



**Asia-Pacific
Economic Cooperation**

**Enhancing the Global Supply Chain Efficiency
by E-Manifest Exchange in APEC Region**

APEC Electronic Commerce Steering Group

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PREFACE

In Ha Noi Declaration (2006), a framework for the adoption of free trade and investment promotion-oriented measurements was decided, assuming the engagement of making efforts to accomplish APEC open and free trade and investment goals. Economic leaders of APEC member economies also approved to initiate APEC Port Services Alliance to enhance the cooperation between ports and related departments. After Ha Noi Declaration, APEC kept making efforts in the area of international trade supply chain to promote its efficiency.

In 2010, Ministers endorsed the APEC Supply-Chain Connectivity Framework Action Plan, with a view to achieve an APEC-wide target of a ten percent improvement by 2015 in supply-chain performance, in terms of reduction of time, cost, and uncertainty of moving goods and services through the Asia-Pacific region. In the APEC Meeting of Ministers Responsible for Trade (MRT) 2013, ministers agreed to continue work on the Action Plans to improve supply chain performance as well as to advance work to establish more interconnected and resilient APEC region.

Manifest is an important part of the goods supply chain, which contains description of goods on a means of transport. Apart from the commercial aspects, manifest is also a key document for Customs control purpose and effectively acts as the notification of import and export cargos and supply chains. In order to improve Manifest submission process, many APEC member economies, such as U.S., Canada, Republic of Korea, P. R. China, have established Electronic Manifest System for trade facilitation and risk control purposes. It requires specified trade parties to electronically submit a list of Customs-defined cargo information to the national border entry or exit point within a time limit. In the flow of manifest, many relevant parties are involved (e.g. traders, freight forwarders, carriers/NVOCCs) and the process is complex, sometimes duplicated information is created. Besides, the differences of required declaration data items, standard enforcement, informatization level, etc. between countries make the process even more complicated and cause extra time and cost to influence the efficiency of supply chain.

This project aims at reviewing the related policies and regulations, investigating the current maritime manifest processes, and evaluating the impacts on the stakeholders, to provide recommendations and suggestions to APEC member economies to promote the supply chain efficiency, in order to build an interconnected, standardized, and efficient APEC region.

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APEC member economies such as Hong Kong, China; Japan; Republic of Korea; Malaysia; Mexico; Peru; Chinese Taipei; Thailand; the United States; etc. helped distribute and collect research questionnaires. Descartes Systems Japan Inc. helped arrange the field research in Japan and Washington CORE, L.L.C. assisted to arrange the interviews of field research in the United States. Substantive inputs and valuable ideas were provided by Kazuyuki YAMASAKI, Takahisa YAMAGUCHI (NACCS), Daijiro YAMAUCHI (JASTPRO), Christopher KOCH (WSC), Marianne ROWDEN (AAEI), Tim C. PERRY (APL), Amy HATFIELD (CBP), etc. during the research. The full list of interviewees is in Table 1.3 and Table 1.4 of the report.

At the ending phase of this project, a high level stakeholder seminar was held on December 18, 2014 in Beijing to share the project findings and collect promotion suggestions. Zhong LIN (CFCFA), Xiaochun WANG (Shanghai EDI Center), Dejin LIU (Descartes Systems Japan Inc.), Takahisa YAMAGUCHI (NACCS), Tat Tsen KOH (CrimsonLogic Pte Ltd), and Chen-Hsin MA (E-Freight Technology Inc.) made excellent speeches and shared their penetrating insights and original views. Active participants from Hong Kong, China; Japan; Papua New Guinea; The Philippines; Russia; Thailand, etc. also shared views and experience in manifest field and provided further suggestions and valuable promotion ideas for the project. Grateful acknowledgments are made hereby for all their contributions.

EXECUTIVE SUMMARY

Objectives

This research aims at evaluating the impacts of e-Manifest conventions and regulations on the global supply chain through analyzing laws and regulations of maritime manifest operations in APEC member economies, investigating current business processes, collecting practical experiences of e-Manifest implementation, researching the standardization and information communication technology (ICT) environment, and evaluating e-Manifest exchange readiness of member economies.

Based on the research results, some recommendations on the improvement of the performance of supply chain by knowledge sharing and even bilateral or multilateral cooperation are put forward for promoting the efficiency of global supply chains and paperless trade development in APEC region.

Methodology

Firstly, desk research was conducted to gather information on international conventions and standards, laws and regulations related to manifest in member economies, statistics reports, and other relevant sources to get preliminary findings. Then, the research team interviewed experts, including the customs declaration services supplier, freight forwarder, and service provider, to design the questionnaires scientifically, map the procedures accurately and clearly, and remit for guidance and advice. Three versions of questionnaires were then designed for governments, obligators of declaration, and relevant parties to survey the current status of manifest declarations in the APEC region, in order to have a better and clearer understanding of the implementation situation and gather data for scientific research and mathematical analysis. In addition, field research to Tokyo, Japan and Washington D.C., U.S. was planned and carried out in September and October, 2014, to observe firsthand the current situation and future development trends of e-Manifest in these experienced economies, and study practical experience concerning manifest declaration and data exchange.

In the “Evaluation of E-Manifest Exchange Readiness of Individual APEC Economies” section, mathematical methods have been used to evaluate the readiness of e-Manifest exchange of economies:

- Principal Component Analysis (PCA) was used to select principal indicators;

- Analytic Hierarchy Process (AHP) was used to determine the ranking and weight of the principal indicators;
- Fuzzy Comprehensive Evaluation (FCE) as well as Data Envelopment Analysis (DEA) were used to get comprehensive evaluation results and analysis.

BPA (Business Process Analysis) Method was also used to evaluate the current processes to gain a deep understanding of e-Manifest implementation situation in typical economies for the case study reports attached in the Appendix.

Research Team

The research work of this project was led by Main Researcher Team from Cofortune Information Technology Co., Ltd., China, consisting of Ms. Shuang GAO, Ms. Meishan LIU, Ms. Xi JIN, and others, who were in charge of conducting and coordinating all research work and producing the final project report. Supporting researchers included Beijing Jiaotong University for the China case, Mr. Sung Heun HA from Korea Trade Network for the Korea case, and Mr. Christopher WOOD from Washington Core for the U.S. case. These researchers performed theoretical research and created specific case studies, along with providing other relevant support for the entire project.

Overall Understanding of E-Manifest

This research concentrates on maritime cargo manifests, which influence the efficiency and security of global trade supply chains. To clarify the scope of study and provide a unified description for the research work, this research defines e-Manifest as follows: the electronic information based on Bill of Lading data with a list of cargo and conveyance information, which is submitted by carrier, shipping agent, NVOCC, and/or freight forwarder (or the designated agent of these obligators of declaration), and handed over to the Customs or Port Authority; the entire processes of declaration and verification are conducted electronically.

The e-Manifest declaration and management procedures are mostly stipulated by governmental regulations and policies. Customs and port authorities are the main agencies responsible for regulatory procedures for entry and exit. Other government agencies may also participate in the verification process of manifests. The logistics service sectors (the aforementioned carrier, shipping agent, NVOCC, and/or freight forwarder) are obliged to file the manifest data, and other relevant parties (i.e. traders, service providers) may also be involved in this process.

Manifests are generally classified as import manifests and export manifests, depending on whether cargo is entering or exiting the economy in question. The benefits that the implementation of e-Manifest can provide include:

- Enhancing entry and exit security;
- Improving the public management and service levels;
- Reducing paperwork and manual operation;
- Improving the efficiency of manifest filing and verification;
- Facilitating customs clearance;
- Promoting the development of modern logistics;
- Promoting trade facilitation.

The implementation of e-Manifest also poses some challenges for stakeholders, such as duplication of information to be declared and processed, extra time, expense and personnel needs, potential risks of inaccurate or incomplete declarations, and related concerns.

Through examination of the latest developments in e-Manifest, this research sums up the main tendency of manifest declarations, including advance manifest declaration, in which the obligators of declaration submit an advance electronic cargo declaration to Customs for export and/or import, and trade community filing, in which the trade community (importer/exporter) submits supplementary cargo data.

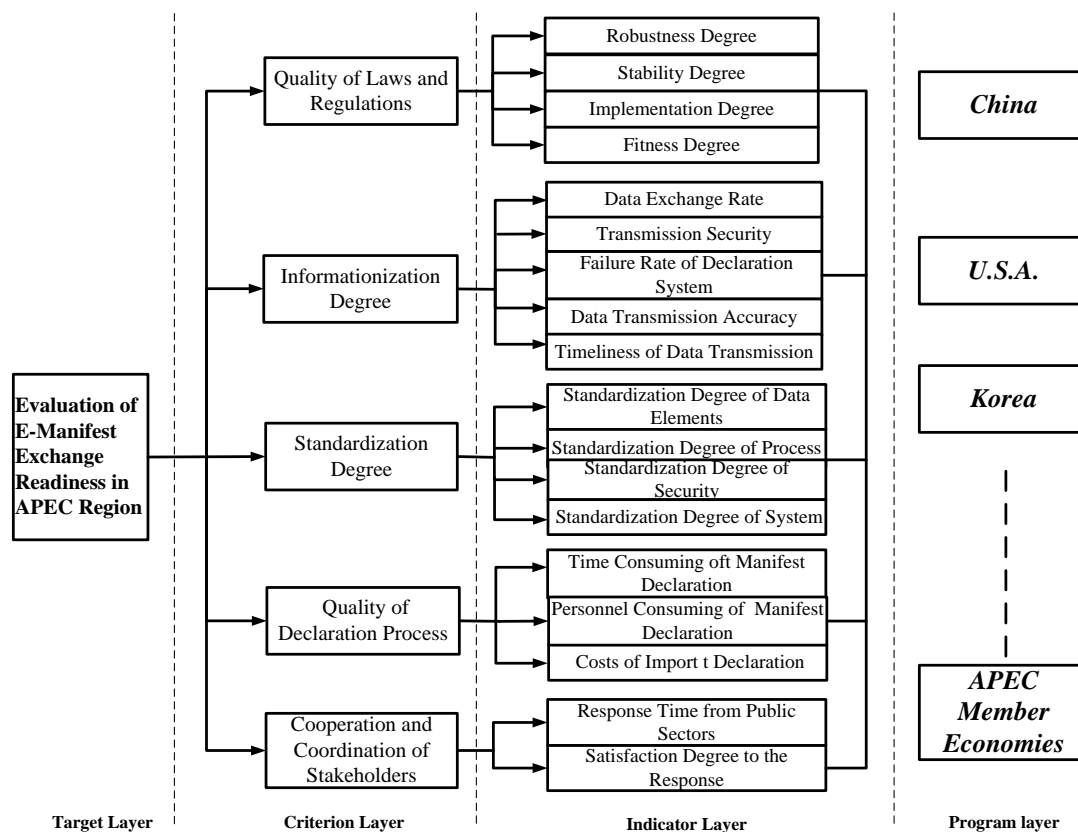
Evaluation of E-Manifest Exchange Readiness of Individual APEC Economies

This research evaluates and analyzes the e-Manifest exchange readiness of APEC member economies based on scientific research and mathematical methods.

Through conducting a survey of e-Manifest implementation status in member economies, 68 questionnaire responses were collected from the following 11 economies: China; Chinese Taipei; Hong Kong, China; The Philippines; Malaysia; Peru; Mexico; Japan; Thailand; Republic of Korea and the U.S. The other 10 economies – Australia; Brunei Darussalam; Canada; Chile; Indonesia; New Zealand; Papua New Guinea; Russia; Singapore and Viet Nam - were qualitatively analyzed on the basis of information gathered from desk research. Relevant laws and regulations and their enforcement, the workflow and procedures of e-Manifest, cooperation and coordination between stakeholders,

informationization, and standardization of e-Manifest practices are analyzed comprehensively.

Moreover, this research quantitatively evaluated the data from the questionnaires collected from the 11 economies. The evaluation was carried out on the following five aspects: quality of laws and regulations, degree of informationization, degree of standardization, quality of declaration process and cooperation and coordination of stakeholders. Firstly PCA was used to screen the selected indicators to identify key indicators in line with the screening principles. Data was gathered from the questionnaires, and then analyzed and processed with SPSS to conduct PCA. By analyzing the cumulative variation contribution rate of the principal components as well as the coefficients of component matrix, the selected indicators were screened to produce the indicator system shown below.



Then Yaahp software was adopted to determine the weight of indicators in accordance with AHP and fuzzy evaluation of single indicator and comprehensive fuzzy evaluation was conducted. After mathematical calculation, the final comprehensive scores of e-Manifest exchange readiness of 11 economies were obtained. This research classifies economies whose comprehensive evaluation score is between 4.0 and 5.0 as mature cases, whose performances are considered to be excellent (the United States; Hong Kong, China; and Mexico belong to this type); economies whose

comprehensive evaluation score is between 3.0 and 4.0 are classified as developing cases, whose performances are considered to be good (Japan; China; Chinese Taipei; and Republic of Korea belong to this type); economies whose comprehensive score is between 2.0 and 3.0 are classified as start-up cases, whose performances are considered to be mediocre (Malaysia; Thailand; The Philippines; and Peru belong to this type).

In accordance with the evaluation objective of “the less input and the more output, the better”, 18 indicators in the Indicator Layer of the indicator system were divided into input indicators and output indicators, and the C²R model of DEA method was adopted to evaluate e-Manifest exchange readiness of each Decision Making Unit (DMU, corresponding to each economy) by calculating the relative efficiency of each indicator and effectiveness of DMU through Matlab software. Along with AHP, the overall efficiency of each DMU and the ranking of DMUs on e-Manifest exchange readiness were obtained. DEA and FCE evaluation were mutually verified and the ranking results were consistent with each other. Based on the DEA evaluation results, the radar charts of the 11 economies and a general radar chart were drawn respectively to conduct further comprehensive analysis and provide corresponding suggestions.

Research Results and Implementation Guidance

Most economies established Customs electronic reporting and data processing system in 1990s, and implemented e-Manifest. As manifest can be considered a management tool for risk assessment, the mechanism of e-Manifest declaration and management depends on the political will of the economy to weigh the significance of border security and trade facilitation, which influences the legal framework and processes for manifest declaration and management.

Cooperation and coordination among public and private sectors also makes an impact on the efficiency of e-Manifest declaration and the readiness of e-Manifest exchange. This consists of the cooperation and coordination among government agencies, between the public and private sectors and among private sector entities.

Regarding Information Communication Technology (ICT) and standardization for e-Manifest, they vary between economies and different locations in a particular economy. Some economies unify the standard enforcement on a national basis and take into account the international codes and standards developed by international organizations; while in other economies the standards are not unified across the local ports. EDIFACT and XML are the primary choices adopted for data transmission.

Through the study and analysis on the different kinds of economies, this research also finds that an economy could take some tailored measures to efficiently facilitate the implementation of e-Manifest declaration and management, and help improve readiness for exchanging manifest data within the trading stakeholders or the corresponding parties in other nations.

According to the comprehensive evaluation results of e-Manifest exchange readiness, this research divides the implementation process into the following three phases: Planning and Preparation, Enactment of Laws and Implementation Adjustment, and Stable Operation. The analysis also provides corresponding principles and practical recommendations for reference according to the current phase of each economy.

The Planning and Preparation Phase is the primary period, during which economies consider whether or not to issue or implement e-Manifest. Next, during the Enactment of Laws and Implementation Adjustment Phase, economies enact necessary regulations and begin to implement and as needed modify the new rules. The Stable Operation Phase describes economies in which the rules and regulations have already been carried out for many years to support trade security and facilitation of manifest processes.

The principles and suggestions for each phase are listed in the table below:

Phase	Implementation Guidance
Phase I: Planning and Preparation	<ul style="list-style-type: none"> • Define a clear strategy target for e-Manifest and make a high-level and strong political commitment. • Work closely with the industries of trade stakeholders and maintain constant open and in-depth consultations concerning the enactment of rules. • Identify the financial requirements and potential availability of funds. • Evaluate the current informationization level and upgrade the ICT infrastructure according to international standards and conventions. • Comply with and optimize practical trade procedures. • Make an exhaustive plan for implementation based on the domestic reality.
Phase II: Enactment of Laws and Implementation Adjustment	<ul style="list-style-type: none"> • Set phased goals for different implementation stages and test by conducting pilots. • Monitor and evaluate performance and progress regularly. • Collect and analyze the feedback from the stakeholders and make adjustments in a timely manner. • Provide training and technical support, and keep the information transparent and updated among all the parties involved.
Phase III: Stable Operation	<ul style="list-style-type: none"> • Review and evaluate overall and practical performance compared with the core targets set at the beginning. • Communicate and share the knowledge and experiences among the domestic and overseas stakeholders.

Improve Global Supply Chain Efficiency by Implementing Cross-border Data Exchange

A supply chain is a system of organizations, people, activities, information, and resources involved in moving a product or service from the supplier to the customer. As a result of the development of information technology and globalization, supply chains are not limited to domestic areas but can cover any and all regions. Therefore, improving the efficiency of global supply chains necessitates a greater focus on cross-border issues. Recently bilateral and multilateral mutual recognition of customs procedures has been growing among many economies in the APEC region, enabling Customs administrations to adopt a broader and more comprehensive view of global supply chains and to eliminate redundant security controls.

Some bottlenecks to closer integration amongst the economies still exist and need to be addressed to implement e-Manifest data exchange, in particular the following five issues:

(i) Information Transparency. Different economies have diverse views and foci concerning the balance between security and trade facilitation. However, there are less direct, frank and efficient channels to have the trade stakeholders get this point. Government agencies and related public parties also lack awareness of the trade industry's desires that Customs seek to get "data from people who have the data" and "design the mechanism to warn early security rather than collect and match all the data". A lack of transparency could result in less industry support for enacting a new rule and also impede practical implementation of manifest related regulations.

(ii) Efficiency of Cooperation and Coordination. In the public sector, data sharing and exchange between the government agencies and during trade procedures is insufficient. There is a lack of a joint scheme to provide low-risk trading entities who participate in trusted trade programs with additional facilitation benefits in customs procedures following manifest declaration. In respect to cooperation and coordination between the public and private sectors, the existing communication mechanisms don't have full representation from every industry involved with manifests and trade, and also don't support suitable and timely adjustment in accordance with the different stages of rules or regulations to be issued and implemented. Within the private sector, there is a lack of cooperation among the traders in different industries on working out the basic and common needs together to comply with requirements related to manifests.

(iii) Trust and Recognition beyond Borders. The biggest problem for bilateral or

multinational cooperation on manifest data sharing and exchange is that the standards adopted and the definitions followed by each economy vary significantly. There are also gaps to be bridged in terms of mutual recognition of laws and regulations, especially concerning risk assessment and management systems.

(iv) Security. The key hurdle to overcome is how to determine what is rightful, compliant and reasonable manifest data content for sharing or exchange as well as who can access, use and transmit the data. Data backup is another crucial and tough issue to solve, especially when it comes to agreement on sharing and exchanging manifest data among different parties across borders. It is difficult to reach a consensus on a safe level of data backup among different economies.

(v) Compatibilities between Different ICT Levels. The integration is not enough to meet the demands for the internal systems of the government agencies. Apart from a few economies which have a Single Window or similar integrated platform, most economies have developed and implemented new systems for manifest declaration and management. Data filers need to report the main data elements which may be transferred or collected from other related procedures. The standards and languages used in different government agencies systems are not uniform, creating barriers to bilateral and/or multinational data sharing and to seamless data exchange with different ICT infrastructures.

Based on overall research findings, this report puts forward the following three recommendations to enhance global trade supply chain efficiency by means of e-Manifest exchange:

(i) Co-research the feasibility of e-Manifest exchange among stakeholders of member economies in the APEC region.

(ii) Establish multilateral public and private dialogues and information sharing mechanisms to keep information transparent and enhance the efficiency of cooperation and coordination.

(iii) Start with practical pilot projects of data exchange and information sharing and carry them forward.

