuals make transactions with the government departments and organizations through electronic commerce, and regulating that paper files and electronic files are of the same effectiveness in the transaction. Besides, Electronic commerce consumer policy protection frame issued by the government in 1999 and Electronic commerce disputes solution issued in 2001, and the regional regulations made by each state complement the federal Electronic Transactions Act. In 1999, Canada made the Uniform Electronic Commerce Act, acknowledging in due form the legal force of digital signature and electronic files.

Japan is also active in consummating its electronic commerce environment and it has legislation in the electronic contract, electronic signature and authentication, electronic proof and the validity of electronic files. For example, in order to handle electronic contract, Japan modified the Law about visiting sales (about specific commercial transactions) and the law about installment sales, issued the Law of the exceptions in the civil law about electronic consumer contract and electronic commitment note etc. In order to deal with the problem of electronic signature and CA authentication, it issued Law Concerning Electronic Signatures and Certification Services, modified Commerce registration law, Notary public law and Civil law implement law etc. In order to handle the validity of electronic proof and electronic files, it published the Law concerning modifying the implement law of commerce law and adjust and consummate relevant laws, the Law concerning the appliance of information communication technologies about written payments and the preparation of relevant laws (IT paper data general term law) etc.

The newly industrializing economies are representatives actively in popularizing electronic commerce and paperless trading, and achieved outstanding results. **Singapore** declared national trade network development scheme as early as 1986, and use EDI in transacting and declaring business from 1991. It established Electronic Transactions Act in 1998 and establish complete legal frame gradually. **Korea** passed Electronic Transaction Basic Act in 1999, which is typical comprehensive electronic commerce legislation, and the content involved many aspects of paperless trading. **Chinese Taipei** made Digital Signature Act in 2001, making clear the validity of electronic files. **Hong Kong, China** issued Electronic Transaction Ordinance in 2000, endowing electronic records and digital signature equal legal statues with written records and signature, and established the authentication system.

Other developing economies are exploring the legislation of paperless trading. **China** government places great emphasis on the legislation of electronic commerce. On November 18th, 1998, in the informal meeting with the leaders of APEC in Kuala

Lumpur, President Jiang Zemin pointed out that electronic commerce represents the direction of the development of future trading manners, and its popularization will bring more trading opportunities for the members. In the development of electronic commerce, we should not only emphasize the role of private enterprises and the business institutions, but also emphasize the program and direction by the government departments, and provide good legal environment for the development of electronic commerce[4]. In March 1999, China issued new Contract Law. It assimilated digital electronic files in the form of contracts and treats it as written contracts. On August 28th, 2004, China passed Electronic Signature Act solves problems of four aspects: establish the legal validity of electronic files and electronic signature; regulate the action of electronic signature; definitude the legal status of authentication institutions and authentication procedures; and regulate the security measures of electronic signatures. According to the new requirements brought forward by the development of paperless trading, Chinese government makes some modifications to Contract Law, Customs Law etc. The scope of adjustment of these laws includes information network service, information network security, information rights, and electronic transaction etc. It has formed a multi-level omni-directional information law system, and provides forceful legal protection for the orderly development of paperless trading.

In order to accommodate the wide application of Internet technology, Russia has launched and castigated a number of laws on e-commerce and relevant paperless trading. Represented by "Act of Electronic Signature", a set of its federal law is shown as following table:

Table 2.2 Table of Russian Paperless Trading Law

Series Number	Date of Launching	Main Content
Federal Law No. 1-FZ	Jan 10, 2002	Electronic Digital Signature
Federal Law No. 24-FZ	Feb 20, 1995 (Addition on Jan 10, 2003)	Information, Informatization and Information Protection
Federal Law No. 15-FZ	Feb 16, 1995 (Addition on Aug 22, 2004)	Communications
Federal Law No. 85-FZ	Jul 4, 1996 (Addition on Jun 29, 2004)	The Participation in the International Information Exchange
Russian Federation No. 3523-1	Sep 23, 1992 (Addition on Nov 2, 2004)	Legal Protection of Computer Programmers and Data Bases
Federal Law No. 61-FZ	28 May 2003 (Enter into force on 1 Jan 2004)	Customs Code of the Russian Federation

[4] Reported on November 18th, Kuala Lumpur, People's Daily, Jiangzeming's Speech at APEC Conference on the Issue of Electronic Business. Beijing: People's Daily, 1998-11-19(1)

Federation № 65	Jan 28, 2002	About the federal target program « Electronic Russia (2002-2010 years)
Federal Law No. 32-FZ	Mar 28, 2002	On Accounting (about a possibility of creation, storage and transfer of the accounts in an electronic aspect supposing computer handling)
Russian Federation No. 5351-1	Jul 9, 1993 (Addition of Jul 7, 2004)	On Copyright and Neighbouring Rights
Russian Federation No. 3520-1	Sep 23, 1992 (Amendments on Dec 27, 2000, and Additions on Dec 30, 2001)	Trade- marks, Service Marks and the Appellations of the Origin of Goods

Other members such as **Mexico, Philippines & Chile** also passed laws directing electronic signature and electronic authentication rules, thus plays a fundamental and regulatory role in the construction of paperless trading environment in the community. However, in legal systems, it is still in the stage of exploration.

BOX 1 Comparison of the Characteristics of Electronic Signatures

Generally speaking, the electronic signature is the key part in establishing network transaction credit system. The legal validity endowed to the electronic signature will clear away the obstacle in the popularization of paperless trading. Each economy places emphasis on different points in the establishing of electronic signature/electronic transaction laws, and forms different characteristics.

Table 2.3 Summarization of the Points of Electronic Signature Laws in Some Major Economies/Areas

Economic Community	Name of Signature Law	Inure Time	Characteristics of Signature Law
The United States of America	Electronic Signatures in Global and National Commerce Act	2000-10	The act declares the validity of electronic contract, electronic signature and other electronic records, allows the two parties of contract to choose transaction authentication technology without the intervening of government; eliminate the requirements that contracts and other records must be signed on paper. The purpose of the act is to assure equal legal protection when the consumer is on line or not. It also gives detailed description of electronic signature, electronic record etc. Beforetime, most states have already issued their

			own electronic signature laws.
Hong Kong, China	Electronic Transaction Ordinance	2000-07	Prescribes that valid digital signature should: requires the signature, his digital signature should be issued by legal certificate organizations and the certificate should not be invalid, logout or abolished. ETO allows digital signature temporarily and not authenticate other electronic signatures, in order to guarantee: the requirements of identity identification, data confidentiality and integrity, and transaction un-deniability. The revised edition of ETO has become effective since July 2004. From then on, with that e-trade that does not concern governmental functions, any kind of electronic signatures is regarded as in accordance with the regulations for e-signature as long as it's reliable and accepted by the recipient. With that e-trade that does concern governmental functions, e-signature is regarded as in line with regulations for e-signature.
Singapore	Electronic Transactions Act	1998	Establish the legal validity of electronic signature and digital signature, compulsive and receptive, and give the definition and technical description of digital signature. The 17th article points out that "safe electronic signature" is approved by the security program that is adequate to prove the issuing of electronic signature, which is managed by a third party or reliable in commerce. The validity of the signature should possess: uniqueness, identity identification, data privacy, and data integrity.
Australia	Electronic Transactions Act	1999	Include articles relevant to digital signature "if a transaction can only be completed with someone's signature, and the signature can be completed in the electronic form, as long as the technical requirements are satisfied, then digital signature is feasible. This law is not aiming at a special digital signature technology, but providing a stretch technology that can satisfy each other's requirements. It has no article aiming at the certificate service organizations.
China	Electronic Signature Act	2005-04	Bring forward the definition of electronic signature for the first time. Prescribe how digital electronic file can satisfy the "written form", "original file form" and "file preservation" that are required by the law and regulations. Definitude the legal status of electronic

			authentication service provider, and the requirements in operation and supervision etc. The new law doesn't cover the whole field of electronic signature in content; some articles are too general, the technology and skills of legislation needs improvement; and it lacks electronic laws to go with it.

2.1.2 Degree of Liberalization

Trade liberalization and convenience is not only the aim of APEC, the degree of implement also exerts great influence to the development of paperless trading. Trade liberalization refers to implementing international trade free and open through cutting custom and non-tariff wall; and trade convenience aims at eliminating the mechanic and technical obstacles in international trade, reduce transaction cost and difficulties, and promote the development of international trade. In 1994, APEC members published Bogar Declaration, which plans to establish Asia-Pacific free trade zone in 25 years since 1995. Developed economies such as The United States of America, Japan, Canada, Australia, New Zealand at most in 2010, other newly industrializing economies and developing economies at most in 2020 to realize the aim of trade liberalization.

Cut custom, reduce or eliminate non-tariff measures, and improve the transparency of trade are among the important methods and contents in realizing trade liberalization. In the process of implement trade liberalization, the 21 economies of APEC will establish his own action plan of reducing custom that abide by the economic interest of the country of area and considering the aim of region liberalization according to each economy's current custom policy and the aim of Bogar Declaration. (Seeing table 2.3 for the schedule of custom reduction for each economy)

Table 2.4 The Average Level of Customs Tariff of APEC Economies

Unit: %

	1988	1993	1996	2003
The United States of America	6.6	6.6	6.4	3.7
Australia	15.6	9	6.1	4.2
Canada	9.1	8.8	6.7	3.9
Japan	7.2	6.5	9	3.1
New Zealand	15	8	5.7	3.1
China	40.3	37.5	35.9	10.4
Chile	19.9	14.9	10.9	6
Hong Kong, China	0	0	0	0
Indonesia	20.3	17	13.1	6.9
Korea	19.2	11.6	7.9	11.2

Malaysia	13	12.8	9	8.4
Mexico	10.6	12.8	12.5	18
Philippines	27.9	23.5	15.6	6.3
Singapore	0.4	0.4	0	0
Chinese Taipei	12.6	8.9	8.6	6.9
Thailand	40.8	37.8	17	15.4
Brunei	3.9	3.9	2	-
Peru	-	-	-	10.2
Russia	-	-	-	9.9
Viet Nam	-	-	-	16.8

Through the analysis of the above data, the custom level of developed economies is relatively low. Up to 2004, the custom level of the United States of America is 3.7%, and the custom of 37.3% of the commodity is zero. Canada; Australia; New Zealand and Japan are active in carrying out the custom reduction commitment made in the Uruguay round negotiation, and the average custom level will be reduced to lower than 5%. In the aspect of non-tariff measures, the transparency of New Zealand is the highest. It uses tariff as the only measure of protecting domestic industry. The United States of America is reducing its subsidy to agricultural products gradually. Canada; Australia and Japan have relatively more non-tariff measures, especially Japan and Australia, the scope of non-tariff measures are broad and the sorts and amount of commodities involved are great.

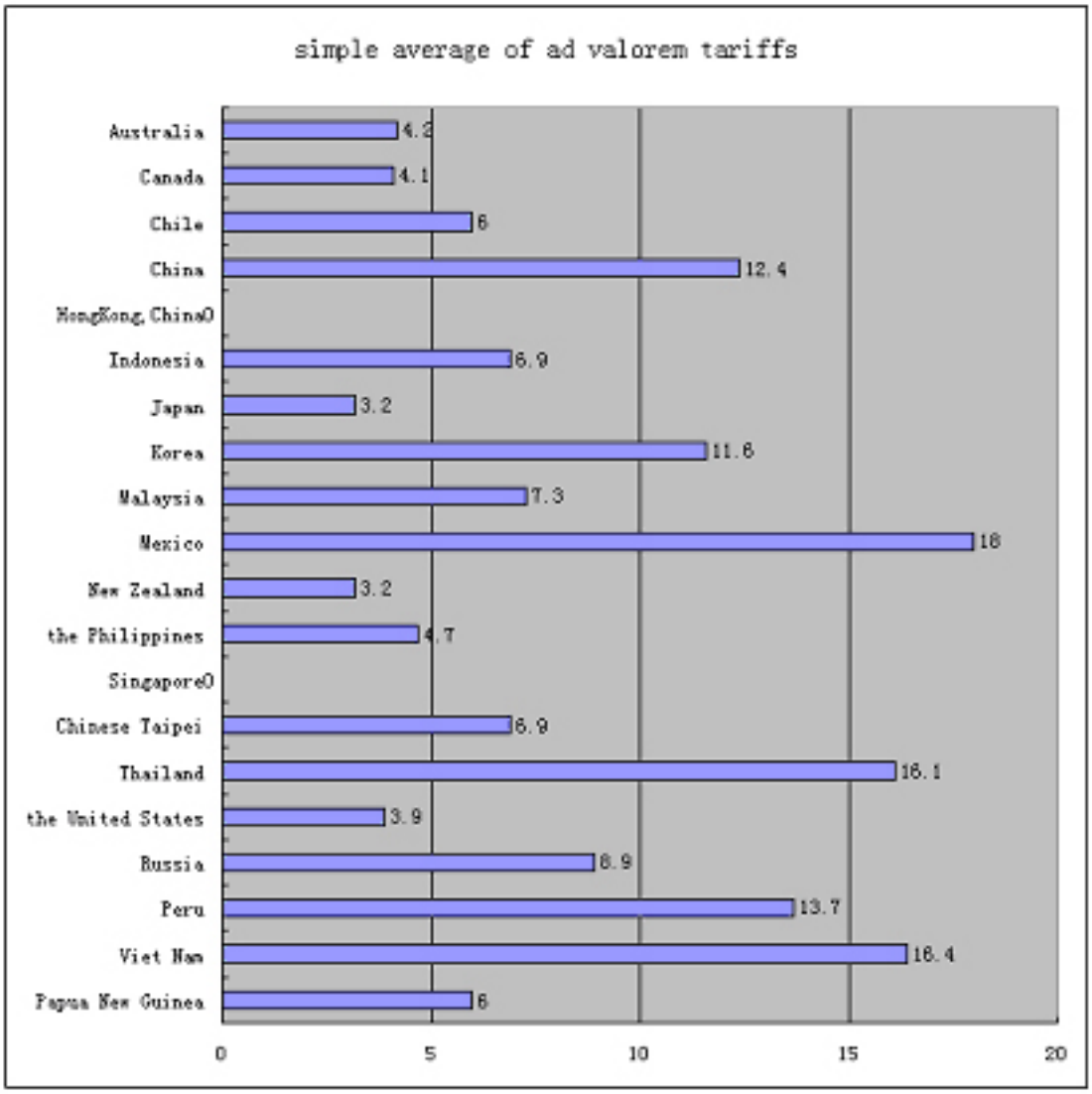
In the newly industrializing economies, Hong Kong, China and Singapore are high on trade liberalization, the customs tariff level is near zero and they use almost no non-tariff measures. Chinese Taipei, China and Korea government once set high tariff to support the development of the relevant domestic industries, after the Uruguay round and APEC single-lateral action scheme, their tariff level decreases obviously. The non-tariff wall concentrates on import limit and license. The single lateral action scheme submitted since 1996 shows that they have eliminated the limit; subsidy and license to many import and export items.

Because of the level of economic development and economic system, the trade open degree of most developing economies is notably lower than that of developed and newly industrialized economies. In different tariff base level, the reduction speed of tariff in recent years showed the efforts of developing economies in promoting trade liberalization. With 1996 as the basic period, China, Indonesia, Chile, Philippines etc reduce custom more than 40%, the average customs tariff level of Chile; Philippines; Indonesia are approaching 5%. Compared with the high customs tariff, the non-tariff walls in China, Chile and Korea are few. Through the continuous predigestion of procedure and elimination of limit, the degree of non-tariff is even better than that of some developed economies. At the same time, there are relatively more non-tariff measures in Mexico; Philippines; Indonesia and Thailand etc.

Ad valorem tariff is the main form of revenue in each economy. The simple average ad valorem tariff is a form that relates with the degree of liberty of the cross border goods trade. According to the trade data of international trade organization and custom statistics, the simple average of ad valorem tariff of each APEC members is as following:

Fig. 2.1 APEC Economies Simple Average of Ad Valorem Tariff Comparison Form

Unit: %



Data source: http://stat.wto.org/CountryProfile/WSDBCountryPFReporter.aspx?Language=E

Malaysia; Thailand and Russia use 2001 statistics, China; Canada; Indonesia; Japan; the United States of America and Viet Nam use 2002 statistics, Australia uses 2004 statistics, others all use 2003 statistics.

Besides custom, trade liberalization also involves non-tariff wall. According to the development degree of economic community trade liberalization, the higher the trade liberalization, the lower the intervention, the fewer the obstacle of commodity flow, the more mature the development of cross border trade industrial chain of commerce flow,

commodity flow, capital flow and information flow, and the more convenient for the appliance of paperless trading.

2.1.3 Standardization Environment

Standardization is an important aspect in realizing the evolution from paper documents to electronic documents.

Summary on Standardization Development of International Paperless Trading

Standardization is an important characteristic in the application of paperless trading. In the early 1980s, UN/EDIFACT standards played a very important role in the simplification of international trade and set off an upsurge of "paperless trading". In the 1990s, global economic trade systems were under construction. As the simplification process of international trade progressed, EDI became the major means to simplify the process of multilateral international trade across borders. Paperless trading was listed on the agendas of government administrations, and received much attention from every relevant party.

EDI has been attractive to many investors and large-scale companies because it is efficient, ingenious, accurate and reliable. But, the complexity and high costs associated with EDI have turned off small -and medium-sized companies. After the 1990s, along with the appearance of HTML and Web technology, information technology based on the Internet has developed substantially. In 1998, the birth of the Extentional Standard Language (XML) program has further enriched the technologies. The information exchange technology based on XML has become the key technique in today's web net business activities. XML has provided a solution based on the Internet. It stipulates business rules from commercial information, has kept the original structure and content of commercial information, and has saved and processed within the application systems. The flexibility of XML has caused problems in the transaction of different exchange regulations; however it provides convenience for business information transactions for every enterprise. In order to improve the efficiency of information exchange and utilize the experiences of EDI standardization, some relevant companies, industrial associations and international standards organizations have launched standard frames based on XML electronic business. The standard aim is to realize a high efficiency among businesses, operational information exchanges and Internet processes.

OASIS (Organization for the Advancement of Structured Information Standards) is an international organization which researches and analyzes e-commerce standards based on XML and enjoys great popularity. Now, there are more than 60 technical committees under OASIS. Among them, UBL focuses on standardization issues of business structures and bill formats based on XML e-commerce. The UBL technical committee has launched a UBL1.0 edition, which includes a business module, actual business information, format of bills, and designated regulations on planning. It has been very

well received throughout the world. UBL now is in coordination with UN/CEFACT and trying to make it reach ISO standards via UN/CEFACT. In order to achieve this goal, the compatibility of UBL and UN/TDED will have to improve. Localization must be improved in order to launch a new sophisticated UBL2.0 edition. On June 21-23, 2004, the APEC e-commerce Guidance Group held another symposium on paperless trading ebXML in Thailand. It further promoted international standard applications among member economies.

Table 2.5 Introduction to Some Influential Standard Frames

OBI	Open Buying on the Internet raised by OBT. The standard is an open and stable standard frame for B2B on the internet.
IOTP	Internet Open Trading Protocol (Internet open trade protocol) rose by Commerce One. This standard is a mutual operations frame for business on the internet.
EcoFrame	EcoFrame is initiated by CommerceNet, and mainly researches e-commerce mutual operations. It is used to guide e-commerce standardization. EcoFrame focuses on three kinds of electronic commerce services, which include: different data resource bases, integrations in many different data languages, secured registration systems and online shopping via intelligence agencies.
BizTalk	Biztalk is a Schema standard e-commerce database initiated by Microsoft. The BizTalk structure enables business industries to define their own Schema, and to submit registration through Biztalk.org. Meanwhile, BizTalk has set some predefined signs for users and every Schema must abide by some rules and attributes. It is only in this way that a standard BizTalk can be formulated.
RosettaNet	This standard is raised by RosettaNet, which is a global electronic commerce standard organization, and is funded by over 200 parties around the world including many famous hardware producers, software developers, infrastructure builders, technology providers, sales businesses, financial institutions, transportation bodies and end users. RosettaNet is mainly focused on the supply chain management of information technology and electronic components companies. A business process and data exchange standard has been formulated, in which the major standard includes PIP (Partners' Interface Process), data dictionary, and RNIF.
CXML	CXML is designed by Ariba, is a series of definitions and is lightweight XML document type. It also defines relevant document types and relevant formats needed for B2B trade. It applies very much to purchasing businesses.
XCBL	XCBL was launched by Commerce One, and is an extentionable, public document pattern base. CBL has built a set of public XML components, with which all types of documents can be exchanged and processed so that efficient exchanges and processes can be achieved for different business documents formats.

Standard Application among APEC Developed Economies

The Unites States of America has always been an initiator and participant for standardization. By the end of the 1960s, The United States of America started to utilize EDI in the shipping industry. The United States of America customs department started to implement an Automatic Management System (AMS) in 1986. The participants of this system include carrier, port and services departments. The automatic billing system permits the participant to submit and receive billing data in two ways: CAMIR (Customs Automated Manifest Interface Requirements) – Customs Internal System and ANSI (American National Standards Institute) ASC X.12 – Transportation Format. In order to increase coordination among trade partners, The United States has developed and applied UN/EDIFACT standard.

Table 2.6 Message Status of the Automatic Commercial Environment Standard of the United States of America

	Standard	Submitting	
		Transmitted to CBP	Transmitted from CBP
ACE	ANSI X.12	309 Complete Manifest or Preliminary Shipments 358 Truck Manifest (Trip/Consist) 353 Event Advisory Message (Manifest Commit)	997 Functional Acknowledgement 355 CBP Acceptance/Rejection 350 CBP Status Information
ACE /FAST	EDIFACT	CUSCAR Customs Cargo Report CUSREP Customs Conveyance Report PAXLST Passenger List CUSDEC Customs Declaration	CUSRES Customs Response REQDOC Request for Documents CONTRL Functional Acknowledgment

Canada: The information exchange between Canadian ports and different agencies can be conducted using different methods of electronic data exchange. Since Canada is a neighbor to the US, VPA has been carried on the American submitting standard – ANSI.X.12. But, as a member of G7, Canadian customs started to implement the first and second strategies based on CUSCAR. VPA is adopting EDIFACT standards recommended by the United Nations in order to keep as similar standards as possible with carriers, customs and ports. Canadian Vancouver Port EDI submission includes:

ANSI 311 Canadian Customs Information	Carrier to Customs as well as VPA.[5]
Terminal Operation Report	Terminal operator to VPA
Vessel Operation Information	Terminal operator to VPA

Australia: Australian Tradegate is a non-profit company for international logistics. Its members include many relevant parties like customs, quarantine, ports, and shipping. There are two functions applied to Tradegate: one is to increase EDI consciousness

[5] VPA: the Vancouver Port Authority.

among the staff members and to educate and train EDI to trade personnel; the second is to encourage trade departments to utilize EDI; meanwhile Tradegate also encourages the utilization of EDIFACT standards. The users include government departments, harbor bureaus, shipping companies, carriers, customs agencies, transportation business owners, airlines companies and import & export companies. CUSCAR submission is applied to Australian customs, while IFCSUM submission is applied to harbor affairs.

Sydney Harbor in Australia is operating an organic whole port system (SHIPS), with which shipping dates and orders that can be processed via computers. It also can coordinate and supervise the ships in the harbor. SHIPS can satisfy electronic transactions on billing (IFCSUM), dangerous goods (IFTDGN), and vessel arrival notices (CUSREP). EDI submission in Sydney, Australia includes:

IFCSUM	Cargo Manifest
IFTDGN	Dangerous Goods notification
CUSREP	Customs Notification of Arrival
CODECO	Gate In/Out

New Zealand: New Zealand customs now is also applying the same UN/EDIFACT standard, and EDI-supported submission mainly includes:

CUSDEC	Customs Declaration
CUSCAR 98^{A}	Customs Cargo Report
CUSCAR 03^{A}	Customs Outward Report
CUSRES	Customs Response

Standard Application in Developing Economies

Chile: Chile customs has implemented an electronic customs declaration since 2002. It is one of the economies taking the lead to utilize customs declaration. The software used for customs declaration has been created completely by the Chilean customs department. Its application system is ISIDORE, which transportation companies and import & export companies are all using. The system utilizes the most open web net technology, and has adopted the XML language, not traditional EDI submitting formats. Submission supported by Chile customs include:

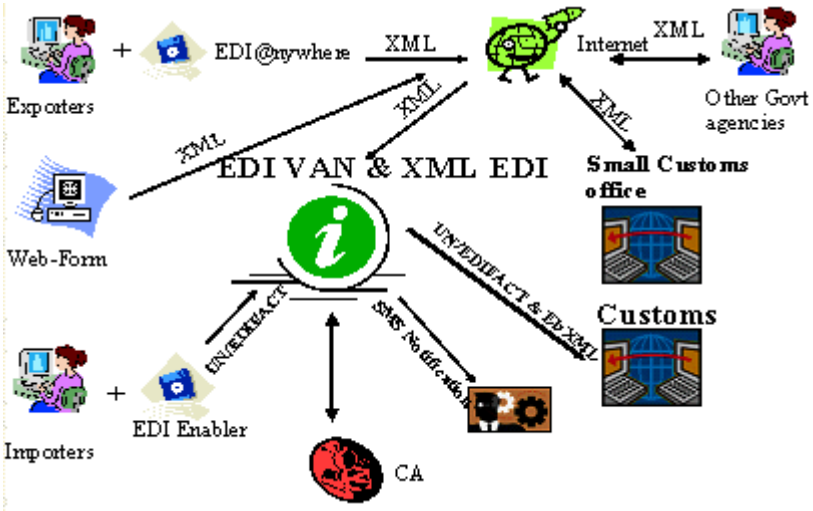
Manifest Header	Includes vessel schedule，Carrier agents sent to customs
Lists associated to Manifests	Includes Mail, passengers lists, Crew, Personal effects, supplies lists
Vessel Arrival/Departure Information	Maritime sent to customs
Bill of lading	Vessel's agent and freight forwards submit to customs
Delivery order	Vessel's agent and freight forwards submit to customs

In 2001, Valparaiso Harbor in Chile (Empresa Portuaria Valparaiso, EPV) and other

harbor organizations built together the Valparaiso Logistic Trade Port (www.vlt.com). With this system, EPV can be contacted during all business processes to supervise ships and goods via electronic bills of lading. The information exchanges among ports, customs, agriculture goods quarantines, transportation companies, shipping companies or agencies all have been completed via XML formats.

Indonesia: Indonesia upgraded their original EDI system in 2004. Its current EDI applications and standards, which are centered on customs, can be described as the following:

Fig. 2.2 EDI Application System & Standard Centralized with Customs in Indonesia



The status of Indonesian electronic trade certificates and the main bills and standards are compared in the following diagram:

Table 2.7 Indonesian Electronic Trade Certificates Status

Certificate	System	Departments Concerned	Standard Description
Vessel Arrival Notice	RKSP	Harbor Bureau, quarantine, Harbor administration office, Depperindag	XML internet, 2003
Taxation certificate	SSPCP	Taxation bureau	EDI VAN & ISO 8583, 2003
Web connection certificate	AFACT IIC	Malaysian customs	Test, EDI VAN, 2003
Permit		Depperindag	XML internet, 2004

Table 2.8 Main Certificates & Application Standard Contrast Table

Certificate	2003	2004	Current Status
Import Customs declaration bills	VAN EDI	VAN EDI & XML EDI	XML EDI testing

Export Customs declaration bills	VAN EDI	VAN EDI & XML EDI	VAN EDI & XML EDI testing
Tax free certificate	VAN EDI	VAN EDI & XML EDI	VAN EDI & XML EDI testing
Vessel arrival notice	VAN EDI	VAN EDI & XML EDI	VAN EDI & XML EDI applies overall
Goods Bills of lading	VAN EDI	VAN EDI & XML EDI	VAN EDI & XML EDI testing

Hong Kong, China: Tradelink in Hong Kong, China developed an electronic bills of lading system (E-MAN), to accomplish electronic information transactions. The largest cargo port in Hong Kong, China – Hong Kong International Cargo Port (HIT) has been using EDI for ten years. The EDIFACT standard has been applied in its system. Currently, its submission includes COPARN (booking message), BAPLIE (Bayplan), dangerous goods info, and Reefer container/cargo information. Its submission supports shipping line information, manifest demands, outstanding manifest advice, government queries, query responses, detention notices, release vouchers and acknowledgements.

Chinese Taipei: funded the first cargo customs clearance network - TradeVan in November 1990. In 1994, customs clearance was realized completely via automation. A second trade value-added supplier (Universal EC Inc.) was funded in April 2002. Currently, a new customs clearance system based on a web information exchange platform is under development. In July 2002, an ASP system via Internet customs declaration was put into operation. In April 2003, a XML information exchange and process system was developed. In the second half of 2004, the direct processing of customs clearance via the Internet was realized.

Malaysia: The Port Klang Community System (PKCS) in Malaysia started its implementation of the EDI e-commerce system in 1993. The major participants of this system are the harbor bureau, customs, and port manager, shipping companies, agencies for customs declaration, carrier agents and banks. PKCS has adopted the UN/EDIFACT submission format. Submitting includes:

CUSREP	Vessel arrival notice
CUSCAR	Cargo manifest
CUSDEC	General customs declaration on export
IFTDGN	Dangerous goods notification message
PAYORD	Payment order message
CREADV	Credit advice message
DEBADV	Debit advice message
PAYMUL	Multiple payment order message
SANCRT	International movement of goods Governmental regulatory message

DEBMUL&CREMUL	For multiple debit and credit transactions to reduce transmission costs

Peru: The freight companies and agencies in Callao must submit electronic manifest to customs, but a hard copy must be submitted when the vessel arrives. It will also have to be handed to the port authorities. Although the paper manifest is required for security reasons, the Callao Port Authority (ENAPU) and customs have realized electronic data transaction. Supported messaging includes:

Import Value verification	Importer, supervisor, customs
Customs declaration	Importer, brokers, customs
Manifest	Shipping line, customs, port authority
Payment of duties	Importer, customs, bank concerned
Customs release	Importer, customs

Philippines: The Manila Port and Manila International Container Port are private sectors licensed by the Philippine Harbor Bureau to operate. The shipping companies can transit manifest to customs by EDI, soft discs or hard copy. Messaging support includes:

Import Declaration: CUSDEC	For warehousing and consumption entries
Final Assessment: CUSRES	Generated by customs automatically
Cargo Release Instruction	Transmitted to the container freight station (CFS) authorizing the release of goods to co-signers
Cargo Release Report	Action taken by CFS based on Release Instruction
Payment Order: PAYORD	Based on the Final Assessment
Payment Advice: PAS4 format	Banks submit to customs after matching of assessment against payment
Quota, Textile Export Clearance and Textile Visa	

Thailand: The Thailand Port Bureau is in support of EDI data transaction with more than 40 shipping companies. But, in light of legal and operational requirements, shipping companies/agencies must submit electronic and paper manifest. The Thailand Port Bureau and customs has chosen to adopt UN/EDIFACT as the standard format to accommodate data transaction between customs, traders and other relevant entities. Traders who adopt other standards or systems (ANSI X 12, TDCC, Cargo Imp, etc.) must transform their data into UN/EDIFACT standard formats before they are transferred to customs. The Federation of Thailand Electronic Data Interchange (FTEDI) and the Thailand Industrial Standard Institute (TISI) have endorsed the plan to implement UN/EDIFACT international standards proposed by the Thailand Customs EDI working group. Messaging supported by the Thailand port includes:

BAPLIE	Bayplan/stowage plan occupied and empty locations message

CUSCAR	Customs cargo report message
CUSREP	Customs conveyance report message
COARRI	Container discharge/loading report message
CODECO	Container gate-in/gate-out report message

Message supported by Thailand customs includes:

CUSDEC	General Customs Declaration on Export
INVOIC	Commercial Invoice Message
CUSREP	Vessel Schedule Message
CUSRES	Customs Response Message
CUSCAR	Customs Cargo Report
CREADV	Credit Advice Message
REMADV	Remittance Advice Message
PAYORD	Payment Order Message
DEBADV	Debit Advice
BANSTA	Banking Status Message

Japan; Korea; Singapore; Hong Kong, China and the United States of America have started working to promote UBL standards.

Japan: UBL Japanese localization working groups of OASIS is studying UBL. Currently, the Japanese part of UBL standards has been reached, and many informational documents have been launched. Apart from this, ECOM has studied UBL-mirrored ECALGA.

Korea: Korea is impelling UBL localization by translating UBL1.0 standards and editing a directory for implementation. The directory for implementation was accomplished in July 2004 and will be approved as the Korean ECIF standard. Apart from this, the Korea localization-working group has also conducted some comparisons on business procedures between UBL and KIEC (Korean Institute of Electronic Commerce), business information entities and electronic manifest based on the XML series of standards. Korea hopes that UBL reaches UN/CEFACT standard as soon as possible to promote its application in Korea.

Singapore: The UBL work has been impelled mainly by Crimson-Logic. Its former entity is Singapore Network Services. Currently it is a joint venture between the Singaporean government and the Singapore National Telecom Company. Upon comparative research of UBL, Crimson-Logic found that UBL was very much consistent with their standard development based on XML. It only requires business information entries on cargo freights to be added into UBL. Meanwhile, Crimson- Logic is also suggesting that UBL add information such as place of origin, digital signature, etc.

Hong Kong, China: Hong Kong, China has followed up closely with UBL localization. The experts of CECID (Center of Electronic Commerce Infrastructure Development) at Hong Kong University are responsible for this work. CECID has united the China

Standardization Institute to develop UBL simplified and traditional Chinese characters. The electronic logistics platform DNNT (Digital Trade and Transportation Network) developed and operated by Tradelink has adopted UBL standards. During the application, it also has raised many needs for UBL and promoted UBL forwarding.