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ABBREVIATIONS

AAEI	American Association of Exporters and Importers
ACE	Automated Commercial Environment
ACI	Advance Commercial Information
AEI	Advance Export Information
AFR	Advance Filing Rules
AHP	Analytic Hierarchy Process
APL	American President Lines, Ltd
B/L	Bill of Lading
BPA	Business Process Analysis
CBP	U.S. Customs and Border Protection
CBSA	Canada Border Services Agency
CSI	Container Security Initiative
DEA	Data Envelopment Analysis
DHS	United States Department of Homeland Security
DMU	Decision Making Unit
DNL	Do Not Load
FCE	Fuzzy Comprehensive Evaluation
ICT	Information Communication Technology
ISF	Importer Security Filings
ITDS	International Trade Data System
JASTPRO	Japan Association for Simplification of International Trade Procedures
KCS	Korea Customs Service
MPA	Maritime and Port Authority of Singapore
NACCS	Nippon Automated Cargo And Port Consolidation System, Inc.
NVOCC	Non-Vessel Operating Common Carrier
PAT	Port Authority of Thailand
PCA	Principal Component Analysis
PGA	Participating Government Agency
SAFE Framework	SAFE Framework of Standards to Secure and Facilitate Global Trade
SMEs	Small and Medium Enterprises
TCD	Thai Customs Department
WCO	World Customs Organization
WSC	World Shipping Council

1 Background of the Study

1.1 Purpose of the Study

Manifest is an important part of the goods supply chain, which contains description of goods on a means of transport. Apart from the commercial aspects, manifest is also a key document for Customs control purpose and effectively acts as the notification of import and export cargos and supply chains. In order to improve manifest submission process, many APEC member economies, such as U.S., Canada, Republic of Korea, P. R. China, have established Electronic Manifest (hereinafter referred to as E-Manifest) System for trade facilitation and risk control purposes. It requires specified trade parties (e.g. carrier, NVOCC) to electronically submit a list of Customs-defined cargo information to their national border entry or exit point, which has exercised a strong influence on the global supply chain, and also brings useful benefits both for the traders and the Customs. The E-Manifest has eliminated many issues that exist in traditional manual (paper) approach, however, exporters and importers still need to create the same (or similar) set of manifest data separately and submit to the corresponding Customs.

“Enhancing the Global Supply Chain Efficiency by E-Manifest Exchange in APEC Region” (CTI 15 2013T (ECSG)), mainly focusing on maritime manifest, will analyze the current situation of manifest declaration and management mechanism, including the legal framework and standardization environment, information communication and technology (ICT) environment, efficiency of manifest submission procedure etc.; collect best practices from experienced economies in realization of cross-border electronic transaction, especially electronic manifest data; design a model to analyse the e-Manifest exchange readiness of member economies; find out the main impacts on stakeholders and global supply chain. Moreover, it will provide acceptable and implementable recommendations to the stakeholders on trade facilitation and paperless trading, including but not limited to the improvement of data exchange readiness of APEC member economies, internationally defined standards adoption, etc.

Overall, this research aims at evaluating the impacts of e-Manifest conventions and regulations on the global supply chain through analyzing laws and regulations of maritime manifest operations in APEC member economies, investigating current business processes, collecting practical experiences of e-Manifest implementation, researching the standardization and information communication technology (ICT) environment, and evaluating e-Manifest exchange readiness of member economies. Based on the research results,

some recommendations on the improvement of the performance of supply chain by knowledge sharing and even bilateral or multilateral cooperation are put forward for promoting the efficiency of global trade supply chain and paperless trading development in APEC region.

1.2 Scope of the Study

"Manifest" is a list of cargo information carried in a means of transport, such as ocean transportation, air transportation, railroad transportation, etc.

Since ocean transportation can take advantage of the natural waterway, not very limited by the infrastructure construction; has large capacity of goods carrying (many container ships can transport up to 8,000 containers of finished goods and products on a single voyage¹); is more energy efficient and economical, it plays a key role in international trade. Statistics states that cargo transported by the liner shipping industry represents about two-thirds of the value of total global trade, equating each year to more than US\$ 4 trillion worth of goods (IHS Global Insight, November 2009).

As ocean transportation is the most efficient and commonly used mode of transportation of goods in cross-border trade and its security is quite essential in border protection, this research will focus on maritime manifest in container cargo and show it as an example to others modes of transport. Besides, this research will not just research manifest-the document itself but its role and the influences on the global supply chain.

1.3 Methodology

1.3.1 Overall Investigation

(1) Desk Research

As a foundation of the research work, research team conducted desk research to gather information on international conventions and standards, laws and regulations related to manifest of member economies, statistics reports, etc. Through searching official websites and collecting relevant reports, the profile of manifest implementation has been acquired, making the preliminary findings quite fruitful.

(2) Expert Interviews

To design the questionnaires scientifically, map the procedures accurately and clearly, remit for guidance and advice on e-Manifest system construction, key

¹ Benefits of Liner Shipping, World Shipping Council,
<http://www.worldshipping.org/benefits-of-liner-shipping/efficiency>

points on future development of e-Manifest, etc., the research team has interviewed electronic ports (i.e. E-ports), such as Ningbo E-port, Guangzhou E-Port, Liaoning E-port, freight forwarders and other experts representing public and private stakeholders.

Table 1.1 Expert Interview List

Role in International Trade	Organization	Experts
Customs Declaration Relevant Services Supplier	Ningbo E-port	Xianfeng Xu
Customs Declaration Relevant Services Supplier	Guangzhou E-Port	Youli Suo
Customs Declaration Relevant Services Supplier	Liaoning E-port	Ruifeng Deng
Customs Declaration Relevant Services Supplier	Dalian Portnet Co. Ltd.	Mr. Liu
Customs Declaration Relevant Services Supplier	Shanghai EDI Centre (Metinform)	Qian Zhou
Freight Forwarder	China International Freight Forwarders Association	Zhong Lin
Freight Forwarder	Beijing Huayijinghai International Freight Forward Co. Ltd.	Hanwei He
Service Provider	E-Freight Technology, Inc.	Chen-Hsin Ma

(3) Questionnaire Investigation

On the basis of the sufficient preliminary findings and suggestions collected from experts, research team has designed three versions of questionnaires to survey current situation of manifest declarations in the APEC region, in order to have a better and clearer understanding of the legal framework and standardization environment, information communication and technology (ICT) environment, procedures of import and export manifests, etc.

The three versions of questionnaires and their main content and the expectant respondents are listed as below (please find the full set of questionnaires in Appendix 2):

Table 1.2 Descriptions of the Three Questionnaire Versions

Version	Main Content	Expectant Respondent
For Government	Legal enforcement, workflow and procedures for manifest declarations, ICT environment, coordination of stakeholders, standardization enforcement, insight and suggestions	Government sectors related to manifest, such as Customs (national, local), port administration, border protection department
For Obligator of Declaration	Legal enforcement, workflow and procedures for manifest declarations, ICT environment, coordination of stakeholders, standardization enforcement, insight and suggestions	Carrier, shipping agency, NVOCC(Non-vessel operating common carrier), freight forwarder
For Relevant Parties	The involvement in manifest-related activities, time and cost spent in the above mentioned activities, difficulties encountered, needs and suggestions	Trader (importer, exporter)

The questionnaires have been sent to the relevant parties of member economies in APEC region. The data collected has been processed and analyzed to be used in the evaluation study.

(4) Field Research

Field researches in Tokyo, Japan and Washington D.C., U.S. were planned and carried out in September and October, 2014, to observe firsthand the current situation and future development trends of e-Manifest in these experienced economies, and study practical experience concerning manifest declaration and data exchange.

In Asian area, Japan is a typical economy of e-Manifest implementation, which has issued the Advance Filing Rules (AFR) in 2012 and implemented the e-Manifest nationally since April 1st, 2014. The research team conducted field research in Japan during September 24th to 27th, interviewed Nippon Automated Cargo And Port Consolidation System, Inc. (NACCS centre), Japan Association for Simplification of International Trade Procedures (JASTPRO), shipping companies, freight forwarders and other stakeholders, learned the laws and rules, working flow, demands and suggestions from many parties in Japan.

Table 1.3 Japan Field Research-Interviewee List

Role in International Trade	Company	Interviewee	Department	Position
Customs Declaration Relevant Services Supplier	Nippon Automated Cargo And Port Consolidation System, Inc. (NACCS)	Kazuyuki YAMASAKI	System Department	Director
Customs Declaration Relevant Services Supplier	Nippon Automated Cargo And Port Consolidation System, Inc. (NACCS)	Takahisa YAMGUCHI	Planning and Global Business Department	Manager
Customs Declaration Relevant Services Supplier	Nippon Automated Cargo And Port Consolidation System, Inc. (NACCS)	Keiko TOMIYAMA	Planning and Global Business Department	Assistant Leader
Industry Association	Japan Association for Simplification of International Trade Procedures (JASTPRO)	Daijiro YAMAUCHI	--	Chief Executive
Shipping Company	SITC JAPAN CO., LTD	Ning HE	IT Group Management Team Acting Team Marketing Team	Acting Team Leader
Shipping Company	SITC JAPAN CO., LTD	Jun KIDA	Sales Group Customer Service Team Marketing Promoting Division	Team Leader
Shipping Company	SITC JAPAN CO., LTD	Xiaohong WANG	Accounting & General Fairs Group Commerce Team	
Shipping Company	SINOTRANS JAPAN CO., LTD.	Tomokazu YAZAKI	General Agency Department	Assistant Manager
Shipping Company	SINOTRANS JAPAN	Makoto TSUKAHARA	Customer Service Sales	Assistant Manager

	CO., LTD.		Department	
Shipping Company	JIN JIANG SHIPPING (JAPAN) CO.,LTD	Hong QIAO	--	President
Shipping Company	Cosco Container Lines Japan Co., Ltd.	Kazuhisa OHTANI	Shipping Agency Department Business Division	Sub Team Leader
Freight Forwarder	NAIGAI TRANS LINE LTD.	Tomoko OKAWA	--	Senior Executive Director
Freight Forwarder	THE KEIHIN CO., LTD.	Yasuaki IMADA	International Transport Department	Manager
Freight Forwarder	THE KEIHIN CO., LTD.	Masayasu WATANABE	System Management Department	Manager
Service Provider	DESCARTES	Dejin LIU	Asian Operations	Director
Service Provider and Consulting	Brainetta Ltd. (BAL)	Shigehiko (Shige) NODA	--	President
Consulting for Service Provider	Ocean Commerce Ltd.	Kenji NAKAGAWA	--	President Publisher
Consulting for Service Provider	Ocean Commerce Ltd.	HI Noboru TSURUMAC	--	System Administrator

American has issued and implemented e-Manifest for many years. In the beginning of twentieth century, the U.S. Code has clarified the requirement that the vehicle manifest should be declared when the cargo go inward and outward. In 1984 and 1996, the ACS and AES systems were developed for manifest declaration. In 2000, the Code of Federal Regulations (amended) required that the vehicle should declare manifest within 24 hours after arriving at U.S. After the "911" event happened, the national security strategy of America was upgraded. In 2002, the Advance Manifest Rules (In maritime area, it requires that the inward and outward cargo should be declared to Customs within 24 hours before loading at the foreign export port.) So far, U.S. has been implementing the e-Manifest rules for 10 years, accumulating lots of valuable experiences to share.

The research team conducted field research in U.S. during October 20th to 24th, interviewed World Shipping Council (WSC), American President Lines, Ltd. (APL), American Association of Exporters and Importers (AAEI), Customs and Border Protection (CBP) and other related stakeholders, learned the laws and rules, working flow, demands and suggestions from many parties in the U.S..

Table 1.4 U.S. Field Research-Interviewee List

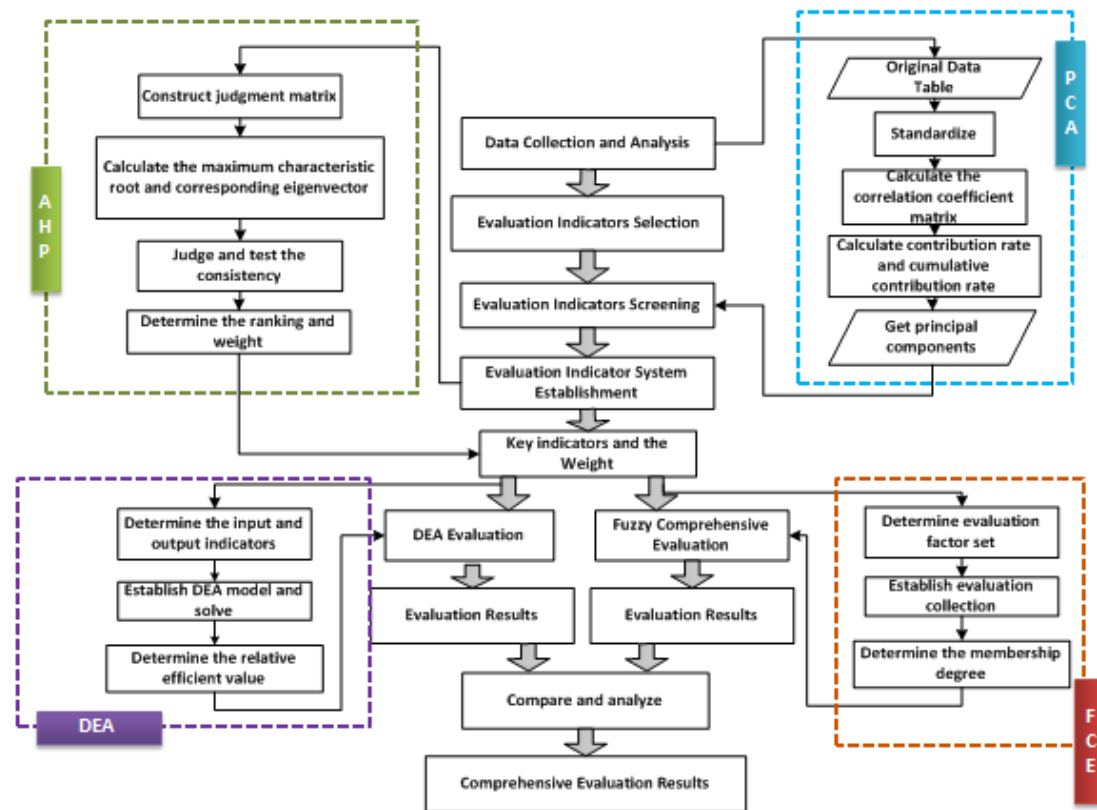
Role in International Trade	Organization	Interviewee	Department	Position
International Organization	World Shipping Council (WSC)	Christopher KOCH	--	President& CEO
Industry Association	American Association of Exporters and Importers (AAEI)	Marianne ROWDEN	--	President& CEO
Shipping Company	American President Lines, Ltd (APL)	Tim C. PERRY	Regulatory and Government Affairs	--
Customs	U.S. Customs and Border Protection (CBP)	Amy HATFIELD	ACE Office	Officer

1.3.2 Evaluation Methodology

(1) Evaluation of E-Manifest Exchange Readiness

In Chapter 4 “Evaluation of E-Manifest Exchange Readiness of Individual APEC Economies”, mathematical methods have been used to evaluate the readiness of e-Manifest exchange of economies: Principal Component Analysis (PCA) is used to get the principal components which influence the efficiency of supply chain most and set the evaluation indicators; then Analytic Hierarchy Process (AHP) is used to determine the ranking and weight of the principal indicators; finally Fuzzy Comprehensive Evaluation(FCE) and Data Envelopment Analysis (DEA) are used to get comprehensive evaluation results.

Chart 1.1 Steps of Evaluation of E-Manifest Exchange Readiness



(2) Case Study

In the case study reports attached in the appendix 1, BPA (Business Process Analysis) Method is used to gain a deep understanding of e-Manifest implementation situation in typical countries. The BPA was put forward by the United Nations to provide a unified process to research different situations in different countries in case for comparison and analysis. The benefits of process analysis is to understand the current situation, benchmark with other countries, raise issues and priorities for improvement, and set a stepping stone for the creation of future better processes, e.g. Process Simplification.

2 General Understanding of E-Manifest

2.1 Definitions

Generally speaking, a maritime manifest is “a document listing the cargo, passengers, and crew of a ship, for the use of Customs and other officials.” Where such a list is limited to identifying passengers, it is a passenger manifest or passenger list; conversely, such a list limited to identifying cargo is a cargo manifest or cargo list.² This research will concentrate on cargo manifest which influences the efficiency and security of global trade supply chain.

With regard to cargo manifest, some economies require the owner or operator of the vessel or its agent who handles the cargo information based on Master B/L information to submit manifest information to government sectors (e.g. Customs); some also require the NVOCC (Non-Vessel Operating Common Carrier) or freight forwarder who consolidates the cargo and knows cargo information based on House B/L information to submit manifest information to government sectors. In the U.S., the importer is required to transmit information containing ten data elements relating to the cargo origin, description and the parties involved in the importation as well. The time limits of these submissions vary in different economies.

However, in some economies in the APEC region, they do not have the term of “manifest”. For example, in New Zealand, Customs requires a person who is, or who is the agent of, the owner or operator of the craft; and a cargo aggregator who, in the course of that cargo aggregator's business, has (in or outside New Zealand) arranged for the carriage of the cargo on the craft under a shared space, or other negotiated volume of cargo, arrangement with the craft's owner or operator³, to declare inward/outward cargo report in the required time limit. Another example is that Japan revised Customs Law in 2012 stipulates the Advance Filing Rules on Maritime Container Cargo Information which require the electronic filing of detailed cargo information. Even though these economies do not use the “manifest” term, they still require reporting the list of cargo information.

To clarify the scope of study and provide a unified description for the subsequent research work, this research makes the following important definitions:

² Wikipedia: Manifest (transportation), [http://en.wikipedia.org/wiki/Manifest_\(transportation\)](http://en.wikipedia.org/wiki/Manifest_(transportation))

³ Customs and Excise Act 1996

- Obligator of declaration: According to the laws or regulations issued by the government sector (e.g. Customs), the person who is required to submit the manifest data within a time limit.
- Manifest: The electronic information or paper documents based on Bill of Lading data with a list of cargo and conveyance information, which is submitted by carrier, shipping agent, NVOCC, and/or freight forwarder (or the designated agent of these obligators of declaration), and handed over to the Customs or Port Authority.

Annotation:

(1) The cargo information submitted by trade community (importer/exporter) is considered as a supplement to manifest;

(2) The manifest declaration is an independent procedure separated from other customs declaration processes.

- E-Manifest: The electronical format of manifest and the entire processes of declaration and verification are conducted electronically. The obligator of declaration or its designated agent should submit documents and information via information systems to the related government sector (e.g. Customs) instead of by himself or by mail and/or fax.

According to the definitions, the core elements of e-Manifest are listed as below:

Table 2.1 Core Elements of E-Manifest

Obligator of Declaration	Data	Data Receiver	Declaration Way
Carrier/Shipping Agent	Master B/L information	Customs/Port Authority	Electronic
NVOCC/Freight Forwarder	House B/L information		
Trade Community (importer/exporter)	Supplementary cargo information		

2.2 Classification

The manifest is generally classified as import manifest and export manifest according to the trade direction and cargo entry/exit. In some economies, export manifest declaration has not been implemented, such as Japan.

Some economies have further classification on import manifest and export manifest. For example, in China, Decree of the General Administration of Customs of the People's Republic of China No.172, which was issued in 2008 and took effect in 2009, defines: 1) for import side, "Original Manifest", which refers to the manifest transmitted by obligators of declaration to Customs that

reflects the information on goods, articles or passengers on board an inbound means of transport; 2) for export side, "Advance Manifest", which refers to the manifest that reflects information on goods, articles or passengers that are estimated to be on board the outbound means of transport and "Load Manifest", which refers to the manifest that reflects information on goods or articles actually loaded onto the outbound means of transport.

2.3 Impacts of E-Manifest Regulations

2.3.1 Benefits

Cargo manifests are mainly used by government sectors (e.g. Customs) for risk assessment and to check that the cargo has been accounted for by a declaration. In the APEC region, most economies established Customs electronic reporting and data processing system in 1990s, and interacted e-Manifest declaration with it. Currently in many economies, the system can be for all import, export and excise entries lodged with Customs.

The main benefits that the implementation of e-Manifest can provide include:

- Enhancing entry and exit security. The cargo manifest information is based on Bill of Lading (Master/House), which contains full list of cargo information, and the consignor, consignee, destination, etc. to clearly indicate what the cargo is, where the cargo is coming from and where it is going to, and thus it allows to make decisions on whether or not the cargo is permitted to entry or exit the border for security reasons and border protection.
- Improving the public management and service levels. The accurate and available manifest data can be gathered for public management and services such as access to international trade data and customizable statistics reports.
- Reducing paperwork and manual operation, by eliminating the paper manifest and decreasing the number of discrepancy reports and in/out bond documents.
- Reducing the error rate and improving the efficiency of manifest filing and verification.
- Facilitating customs clearance. It improves communication between public and private sectors and facilitates customs clearance process.
- Promoting the development of modern logistics; improving customers' service quality of logistics service sectors, and enhancing enterprises' competitiveness.

- Promoting trade facilitation. Manifest submission, particularly in electronic form, before customs goods declaration, enables Customs to know what cargos arrive or will arrive in its territory and to verify whether the cargos have been declared, thus to shorten the cargo dwell time in the ports to promote facilitation.

2.3.2 Challenges

The implementation of e-Manifest also poses some challenges for stakeholders:

- Duplication of information to be declared and processed. The cargo manifests need to be declared both at import side and export side, and duplicated information has to be submitted.
- Extra time, expense and personnel needs. It causes logistic service sectors extra time, cost and personnel to prepare for the data and submit it to the government sectors. Besides, the implementation of e-Manifest requires construction of information system, which should be invested much money on it and is quite time-consuming. It not only requires the public sectors to build up infrastructure, but also requires the private sectors to set up and upgrade their information systems. For large companies, it is acceptable; while for SMEs (Small and Medium Enterprises), they do not have sufficient motivation to invest money on paying the systems.
- Potential risks of inaccurate or incomplete declarations. The inaccurate or incomplete data submission may cause customs violations and monetary penalties on the obligators of declaration, increased inspections and delay of cargo.