The United States of America: In January 2005, the name and the rules of a UBL standardized design were approved as the OASIS standard. Currently, The Navy of the United States of America has adopted this standard. American CIDX (Chemical Industrial Data Exchange) has adopted the standard as their base design in the XML module.

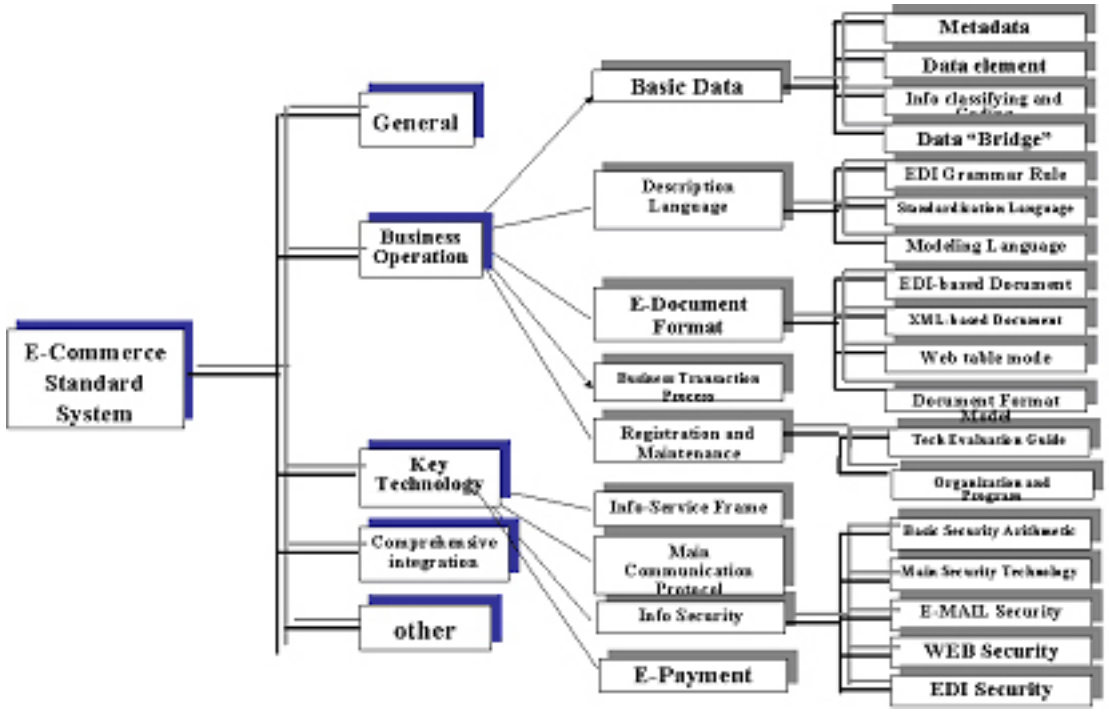
Summary

International organizations and every economy have paid great attention to the standardization of electronic commerce and paperless trading. Some developed economies have widely applied the EDIFACT standard based on EDI in the areas of international transportation, customs clearance, etc, and have started to transfer the EDIFACT standard to XML standards. Most developing economies have also made great efforts in then construction of paperless standardization. Some electronic messaging systems have been put in place. Since some developing economies have not applied EDI in a wide range, the migration costs from EDI to open the XML standard have been reduced. It is beneficial to accelerate standardization and paperless trading development in developing economies.

BOX 2 The Standardization in Mainland China

In order to strengthen the standardization construction on paperless trading, supported by the China Standardization Authority, an EDI standard technology entity has been funded. It has participated in the standardization of EDIFACT, ISO/TC154, and has achieved some progress. It has set an EDI standard system, launched more than 60 EDI messaging systems, data components, and code standards in succession. Along with the development of globalization and information technology, the paperless trading environment has had a great innovation. The original EDI standards can no longer satisfy the application of paperless trading and growing needs. In this respect, China is migrating to research and formulating a new generation standard based on XML, which includes standard system, standard revising methodology and procedures, standard series and relevant standard formulation.

Fig. 2.3 Standard System of Paperless Trading



BOX 3 RosettaNet Standard & Its Application

RosettaNet is an open standard based on XML, via unified PIPs (Partner Interface Processes) to realize the linkages among different enterprises' and relevant entities' application systems, as well as to conduct data transaction on the internet. RosettaNet standard can protect enterprises' original investment on information infrastructure, reduce the initial costs and attract more and more small and medium enterprises to participate. Meanwhile, the standard has set a serious regulations for the commercial procedure, which concerns trade information, product information, order management, storage management, market information management etc every element of the commercial process. It can assist the realization of automation in the supply chain. Thus, many large scaled companies abandon their original standards, and start to implement RosettaNet among other partners. By the end of 2005, RosettaNet had more than 4,400 linkages, among them including IBM, Intel, Motorola, Microsoft, Nokia, Sony, Oracle etc famous multinational companies.

RosettaNet plays an important role in global promotion of paperless trading and the formulation of supply chain via its implementation in high tech enterprises. It also enjoys very authentic and leadership position. The fact that RosettaNet standard has been successfully in practice in Europe and Asian economies indicates the importance to master RosettaNet. Meanwhile, RosettaNet has been well received by industrial enterprises and governments during the promotion process. Currently, there are more than 500 enterprise memberships in RosettaNet. Asian economies in particular, support

RosettaNet standard, for which government investment only is exceeding more than 51million dollars in 2003.

RosettaNet Application in Singapore

RosettaNet standard has been introduced to Singapore in 2000. More than 100 enterprises have accomplished and or are implementing RosettaNet standard, including AEM Evertech, ST Assembly Test Services Etc. According to Mr. Wong Cheong Phone, IT Vice President in Asia of Seagate: as a big user of RosettaNet, Seagate has realized soft management and instant response via implementation of B2B standard of RosettaNet, and has achieved a better customer satisfaction. Seagate is able to get instant information exchange for forecast, delivery and storage management by implementing RosettaNet PIPs in small and medium suppliers in Singapore.

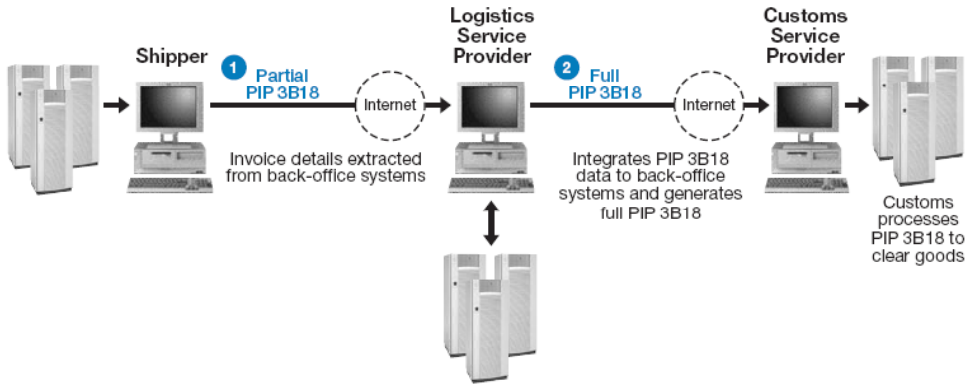
Effectiveness of RosettaNet Standard in Customs Operation

Apart from B2B application in the chain of supply, RosettaNet standard is starting to penetrate to the procedure of trade management. Intel is trying RosettaNets standard in the customs entry procedure to decrease the time of custom entry. The resting project is to adopt RosettaNet to automate the application procedure for customs entry, realize the data transaction among consignors, carriers and consignees in order to decrease time and costs. The team in corporation includes: carrier company, suppler, transfer, customs declaration agent and supporting service provider, as well as Malaysia and Philippine customs in carrying out this solution. .

The supremacy of procedure has directly impact on efficiency of customs entry. Intel's estimation on the efficiency of time and costs is as following:

- A cost deduction of 30% to 50% in every customs declaration;
- A time save of approximate 50%;
- Acceleration of response speed on customs' needs;
- Deduction on the need of artificial work on data entry, filling and submitting of paper forms etc; in result decreasing potential mistakes.

Fig. 2.4 Flow Chart of RosettaNet Standard Customs Business



1 Intel (the shipper) triggers a partial PIP 3B18 to the logistics service provider. The partial PIP 3B18 contains goods shipping information but not flight shipment details.

2 The logistics service provider completes the PIP 3B18 with flight shipment details. It then sends the complete PIP 3B18 to customs through the customer service provider for shipment clearance. The logistics solution provider then waits for customs response to confirm clearance approval.

The team of Intel and the e-customs of Malaysia and Philippine have researched and developed a new method to improve the chain of supply by implementing RosettaNet. The e-customs system has already proved that it can save money by reducing time and costs. Stepping on this, RosettaNet is going to expand their solutions in other Asian Chain of supply.

2.1.4 Security Authentication Environment

In respect to the risk reduction of paperless trading, the PKI/CA, as the key technology of paperless trading information security, and relevant security authentication environment creation have been paid enormous attention to by member economies. Each economy has been actively promoting and building their own security authentication modules.

The Unites States of America

The United States of America is the example of PKI users among developed economies. For twenty years the U.S. has used PKI research and applications. Almost every large corporation, federal and state governments have set their own electronic authentication systems. The electronic authentication system structure is mainly in the constitution of the FBCA-Federal Bridge CA, CPA-Principal CA and SCA-Subordinate CA. Later, a federal electronic bridge authentication system was built. It has realized all kinds of electronic authentication and cross authentication. American PKI has been primarily used in electronic government and electronic commerce. Electronic authentication at the enterprise level is mainly used as internal security management.

There is no root CA concept in the federal PKI system structure, instead it is a principal CA. This is because the structure of the trust domain varies; federal PKI system

structures can support a hierarchical structure, net structure and a trust list. Only the principal CA that offers a hierarchical style can be called Root CA; therefore it permits the structures that are joined with federal PKI systems to use any PKI domain of trust. Federal Bridge CA is the core aspect of the PKI system. It is the bridge CA in different domains of trust, and it is responsible for principal CA issues and cross authentication. The Federal Bridge CA also sets up a mirror relationship between the guarantee levels of every domain of trust and the guarantee levels of federal bridge CA, updating the cross authentication certificates and issue the fraud lists of cross authentication certificates. But it does not require any abidance to the PKI mirror relationship while one entity has a trust domain relationship with another entity. Instead it can adopt any mirror relationship which they regard suitable.

On June 7, 2001, federal electronic authentication was carried out into real time operations. On September 18, 2002, four PKI governmental departments – National Aviation and Space Flight Authority (NASA), Department of Defense (DOD), Department of the Treasury (DOT), the Federal Agriculture Department/National Finance Center and the Federal Bridge Electronic Authentication conducted cross-authentication in succession.

Canada

Research on the KPI system in Canada was conducted much earlier than in The United States. In 1993, the Canadian Communications Security Establishment (CSE) started researching the governmental PKI System. At that time the research was mainly conducted in order to develop a PKI product, which could accommodate governmental needs and realize shelfless trade. The Canadian government announced and started to promote the principles for electronic authentication in 2004 to strengthen the confidence of building a digital society in the 21 century.

The Canadian PKI system structure is constituted with the Policy Management Authority (PMA), CCF, first level of CA and the Local Registration Authority (LRA).

The PMA is an entity composed of many departments, and is led by the secretariat of the Canadian Department of Treasury. It supervises the comprehensive policies of the governmental PKI system and its implementation. CCF is the Central Certification Federation. It carries out all of the policies of the PKI system, signs and manages the first level of CA and cross-authentication. The first level of CA is operated at the governmental level. It sets up one or several certificate guarantee levels, distributes and manages digital certificates, issues or cancels the unauthorized name lists regularly. The domain of trust within the Canadian government's PKI system is a hierarchical structure. To set up a trusting relationship, it only requires the cross-authentication with the first level of electronic certificates. It has to go through the central authentication entity if a trust relationship has to be set between two hierarchical structures. Direct trust relationships between one hierarchical structure and another is prohibited. Central

authentication entities are the only interface to set a trust relationship with an outsider.

The Canadian government's PKI system is simple and easier to operate. It is worthy to use as a reference system for other economies.

Japan

"The Law Concerning Electronic Signatures and Certification Services" for promotion of information circulation and information processing by ensuring smooth use of electronic signature went into effect on April 2001 in Japan.

The Japanese electronic authentication business is already becoming an independent industry, which has brought significant income. Based on the assessment of the Ministry of Internal Affairs and Communications (2002), the market value of electronic authentication services and related software development is estimated to be 41.95 billion Japanese yen in 2006.

Japan PKI Forum played the main role to initiate the Asia PKI Forum in 2000. The main members are Japan; Singapore; Korea; Chinese Taipei; Hong Kong, China; Macao China; Thailand and Mainland China, Japan; Singapore; Korea and Chinese Taipei together have also conducted an experiment on PKI inner operations."

Korea

In 1999, Korea passed the "Basic Electronic Commerce Law", which defines authentication entities and the management and control of authentication entities. This is a typical comprehensive law on electronic commerce, and can be used as a good reference if a comprehensive and basic legislation is required.

There are three levels in the authentication structure: at the top is the Ministry of Information Communication (MIC); at the middle level is the national CA center funded by the Ministry of Information; and the at last level is a licensed authority funded by the Ministry of Information. The Ministry of Information is also in charge of relevant regulations and implementation, as well as cross border authentication. The center of authentication is to undertake the responsibilities of CA operation, assessment and support. To fund a CA authentication and get it licensed in Korea, it has to satisfy three conditions: 6 million US dollars in assets, at least 12 professional operators and relevant equipments and facilities. The Korean International CA Authentication Center was funded in 1999.

Singapore

In 1998, Singapore passed the "Electronic Trade Act". In 1999, "Regulations on Singaporean Electronic Trade (Authentication Entities)" and a "Security Guidelines on

Singaporean Authentication Entities" were passes. The "Electronic Trade Act" regulates the authentication entities and their limited duties. The license of authentication is issued by the designated management authority and can be applied voluntarily. It is issued by licensed authentication entities and has strong testimony efficacy. "Security Guidelines on Electronic Trade (Authentication Entities)" enabled the government to license and fund an Authentication Management Bureau. The National Computer Committee is the administrative entity for the Authentication Management Bureau. These regulations have also ruled out internal management structures, assessment standards, application fees, certificates testimony efficacy and limited duties.

Singapore does not fund or license any security authentication entities. Any capable organization can enter into the security authentication market (It has to be examined by Singaporean administration departments before any authentication entities outside of Singapore can enter the market.), and build up their credit by their own market competency. But, the market management on security authentication is very stringent in Singapore.

Malaysia

In 1997, Malaysia passed the "Digital Signature Act". It recognizes the legal efficacy on digital signature, and requires the authentication entities to possess a license to be able to engage in this industry.

The "Digital Signature Act" is based on the technology of public key and is built on the technical module with a complete authentication system. It also defines the authentication market and work in detail. It rules out that the management of authentication will be responsible by an official or personnel nominated by the Malaysian government, called a supervisor. The supervisor is entitled to organize his/her own supervising entity in accordance with task needs and with the permission of the minister.

There is a national authentication entity in Malaysia to carry out everyday work.

Hong Kong, China

Electronic authentication is managed by the Hong Kong, China government. An "Electronic Trade Regulations" (ETO) has also been launched. The regulations have allowed the authentication entities to apply freely for recognition of the municipal government. In accordance with the regulations, the director of governmental science consultation is endowed with the rights to authenticate the certificates issued. Currently, the authentication entities endorsed by the government include: 1.) Head of the Post Office Beaurou; 2) Authentication service companies; 3) HiTrust.com (Hong Kong) Inc. Ltd. All of the e-certificates recognized is consistent with the third edition of the X.509 standard, and is used as an international example.

In November 2001, Chinese Taipei launched an "Electronic Signature ACT", with a concise relatively short structure. It is the shortest among all APEC member electronic signature acts (apart from Clause 17). In 2002, Chinese Taipei consolidated the existing electronic authentication system, and changed TAI electronic authentication into TF electronic authentication, e.g. the Financial Electronic Authentication, which was built by Chinese Taipei Financial Union and other financial banks.

The Banks Union adopted the principle module of trust and consolidated e-certificates under the management of the single financial certificates at the highest level. The Chinese Taipei Web net Authentication Company takes the management role in financing these certificates (Chinese Taipei Financial Root CA, TFCA), to build the financial PKI authentication framework to promote the interoperation of electronic authentication.

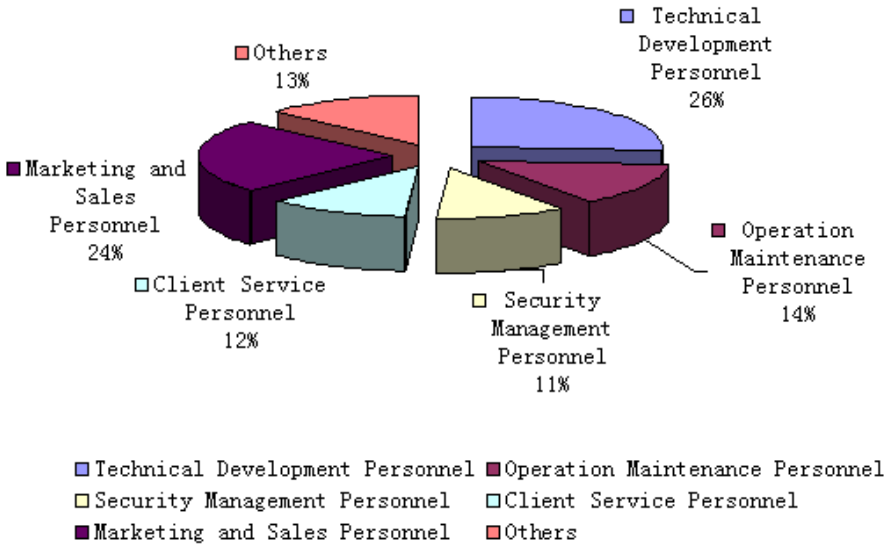
China

The Chinese government has paid great attention to information security. In September 2004, it released a "Notice on Publishing 'the Implementation Opinions on the Protection of Information Security Levels'", which set out specific requirements on principals, basic contents, information and securities.

In light of the facts that the application of paperless trading has expedited the increase of needs on web net information securities, China's electronic authentication services industry is still at the early stages. The conditions of the market and industrial self-regulation are still pre-mature, it is necessary for the government to supervise and manage the authentication entities appropriately. With regards to this, the government has carried out a "Management Means on Electronic Authentication Services" to compliment the "Electronic Signature Act".

Since the foundation of the first CA authentication entity on May 17, 1998, there has already been more than 100 CA authentication centers. But there are less than 50 entities able to issue valid digital certificates. By the end of 2004, twenty-two regional CA centers had been approved and ten of them passed technical appraisal. The entities which have been approved the electronic authentication are different. 10% of them were approved by the central government. Local governments approved 80% of them. Another authority approved 10% of them. There is a range of 30-55 employees at most entities (some entities have a range between 15 and 65). Among them, technical development personnel stands at 26%, operational and maintenance personnel 14%, security management personnel 11%, client services personnel 12%, and marketing and sales personnel 24%; others account for 13%.

Fig. 2.5 Employee Demographics of China Authentication Center



Informationalization work started early in China. It has been developing for more than 20 years. It is accessible online with customs declaration, trade processing and tax deduction records and application, manifest declaration, duty payment, license application, inspection application, application for certificate of origin for e-commerce businesses. It has also built a comprehensive security authentication services system.

Summary

CA authentication entity is the technical safeguard for electronic signature security. The focus of legislation on electronic signature is the management of authentication entities, especially the foundation of authentication entities, qualification and behaviors.

In terms of management on authentication entities, there are the following different application modules:

Table 2.9 Comparison on Management Modules of Authentication Entities

Management Module	Characteristics	Typical Economies	Characteristics of the Economies
Self-regulation	Government does not interfere; the authentication entities build up their credit by their own competencies.	The United States of America	Advanced in technology and capital, market is mature, the credit system is healthy, the non-governmental authentication system is perfecting.
Combination of government supervising and market guidance	A limited interference from government	Singapore	The economy which adopts this management on authentication entities sets a voluntarily authentication system, so that authentication entities do not have to possess a license by law, but authorized ones enjoy privileges of reduced duties.
Government-led	Government conducts a process of licensing and scrutiny on authentication entities.	Malaysia, China	Developing economies are inferior in terms of technology, capital, and market maturity, meanwhile fast development is expected. As a result, these economies are more likely to have government interference to develop their own authentication systems.

In the vision of long-term development, it is inevitable to have a unified and standard electronic authentication system in place internationally. During this procedure, there must be constant collaboration, inter permeation, cross authentication, competition, mergers and acquisitions. This is a result of the development of paperless trading and market competition.

2.1.5 Government Support

During the process of paperless trading development, government plays a significant role in some none market elements such as environment creating, policy support.

The United States of America

American EDI business started early and develops fast. It has been widely applied in customs, transportation, banking, retail business, motor vehicle and general merchandize etc. In the early stage of EDI development, American customs dealt with the customs declaration submitted via EDI system in priority. The customs clearance that is not submitted via EDI system will be dealt delayed. American customs and

border protection bureau set an office specifically for customs modernization to develop an automotive commercial environment (ACE). Set the single window as the goal and formulated a detailed development plan.

Australia

Australian government has been driving the application of EDI. At the earlier stage of paperless trading, it authorized Tradegate (Tradegate Australia Ltd) as the only EDI business operation entity. It's constituted with Australia airlines, Port Management Association etc eleven entities. Its major mission is: to provide comprehensive paperless trading services via the trade chain across whole Australia; to expertise the turn around speed of goods, thus to improve the economic efficiency. Meanwhile, Australia government invested and built a comprehensive electronic trade system Supply line based on the Australia Customs Services (ACS) and freight tailing system. Australia government does not interfere directly while promoting EDI. It is very much the relevant industrial associations to drive.

New Zealand

EDI development in New Zealand is different with other economies. It built a several independent industrial departments to form a national EDI center. Since New Zealand government is in a liberal manner in terms of management of telecom industry, therefore every EDI system has its own web net developer. Meanwhile, in order to improve operation efficiency, the cooperation is encouraged between the developers.

Hong Kong, China

Hong Kong, China government formulated a digital 21 plan for information technology strategies. Its goal is to strengthen Hong Kong, China Information infrastructure and services. In May 2001, a new strategy was launched, which the goal is to get Hong Kong, China become an advanced electronic commerce and digital city. In March 2004, a new strategy to benefit every citizen in Hong Kong, China was announced to strengthen Hong Kong, China's position in the globe. The Special Administrative Government of Hong Kong, China funded a Tradelink Ltd. with the cooperation of other 12 private entities. In which the government takes a share of 42% and has granted a 7-year exclusive rights from 1997 to 2003. In January 1997, it launched the first Electronic certificates services – textile tariff certificate service. In 1999, it has been completely on electronics. On April 1, 1997, it released an electronic customs declaration services. In April 2000, it became electronics completely. Until today, there are seven electronic government services. Till 2004, there are 53000 registered clients with tradelink. More than 80,000 e-trades are processed. The total amount of documents processed per year is more than 18millions. China, Japan, Korean, Singapore and Malaysia are able to conduct cross border trade services via Pan-Asia Electronic Trade Alliance. From January 2004, Hong Kong Special Administration government acts in

the principal of “Opening Market, Introducing Competition” by granting other parties to provide e-government services. Later, apart from Tradelink which provides 7 e-government services, there are Global e-Trading Services Limited (Ge-TS) to provide also 2 services, e.g. e-custom entry (TDEC) and the application service for permits of taxable goods.

Environment creation: Hong Kong, China government released “Electronic Trade Regulations” in 2000, setting up legal protection for electronic business. “Electronic Trade (Revised) Regulations” was launched in 2004. In terms of information security, a “Computer Security Accident Coordination Center” was set to formulate a comprehensive policy on security and procedures, to adjust management structure, to supervise implementation of security strategies, to promote self consented plan by authentication entities, to educate the population to raise the public conscious on information securities.

In recent years, as international freight center moves towards to Mainland China, the center positions of international freight have been challenged. In order to improve Hong Kong competency, led by Hong Kong Special Administration Government, followed by public and private entities, a “Digital Trade for Transportation Network” (DTTN) is proposed, with the aim to provide a trade platform that is independent, open, none patent, transparent and advanced. DTTN is a structure based on standard electronic information linking with the chain of supply (buyer/importer, buyer/exporter, shipping companies, manifest companies, ports, government and relevant governmental departments, financial department, insurance companies, inspection departments), which comes out with comprehensive operational environment to share and to compliment for every participant. According to the report of Hong Kong government, the investment of DTTN during next 17 years will be in total of 3 billion Hong Kong dollars. It will also save 11.8 billion Hong Kong dollars for trade and logistics industry. Tradelink has been selected to be the service provider for DTTN and will carry out the first stage of trial.

Korea

In order to promote paperless trading, Korean government released an “Act on Promotion of Trade-Automation) in 1990, that defined a goal in a legal formats. That is to achieve paperless trading by utilizing value-added net and electronic data interchange (VAD/EDI) among relevant parties-banks, insurance companies, customs etc. To accommodate the development of information and technology, Korean government has revised the act in 2005, and renames it as “Act on Electronic Promotion” and “Electronic Trade Law”.

Korean government funded an “e-Trade Facilitation Committee” in 2004, and the Korean president took the role of first chairman. The committee is responsible to formulate relevant regulations to promote the fast implementation of technology and

administration, as well as the collaboration with private entities. Korean government also released an “Electronic Trade 2010 mid or Long Term Strategies”. In which it concerns the following four aspects: “Electronic Trade Infrastructure construction based on internet”, “Medium and small enterprises electronic trade basement construction”, “Global electronic trade network construction”, “Legislative regulations to improve electronic trade environment”. It was also consented as a development strategy for the economy.

Singapore

Singapore government played an important role in driving the application of paperless trading. At the early stage of paperless trading, Singapore Trade Industry, National Computer Bureau, Trade Development Bureau and Singapore National University has funded a project group, formulate a general EDI program. It was the EDI application module in the world.

Thailand

It is the view of Thailand government that the costs of logistics and efficiency have direct impact on national competency. According to its national statistics, cost of logistics in Thailand accounts for 19% of GDP, while developed economies have only account for about 7% of GDP. If the cost of logistics in Thailand has been reduced to 5%, it could have saved 7.5 billion US dollars for Thailand. In 2003, Thailand government has set up a National Competency Committee, led directly by the premier. In 2004, it also set up a special goal reaching working group, which set up a special program to improve the logistics efficiency and economic competency by promoting paperless trading application. The working group has set up a three-stage strategic development plan to create a paperless trading environment, as well as strengthen the business links with other economies. Meanwhile, Thailand has also set up a national electronic logistics committee, which reports directly to the premier and the cabinet. As a cooperative platform between relevant governmental departments and public or private enterprises, the committee contains 17 associations in order to make it easier to communicate among the associations and governmental departments, particularly among the policy makers. Thailand government has provided a plenary capital support to the single window for electronic logistics. Until now it has invested about 31 million US dollars, and the special account of 6.5 million US dollars as planned has also been in place.

Russia

Russian government programmed an “Electronic Russia 2002-2010” plan in 2002, and has set up detailed development strategies and staged goals to foster national e-commerce and paperless trading environment. Meanwhile, it has been trying to simplify trade documents, adopt standard systems, and strengthen the cooperation

among other national relevant institutes and increase national trade efficiency by improving business procedures.

Malaysia

Malaysia was planning to promote EDI in 90s, and intended to legislate it and implemented it by government.

Summary

The governments in the economies have played a significant role in promotion of paperless trading at its early state. Particularly, it was to do with the planning on paperless trading and relevant policies that is beneficial to paperless trading. For instance that Korean government launched the "Electronic Trade 2010 Mid-or-Long Term Development Strategy. Australian and Singapore governments released favorable policies to paperless trading.

Summary on Application Environment Assessment

Based on the description of the status of paperless trading, we have the following assessment on application environment of paperless trading in APEC economies:

Economies	Environment Assessment
Australia	Australian tariff is lower; the reduction of tax is focusing on several specific areas; Paperless trading has core legislation; and less impediments; Standard system exists, but there is no unified messaging system; Regional and industrial authentication services systems have been set; Government has set up a concrete development plan to support paperless trading.
Canada	One of the economies enjoys low tariff; None tariff barriers is within the framework of GATT clauses; A core legislation on paperless trading has been set; Less impediments; Standard system is migrating from ANSI X 12 to EDIFACT recommended by United Nations; Have set up a authentication system in hierarchical centered with government management entities; Government created a regulatory environment for paperless trading development;
Japan	Actively promoting tax deduction, but tariff in some fields is still higher (such as agriculture, shoes manufacture etc.) There are number of hidden tariff; A basic legislative environment on paperless trading is created; Less impediments; It is mature in industrial authentication development; government is supporting paperless trading development by regulations.
New Zealand	Customs tax is reaching zero; tariff is getting transparent; have set up relevant regulations and legislations.
The United States of	Tariff is lower; None tariff barriers are less; paperless trading system has almost been formulated and is comparative mature. ANSI X12 has been

America	applied widely domestically, some system started to adopt EDIFACT standard; Industrial authentication is comparative mature; some government departments and federal bridge electronic authentication is able to realize cross authentication; Government is supporting paperless trading by creating better environment.
Singapore	Typical liberal trade economy; Tariff is reaching zero; There is little none tariff barriers; the core legislation on paperless trading has been set; the system is almost completed; Standardization system on paperless trading is comparatively completed; the market of authentication is open, fair competition, government does not interfere; Government is supporting paperless trading by implement concrete plans.
Hong Kong, China	Typical free port; Tariff is reaching zero; It does not proposition in none tariff barriers; Core legislation on paperless trading has been set, and is getting perfect; Standard system is comparatively mature; Be able to share data in the region; Government manages authentication market comprehensively; Industrial application is very popular; Government is making a great effort to support and create paperless trading environment.
Chinese Taipei	Working for tariff deduction; bar for import quantity and regional limit etc; A core legislation has been passed; less legal barriers; National standard has been set; Industrial application is comparative mature; Government is supporting paperless trading by providing regulatory environment.
Korea	Reducing tariff regularly, none tariff barriers are mainly in limitations on import; Legislation system on paperless trading is comparatively completed; Less legal barriers; standard system is getting mature; unified interface for cross border services; National authentication is managed by Information Ministry; Cross border authentication is set to start; Government is supporting paperless trading development by policies and capital; There is a comprehensive plan.
Chile	Tariff is lower; no market entry limitation; no quantity limitation and no citizen treatment limitation; standard system is getting mature; XML system is widely applied;
Indonesia	Reducing tariff regularly; None tariff barriers are in many fields; Standard system is accomplishing; XML standard started to be applied in customs systems;
Malaysia	Tariff is lower, None tariff barriers is comparative more;
Mexico	Tariff is higher, None tariff barriers are mainly around import permits;
Philippines	Tariff is higher; Is in the process of cancellation of none tariff barriers;
China	Tariff is higher, none tariff barriers are mainly around import permits management; Have ruled out the electronic signature; less legal barriers on paperless trading; Standard system is widely applied in industries; There are many industrial and regional authentication entities, but less standard; government is supporting paperless trading by providing policy environment.

Thailand	Tariff is reducing; there is always a permit management in agriculture products; Government has clearly a paperless trading development plan and also provides policy support.

2.2 Application Level

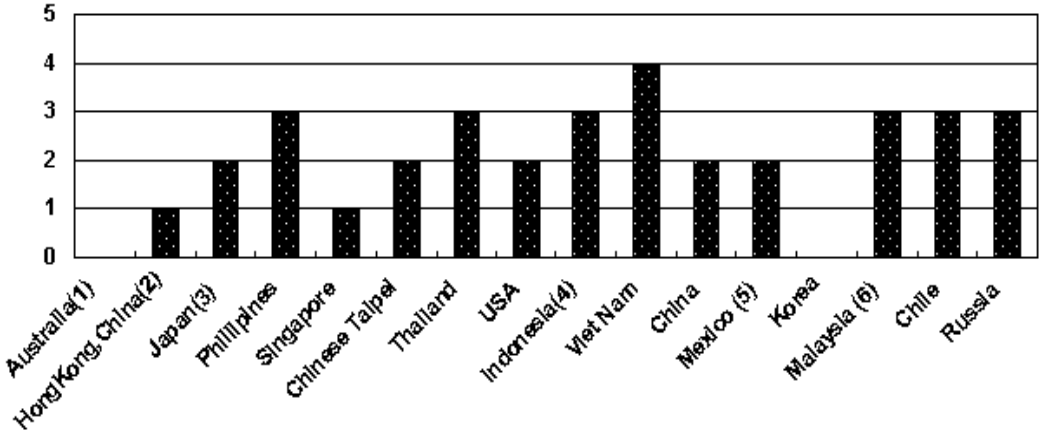
Since the birth of EDI in 80s of twenties century, it is the most challenging task to reduce or eliminate paper documents in international trade with their development plan in every economy. It is at different levels that the challenge is conscious to APEC economies.

2.2.1 Application of Paperless Trading in Customs Clearance

The main line of efficiency in the chain of international trade is the application of paperless trading in customs clearance, in conjunction with the transmitting of trade administration documents. From global point of view, governments usually promote electronic certificates by principlizing electronic declaration, prohibiting paper declaration or charging high processing fee with paper declaration.

In line with the Paperless trading Individual Action Plan submitted by APEC economies in 2002 and in result of the research on electronic certificates done by APEC transportation work group in 1999, the key trade related documents such as permits on import and export, certificates on animal and plant quarantine, original place of production certificate, customs declaration documents mandated by regulations in APEC Economies.

Fig. 2.6 Key Trade-Related Documents Mandated by Regulations in APEC Economies



Customs Application on Paperless

Customs paperless declaration, also called electronic customs clearance, refers to the procedure of accomplishing the whole custom clearance by electronic means, including utilizing EDI technology to exchange and process the custom clearance documents between customs and customs declarer, and to realize online customs declaration, online payment, online searching for permits, network search on release of goods, and network supervising, automatic complete the process in time. Electronic Customs clearance system concerns the import and export goods declaration, inspection, taxation and release etc elements, as well as involvement of the parties such as customs declaration agencies, financial institutes, storages, transportation entities and international trade administration departments etc.

In light of global status, comparing with other government departments, customs has always been pioneering the progress of electronicalization. Till 2004, among the declaration documents in **the United States Customs**, 96% of them are processed upon EDI system, and 45% of them have realized paperless custom entries. Electronic taxation (via ACH system) has reached 91% of total. To effectively restrict textile products from other economies attacking national market, the US customs links the networks with departments of Singapore and China, to exchange information of textile quota via EDI system.

Canadian Customs has also developed the customs declaration system in joint with their customs automatic processing system (CCS). Its business includes declaration, inspection, clearance, release, freight, cargo data analysis, statistic, money transaction, customs duties and domestic tax payment etc. Canadian also released “Customs 2000” plan based on this. The plan has tried to realize the negotiation procedure, customs entry, and inspection on in and out of borders, transportation, and payment via electronic means. Currently, there is more than 83% of customs declaration has been conducted via EDI system in Canada.

Australia Customs has adopted EDI system to handle import and export goods. It has almost realized “paperless customs entry”. During 2003-2004, 99% of import and export goods have been declared by electronic means. Customs process of 99% of import goods can be completed within 15 minutes by electronic entry system.

New Zealand started to set EDI international electronic commerce system since 90s. It involves domestic customs, exporters, financial industry, meat processing plant and main trade partners (such as American hygienic inspection department, statistic department, GE etc, Australian customs, airport etc.) Most of imported goods have realized electronic entry. Time of customs entry process is reduced. This system enables the importers to exchange electronic exchange entry documents to the customs via electronic exchange system and receive responses from the customs within 15 to 3 minutes. Usually, this information requires importers to prepare a delivery order, for the purpose of submitting to customs and taking the goods after their arrival. The whole process of customs entry does not require any paper document. Since the original paper

document has already been ceased, importers can prepare their own report to the customs based on their own needs, or link the electronic customs entry function with their own commercial systems, therefore to improve the efficiency. New Zealand electronic export declaration format has adopted international EDIFACT standard. Meanwhile it also applies the references provided by New Zealand statistic bureau. The customs entry and statistics can be completed at once; therefore the cost of statistics has been significantly reduced. It also improves the statistics effectiveness and accuracy. Currently, 96% of import customs entry and 60% of export customs declaration have been completed via electronic means in New Zealand.

Japanese Customs applied the NACCS: Nippon Automated Cargo Clearance System since 70s then extended to shipping gradually. In 2004, approximately 98% of import and export customs entries have been conducted via this system. Average time spent on the process of customs entry from import deliration to import permission is about 4 hours for sea cargoes and 0.4 hours for air cargoes.

China developed a paperless customs entry system in 2002 based on the experiences of international practices. The System enables the import electronic declaration data to process automatically rather than processing customs declaration by traditional paper bills. It has accelerated not only the customs entry process, but also has improved the management level. It has also been promoted to the whole nation after having been experimented in Shanghai and Qingdao. Currently, China customs has been able to transmit the declaration data 100% by electronic means, but paper bills still have to be submitted as final legal efficacy.

As a free trade port of “zero” custom duty, Hong Kong municipal government is actively promoting the e- custom entry project. According to the sixties articles of the Regulations on Import and Export Registration/Industrial Training Regulations, any goods apart from duty free ones are subject to be declared within fourteen days after the goods being imported or exported. Any delay will result in a penalty. Importers and exporters can clear customs by accessing the electric services provided by Tradelink. Since it was launched in 1997, total of 53,000 companies have been in use of this service. Since there are many manufactures owned by Hong Kong citizens in Guangdong Province, links have been set between Tradelink and Mainland China International Electronic Commerce Center for trade facilitation by the end of 2001.

Chinese Taipei built EDI customs entry information exchange network – TradeVan in 1990 to drive the automation for Chinese Taipei cargo customs clearance. It has almost realized that the declaration process to be completed via electronic means. In line with the statistics, more than 99% enterprises in Chinese Taipei are utilizing TradeVan. Time of aviation customs entry has been reduced to 0.216 hours; Time of marine customs entry has been reduced to 2.049 hours; Time of customs entry for Cargo of inspection free and quarantine free has been reduced to within 10 minutes.

Thailand Customs started to build EDI customs declaration system since 1996. After many years' practices, electronic customs clearance have now in testing operation with the projects of fruit export and car imports etc. Now 90-95% of export customs declarations have realized electronicalization. 85-09% import customs declaration has realized electronicalization.

Korea started Trade EDI project led by government since 1990. Korean customs built import and export customs entry systems, automation tax rebate systems etc since 1994. Currently, the electronic bills on customs, trade administration and international transport etc have realized 100% paperless.

In 2004, the first electronic comprehensive customs system of **Russia** was started to use in Moscow. The new system has decreased the time on goods inspection from several hours to 25-30 minutes, which significantly increases work efficiency. It utilizes digital signature technology to replace paper signatures. The process of goods inspection can be completed via telescreens. It was reported by Russian customs website on 25th of January 2005 that: Federal customs bureau was planning to increase the amount of customs with electronic customs systems from 10 to 54 by 2005. . Electronic customs have already decreased the amount of goods inspection from average 95% to 60%. Federal customs bureau planned to decrease the inspection rate for import goods within 10% and inspection rate for export goods within 8%.

An XML-based system, with the name of ISIDORA, has been applied in **Chile** customs. It enables the custom to accept electronic declarations, pay electronically as well as sign electronically instead of the traditional written signature. It not only simplifies the custom and transaction procedures but also provides more choices to examine the goods. By the end of 2002, more than 50,000 importers and exporters have applied electronic signatures to customs declaration. With e-declaration, the whole declaration procedure can be completed in 15 minutes. Chile's e-declaration system is operated by a company that is recognized by and registered at the customs. Users can make e-declarations on the condition that they sign an agreement with the company and pay $40 each year.

In 2004, **Malaysia** began to implement EDI in the ports, airports and customs nationwide. The implementation of the program, aimed to electronize the customs data, can overcome the problem of efficiency of Malaysian customs and upgrade the custom service into a new phase since manpower is still used in certain operations.

Viet Nam Customs have developed an electronic custom declaration system, which will be tested at two major ports.

As can be seen in the World Customs Organization **(WCO**) data, customs of developed economies have widely used EDI technology to handle their chief operations. Since EDI system has been operated normally in domestic trade industry, the customs of developed economies have shifted their focus to develop EDI between the customs and

other administrations or between international customs. Besides, the application of EDI has been extended from customs clearance to other areas like management of quota license and international passengers. For example, the EDI management of textile quota licenses at U.S and Singapore customs, air passenger forecast system between the U.S, Australian and New Zealand customs and airlines, EDI integration of Korean and Malaysia customs.

The following describes the proportion of e-declaration in selected economies and the development of e-declaration and paperless customs clearance.

Fig. 2.7 Percentage of Customs e-Declaration in Selected Economies

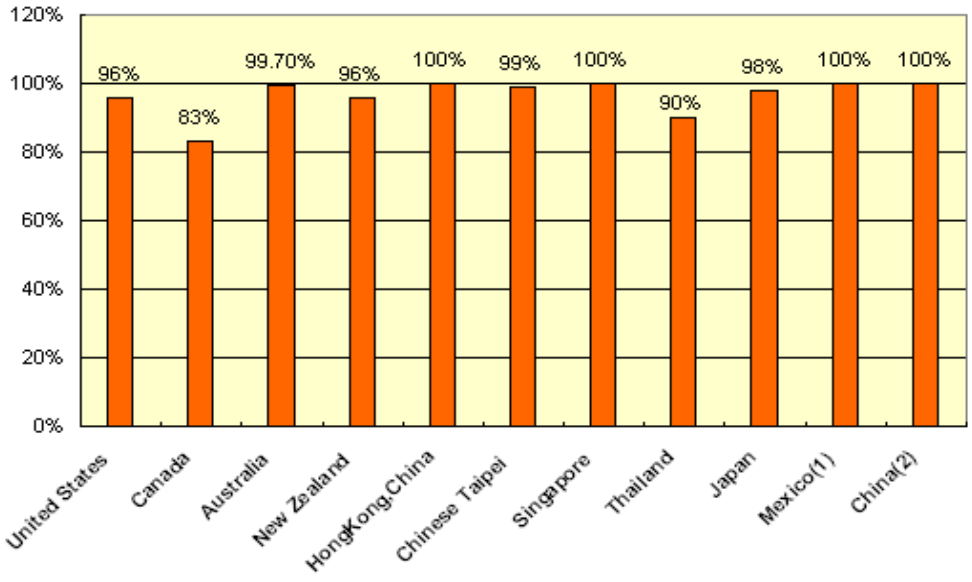
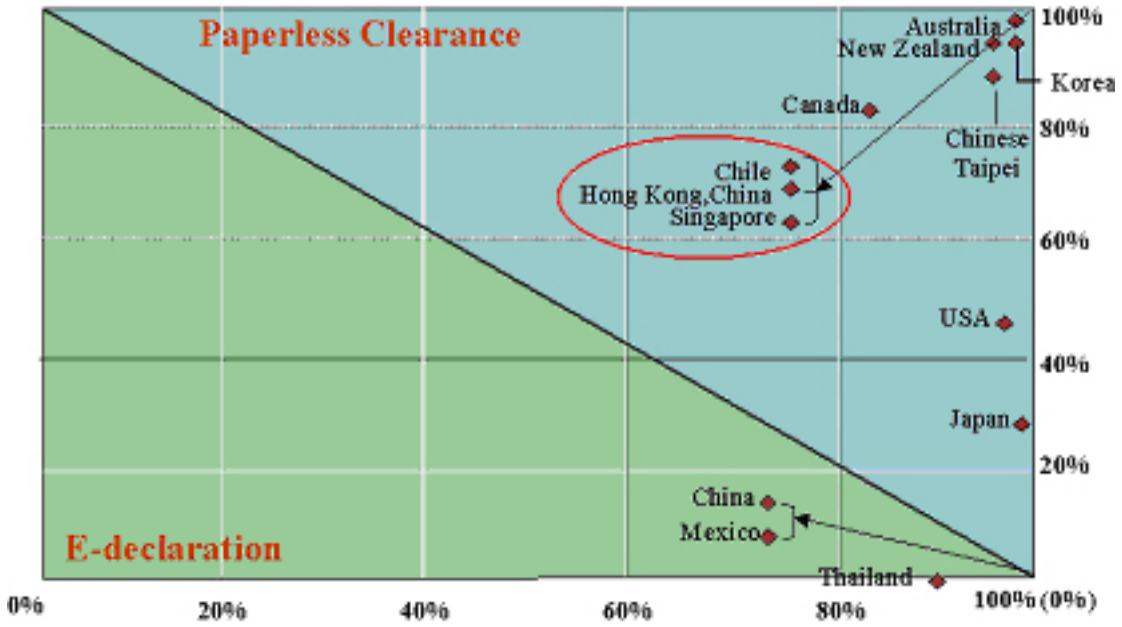


Fig. 2.8 E-Declaration & Paperless Clearance Status of Selected Economies



As shown above, many economies can realize whole paperless clearance. However, for some economies, such as China and Mexico, although percentage of customs e-declaration has reached 100%, they are not truly whole paperless clearance since importers and exporters still need to submit written declarations to complete the whole procedure.

Status of China Customs e-Declaration

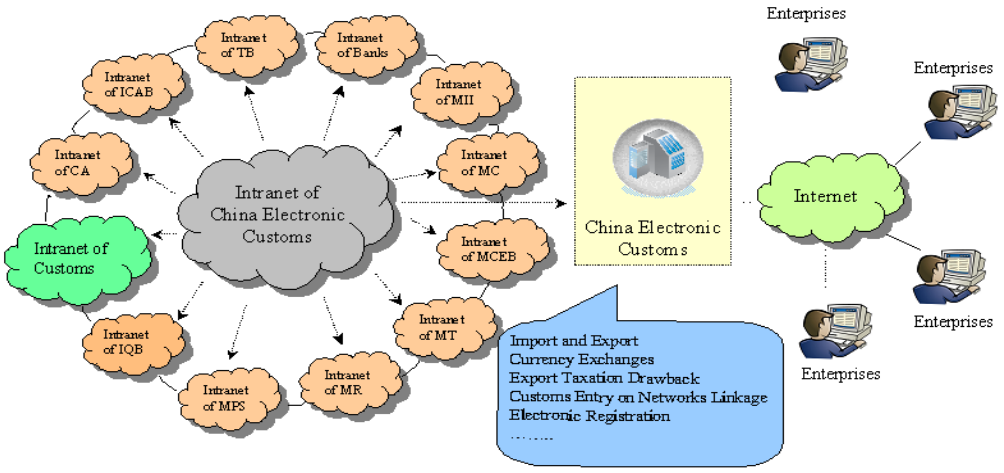
China Customs began to implement paperless trading from 1978. Having experienced three development phases, namely individual application, systemized application and online application across departments and regions, China Customs have gradually established and improved three main systems including “e-customs”, “e-port” and “e-general administration”.

During the individual application phase, the period before 1988, paperless trading was only applied to certain sectors with large businesses to handle individual items such as taxation, statistics, which was the beginning of paperless trading. Since 1988, H883, the automatic declaration system has been used to handle the customs declaration procedure wholly and automatically within the same custom area, which greatly improved the clearance efficiencies and standardization. An internal network of national customs was established with the support of telecommunication infrastructure after 1998. Then, customs nationwide can operate online fully across the custom areas and an “e-custom” system has been primarily set up to manage the imports and exports of various regions uniformly through the network.

In 2000, the State Council approved the joint request of twelve administrations

including Customs General Administration, Ministry of Foreign Trade and Economic Cooperation, Ministry of Public Security, State Administration of Taxation, People's Bank of China, State Administration of Foreign Exchange (SAFE), State Administration of Industry and Commerce (SAIC), AQSIQ, Ministry of Railways, Ministry of Communications, General Administration of Civil Aviation, Ministry of Information Industry to build "E-Port". An e-port data center was established, marking the startup of "E-Port China" construction. The achievements of more than ten years of e-customs building provide a solid and extensive application basis. In recent years, e-customs and e-port develop simultaneously, sharing data with ministries and commissions including Customs General Administration, SAFE, State Administration of Taxation, AQSIQ, SAIC, MOC, Ministry of Public Security, Ministry of Railways, China Council for the Promotion of International Trade (CCPIT), Hong Kong, China Trade and Industry Department, Macao Economic Services, as well as thirteen commercial banks including BOC, ICBC, ABC, CBC, CMB. With nearly 190,000 companies participating in the network, the daily handle of electronic documents reaches 500,000.

Fig. 2.9 Network Electronic Ports in China



Notes: ICAB--Industrial and Commercial Administration Bureau. TB--Taxation Bureau. MII-- Ministry of Information Industry. MC--Ministry of Commerce. FCEB--Foreign Currency Exchange Bureau. MT--Ministry of Transportation. MR--Ministry of Railway. IQB--Inspection and Quarantine Bureau. CA--Civil Aviation.

China customs started to build "E-General Administration" since 2001, aiming to set up a network system of decision, instruction centering Customs General Administration. A series of application programs have been started up, serving as a basis of paperless clearance.

China began to develop paperless clearance system on the basis of drawing lessons from the international practice in early 2002. This system automatically handles the electronic declaration data of import and export goods directly, changing the traditional practice of handling customs clearance with written documents. It not only speeds up the customs clearance but also improves the management of customs. After being tested in Shanghai and Qingdao, the system has already been extended.

The construction pattern of "e-customs", "e-port" and "e-general administration" greatly accelerates the development of paperless clearance. Take Shanghai (the chief port of imports and exports in China) for example, of the 58 commonly used customs clearance logistics documents, 41 (or 70.7%) have already been electronized. In 2003, the transmission of electronic documents reached 18.842 million, increasing 102.11% from the previous year. Shipping order, CSI information service, pre-shipping document, shipping order and other electronic documents have already been formally put to use. The approval of customs, examination and quarantine authorities, and electronic bill of lading information have become the foundation to pick up the goods. The customs clearance time for general imports at Shanghai port have been reduced from 96 hours to 48 hours for sea transportation and 72 hours to 14 hours for air parcel. The customs clearance time for imports at Waigaoqiao Free Trade Zone (WFTZ) reduced from 72 hours to 6 hours for air parcel and even reduced to 4 hours at Songjiang Export Processing Zone. Through EDI paperless clearance system, the average time limits from declaration to actual pass for imports and exports are 15 hours and 43 minutes respectively.

Besides, automatic check and pass system has been implemented at the three main overland ports. A vehicle can be checked and approved to pass in five seconds. A quick pass model of "forward declaration, pass when arrival, check at the gate, cancellation after verification" has been applied to empty containers. Now the time that empty containers are detained is shortened from the original two or three days to one to two hours. Meanwhile, customs clearance for logistics at Yantian port is fully electronized and business hours are extended to 24 hours each day. In 2004, the imports and exports clearance time at Dalian customs have been reduced 43.8% and 34.1% respectively compared to 2003 through reforms and the application of several programs such as "online declaration", "paperless customs clearance" and "e-pay".

Status of Singapore Customs' Paperless Clearance

Singapore government invested $210 million to build a seamless one-stop electronic customs clearance system (TradeNet) in 1989. TradeNet, developed by the Singapore government, is the first national customs clearance system in the world. It can connect all the international trade management bureaus (altogether 35 administrations) to a single integrated network, providing a network operation platform for importers, exporters, re-exporters, customs, ports, etc. Each party on the trade chain can transmit import and export e-documents, declare, examine and approve imports and exports, share information so that the communication efficiency between official and non-governmental is greatly improved. TradeNet fully supports the paperless trading transactions in Singapore.

According to statistics, over 95% imports and exports companies in Singapore declare goods to the customs through TradeNet. The system's customers have risen from the original 260 in 1989 to 25000. TradeNet enables the customs clearance fee to be saved

by 40% to 60% and administrative expenses to be cut by 30% to 50%. TradeNet handles 10 million customs declarations annually, saving 1 billion Singaporean Yuan (approximately $0.6 billion) of document handling expenses.

Table 2.10 Comparison on Pre & Post TradeNet

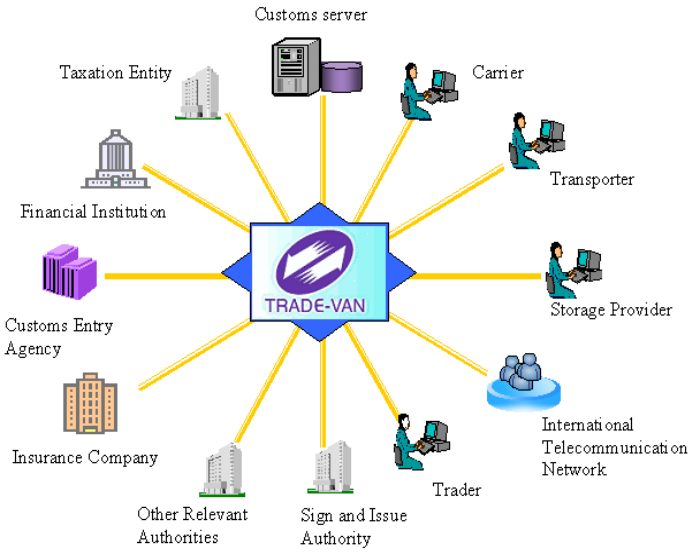
	Before the Application of TradeNet	After the Application of TradeNet
Processing time of each declaration	2 － 7 days	Less than 10 seconds
Charges of each declaration	10－20 Singaporean Yuan	6.40 Singaporean Yuan
Documents of each declaration	3 － 35 documents	One document
Means of Submission	Specially assigned person	Electronic transmission
Each Document	At least be brought to the governmental office twice	Be submitted using mouse
Way of Handling	By manpower	automatic
Time limit	4 hours（urgent）to 2 days	< 5 minutes
Accuracy of data	100% Checked by Manual work	Fully automatic, no manual work

Cargo Clearance Automation of Chinese Taipei

Cargo Clearance Automation is a national Value Added Network (VAN) with the name of "Cargo Clearance Automation System" (called TRADE-VAN for short, or abbreviated as T/V) established by the customs and all the other related institutes, practitioners through EDI (Electronic Data Interchange) technology in order to replace the traditional manual transmission and process the documents automatically instead of manual operation. The following is a sketch of CCAS procedure.

Today Chinese Taipei has completed the electronization of various declarations of trade administrative procedures on the whole. It is estimated that over 99% companies declare goods to the customs through TradeVan，and air-parcel and sea cargo have been able to be declared to the customs 100% automatically. Through the system, the average processing time of customs clearance for air parcel has been reduced to 0.216 hours and for sea transportation to 2.049 hours. The average customs clearance time for check-free goods has been reduced to no more than 10 minutes.

Fig. 2.10 Network of Trade Van



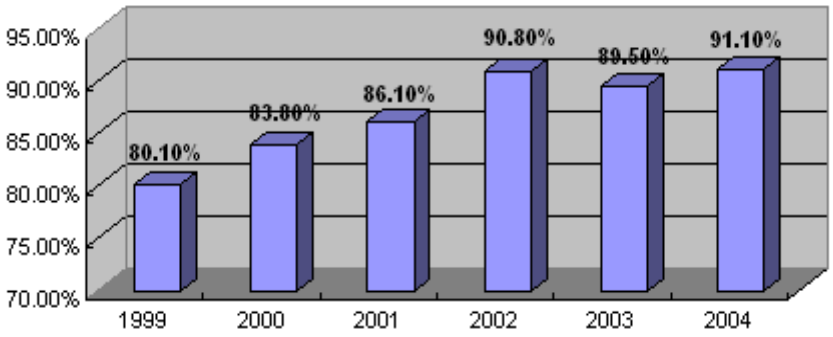
Electronic Transfer System of the U. S. Customs

The U.S customs implement three different electronic transfer systems:

Automated ClearingHouse (ACH) is an electronic payment option that allows participants to pay customs fees, duties and taxes to the U.S customs electronically;
Intergovernmental Payment and Collection System facilitates the intra-governmental transfer of funds;
Fdewire system is mainly used to transfer the taxes that need to be reported to IRS.

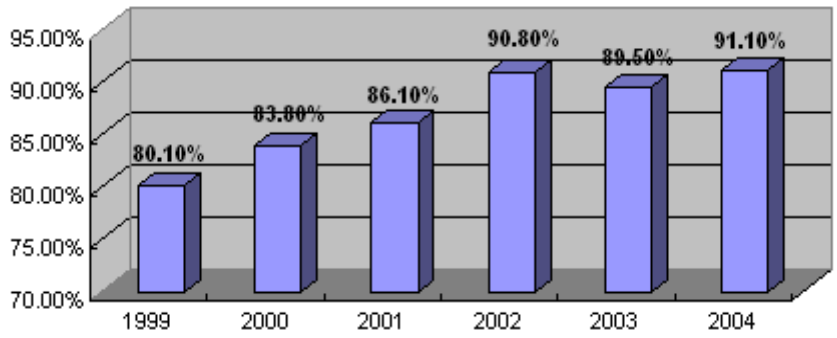
The percentage of revenue collections received via electronic means by the US Customs and Border Protection between 1999 and 2004 are shown as following.

Fig. 2.11 Percentage of Revenue Collections Received via Electronic Means



According to the statistics of US Customs and Border Protection, percentage of commercial invoices payments made by electronic funds transfer between 1999 and 2004 are shown as following.

Fig. 2.12 Commercial Invoices Issued by Electronic Transfer (Percentage)



Other Trade Authorities

Other trade authorities refer to the related administrations that issue certificates including quarantine and inspection, place of origin as well as imports and exports licenses.

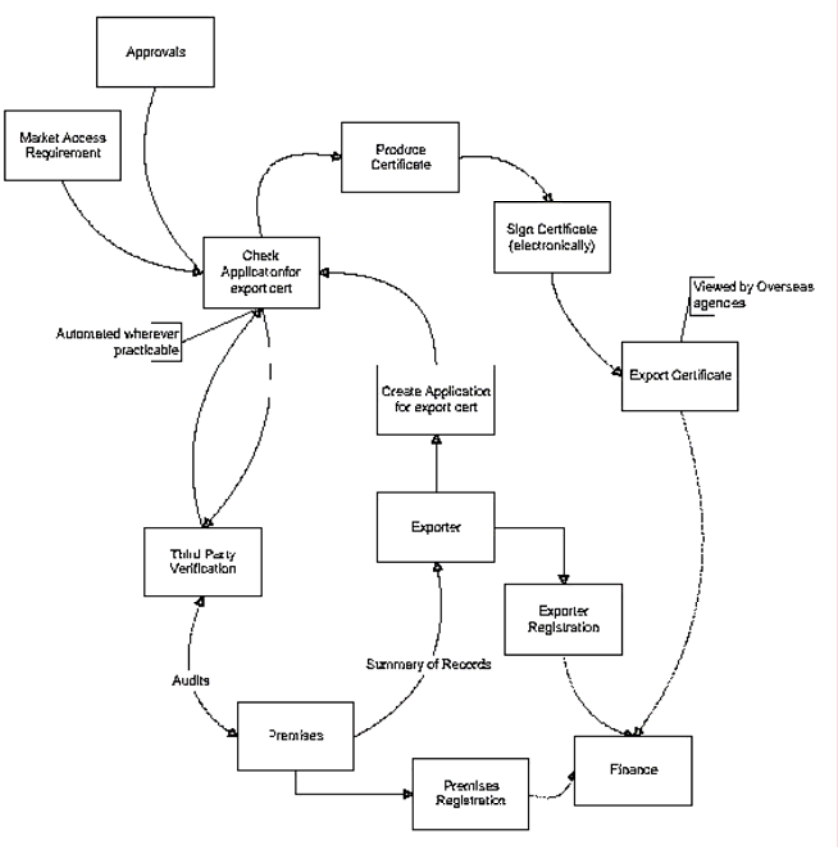
AQIS

Australian Quarantine and Inspection Service (AQIS) owns rich experiences in issuing electronic inspection and quarantine certificates. AQIS developed an electronic certification system (EXDOC) in 1992. In its early period of application, EXDOC was specially used to issue written certificates of quarantine and inspection for usable export meat products while its application gradually extended to other meat products, produces and export fishing products in the later period. AQIS, together with the related institutions in the U.S and New Zealand, developed sanitary and phytosanitary certificates (SPS) in 1994, which is called SANCRT message. The use of SANCRT not only simplifies the quarantine and inspection procedures but also reduces the cost of transaction as well as the time to prepare for the certification. Since SANCRT messages are transmitted directly between the governments of the transaction parties, its confidentiality and security are also greatly strengthened. E-cert, an Internet based government-to-government data transmission system for electronic export certificates, was the result of collaboration between the food safety authorities of Australia and New Zealand in 2002 in order to replace the original SANCRT system. E-cert enables the related administrations of import economies to acquire the quarantine and inspection messages about the goods from the export economies safely through the Internet. Now, E-cert can issue electronic quarantine and inspection certificates for all the food including meat, seafood, and dairy products and planting products. E-cert system can transmit messages to the quarantine and inspection authorities of import economies even before the goods leave the export economies, which facilitates the import economies' operation. The quarantine and inspection authorities of import economies can choose to browse the related messages about the goods on the web or download the messages to their own management system in XML format.

E-Cert in New Zealand

E-Cert was coined to describe the full New Zealand electronic SPS certification application. The electronic certification system assist the Food Safety Authority of New Zealand to provide quarantine and inspection guarantees that meets the health and safety requirement of the import economies. The system can transmit the certification messages to the quarantine and inspection authorities of import economies before the goods leave the export economies. It not only enables the import economies to get a general idea about the imports but also enables the exporters to acquire the permit of import economies before shipping, which greatly reduces the transaction risks of both transaction parties.

Fig. 2.13 Flow Chart of e-Cert in New Zealand



E-cert is a very important tool for the export authorities and the overall economic development of New Zealand. The system has a wide influence on the country's international competitiveness and world reputation. E-cert system issues over 300,000 electronic certificates annually, covering primary products and by-products valuing 13.5 billion New Zealand Yuan, which mainly includes:

- Dairy products —— (About 8 billion New Zealand Yuan's dairy products are certificated through E-cert and exported to the world annually);
- Meat and seafood —— (About 4.5 billion New Zealand Yuan's meat products

and seafood are certificated through E-cert annually);

- Planting products (including gardening and forest products) —— (About 1 billion New Zealand Yuan's planting products are certificated through E-cert and exported to the world annually).

The main users of e-Cert include:

- Both parties of transactions;
- The independent quarantine and inspection authorities responsible for the inspection of products;
- The quarantine and inspection authorities of import economies.

Now the electronic certificates issued through E-cert are accepted by many economies, which include Canada; Australia; the U.S and Mexico. More and more APEC economies (for example, Singapore; Chinese Taipei; Korea; Japan; etc.) begin to accept them as well.

General Administration of Quality Supervision, Inspection & Quarantine of P. R. China (AQSIQ)

As a governing authority, AQSIQ actively pursues the building of "Grand Customs Clearance" as the main application of paperless inspection. Since its startup in 1998, building of "Grand Customs Clearance", the inspection and quarantine program, has achieved distinct results. A new customs clearance system with inspection and quarantine wide area network as its trunk has formed based on the reform of existing supervision model of inspection and quarantine as well as establishment of coordination mechanism. It mainly includes declaration to inspection and quarantine before declaration to customs, sharing information, electronic customs clearance.

Under the system, ten programs are implemented:

- To build electronic operation platform, to streamline CIQ2000. The new system has three functions of e-declaration, e-supervision and e-pass (Three Es);
- To actively pursue the "Three Es" program to build an electronic pass network between the customs and the inspection and quarantine authorities;
- To consolidate the port information resources, to develop and implement an e-declaration and quick check system;
- To develop and implement e-examination quick check system;
- To establish a website (www.eciq.net) providing full services to companies. The procedures from accepting declaration to certification have been reduced from 11 to 6. Declaration period for products that do not need to check has been reduced from the original at least one or two days to no more than one hour, greatly reducing the customs clearance time;
- To prioritize the urgent work, arrange the inspection and quarantine rationally,

realize source control;

- To develop electronic customs clearance system together with the customs and pursue e-clearance actively. Since January 1 2003, 13 inspection and quarantine bureaus directly under AQSIQ and 17 corresponding customs begin to share information and realize direct customs clearance. By the end of June last year, more than 230,000 batches of goods realized electronic customs clearance;
- To implement new supervision model for export processing zone;
- To cooperate with the customs to check and examine so that re-checks are reduced;
- To put the "green pass" system in practice and speed up the customs clearance in mainland. The first batches of over 1000 exports manufacturers enjoy the use of "green pass" system.

Presently ECIQ (http://www.eciq.cn) provides services including: e-declaration, e-certification of origin and other related electronic services offered by AQSIQ, to recommend excellent companies and products, to support the electronization of companies, to exchange industry information and other value-added services. With its further development, ECIQ in China will introduce more services to accelerate the port customs clearance and speed up the building of electronic inspection and quarantine. Meanwhile China will improve the establishment of CIQ2000, standardize the operation platform and practice, complete the coordination of different systems, extend functions, share information of various port authorities, introduce other services including "Dynamic Supervision of Special Equipments and Online Declaration of Administrative Permits", "Declaration of Manufacture Permits through External Network". It is known that AQSIQ will actively implement PKI mechanism (e-government system) in 2005 to support the enforcement of electronic signature legislation and gradually apply identification technology to various business systems.

Meantime, an e-customs clearance online checking system was developed under the joint effort of AQSIQ and Customs General Administration in order to ensure the inspection and quarantine authorities' effective supervision on imports and exports, facilitates entry and exit, accelerate customs clearance. The system has been applied to the inspection and quarantine authorities and customs of main ports since January 1, 2003. The system can transmit the electronic data of the entry-exit certificates issued by the inspection and quarantine authorities to the computers of the customs. Then, the customs will check the data against that declared to the customs and let pass if they are consistent. At present, written certificate still needs to be verified to complete the customs clearance.

Electronic Certificate of Origin (E-C/O)

Hong Kong, China introduced Electronic Certificate of Origin (E-C/O) in August 1999 and began full implementation since September 25, 2000.

Chinese Taipei introduced E-C/O in March 2005. In July 2005, the Chamber issued

12,621 E-C/O, which accounted for 26.36% of total in the month.
In **China**, E-C/O mainly refers to the general certificate of origin and GSP FORMA. The issuance of C/O is subject to AQSIQ and China Council for the Promotion of International Trade (CCPIT).

The following describes the development of E-C/O under AQSIQ.

The "E-Certification of C/O Software for Company" passed the examination of AQSIQ and got the certificate of quality.

The system was implemented in Beijing, Guangdong, Liaoning, Shandong in September 1999 and got satisfying results.

Since September 2000, E-C/O has been fully implemented in Hebei, Tianjin, Jiangsu, Anhui, Ningbo, Fujian and Xiamen.