2.4 Trends

With the development of international trade and national strategy, some new measures of manifest implementation have arisen.

After "911" terrorist event in 2001, the national security strategy of America was upgraded. United States Department of Homeland Security (DHS) was founded. In 2003, pursuant to the Trade Act of 2002 (Public Law 107-210, which required that importers and exporters submit advance cargo manifest information prior to cargo arriving at a U.S. port), U.S. Customs and Border Protection (CBP) published a new regulation called the "24 Hour Rule" that requires the filing of shipment data for maritime containerized imports 24 hours before loading the cargo to the vessel.

In June, 2005, the SAFE Framework of Standards to Secure and Facilitate

Global Trade (hereinafter referred to as the “SAFE Framework”) was put forward by WCO, allowing WCO members to enhance the security and facilitation of international trade and stating that countries can enact their own rules under the instruction. Many countries and regions have implemented this Advance Manifest Declaration (e.g. Canada 2004, China 2009, Republic of Korea 2012, Japan 2014) under different national laws and rules.

In November 2008, U.S. CBP published the "10 + 2 Rule", requiring U.S. importers to transmit to CBP, 24 hours prior to vessel loading, Importer Security Filings (ISF) containing ten data elements, and also requiring ocean carriers to transmit, Additional Carrier Requirements containing vessel stow plans and container status messages for U.S. destination cargo. The “10 + 2 Rule” became effective on January 26, 2009. It provides CBP with more and better quality data that the agency uses in the cargo risk assessments that it conducts before cargo is loaded onto a ship. Besides U.S., the ACI (Advance Commercial Information) program of CBSA (Canada Border Services Agency) will also require the electronic transmission of advance importer data from importers or their brokers in the third phase of this program.

2.4.1 Advance Manifest Declaration

The SAFE Framework states that “the carrier or his/her agent should submit an advance electronic cargo declaration to the Customs at export and/or at import. For maritime containerized shipments, the advance electronic cargo declaration should be lodged prior to the goods/container being loaded onto the vessel.” Under the instruction, many economies have implemented advance manifest declaration on import container cargo. The time limit is usually 24 hours prior to the loading (in principle, not including exceptions such as short sea shipping). Japan AFR requires obligators of declaration to electronically submit detailed information for maritime container cargos to be loaded on a vessel intending to enter a port in Japan, in principle, before departure of the vessel from the port of loading.

For export cargo, not many economies have required the manifest to be declared in advance, usually a certain time after departure, such as Australia- no later than 3 days after the day of departure, New Zealand-48 hours after the time of departure for more than half of the volume is not in bulk cargo containers, Hong Kong, China-within 14 days after the departure of the vessel.

Some economies have implemented the advance electronic cargo declaration on export side. Decree of the General Administration of Customs of the People’s Republic of China No.172 (took effect in 2009) stipulates the obligator of declaration shall transmit to Customs the advance manifest 24 hours before loading onto container vessels, and transmit the electronic data of the load manifest to Customs 30 minutes before loading of goods or articles onto the

means of transport; Korea Customs Service (KCS) requires at least 24 hours before commencement of loading and it was in force on June 30, 2012 for export cargo.

For governments, the Advance Manifest Declaration can ensure better security against terrorism, enable to have a good ability to risk assess, and minimize potential risks that are coming to the border. It can help improve the ability of governments to detect and deal with high-risk consignments in advance and increase efficiencies in the administration of goods, thereby expediting the clearance and release of goods. The expedited processing of goods will also benefit for the business. Submitting manifest data prior to loading can also lessen the losses for improper shipment. In spite that the obligators should prepare data in advance and more cost might be caused, the security of trade against the threat of global terrorism and at the same time the facilitation of the movement of legitimate trade make the Advance Manifest Declaration a tendency.

2.4.2 Trade Community Filing

As e-Manifest has been implemented for many years, U.S. made judgment that more and better cargo information is needed for risk assessments before cargo is loaded onto a ship and thus “10+2 Rule” (ISF for importers and Additional Carrier Requirements) was issued. ISF for the trader is consistent with WCO SAFE framework, which states that “the advance cargo declaration may have to be followed by a supplementary cargo declaration as stipulated by national law”.

U.S. is the first government that requires the importer to submit data before vessel loading, data elements including importer of record number, consignee number, seller name and address, buyer name and address, ship-to party name and address, etc. Canada initiated ACI on April 19, 2004, requiring electronic pre-arrival information to identify health, safety and security threats related to commercial goods before the goods arrive in Canada. In the third phase of ACI, electronic transmission of advance importer data will be also required from importers or their brokers.

For the export side, on January 2014 a pilot program was announced for the Advance Export Information (AEI) in U.S., which similar to the “10+2 Rule” for imports, will require the filing of 10-12 data elements pre-departure with the remaining data elements to be filed 5 days after departure/export.⁴

The filing rule for trade community (importer/exporter) allows the government to gather data from people who own the data. In manifest, details on transportation, conveyance, etc. can be submitted; while the buyer, seller and

⁴ Delansky, William. “Export Processing In ACE CESAC/MMM SESSION.” Cargo Control & Release, ACE Business Office. March 18, 2014

manufacturer of the goods, etc. are not included and the logistics service sectors do not have the data. Trade Community Filing makes the data collected from who have the possession of the data and enhances the trade security for better risk assessment.

3 Stakeholder Roles

3.1 Public Sector

The manifest declaration and management procedures are mostly stipulated by governmental regulations and policies. Customs and port authorities are the main agencies responsible for regulatory procedures for entry and exit. Other government agencies may also participate in the verification process of manifests.

3.1.1 Customs

Customs is the leading government agency in enacting laws and regulations related to manifest and implementing these laws and regulations. Manifest data is required to be submitted to Customs in most economies.

In APEC region, most economies require the carrier or its agent to submit Master manifest (manifest data based on Master B/L information) and the NVOCC/freight forwarder to submit House manifest (manifest data based on House B/L information). Customs will crosscheck the consistency of the data submitted from multiple obligators of declaration, check the targeting system or database for risk assessment and notify the verification results to the obligators. While in some economies, only Master manifest is required to be submitted by carrier or its agent. For example, House B/L information declaration is an optional item in Hong Kong, China and would only be provided to government upon request; in China, only master B/L is required to be submitted in the ports of Shanghai, Guangzhou, Shenzhen etc. at current phase of implementation of the laws and regulations related to manifest.

The time limit for import and export manifest declaration also varies in different economies according to national laws and regulations. For import, the time limit is a certain period before loading, before departure, before arrival, or after arrival; for export, it is a time period before loading, before departure or after departure. At the June 2005 annual Council Sessions in Brussels, SAFE Framework was unanimously adopted by Directors General of Customs representing 166 members of WCO. "An advance electronic cargo declaration to the Customs at export and/or at import" stated in the SAFE Framework and its adoption by member economies as aforementioned influence the procedures as well.

3.1.2 Port Authority

The port authority mainly regulates and licenses port and marine services and facilities. It comprises a number of public and/or private facilities and terminals that handle a wide range of cargo, stimulates the flow of waterborne commerce, guides and supervises the administrative law enforcement of ports and is responsible for the management of domestic and foreign ships' entry and exit.

In some economies, manifests get submitted to the port authorities. In Singapore, Customs does not require the cargo manifest; they rely on the shipping agent to check that the cargo has been accounted for, who are responsible for providing Customs with a "reconciliation report". Cargo manifests are submitted to the port authority. The Maritime and Port Authority of Singapore (MPA) is responsible for the overall development and growth of the port of Singapore. In Chapter 170A of Maritime and Port Authority of Singapore Act, it stipulates "the owner, agent or master of any vessel arriving in the port shall provide within such time and by such means to the Port Master a copy of the manifest of goods to be discharged or transshipped in the port"; for leaving the port, the owner, agent or master shall obtain port clearance from the Port Master, "a copy of the manifest of goods on board and cargo loaded on or discharged at the port" shall be provided for applying for port clearance. In the case of Thailand, three government agencies require the same type and format of e-Manifest: Thai Customs Department (TCD), Port Authority of Thailand (PAT) and Marine Department (MD). E-Manifest is not only required to be submitted to Customs but also to the port authority for managing the logistics.

3.1.3 Other Government Agencies

As one of the methods to achieve trade facilitation, Single Window is now actively promoted by international organizations such as United Nations (UN), Asia Development Bank (ADB), Asia-Pacific Economic Cooperation (APEC) and World Customs Organization (WCO) in recent decades. "...a Single Window is defined as a facility that allows parties involved in trade and transport to lodge standardized information and documents with a single entry point to fulfil all import, export, and transit-related regulatory requirements. If information is electronic, then individual data elements should only be submitted once."⁵

In APEC region, many economies (e.g. Chile, New Zealand, Thailand, Mexico, United States) are developing their Single Window systems to expedite operations relating to import, export and transit of goods, through the

⁵ UN ECE Recommendation 33, Recommendations and Guidelines on Establishing a Single Window

interoperability among the different government agencies. Manifest declarations have been or will be incorporated into the Single Window in these economies. Besides Customs, other government agencies may participate in the verification and risk assessment process as well. For example, in U.S. case, CBP is focusing on the development of the International Trade Data System (ITDS). This “Single Window” allows for one submission of all trade relevant data into one centralized location called ACE (Automated Commercial Environment). As of August 2012, 47 PGAs were involved in ITDS implementation, with the Treasury Department coordinating interagency participation and CBP responsible for building and managing ITDS. All the government agencies involved in ITDS have different authorities and they would only get access to information based on what authority they have. The Food and Drug Administration (FDA) has border presence (officer and staff in the ports to do inspections) and it has its own authority to place holds on risking cargo that are coming into ports and remove holds, which influences the procedures of manifest verification and cargo entry.

3.2 Logistics Service Sector

3.2.1 Carrier

“Carrier” means any person by whom or in whose name a contract of carriage of goods by sea has been concluded with a shipper.⁶ The carrier performs transportation services for the shipper in accordance with the terms and subject to the conditions of the contract and has responsibility and liability for the loss of or damage to, or in connection with, the custody and care and handling of the goods prior to the loading on, and subsequent to the discharge from, the ship on which the goods are carried by sea.

In manifest declaration, carriers are generally required to declare Master manifest with cargo and conveyance information, including consignor name and address, consignee name and address, descriptions of goods, gross weight, volume, estimated date of arrival, port of origin, port of discharge, etc. With regards to the manifest declaration of economies that have implemented Advance Manifest Declaration, most carriers usually try to submit the manifest ahead of the required time limit in case that a hold will be placed on the cargo for inaccurate or incomplete information on the manifest after it is submitted. It is advantageous for the carriers to complete the manifest filing a little early so that if a hold is placed on the cargo, they could gather additional information, resubmit the manifest, and get the hold cleared before the scheduled loading time.

In some economies (like U.S.), the carriers can also declare House manifest

⁶ United Nations Convention on the Carriage of Goods by Sea, 1978

on behalf of the NVOCC.

3.2.2 Shipping Agent

Shipping agent (agency) is the person (company) that is entrusted by the shipping company (i.e. the carrier in sea transportation) to perform various business and go through formalities for the ship, including manifest declaration according to the terms in the agreement between shipping company and the agent. The shipping agent usually needs to get registered or filed in the competent government agency to be qualified for manifest submission.

For import manifest declaration, some economies require the domestic registered enterprises or agents to submit import manifest data. In this particular case, overseas shipping companies may consign a local shipping agent at the destination port to declare the manifest on behalf of them.

3.2.3 NVOCC

NVOCC is a person or company that organizes shipments for individuals or corporations to get goods from the manufacturer or producer to a market, customer or final point of distribution.⁷ NVOCC contracts with a carrier to move the goods; it is generally not engaged in actual transportation service, only in the transportation organization, goods distribution, the selection of mode and route of transportation and service improvement. NVOCC arranges for the carriage of the cargo on the ship under a shared space. It issues House B/L to the consignor and is required to file House manifest in the economies that House manifests are required by the government sector.

3.2.4 Freight Forwarder

The freight forwarder is the agent of consignor. It provides multiple services in international trade, including cargo space booking, packing, storage, customs declaration, insurance and transportation arrangement.

In economies like Japan, there are no obvious differences between the NVOCC and freight forwarder in logistics services. The freight forwarder can also arrange the cargo transportation and issue House B/L. In economies like China, the government agency in charge of NVOCC is Ministry of Transport while the competent government agency for freight forwarder is Ministry of Commerce; and the freight forwarder cannot issue House B/L, only a forwarder's cargo receipt. However, the freight forwarder can get the qualification of NVOCC (get registered and managed by Ministry of Transport

⁷ <http://en.wikipedia.org/wiki/NVOCC#USA>

and pay a deposit of ¥800,000 (\$130,000)) and file House manifest data. In economies like the U.S., freight forwarders have no responsibilities to Customs. They have no authority to submit manifest data to CBP. As a freight forwarder in U.S. case, it may file the Importer Security Filing (ISF) on behalf of the importer.

3.3 Other Relevant Parties

3.3.1 Trader

Traders are the initiating parties of international trade and the information source of manifest data. In the manifest declaration process, traders in most economies are not required to declare and in general they submit related information to obligators of declaration and let them declare.

In some economies, such as the U.S., the importers are required to submit data elements including importer of record number, consignee number, seller name and address etc. before vessel loading. In this case, importers are involved in the import manifest declaration process to submit supplementary data to the government. The importers usually provide the necessary information to its customs brokers or freight forwarders on behalf of them to declare the data.

3.3.2 Service Provider

Service providers provide e-Manifest services for obligators of declaration. They offer obligators of declaration online filing from a platform, or a software and communications package to set up the required interface software to submit filings, to comply with e-Manifest requirements and streamline the shipment management processes. The service providers are generally used by SMEs who do not have sufficient money to build their own systems to directly connect with the declaration management system provided by government. Usually the government or the operator of declaration management system will issue the service providers a qualification and publish their information on the public website for obligators choosing the qualified and suitable service providers.

Most economies require domestic service providers or their local offices to connect with the declaration management system. In Japan, overseas service providers can connect with the electronic data processing system managed and operated by Nippon Automated Cargo and Port Consolidated System, Inc. (NACCS Center). It only requires that the service provider sets one server in Japan and has the license of systems. Most Japan AFR filers choose to submit the filing through service providers, accounting for about 90%.

4 Evaluation of E-Manifest Exchange Readiness of Individual APEC Economies

4.1 Overview of E-Manifest Exchange Readiness Evaluation

4.1.1 Background and Significance of Evaluation

(1) Background

The manifest, carrying important information in cross-border trade, not only truly reflects the condition of cargos conveyed by the transportation tools, but also includes trade information and other information related to Customs, port authority, wharf, obligators of declaration and relevant parties. The declaration and management efficiency influences the overall effectiveness of supply chain, and even exerts an effect on the development of international trade. In order to improve the efficiency of supply chain in APEC region, create good environment for international trade and strengthen cooperation, promote data exchange and information sharing of e-Manifest and accelerate common development of regional economy, this research will conduct evaluation and analysis of e-Manifest readiness of member economies in APEC region and provide appropriate solutions to facilitate bilateral or multilateral data exchange and information sharing in the future.

As differences exist in rules, business process, standardization and information construction of e-Manifest among different economies, to make up for the limitation of desk research of learning the current situation of manifest implementation and ensure reliability of evaluation data, this research conducts questionnaire survey on the implementation condition of member economies. 68 questionnaires have been collected from 11 economies, which are China; Chinese Taipei; Hong Kong, China; The Philippines; Malaysia; Peru; Mexico; Japan; Thailand; Republic of Korea and the U.S.A. Among the three versions of questionnaires aforementioned, the responded questionnaires from obligators of declaration are the most, the number of which is 44, accounting for 64.7%. The other 10 economies that questionnaire are not recycled, which are Australia; Brunei Darussalam; Canada; Chile; Indonesia; New Zealand; Papua New Guinea; Russia; Singapore and Viet Nam, are analyzed with the method of qualitative analysis on the basis of the information gathered from desk research, including laws and regulations and the enforcement, the electronic conditions of declaration and verification, information system construction, the Advance Manifest Declaration and its

exact required time, standard application and so on. Comprehensive evaluation analysis is made based on the questionnaire data and the information handled.

(2) Significance

Based on development tendency of e-Manifest and the needs on improving manifest data exchange efficiency in APEC region, this research will make evaluation of e-Manifest exchange readiness and put forward solutions over the evaluation results through data processing and math models establishment and analysis, to promote data exchange and information sharing among different economies, enhance the efficiency of global supply chain, and promote the development of cross-border trade. Three aspects of the significance of evaluation are as follows:

1) Overall analysis of the current implementation status of manifest declaration in the APEC region

The evaluation covers legal system establishment, fundamental states, declaration processes, standardization establishment, informationization establishment, cooperation and coordination of stakeholders, and the development and suggestions. Basically, it can overall reflect the implementation condition of manifest declaration of member economies. By evaluation and corresponding analysis, it contributes to getting a better understanding of implementation condition of e-Manifest and its differences among economies both quantitatively and qualitatively.

2) Support for improving e-Manifest exchange efficiency in the APEC region

The suggestions for e-Manifest declaration mechanism and data exchange efficiency are put forward by evaluation and analysis of e-Manifest exchange readiness of economies quantitatively and qualitatively, covering information connectivity, declaration process, laws and regulations, standardization and so on. It offers great help for promoting the efficiency of international trade supply chain.

3) Helpful for understanding e-Manifest declaration mechanism clearly

Though the evaluation, government agencies, obligators of declaration and relevant parties mentioned in evaluation, especially Customs and the filing companies as main participants in manifest, can raise the awareness of data exchange efficiency and domestic readiness for e-Manifest exchange. It will let government pay more attention to the improvement of e-Manifest declaration mechanism and e-Manifest exchange readiness.

4.1.2 Evaluation Scope

This evaluation is carried out based on e-Manifest exchange readiness of

APEC economies. There are five evaluation cores, containing implementation of laws and regulations, workflow and procedures of e-Manifest declaration, cooperation and coordination of stakeholders, informationization degree and standardization degree of APEC economies.

(1) Implementation of Laws and Regulations

The laws and regulations related to manifest are generally enacted by Customs. Apart from published official laws, there is usually corresponding legal notice or normative documents for instructing and regulating the implementation of manifest mechanism as well. In the management and verification of manifest, in some economies there are also other relevant government agencies involved in. For example, in China obligators of declaration (shipping agents oriented) need to get registered and filed in Ministry of Transportation of P. R. China before filing the manifest data. For those economies implementing Single Window, departments of commerce, inspection and quarantine, and other relevant agencies will get involved as well. Some economies also require the declaration of manifest to port authority independently (like Singapore) or simultaneously (like Thailand).

(2) Workflow and Procedures of E-Manifest

Regarding workflow and procedures of e-Manifest, more than 70% economies require the carrier or the shipping agent to declare Master Manifest; as for House Manifest, most economies require the carrier or the freight forwarder to declare. The time limits of import manifests are usually 24 hours before loading, 24 hours before departure, 24 hours before arrival and within 24 hours after arrival. It is required advance declaration of imported, transship and transit cargo in Japan, U.S.A., Canada, etc. while China requires advance declaration of all the imported container vessel cargo. Basically, the manifest verification process of China, Peru, Malaysia, Thailand and Mexico is almost the same, with utilizing automatic check of information system. Besides, as for the import manifest declaration procedures, they are very similar in China; Chinese Taipei; Hong Kong, China; The Philippines; Malaysia; Peru; Japan; Thailand and Republic of Korea, of which one to three persons are needed and it costs one day to declare in average. The cost ranges from 50 to 230 US dollars.

(3) Cooperation and Coordination of Stakeholders

Different economies show differences in the department for processing complaints and consulting about manifest declarations and means provided for expressing these complaints and consulting. The U.S.A; Hong Kong, China; Malaysia and Peru provide multiple channels to support manifest declarations and give prompt response to complaints or requests for consultation, which help improve the efficiency of declaration. Service hotline and service emails are mostly used. Besides, some government agencies of economies (like the U.S.A.) also provide special consulting and technical personnel to each

obligator of declaration for better service and support.

In addition, this research also makes a survey and gets a general understanding about major consulting and complaining issues from enterprises, feedback duration by government dealing these issues and satisfaction of enterprises on the feedback results, to analyze the cooperation and coordination among stakeholders of e-Manifest declaration in a comprehensive way.

(4) Informationization

The first time economies came into implementing e-Manifest declaration system is different. Hong Kong, China; Japan; Malaysia; Thailand etc. used it after 2000, and China; Peru; Australia; New Zealand; etc. started to use it before 2000.

In the aspect of operation quality of manifest declaration and management system, the analysis results of questionnaires show that the response of obligators of declaration to technical error rate, transmission security, data exchange rate, facilitation and accuracy of data transmission in each economy mostly falls into strongly agree, agree and normal categories, which suggests the systems are relatively reliable. Besides, this research also makes evaluation on functions of the related manifest declaration and management system.