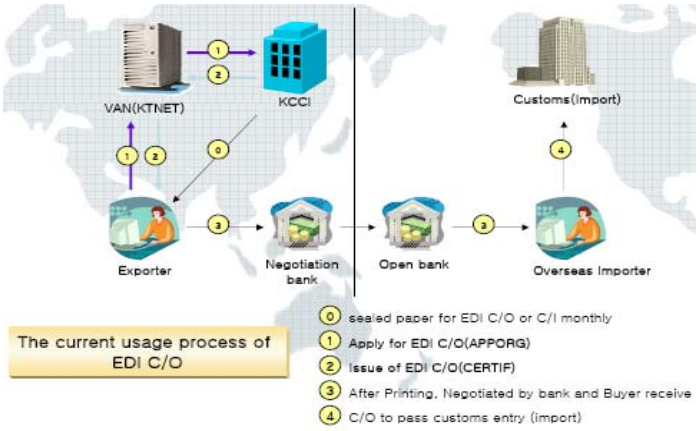
So far E-C/O has been implemented in all the port cities nationwide replacing manual processing. Actual users of E-C/O exceed 100,000. The issuance rate of E-C/O reaches 60%.

Singapore began to provide 24-hour E-C/O services since April 2003. The whole process from accepting declaration, issuing C/O to transmit C/O messages to the appointed third party (e.g., buyers) is fully done on electronic platform.

Development of E-C/O in Korea

In 1999, the Korea Chamber of Commerce and Industry (KCCI) developed an EDI C/O issuance system together with KTNET to provide companies with E-C/O service. Companies in Korea can apply C/O through KTNET and get EDI C/O once approved. Meanwhile, companies print the EDI C/O in documents (under KCCI's permission beforehand) and validate it after sealed by the government. To make management convenient, companies should report their latest EDI C/O list printed to KCCI. Here is a detailed procedure of EDI C/O:

Fig. 2.14 Flow Chart of E-C/O Issuance in Korea



The number of EDI C/O issued increases year by year (see Fig. 2.14). The percentage of E-C/O to total C/O has increased from 4% in 2002 to 19% in 2004 (see Fig 2.15).

Fig. 2.15 Amount of EDI C/O & C/O Issued from 2002 - 2004

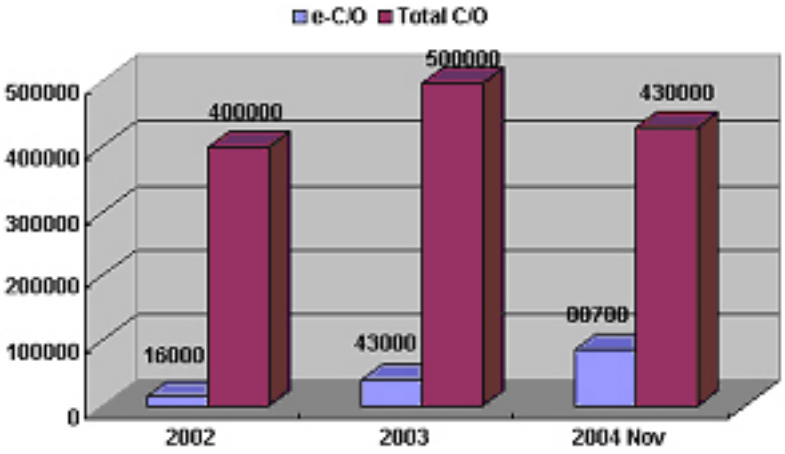
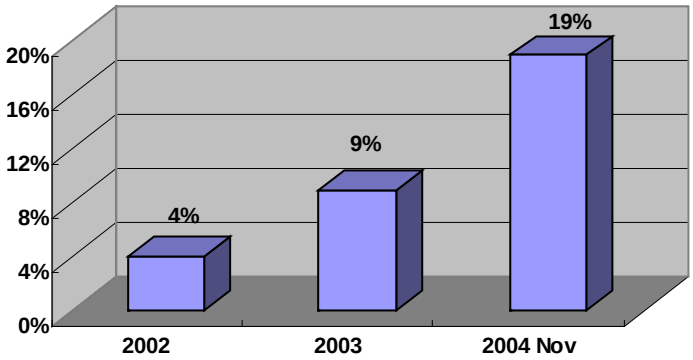


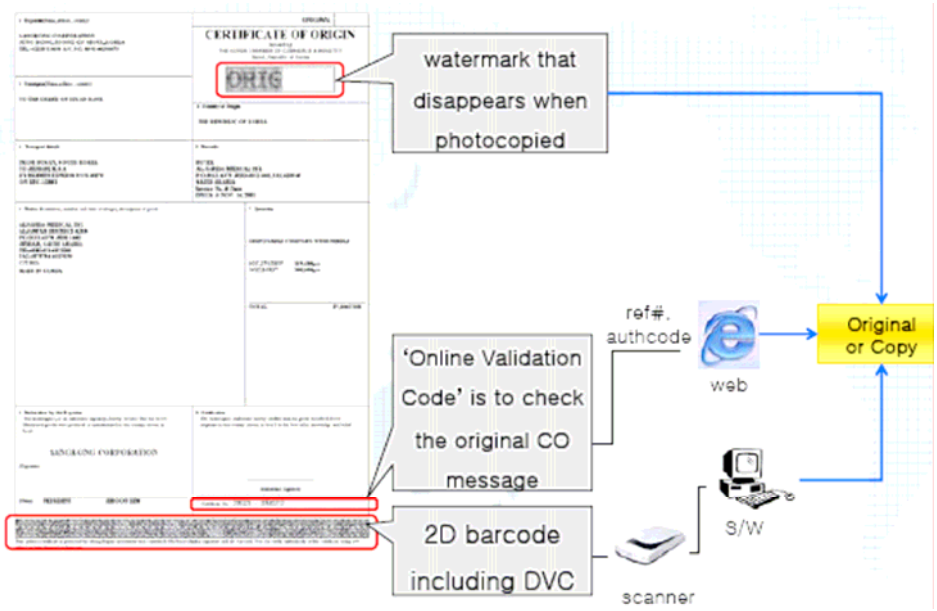
Fig. 2.16 Percentage of E-C/O to Total C/O Issued from 2002- 2004



To achieve the goal of truly E-C/O (i.e. do not need to print written documents, E-C/O itself is valid), and to meet the needs of Korean companies as well, KTNET upgraded the electronic certification system and adopted four safety technologies:

I. Watermarking prevents the companies from printing E-C/O without authorization of KCCI;
II. 2D Barcode mark proves the authenticity and reliability of E-C/O;
III. Data Validation Certificate shows the issuance authority, period of validity, etc.;
IV. Online Validation Code: Any user under the authorization of KCCI can check the authenticity of E-C/O information online.

Fig. 2.17 E-C/O Print Out



Since electronization of trade documents is a bilateral process, partner economies should cooperate besides one single economy's effort. Therefore, Korea develops

bilateral or multi cooperation with many economies such as Chinese Taipei, Singapore, Japan. Korea and Chinese Taipei customs are expecting the E-C/O transmitted cross boarders in 2006.

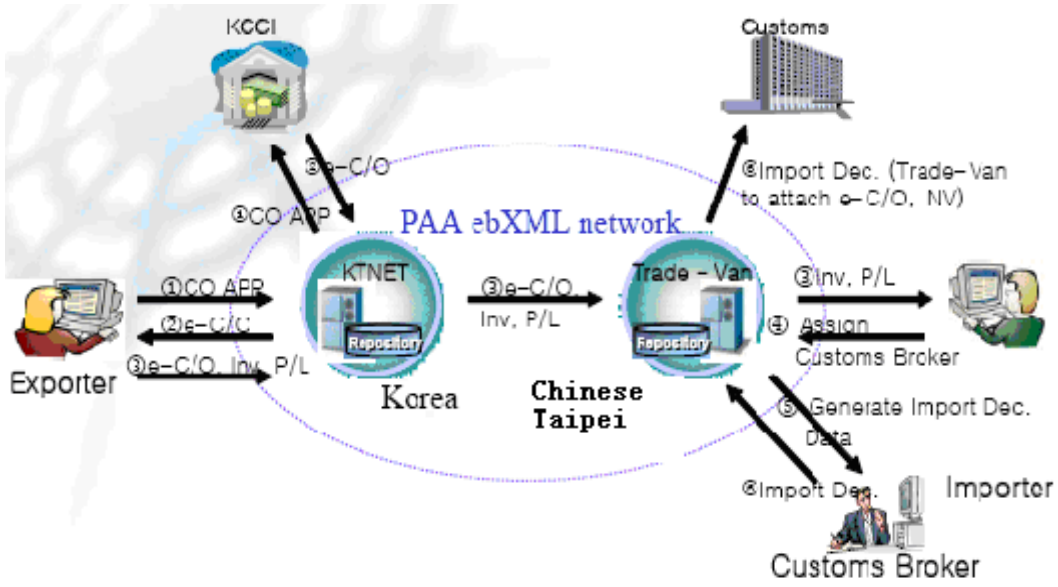
Korea & Chinese Taipei e-Certificate of Origin Interchange Project

With the support of MOCIE of Korea and BOFT in Chinese Taipei, KTNET and TradeVan are jointly developing e-CO Interchange project.

The two sides cooperate on the following basis:

- E-CO has been widely used within the two economies;
- Sound interchange network and PKI system recognized by each other to ensure the authenticity and reliability of e-documents are available;
- E-documents and e-signatures are valid in both economies;
- Online e-CO database has been established for inquiring and upgrading.

Fig. 2.18 Scenario of E-C/C Piloting Project between Korea and Chinese Taipei

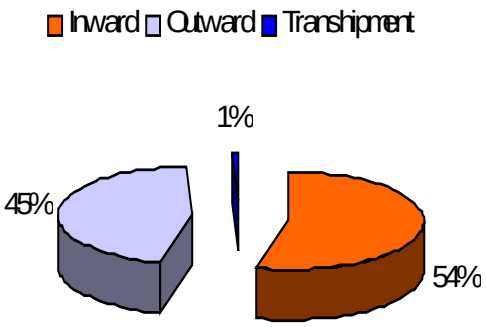


E-Permits for Import & Export

Chinese Taipei formally launched electronic certificate services in March 2005. Only in July 2005 one month, there are more than 17,385 certificates issued electronically, which accounted for 41.72% of total, issued in the month.

Singapore Customs, the authority of permits for import and export in Singapore, issues licenses via TradeNet. As pointed in the Singapore Customs 2003/2004 Annual Report, the Singapore Customs issued 8.6 million permits for import and export through TradeNet in 2003, 90% of which were processed within 10 minutes.

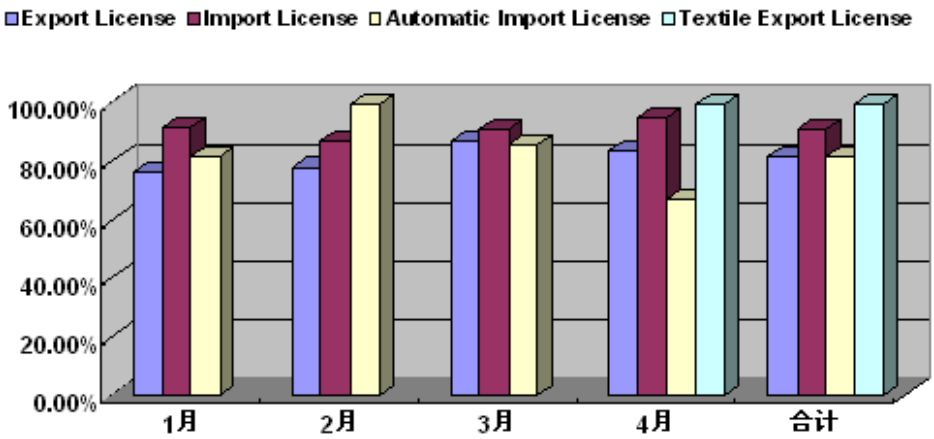
Fig. 2.19 Permits Issued by Singapore Customs via Trade Net



Development of e-Permits in China

In order to realize paperless trading and promote the application of e-permits, as the chief server of Golden Customs Project, China International Electronic Commerce Center (CIECC) establishes a network covering the whole nation and connecting to the world. Management of trade permits has developed from the single computer application to fully electronic processing. Now 62 issuance authorities in the nation have all realized online management and checking of electronic data. 4922 companies in 27 provinces and 4 municipalities participate in online application of permits. The percentage of export permits applied via Internet in the total export permits issued rose from 14.43% in 2002 to 81.73%. Online management of permits has been widely accepted by the issuance authorities and companies. Statistics about online application and issuance of permits are shown in the following.

Fig. 2.20 Percentage of Permits Applied via Internet to the Total Number Issued (January to April, 2005)



Note: The total permits issued include the permits applied and certificated online and those approved online but received by the companies themselves.

Three steps of experimental work:

Firstly, to realize paperless online application and use electronic signature as examination and approval results.

Secondly, to issue electronic permits online for filing and browse by the companies, as well as chief means of printing certificates in the other cities (printing is a problem). Meanwhile, written certificates are still valid.

Thirdly, to realize paperless customs clearance

Presently, on the basis of online checking of textile quota with customs of the U.S, EU, Canada, Turkey, etc, the Ministry of Commerce has completed the computer online management and checking of electronic data with 62 permits-issuing authorities nationwide. e-Bidding has been available for all the products. In January 2002, "management system of import and export permits" started to use in the permits-issuing authorities. In January 2003, application system of permits was implemented throughout the nation.

Next, procedures of paperless trading for permitted imports and exports will be subdivided and paperless customs clearance be promoted, establishing a basis for paperless e-declaration to customs and inspection authorities, as well as e-taking of certificates.

2.2.2 Application of Paperless Trading on Transportation

Survey

EDI is the primitive application technique of paperless trading, which is quite widely used in shipping companies. Many large-scaled shipping companies have established EDI data transmission system of their own, the major function of which is to send cargo manifest EDI data from the port of departure to the EDI receiving systems of each port agent and the head office. In general, the receiving place of EDI can receive detailed data materials in the manifests in several minutes, which can enable each port agent to learn about the situation and make preparations to unload the ship and deliver good as well as compile various instruments and provide the quickest service to the consignees. The most important function of EDI technique is to improve the transmission speed of the materials and ensure that the materials can be delivered accurately, which can avoid accidents such as mistakes in delivery by mail etc. The application of EDI in this respect has gradually become mature.

With the wide popularization and application of Internet and the rapid formation and development of XML technique, new vigor has been injected into the development of E-commerce, for example, the inquiry of freights, which has always been made through tariffs, telephone or fax, can be made directly through Internet and the detailed materials can be obtained through the transmission of electrical documents. Moreover, bills of

lading, shipping notes and customs declaration forms can be made out online and electronic payment is available etc. At present, some large international shipping companies have adopted XML format to make out electronic bills of lading, and circulate and deliver them according to rules of EDIFACT. Various companies have taken part in the competition circle of paperless trading one after another to strive for survival and development under the fierce competitive environment in shipping industry. Paperless trading has improved the operational efficiency, has brought about convenience in trading, and has strengthened the communication with clients as well as has embodied the greatest value through integration with shipping companies from the application of EDI orders to the promotion of electronic bill of lading, and from the introductive websites to the powerful website with various transaction functions (such as APL, MEARSK, EVERGREEN companies etc) As the paperless trading technique is widely used in the most developed economic entities in ocean shipping, paper shipping instruments are gradually disappearing, and the management manners have undergone structural changes. Various standards formulated by international EDI organization are becoming the basis trade partners abide by, and even EDI has become the only trading method between trade partners in some economies and industries. Moreover, some economic entities and government agencies have imposed certain restriction and punishment measures on those industries and enterprises that refuse to use EDI in transactions. For example, such economic entities as America, Australia, Singapore etc. have regulated in sequence that EDI must be used in clearing goods through the customs, loading and unloading at the port etc., or the handling will be put off and a great sum of commission will be charged; And the ship owners shall be held responsible for the delay of the vessels, if any.

The following table is the electronic application in international transport by the economic entity in APEC.

Table 2.11 Potential & Current Status of Providing e-Service in Logistics

Type of Service	Potential for Completely Realizing Electronicization	Current Situation of Electronicization
Transport (Air transport, ocean shipping, land transport etc.)	Medium/Large	Some economic entities have a high degree of electronicization, while some economic entities are rather backward. Generally speaking, various electronic methods are being constantly adopted in transport by various economic entities to realize electronicization. At present some of them have begun to be integrated with international cargo tracking and inquiry system.

Supplementary Service (3PL/4PL, single service window, agent etc.)	Quite Large	It has a high degree of electronicization, but has not completely realized system integration.

Australia − Sydney Harbor

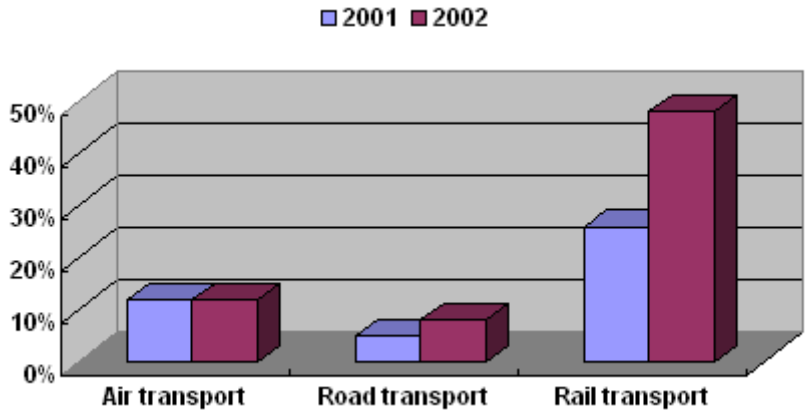
In Australia, the carriers shall send ocean shipping cargo manifest information in electronic forms to port authorities and customs respectively. Sydney harbor sends and receives electronic cargo manifest information (IFCSUM), reports of dangerous goods and customs notification of arrival t mainly through computer booking system ShIPS. The liners transmit electronic cargo manifest information through e-mails in general.

Australian customs receives electronic cargo manifest information from the carriers through sea cargo automation system (SCA), and then transmit the relevant information to various ports and ports authorities concerned.

Canada

The following diagram is on percentage of the use of internet-based EDI in Canada logistics enterprises in 2001 and 2002.

Fig. 2.21 Use of Internet-Based EDI in Canada, 2001 & 2002



Source: Statistics Canada (2003), 2002 E-commerce Survey, and Statistics Canada

Canada Automatic Cargo Manifest System (ACI)

- Ocean shipping declaration was implemented since April 19, 2004;
- Carriers or their agents declare A6A cargo materials in the form of EDI 24 hours before loading the vessels;
- All the supplementary materials shall be declared in the form of EDI 24 hours before containing the cargo whether such materials are transmitted through

cargo agents or carriers;

- Shipping companies shall declare shipping materials in the form of EDI 96 hours before berthing at the first port of Canada;
- Air transport and railway transport declaration was implemented since May 9, 2005;
- Air transport shall be declared 4 hours before the plane arrives in the territorial air of Canada;
- Railway transport shall be declared 2 hours before the train arrives in Canada;
- ACI automatic cargo manifest declaration system will have been implemented comprehensively for all the entry transport by the end of 2005.

Port Halifax

EDIPORT Atlantic INC was founded in 1989, which is a non-profit organization. Its members include: various industrial organizations, companies, government agencies and agencies inside Halifax Port Authority. Its major function is to promote the implementation of EDI in port Halifax. EDIPORT began to receive funds from port Halifax and provincial Technology Transfer Association, and set out to carry out planning and research on EDI. It invested 450,000 Canadian Dollars and 250,000 Canadian Dollars in sequence in development in Sept. 1991. There are 12 partners in the system, including container-shipping companies, ocean shipping piers, and customs agents, Canadian North-American Company, Canada Coastguard, Canada Customs, Canada Agricultural Company and Port Halifax etc. The future planning of EDIPORT of port Halifax is to cooperate with truck transportation companies to realize automation in the process of transmission at the piers.

Chile − Port Valparaiso

The carriers can send electronic cargo manifests to Chile customs directly through ISIDORA system, and then the cargo manifest information is transmitted to the electronic system of the port authority at the Port Valparaiso after audited and passed by the customs. And the port authority checks the manifest information through the electronic system. The system can enable the port to handle the operation flow according to the electronic cargo manifest information submitted by carriers. All the information exchanges between the customs, agricultural Inspection and Quarantine Bureau and liner companies are all based on XML technique.

Port Valparaiso established a logistics trading website of the Port Valparaiso in 2001: www.vlt.com. The website provides relevant information on cargos and vessels as well as timely inquiry service on the state of the cargos etc. to such agencies as importers, exporters, liner companies and customs.

The key factors why ISIDORA system at Port Valparaiso has been successful include:

Proper Choice of Techniques:

Flexible, low-cost and "open" Internet technique is one of the key factors why ISIDORA system has been successful. The system has chosen XML techniques instead of EDI text system, which has greatly saved the expenses in funds and time cost.

Concept of Trading Lubricant:

Under the premise that fiscal revenue will not be reduced and the frontier protection will not be weaken, Chile Customs authority is cutting down unnecessary interference with the enterprises to the greatest extent. They are trying to realize it through improving risk management system and other relevant skills. And Chile Customs has realized that customs cannot add any value to the trading chain in the trading flow, so they are trying to play the role of trading lubricant and propeller of convenience in trading.

Cost-efficiency and Connectability of the System:

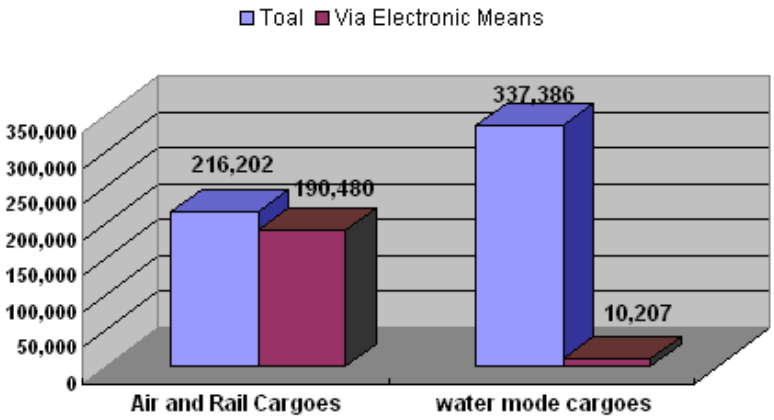
Customs authority does not charge any fees for the use of ISIDORA system. The user can use the system only by adjusting the Internet configuration. Of course, it is the open technique framework chosen by the system that has enabled any enterprise to use the system with a low cost.

Hong Kong, China

Hong Kong, China formally launched electronic cargo manifest service on April 11, 2003, which is fit for air transport, ocean shipping and railway transport (except highway transport). The carriers can submit electronic cargo manifests to Trade and Industry Department, Hong Kong, China Customs and Census and Statistics Department through Tradelink companies.

On July 17, 2004, electronic means were comprehensively implemented in Hong Kong, China to submit aviation and railway cargo manifests. The submitting way via the two ways of electronic and paper since April 2003 will be completely electronically by the end of 2005. Electronic submission of cargo manifests in land transport is on the way of planning. The government is consulting widely with the industry to carry out "Forecast Program for Road Freight", with the aid of launching relevant regulations in the end.

Fig. 2.22 Statistic Cargo Manifests Submitted in Hong Kong, China in 2004



Hong Kong International Terminals Ltd. (hereinafter referred to as "Hong Kong International Terminals") is the flagship company affiliated to Hutchison Whampoa Ltd and is a leading international dealer in port investment and development. Hong Kong International Terminals lies in the busiest container port in the world-----Hong Kong Kwai Chung Container port, and deals with 11 berths at No. 4, No. 6, No. 7 and No. 9 piers while cooperating with COSCO Pacific Co., Ltd. in dealing with two berths at the No. 8 pier (east). In 2003, the container handling capacity of Hong Kong International Terminals and COSCO---International Terminals reached 6.39 million standard containers in all, handling about over 50% of the volume of handled containers at Kwai Chung Container Port.

Hong Kong International Terminals can provide the following electronic services:

1 Electronic data exchange and information exchange service;
2 "Appointment" System;
3 Control Tower and Planning;
4 Sluiceway Programmable Automation;
5 Stack Programmable Automation;
6 Stage ID Card System;
7 Port Circulating Information;
8 Ship's Position Planning System;
9 Identifying System of Vessel Weights and Types & Operation Checking System.

One of the important strategies of Hong Kong International Terminals is: shifting the emphasis on operation of the ports to service for the clients, which has greatly helped clients make a good use of information and upgrade operation. Customer Plus and One-Stop-Port are two examples in it. Both can make the clients benefit from the central database of Hong Kong International Terminals depending on Internet, and has saved them the inconvenience in printing and delivering documents.

Information Service Department of Hong Kong International Terminals is responsible for promoting various information technologies and providing support in resource information and technology to Operation Department, Commerce Department, Financial and Administrative Departments etc. Hong Kong International Terminals tries its best to be different from the common run. One of the keys for the successes of the dealers of container ports is that information exchanges must be swift and accurate. Hong Kong International Terminals has developed a precise and advanced computerized information network system and has established enterprise business information management system (EBIS) as well as has implemented EPR. Moreover, it has invested 100 million Yuan in establishing 3P（productivity plus program）Pier Management System. And the controlling center inspects the operational details of the whole pier on all fronts in front of the computer screen, and is responsible for supervising the trend of each container in the stack and directing the operation of the port as well as providing high-quality and efficient service to the clients. The advanced "Port Management System" of Hong Kong International Terminals is the core system that the whole port depends on for effective operation.

3P pier management system has achieved remarkable benefits: the piling capacity at the pier has been improved by 37%, and 15% for the piling speed. The transshipment time has been quickened by 20%, and the loading& unloading efficiency has been increased by 25%. The density of the containers at the pier has reached 90% (60% in the past). And the number of the turnover days of the containers has been reduced from over 10 days to less than 7 days.

Malaysia－Port Kelang

Malaysia planned to promote EDI at the beginning of 1990s and the government stepped in to promote the implementation of it through legislation. Under the support and promotion of the government, Malaysia planned to realize EDI information transmission and operation between such agencies as the ports, shipping companies, ship agents, customs, custom-house brokers, duty and banks in the country. And the largest port, Port Kelang was chosen first for trial operation of EDI technique in the ports and shipping industry in Malaysia.

Port Kelang is the largest port in Malaysia with over 600 lines leading directly to various ports in the world. Port Kelang developed "Port Kelang Community System" in 1993, which was the first information service system that adopted EDI technique.

The major objectives of the system are:

- Improve port clearance operation of the cargos at the port and reduce the port demurrage time;
- Track and monitor the state of the consigned cargos;

- Provide detailed lists of the cargos and declaration information of the cargos in clearing the port accurately and promptly;
- Provide standardized trade documents.

At present, PKCS system has succeeded in linking such industries as ocean shipping industry, shipping agency industry, customs, port authority, dealers of freight yards and banks etc. electronically through customs information system and SMK（System Maklumat Kastamand EDI Malaysia's Dagang Net. The customs clearance procedures used to take 3-4 days in the past, but it takes only several hours at present, which is only a small part of the operation time originally needed. Ocean shipping dealers can pay import duties directly online through the bankers connected with them in addition to promoting exchanges of relevant documents and upgrading shipping efficiency of containers (cargos).

In view of the fact that port operation is usually restricted by various regulations of the customs, which will influence the turnover efficiency and speed of the cargos, Port Kelang Authority established Free Commercial Zone (FCZ) in April, 1993 to promote the efficiency of port service, which was managed by the port Kelang Authority. The implementation of EDI system of the Free Commercial Zone (hereinafter referred to as FCZ-EDI system) is to change the manual operation in instrument processing system to paperless system, which can increase efficiency and productive force through faster customs clearance of the instruments and cargos. The system began to operate since January 1999, which was also the first paperless system in Malaysia.

The applicants can send the declaration materials and cargo manifest materials of the free commercial zone electronically to port Kelang authority through PKCS system in his own office via FCZ-EDI system. PKCS system will transmit such declaration materials to the port authority as well as other ports and storage dealers. Upon the authorization of the application materials by Port Kelang Authority, the authorization form will be sent back to the applicant and will be transmitted to various ports and storage dealers with the registration number.

The implementation of FCZ-EDI system has improved the processing time of the declaration forms in the free commercial zone, which can finish the transaction of 85% of the application forms within 25 minutes. And the manpower needed in the management and statistics department in the free commercial zone has also been lowered. Moreover, the operation cost has been lowered 1.5 million Malaysian Ringgit annually (including the potential saved sum of 0.4 million Malaysian Ringgit in paper and printing).

FCZ-EDI system and PKCS system has endowed Port Kelang with the decisive competitive edges necessary for it to become a regional cargo hub center.

The major factors for the success of the system

- Malaysia boasts perfect information and telecommunication infrastructure, and PKCS system developed by DagangNet is a national data network system;
- Due to the security for the safety and authenticity of the data on the network, the service provided by PKCS can be adopted rapidly nationwide. Because the team, which is composed of experienced personnel in the various relevant groups in the port community, takes charge of the development of the system, it guarantees to a certain extent that the service provided by the system can meet the requirements of the port groups;
- Perfect educational plan and plan of training on use have guaranteed the smooth participation in PKCS system by various parties;
- Great policy support to the construction of e-commerce platform by Malaysia government is the powerful driving force for the successful operation of PKCS.

Singapore

Since the middle and late 1980s, Singapore government decided to promote EDI in container transport in ports and navigation agencies first to improve the loading and unloading efficiency of the containers and shorten the time for custom clearance. At present, Singapore has over 350 application systems dealing with port management, planning and operation, the major system of which include PORTNET----which is responsible for electronic data communication and exchanges with the outside, CITOS (Computer Integrated Terminal Operation System), CICOS (Computer Integrated Conventional Operation System), and CIMOS (Computer Integrated Marine Operation System).

Singapore PORTNET system was started in 1984. At the beginning, PORTNET was only used as a data mailbox. Later, with the gradual increase in the amount of information, it included database on the arrival and departure of the vessels, vessels at the port and chemicals. Then it developed into two-way communication. Communication contact from computer to computer to carry out electronic data exchanges was first realized in Maersk Company in 1987. The first overseas communication route was set up with Hong Kong, China International Terminals Ltd. to exchange loading information of the containers electronically, which improved the work in the stacks and vessel dispatching as well as quicken the turnover time of the vessels. PORTNET was implemented in 1989, and its functions were greatly expanded. PORTNET adopted EDIFACT text standards and such EDI network system is being used by over 1,200 companies now. At present, Singapore has established electronic communication routes with 2 Asian ports and 6 African ports. The future development plan of Port of Singapore Authority (PSA) is: continuously extend and improve the functions of PORTNET to make it more perfect and automatic; establish more computer communication routes to link the users of the ports, agencies and banks related to navigation so as to quicken the circulating speed of the vessels and cargos.

PSA and TDB jointly has developed a new EDI system---- Marine Information System (MAINS), which has unified the relevant transport documents of the shipping companies, freight transport agents, trade partners and supervision agencies in the form of electronic data, thus making Singapore become the first country that has successful regulated various transport documents and data in the world.

Singapore EDI network system (PORTNET) and State Tradenet (TRADENET) are two mutually independent EDI systems. Singapore customs are operation on TRADENET, and the users of PORTNET can transmit information to TRADENET through EDI Center, but the users of PORTNET need to go through separate procedures for access to TRADENET otherwise in case they need other service of the customs.

Singapore government agencies have adopted compulsory measures to promote EDI. And the process of the promotion was mainly divided into three periods: trial operation---compulsory--sealing. Trial operation period mainly consists of training personnel and purchasing EDI software& hardware systems by the users; in the compulsory period, relevant users must adopt EDI, or 10 more Singapore dollars will be charged for each standard container as a fine; In the sealing period, the ports refuse to accept all the containers that do not adopt EDI.

Peru − Port Callao

Liner companies can send electronic cargo manifest information to customs before the vessels arrive at the port concerned, but it is still necessary to submit paper duplicates of the cargo manifests to the customs after the vessels arrive. Moreover, only the customs agencies can receive the relevant information sent by the carriers before the vessels arrive, and other port entities such as port authority can get relevant information only after the vessels arrive at the port, which will necessarily affect the handling efficiency of the cargos.

Different from other economic port entities, customs brokers or importers must get certificate of value from a third party----Valuation Supervision before loading the cargos. They cannot complete the whole custom clearance procedures until they provide complete documents such as certificate of value, import declaration forms and cargo manifests etc. at the same time.

Philippines − Port Manila

The most important port in Philippines----- Port Manila and Manila International Container Port was contracted out to a private agency for operation and management in the form of leasing by The Philippines Port Authority. Liner companies can transmit relevant information to port.

Operators through EDI, and may also directly submit paper cargo manifests. For

example, when the vessels arrive at the port, the port operators will notify customs and other relevant port agencies. Importers submit import electronic declaration forms to ACOS system in the customs through InterCommerce Gateway. And importers may also submit written declaration forms, which cannot be processed rapidly through the Customs Super Green Lane.

OCEAN－Ocean Carriers' Electronic Access Network

In addition to the fact that each port boasts an EDI automatic operational system of their own, shipping companies mainly engaged in North-American market signed "Information System Agreement" in 1991 which made it common objectives to meet the information requirements of the clients, establish information transmission standards in ocean shipping, save the investment in information technology as well as jointly promote the application of new technology in ocean shipping and the improvement of economic benefits etc. so as to upgrade the market competitiveness of them. 9 large-scaled international shipping companies, APL, Maersk, Sea-Land and P & O Nedlloyd etc. planned to found OCEAN in Sept. 1995. The container ships of the members of the organization has exceeded 400, and the total container volume was about 1.4 million TEU, which berth at 300 ports worldwide with its carrying capacity over 40% of that of the world as a whole.

The organization can provide standard information ranging from Booking、Shipping Instructions、Bill of Lading、Invoice、Container Summary、Vessel Schedule to Arrival Notice etc. To cargo owners and custom brokers through on-line EDI system at present. And the clients can exchange electronic materials with 11 shipping companies simultaneously through the OCEAN software that has been jointly developed, which can save a lot of development expenses of computer systems. And ISA will continue to exchange relevant loading/entry & exit information etc. with the ports and piers. It is believed that more shipping dealers will join the organization in the future.

SHIPNET shipping information service network was established by NTT Company in 1986 in Japan to provide shipping information exchange service. And 18 shipping companies, 133 forwarders and 2 notary offices founded an association---Port Logistic Information System Association (POLISA) in May, 1995, which succeeded to the service provided by SHIPNET, and its named was changed into POLINET. At present, there are only 81 proprietors are using it, which accounts for over 50%. The reason is that EDI has not been widely used in Japan, and most proprietors are still transmitting information in the format of their own; Moreover, such factors as the transmission processing fees is much too higher than other network service companies etc. have made the promotion of POLINET not so smooth as had been expected.

According to the statistic results in the 7th EDI survey by Japan Electronic Commerce Promotion Council (ECOM), 78.5% of the Japanese enterprises implemented EDI system, and 36% of the enterprises adopted EDI in logistics system to track, inquire of

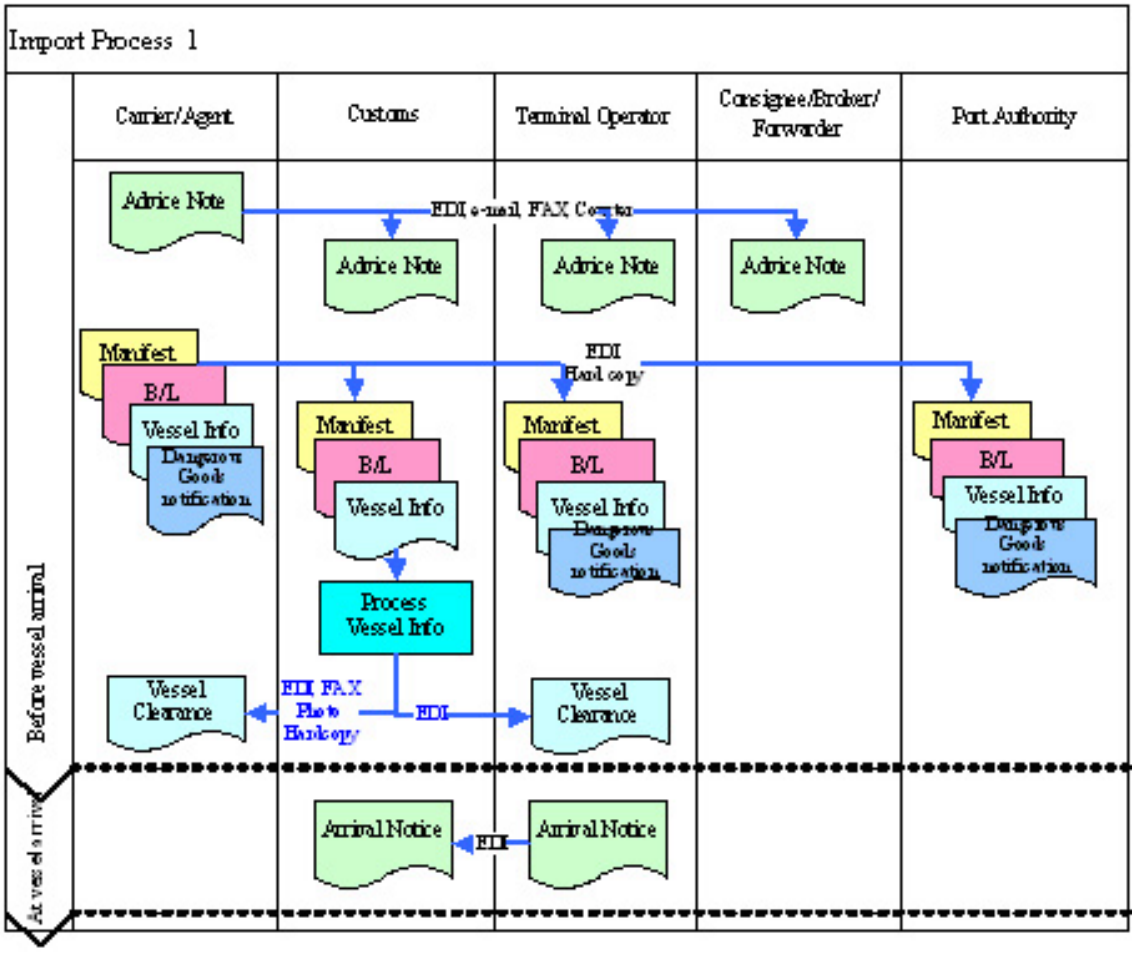
cargos and deliver notice of loading etc.

BOX 4 Port Vancouver

In Canada, container carriers need to send relevant information on cargo manifest and bill of lading to port authority electronically, and other carriers may also choose to submit relevant paper instruments directly. Port of Vancouver Authority is devoted to improving the relevant infrastructure at the ports to further promote carriers to submit relevant information electronically. And their target is to upgrade the efficiency in data transmission under the premise that influence on carriers can be reduced as much as possible.

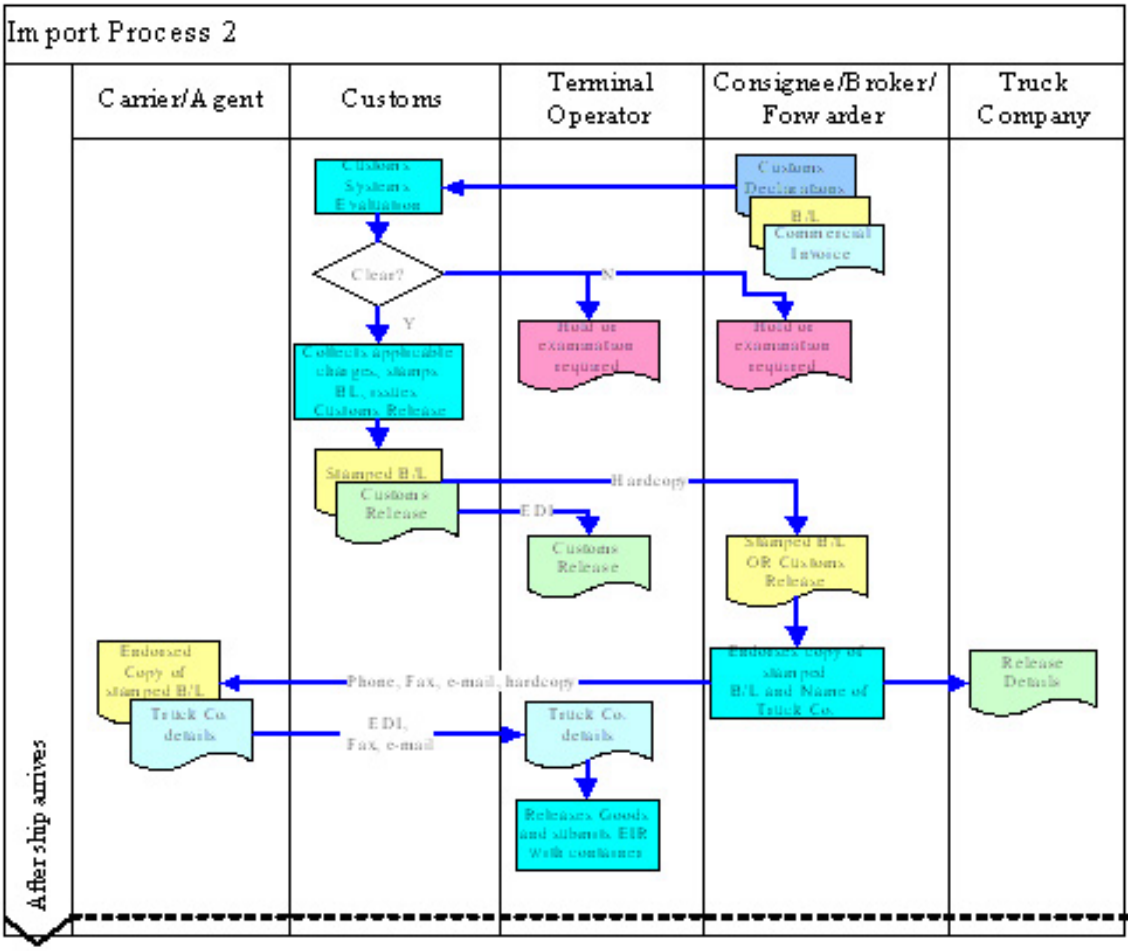
The communication manners between Port Vancouver and various carries are different from each other: EDI, fax, telephone, e-mail and paper instrument information etc. This is mainly due to the fact that not all the enterprises at the port are capable of receiving and sending electronic documents, and lack of an integrated port information system has restricted the development of Port Vancouver to a certain extent.

Fig. 2.23 Vancouver – Vessel Pre-Arrival



The carriers can send notification of arrival to customs, pier operators and other relevant parties through EDI, e-mails and fax etc. before the vessels arrive at the port. Then, the carriers need to send information on cargo manifests, bill of lading and vessels to Canada customs, port authority and pier operators, and the carriers may choose to send such information through EDI or paper instruments. Canada customs will send the duplicates of such documents to Canada agricultural and statistic agencies. After receiving the relevant information, Canada customs will transmit the information on customs clearance to carriers and pier operators (through EDI) through EDI, fax, telephone or paper instruments etc. (through EDI)

Fig. 2.24 Vancouver – Post Arrival



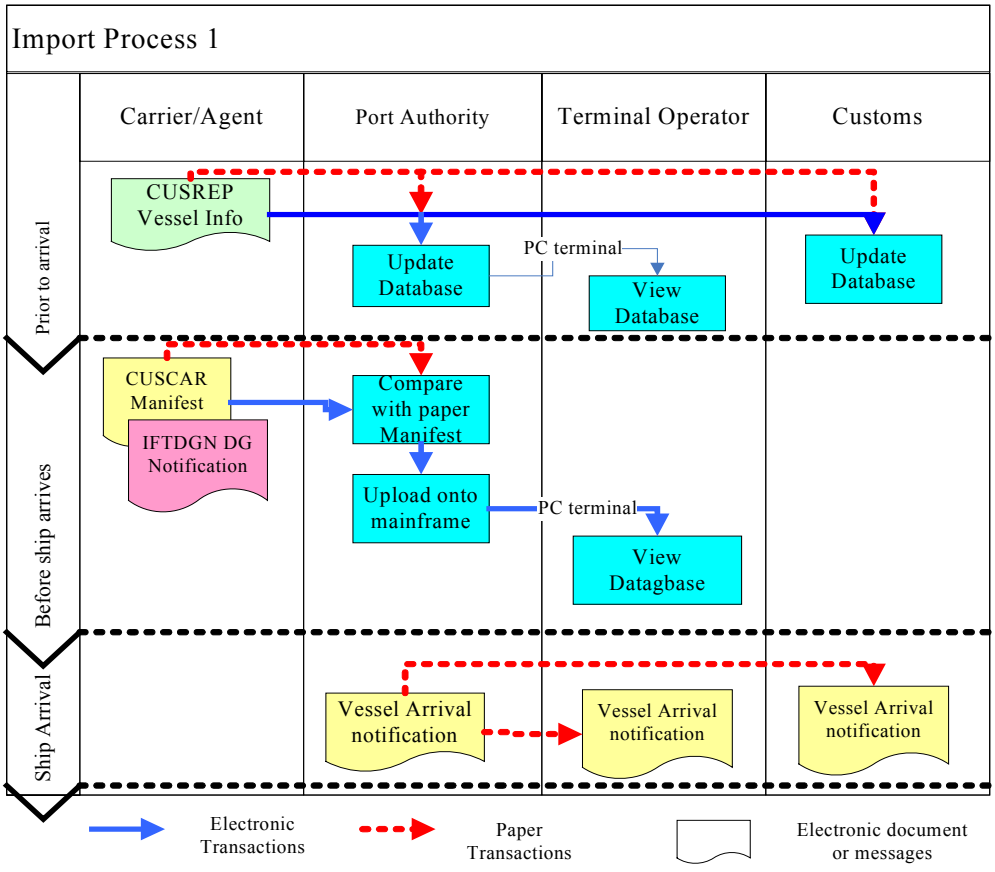
After the vessels arrive at the port, the importers will submit import declaration forms to the customs, which will audit the declaration forms and the attached instruments. In case there is no mistake, the customs will clear the goods through the custom after charging corresponding taxes and fees, or the customs may need to make further inspections of the cargos. In case the carriers submit photocopies of the bill of lading that has been filed to Port of Vancouver Authority, the customs will affix seals on such photocopies and clear the cargos through the customs. In case the carriers submit electronic bill of lading, the customs will not give separate notice to Port of Vancouver Authority. The carriers will inform the pier operators of the detailed information on

customs release permit and truck companies, and the customs will clear the cargos through the customs after confirming that there is no mistake.

BOX 5 Thailand – Bangkok Seaport

Port of Thailand Authority has established EDI links with over 40 liner companies. The shipping companies can submit electronic cargo manifests to the port authority. But the shipping companies are still required to submit paper cargo manifests due to the regulations of law. Port authority will compare and check the electronic information and information in paper instruments to confirm the consistency of the information between them. Paper cargo manifests and electronic cargo information shall be submitted to the port authority 6 hours before the vessels arrive at the port.

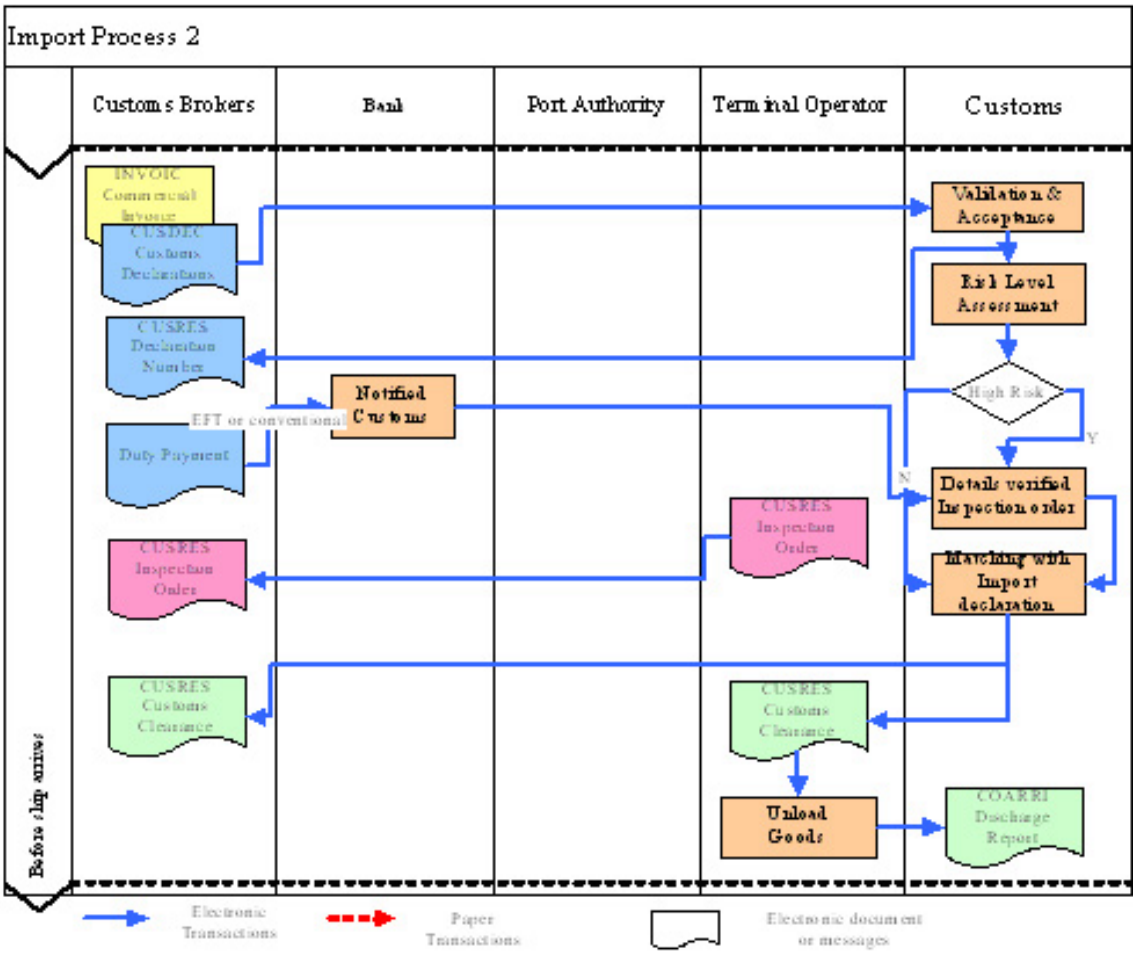
Fig. 2.25 Bangkok Seaport – Pre-Arrival



The carriers need to send CUSREP information (information on the state of the vessels) to the port authority and customs through EDI system before the vessels arrive at Port Bangkok. The relevant data will enter into the mainframe system of the port authority, which will enable each user of the information such as port operators and warehouse employees to get relevant information from time to time. The carriers need to submit cargo manifests in paper and electronic forms to the port authority. The personnel at the

port authority will check both of them to ensure that the information contained in both of them is completely consistent before transmitting it to the mainframe system. Carriers/Shipping Agents may also submit the statements on dangerous goods to the port operators so that relevant parties will make a good preparation to prevent any particular situations.

Fig. 2.26 Bangkok Seaport – Post Arrival



Port authority will give notice to pier operators, customs and other relevant port agencies after the vessels arrive at the port. The importers will submit relevant data such as import declaration forms and invoices to the customs. The computer system of the customs will automatically check the consistency and legitimacy of cargo manifests, import declaration forms and the attached documents. In case there is no mistake in various items, the customs will fix the risk level of the cargos through appraisal, and issue green or red audit forms attached with entry number and inspection forms. The customs will clear all the goods in the green lane through the customs directly. And the customs will clear those in the red lane through the customs after such goods are confirmed to be qualified in inspection. Importers and exporters may choose to pay duties and fees through EFT or traditional fund transfer.

Brief Summary

The application of paperless trading in international transport of each economic entity in APEC is listed in the following table respectively mainly based on the research reports of the 2001 electronic port cargo manifest project (TPT 02/2001T).

Economic Entity	Current Situation of Coverage & Degree of Synergy & Existing Problems
Canada	At present, Canada lacks an integrated platform that can enable various parties in the port community to realize information sharing in a "paperless" and highly efficient environment, which has brought about certain difficulty in reforming the procedures at Canadian ports.
USA	American customs began to use automated cargo manifest system since 1986. The participants of the system include carriers, customs, port authority and relevant service
Mexico	Electronicization has been realized in cargo manifests in ocean shipping, and is expected to have been completely realized in cargo manifests in air transport by the end of 2005.
Peru	Many practices at the Peru ports will increase some unnecessary interference with trade chain, and has increased the chances of making mistakes. For example, liner companies need to submit import declaration forms to a third party agency lest disputes should arise between the customs and importers; Moreover, customs brokers or importers must obtain certificate of value from a third party--- Valuation supervisor before loading the cargos. Though the telecommunication infrastructure and information technical service in the capital of Peru, Lima, and other big cities are relatively perfect, the telecommunication infrastructure in other regions in Peru is rather backward in comparison, which has made it impossible for information processing systems based on reliable and timely communication such as customs system to be widely used in any region in the country, and has made it necessary to use paper documents. The information management systems established in some ports in Peru can not get constant system support service from 24X7. In case the system goes wrong on Fright night, the system cannot be inspected and repaired by the technicians until the next Monday morning, which will necessarily seriously affect the normal operation of the whole port.
Chile	Carriers can send electronic cargo manifests to Chile customs directly through ISIDORA system. The customs will transmit the information on cargo manifests etc. to the electronic system of Port of Valparaiso Authority after auditing such manifests. The port authority will check information on cargo manifests through such

	electronic system. Meanwhile, a logistic trade website: www.vlt.com has been established in Port Valparaiso. The website can provide relevant information on cargos and vessels, such service as timely inquiry about cargo state etc. to such agencies as importers, exporters, liner companies and customs etc. through internet. It is safe to say that Port Valparaiso in Chile has been highly informatized.
Russia	Though Russia has made certain development in the field of paperless trading, it is still confronted with arduous tasks: establish a good information technical infrastructure, create a legal and standard environment fit for the development of e-commerce while constantly strengthening the construction of credit system inside the financial industry etc.
China	It can be said that China has made great progress in the construction of electronic ports in recent years, but there are still may problems to be resolved, for example, each major port has a relatively independent EDI center. Though each center supports UN/EDIFACT text format, each EDI center is still at the risk of isolated operation due to the influences of local control, which has made it necessary for a special agency to make unified coordination for the development of each EDI center. Moreover, electronic fund transfer through internet has not been used more widely due to the consideration for network safety. Thus it is necessary to strengthen the confidence of the nationals in electronic fund transactions to construct a paperless environment in the field of international transport.
Hong Kong, China	As Hong Kong, China is a free-trade port, all the passing vessels only need to submit cargo manifests to the customs for the purpose of statistics, and do not need to submit such manifest information to other agencies. Hong Kong, China implemented electronicization in submission of cargo manifests in aviation and railway transport on July 17, 2004. On July 17, 2004, electronic means were comprehensively implemented in Hong Kong, China to submit aviation and railway cargo manifests. The submitting way via the two ways of electronic and paper since April 2003 will be completely electronically by the end of 2005. Electronic submission of cargo manifests in land transport is on the way of planning. The government is consulting widely with the industry to carry out “Forecast Program for Road Freight”, with the aid of launching relevant regulations in the end. The low electronicization ratio of the cargo manifests in ocean shipping is partly due to the fact that participants are unwilling to change the original workflow that they have been used for years and accustomed to. Though the application of the new system can greatly improve the overall operational

	efficiency. Under the unified planning of Hong Kong, China Special Administration government, DTTN being constructed at present is an electronic platform that can help personnel in the business circle and relevant client's systems realize networking and connection as well as promote information circulation and upgrade operational efficiency. It connects various links in the trade chain (buyer/importer, seller/exporter, forwarders---including supplier of logistic service at the third party, carriers (ocean, inland rivers, highway, railway and aviation) at the third party-----including express freight transporters, ports, government and its relevant agencies, banks and financial institution, insurance companies and inspection and quarantine agencies with standard electronic information to realize information sharing.
Philippines	The diversification in forms will restrict the use of electronic cargo manifests. Moreover, the system cannot form electronic cargo manifests when several liner companies load or unload cargos at the same time. In Port Manila, many liner agencies are not capable of submitting electronic cargo manifests due to such reasons as cost etc.
Thailand	The service provided by the current systems is complex in operation and the cost is high.
Malaysia	Port Kelang developed PKCS (Port Kelang Community System) in 1993, which is an information service system that adopts EDI techniques. PKCS system has succeeded in linking such industries as ocean shipping industry, shipping agencies, customs, port authority, stack dealers and banks etc. electronically through customs information system and SMK (System Maklumat Kastam) and EDI Malaysia's Dagang Net.
Singapore	Singapore has over 350 application systems that are dealing with port management, planning and operation at present, the major system of which include PORTNET----which is responsible for electronic data communication and exchanges with the outside, CITOS (Computer Integrated Terminal Operation System), CICOS (Computer Integrated Conventional Operation System), and CIMOS (Computer Integrated Marine Operation System).
Australia	At present, various ports in Australia lack an automatic management system in which port authority, customs, inspection and quarantine bureau, container port terminals and other relevant parties can realize information sharing between them. Though various parties are wiling to construct a similar system, the electronicizaiton degree in various ports in Australia is not high due to lack of a unified channel to collect information on relevant parties such as carriers etc. and a special agency that can communicate with and coordinate various parties over the matter.

Note: Coverage----mainly measured according to the application degrees of the electronic information measures at various ports provide above.

Degree of Synergy-----mainly measured according to the degree of information sharing between trade administration agencies such as various ports and trade administration agencies such as customs, commodity inspection agencies etc.

2.2.3 Application in the Field of Finance

Realizing paperless operation can not only bring convenience and efficiency to works between banks, banks and enterprises, banks and government, but also reduce transaction cost. According to the survey made by OECE, the cost for each transaction, if operated through on-line banks, reduces from USD1.08 to USD0.13. In international trade, financial institutions play a more important role by undertaking all sorts of works relating to accounting during trade processes, which is especially obvious in international settlement. The methods most commonly used in trade settlement are L/C, TT, and D/P.

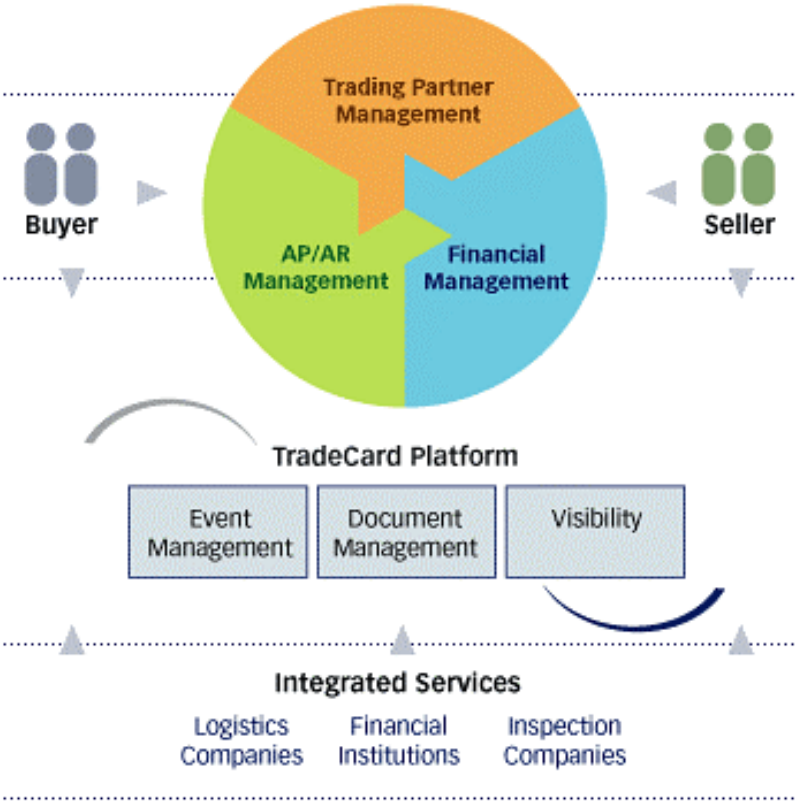
The following paragraphs will analyze the application of EDI by economies in the field of finance through cases regarding L/C, EDI between banks and enterprises, and EDI between banks and customs.

BOX 6 Application of Electronic L/C – Tradecard

The Tradecard Company is an e-commerce company located in New York, USA. Their operating procedures include transaction matching, cargo transportation, and payment defrayal. Besides providing electronic market matching contracts, it establishes a financial supply chain management including a payment inspection document mechanism that consolidates Coface payment assurance mechanism and Thomas Cook exchange transfer mechanism, therefore operates information management that consolidates business searching, contract making, payment and delivery, which greatly decreases the cost for using trade documents. Meanwhile, the Tradecard system refers to the electronic documents used in transaction for checking and verifying the delivery of goods and payment as regulated in the contracts, which avoids the potential difficulties aroused by the usage of trade documents in material objects transaction and its electronic version.

The concept of TradeCard operating mode was first conceived by the World Trade Centers Association, WTCA in 1994. In 2001, TradeCard introduced the TradeCard Platform (TradeCard financial supply chain platform), which enabled TradeCard to cooperate with logistic companies, financial institutions, insurance companies, and international inspection institutes to establish a transaction platform for paperless trading with sufficient functions and perfect services.

Fig. 2.27 Functions of Tradecard Platform



With the safe TradeCard platform, the two parties in a trade can accomplish all the trade operations relating to capital transfer from placing orders, document verification, and payment. Through this safe web net trade platform, paperless trade can be realized between trade partners. Nevertheless, they can manage the process of purchase and financial operations all the way from order to settlement in a safe and transparent way, whereby optimize the cash transfer and line of credit management. Besides, TradeCard platform can provide multiple trade services including export and seller financing, payment guaranty, and currency transfer check.

By applying TradeCard platform, the trade partners may realize paperless trade, which enhances efficiency and decreases operating cost. For example, sport shoes manufacturer, Hi-Tec Sports in California, U.S.A, commissioned a shoes factory, Lu Tai Company in Shandong, China, to produce products in OEM method. In the past, Hi-Tec had to open an L/C from a bank every time they gave an order to the provider, Lu Tai Company, for which they had to provide large quantities of documents. It would normally take the bank one week to deliver the L/C to the bank in which the Chinese provider had an account. The local Chinese bank would inspect these documents and inform the provider that the payment might be collected when delivering the goods. The whole transaction process took two weeks, during which Hi-Tec had transferred their capital but didn't get the goods at the same time. After Hi-Tec adopted the TradeCard platform system, all the functions including purchase order and L/C are included in one electronic document, which reduces the time for accepting written documents and

enables Hi-Tec to monitor the transfer of goods and payment. TradeCard substitutes the banks of both parties with Coface, a credit insurance company to guarantee the success of transaction. With the insurance company collecting premium from the buyer, and therefore takes over the credit risks of the buyers, the provider just pays the operating charge of the platform. In this way, the cost of the two parties of the trade is reduced. Due to the expedition of information and capital transfer, the ordering cycle was shortened, while the financing cost was lowered, and the cost for ordering a pair of shoes was reduced by 20 cents.

Presently, the customers of TradeCard are mainly in Asian-Pacific Areas. Till the end of 2003, there are more than 600 users including the internationally well-known companies such as Nike, JC Penny, and SK Global, etc. In 2002, there was a trade volume of approximately USD 300 million every month on the TradeCard platform. Currently, the orders transferred through the platform increase by 15% every month; in 2003, the trade value processed through TradeCard exceeded USD 5 billion.

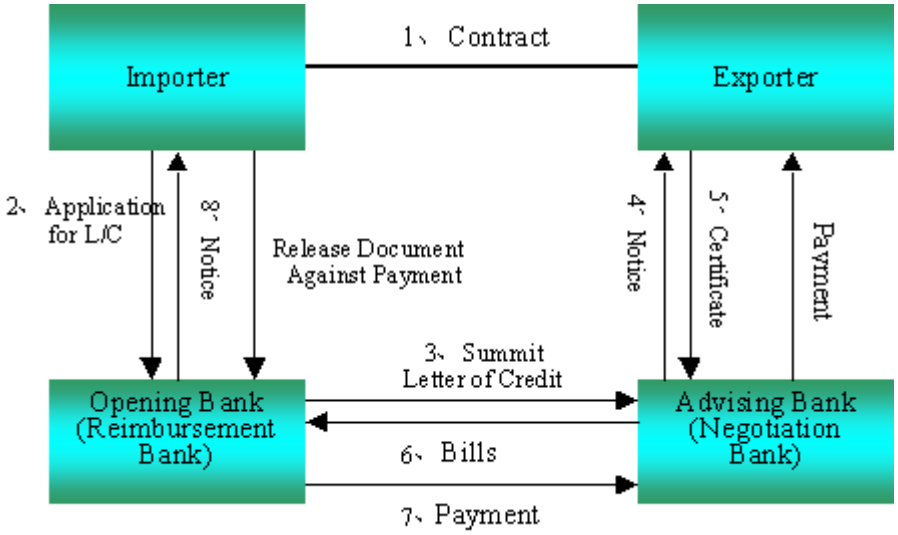
BOX 7 Electronic L/C – CCEWeb

Developed by Canada Electronic Business Software Company, the CCEWeb can be used for operating global trade. This system combines the functions of L/C and credit card, and integrates multiple functions including internet-based trade payment, trade process, and document management. The "document reckoning center", which is the core of the system, functions like the financing department of a bank, which collectively processes and transfers all kinds of documents regarding trading, transportation, insurance and financing, etc. Just like the way banks operates an L/C transaction, the document reckoning center makes the payment covered in the L/C, inspects the exterior consistency of documents presented by the beneficiary and concludes the whole transaction process after paying off the beneficiary. Though the CCEWeb system provides a safe electronic transaction platform, it does not provide a right registration center to realize the transfer of goods and rights between the buyer and the seller. Besides, the CCEWeb system has an other specialty, that is, it can process traditional paper documents.

Procedures for Processing Electronic L/Cs

The general electronic L/C procedures include the following basic segments as shown in the chart below:

Fig. 2.28 Flow Chart of Electronic L/C



1. The buyer and seller exchange information and negotiate about import & export business via web net. After reaching an agreement, they input the order into the EDI system, which will automatically inspect the order for its accordance with the requirements, make a contract and send it to the importer via web net. The importer puts his digital signature in the contract and then sends it back via telecommunication network. Both parties agree in the contract that the payment shall be made by L/C;

2. The importer submits the electronic application for L/C to the opening bank, applying for opening L/C;

3. According to the ratified credit amount of the customer, the opening bank opens a L/C to the exporter (the beneficiary) as regulated in the application form, and sends the L/C to the subsidiary bank or agency bank (the advising bank);
4. After verifying the seals, the advising bank transfers the electronic L/C to the e-mail address of the exporter;

5. After the exporter receives the electronic L/C, the EDI system will automatically inspect the L/C and the contract. Once confirmed, the EDI system will automatically generate a whole set of documents and deliver them via telecommunication network to the relevant departments: the transportation company, the insurance company, the customs and the product inspection authority, etc, and require these authorities to issue electronic certificates such as bill of lading, insurance policy, customs invoice, and certificate of inspection, etc, pursuant to the content of the L/C and the condition of the actual goods. After the exporter delivers the goods as regulated in the L/C, the above-mentioned authorities will send the bill of lading to the exporter via telecommunication network. Once the exporter has gathered all the electronic bills/certificates, he opens an electronic bill of exchange and sends it to the negotiation bank to require for payment. After verifying the bills/certificates according to the terms in the L/C, the EDI of the negotiation bank will pay the exporter;

6. The negotiation bank sends the electronic bill of exchange and bill of lading to the opening bank (or its designated reimbursement bank) via e-mail to require for repayment;

7. The opening bank pays the negotiation bank back after verifying the bills/certificates;

8. The opening bank informs the importer and releases the electronic documents against payment, which the importer transfers to the carrier via network in exchange of goods.