(5) Standardization of E-Manifest

As for the evaluation of standardization degree of manifest declaration, standards of business and technology are taken into consideration. Business standards include data set, document format, syntax rules, management of obligator of declaration, declaration procedures, service evaluation qualification of obligator of declaration, filing management etc. Technical standards include interface specification, interconnection, e-signature, authorization management etc. The different standardization degree in business and techniques of each economy affects the e-Manifest exchange readiness.

4.1.3 Evaluation Content and Process

(1) Evaluation Content

The evaluation is carried out on five aspects aforementioned, which are quality of laws and regulations, informationization degree, standardization degree, quality of declaration process and cooperation and coordination of stakeholders based on desk research and questionnaire survey. The quality of laws and regulations is mainly for the robustness degree, stability degree, implementation degree and fitness degree of laws and regulations.

Informationization degree refers to the evaluation of timeliness of data transmission, data exchange rate, transmission security, failure rate of declaration system, data transmission accuracy, etc. Standardization degree consists of the evaluation of standardization degree of data elements, process, security and system. The quality of declaration process refers to time consuming, personnel consuming and costs of manifest declaration. Cooperation and coordination of stakeholders includes the evaluation of manifest response time from public sectors, satisfaction degree to the response, etc.

(2) Evaluation Process

There are seven major steps of evaluating e-Manifest exchange readiness, which are data collection and analysis, indicator selection, indicator screening, establishment of indicator system, calculation of the weight of key indicators, comprehensive evaluation of FCE and DEA, and analysis of evaluation results of e-Manifest exchange readiness.

This research will adopt the mathematical methods to make quantitative evaluation of the 11 economies that questionnaires have been collected with adequate data. Firstly, collect the questionnaires and process the data gathered to get useful information for analyzing. Then adopt PCA to standardize the selected evaluation indicators and figure out correlation coefficient matrix, as well as contribution rate and cumulative contribution rate to find out principle components and establish indicator system. Use AHP to establish judgment matrix and figure its largest latent root and characteristics vector, and check the consistency of characteristics vector; then calculate weight of key indicators. FCE is adopted to determine evaluation factor set and establish evaluation collection to determine the membership degree. DEA is applied to decide performance evaluation objects, obtain data and establish model for the inputs and outputs of decision making units, and conduct effectiveness and projection analysis. FCE evaluation and DEA evaluation verify the evaluation results with each other and accomplish the evaluation results and comprehensive analysis of e-Manifest exchange readiness.

4.2 Introduction of Evaluation Methods

Based on data analysis of questionnaires, PCA, AHP, FCE and DEA are used in the evaluation. PCA is mainly used for screening proposed indicators to get principal components and establish the indicator system; AHP is mainly used to get the weight of each screened indicator; FCE and DEA are adopted simultaneously for comprehensive evaluation, for verifying the evaluation results with each other to obtain better and more reasonable optimized strategies.

4.2.1 Principal Component Analysis

(1) Overview of Principal Component Analysis

Principal components analysis (PCA) is a standard tool in multivariate data analysis to reduce the number of dimensions, while retaining as much as possible of the data's variation.⁸ It uses an orthogonal transformation to convert a set of observations of possibly correlated variables into a set of values of linearly uncorrelated variables. They are sequenced by variance in descending order and the data comes to lie on the first principle component, the second principle component, and so on. PCA aims to use the least and independent indicators to reflect the most information of several original indicators. It is a dimensionality reduction technique mathematically.

A research object is always a complex system with many data elements. Too many variables will increase the difficulty and complexity of analysis. It will simplify the data analysis by taking advantage of the correlativity of original variables and making use of fewer new variables with corresponsive information of original ones instead of the numerous original variables.

(2) Fundamental Principles

Suppose there are n samples and each one has p variables. Make up a data matrix X of n multiplying p :

$$X = \begin{bmatrix} x_{11} & x_{12} & \cdots & x_{1p} \\ x_{21} & x_{22} & \cdots & x_{2p} \\ \vdots & \vdots & & \vdots \\ x_{n1} & x_{n2} & \cdots & x_{np} \end{bmatrix}$$

Remark original variables as x_1, x_2, \dots, x_p . Assume new comprehensive variables after the dimensionality reduction as $z_1, z_2, z_3, \dots, z_m$ ($m \leq p$), then

$$\begin{cases} z_1 = l_{11}x_1 + l_{12}x_2 + \cdots + l_{1p}x_p \\ z_2 = l_{21}x_1 + l_{22}x_2 + \cdots + l_{2p}x_p \\ \dots\dots\dots \\ z_m = l_{m1}x_1 + l_{m2}x_2 + \cdots + l_{mp}x_p \end{cases}$$

The principles of solution to coefficient l_{ij} are:

- (i) z_i and z_j ($i \neq j; i, j=1, 2, \dots, m$) are independent of each other;
- (ii) The variance of z_1 is the biggest among all the linear combinations of x_1, x_2, \dots, x_p ; the variance of z_2 is the biggest among all the linear combination

⁸ Groth D, Hartmann S, Klie S, Selbig J., Principal Components Analysis, Methods Mol Biol, 2013.

x_1, x_2, \dots, x_p without relation with z_1 ; the variance of z_m is the biggest among all the linear combination x_1, x_2, \dots, x_p without relation with z_1, z_2, \dots, z_{m-1} .

New variables z_1, z_2, \dots, z_m are respectively called the first, the second, ..., the m -th principle component of original variables x_1, x_2, \dots, x_p .

Seen from above analysis, the essence of principle component analysis is to determine the load l_{ij} ($i=1, 2, \dots, m; j=1, 2, \dots, p$) of original variable x_j ($j=1, 2, \dots, p$) on different components z_i ($i=1, 2, \dots, m$). It can be proved mathematically that they are respectively the eigenvalues of corresponding eigenvectors of the correlation coefficient matrix.

(3) Calculation Procedures

1) Standardize indicator data

Since it is not unified on indicator dimension and order of magnitudes of relevant indicators, it needs to transform original data to be standard for comparability. After the transformation, the original X matrix turns into a standard matrix X' of $N \times P$.

2) Calculate correlation coefficient matrix

$$R = \begin{bmatrix} r_{11} & r_{12} & \cdots & r_{1p} \\ r_{21} & r_{22} & \cdots & r_{2p} \\ \vdots & \vdots & & \vdots \\ r_{p1} & r_{p2} & \cdots & r_{pp} \end{bmatrix}$$

r_{ij} ($i, j=1, 2, \dots, p$) is the correlation coefficient of original variable x_i and x_j , $r_{ij}=r_{ji}$. Its equation is,

$$r_{ij} = \frac{\sum_{k=1}^n (x_{ki} - \bar{x}_i)(x_{kj} - \bar{x}_j)}{\sqrt{\sum_{k=1}^n (x_{ki} - \bar{x}_i)^2 \sum_{k=1}^n (x_{kj} - \bar{x}_j)^2}}$$

3) Calculate eigenvalues and eigenvectors

Calculate the characteristic equation $|\lambda I - R| = 0$, usually using Jacobi to get eigenvalues and sequence them $\lambda_1 \geq \lambda_2 \geq \dots \geq \lambda_p \geq 0$.

Calculate the eigenvectors e_i ($i=1, 2, \dots, p$) corresponding to the eigenvalues

λ_i respectively. Let $\|e_i\| = 1$, which is $\sum_{j=1}^p e_{ij}^2 = 1$ (e_{ij} is the j -th sub-vector of

vector e_i).

4) Calculate contribution rate and cumulative contribute rate

Contribute rate:

$$\frac{\lambda_i}{\sum_{k=1}^p \lambda_k} \quad (i = 1, 2, \dots, p)$$

Cumulative contributive rate:

$$\frac{\sum_{k=1}^i \lambda_k}{\sum_{k=1}^p \lambda_k} \quad (i = 1, 2, \dots, p)$$

Generally the eigenvalue whose cumulative contribution rate is above 85% is taken. $\lambda_1, \lambda_2, \dots, \lambda_m$ are corresponding to the first, the second ... the m-th ($m \leq p$) principal component.

5) Calculate the loads of key components

$$l_{ij} = p(z_i, x_j) = \sqrt{\lambda_i} e_{ij} \quad (i, j = 1, 2, \dots, p)$$

6) Calculate scores of key components

$$Z = \begin{bmatrix} z_{11} & z_{12} & \cdots & z_{1m} \\ z_{21} & z_{22} & \cdots & z_{2m} \\ \vdots & \vdots & & \vdots \\ z_{n1} & z_{n2} & \cdots & z_{nm} \end{bmatrix}$$

4.2.2 Analytic Hierarchy Process

The analytic hierarchy process (AHP) provides a comprehensive and rational framework for structuring a decision problem, for representing and quantifying its elements, for relating those elements to overall goals, and for evaluating alternative solutions.⁹ It needs to decompose the decision problem into a hierarchy with several layers firstly. According to the characteristics of the decision problem and general goals supposed to be achieved, the problem can be divided into different components, each of which can be analyzed

⁹ Wikipedia: Analytic Hierarchy Process, http://en.wikipedia.org/wiki/Analytic_Hierarchy_Process.

independently and gathered according to different layers in terms of correlative relations and membership to form a hierarchy model. The hierarchy model is generally made up of target layer, criterion layer, indicator layer and program layer.

AHP can be applied to ranking in performing the evaluations. In the calculation of ranking, the single ranking of one element of each layer to another element in the above layer in the hierarchy can be simplified to the comparison of a series of elements. In order to qualify comparison and judgment, the 1 to 9 scale method is brought in to judge the elements' relative meaning and importance, and then a judgment matrix can be formed. By calculating the biggest latent root and corresponding eigenvector of the judgment matrix, the weight value of an element in a certain layer over the elements in the above layer can be figured out. Then weight elements in the above layer, to work out the weight value of relative importance of one layer to the above layer. Sequentially conduct the calculation of relative importance of one layer to the above layer and numerical priorities are calculated for each of the alternatives with numbers representing the alternatives' relative ability to achieve the decision goal. Based on this quantitative analysis, decision makers or evaluators can make judgment and system evaluation, make or modify plans, decide demands, make prediction and find solutions to problems etc.

4.2.3 Fuzzy Comprehensive Evaluation

Fuzzy comprehensive evaluation (FCE) is a kind of comprehensive bid evaluation method based on fuzzy mathematics. This comprehensive evaluation method transforms qualitative evaluation into quantitative evaluation on the basis of the mathematical theory of membership degree, which is using fuzzy mathematics to make a general evaluation of problems or objects influenced by many factors. FCE is suitable for solving problems that are difficult to be quantized or with uncertainty.

The calculating procedures are:

(1) Establish Evaluation Set

Establish evaluation set $U = \{U_1, U_2, U_3, \dots, U_n\}$. Determine it as $U = \{\text{excellent, good, mediocre, not well, bad}\}$ based on the indicators in this evaluation, in which excellent scores 5, good scores 4, mediocre scores 3, not well scores 2 and bad scores 1.

(2) Determine Weight of Evaluation Elements

The weight of each evaluation indicator is gotten through AHP method.

1) Scored by experts

In AHP, in order to quantify the judgment in decisions, experts can be invited to score the relative importance of one indicator to another indicator with their experience. To make the judgment unified and proper, 1 to 9 scaling method suggested by A. L. Saaty can be adopted.

Table 4.1 Scale and meaning of judgment matrix

Scale	Meaning
1	If refers to the two indicators are equivalently important when comparing
3	It refers to one indicator is slightly more important than the other one when comparing
5	It refers to one indicator is obviously more important than the other one when comparing
7	It refers to one indicator is strongly more important than the other one when comparing
9	It refers to one indicator is extremely more important than the other one when comparing
2, 4, 6, 8	Mid-value of adjacent scales above
Reciprocal	If comparing indicator i with indicator j , the judgment scale is b_{ij} , then the judgment scale is $b_{ji} = 1/b_{ij}$ when comparing indicator j with indicator i .

2) Get judgment matrix

The comparison of the relative importance among the related indicators in the same level is shown by the judgment matrix. Pairwise compare scores given by experts, and then a judgment matrix set can be gotten. For example, pairwise compare the relative importance of indicators to get the matrix:

$$A = \begin{bmatrix} \frac{X_1}{X_1} & \frac{X_1}{X_2} & \dots & \frac{X_1}{X_m} \\ \frac{X_2}{X_1} & \frac{X_2}{X_2} & \dots & \frac{X_2}{X_m} \\ \dots & \dots & \dots & \dots \\ \frac{X_m}{X_1} & \frac{X_m}{X_2} & \dots & \frac{X_m}{X_m} \end{bmatrix} = \begin{bmatrix} b_{11} & b_{12} & \dots & b_{1m} \\ b_{21} & b_{22} & \dots & b_{2m} \\ \dots & \dots & \dots & \dots \\ b_{m1} & b_{m2} & \dots & b_{mm} \end{bmatrix}$$

3) Calculate weight vector and the biggest eigenvalue

Calculate the product M_i of elements of every single row:

$$M_i = \prod_{j=1}^m b_{ij}, i=1, 2, 3, \dots, m$$

Calculate the m-th root of M_i , \overline{W}_i :

$$\overline{W}_i = \sqrt[m]{M_i}$$

Regulate the vector $\overline{W} = [\overline{W}_1 \ \overline{W}_2 \ \dots \ \overline{W}_m]$ and get the eigenvector:

$$W_i = \frac{\overline{W}_i}{\sum_{i=1}^m \overline{W}_i}$$

$W = [W_1 \ W_2 \ \dots \ W_m]^T$ is the needed weight vector.

Calculate the biggest eigenvalue λ_{max} of the judgment matrix:

$$AW = \begin{bmatrix} b_{11} & b_{12} & \dots & b_{1m} \\ b_{21} & b_{22} & \dots & b_{2m} \\ \dots & \dots & \dots & \dots \\ b_{m1} & b_{m2} & \dots & b_{mm} \end{bmatrix} \cdot [W_1 \ W_2 \ \dots \ W_m]^T$$

$$\lambda_{max} = \sum_{i=1}^m \frac{(AW)_i}{nW_i}$$

In the above equation, $(AW)_i$ is the i-th element of vector AW.

4) Check consistency

Saaty suggested adopting the ratio between coincidence index C_I and random coincidence index R_I , which means the average random coincidence index C_R is the discriminant of consistency check.

The formula is:

$$C_R = C_I / R_I$$

$$C_I = \frac{\lambda_{\max} - n}{n - 1}$$

R_I presents average random consistency index of same order. Its value is listed in the following table:

Table 4.2 Average Random Consistency Index R_I of Same Order

Order of Matrix	1	2	3	4	5	6	7	8
R_I	0	0	0.58	0.90	1.12	1.24	1.32	1.41

In the case of $C_R=0$, the judgment matrix presents exact consistency; in the case of $C_R \leq 0.1$, it presents satisfactory consistency; and in the case of $C_R > 0.1$, it presents non-satisfactory consistency. Only when the weight vector passes the consistency check, it will be regarded as reasonable. Otherwise, abandon or making an adjustment to re-calculate the judgment matrix is needed.

(3) Fuzzy Evaluation of Single Indicator

Make statistics over the evaluation results of different indicators and inform the fuzzy evaluation matrix of single indicator S_i , $i=1, 2, \dots, m$. Calculate single indicator evaluation matrix according to the formula:

$$R_i = W_i^T \cdot S_i, i=1,2,3, \dots, m$$

Thus, the fuzzy relation matrix $R = [R_1^T \ R_2^T \ R_3^T \ \dots \ R_m^T]$.

(4) Comprehensive Evaluation of Multiple Indicators

The comprehensive evaluation matrix is worked out through the equation below to make a comprehensive evaluation of e-Manifest exchange readiness.

$$B = W \cdot R^T$$

“B” stands for the evaluation results of e-Manifest exchange readiness. The comprehensive evaluation can be determined according to maximum rules of membership degree.

4.2.4 Data Envelopment Analysis

(1) Overview of Data Envelopment Analysis

Data Envelopment Analysis (DEA) is a nonparametric estimation method, put forward by famous operational research experts Charne¹ A and Cooper W on the basis of relative efficiency concept. It is used to evaluate the effectiveness of Decision Making Unit (DMU) with multiple inputs and outputs. Since the first and the most important and typical DEA model C²R emerged, a complete set of theories, methods and models have been formed based on the concepts such as efficiency, production possibility set and production frontier. The initial DEA model C²R is a fractional programming, however, it can be transformed into an equivalent linear programming since the C² conversion put forward by Charnes and Cooper in 1962 was applied. The fractional programming is a relative efficiency concept which promotes the definition of science and engineering efficiency into a multi-input and multi-output system; and then by means of the duality theory of linear programming, a dual programming is gotten, which has economic implications and connects with production possibility set and the production frontier of projection. To determine whether a DMU is efficient, in essence, is to determine whether the DMU falls onto production frontier of the production possibility set. The production frontier actually refers to the effective portion of the envelope surface's input and output data. Viewed from the perspective of multi-objective programming and aimed at maximum output with minimum input, the Pareto surface of the corresponding multi-objective linear programming which makes the production possibility set as its constrain set is the production frontier, i.e., the effective portion of the data envelope surface.

Three possible results of the DMU, which are DEA efficient, weakly DEA efficient and DEA inefficient, can be gotten by DEA method. Besides, the direction and size of improvements on basis of the results can be obtained as well to provide sufficient information to evaluators. Apart from DEA method, some other methods are used to evaluate the effectiveness of the inputs and outputs, but almost limited to single output. In contrast, DEA method has absolute advantages to deal with multi-input especially multi-output problems. Moreover, DEA method can not only evaluate whether the corresponding points of DMU are located on the efficient production frontier by means of linear programming, but also obtain plenty of useful information about management. Therefore, it is superior to and more widely used than other methods including the statistical method.

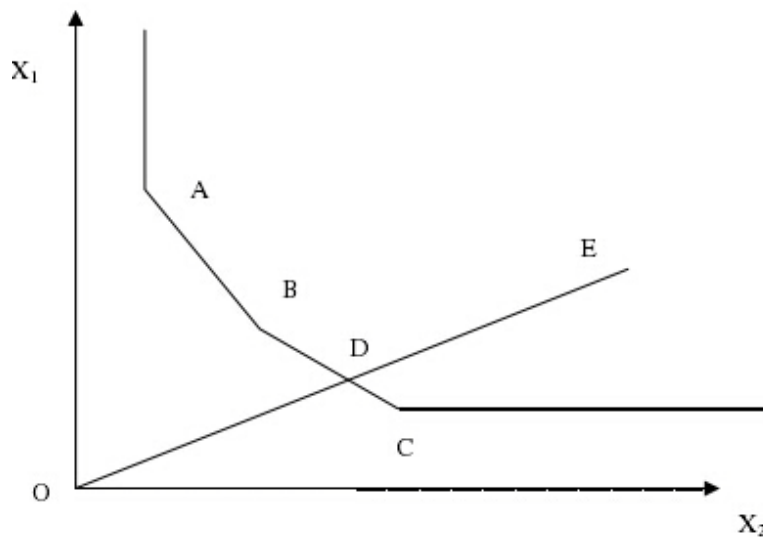
(2) Basic Principles and C²R Model

1) Basic principles

Assume a production activity needs to invest two resources X_1 and X_2 , and

make Y as the output. If the output Y is fixed, there will be five different combinations of inputs X1 and X2, namely, A, B, C, D, E. As shown in Chart 4.1: DMU A, B, C and D locate on production frontier and are DEA efficient, while E is in the state of enveloped, which is DEA inefficient. The line in connection of point E and the Origin crosses the production frontier at point D, i.e., D uses fewer resources to get the same output. It shows that E is resource-wasting relatively to D. OD/OE can be used to represent the adjustment size of DMU E, which means to make the input of E as OD/OE times of the original and the output keeps the same.

Chart 4.1 DEA Efficiency Evaluation Principles



DEA is based on the above ideas to evaluate the relative efficiency of DMU by constructing a linear programming model through the distance ratio of the linear combination between the evaluated DMU and its corresponding production frontier.

(2) Model C²R

This research mainly introduces the most basic DEA model-model C²R.

Set the number of DMU is n and each one has the same m inputs; the input vector is:

$$x_j = (x_{1j}, x_{2j}, \dots, x_{mj})^T > 0, j = 1, 2, \dots, n$$

Each DMU has the same s outputs; the output vector is

$$y_j = (y_{1j}, y_{2j}, \dots, y_{sj})^T > 0, j = 1, 2, \dots, n$$

That is each DMU has m types of “input” and s types of “output”.

X_{ij} means the input quantity of the j-th DMU to the i-th input;

Y_{ij} means the output quantity of the j-th DMU to the i-th output.

In order to unify all the inputs and outputs, i.e. , to regard the production process as a simple one with only one input and one output, empower each input and output is needed. Respectively set the weight vector of input and output as $v = (v_1, v_2, \dots, v_m)^T$, $u = (u_1, u_2, \dots, u_s)^T$ V_i is the weight of the i -th type of input, U_r is the weight of the r -th type of output.

Then the integrated input value and output value for the j -th DMU is $\sum_{i=1}^m v_i x_{ij}$ and $\sum_{r=1}^s u_r y_{rj}$. Define efficiency evaluation index for each DMU as:

$$h_j = \frac{\sum_{r=1}^s u_r y_{rj}}{\sum_{i=1}^m v_i x_{ij}}$$

In the model, X_{ij} and Y_{ij} are known numbers which can be obtained by historical data or forecast data, then the problem actually is to determine the best group of weight vectors v and u which makes h_j the maximum efficiency value of the j -th DMU. The maximum value is a relative efficiency evaluation value that is impossible to surpass for this DMU in relation to others. Suppose h_j ($j = 1, 2, \dots, n$) is no more than 1, i.e., $\max h_j \leq 1$. It means that if the value of the k -th DMU $h_k = 1$, then the DMU has the maximum productivity in relation to others, or the production system is relatively effective; if $h_k < 1$, then the productivity of this DMU has to be improved in relation to others, or the production system is still not effective.

Based on the above analysis, the optimization evaluation model for relative efficiency of DMU_{j_0} is:

$$\max h_{j_0} = \frac{\sum_{r=1}^s u_r y_{rj_0}}{\sum_{i=1}^m v_i x_{ij_0}}$$

$$s.t. \begin{cases} \frac{\sum_{r=1}^s u_r y_{rj}}{\sum_{i=1}^m v_i x_{ij}} \leq 1, j = 1, 2, \dots, n \\ v = (v_1, v_2, \dots, v_m)^T \geq 0 \\ u = (u_1, u_2, \dots, u_s)^T \geq 0 \end{cases}$$

This is a fractional programming model which has to be translated into a linear one to be resolved. So set

$$t = \frac{1}{\sum_{i=1}^m v_i x_{ij_0}}, \quad \mu_r = t u_r, \quad w_i = t v_i$$

Then the model is transformed into:

$$\begin{aligned} \max h_{j_0} &= \sum_{r=1}^s \mu_r y_{rj_0} \\ \text{s.t.} \left\{ \begin{array}{l} \sum_{r=1}^s \mu_r y_{rj} - \sum_{i=1}^m w_i x_{ij} \leq 0, \quad j=1,2,\dots,n \\ \sum_{i=1}^m w_i x_{ij_0} = 1 \\ \mu_r, w_i \geq 0, \quad i=1,2,\dots,m; \quad r=1,2,\dots,s \end{array} \right. \end{aligned}$$

Write in vector form:

$$\begin{aligned} \max h_{j_0} &= \mu^T Y_0 \\ \text{s.t.} \left\{ \begin{array}{l} \mu^T Y_j - w^T X_j \leq 0 \\ w^T X_0 = 1 \\ w \geq 0, \mu \geq 0 \end{array} \right. \quad j=1,2,\dots,n \end{aligned}$$

A very important and effective theory in linear programming is duality theory. Construct a dual model makes it easier to conduct in-depth analysis theoretically and from the economic meanings. The dual problem is:

$$\begin{aligned} \min \theta \\ \text{s.t.} \left\{ \begin{array}{l} \sum_{j=1}^n \lambda_j x_j \leq \theta x_0 \\ \sum_{j=1}^n \lambda_j y_j \geq y_0 \\ \lambda_j \geq 0, j=1,2,\dots,n \\ \theta \text{ is unconstrained} \end{array} \right. \end{aligned}$$

Furthermore, introduce the slack variable s^+ and the remaining variable s^- and change the above inequality constraints into equality constraints:

$$\begin{aligned} \min \theta \\ \text{s.t.} \left\{ \begin{array}{l} \sum_{j=1}^n \lambda_j x_j + s^+ = \theta x_0 \\ \sum_{j=1}^n \lambda_j y_j - s^- = y_0 \\ \lambda_j \geq 0, j=1,2,\dots,n \\ \theta \text{ is unconstrained } s^+ \geq 0, s^- \geq 0 \end{array} \right. \end{aligned}$$

Assume the optimal solutions to the above problem are λ^* , s^{*+} , s^{*-} , θ^* , and then get the following conclusions and economic implications:

(i) If $\theta^* = 1$ and $s^{*+} = 0, s^{*-} = 0$, then the DMU_{j_0} is DEA efficient, i.e., among the solutions of the original linear programming exists one solution making $w^* > 0, \mu^* > 0$, and the optimal value $h_{j_0}^* = 1$. In this case, the production activity of DMU_{j_0} is efficient both in technology and the scales.

(ii) At least one existing input or output slack variable is greater than zero.

The optimal value of the original linear programming $h_{j_0}^* = 1$. In this case, the DMU_{j_0} is weakly DEA efficient, which means its production activity is not efficient in technology or the scales.

(iii) If $\theta^* < 1$, then the DMU_{j_0} is DEA inefficient. Its production activity is neither best in technology nor optimal on the scale.

(iv) Besides, in the model C^2R , the scale earnings of the DMU can be evaluated by the optimal value λ_j . If there is $\lambda_j^* (j=1, 2, \dots, n)$ making $\sum \lambda_j^* = 1$, then the scale earnings of DMU_{j_0} do not change; if there is not $\lambda_j^* (j=1, 2, \dots, n)$ making $\sum \lambda_j^* = 1$, then the scale earnings of DMU_{j_0} are increasing; if there is not $\lambda_j^* (j=1, 2, \dots, n)$ making $\sum \lambda_j^* = 1$, and if $\sum \lambda_j^* > 1$, then the scale earnings of DMU_{j_0} are decreasing.

4.3 Indicator Screening Based on Principal Component Analysis

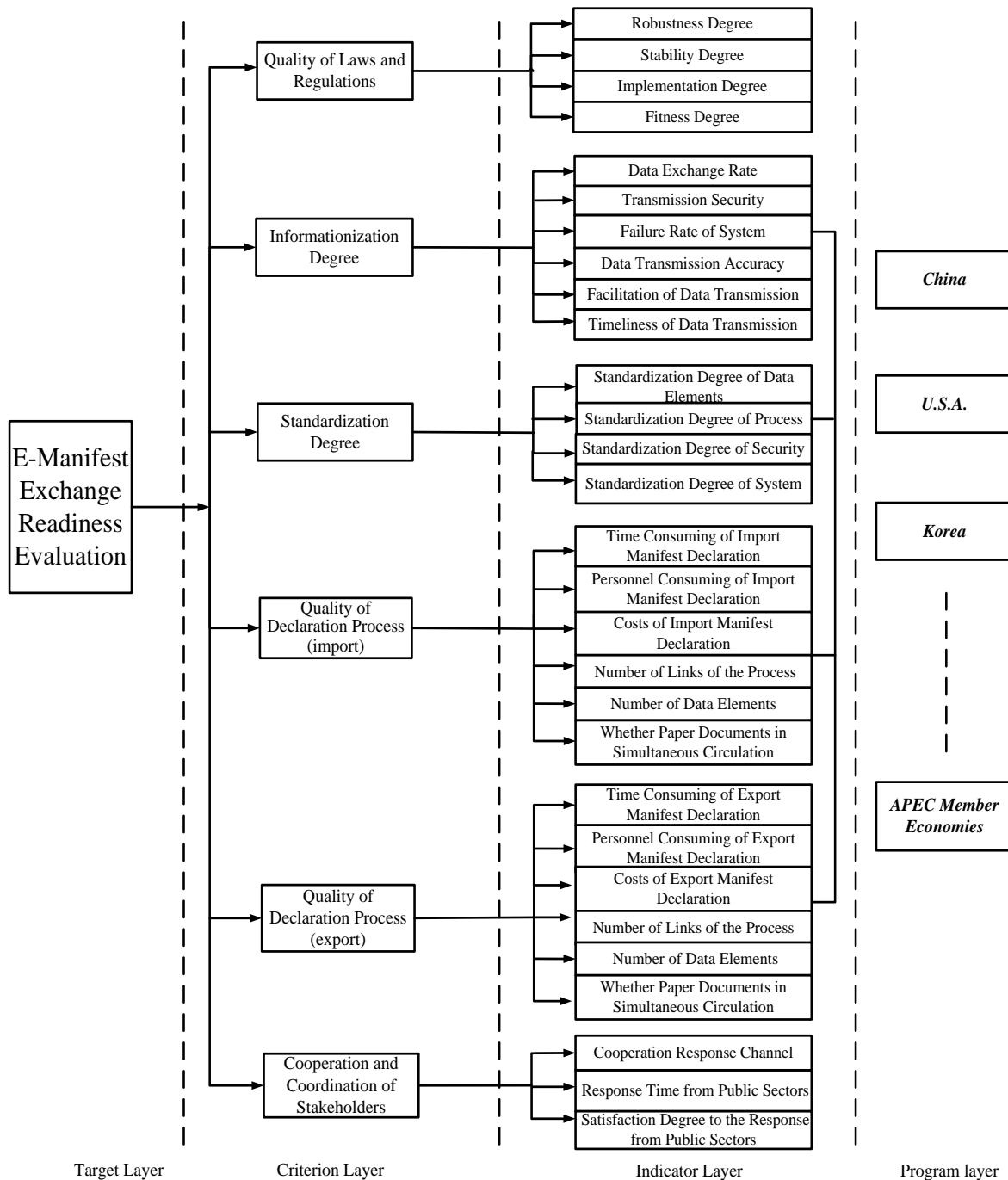
In order to establish indicator evaluation system, firstly it needs to screen the selected indicators to get key indicators in line with the screening principles, and then make the evaluation and analysis. The indicator screening is carried out by means of PCA in the research.

This section is mainly to gather data from the questionnaires, analyze, and then input the data into the SPSS to conduct PCA. By analyzing the cumulative variation contribution rate of the principal components as well as the coefficients of component matrix, screen the selected indicators and get the indicator system to be used in the following evaluations.

4.3.1 Brief Description of the Selected Indicators

In accordance with the scope and content of evaluation aforementioned, the evaluation indicators initially selected can be divided into the following criterion layers, namely, quality of laws and regulations, informationization degree, standardization degree, quality of declaration process (import/export) and cooperation and coordination of stakeholders. Each criterion layer has several indicators. The selected indicator system is shown as below.

Chart 4.2 Selected Indicators



4.3.2 Indicator Screening by PCA

Conduct indicator screening for the five criterion layers mentioned above one by one through PCA. The specific screening processes are listed as below.

(1) Screening Process and the Result of Quality of Laws and Regulations

Table 4.3 Total Variance Explained (Indicator Screening of Quality of Laws and Regulations)

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.943	78.572	78.572	2.943	78.572	78.572
2	.693	13.326	91.898			
3	.217	4.437	96.335			
4	.147	3.665	100.000			

Extraction method: Principle Component Analysis

Table 4.4 Component Matrix^a (Indicator Screening of Quality of Laws and Regulations)

	Component
	1
Robustness Degree	.939
Implementation Degree	.934
Stability Degree	.756
Fitness Degree	.785

Extraction method: Principle Component Analysis

a. one component extracted.

As shown in Table 4.3, the cumulative variance contribution rate of the first principal component is 78 % (the cumulative variance contribution rate reaching more than 75% is deemed to be extracted in this research), thus only one principal component is output. From Table 4.4, the coefficients of four variable indicators are all above 0.75; the original four variable indicators are extracted.

(2) Screening Process and the Result of Informationization Degree

Table 4.5 Total Variance Explained (Indicator Screening of Informationization Degree)

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.475	79.581	79.581	4.475	74.581	74.581
2	.718	9.968	88.549			

3	.445	6.419	94.967			
4	.191	3.176	97.144			
5	.127	1.125	99.268			
6	.044	.732	100.000			

Extraction method: Principle Component Analysis

Table 4.6 Component Matrix^a (Indicator Screening of Informationization Degree)

	Component
	1
Data Exchange Rate	.910
Transmission Security	.937
Failure Rate of Declaration System	.881
Data Transmission Accuracy	.847
Facilitation of Data Transmission	.447
Timeliness of Data Transmission	.925

Extraction method: Principle Component Analysis

a. one component extracted.

Table 4.5 shows that the cumulative variance contribution rate of the first principal component reaches almost 80 %, indicating that the component basically contains all the information. The data of Table 4.6 states that the indicator of facilitation of data transmission has a small coefficient of component matrix which leads to being screened out. Therefore, select the indicators of data exchange rate, transmission security, failure rate of declaration system, data transmission accuracy, and timeliness of data transmission.

(3) Screening Process and the Result of Standardization Degree

Table 4.7 Total Variance Explained (Indicator Screening of Standardization Degree)

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.204	44.084	44.084	2.204	44.084	44.084
2	1.660	33.198	77.282	1.660	33.198	77.282
3	.685	13.707	90.989			
4	.451	9.011	100.000			
5	2.019E-16	4.037E-15	100.000			

Extraction method: Principle Component Analysis

Table 4.8 Component Matrix^a (Indicator Screening of Standardization Degree)

	Component	
	1	2
Standardization Degree of Data Elements	.425	.741
Standardization Degree of Process	.371	.732
Standardization Degree of Management	.585	.387
Standardization Degree of Security	.879	-.462
Standardization Degree of System	.879	-.462

Extraction method: Principle Component Analysis

a. two components extracted.

Table 4.7 and Table 4.8 show that the cumulative variance contribution of the first two principal components is 77%, indicating that the two components basically contain all the information. The variance contribution rate of the two principal components is respectively 44% and 33% and each of them has two indicators with large coefficient; therefore choose two indicators from each component (the screening of indicators below follows the same principle). According to the coefficient of the component matrix, choose the indicators of standardization degree of security and standardization degree of system from the first principal component, and the indicators of standardization degree of data elements and standardization degree of process from the second one.

(4) Screening Process and the Result of Quality of Declaration Process (import)

Table 4.9 Total Variance Explained (Indicator Screening of Quality of Declaration Process)

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.314	62.084	62.084	3.314	68.084	68.084
2	1.264	27.813	89.897	1.264	21.813	89.897
3	.485	7.707	97.604			
4	.151	2.392	100.000			
5	1.68E-7	4.037E-15	100.000			
6	2.019E-16	6.214E-23				

Extraction method: Principle Component Analysis

Table 4.10 Component Matrix^a (Indicator Screening of Quality of Declaration Process)

	Component	
	1	2
Time Consuming of Import Manifest Declaration	.899	-.541
Personnel Consuming of Import Manifest Declaration	.312	.832

Costs of Import Manifest Declaration	.879	.387
Number of Links of the Process	.379	.262
Number of Data Elements	-.279	-.462
Whether Paper Documents in Simultaneous Circulation	.155	.241

Extraction method: Principle Component Analysis

a. two components extracted.

Table 4.9 and Table 4.10 show that the cumulative variance contribution of the first two principal components is around 90%, indicating that the two components basically contain all the information. The variance contribution rate of the two principal components is respectively 62% and 27%; choose two indicators from the first one component and one indicator from the second one. According to the coefficient of the component matrix, choose the indicators of time consuming and costs of import manifest declaration from the first component, and select the personnel consuming of import manifest declaration indicator from the second one.

(5) Screening Process and the Result of Quality of Declaration Process (export)

In terms of the quality of export declaration process, six indicators have been proposed like the import side, namely, time consuming of export manifest declaration, personnel consuming of export manifest declaration, costs of export manifest declaration, number of links of the process, number of data elements, and whether paper documents in simultaneous circulation. Since some economies such as Japan have not implemented export manifest declaration, the data of this part is missing; besides, it is impossible to take the indicators into account and evaluate all the economies under the same criterion. Therefore, the criterion layer and indicators of the quality of export manifest declaration will no longer be considered into comprehensive evaluation.

(6) Screening Process and the Result of Cooperation and Coordination of Stakeholders

Table 4.11 Total Variance Explained (Indicator Screening of Cooperation and Coordination of Stakeholders)

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.133	43.759	43.759	1.133	37.759	37.759
2	1.017	38.903	81.661	1.017	33.903	71.661
3	.650	18.339	100.000			

Extraction method: Principle Component Analysis

Table 4.12 Component Matrix^a (Indicator Screening of Cooperation and Coordination of Stakeholders)

	Component	
	1	2
Cooperation Response Channel	-.775	-.029
Response Time from Public Sectors	.587	-.625
Satisfaction Degree to the Response from Public Sectors	.434	.791

Extraction method: Principle Component Analysis

a. two components extracted.

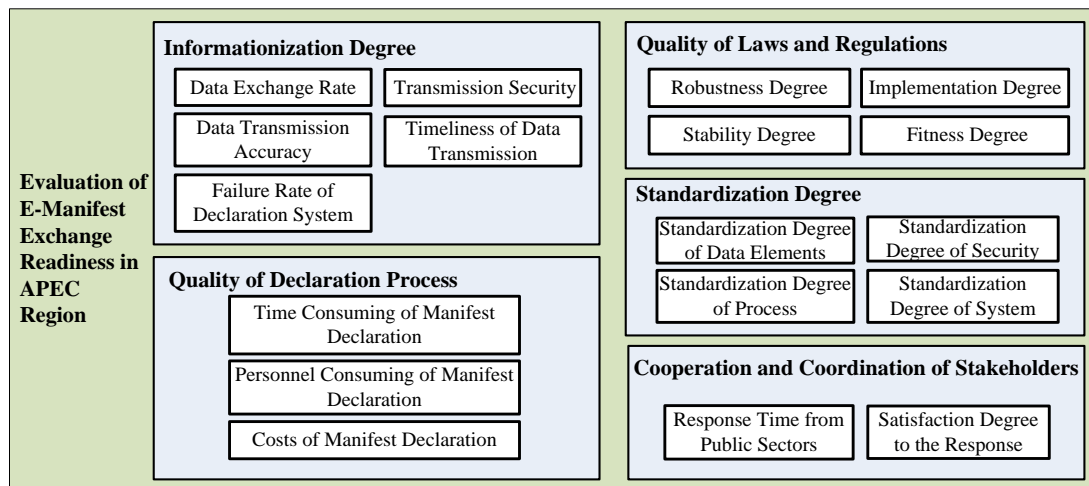
Table 4.11 and Table 4.12 show that the cumulative variance contribution of the first two principal components is 81%, indicating that the two components basically contain all the information. The variance contribution rate of the two principal components is respectively 43% and 39%; choose one indicator from each component. According to the coefficient of the component matrix, choose the indicator of response time from public sectors from the first component, and select the indicator of satisfaction degree to the response from public sectors from the second one.

4.3.3 Screening Result

Through PCA, 18 indicators have been screened from five criterion layers that are quality of laws and regulations, informationization degree, standardization degree, quality of declaration process and cooperation and coordination of stakeholders.

The indicators are specified as below.

Chart 4.3 Screened Indicators



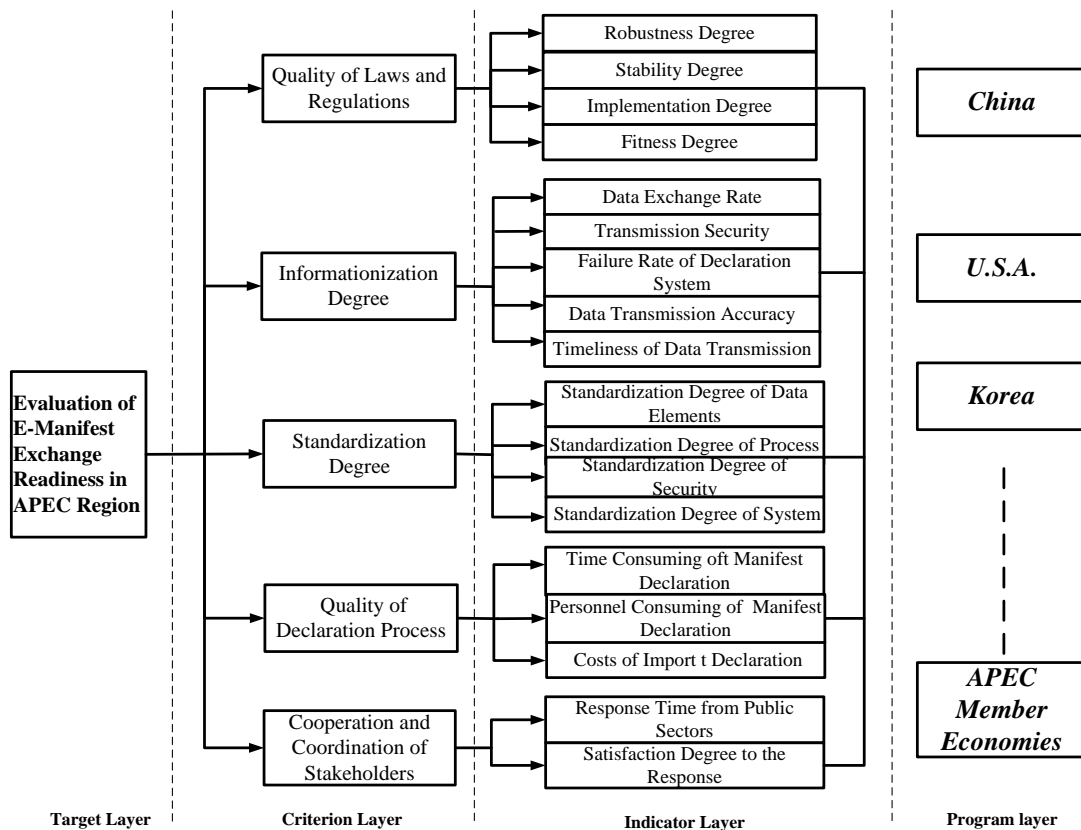
4.4 Fuzzy Comprehensive Evaluation on E-Manifest Exchange Readiness

The basic steps of FCE are: indicator system establishment, weight of indicators determination, evaluation set definition, fuzzy evaluation of single indicator and comprehensive fuzzy evaluation.