BOX 8 Chinese Taipei – Supply Chain e-Financing

When the project was completed in 2003, 8 financial institutions, 11 first-tier IT manufacturers and 2700 suppliers participated in the e-Financing network. Since then, the network has been expanded to include 52 banks, 300 manufacturers and 4500 suppliers, while the volume of e-Financing has grown from USD 350 million in 2003 to 1.75 billion in 2004.

In terms of liquidity management, the project has simplified the credit approval process and shortened the time required to obtain the loan. Prior to the implementation of Supply Chain e-Financing, IT manufacturers and suppliers would have to provide collateral to secure a loan. With the e-Payment and e-Financing services, the IT industry could simply secure a loan using on electronic purchase order. In addition, the approval time has been reduced by 1 to 2 weeks in the IT industry, and by 3 months for other industries. The banking industry now offers versatile financing products based automatically on the purchase order information as well as the transaction records with the banks. Because the banking industry retrieves PO information from manufacturers, it could offer suppliers better terms, knowing that these purchase orders are reliable. In addition, the project encourages various financial intuitions to tailor their offering to a specific PO transaction, thus offering the suppliers and manufacturers the choices of best terms.

For the banking industry, it is estimated that the project saves the human resource cost by 4 million this year, and per transaction cost has been reduced from USD 43.5 prior to project implementation to USD 1.5. The time needed to process the documents for approval has also been shortened from 1 to 2 days to just a few minutes. The banking industry now offers e-PO, e-Delivery Bill, e-Inspection Receipt, and e-invoice, to replace the manual documents.

The Supply Chain e-Financing project is an exemplar case where the financial supply chain is tailored to the IT supply chain.

BOX 9 EDI between Banks & Enterprises – Chinese Taipei FEDI System

Payment operations between many membership banks and enterprises are paperless. The system used by them for transferring digital data is financial EDI system (FEDI).

In the finance field of Chinese Taipei, after the FEDI united center was established, the finance information system center (FISC) and principal banks can provide enhanced and integrated FEDI bank services such as customs payment, enterprise payment, and capital and document transaction between banks. The FEDI united center connects the seller, the buyer, the retailer, the customs, the customs agency and their trade partners via industrial EDI VANs (such as the commercial EDI VAN and TRADE-VAN).

Two authentication systems are installed to provide safety control. One system, operated by Trade-VAN, provides authentication service to users of the customs EDI system. The other one, operated by the financial information service center (FISC), provides authentication service to users of the commercial EDI system and the financial EDI system. Both systems have the function of online authentication management: the Trade-VAN adopts the KEYMAN standard while the FISC adopts the Internet standard, which is being widely used.

There are five financial electronic documents transmitting operations in Chinese Taipei: the financial EDI taxation payment system, the financial EDI taxation payment increment system, the commercial EDI electronic virement system, the financial EDI bank-to-bank payment system, the financial EDI L/C business system.

The FEDI system of Chinese Taipei can bring about the following benefits: provides the banks with market based sales strategy that promotes FEDI or EOI services to different customer groups; easy and convenient for enterprise users and prone to be promoted; prone to be established and reduces the establishment cost for end users; applicable to investigation and check management mechanism of enterprise users; identify the integrity, undeniability, transfer secrecy and identity identifiability.

BOX 10 Banks & Enterprises' – Manhattan Bank EDI

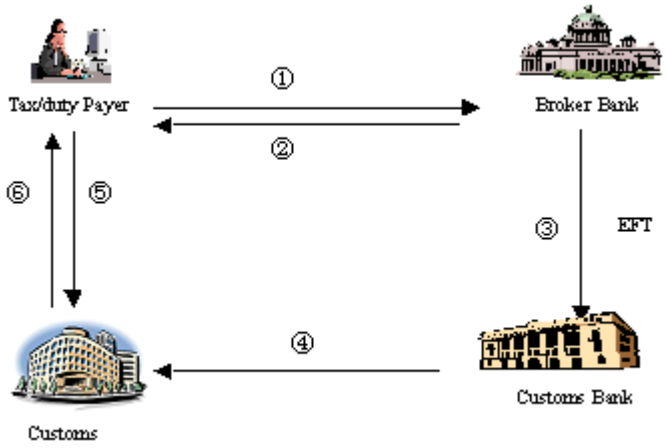
The Chase Manhattan Bank collaborates with the Ultramar Diamond Shamrock Company to develop FEDI system. The whole FEDI system process & payment process, including payment application to payment confirmation, takes 6 to 12 minutes only, and its all automatic. By using the FEDI system to process the payment, the UDS rids itself of processing some of the bills. It is estimated by the UDS that 75% of the payment cost is saved by the on-line FEDI.

The suppliers of UDS are eager to join in the electronic payment group. In just one year, 600 trade partners of UDS realized on-line FEDI. 50 to 100 trade partners signed the agreement every month. The paying process is shortened from the formerly 2 to 6 weeks to 10 minutes.

BOX 11 Application of EDI between Financial Institutions & Customs – the Krung Bank & the Customs

The Krung Bank established its connection with the customs in January 2000. The systems used by them for transferring digital data are: the Teller Payment System, and the Electronic Fund Transfer (EFT) system. In this automatic EFT system, the importers and exporters, agency banks (banks in which the importers and exporters open their accounts), the customs banks and the customs authority can operate with electronic payment, which realizes the paperless payment.

Fig. 2.29 Flow Chart of EFT



1. The importers and exporters inform their account-opening bank to transfer fund to the account-opening bank of the customs;

2. Once authorized, the account-opening bank of the importers and exporters assign them a transfer code that will be referred to during fund transfer from the account-opening bank of the importers and exporters to the one of the customs;

3. Once receiving the total payment via EFT, the account-opening bank of the customs electronically sends a payment message to the customs authority, which refers to the transfer code assigned by the account-opening bank of the importers and exporters to the importers and exporters;

4. Meanwhile, the importers and exporters electronically send a payment message to the customs authority, which also refers to the transfer code assigned to him by his account-opening bank;

5. The EDI system of the customs compares the payment message from the importers and exporters and the one from the account-opening bank of the customs, and compares both of them to the original application;

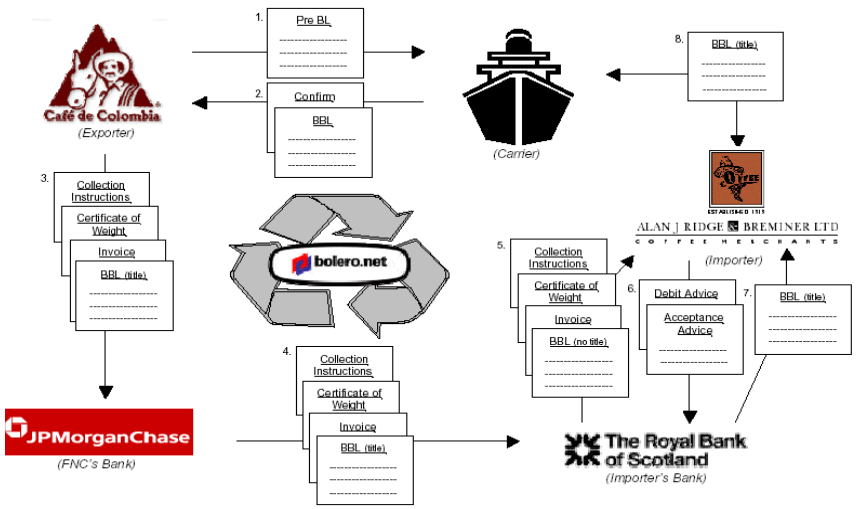
6. If all the messages are correct, the customs will inform the importers and exporters to draw their receipts for goods inspection and delivery.

BOX 12 Bolero Application in Bank JP Morgan

As a third party platform and an independent financial service entity, invested by TT Club and S.W.I.F.T two giant organizations, Bolero.net has been playing an important role in the chain of international trade by uniting more than 12,500 transportation companies, container vassals, ports and financial institutes. Enterprises utilize Bolero.net platform to exercise paperless trading as a typical application module. It is currently providing only two services. One of them is CMP (Core Messaging Platform), which provides secure information transaction. Another one is TR (Title Registry), which provides title transfer registration services and endorsement of valid bills just like paper environment. American Bank JP Morgan took the lead to realize the electronic bill transaction and collect money via Bolero platform.

JP Morgan is the first bank that used electronic bill transaction for money collection by Bolero. Net. This business is that Columbia FNC Company (The National Federation of Coffee Growers of Colombia, the biggest coffee exporter) exported their coffee to English. JP Morgan is the collection bank and the Royal Bank of Scotland is the Collection Bank, which is to collect bill of lading and invoices. It would take at least one week to accomplish this business if by traditional procedure of trade. But it took only several hours for the bills to get to the buyer. All of this indicates that paperless trading has achieved a periodic progress and starts to show its commercial value. Apart from this, more complicated e-trade will become reality as eUCP became effective and other trade convention regulations have appeared, just like the following Figure.

Fig. 2.30 FNC Trade Procedure



2.2.4 Third Party Integrated Service

Hong Kong, China

There are approximately 130 thousands importers and exporters and manufacturers in

Hong Kong, China 98% of them are medium or small enterprises. In order to help the medium and small enterprises enjoy the convenience brought about by the e-commerce with the lowest cost, the government of the Special Administrative Area and other private enterprises jointly invested in the establishment of the Tradelink Electronic Trade Co., Ltd (the Hong Kong, China Government is holding 42% of its shares at the time), which established the Tradelink Electronic Transaction Platform. Connecting the local manufacturers in Hong Kong, China and the government of Hong Kong, China Special Administrative Area with network, it provides a service of electronic trade services to about 70 thousand trade companies in Hong Kong, China. The services of the Tradelink concentrate in making the electronic governmental legal trade documents, including quota export application and customs entry. The government regulates that, since January 1999, the counter accepting restricted textile export license application was cancelled, only electronic applications were accepted; since April 1, 2000, the paper form customs entry service was ceased, and all the declaration documents shall be submitted electronically. If an enterprise would like to use electronic services, it may go through the registration procedures on the Tradelink. After registration, the Tradelink will give the enterprise a customer code and a password, which enable the access to the Tradelink system. The Tradelink will send an electronic signature key to each authorized person in the enterprise. Meanwhile, the government increases the lowest cost for submitting paper documents from 5 HK dollars per copy to 13 HK dollars per copy, while decreasing the cost for submitting the electronic documents from 5 HK dollars per copy to 50 HK cents per copy.

With the powerful promotion of the government, the present customs entry application procedures are now 95% electronic. Till August 2005, Tradelink has penetrated 95% of the market with 53,000 users, and 80,000 bills are processed everyday. All the documents are provided with authorized electronic authentication service licenses, electronic signature and encrypt functions, and can be transmitted freely within the network.

The principal services presently provided by the Tradelink are: customs entry declaration service, submission service for electronic business bills/documents (such as carrier’s notice, Certificate of Product Origin, and production notice, etc), packing list submitting service to the US and Canadian customs 24 hours advanced information forecast service, on-line customs entry service for medium and small enterprises. What’s more, for those medium and small enterprises that are unable to use electronic service directly within the enterprises, the Tradelink set up service centers in Hong Kong, China, Koulong, and New Territories, etc to provide the service of transforming paper documents to electronic information and transferring them directly to the government in electronic mode.

Korea

Founded 100% by the Korean International Trade Association pursuant to the laws

made by the Korean Ministry of Industrial Resources in 1991, the Korean Trade Net Co., Ltd (KTNET) is responsible for establishing and operating the national electronic commerce platform to provide overall electronic trade services for Korean enterprises. In November 1992, the Korean customs assigned the KTNET Company as the customs web net service provider, and grant the KTNET Company with the exclusive operating privilege. The KTNET company developed relevant automatic customs operating system, including customs declaration system, cargo management system, and export taxation drawback system, etc. By the end of February 2003, there have been 12000 enterprise users. In 2004, the KTNET gained an operating income of USD50 million, provided approximately 300 electronic document services, and dealt with 9.6 million transactions every month in average.

The services presently provided by the KTNET are: electronic services for trade procedures (such as: L/C opening commission, arrival notification, payment notification, L/G (Letter of Guarantee), raw material purchasing application (license issued by banks acting as agents of the government), cargo insurance application, customs declaration application, and licenses, etc); data base service (provides trade information such as relevant information of import and export goods, and import and export customs declaration statistic information, etc); research & consultation service (provide B2B enterprises with enterprise consultation and training services regarding e-commerce) and CA authentication service. Nevertheless, in order to further promote the development of B2B, the KTNET constructed integrated trade service websites such as ECPlaza, and cTrade world.com, etc). The KTNET provides extensive trade process services from contract to cargo shipment, from settlement to backup.

KTNET made a general agreement with Korean Customs in 1992. KTNET finances part of the necessary expenses for constructing and operating the electronic customs system in return for being authorized the monopolized succession for automatic EDI customs declaration system, which will be for free bid after 2003. Presently, KTNET is actively cooperating with relevant institutions of trade partner economies to promote cross-board paperless trade.

KTNET provided convenient environment and conditions for Korean enterprises to engage in international trade. During the 7 years from 1994 when it was put into practice to the end of 2000, a trade cost of USD 18.17 billion was saved. According to relevant statistics, Korea has saved 6.4 billion via trade facility in 2004.

Chinese Taipei

In 1996, Chinese Taipei Financial department (processing 37% shares of the company) and civil private institutions jointly invested in the establishment of the GATT Network Corp. (TradeVan) to make the customs & trade network a nongovernmental business. While proceeding in promoting the automation of customs declaration, the company endeavors in providing overall trade network increment services, such as customs

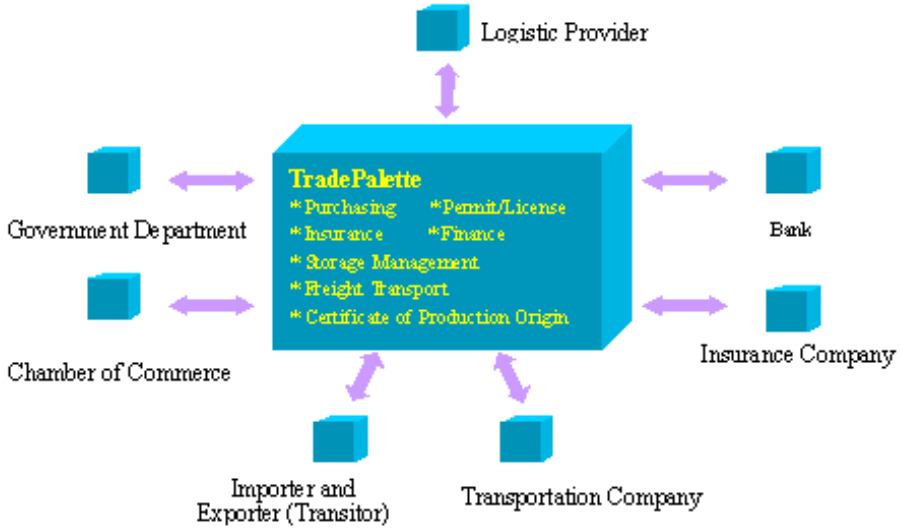
declaration increment service, on-line customs declaration service, electronic trade service, mono-window signing and inspection service and operational research service, so as to realize that the enterprise trade information is “being put in one place, and used all through the procedures”.

Centralized in the trade operation electronic center, the updated system consolidates documents of import-export-related industries and units and provides network on-line services. It also standardized the import-export-related operation procedures and documents (such as S/O, D/O, B/L, CLL, P/L, Invoice, cargo arrival notification). The electronic documents, which can be viewed in EDI, XML, TEXT formats, can be transferred in different electronic document formats from one to multiple formats, multiple formats to one, and multiple to multiple formats, as well as inter-transfer between different formats. To provide communication and safety control, the system supports communication agreements such as HTTP, SMTP, TCP/IP, FTP, and POP3, etc, and provides electrical signature, information monitoring, document receipt/delivery inquiry, and time/intermittent initiative transmission methods. With connected network, customers can access marine insurance, cargo arrival notification, shipment booking, B/L confirmation, cargo claim close inquiry, container mix indications, as well as dynamic container information, and international network linkage services.

Singapore

The TradeNet of Singapore is developed and operated by CrimsonLogic (the former Singapore Network Services Pte Ltd). CrimsonLogic is a private company, its shareholders are consist of Singapore trade development bureau, port bureau, telecommunication administration bureau, and avionic transportation bureau. After more than 10 years of improvement to the TradeNet, CrimsonLogic developed an overall system including international trade information, logistic, and customs entry procedures, the TradePalette—it can simultaneously provide a series of services including purchasing, storage management, payment, certificate of product origin application, and insurance. According to the specific requirements of a customer, it can make an operation procedure especially for that customer to realize their one-shot electronic transaction in their working place. The application of the whole series of services strengthened the administration of the government to trade and logistics while improved the efficiency and transparency on the international trade chain, as well as providing a reliable electronic trade platform for the enterprises to enhance the interior management, and enlarge trade channels.

Fig. 2.31 Flow Chart of TradePalette



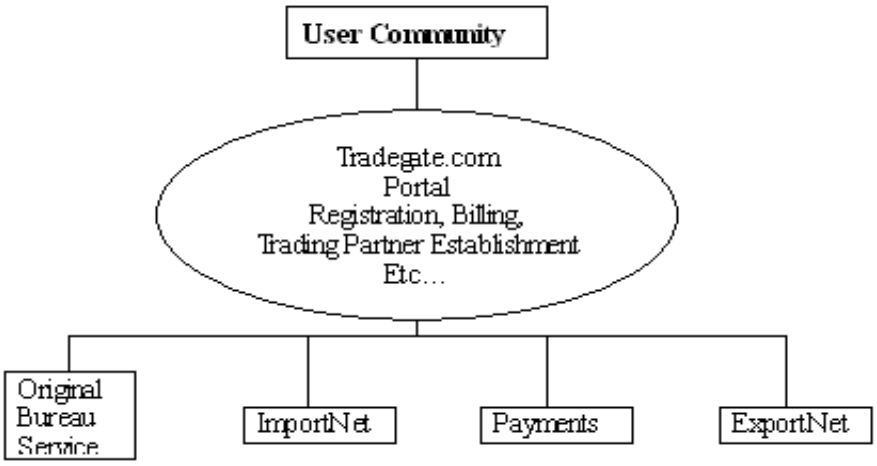
Australia

Australia TRADEGATE was established in 1989 following the advice of NCWP Intercontinental Council. It is a non-profit company, including Australia Customhouse, Qantas (IATA), AAPMA, ACOS, ANMA, AFAFF, CBCA, Railway of Australia (ROA), Australian Road Transportation Federation (ARTF) and the government department AUSTRADE.

The missions for TRADEGATE are as follows: to provide Paperless Trading services through the trade chain all over Australia so as to improve the efficiency, quicken the cargo-flow speed, and raise the economic benefit. Meanwhile, on the basis of Australia Customs Service (ACS) and the Cargo Tracking System, the Australian Government has financed a comprehensive electronic trading system Supply line, which was initiated in October 1990, finished in May 1991, and put into use afterwards.

TRADEGATE is able to provide a series of electronic services related to the international trade and transportation, which have been specified in the sketch below:

Fig. 2.32 Framework of Tradegate



ImportNet - Scheduled ship companies can, through ImportNet System, send electronic information to inform Customs Entry Agent and Freight Agent.

Tradegate Payment - it is an electronic payment system that can automatically transfer the fund into the trading partner who has registered in the system. At present, it is mainly applied to pay for the transportation fees as well as the service charges of sending the electronic invoice through ImportNet.

ExportNet - it is to generate the electronic sea transportation bills and send them to the involved parties on the Supply Chain.

At present, the number of TRADEGATE users has well exceed 600, including government departments, the authorities of port affairs, Open sea companies, shipping companies, customs agents, land transportation operators, dock operators, aviation companies, importers and exporters, etc. all those related to the import and export business are the potential clients of TRADEGATE.

Japan

As early as in 1971, Trade Form Standardization Committee was set up in Japan. In 1974, Japan Association for Simplification of International Trade Procedures (JASTPRO) was established under the joint management of the ministry of Finance, the Ministry of International Trade and industry as well as the Ministry of Transportation.

Ever since 1991, Japan initialized the automatic customs clearance system, and so far, almost all the applications for import and export customs clearance have been done electronically. In 1998, based on the request from various trade related industries, Ministry of International Trade and Industry (now Ministry of Economy, Trade and Industry) proposed to establish TEDI system. TEDI is the abbreviation for Trade

Electronic Data Interchange. It formerly started its business services for enterprises in 2001. From 2001 to 2003, it had done the connecting experiments with related systems in Korea, Chinese Taipei, Malaysia, Singapore and Thailand. Meanwhile, it had tried to cooperate with Japan's customs, aimed to set up a basic system that can connect the enterprises with all the international and domestic trade institutions. Through the promotion of standard codes among its members, it aimed to promote the practice of EDI in Japan's trade and finance business.

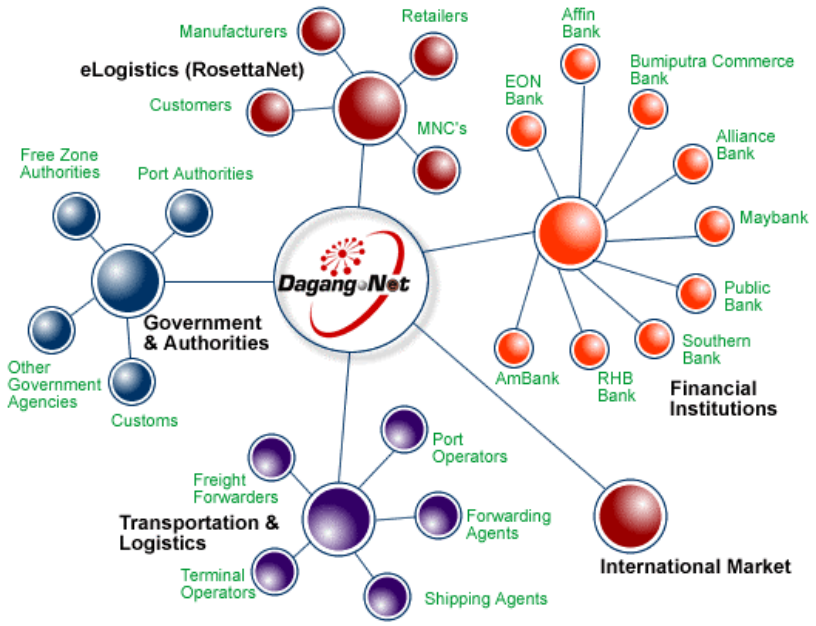
In 2000, Japan's trading companies, shipping Carrier, banks, and insurance companies, etc established TEDI Club. So far there have been 74 enterprises in TEDI Club. As the main activity, taking advantage of its character that the members cover almost all industries related to trading, it submits recommendations for Japanese Government to achieve the full paperless trading system in Japan. TEDI Club is aiming to reduce the transaction time and cost for international trade in order to enhance the competitiveness of Japanese enterprises, to contribute the wide application of electronic certificates instead of the use of paper certificates step by step, and thus realize the paperless trade ultimately.

At present, the Japanese Government is enhancing the link between the automatic customs clearance system for cargo and other related systems, trying to make it a 'one-stop' service and enable the system users to go through all the required procedures with the transmission of electronic information."

Malaysia

Dagang Net was established in 1989. As a member of Maylaysia's EDIFACT Committee, it has always been working hard to promote the government's reform on law and statute so as to further the development of e-commerce in Malaysia. At present, Dagang Net is the only service provider in Malaysia that can deal with port affairs management, logistics management and the related electronic transaction documents of the customs. It is in charge of the EDI system in Port Kelang. This system can link all the aspects such as the logistics, the port, the banks, the port authority, the port operator as well as the ship-owner together, and enable the electronic trading documents to be submitted and approved smoothly. So far, Dagang Net has a cluster of about more than 2000 enterprise clients, deals with about 40, 000, 000 electronic transactions and helps collect approximately 1.8 billion Ringgit customs duty each year.

Fig. 2.33 Diagram of Dagang Net



BOX 13 Case Study – The Roading of Hong Kong, China – A Paperless Trading Development

Hong Kong, China is a free-trade port that imposes no tariff on all the imported or exported cargos. Hence, there is no Customs Entry Agent in Hong Kong, China. All of the importers and exporters should go through a service provider, like Tradelink to submit the electronic declarations to Hong Kong Customs. The government of HK SAR has been devoted to the goal of paperless customs declaration. The main five categories of government-related trading documents must be submitted in the electronic form. Specifically, they are restrained textiles export licenses, electronic cargo manifest, certificates of origin, production notifications, trade declarations and dutiable commodities permits.

Below are a few statistics concerning Hong Kong, China and the government's related trading documents:

- In 2004, there were 18, 000, 000 trade declarations in Customs Department of Hong Kong, china, all done electronically. In 1998, computers were firstly introduced into Hong Kong, China customs declarations, and then there were about 145 customs officials in charge of the related jobs of import-export trade declarations; in 2004, Hong Kong, China customs declarations had completely become electronic, and merely 69 customs officials were in charge of the related jobs of import-export trade declarations;

- According to the statistics by Trade and Industry Department, there were 221, 308

applications for certificates of origin that were submitted in electronic forms. The response time was shortened from 2 working days to 1.5 working days;

- 227, 410 applications for production notifications;

- There were 553, 588 bills of lading received (excluding the land transportation ones). Among them, 200, 687 bills of lading (or 36.3% of the total) were electronic ones, and all the air waybills were electronic;

- In 2004, there were 102, 454 applications for dutiable commodities permits that were submitted electronically, and the response time was shortened from 2 working days to 0.5 working days.

In Hong Kong, China, there are 130, 000 importers, exporters and manufacturers, and 98% of them are medium-sized or small enterprises. In order to enable them to enjoy the convenience of e-commerce with the least cost, the government of HK SAR has taken a series of measures to set up a governmental, e-commerce service market to ensure a nice e-commerce service environment for its medium-sized or small enterprises.

Legislation

In January 2000, Electronic Transaction Ordinance was formulated in Hong Kong, China, which provided a clear legal framework for e-commerce. According to the ordinance, the electronic records and digital signs are as lawful as the written records and signs, and certain mechanisms should be set up to approve the certificating organs and digital certificates in conformity with the government standards. To meet the requirements in the new situation, in 2004 the government of HK SAR had reviewed and emended Electronic Transaction Ordinance, which became effective on July 30, 2004.

The Government e-Trade Services

In the market of Government E-commerce Services, the government acts as a framer of standard market operation codes and service charges as well as the supervisor of fair competition. A few private enterprises are appointed by the government to be the e-commerce services providers, and they will offer e-commerce services to the trading companies in Hong Kong, China. Their efforts concentrate on turning the government's legal trading documents into electronic ones, including the main five categories of government-related trading documents such as the application for quota export licenses, import-export trade declarations, etc.

In 1997, the government of HK SAR and other private enterprises jointly set up Tradelink Electronic Commerce Ltd, and the its e-commerce platform. Connecting the local manufacturers with the government of HK SAR through the network, it can

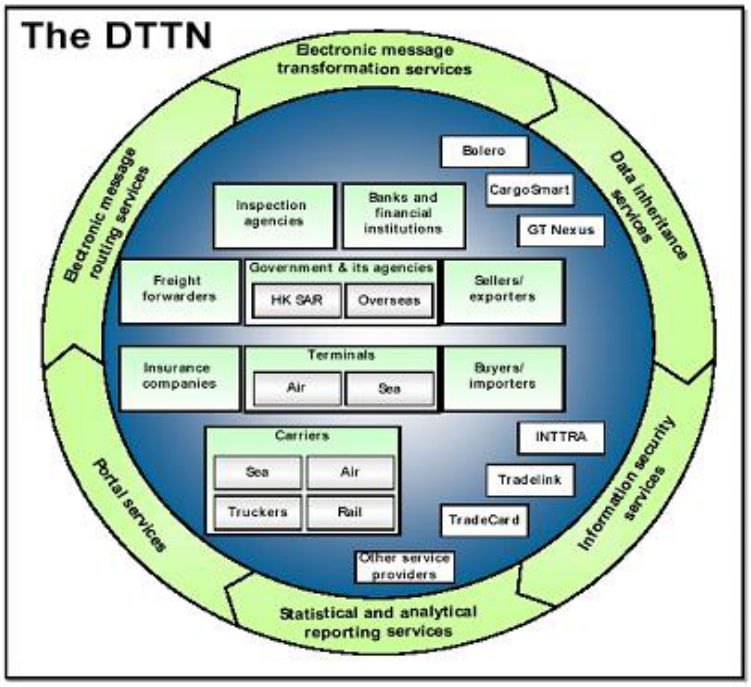
provide a series of services to about 70, 000 trading companies in HK. The main services provided by Tradelink at present include: trade declarations, submission of e-commerce certificates (such as electronic manifests, certificates of origin, production notifications, etc), Box list service to America's customs, trade declarations on the internet for the medium-sized and small enterprises. Besides, for some reason, a few medium-sized or small enterprises have no way to apply the electronic services directly, hence Tradelink has set up service centers in HK, Kowloon, New Territories, etc, which can turn the paper documents into electronic ones and transmit them to the government electronically. If the enterprises want to use the e-service provided by the government, they can register in Tradelink.

After the registration, Tradelink will send the companies the serial numbers and codes to use the Tradelink system. Tradelink will send the individual electronic sign key to each person accredited by the respective enterprise. In order to promote the e-services, the government of HK SAR has increased the minimum cost of submitting each paper document from 5 HK Yuan to 13 HK Yuan, and reduced the cost of submitting each electronic document from 5 HK Yuan to 50 HK Cents. By April 2005, Tradelink has penetrated into every corner of the market, with a group of 53, 000 users and an annual amount of 1, 700 transactions. All documents have gained the approved e-certification service permits, the electronic sign and code function, and can be transmitted freely in the network.

DTTN

To further Hong Kong, China's status as the main center of international freight transportation, the government of HK SAR has set up Digital Trade Transportation Network (DTTN) with a capital of 3,000,000,000 HK Yuan. DTTN is an electronic platform that will help the involved personnel to connect with related users' systems through the network, promote information flow and raise the operation efficiency. It connects all links on the trade chain [buyer/importer, seller/exporter, sender-including the third party: logistic enterprises & carriers (open sea, freshwater, roadway, railway and aviation), express freight transporters, the ports, government and its organs, the banks and financial institutions, insurance companies as well as inspection and quarantine institutions] through the standardized electronic information and enables them to share information fully.

Fig. 2.34 Network of DTTN



Source: website of the government of HK SAR

Table 2.12 List of Standard e-Documents of DTTN

1	Sales order / Purchase order	31	Container inventory information
2	Insurance application form	32	Container maintenance status
3	Insurance policy / certificate	33	Trucking company information
4	Open / floating insurance policy	34	Equipment interchange receipt
5	Declaration on shipment details and insured amount against open / floating insurance policy	35	Export consignment details form
6	L/C application form	36	Reception checklist
7	L/C	37	Bill of lading
8	L/C amendment request	38	Sea waybill
9	Packing list	39	House bill of lading
10	Commercial invoice	40	Surrender notice for telex release / telex release
11	Inspection arrangement request	41	Departure notice
12	Inspection arrangement notice	42	Company guarantee
13	Inspection certificate	43	Detention notice 1
14	License / certificate / permit application form	44	Detention notice 2
15	License / certificate / permit	45	Delivery order (D/O)
16	Notification	46	Release order
17	Advice shipping notice	47	House D/O
18	Shipping instruction / order form	48	Transshipment notification

19	Confirmation of shipping instruction / order form	49	Bill of exchange
20	Shipping order / booking request	50	L/C collection letter
21	Booking confirmation notice	51	Document arrival notice
22	Cargo receipt / cargo reception slip	52	Trade declaration
23	Empty container order / transport set	53	Invoice from insurance company
24	Draft master bill of lading	54	Invoice from inspection agency
25	Manifest	55	Invoice from freight forwarder
26	Master air waybill	56	Invoice from carrier
27	House air waybill	57	Invoice from trucker
28	Pre-alert package	58	Invoice from terminal
29	Cargo arrival notice	59	Payment instruction
30	Shipment arrival notice	60	Payment confirmation

BOX 14 E-Trade Korea

1. KITA

Over the past half-century, KITA has grown into a trade promotion agency representing Korea. KITA provides a variety of direct services such as business arrangements and trade consulting. It also assists trading companies in resolving grievances by reporting them to relevant government authorities. KITA will continue to enhance public awareness on the significance of trade in order to foster and promote Korea's commercial potential with the global community.

It has been and will continue to be in the 21st century the driving force behind Korea's international trade by building the necessary infrastructure through the training of trade experts, establishing cyber trade infrastructure, hosting international special exhibitions, and implementing new trade strategies.