4.4.1 Indicator System Establishment

Based on cluster analysis of 18 indicators screened through PCA, establish the indicator system shown as below.

Chart 4.4 Indicator System



- (i) Quality of laws and regulations: it refers to the enactment and implementation situation of the laws and regulations related to manifest, containing robustness degree of laws and regulations, stability degree of laws and regulations, implementation degree of laws and regulations and fitness degree of laws and regulations.
- (ii) Informationization degree: the informationization degree of manifest is related with the efficiency of manifest declaration and management, which contains the indicators of data exchange rate, transmission security, failure rate of declaration system, data transmission accuracy, and timeliness of

data transmission.

- (iii) Standardization degree: standardization degree of manifest determines the collaboration ability of economies in import and export activities, containing standardization degree of data elements, standardization degree of process, standardization degree of security and standardization degree of system.
- (iv) Quality declaration process: it takes import manifest declaration process as main analytic object and is composed of the indicators of time consuming, personnel consuming and costs of manifest declaration.
- (v) Cooperation and coordination of stakeholders: it reflects the communication degree and ability of economies on handling complaints and consulting related to manifest, mainly containing response time from public sectors and satisfaction degree to the response from public sectors.

4.4.2 Indicator Weight Determination

Yaahp software is adopted to determine the weight of indicators.

(1) General judgment matrix for target layer is shown in Table 4.13.

Table 4.13 General Judgment Matrix

Evaluation indicator system of e-Manifest exchange readiness in APEC region						
Consistency ratio of judgment matrix: 0.0000; Weight to general objective: 1.0000						
Evaluation indicator system of e-Manifest exchange readiness in APEC region	Quality of Laws and Regulations	Informationization Degree	Standardization Degree	Quality of Declaration Process	Cooperation and Coordination of Stakeholders	Wi
Quality of Laws and Regulations	1.0000	0.6667	0.5000	0.4000	2.0000	0.1333
Informationization Degree	1.5000	1.0000	0.7500	0.6000	3.0000	0.2000
Standardization Degree	2.0000	1.3333	1.0000	0.8000	4.0000	0.2667
Quality of Declaration Process	2.5000	1.6667	1.2500	1.0000	5.0000	0.3333
Cooperation and Coordination of Stakeholders	0.5000	0.3333	0.2500	0.2000	1.0000	0.0667

(2) Aggregation judgment matrixes are shown in Table 4.14-Table 4.18:

Table 4.14 Aggregation Judgment Matrix-Quality of Laws and Regulations

Quality of Laws and Regulations					
Consistency ratio of judgment matrix: 0.0438; Weight to general objective: 0.1333					
Quality of Laws and Regulations	Robustness Degree	Stability Degree	Implementation Degree	Fitness Degree	Wi
Robustness Degree	1.0000	3.0000	5.0000	7.0000	0.5638
Stability Degree	0.3333	1.0000	3.0000	5.0000	0.2634
Implementation Degree	0.2000	0.3333	1.0000	3.0000	0.1178
Fitness Degree	0.1429	0.2000	0.3333	1.0000	0.0550

Table 4.15 Aggregation Judgment Matrix-Informationization Degree

Informationization Degree						
Consistency ratio of judgment matrix: 0.0569; Weight to general objective: 0.2000						
Informationization Degree	Timeliness of Data Transmission	Data Exchange Rate	Transmission Security	Failure Rate of Declaration System	Data Transmission Accuracy	Wi
Timeliness of Data Transmission	1.0000	0.6667	0.5000	0.4000	2.0000	0.1333
Data Exchange Rate	1.5000	1.0000	0.7500	0.6000	3.0000	0.2000
Transmission Security	2.0000	1.3333	1.0000	0.8000	4.0000	0.2667
Failure Rate of Declaration System	2.5000	1.6667	1.2500	1.0000	5.0000	0.3333
Data Transmission Accuracy	0.5000	0.3333	0.2500	0.2000	1.0000	0.0667

Table 4.16 Aggregation Judgment Matrix-Standardization Degree

Standardization Degree					
Consistency ratio of judgment matrix: 0.0562; Weight to general objective: 0.26687					
Standardization Degree	Standardization Degree of Data Elements	Standardization Degree of Security	Standardization Degree of Process	Standardization Degree of System	Wi
Standardization Degree of Data Elements	1.0000	6.0000	3.0000	5.0000	0.5531
Standardization Degree of Security	0.1667	1.0000	0.2000	0.3333	0.0583
Standardization Degree of Process	0.3333	5.0000	1.0000	3.0000	0.2685
Standardization Degree of System	0.2000	3.0000	0.3333	1.0000	0.1201

Table 4.17 Aggregation Judgment Matrix-Quality of Declaration Process

Quality of Declaration Process				
Consistency ratio of judgment matrix: 0.0707; Weight to general objective: 0.3333				
Quality of Declaration Process	Time Consuming of Manifest Declaration	Personnel Consuming of Manifest Declaration	Costs of Manifest Declaration	Wi
Time Consuming of Manifest Declaration	1.0000	0.3333	0.2500	0.1172
Personnel Consuming of Manifest Declaration	3.0000	1.0000	0.3333	0.2684
Costs of Manifest Declaration	4.0000	3.0000	1.0000	0.6144

Table 4.18 Aggregation Judgment Matrix-Cooperation and Coordination of Stakeholders

Cooperation and Coordination of Stakeholders			
Consistency ratio of judgment matrix: 0.0000; Weight to general objective:: 0.0667			
Cooperation and Coordination of Stakeholders	Response Time from Public Sectors	Satisfaction Degree to the Response	Wi
Response Time from Public Sectors	1.0000	3.0000	0.7500
Satisfaction Degree to the Response	0.3333	1.0000	0.2500

From above calculation, every consistency check for judgment matrix meets standards. The results of above weight determination are effective.

4.4.3 Evaluation Set Definition

Establish evaluation set $U = \{U_1, U_2, U_3, \dots, U_n\}$. Determine it as $U = \{\text{excellent, good, mediocre, not well, bad}\}$ based on the indicators in this evaluation, in which excellent scores [4.0, 5.0], good scores [3.0, 4.0], mediocre scores [2.0, 3.0], not well scores [1.0, 2.0] and bad scores [0.0, 1.0].

4.4.4 Fuzzy Evaluation of Single Indicator

The data of indicators is gathered from questionnaires. Through the analysis of data, form a fuzzy matrix of single indicator noted as S_i ($i=1, 2, \dots, m$), and then calculate single indicator evaluation matrix using the following formula,

$$R_i = W_i^T \cdot S_i, i=1,2,3, \dots, m$$

Get the fuzzy relation matrix $R = [R_1^T \ R_2^T \ R_3^T \ \dots \ R_m^T]$.

Analyze each indicator according to the questionnaire data collected from the 11 economies-China; Chinese Taipei; Hong Kong, China; The Philippines; Malaysia; Peru; Mexico; Japan; Thailand; Republic of Korea and the U.S.A.

Take China case as an example. The evaluation of current situation of each indicator is shown in Table 4.19.

Table 4.19 Indicators' Evaluation of Current Situation

Evaluation indicator		Very satisfied	Satisfied	Normal	Dissatisfied	Very dissatisfied	Weight W
Quality of Laws and Regulations	Robustness Degree	0	2	1	1	0	0.5638
	Stability Degree	0	2	1	1	0	0.2634
	Implementation Degree	0	1	2	1	0	0.1178
	Fitness Degree	1	2	1	0	0	0.0550
Informatization Degree	Data Exchange Rate	1	1	2	0	0	0.0683
	Transmission Security	0	1	2	1	0	0.2747
	Failure Rate of Declaration System	0	1	1	2	0	0.1410
	Data Transmission Accuracy	0	2	2	0	0	0.4809
	Timeliness of Data Transmission	0	1	1	2	0	0.0351
Standardization Degree	Standardization Degree of Data Elements	0	1	2	1	0	0.5531
	Standardization Degree of Process	1	1	1	1	0	0.2685
	Standardization Degree of Security	0	1	2	1	0	0.0583
	Standardization Degree of System	0	2	1	1	0	0.1201
Quality of Declaration Process	Time Consuming of Manifest Declaration	1	1	2	0	0	0.1172
	Personnel Consuming of Manifest Declaration	1	2	0	1	0	0.2684
	Costs of Manifest Declaration	0	2	1	1	0	0.6144
Cooperation and Coordination of Stakeholders	Response Time from Public Sectors	1	1	2	0	0	0.7500
	Satisfaction Degree to the Response	0	2	2	0	0	0.2500

With regard to the numbers in the table above, such as numbers of 0, 2, 1, 1, 0 in the line of “Robustness Degree of Laws and Regulations”, which indicate respondents’ satisfaction degree to the robustness of laws and regulations. It means among the 4 respondents, no respondent (the number is 0) is very satisfied; 2 respondents are satisfied; 1 respondent deems it as normal; 1 respondent is dissatisfied; no respondent (the number is 0) is very dissatisfied. The meanings of other numbers are the same accordingly. S_1, S_2, S_3, S_4 and S_5 are derived in accordance with the statistics in the table above.

$$S_1 = \begin{bmatrix} 0 & 0.5 & 0.25 & 0.25 & 0 \\ 0 & 0.5 & 0.25 & 0.25 & 0 \\ 0 & 0.25 & 0.5 & 0.25 & 0 \\ 0.25 & 0.25 & 0.5 & 0 & 0 \end{bmatrix}$$

$R_i = W_i^T \cdot S_i$ is used to fuzzy evaluate the quality of the hierarchy in accordance with judgment matrix of single factor S_i and indicator weight W_i^T ; evaluation results of quality of laws and regulations, informatization degree, standardization degree, quality of declaration process and cooperation and coordination of stakeholders can be obtained. The corresponding R_1, R_2, R_3, R_4 and R_5 are calculated as follows:

$$R_1 = W_1 \bullet S_1 = (0.5638 \quad 0.2634 \quad 0.1178 \quad 0.0550) \bullet \begin{bmatrix} 0 & 0.5 & 0.25 & 0.25 & 0 \\ 0 & 0.5 & 0.25 & 0.25 & 0 \\ 0 & 0.25 & 0.5 & 0.25 & 0 \\ 0.25 & 0.25 & 0.5 & 0 & 0 \end{bmatrix}$$

$$= [0.0138 \quad 0.4568 \quad 0.2932 \quad 0.2362 \quad 0]$$

$$R_2 = W_2 \bullet S_2 = (0.0683 \quad 0.2747 \quad 0.1410 \quad 0.4809 \quad 0.0351) \bullet \begin{bmatrix} 0.25 & 0.25 & 0.5 & 0 & 0 \\ 0 & 0.25 & 0.5 & 0.25 & 0 \\ 0 & 0.25 & 0.25 & 0.5 & 0 \\ 0 & 0.5 & 0.5 & 0 & 0 \\ 0 & 0.25 & 0.25 & 0.5 & 0 \end{bmatrix}$$

$$= [0.0171 \quad 0.3702 \quad 0.4560 \quad 0.1567 \quad 0]$$

$$R_3 = W_3 \bullet S_3 = (0.5531 \quad 0.2685 \quad 0.0583 \quad 0.1201) \bullet \begin{bmatrix} 0 & 0.33 & 0.33 & 0.34 & 0 \\ 0.33 & 0.34 & 0.33 & 0.25 & 0 \\ 0 & 0 & 0.67 & 0.33 & 0 \\ 0 & 0.67 & 0 & 0.33 & 0 \end{bmatrix}$$

$$= [0.0886 \quad 0.3543 \quad 0.3102 \quad 0.2469 \quad 0]$$

$$R_4 = W_4 \bullet S_4 = (0.1172 \quad 0.2684 \quad 0.6144) \bullet \begin{bmatrix} 0.25 & 0.25 & 0.5 & 0 & 0 \\ 0.25 & 0.5 & 0 & 0.25 & 0 \\ 0 & 0.5 & 0.25 & 0.25 & 0 \end{bmatrix}$$

$$= [0.0964 \quad 0.4707 \quad 0.2122 \quad 0.2207 \quad 0]$$

$$R_5 = W_5 \bullet S_5 = (0.75 \quad 0.25) \bullet \begin{bmatrix} 0 & 0 & 1 & 0 & 0 \\ 0 & 0.5 & 0.5 & 0 & 0 \end{bmatrix} = [0 \quad 0.125 \quad 0.875 \quad 0 \quad 0]$$

4.4.5 Comprehensive Fuzzy Evaluation

Calculate comprehensive evaluation matrix according to the formula below to evaluate e-Manifest exchange readiness comprehensively.

$$B = W \cdot R^T$$

“B” is the final evaluation results of e-Manifest exchange readiness, and the condition of e-Manifest exchange readiness can be confirmed on the basis of principle of maximum of membership degree. Take China case as an example to conduct comprehensive fuzzy evaluation.

$$B = W \bullet R = [0.0610 \quad 0.3946 \quad 0.3421 \quad 0.2022 \quad 0]$$

$$B_0 = W_0 \bullet R_0 = [0.0610 \quad 0.3946 \quad 0.3421 \quad 0.2022 \quad 0] \bullet \begin{bmatrix} 5 \\ 4 \\ 3 \\ 2 \\ 1 \end{bmatrix} = 3.5141$$

According to the formula above, the final comprehensive score of e-Manifest exchange readiness of China is 3.5141. The same procedures are adopted to obtain the performance scores of the other 10 economies. The scores of criterion layer evaluation and comprehensive evaluation of the 11 economies are shown in the following table.

Table 4.20 Comprehensive Evaluation and the Scores

Score Indicator Economy	Quality of Laws and Regulations	Informa-tization Degree	Standardi-zation Degree	Quality of Declara-tion Process	Cooperation and Coordination of Stakeholders	Compre-hensive Evaluation Score	Performanc e
China	3.2482	3.2477	3.2846	3.7428	3.1250	3.5141	Good
Chinese Taipei	3.5713	3.2447	3.3467	3.3471	3.1258	3.3145	Good
Hong Kong, China	4.0051	3.4126	3.5217	4.1711	3.6313	4.0480	Excellent
The Philippines	2.6810	2.7823	2.8147	2.7092	2.6766	2.7146	Mediocre
Malaysia	2.9832	3.1035	3.1042	2.6025	2.8625	2.8924	Mediocre
Peru	3.3018	3.3299	2.3422	2.2221	3.3750	2.6966	Mediocre
Mexico	3.8913	4.1358	3.767	4.2523	3.9949	4.0021	Excellent
Japan	3.5731	3.8024	3.6712	3.8245	3.5219	3.7260	Good
Thailand	2.9214	2.9130	2.6173	2.6047	2.8013	2.7459	Mediocre
Republic of Korea	4.2326	3.2774	2.6088	2.8432	3.3750	3.0882	Good
The United States	4.6513	4.3442	4.0182	3.7766	3.5625	4.0569	Excellent

According to the data distribution characteristics of e-Manifest exchange readiness evaluation result, this research defines that economies whose comprehensive evaluation score is between 4.0 and 5.0 are classified as mature type, their performances are considered to be excellent; economies whose comprehensive evaluation score is between 3.0 and 4.0 are classified as developing type, their performances are considered to be good; economies whose comprehensive score is between 2.0 and 3.0 are classified as start-up type, their performances are considered to be mediocre.

Table 4.21 Type of Each Economy in E-Manifest Exchange Readiness

Type	Economies
Mature type	The United States; Hong Kong, China; Mexico
Developing type	Japan; China; Chinese Taipei; Republic of Korea
Start-up type	Malaysia; Thailand; The Philippines; Peru

4.5 DEA Evaluation of E-Manifest Exchange Readiness

E-Manifest exchange in APEC region is a process with multiple inputs and outputs. DEA can be adopted to deal with the correlation and evaluation of the whole system of e-Manifest exchange in APEC region, effectively to solve the

strong correlation of each internal element and its existing relative efficiency of input and output. “Relative ranking” is used to solve the problem of non-unified indicators and improvement suggestions can be provided in accordance with the evaluation results.

4.5.1 Data Acquisition

Select the 11 economies as Decision Making Unit (DMU) of e-Manifest exchange readiness evaluation, namely, China (DMU₁), the United States (DMU₂), Japan (DMU₃), Republic of Korea (DMU₄), The Philippines (DMU₅), Malaysia (DMU₆), Thailand (DMU₇), Peru (DMU₈), Mexico (DMU₉), Hong Kong, China (DMU₁₀) and Chinese Taipei (DMU₁₁).

Based on the indicator system screened in Section 4.3, the data of 18 indicators that influence e-Manifest exchange readiness has been acquired through the processing and analysis of questionnaire data, and dimension of initial data has been unified. Data of each indicator is shown in Table 4.21(the sequence of indicators is in accordance with the order of input and output indicators in the “Evaluation Indicator” column in Table 4.22).

Table 4.22 Data of Each Indicator

Economy	Indicator Value
China	3.21,3.23,3.26,3.28,3.20,3.23,3.25,3.27,3.25,3.26,3.28,3.28,3.29,3.54,3.74,3.82,3.07,3.15
The United States	4.65,4.62,4.57,4.67,4.32,4.33,4.35,4.37,4.34,3.89,4.01,4.03,4.04,3.75,3.77,3.80,3.54,3.57
Japan	3.32,3.27,4.08,3.22,3.77,4.15,3.52,3.63,4.03,2.51,2.44,2.74,2.86,3.69,3.93,3.75,3.42,3.74
Republic of Korea	4.21,4.13,4.27,4.25,3.16,3.27,3.28,3.39,3.21,2.48,2.69,2.54,2.67,2.85,2.83,2.82,3.25,3.47
The Philippines	2.46,3.07,2.38,2.99,2.42,2.64,3.52,3.04,2.85,2.78,3.04,3.06,2.52,2.98,3.02,2.34,2.54,2.82
Malaysia	2.96,3.07,2.98,2.99,3.02,3.44,2.92,3.24,3.45,2.98,3.04,3.16,3.12,2.98,2.02,2.54,2.74,2.92
Thailand	3.03,2.81,3.19,2.74,3.07,2.82,3.13,2.95,2.74,2.46,2.55,2.79,2.66,2.49,2.76,2.62,2.67,3.08
Peru	3.30,3.29,3.34,3.27,3.33,3.14,3.35,3.17,3.34,2.33,2.35,2.34,2.32,2.22,2.18,2.36,3.35,3.46
Mexico	3.82,3.89,3.92,3.76,4.14,4.13,4.07,4.21,4.16,3.43,3.45,3.46,3.48,4.25,4.32,4.17,3.42,3.53
Hong Kong, China	4.01,4.12,3.98,3.89,3.27,3.43,3.41,3.19,3.38,3.52,3.48,3.67,3.58,4.17,4.27,4.08,3.54,3.68
Chinese Taipei	3.54,3.66,3.62,3.57,3.04,3.08,3.92,3.35,2.96,3.26,3.37,3.25,3.42,3.27,2.46,2.54,2.98,3.33

4.5.2 Relative Efficiency Evaluation of DMU

(1) Establishment of Input and Output Indicator Evaluation Set of DMU

In accordance with the evaluation objective of “the less input and the more output, the better”, 18 indicators related to quality of laws and regulations, informatization degree, standardization degree, quality of declaration process and cooperation and coordination of stakeholders are divided into input indicators and output indicators, so as to create input and output indicator evaluation set of DMU. Table 4.23 shows the data of input and output indicators of each DMU, in which X_{ij} means the j -th input indicator of i -th indicator and Y_{ij} means the j -th output indicator of i -th indicator in criterion layer U_i ($i=1, 2, \dots, 5$).

Table 4.23 Data of Input and Output Indicators of Each DMU

Criterion Layer		Evaluation Indicator	DMU ₁	DMU ₂	DMU ₃	DMU ₄	DMU ₅	DMU ₆
Quality of Laws and Regulations Indicator U ₁	Output indicator	Robustness Degree Y ₁₁	3.21	4.65	3.32	4.21	2.46	2.96
		Stability Degree Y ₁₂	3.23	4.62	3.27	4.13	3.07	3.07
		Implementation Degree Y ₁₃	3.26	4.57	4.08	4.27	2.38	2.98
		Fitness Degree Y ₁₄	3.28	4.67	3.22	4.25	2.99	2.99
Informatization Degree Indicator U ₂	Input indicator	Failure Rate of Declaration System X ₂₁	3.20	4.32	3.77	3.16	2.42	3.02
	Output indicator	Data Exchange Rate Y ₂₁	3.23	4.33	4.15	3.27	2.64	3.44
		Transmission Security Y ₂₂	3.25	4.35	3.52	3.28	3.52	3.92
		Data Transmission Accuracy Y ₂₃	3.27	4.37	3.63	3.39	3.04	3.24
		Timeliness of Data Transmission Y ₂₄	3.25	4.34	4.03	3.21	2.85	3.45
Standardization Degree Indicator U ₃	Output indicator	Standardization Degree of Data Elements Y ₃₁	3.26	3.89	2.51	2.48	2.78	2.98

		Standardization Degree of Process Y ₃₂	3.28	4.01	2.44	2.69	3.04	3.04
		Standardization Degree of Security Y ₃₃	3.28	4.03	2.74	2.54	3.06	3.16
		Standardization Degree of System Y ₃₄	3.29	4.04	2.86	2.67	2.52	3.12
Quality of Declaration Process Indicator U4	Input indicator	Time Consuming of Manifest Declaration X ₄₁	3.54	3.75	3.69	2.85	2.98	2.98
		Personnel Consuming of Manifest Declaration X ₄₂	3.74	3.77	3.93	2.83	3.02	2.02
		Costs of Manifest Declaration X ₄₃	3.82	3.80	3.75	2.82	2.34	2.54
Cooperation and Coordination of Stakeholders Indicator U5	Input indicator	Response Time from Public Sectors X ₅₁	3.07	3.54	3.42	3.25	2.54	2.74
	Output indicator	Satisfaction Degree to the Response Y ₅₁	3.15	3.57	3.74	3.47	2.82	2.92

Table 4.23 (continued) Data of Input and Output Indicators of Each DMU

Criterion Layer		Evaluation Indicator	DMU ₇	DMU ₈	DMU ₉	DMU ₁₀	DMU ₁₁
Quality of Laws and Regulations Indicator U ₁	Output indicator	Robustness Degree Y ₁₁	3.03	3.30	3.82	4.01	3.54
		Stability Degree Y ₁₂	2.81	3.29	3.89	4.12	3.66
		Implementation Degree Y ₁₃	3.19	3.34	3.92	3.98	3.62
		Fitness Degree Y ₁₄	2.74	3.27	3.76	3.89	3.57

Informatization Degree Indicator U2	Input indicator	Failure Rate of Declaration System X_{21}	3.07	3.33	4.14	3.27	3.04
	Output indicator	Data Exchange Rate Y_{21}	2.82	3.14	4.13	3.43	3.08
		Transmission Security Y_{22}	3.13	3.35	4.07	3.41	3.92
		Data Transmission Accuracy Y_{23}	2.95	3.17	4.21	3.19	3.35
		Timeliness of Data Transmission Y_{24}	2.74	3.34	4.16	3.38	2.96
Standardization Degree Indicator U3	Output indicator	Standardization Degree of Data Elements Y_{31}	2.46	2.33	3.67	3.52	3.26
		Standardization Degree of Process Y_{32}	2.55	2.35	3.84	3.48	3.37
		Standardization Degree of Security Y_{33}	2.79	2.34	3.59	3.67	3.25
		Standardization Degree of System Y_{34}	2.66	2.32	3.75	3.58	3.42
Quality of Declaration Process Indicator U4	Input indicator	Time Consuming of Manifest Declaration X_{41}	2.49	2.22	4.25	4.17	3.27
		Personnel Consuming of Manifest Declaration X_{42}	2.76	2.18	4.32	4.27	2.46
		Costs of Manifest Declaration X_{43}	2.62	2.36	4.17	4.08	2.54
Cooperation and Coordination of Stakeholders Indicator U5	Input indicator	Response Time from Public Sectors X_{51}	2.67	3.35	4.15	3.54	2.98
	Output indicator	Satisfaction Degree to the Response Y_{51}	3.28	3.46	3.86	3.68	3.33

(2) The C²R Model of Quality of Declaration Process Indicators

According to the principles and process of establishing models by DEA introduced in section 4.2.4, this research takes “Quality of Declaration Process” of DMU as an example, using C²R model to evaluate the e-Manifest exchange readiness. The relative efficiency of each indicator will be calculated accordingly with no more tautology here. The results will be attached to Table 4.24.

Matlab software is applied to carry out data envelopment analysis on the basis of the input indicator data of quality of declaration process given in Table 4.22. This DMU has only input indicators; however, DEA method requires the DMU to be evaluated has both input indicators and output indicators. Therefore, one or more output indicators should be assumed in order to evaluate it. Here one output indicator is assumed for calculation.

This research takes DMU₁ as an example to calculate and analyze (the other DMUs can be done by analogy). The linear programming model is ($\epsilon=10^{-6}$):

$$\min[\theta - \epsilon (S_1^- + S_2^- + S_3^- + S_1^+)]$$

$$3.54\lambda_1 + 3.75\lambda_2 + 2.69\lambda_3 + 2.85\lambda_4 + 2.98\lambda_5 + 2.98\lambda_6 + 2.49\lambda_7 + 2.22\lambda_8 + 4.25\lambda_9 + 4.17\lambda_{10} + 3.27\lambda_{11} +$$

$$S_1^- = 3.54\theta$$

$$3.74\lambda_1 + 3.77\lambda_2 + 2.93\lambda_3 + 2.83\lambda_4 + 3.02\lambda_5 + 2.02\lambda_6 + 2.76\lambda_7 + 2.18\lambda_8 + 4.32\lambda_9 + 4.27\lambda_{10} + 2.46\lambda_{11} +$$

$$S_2^- = 3.74\theta$$

$$3.82\lambda_1 + 3.80\lambda_2 + 3.75\lambda_3 + 2.82\lambda_4 + 2.34\lambda_5 + 2.54\lambda_6 + 2.62\lambda_7 + 2.36\lambda_8 + 4.17\lambda_9 + 4.08\lambda_{10} + 2.54\lambda_{11} +$$

$$S_3^- = 3.82\theta$$

$$3\lambda_1 + 4\lambda_2 + 2\lambda_3 + 2\lambda_4 + 2\lambda_5 + 2\lambda_6 + 2\lambda_7 + 3\lambda_8 + 6\lambda_9 + 5\lambda_{10} + 2\lambda_{11} - S_1^+ = 1$$

$$\lambda_1, \lambda_2, \lambda_3, \lambda_4, \lambda_5, \lambda_6, \lambda_7, \lambda_8, \lambda_9, \lambda_{10}, \lambda_{11} \geq 0$$

$$S_1^-, S_2^-, S_3^- \geq 0, S_1^+ \geq 0$$

Use Matlab software to solve the model above, and get the following results:

objective function $\theta=9125$, $S_1^- = 0.5743$, $S_2^- = 0.1208$, $S_3^- = 0.0638$, $S_1^+ = 0$; it means DMU₁ has not reach DEA efficiency, and the production elements input have not been fully used to achieve best output (it refers to the input elements of quality of declaration process indicator).

Calculation process of other DMUs is the same as above. The relative efficiency of each DMU is shown in Table 4.24.

Table 4.24 Relative Efficiency of Quality of Declaration Process Indicators of Each DMU

DMU	S_1^-	S_2^-	S_3^-	S_1^+	θ
China	0.5743	0.1208	0.0638	0	0.9125
U.S.A	0	0	0	0	1
Japan	0.1347	0.0625	0.1743	0	0.8237
Republic of Korea	0.1036	0.1146	0.0372	0	0.9348
The Philippines	0.1728	0.0702	0.2103	0	0.7986
Malaysia	0.8327	0.3296	0.7512	0	0.7675
Thailand	0.3412	0.1337	0.0857	0	0.8014
Peru	0.2411	0.1985	0.1563	0	0.7865
Mexico	0	0	0	0	1
Hong Kong, China	0	0	0	0	1
Chinese Taipei	0.1743	0.1528	0.0936	0	0.8146

(3) Effectiveness Analysis and Projection Analysis

- (i) Among 11 DMUs, which refers to 11 economies, the U.S.A; Hong Kong, China and Mexico are DEA efficiency ($\theta=1, S^- = S^+ =0$); the other eight economies are DEA inefficiency ($\theta < 1$), which means the elements of DMU have not reached their ideal conditions. Analyzing from the perspective of overall effectiveness, it shows that input elements of quality of manifest declaration indicator in U.S.A, Hong Kong and Mexico have reached their optimal combinations and are located in the DEA efficient production frontier (i.e. reasonable input and output to reach a better level of e-Manifest exchange readiness in APEC region).
- (ii) According to data in Table 4.23, except for U.S.A, Hong Kong and Mexico, other economies are DEA inefficient; however, the projection on the production frontier is DEA efficient. Consequently DEA efficiency can be achieved by adjusting the input and/or output. In respect of quality of declaration process indicator, take China case as an example to describe how to improve the performance. There are only input indicators and no output indicator in the criterion layer of quality of declaration process indicator. Therefore, according to the evaluation objective of “the less input and the more output, the better”, the value of these input indicators should be reduced. The decrease of time consuming, personnel consuming, and

costs of manifest declaration will directly reduce the total cost of e-Manifest declaration to improve performance. According to the adjustment method of DEA and the specific values of these three indicators in Table 4.23, in the descending order of reduction degree, it should be time consuming, personnel consuming and costs. The adjustment schemes of the other seven economies can be obtained in the same way. Improvement measures can be put forward for enhancing e-Manifest exchange readiness in accordance with this projection principle.

4.5.3 Comprehensive Evaluation on E-Manifest Exchange Readiness

In Section 4.5.2, C²R model has been used to evaluate the efficiency and effectiveness of DMU. The ultimate purpose is to use DEA along with AHP to evaluate the overall efficiency of each DMU and finally obtain the ranking of DMUs on e-Manifest exchange readiness, in order to have a better understanding of the current condition of readiness to exchange e-Manifest data and guide and promote the operation and management of e-Manifest to some extent.

The relative efficiency of quality of declaration process indicator of each DMU has been obtained through previous calculation and analysis. Similarly, according to C²R model, the relative efficiency values of other four indicators in criterion layer can be obtained. The results are as follows.

Table 4.25 Relative Efficiency of Indicators in Criterion Layer

	DMU ₁	DMU ₂	DMU ₃	DMU ₄	DMU ₅	DMU ₆	DMU ₇	DMU ₈	DMU ₉	DMU ₁₀	DMU ₁₁
U ₁	1	1	1	1	0.8326	1	1	0.8737	0.9215	1	1
U ₂	0.9738	1	1	1	0.6572	0.6539	0.7736	0.5942	0.9546	1	1
U ₃	0.9396	0.9824	1	1	0.6765	0.7621	0.7235	0.6513	1	0.9574	1
U ₄	0.9125	1	0.9237	0.9148	0.7886	0.7675	0.8014	0.7865	1	1	0.8146
U ₅	1	0.9365	0.7193	0.5283	1	0.8152	0.8489	1	0.8657	0.8763	0.9142

The overall efficiency value of each DMU is figured out through weighted calculation. For example, the final overall efficiency value of DMU1 is calculated through the following procedure:

$$\sigma_1 = 0.1333 \times 1 + 0.2000 \times 0.9738 + 0.2667 \times 0.9396 + 0.3333 \times 0.9125 + 0.0667 \times 1 = 0.9495$$

The methods of calculating the final overall efficiency values of other DMUs are the same. Finally, based on the obtained comprehensive performance values, the ranking results are shown in Table 4.26).

Table 4.26 Comprehensive Evaluation Results by DEA

w_j	DMU ₁	DMU ₂	DMU ₃	DMU ₄	DMU ₅	DMU ₆	DMU ₇	DMU ₈	DMU ₉	DMU ₁₀	DMU ₁₁
U_1	1	1	1	1	0.8326	1	1	0.8737	0.9215	1	1
U_2	0.9738	1	1	1	0.6572	0.6539	0.7736	0.5942	0.9546	1	1
U_3	0.9396	0.9824	1	1	0.6765	0.7621	0.7235	0.6513	1	0.9574	1
U_4	0.9125	1	0.9237	0.9148	0.7886	0.7675	0.8014	0.7865	1	1	0.8146
U_5	1	0.9365	0.7193	0.5283	1	0.8152	0.8489	1	0.8657	0.8763	0.9142
σ_j	0.9495	0.9911	0.9558	0.9401	0.7524	0.8108	0.8047	0.7378	0.9715	0.9804	0.9458
Rank	5	1	4	7	10	8	9	11	3	2	6

Table 4.27 Ranking of E-Manifest Exchange Readiness

Order	1	2	3	4	5	6	7	8	9	10	11
Economy	The United States	Hong Kong, China	Mexico	Japan	China	Chinese Taipei	Republic of Korea	Malaysia	Thailand	The Philippines	Peru

Table 4.26 shows the final overall evaluation results of e-Manifest exchange readiness of 11 economies; that is, through the weighted comprehensive analysis of DEA efficiency values of the indicators in criterion layer of each DMU, the overall performance value is obtained. Table 4.27 is thus obtained after the ranking of overall performance value.

As seen from the final overall efficiency value of each DMU (σ_j), the overall readiness value of e-Manifest exchange of each economy is less than 1, indicating that the optimal state has not been reached and there are still shortcomings in some aspects.

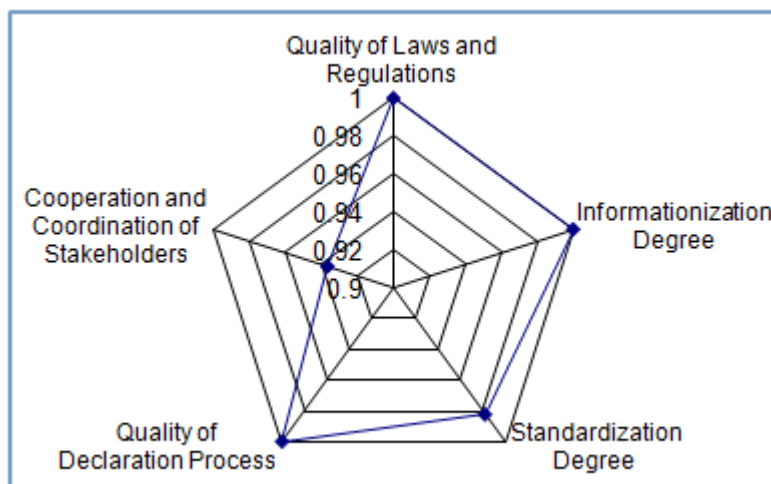
It can be seen from the ranking in the table that the U.S.A ranks first. Its overall readiness is relatively high and it reaches the optimal state in quality of laws and regulations, informatization degree, standardization degree and quality of declaration process. Obviously, the overall readiness of Peru is relatively low. After the data analysis, it can be known that Peru scores lower in terms of standardization degree and quality of declaration process, especially in the informatization degree. The overall evaluation result of Peru shows that it should attach importance to the improvement in informatization and appropriately adjust the investments to achieve the optimization of overall readiness. For Peru, The Philippines and Malaysia, they can formulate and implement the plans for improvement in e-Manifest readiness according to the theories and processes given in the previous sections.

In general, from the fact that the final overall efficiency of DMU (σ_j) is less than 1, it indicates that the performance of the e-manifest exchange readiness has not achieved its best possible optimizations, which means the comprehensive performance of informationization, standardization and relevant cooperation and coordination is relatively low, especially in the aspect of informationization and standardization. In addition, there is an obvious gap in the comprehensive performance between different economies, which needs to be narrowed. Previous analysis also shows that quality of declaration process has become a key and difficult point of the operation and management of e-Manifest in APEC regions. Only by constant adjustment of investment and outcome of the indicators, can sustainable and stable development of the operation and management of e-Manifest exchange in APEC region be vigorously advanced.

4.6 Analysis of Evaluation Results of E-Manifest Exchange Readiness in the APEC Region

It can be seen from the evaluation results in section 4.4 and 4.5 that the FCE and DEA evaluation are mutually verified and the ranking results are consistent with each other. The evaluation efficiency of DEA is easier to obtain the relative efficiency of 11 economies. Therefore, based on the DEA evaluation results, the radar charts of 11 economies and a general radar chart are drawn respectively to make further comprehensive analysis.

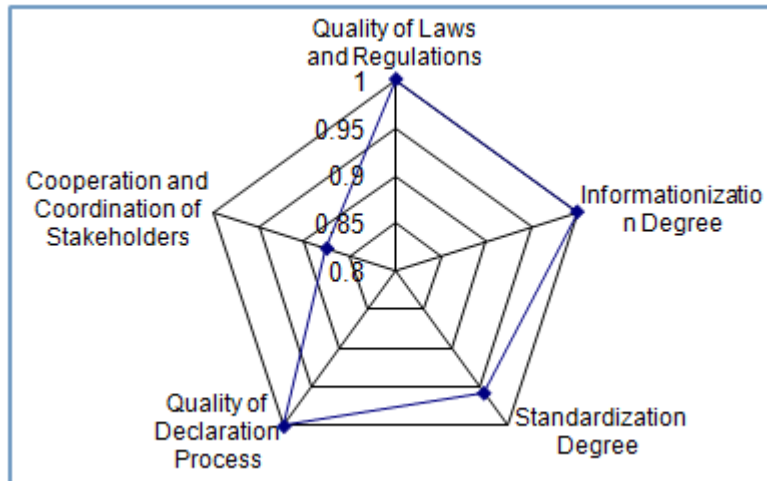
Chart 4.5 Radar Chart-The United States



The United States has outstanding performance in terms of quality of laws and regulations, informatization degree and quality of declaration process, followed by standardization degree; but it is relatively weak in terms of cooperation and coordination of stakeholders. Although U.S. CBP assigns staff members to be client representatives for each carrier and NVOCC for consulting and the client

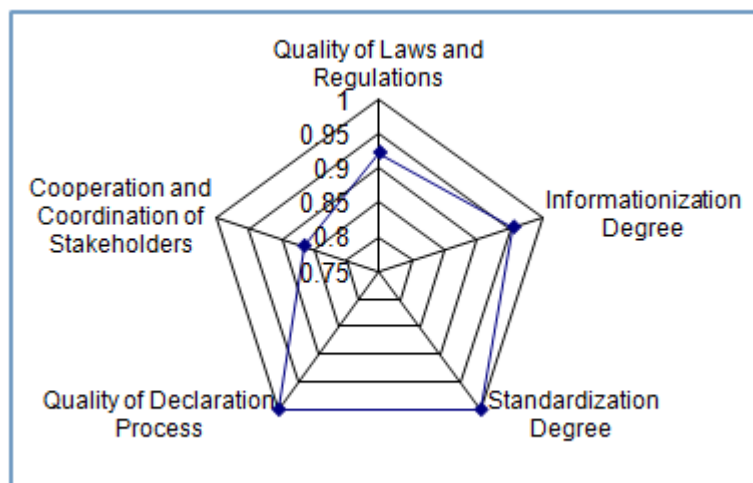
representatives are knowledgeable and helpful about policies, sometimes they cannot help with some technical support issues. In such cases it is necessary to call the CBP field office at the port in question, and it can take a couple days to get a response, which may influence the cooperation efficiency between CBP and the logistics service sectors.

Chart 4.6 Radar Chart-Hong Kong, China



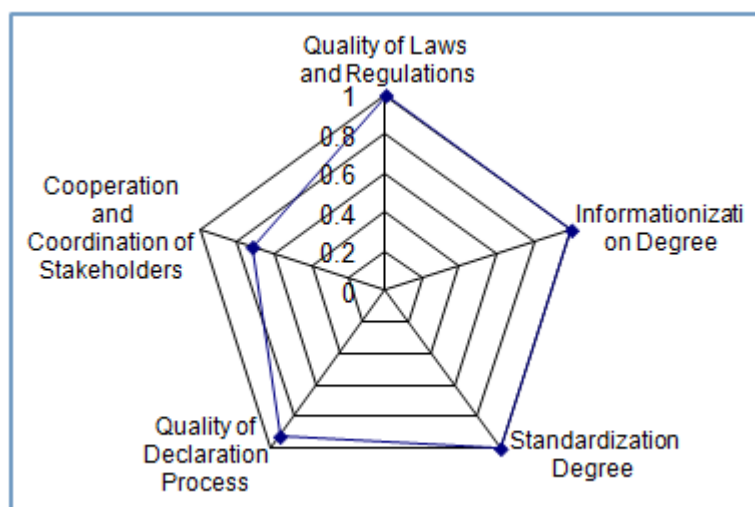
Hong Kong, China also has outstanding performance in terms of quality of laws and regulations, informatization degree and quality of declaration process; but it is relatively weak in terms of standardization degree and cooperation and coordination of stakeholders.