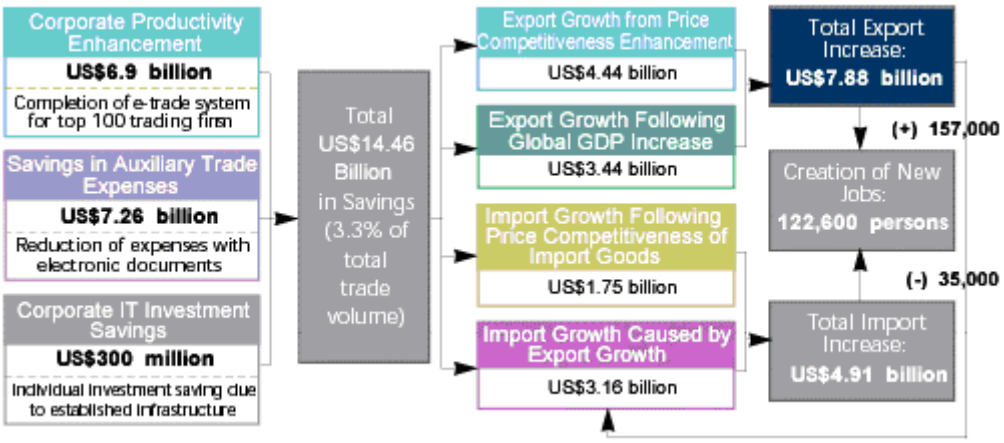
2. Effects of e-Trade

E-Trade can improve Korean high-cost trade structure basically by reducing auxiliary expenses dramatically through trade process innovation.

According to the survey results of a specialized agency, when the e-trade system is completed in 2005, the nation will be able to save an estimated US$14.5 billion in auxiliary trade expenses (17.4 trillion won: 24.5% of total trade expenses), increase exports by US$7.9 billion and create more than 120,000 new jobs annually.

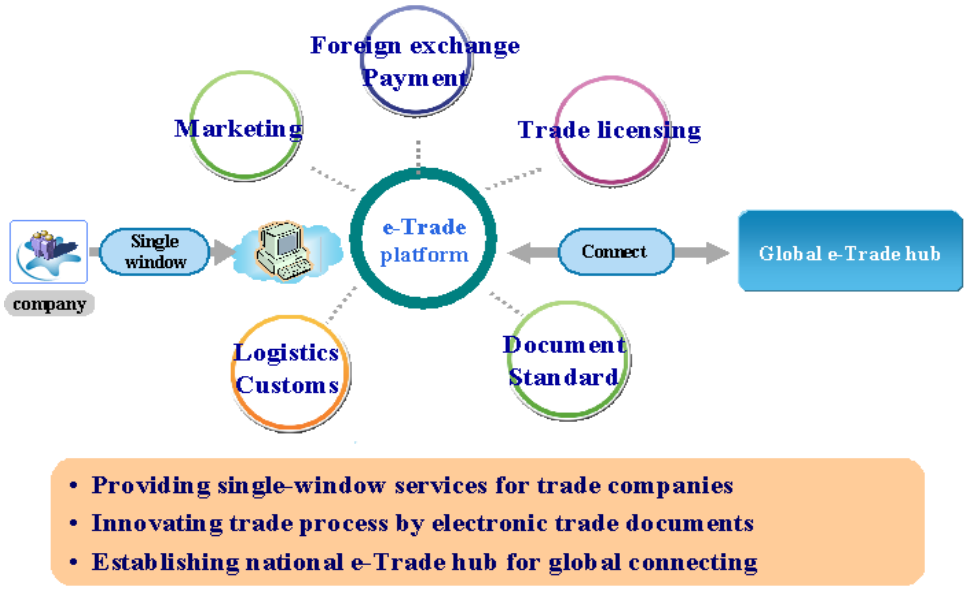
3、E-Trade KOREA 2007

Fig. 2.35　Analysis of e-Trade's Expected Effects



The National e-Trade Committee, created under the Prime Minister in July 2003, established a "three-year promotion plan for e-Trade" during the first meeting in December 2003 and laid out a framework for "e-Trade Korea 2007 " during the second meeting in September 2004, e.g. to build a e-trade single window services platform.

Fig. 2.36　E-Trade Platform Model of Korea



In order to achieve the goal of development, it will carry out the following seven works:

- Build a e-trade platform based on internet to exchange electronic documents, release information and link relevant government institutes;
- Create an on and off services system to provide overseas marketing and sales

information or trade companies;

- Move the trade licensing process from offline to online, and to assist the government to cancel unnecessary procedures;
- Integrate electronic trade platform, trade logistics and customs clearance systems, therefore e-documents can be used during the whole process of trade;
- Computerize the local account settlement;
- Lift international corporation to the level of private and governmental entities, so that e-documents can be globalized;
- Build a legislative framework for promoting e-trade.

Until 2007, trade department will be able to conduct business online; the income of e-trade is expected to reach 1.8 billion US dollars per year.

BOX 15 Pan Asian e-Business Alliance (PAA)

Pan Asian e-Commerce Alliance (PAA) was founded in July 2000. Currently Chinese Taipei's TRADE-VAN Information Services Co., Ltd., Singapore's CrimsonLogic, Tradelink in Hong Kong, China, China's CIECC, Korea's KTNET and Japan's TEDI are co-founders.

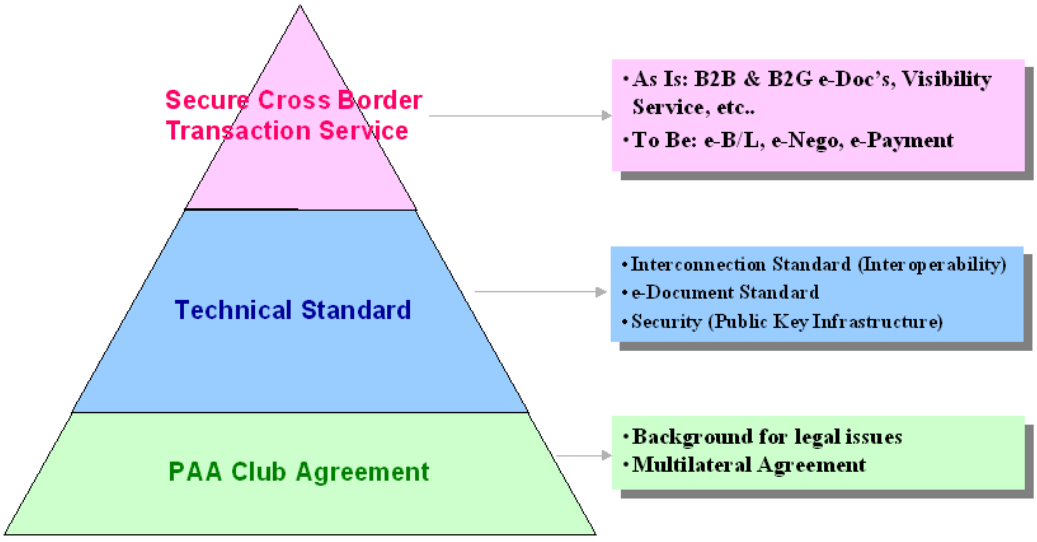
Pan Asian e-Commerce Alliance is the first regional e-commerce organization in Asia, its goals are as follows: to improve the efficiency and convenience of the global trade and logistics through the safe and reliable IT system; to formulate the electronic certificate standards that conform to the interests of its member states and member regions, and thus promote e-commerce extensively; to realize the exchange of electronic documents among its members by using PAA members' digital proofs from their respective authoritative institutions. So far, the number of PAA members has increased to 9, and its client enterprises from the east and southeast of Asia have totaled to more than 140 thousands.

Table 2.13 Brief Introduction on PAA Member Economies

State/Region	Member Name	Supportive Government
China	China International Electronic Commerce Center	Ministry of Commerce of China
Hong Kong, China	Tradelink Electronic Commerce Ltd.	Co-set by government of HK SPA and the commercial circle，making government's legal trading documents and trade declarations electronic

Chinese Taipei	Trade-Van Information Services Ltd.	Originated by automatic freight customs declaration planning team under Ministry of Finance of Chinese Taipei
Macao, China	Tedmev	Purchased by government of HK SPA & industry and commerce in 2004
Korea	Korea Trade Network	With Korean Trade Promotion Council as the main shareholder，the support from Korea's Ministry of Commerce, Industry and. Energy
Japan	Trade Electronic Data Interchange Club (TEDI club)	Ministry of Economy and Trade and Industry
Malaysia	Dagang Net Dagang Net Group of Companies	Ministry of Finance of Malaysia
Thailand	Communications Authority of Thailand (CAT) Cat Telecom Public Company Limited	Unclear
Singapore	Crimsonlogic Pte Ltd.	With as Trade Development Bureau of Singapore, Aviation Bureau, port authority, and Telecom of Singapore as its co-shareholders

Fig. 2.37　Diagram on PAA Completed Structure



Due to the varied background of its members, any Cross Economy organization is fated to meet all kinds of barriers from its birth. There is no exception for PAA. Its first barrier is the varied legal and security formations of its members. Hence, how to integrate the different regional security formations and ensure the smooth Cross Border

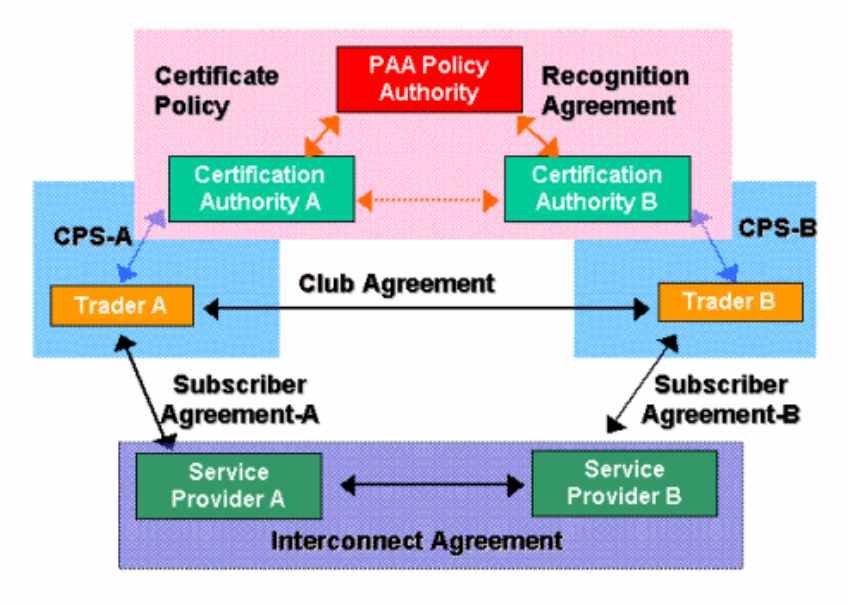
electronic certification services has been a common task of PAA members. At present, PAA members realize their digital certificates exchange by recognizing one another's certificates. The whole recognizing of one another's certificates comes out in stages, with Central Authority as its top stage. It is the dominated certification center that is in charge of the formulation of certificating policies, auditing the function of its members' approval institutions, carrying out the Cross Border security standard and exchange, and checking the security certification grade of its members' approval institutions.

Such a security formation is good for the organization to absorb new members, and enable them to operate under this same security formation. It has pre-set the straight trust-worthy relationship between any trading partner and its service providers, and any approved digital certificates of the trading partners' shall be trusted by its service providers, and vice versa. In order to establish the trust-worthy relationships among the certification institutions from different regions, PAA authorities have been playing an important role in the management and recognition of different certification institutions from different regions.

PAA authorities control the general certificating policies and other relevant ones that are recognized by the testing appraisal or the certification standards. The general certificating policies include the basic conditions for all regions' certification institutions, that is, any certification institution that has met the above basic conditions can enter into the contract relationship with PAA and become the latter's approved certification institution and also can cooperate with its counterparts from other regions. The message sent to PAA service provider Y by PAA service provider X shall be recognized accordingly.

The certificating policies of PAA authorities include the criterion for the use, release and management of the digital certificates, with its main purpose of supporting the member regions to carry out commercial transactions and document exchange in a secure and reliable transmission environment, and enhancing the non-denial function of commercial transmission; meanwhile, it offers the convenient interlinkage network services to all transaction parties in their e-commerce transaction, and helps PAA entrance website to connect with the whole world.

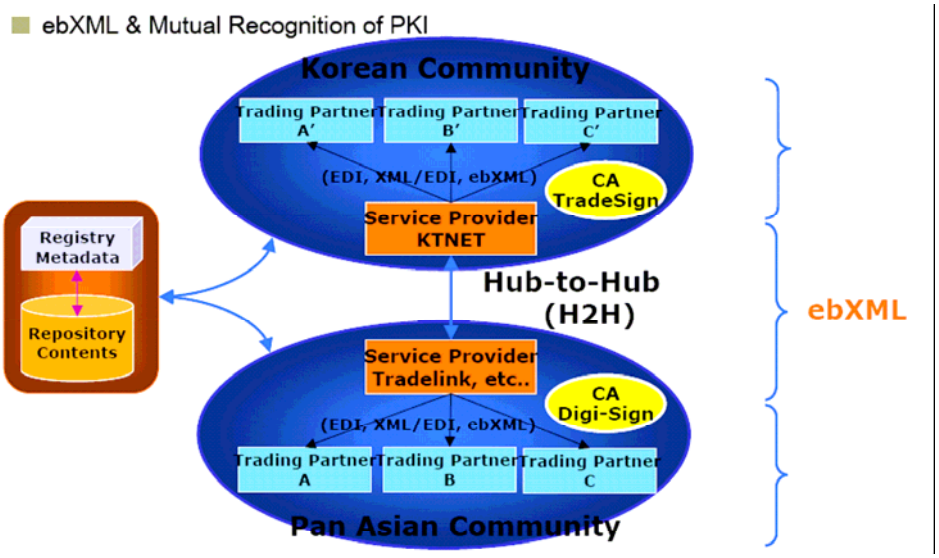
Fig. 2.38 PAA Legislation & Security Structure



Besides the certificate policy, the following agreements are also required when doing the cross state transaction under PAA formation:

Recognition agreement;
Subscriber agreement;
Club agreement;
Interconnection agreement.

Fig. 2.39 PAA Technical Framework (Sampled with KTNET)



BOX 16 Third Party Services of China e-Trade

China International Electronic Commerce Center (CIECC) was established in 1995, and has mainly engaged itself in E-commerce Third Party Services.

With "Facilitate Trade Chain" as its mission and making full use of China International Electronic Commerce Net's IT formation and technical means, CIECC can improve the efficiency of relevant certification applications on international trade chain, certificate transfer and digital exchange, provide common services, specialized services, logistics services and financial services for trading and thus realize the high efficiency, rapidity and reciprocity in the whole trading procedure. At present, a network covering the whole country and connecting with the world has basically come into shape. Now Ministry of Commerce of China has been in connection with the customs, the taxation bureau, and foreign exchange bureau through the net. Through the net-certified security system based on PKI/CA system, the security system consisting of communications platform, digital exchange platform and the application platform has been established.

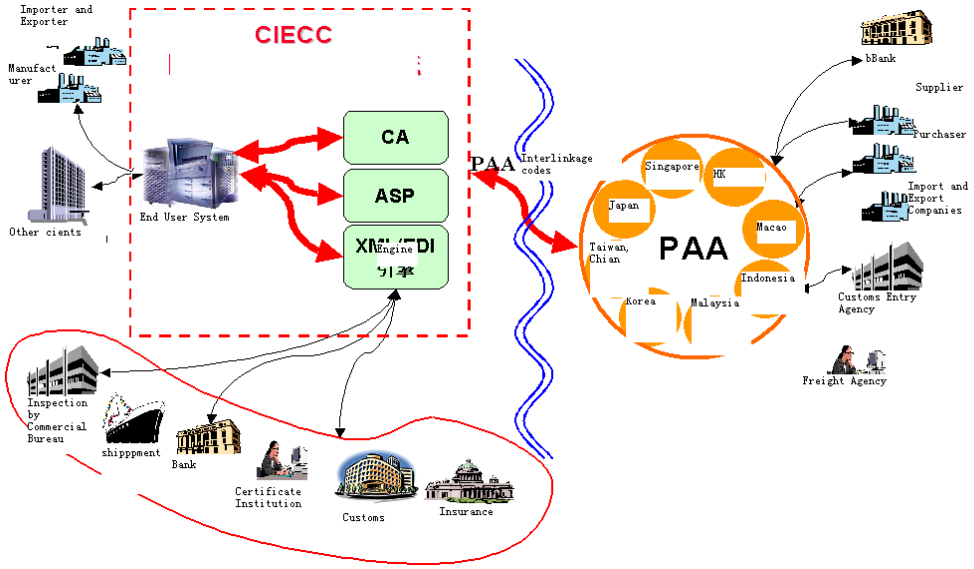
On the basis of the co-checking of textile products quota through the network with the customs of America, European Union, Canada, Turkey, etc, CIECC has co-managed the computer network and co-checked the digital data with 62 certificate organs all over the country. All the goods intended for public bidding have been bid electronically. In January 2002, The Import and Export Licenses Management System was introduced into all certificate issuing institutions all over the country, and in January, 2003, the Network Licenses Application System for Enterprises was put into use all over the country. The next job is to further specify the paperless trade procedure for goods that require Import and Export Licenses, and promote the preparation work for the paperless customs declarations of goods that require Import and Export Licenses, so as to pave the way for the paperless electronic customs declaration, electronic application for inspection, and electronic issuance of licenses.

In July 2000, China's CIECC, together with Tradelink in Hong Kong, China, TRADE-VAN Information Services Co., Ltd in Chinese Taipei's, Singapore's CrimsonLogic, Korea's KTNET and Japan's TEDI, co-launched Pan Asian E-Commerce Alliance (PAA). Pan Asian E-Commerce Alliance is the first regional paperless trade organization in Asia, with its goals as follows: to improve the efficiency and convenience of the global trade and logistics through the safe and reliable IT system; to formulate the electronic certificate standards that conform to the interests of its member states and member regions, and thus promote e-commerce extensively; to realize the exchange of electronic documents among its members by using PAA members' digital proofs from their respective authoritative institutions. So far, the number of PAA members has increased to 9, and its client enterprises from the east and southeast of Asia have totaled to more than 140 thousands.

CIECC has been actively participating in the exchange of projects and technique with PAA. In order to realize the e-commerce certificate exchange with foreign members, it

has started the e-commerce service platform- I-Trade. Net, which has gained the desirable effects in the primary trial places.

Fig. 2.40 CIECC Cross Border Paperless Trading



In order to promote the development and wide application of paperless trade, on December 2, 2004, CIECC and Korea's KTNET jointly signed "The Sino-Korea Transnational Paperless Trade Cooperation Memorandum" for improving the bilateral paperless trade environment. At present, CIECC has centered on trade and finance, united with many involved trade partners (such as government organs, coastal logistic enterprises, banks, insurance companies, etc) as well as the foreign e-trade service platform, and aimed to build an integrated value chain of e-trade services that links trade, public services of the government, coastal logistic enterprises and financial balance eventually.

Table 2.14 Operation Items of e-Trade Services of CIECC

Services	Operation Items
Fundamental trade services	Electronic exchange of trade certificates（I-TradeNet）
	Electronic categories（unified codes）
Common trade services	Integrated service platform for electronic government affairs
	Integrated service platform for electronic trade declarations
	China International Electronic Commerce Net
Specialized trade services	On-line Guangdong Trade Fair
	China commodity market
	Electronic commerce based on the supply chain: Trade Engine
	E-commerce in the line: MXN/CNX
	Value-added, economic and trade information services
	Wireless, value-added services
	Internet application services

Financial services for trade	Financial services
	Insurance services
Logistic services for trade	Integrated service platform for logistic information

BOX 17 Port Construction in Shanghai, China

Port of Shanghai is China's largest port for international trade. At present, it has got an operation platform with the capacity to deal with 1,000, 000 transactions daily. Basically, it has formed the management mode of integrating customs declaration and logistics with foreign trade and investment, built the wide band that covers the relevant seaports, airports and coasts as well as the main industrial parks (i.e. development zones, export processing zones, Bonded areas), and met the demand for data in-transmission of coastal management departments, enterprises and other relevant units. Also, it has joined with the operation platforms of the customs, quality inspection and trade management on the net for information share, thus enabled the information network of Shanghai Seaport to link closely with that of all state ministries for the joint share of information.

So far, among the 58 commonly used customs declarations and logistics certificates in Shanghai Seaport, 41 have become electronic, which has taken up a proportion of 70.7% of the total. In 2003, the electronic message transmission was up to 18, 842, 000 pieces, with a growth of 102.11% compared with the same period of the previous year. Electronic encasement lists, CSI information services, pre-set shipment lists, put-in encasement lists, etc were launched into formal use; the electronic bill of lading was introduced into the operation, and enterprises could pick up their goods as long as they had got "green light" from the customs, the inspection and quarantine bureaus as well as the proper information from the electronic bill of lading; the world top 20 shipping companies together with many other shipping agencies started the business of electronic in-advance cabin-booking; the electronic data transmission services for entrance/exit message, loading/unloading message, barging loading/unloading message, case management information greatly helped the shipping companies to improve their operation and management efficiency; message transmission of inner lateral shipping lists, shipping declaration system of maritime affairs bureau, bulk cargo and grocery dock-barrier, shared information projects for seaports were put into trial use; the delivery order and allocation list of the export processing enterprises were transmitted; date concerning the declaration and customs inspection & discharging of Pudong Airport Authority Area enterprises were transmitted on the network.

On the basis of electronic payment system and following the port's goal of realizing "One Master-card", in the beginning of 2003, the design and development of the electronic payment system through the network were launched, and the system was put into use in October 2003. Currently, there are 20-odd electronic payment items on the plat form, including import/export tariff, inspection & quarantine fees, tidy-up fees, dock expenditure, and all customs declaration charges by shipping companies, etc.

besides, there are many characteristic functions (such as long-term payers, payment in advance, designated payment-collectors, multi-level management, etc) and individualized services. By the end of 2003, there had been an accumulated taxation fee of RMB 137,000,000 collected by the system.

To further the trade convenience and the process of paperless trade, Port of Shanghai has started the plan of "efficient customs declaration, cross-region fast customs declaration and paperless customs declaration". For one thing, the export goods of the enterprises can be declared 3 days in advance of their arrival at the customs authority area; for another, after the shipping of the imported goods and before their arrival at the target port, provided that the shipping /aviation agency transmits timely and accurately the electronic shipment list to the customs, the import enterprises can go through the customs declaration in advance. In a word, the new mode of "one declaration, one inspection and one discharging" is in wide use already.

On December 15, 2004, Shanghai Government released Notification on Advancing Shanghai Port's Electronic Encasement List for Export Containers. From then on, the consignment procedure at Shanghai Port can be finished with the electronic certificates from the customs and the in-and-out inspection/quarantine bureaus, and it has changed the traditional working mode of forcing the enterprises to rush about the authorities for the needed certificates, simplified the procedure and thus helped reduce the cost of the enterprises. In the traditional way, the enterprises need to get 6 certificates for each pick-up of their goods, and each certificate would take them half a day to line up. Ever since the practice of "Electronic Encasement List for Import Containers", the mode of "fast customs declaration" shall automatically send the electronic certificates from the customs, the inspection and quarantine bureaus to the electronic bill of lading, and the enterprises need to spend only one hour for their inspection-free goods.

At present, in Shanghai Port, there are 22 shipping agencies and 17 freight agencies and customs entry agencies that have practiced the electronic bill of lading; however, there are in total more than 530 enterprises that have been approved by Ministry of Commerce of China as "Top Grade" freight agencies in Shanghai, 61 specialized customs entry agencies approved by the Customs General, and about other 3000 representative institutions of international freight agencies in customs declaration business and without-ship carriers. Therefore, there is still big room for the practice of electronic encasement list for containers.

BOX 18 Paperless Trading Case Study - Paperless Trade Development Status with China Foreign Trade Transportation (GROUP) Corporation (SINOTRANS)

Established in 1950, China Foreign Trade Transportation (GROUP) Corporation is an international, modern, large scale logistic enterprise that dominates in the sea-land-air international freight agency business and integrates sea transportation, air transportation, air express, railway, international multi-mode transportation, the motor transportation, storehouse business, ship management, ship rents, vessel affairs agency, and comprehensive logistics. As one of China's three giants in sea shipment and an advanced comprehensive logistics provider, by the end of 2003, China National Foreign Trade Transportation (GROUP) Corporation has set up 40 subsidiary companies in China, one listed company in HK, one domestic A-share listed company, and 1000 domestic operation entities. In abroad, it has set up 8 representatives, 22 overseas enterprises, and established the agency relationship with more than 400 transportation companies abroad, which means it has shaped its own efficient transportation service network that covers the whole country and connects with the whole world as well.

Ever since 1994, China Foreign Trade Transportation (GROUP) Corporation has been in the trial practice and exploitation for the paperless trade. After its 10-odd years' development and efforts, a complete set of systems and formations of paperless trade has gradually come into shape, and its basic principles and strategic ideas have been fixed. Specifically, based on the standardization of its operation codes, it aims to establish the integrated and centralized business operations and many other internal operation platforms such as the business management information platform, decision-making sustaining platform, information service platform, communication platform with clients, etc. through EAI integration and the unified B2B/EDI platform, it can achieve the paperless trade with numerous partners like the clients, shipping companies, freight agencies, shipping agencies, customs, quality-inspection bureaus, ports, etc.

Technical Standards for Paperless Trade

After 10-odd years' accumulation and integration, the paperless trade platform of China National Foreign Trade Transportation (GROUP) Corporation conforms not only to the traditional technical standard EDI (such as EDIFACT\ANSIX12), but also to the advanced exchange technique (such as ROSSETNET and WEBSERVICE); besides, it can conform to each enterprise' various internal standards as well.

In terms of its message categories, they include EDIFACT, ANSIX12, ROSSETNET, EBXML, TDCC, FLATFILE, the standard of the ministry of transportation, as well as a lot of user-defined message forms.

In terms of its communication modes, they support the common agreements such as FTP/FTPS, HTTP/HTTPS, SMTP/POP3, X.25, etc, as well as a few special communication agreements.

It supports not only the traditional VAN, but also INTERNET, VPN, DDN.
It supports all kinds of BPI/BPM integration of enterprise operations such as trading partners' development, FA tracking, irregularity treatment system, priority treatment mechanism, ASN tracking, etc.

It supports the design, development, deploy and operation of flow modules, and the major use and inheritance of RULES, ROUTES, etc.

Application Modes of Paperless Trade

From above, it is clear that the paperless trade platform of China Foreign Trade Transportation (GROUP) Corporation has a strong compatibility and expansibility, which has guaranteed the diversity and flexibility of its application modes. For example, in the project of Hisense Logistics, it has selected HTTP, the user-defined XML, DDN special line, BPM flow integration (i.e. SO/PO confirmation, ASN tracking, POD tracking, financial balance, etc) for the application modes; in sea shipment operations, when its East China subsidiary company was importing the shipping list operations with Hanjin shipping company, the modules such as SMTP/POP3, IIFCSUM Standards, INTERNET were chosen as the paperless trade modes.

In terms of the application modes, China Foreign Trade Transportation (GROUP) Corporation attaches great importance to the diversity and flexibility mainly because, as a large domestic 3PL company, it has numerous clients, involves various trades, varied information level of different partners and differed technical standards in paperless trade. Hence, as a service provider, China Foreign Trade Transportation (GROUP) Corporation follows, when constructing its paperless trade platform, the principle as this: under the precondition that there are a lot of useful and inheritable standard application modules available, on the basis of SOA formation principle and the practical needs of projects, the company will try to organize flexible, diversified and highly compatible application modes.

Integration Degree of Paperless Trade

The application of Paperless Trade by China National Foreign Trade Transportation (GROUP) Corporation is not confined in the exchange of digital information only; it has achieved the integration of data flow and process flow, and in some individual cases, it has achieved the integration of inside/outside information flow, logistics flow, capital flow and function flow, which means it has finally achieve the organic link between the operation system and the information system.

The integration degree of paperless trade in China National Foreign Trade Transportation (GROUP) Corporation displays itself not only in the high integration with external parties, but also in its internal integration and coordination of all the operational systems. Taking a SO entrust as an example, for the users, they merely

exchange with B2B/EDI platform of China National Foreign Trade Transportation (GROUP) Corporation in the full process of Issuance, confirmation, shipment, transportation, reception sign and settlement; however, for China National Foreign Trade Transportation (GROUP) Corporation, the internal information and flow adjustment and control are done through EAI center, and this integrated, high-centralized internal system formation has provided excellent paperless trade services to its partners.

Application Dimensions of Paperless Trade

So far, there are around 120 to 150 partners that carry out paperless trade with China National Foreign Trade Transportation (GROUP) Corporation, including not only a few domestically well-known enterprises such as Legendary, Tsinghua Ziguang, Hisense, etc, but also some multinational companies like Shell Oil, BenQ, etc; besides, there are many domestic freight and shipping agencies and consignors, such as Maersk, COSCO and Hanjin, and the customs, quality inspection bureaus, ports, harbor offices, etc.
Statistic by the operation categories of certificates (excluding those under the same operation category but different criterion codes) shows that there are about 50 to 60 categories, including the domestic logistic SO, PO, POD, financial balance, on-way information, etc, as well as the international logistics such as cabin booking, cabin-booking confirmation, import shipping list, vessel chart, etc.

Economic & Social Benefit of the Paperless Trade

Ever since the practice of Paperless Trade, China National Foreign Trade Transportation (GROUP) Corporation has achieved great economic and social benefit.

As a 3PL enterprise, China National Foreign Trade Transportation (GROUP) Corporation has to consistently deal with a lot of information and certificate exchange with its partners. So, if it does them in the traditional way such as the fax, the express or the phone, it shall cause high cost of personnel, condensed labor intensity, low efficiency, more man-made mistakes in data transmission and slow response speed. Through the paperless trade, all the mentioned problems above can be solved or avoided, and the operation cost of China National Foreign Trade Transportation (GROUP) Corporation can be greatly reduced while its efficiency is greatly improved.

The paperless trade has been a prerequisite and basis for the cooperation between China National Foreign Trade Transportation (GROUP) Corporations to provide excellent IT services to its partners. Particularly, as the information level of its partners are going up step by step, more and more clients have considered the paperless trade as one basis of cooperation.

The paperless trade is extremely helpful to raise the loyalty of its clients to China National Foreign Trade Transportation (GROUP) Corporation. From its previous

experience, the more complicated the paperless trade and the higher the automation degree, the more loyal the clients shall be.

Judged from the whole society, the paperless trade can greatly reduce the cost of social information exchange, and raise the information exchange efficiency and accuracy between enterprises, between the enterprise and the government institution, and between government institutions. Hence, the whole social efficiency can be raised accordingly.

Issues for the Paperless Trading

Though China National Foreign Trade Transportation (GROUP) Corporation has made a lot of efforts in the paperless trade and achieved certain harvest, it has encountered difficulties and problems as well. Some of the difficulties are technique-related, some operation-related, and all of them can be controlled and solved within the company. Comparatively speaking, the lack of unified and authoritative paperless standard and code is the worst barrier that prevents its paperless trade development. This problem is the most obvious for the third party logistics provider, as a third party service provider, it is always in a disadvantageous position in the operation transaction, and this is why it has to accept its partners' technical standards passively in the paperless transaction. With numerous partners and clients, if there is not one certain standard or a few more unified international, stately, or trade standards, and everyone is doing things in his own way, the paperless trade would become to complex to be in order. Considering from the social point of view, this problem is also one major factor that will restrict the further development of the domestic paperless trade. Nevertheless, it is beyond any single enterprise's capacity to fix the proper standards; instead, it can only be done through the well organized planning and formulation by the relevant government institutions and the trade associations as well.

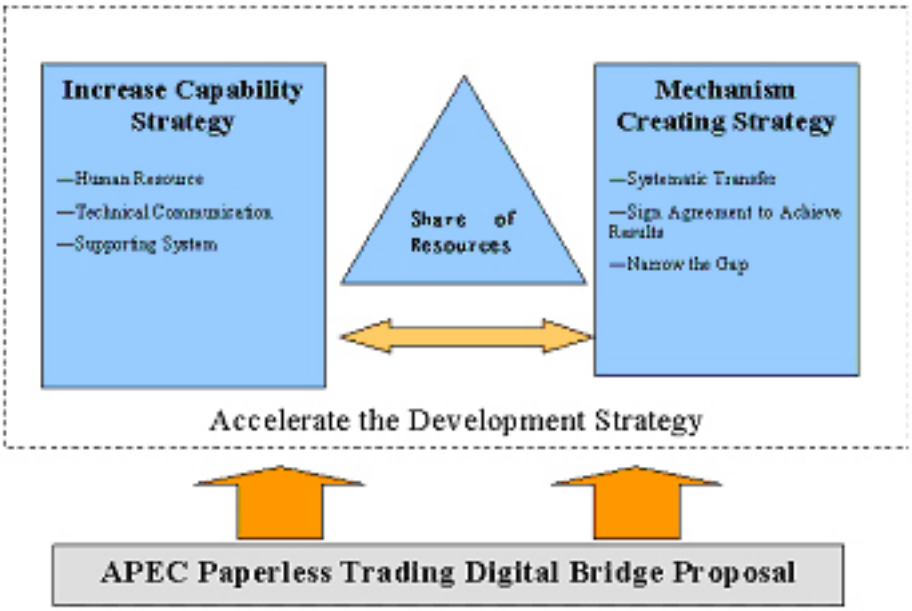
Part III Proposals on APEC's Paperless Trading

3.1 Proposals on Development Strategy

3.1.1 To Adjust Timely the Strategies of Paperless Trading

With the aim of realizing paperless trading in APEC developing member economies by 2010, the development procedure shall be accelerated. It is essential to adjust timely the development strategy - the "APEC Paperless Trading Digital Bridge Program", which the key is to "accelerating development", and which the support is "capability building" and "mechanism innovation promoting".

Fig. 3.1 APEC Paperless Trading Digital Bridge Proposal



3.1.2 To Accelerate the Realization of Paperless Trading in Developing Economies

The next five years is a very important historical period to realize digital APEC, as well as a very good opportunity period for achieving goals of paperless trading, accelerating trade liberalization, improving the technical exchange and coordination among the member economies. Accelerating the development refers that: it is to share the experiences on paperless trading, narrowing the gap of application of paperless trading

between the developed economies and developing economies via communications and coordination. Meanwhile, a development module shall be in place to increase the application levels in developing economies, so that to reach the pre-set goal of paperless trading by 2010.

3.1.3 Capability Building Drives Development

During the procedure of paperless trading development, most of developing economies have been restrained by technology, economic and social development situation. Capability in implementing paperless trading is becoming the bottleneck. Therefore a strategy of capability building is proposed. It is to share the successful experiences from developed economies, to build a data base including case studies, paperless trading experts database, standards, legislations and regulations etc, to build technical, regulatory, and risk guard systems, so that it can assist the development of paperless trading in management, technology, marketing, finance, and legal areas.

3.1.4 Mechanism Innovation Promotes Development

While implementing "APEC Paperless Trading Digital Bridge Program", it is necessary to reach a coordination agreement between two member economies that their application levels of paperless trading are adjacent, and to compliment the innovation of organization structure, management, operations etc. Abandon "Stiff Mechanism" module to innovative mechanism strategy, and keep it on track within bounds.

3.2 Strategy Implementation

3.2.1 Accelerate Trade Liberalization & Trade Facilitation Process

In light of development level of trade liberalization, it is more beneficial to the development of paperless trading if the trade liberalization level is higher in the economies, the artificial interferences and impediments of goods flowing are less, and if the development of the industry on cross border business, logistics, capital and information flow is more mature. Therefore, APEC member economies shall accelerate the procedures of trade liberalization, to reduce the impediments of implementation of paperless trading, based on the economic and technical corporation among them.

3.2.2 Continue to Elaborate Governments' Important Driving Role

Evaluate the governments' role in promoting paperless trading, particularly at the start

and growing stages. In view of the situation that there are many small and medium enterprises in developing economies, it is very crucial to strengthen governments' role in legislation, standard, security, policy and capital etc. areas.

3.2.3 Improve Government & Enterprises' Awareness

It is the pre-condition for accelerating strategic development to improve economies' government, enterprises' understanding of paperless trading. With governments, the issue of paperless trading promotion shall be viewed at the level that it is to raise trade service level, increase policy transparency, control trade risk, reduce economics tax, increase trade security in the economies, restrain corruption, and promote a service government innovation. With enterprises, reducing the process of paper documents will be beneficial to increasing the transparency of supply chain, realizing business collaboration, improving the efficiency of supply chain, thus to reduce costs and expenses and increase enterprises' profit. Therefore, governments and enterprises in the economies shall increase the promotion of paperless trading and public awareness via various ways, such as training and seminar etc.

3.2.4 Evaluate the Participation of Paperless Trading from Private Entities

Elaborate the role of private entities (including associations) in paperless trading in member economies. Listen to the suggestions of private entities, and valuate their participations. Meanwhile private entities shall participate actively in implementation of paperless trading.

3.2.5 Select a Suitable Development Module

It can be found in the process of paperless trading development that there are a certain number of economies that regard paperless trading is more beneficial to developed economies while considering limitation of self-competency. The fact is that either developed economies or developing economies shall select a suitable development module for them to promote paperless trading. Particularly with developing economies, the governments shall realize that paperless trading is a long process of development. First of all, environment creation shall be taken care of, and encouraging policies shall be formulated. Select a solution that is simple, low cost and easier to excess from paper documents to paperless documents system. With developed economies, and newly raised economies, the corporations cross governments and regions shall be strengthened and the coherence of standards and authentication shall be improved to realize paperless trading cross boarder. Stress the paperless trading development in large scale of multi-national enterprises, and bring along electronic documents application with

medium and small enterprises.

3.2.6 Improve Integration Resources of Paperless Trading

It is the pre conditions to consolidate human resources, technology, standard, authentication, and legislation etc. resources to be able to achieve paperless trading efficiency. Therefore it should strengthen the participants' coordination among the member economies in support of paperless trading.

3.2.7 Strengthen Standardization

Standard is still the one of bottlenecks. It requires governments to initiate international paperless trading standard. Particularly in the paperless trading application cross boarder, it shall be in accordance with needs to integrate different electronic technologies, such as UN/EDIFACT, UneDoes, Business Module, UBL, UN/CEFACT Core Components, ebXML, and RosettaNet etc. Meanwhile, it shall also be in line with application level and culture differences, and strengthen international collaboration of standards. An exchange and communication system shall be set to share the experiences of standardization and best practices with international organizations, such as UN Regional organization, EU, ASEM etc.

3.2.8 Set an Mechanism Assessment System for Paperless Trading

In order to summarize the experiences and lessens of paperless trading, assess the benefits brought to enterprises and member economies by paperless trading, and reduce the risk of paperless trading, it should strengthen the assessment and statistic systems building, value the original data collection to ensure that paperless trading is on a healthy track.

Appendix

Appendix A: APEC Paperless Trading Digital Bridge Program

1. Aim of Construction

Based on Digital APEC Strategy，and guided by APEC Electric Commerce Action Plan，coordination should be strengthened on the base of electronic commerce service system of economies and search the solution of "main body centralization". To build a APEC Paperless Trading coordination service system together，realize the share environment

between developed economies and developing economies in Paperless Trading resources, in a bid to promote the development of the application cross-boundary Paperless Trading. Try best to make most developing economies made a great development in the construction of lawmaking, standardization, and security authorization service system before 2010. Try to double the trading volume of Paperless Trading within five years，and to promote most developing economies to primary or middle level in the application of Paperless Trading.

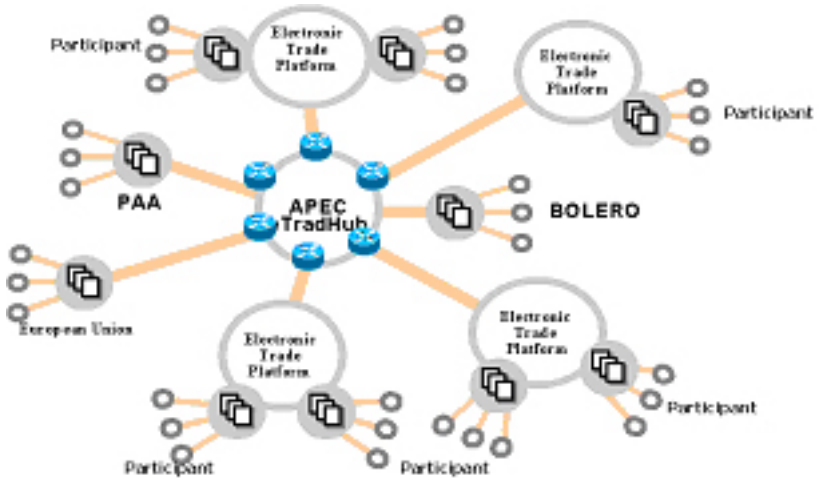
Appendix Fig. 1　APEC e-Trade Hub

2. Emphases of Construction

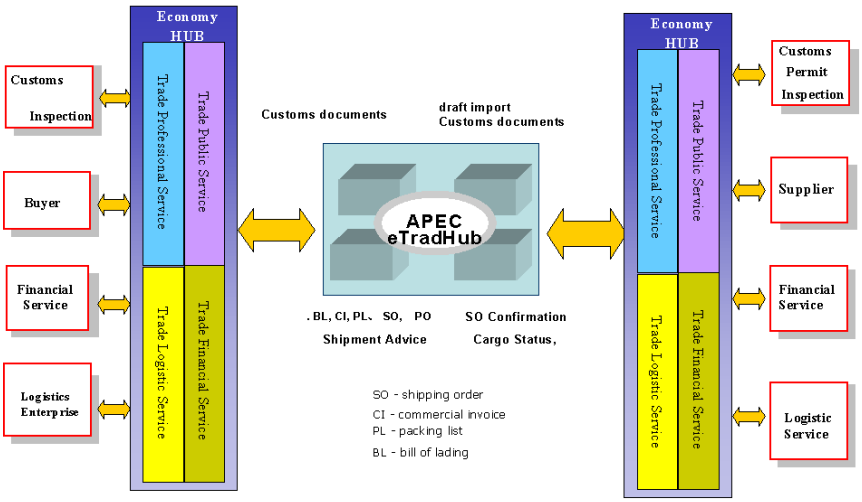
The realization emphasis of APEC Paperless Trading coordination service system is: to set up **"**APEC E-Trade Hub**".**

The application of APEC Paperless Trading has wider coverage and mutual communication requirements. At present, APEC developed economies and newly emerged economies have basically formed respective electronic trade service network platform. However, they are mainly in the form of inner platform within economies, the relatively independence has set obstacles for the cross-boundary coordination operation of Paperless Trading. To set up a APEC e-Trade Hub，for the establishment of a public, open and effective managed coordination operation network platform. Therefore, the operation efficiency of APEC paperless trading's cross boundary service can be enhanced, and the high cost in the basic equipment construction in developing economies has been greatly decreased. It not only creates a convenient operation environment for the cross boundary coordination operation of paperless trading, but also makes an innovation in technology structure and operation mode.

Appendix Fig. 2　APEC e-Trade Hub Interrelationship



Appendix Fig. 3　APEC e-Trade Hub Structure



3. Forerunner Projects

(1) Paperless Trading Cooperation Projects in Hong Kong, China, Chinese Taipei & Mainland China

Based on trade and international logistics, APEC e-Trade Hub modelling project among CIECC of Mainland China, TRADELINK/DTTN of Hong Kong, TRADE_VAN of Chinese Taipei has been given support. P2P (Peer-To-Peer) open network structure has been adopted. It means that in APEC e-Trade Hub networks，enterprises in the economies can conduct electronic certificate's transmission and treatment according to

the requirements with any cooperation partners of other economies, in a bid to set up a mutual coordination operation platform environment. At the same time, double authorization service system among Hong Kong, Chinese Taipei and Mainland China should be established, providing Paperless Trading for enterprises in these three places. Based on this foundation, cooperation with neighbouring economies in Paperless Trading should be promoted.

At present，CIECC, TRADELINK/DTTN and TRADE_VAN have developed relevant cooperation in PAA，and have begun to establish electronic commerce and the service system and realization structure of modern logistics, the testing project of which has made phrasing achievements. In 2005，CIECC has begun to establish electronic trade service system compromising of professional commerce service, trade public service, trade finance and trade logistics service; Hong Kong starts up "dttn" public trade logistics service platform; Chinese Taipei TRADE_VAN has also begun services based on Custom entry and has explored and spread application fields. Paperless Trading plans developed in Hong Kong, Chinese Taipei and Mainland China has laid a foundation for the implementation of **"APEC Paperless Trading Digital Bridge Program"** and the establishment of APEC e-Trade Hub forerunning cooperation projects.

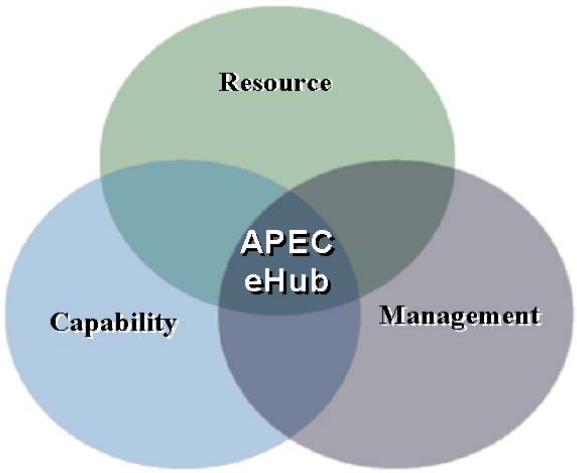
(2) Northeastern Asia Cooperation Project

Northeastern Asia region is an important region for economies of China, Korea, Japan, Russia and Singapore to strengthen their cooperation and mutual drive the development of Paperless Trading. As an important port in northeastern Asia, Dalian of China has developed to the centre of economies cooperation. It has begun to build northeastern Asia international shipping centre and build "one-stop" service system in Dalian Port. Singapore economies have begun to make joint venture to run Dalian port service and Dalian port is also one of the main ports between China and Korea, Japan and Russia. Choosing Paperless Trading cooperation in northern Asia among China, Korea, Japan, Russia and Singapore economies as the breakthrough, they use Paperless Trading as the methods to provide convenience service for enterprises of the economies. Cross boundary development experience of Paperless Trading should be explored and accumulated, in a bid to enlarge the application scope of APEC Paperless Trading.

4. Insurance Measures

Insurances measures refer to those measures to promote the smoothly implementation of "APEC Paperless Trading Digital Bridge Program"，to set up APEC e-Trade Hub，and measures used in resources utilization, coordination management and ability building. (See the following figure)

Appendix Fig. 4　APEC e-Trade Hub Insurance Interrelationship



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Unitization of Resources

1) Human Resources

Fully make use of the gained results of APEC in economic and technology cooperation, lateral plans and multi-lateral plans，continuously carry on Paperless Trading training，set up and perfect Paperless Trading experts consultation network and experts database，and cultivate imperative talents needed by APEC Paperless Trading through research and case analysis.

2) Technology & Market Resources

Strengthen developed economies and developing economies' communication and cooperation in Paperless Trading technology，and exert resource advantages respectively through cooperation project and market operation, in a bid to form a mutual development and cooperation atmosphere.

3) Utilization Environment Resources

Developed economies should provide mature experiences formed in the implementation of Paperless Trading, such as laws and regulations, trade regulations, standards, development mode to developing economies, in a bid to quicken the implementation of their Paperless Trading application environment.

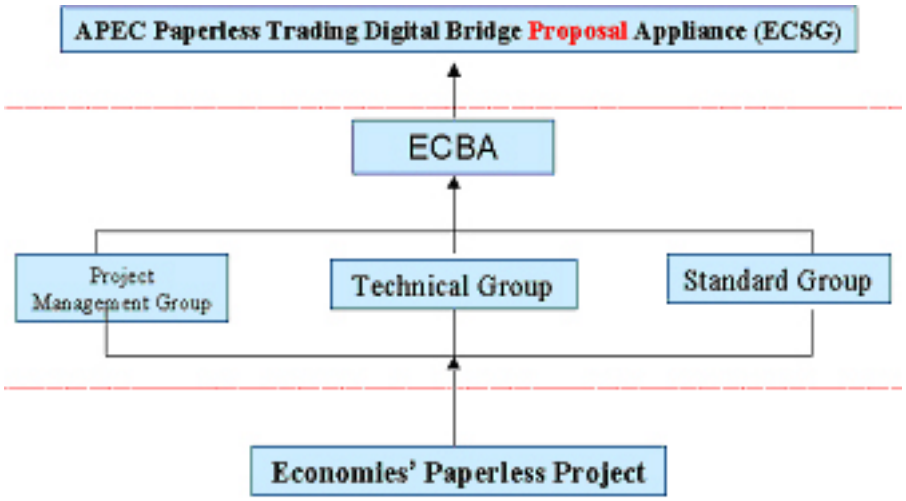
Organization & Management

1) Organization

To ensure the smoothly implementation of the project， ECSG should take charge of the

organization and coordination work of "APEC Paperless Trading Digital Bridge Program", which should be concretely implemented by APEC Electronic Trade Industrial and Commercial Committee.

Appendix Fig. 5 Organization Structure of APEC Paperless Trading Digital Bridge Program



The above figure shows the organization structure of APEC Paperless Trading is made up of coordination layer, implementation layer and project implementation layer.

2) Plan

Under the directly coordination and organization of ECSG, the APEC electronic industrial and commercial committee should presider over the layout, project establishment and implementation.

Implementation Ability

1) Coordination Ability

Set up and perfect coordination and communication system, exert economies' governments' coordination role in plan exertion and strengthen the connection and cooperation in the exertion of plans, in a bid to avoid the conflicts in the exertion of plans.

2) Market Ability

Under the great support of the governments, the market ability in the exertion of the plans has been paid attention to. The coordination service of Paperless Trading has been closely connected with the demands of the market, which quickens the conversion of productions and service to market.

3) Operation Ability

Set up data transmission and treatment, standard maintenance, security insurance system among platforms, and promote the coordination operation ability of Paperless Trading.

4) Financial Ability

Capital is the main choke point to realize this plan. To the end, many capital-rasing modes should be adopted. First, to shoot for the support of international financial organizations such as IMF, WB and ADB; The second is to shoot for the support of business circle; and the third is to pull off the self-results of the project to create economic benefits. At the same time, encourage economies to set up the development capital for this project to take charge of the rasing and unitisation of relevant capitals， creditor's rights' application, the control of cost and the ability of payoff.

Appendix B: Questionnaire (1)

Background Information for Assessment of Paperless Trade Implementation in APEC Economies

Taking into account diverse legal and regulatory frameworks in the region, APEC Ministers agreed that member economies should endeavour to reduce or eliminate the requirement for paper documents needed for customs and other cross border trade administration and other documents and messages relevant to international sea, air and land transport i.e. "Paperless Trading" (for trade in goods), where possible, by 2005 for developed and 2010 for developing economies, or as soon as possible thereafter. To this end, relevant APEC sub-fora should examine specific initiatives.

With reference to your objectives stated in paragraph 1, provide detailed criteria (quantitative and qualitative) for how you will measure your results in the short and long term to know if your project has been successful. State your current benchmarks for measurement, your target results from the project for each measurement criterion and the range of acceptable results both in numerical and percentage terms, where possible.

The study will produce a final report outlining the economic benefits and best practices for implementing paperless trading systems to the APEC e-Commerce Steering Group. This will be used to analyse the current status of e-Commerce and paperless trading development with the aim of introducing best practices and identifying challenges and solutions applicable to all APEC member economies.

In the short term, the input of participants can be used as a base to further accelerate pursuing APEC's Paperless Trade Goals and establishing a cross border paperless trade environment.

"APEC Symposium on ebXML for Internet Paperless Trading and Collaborative e-Business" held by Thailand in July 2004 will be used as the benchmark for measurement. In the long term, the success of project will be measured by the extent to which member economies create better environments for the development of paperless trading by adopting the successful experience of other member economies, respond to the challenges and implement the solutions used by some developed economies. The symposium aims to accelerate member economies efforts to pursue the goal of 2005/2010 and to facilitate the establishment and interoperability of cross border paperless trading.

Checklist for Seeking Detailed Information

We would like each of the APEC economies to provide the following information as much as possible. The following information might be relevant specifically to government agencies in cross border trade administration, customs offices, transport department, banking authorities, etc. Please give us a list of experts in the following fields, so that we may contact with them for detailed information.

The following outline is a guideline for seeking relevant information and expert advices for paperless trading implementation assessment among APEC economies. The information to be provided according to the following outline will be based on your own member country (or APEC economy).

1. Electronic Trading and Aggregation of Buyers & Sellers for Cross Border Trade

- Names, contact and website addresses of recognized trading opportunities website (matching international buyers and sellers);
- The online trading volume of cross border trade of the above trading site, if possible the annual growth rate for successful trading;
- The feedback (e.g. pros and cons) from buyers and sellers who used the above sites for online cross border trading;
- Statistics and quantitative measurement for evaluating the above services;
- Expert names and contacts for the above information.

- Names, contact and website addresses of agents of trust supporting the paperless trade, e.g. the third party agencies for facilitation of cross border paperless trading in trust, certifying services, etc.;
- The feedback (e.g. pros and cons) from buyers and sellers who used the above sites for online cross border trading services;
- Statistics and quantitative measurement and information for evaluating the above services;
- Expert names and contacts for the above information.

2. Legal & Regulatory Framework & List of Laws & Regulation Relevant to Cross Border Paperless Trade

- Legal and regulatory framework relevant to paperless trading;
- Information sources for the above information;
- Expert names and contacts for the above information.

3. Customs & Other Cross Border Trade Administration

- Government administrative support (including policies for adoption of) for cross border paperless trade;
- Descriptions of government administrative procedures in paperless trading process (e.g. government licensing and quota management);

- Statistics and quantitative measurement and information for evaluating the benefits of paperless handling during the trade facilitation process;
- Expert names and contacts for the above information;
- The trade volume and percentage of import and export that go through electronic paperless customs clearing;
- Descriptions and report on administrative and control of cross border trade by means of paperless documents instead of paper requirements;
- Descriptions and report on how much extend the above paperless administrative and control data of cross border trade integrated with other government agencies and other authorities, e.g. taxation offices, special economic zones, port authorities, etc.;
- Statistics and quantitative measurement and information for evaluating the benefits of paperless handling during the trade facilitation process;
- Expert names and contacts for the above information.

4. Relevant to International Sea, Air & Land Transport

- Descriptions and report on paperless transfer of transportation documents, e.g. electronic handling of shipping order, airway bill, land transport documents, seaway bills, and ocean bill of lading;
- How much extend the paperless shipping documents and data integrated with other authorities, e.g. insurance companies, port authorities, customs office, etc.;
- Statistics and quantitative measurement and information for evaluating the benefits of paperless handling during the trade facilitation process;
- Expert names and contacts for the above information.

5. International Electronic Payment & Settlement Systems for Paperless Trading

- How much extend the banks use paperless means to transfer trade documents;
- How much the paperless trade documents and data in handling of international settlement integrated with other authorities, e.g. customs office, foreign exchange authority, taxation office.

6. Statistical Data for Assessment of Paperless Trade

- Size of Paperless Trade:
  Paperless cross border transaction volume;
  Percentage of paperless customs clearance of cross border trade;
  Percentage and trading volume of international settlements in terms of paperless trade documents presentation;
  Measurement of paperless trade certifying process by third party trust services.

- Efficiency of Paperless Trade:
  Number of documents eliminated during trade facilitation process;
  Handling time saved after adoption of paperless trade;

Cost saved by international buyers and sellers after adoption of paperless trade.

- Effectiveness of Paperless Trade:

  Functional integration of cross border trade documents and data among trade parties. (importers and exporters, international forwarders, insurance companies, banks, government agencies, customs office, commodity inspection authorities, port authorities, foreign exchange authorities, trade promotion agencies, trade associations, etc.)

Third party value added services and to what extend they can function in paperless trade

7. Case Studies

- Typical case studies in the recent three years either successful or failure in the paperless trade process at both national and international level of implementation and development of paperless trade

Data Collecting Methods

1. Primary Data
- Email exchange of opinions with experts in APEC economies;
- Telephone interview with experts in APEC economies;
- On-site visits and investigation to selected economies;
- On site interview with experts.

2. Secondary Data
- Online searching of relevant information;
- Reports and information from each of APEC economies;
- Reports and information from international organizations;
- Academic research references.

For further information, please contact:

Zhan Fu Dong
Coordinator for APEC report, senior consultant, Ministry of Commerce, P.R. China
zhanfd@ec.com.cn

Wang Jian
Professor of International Business, University of International Business and Economics (UIBE)
wangjian@ibb.cn

Appendix B: Questionnaire (2)

Note: This form is designed for collecting information concerning current status of paper documents in use. Please provide relevant information to us in accordance with the real condition of your economy. You can refer to the Individual Action Plan of your economy. **Please make sure that the information you provided is updated.**

Business & Government Documents	
Documents Such As Following	***Current Requirements for Paper Documents***
Ⅰ. Business to Government	
1. Government Import & Export Licenses (Permits)	
2. Quarantine Documentation	
3. Health Certificates	.
4. Certificates of Origin, Standards Certification	
5. Payment of Taxes & Levies on Traded Goods & Services	
6. Land Transport Documentation	
7. Ports & Airports Documentation	
8. Customs Documentation	
9. Seamless Interface to Government	

Ⅱ Business to Business Documents **E.g. Invoice, Payment Order Insurance Certificates, Letters of Credit, Bills of Lading.**	
Ⅲ Impediments of Paperless Trading Implementation & Timetable for Implementing Paperless Trading	

Improvements in Your Economy's Approach to Paperless Trading Since 1998

Criteria	Position at Base Year (1998)	Cumulative Improvements Implemented to Date
Telecommunications Infrastructure Condition		
General Regulations & Their Enforcement Conditions Concerning Paperless Trading		
Government Services Integration		
Electronic Certification & Authentication	•	•
Data Protection Measurement		
Harmonization of Requirements & Acceptance of Electronic Documents		
Public Key Infrastructure		
Harmonization of Code Standard System		
Domestic e-Trade Related Services Integration Mechanisms		

E-Payment Systems Integration		
Efforts to Provide Expertise on Paperless Trading (Education & Training Condition)		
Co-operation in Bilateral, Regional, Multilateral fora		

Be based on your own member economy; please provide relevant information and expert advices for paperless trading implementation according to the following outline.

Part Ⅰ Legal & Regulatory Framework

1. Please list laws and regulations relevant to e-commerce and cross border paperless trading;
2. Please provide information sources for the above information.

Expert Name:
Position:
E-mail:
Contacting Phone Number:

Part Ⅱ Trading Opportunities Websites

1. Please list domestic well-known trading opportunities websites that can match international buyers and sellers;
2. Please specify the online trading volume of cross border trade of the above trading site, if possible the annual growth rate for successful trading;
3. What's the feedback (e.g. pros and cons) from buyers and sellers who used the above sites for online cross border trading;
4. Please provide available statistics information about above trading websites.

Expert Name:
Position:
E-mail:
Contacting Phone Number:

Part Ⅲ Cross Border Trade Administration

1. Please specify government administrative support (including policies for adoption of) for cross border paperless trading;
2. Descriptions of government administrative procedures in paperless trading process (e.g. government licensing and quota management);

3. Statistics and quantitative measurement and information for evaluating the benefits of paperless handling during the trade facilitation process;
4. The trade volume and percentage of import and export that go through electronic paperless customs clearing;
5. Descriptions and report on administrative and control of cross border trade by means of paperless documents instead of paper requirements;
6. Descriptions and report on how much extent the above paperless administrative and control data of cross border trade integrated with other government agencies and other authorities, e.g. taxation offices, special economic zones, port authorities, etc.;
7. Statistics and quantitative measurement and information for evaluating the benefits of paperless handling during the trade facilitation process.

Expert Name:
Position:
E-mail:
Contacting Phone Number:

Part Ⅳ Information Relevant to International Sea, Air & Land Transport

1. Descriptions and report on paperless transfer of transportation documents, e.g. electronic handling of shipping order, airway bill, land transport documents, seaway bills, and ocean bill of lading;
2. How much extent the paperless shipping documents and data integrated with other authorities, e.g. insurance companies, port authorities, customs office, etc.;
3. Statistics and quantitative measurement and information for evaluating the benefits of paperless handling during the trade facilitation process.

Expert Name:
Position:
E-mail:
Contacting phone Number:

Part Ⅴ International Electronic Payment & Settlement Systems for Paperless Trading

1. How much extent banking industry use paperless means to transfer trade documents;
2. How much the paperless trading documents and data in handling of international settlement integrated with other authorities, e.g. customs office, foreign exchange authority, taxation office.

Expert Name:
Position:
E-mail:

Contacting Phone Number:

Part Ⅵ Statistical Data for Assessment of Paperless Trade

1. Size of Paperless Trading:

    - Paperless cross border transaction volume;
    - Percentage of paperless customs clearance of cross border trade;
    - Percentage and trading volume of international settlements in terms of paperless trade documents presentation;
    - Measurement of paperless trade certifying process by third party trust services.

2. Efficiency of Paperless Trade

    - Number of documents eliminated during trade facilitation process;
    - Handling time saved after adoption of paperless trade;
    - Cost saved by international buyers and sellers after adoption of paperless trade.

3. Effectiveness of Paperless Trade

    - Functional integration of cross border trade documents and data among trade parties (importers and exporters, international forwarders, insurance companies, banks, government agencies, customs office, commodity inspection authorities, port authorities, foreign exchange authorities, trade promotion agencies, trade associations, etc.);
    - Third party value added services and to what extend they can function in paperless trade.

Expert Name:
Position:
E-mail:
Contacting Phone Number:

Appendix C: Assessment Methodology

Methodology on Paperless Trading

Notes:
A synthesized methodology to score assessments has been adopted. Based on relevant sub indexes and weights, a 100-point system has been developed. There are five levels, (1, 2, 3, 4 and 5), which correspond to scores of 0-20, 20-50, 50-75, 75-85, and 85-100 points, relatively.

Sequence Number	Name of Index	Assessment Standards
1	**Environmental Assessment**	
1.1	**Regulatory Environment**	
1.1.1	Legislation Level	Some acts are under formulation, but there are many legislative impediments in the paperless trading process = 1 System is not completed (only electronic signature is enacted), and there are a number of legislative impediments = 2 System is comparatively completed (acts of electronic trading and electronic signature have been implemented), full implementation is on the way, but there are some legislative impediments in the paperless trading process = 3 System is basically completed (acts of electronic trading, electronic signature, and privacy have been implemented), some implementation is done, but there are still a few legislative impediments in the paperless trading process = 4 System is completed, and full implementation has been running for some years, there are few legislative impediments in the paperless trading process = 5
1.1.2	Liberalization Level	Average customs tax is over 12% = 1, 9%-12% = 2, 6%-8% = 3, under 5% =4, 0% =5
1.1.3	Support Level	Governments haven't formulated a development plan, nor have they launched relevant regulations or legislation = 1 Governments are working on a development plan,

		relevant regulation and, relevant legislation = 2 Governments already have a development plan and created a basic regulatory and legislative environment = 3 Governments have made a comprehensive development plan, created a fine regulatory and legislative environment, and are giving a certain level of support in organization, coordination and capital = 4 Governments have created a comprehensive development plan, created a fine regulatory and legislative environment, and are giving strong support in organization, coordination, and capital = 5
1.2	**Technical Environment**	
1.2.1	Specification and Standards	Some businesses have adopted the EDIFACT standard, and the standard system is under construction = 1 EDIFACT has been applied widely, but there is no comprehensive standard system in paperless trading = 2 Businesses have built a comprehensive standard system on paperless trading, and have started transferring from EDI standards to XML standards = 3 Businesses have basically built a completed standard system on certificates, documentation, and XML standard is widely applied = 4 Businesses have built a comprehensive standard system on certificates, documentation, and XML standard is widely applied = 5
1.2.2	Securities	Services on security certification is under consideration = 1 Have a set security certification organization, but have not set a security certification system = 2 Have built CA services system in some industries or areas = 3 Have built CA services system in many industries and areas = 4 Have built comprehensive CA services system and realized cross border CA services = 5
2	**Application Assessment**	

2.1	**Application Level**	
2.1.1	Coverage Rate	Paperless trading is only applied to few areas such as customs, government administrations, transportation, payments, etc. = 1 Paperless trading is applied to some areas such as customs, government administrations, transportation, payments, etc. = 2 Paperless trading is applied to main areas such as customs, government administrations, transportation, payments, etc = 3 Paperless trading is applied to most areas such as customs, government administrations, transportation, payments, etc. = 4 Paperless trading is applied every area such as customs, government administrations, transportation, payments, etc. = 5
2.1.2	Integration Rate	Paperless trading is limited to application in internal departments = 1 Some participants have realized resource integration in the chain of paperless trading = 2 Participants have realized resources integration in major parts in the chain of paperless trading = 3 Participants have realized resources integration in most of parts in the chain of paperless trading = 4 Participants have realized resources integration, and realized paperless application across borders in some areas = 5
2.1.3	Trade Quantity	Less than 20% of trade certificates have been transmitted electronically = 1 More than 20% of trade certificates have been transmitted electronically = 2 More than 50% of trade certificates have been transmitted electronically = 3 More than 70% of trade certificates have been transmitted electronically = 4 More than 85% of trade certificates have been transmitted electronically = 5
2.2	**Application Efficiency**	
2.2.1	Module Efficiency	Have not yet realized application module efficiency=1 Application module efficiency is average = 2 Application module is efficient = 3 Application module efficiency is obvious = 4

		Application module efficiency is significant = 5
2.2.2	Reduction Rate on Costs and Expenses	Costs and expenses have not been reduced = 1 Costs and expenses have been reduced insignificantly = 2 Costs and expenses have been reduced obviously in some sessions during trading = 3 Costs and expenses have been reduced in most of sessions during trading = 4 Costs and expenses have been widely reduced = 5
2.2.3	Time Reduction Efficiency	Trade process times have not been reduced = 1 Trade process times have been reduced comparatively = 2 Trade process times have been reduced to a certain level=3 Trade process times have been reduced obviously = 4 Trade process times have been reduced significantly = 5
2.2.4	Accelerate the Simplification Process of Trade	Have not conducted the simplification process = 1 Have realized process simplification in some sessions of trading = 2 Have realized process simplification and improvement in some sessions of trading = 3 Have realized process simplification and supremacy in some sessions of trading=4 Have realized process simplification and supremacy in all sessions of trading = 5

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Prepared by:
Prof. Zhan Fudong
Prof. Wang Jian

Contact:
APEC Electronic Commerce Business Alliance Secretariat
No.11 Ronghua Rd, Economy Technology Development Area
Beijing,China 100176
Tel: (86) 10-6780 0402 Fax: (86) 10-6780 0327
Email: info@apec-ecba.org
Website: www.apec-ecba.org

FOR THE ASIA-PACIFIC ECONOMIC COOPERATION
SECRETARIAT
35 Heng Mui Keng Terrace Singapore 115616
Tel: (65) 6775 6012 Fax: (65) 6775 6013
Email: info@apec.org
Website: www.apec.org

Prepared by:
Prof. Zhan Fudong
Prof. Wang Jian

Contact:
APEC Electronic Commerce Business Alliance Secretariat
No.11 Ronghua Rd, Economy Technology Development Area
Beijing,China 100176
Tel: (86) 10-6780 0402 Fax: (86) 10-6780 0327
Email: info@apec-ecba.org
Website: www.apec-ecba.org

FOR THE ASIA-PACIFIC ECONOMIC COOPERATION
SECRETARIAT
35 Heng Mui Keng Terrace Singapore 115616
Tel: (65) 6775 6012 Fax: (65) 6775 6013
Email: info@apec.org
Website: www.apec.org

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