Chart 4.7 Radar Chart-Mexico



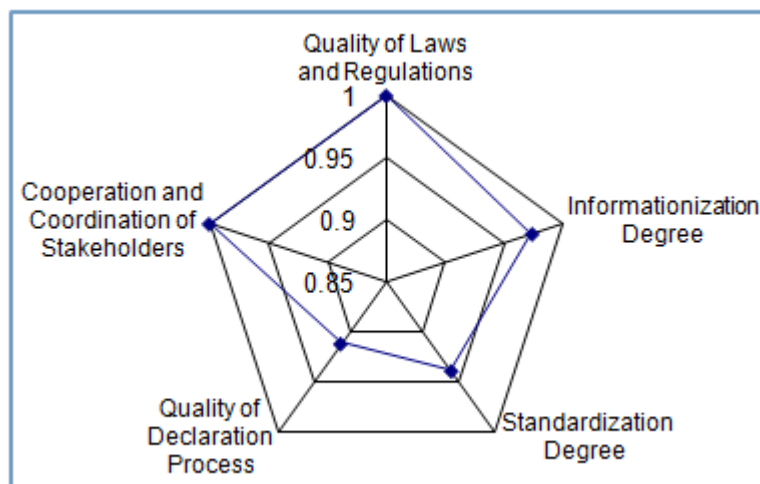
Mexico has better performance in terms of standardization degree and quality of declaration process, but it is relatively weak in terms of informatization degree and cooperation and coordination of stakeholders.

Chart 4.8 Radar Chart-Japan



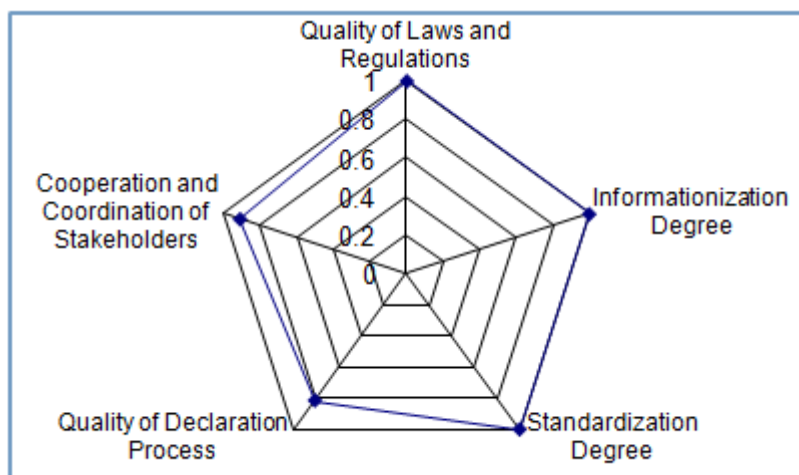
Japan has better performance in terms of quality of laws and regulations, informatization degree and standardization degree, but there is room for improvement in quality of declaration process and cooperation and coordination of stakeholders.

Chart 4.9 Radar Chart-China



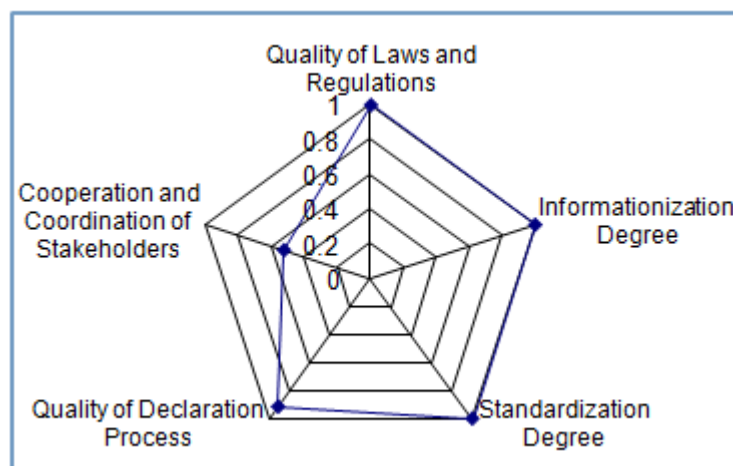
China has better performance in terms of quality of laws and regulations and relevant cooperation and coordination, but there is room for improvement in informatization degree and standardization degree and further efforts on unified declaration process nationwide.

Chart 4.10 Radar Chart-Chinese Taipei



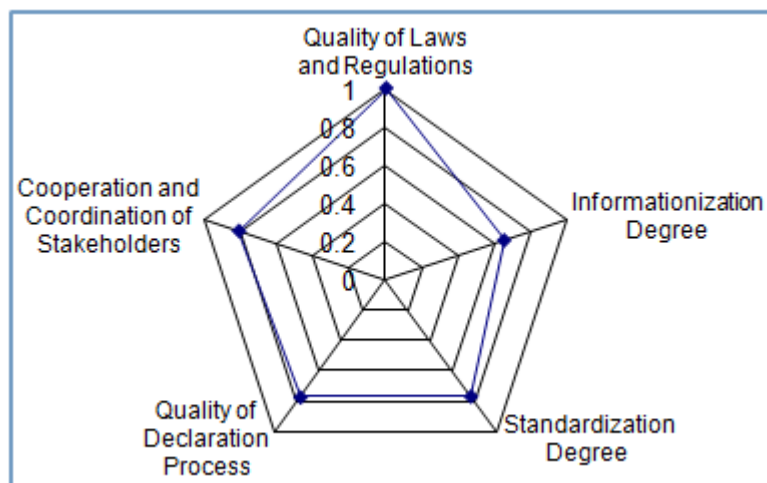
Chinese Taipei is relatively balanced in all aspects, but there is room for improvement in the relevant coordination and cooperation and quality of declaration process.

Chart 4.11 Radar Chart-Republic of Korea



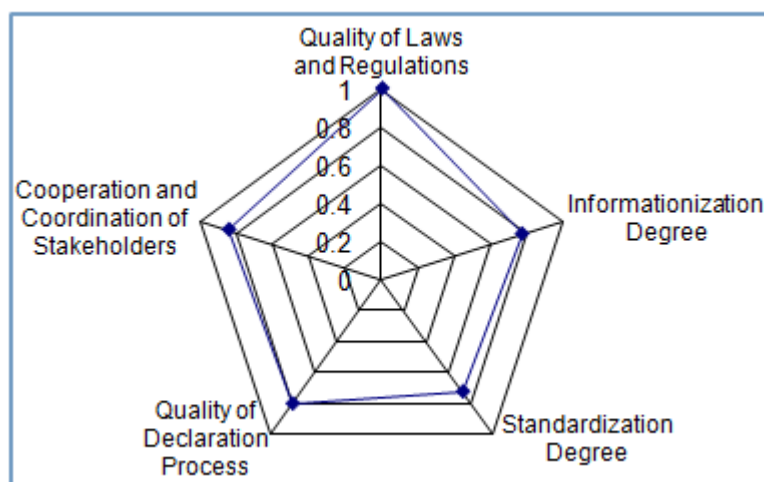
Republic of Korea has better performance in terms of quality of laws and regulations, informatization degree and standardization degree, followed by quality of declaration process; but it is relatively weak in terms of cooperation and coordination of stakeholders.

Chart 4.12 Radar Chart-Malaysia



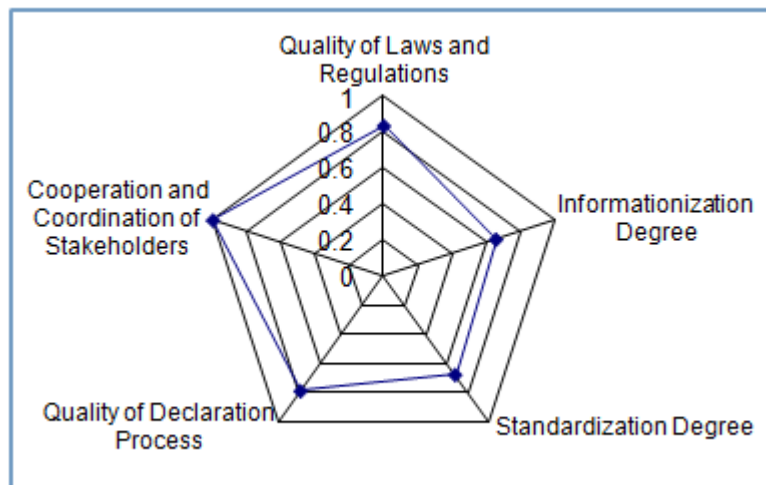
Malaysia has good performance in terms of quality of laws and regulations, but there is room for improvement in informatization degree, standardization degree, quality of declaration process and relevant cooperation and coordination.

Chart 4.13 Radar Chart-Thailand



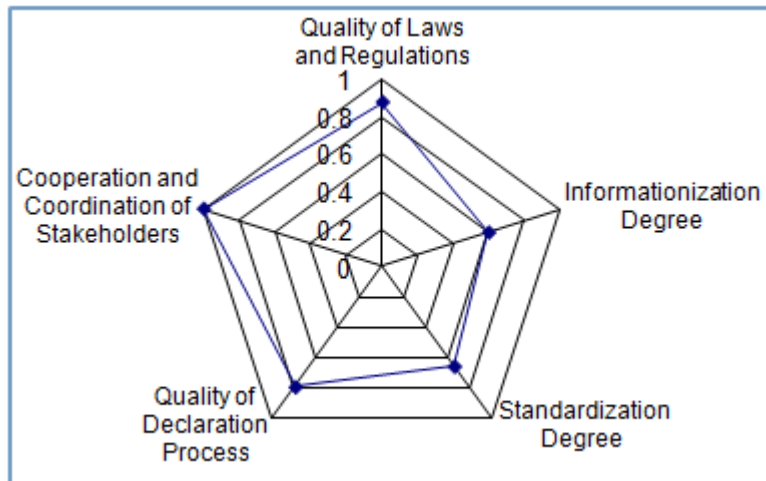
Thailand also has good performance in terms of quality of laws and regulations, but improvements on informatization degree, standardization degree, quality of declaration process and relevant cooperation and coordination are still needed.

Chart 4.14 Radar Chart-The Philippines



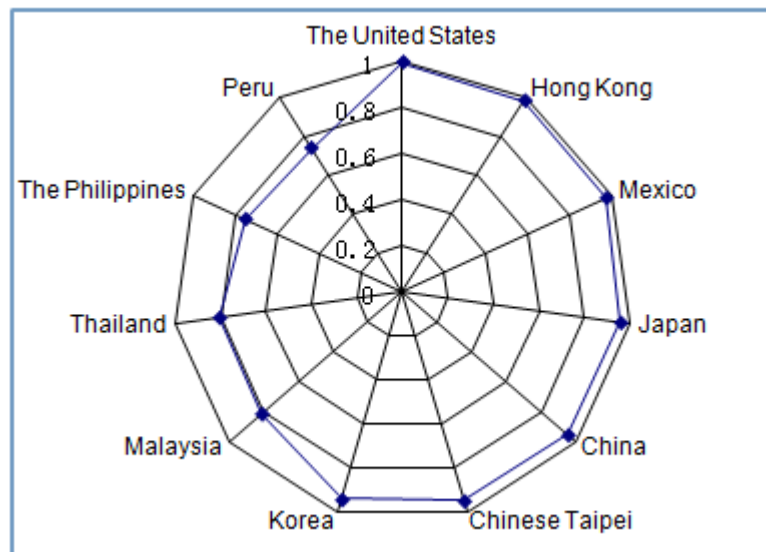
The Philippines has relatively good performance in terms of cooperation and coordination of stakeholders, but there is still room for improvements in terms of quality of laws and regulations, informatization degree, standardization degree and quality of declaration process.

Chart 4.15 Radar Chart-Peru



For Peru, the cooperation and coordination of stakeholders and quality of laws and regulations are relatively well; however there is large room for improvements in terms of informatization degree, standardization degree and quality of declaration process.

Chart 4.16 Radar Chart for Comprehensive Evaluation



As seen from the chart, U.S.A has the best performance, followed by Hong Kong, China; and Mexico. Although Japan; Republic of Korea; China; and Chinese Taipei are behind the three outstanding economies, the gaps are not too large. There is a significant gap between other economies with those first echelon and second echelon economies; reasons and solutions according to the actual situations should be found to improve e-Manifest exchange readiness as well as the overall efficiency of supply chain in the APEC region.

5 Research Results and Implementation Guidance

5.1 Research Results

5.1.1 Economy Development Strategy Influencing Legal Framework and Process

Through the evaluation with desk research and questionnaire survey, it is seen that most economies in the APEC region have implemented e-Manifest declaration since 1990s. The mechanism of e-Manifest declaration, including the legal framework, the declaration process, i.e. what data elements are required to be submitted, who is required to file the information, when the data must be submitted etc., varies in different economies and is mainly influenced by the economies' political will, which means what is more important to the country or region's development, the development of economy, the border security, and/or the trade facilitation.

Prior to 911, U.S. Customs was under the Department of Treasury since it was the second leading revenue collecting agency in the economy next to the tax division. After 911 happened, Customs was moved from the Department of Treasury to the newly founded Department of Homeland Security (DHS). The focus of Customs still is revenue and revenue protection but also a huge side into the world terrorism. In 2003, pursuant to the Trade Act of 2002, CBP published the "24 Hour Rule" that requires the filing of shipment data for maritime containerized imports 24 hours before the cargo loading, which advances the cargo manifest declaration when the cargos are still at the foreign port. In 2009, the "10 + 2 Rule" became effective, which provides CBP with more and better quality data used in the cargo risk assessments. ACE (the system used to process cargo) focused on trade facilitation and streamlined the process of moving international cargo in and out of the U.S. prior to 911, and it has turned not only to the revenue collection part but also security part as well.

Not like the security oriented strategy, some economies concentrated more on the development of international trade and trade facilitation. Singapore port is one of the world's largest container ports. It ranked as number two in the top 50 containers ports in 2013, mainly because it is an important hub where containers from one-liner service are transferred to another liner service for on-carriage to their final destination. Singapore's trade facilitation performance is relatively high. It performs better than the averages of Asian and high

income countries in all the areas covered by OECD trade facilitation indicators based on the available data of January 2013. In Singapore, manifests are not even required by Customs.

For trade security or facilitation is really a dilemma and it mainly depends on the political will of the economy. Most economies require an independent declaration of manifest data separated from other customs declaration process. However, the manifest data is based on Bill of Lading information, which generates from the trade communities. Through the questionnaire survey and field research, the research team finds that the logistics service sectors mainly suggest: the scope of manifest reporting should be limited so that carriers and NVOCCs are required to provide with only the information that they have in their possession as a part of normal business operations; they should not be required to provide information that is not in their possession, such as the country or region of origin of goods. For security reasons, government may acquire much data while the really usage of these data is doubted; for facilitation reasons, many data elements in manifest can be actually gotten from customs declaration procedures.

Manifest can be considered a management tool for risk assessment. The mechanism of manifest declaration is in accordance with the economy development strategy and thus varies in different economies. In terms of the balance between border security and trade facilitation, instead of judging the performance of manifest and its influence on global supply chain, the best way to achieve efficient border security may be to have all the data submitted and checked electronically on the basis of the research findings from relevant parties. Use information system to file the data, transmit it and then check and target units of all different ports of entry, to make the cargo constantly moving and flowing.

5.1.2 Cooperation and Coordination of Stakeholders

Cooperation and coordination of stakeholders (i.e. public and private sectors involved) makes an impact on the efficiency of e-Manifest declaration and the readiness of e-Manifest exchange. Through the evaluation, it is seen that some economies perform well in this aspect while others need to improve the efficiency and effectiveness of cooperation and coordination.

The cooperation and coordination of stakeholders mainly contains the following three aspects:

(1) Cooperation and Coordination among Public Sectors

Besides Customs and port authorities, other government agencies may also get involved in the manifest procedures since the agencies have different views on risks. It is vital to have one leading government agency and have

specific rules for other agencies to enforce to clarify each government agencies' authorities. For example, in the U.S., CBP is responsible for building and managing ITDS; the other 47 agencies have the release and hold authority. If other government agencies conduct the risk assessment and want to do inspections, they will send an electronic request back to CBP. CBP would like to inspect the containers and the officers at the port will make a decision whether or not they will place the containers on hold. CBP will send a message back to the carrier regarding the hold with the information of what government agency put this hold and the contact phone number. The cooperation between CBP and these agencies can make sure the risk assessment and the put and release of hold going smoothly.

(2) Cooperation and Coordination between Public and Private Sectors

The cooperation and coordination between public and private sectors is quite important. To work with the trade can make sure that the voices from the trade have been considered into making policies and the trade can smoothly adapt to these new policies; the training and technical support gained from the government can smooth the declaration process; the timely response of government to the problems on e-Manifest declaration can also improve the efficiency.

Take U.S. case as an example. All U.S. agencies have advisory committees made of the private sectors, and regarding the Customs, the advisory committee is the COAC (Customs Operation Advisory Committee). It is composed of members of the trade and government employees that are employed by the secretariat of DHS, to advise Customs the business practices. Before a big change is made, Customs will go to the advisory committee to ask for their opinions. COAC may request 18 months in advance notice of the change for the industry having enough time to program those changes. There is also a group called Trade Support Network (TSN) that was formed by Customs to reach out the trade in technical operation level to do the implementation of regulation. All the different ocean carriers, importer and exporters, manufacturers, software providers, brokers, forwarders are organized together and there is a lot of dialogue and cooperation between CBP and these private sectors.

In the implementation of manifest, CBP also assigns staff members to be client representatives for each carrier and NVOCC. If a problem with manifest submission occurs, they can call the client representatives and get an answer in less than 30 minutes about how to fix the problem. For really urgent issues it is usually possible to speak to a client representative immediately. Additionally, the carrier or NVOCC could contact CBP directly to set up a conference call to discuss a concern. CBP has a 24-hour technical help desk to address technical problems with manifest submission as well.

In Japan case, during the implementation of Japan's AFR, Customs and

NACCS held many seminars and training meeting for filers with service providers in Japan and overseas. There is also a special committee for AFR consulting and implementation which was formed by the experts from both public and private sectors before AFR was issued.

(3) Cooperation and Coordination among Private Sectors

In the manifest declaration process, the carrier and NVOCC get data from the trader or its agent. The timely acquisition of data elements can comply with the time limits of the rules and avoid the penalties from Customs.

In economies that require both Master manifest and House manifest, the good coordination between the carrier and NVOCC can expedite the manifest process as well. In U.S. case, the speed of manifest declaration is determined by the submission of the Master B/L which is performed by the carrier. Even if the House B/L is filed earlier, the process cannot move forward until the Master B/L is filed. In Japan case, according to AFR, after the carrier declares the ATD (Departure Time Registration, the carrier is required to file the date and time of departure from the port of loading after a vessel leaves the port), the manifest data cannot be updated. However the NVOCC has no idea when the carrier reports the ATD, which results in that NVOCC could not change or update the data in time if amendment is needed. NVOCC has to ask service provider to help inquire whether the ATD is reported. There is no necessary notification between the carrier and NVOCC, which influences the efficiency of manifest modification.

Another coordination among private sectors is the cooperation between the importer and exporter. A survey conducted by AAEL in 2012 (Full Results of the AAEL 2012 Benchmarking Survey) indicated that: when it came to “which part in the supply chain was the most difficult to deal with during your implementation of ISF?”, 86% of the respondents chose “overseas suppliers”. The ISF forces U.S. companies to spend more cost to take control over data, much earlier than the process even though they don’t generate the data.

5.1.3 ICT and Standardization

Regarding e-Manifest declaration, according to the survey, most economies have developed declaration management system or incorporated this module into a centralized platform (e.g. Single Window) for obligators to submit data. It is usually free and allows the enterprises’ ERP systems to directly connect with them. For SMEs who do not have sufficient motivation to invest money on paying the systems, service providers’ declaration services are used to submit the data.

The informatization level varies between economies and different locations in a particular economy. Some economies unify the standard enforcement on a

national basis and take into account the international codes and standards developed by ISO, WCO and the United Nations; while in other economies the standards are not unified across the local ports. EDIFACT and XML are mostly adopted. In Japan, NACCS uses EDI and UN/EDIFACT way that is made tiny changes to localize it. China Customs is using XML and the format of it has been released on the website for adoption. U.S. CBP is encouraging XML because it is a readable language and makes development and data processing much easier. Some industries push back on that because they are spending so much money right now to get with existing infrastructure. They are going to have to re-do it all in XML. Customs is trying to translate it into XML regardless of whatever language the carriers use and whatever existing service carriers use.

5.2 Implementation Guidance

According to the study and analysis on the different kinds of countries or regions, the research team finds that one economy could take some tailored measures to efficiently facilitate the implementation of e-Manifest declaration and management, and help improve readiness for exchanging manifest data within the trading stakeholders or the corresponding parties in other nations.

Based on the comprehensive evaluation results of e-Manifest exchange readiness, the 11 economies are divided into three different types: mature type, developing type and start-up type. This research suggests that corresponding measures should be taken according to which type the economy is. For universality of the guidance, the e-Manifest implementation process can be divided into Planning and Preparation Phase (start-up), Enactment of Laws and Implementation Adjustment Phase (developing) and Stable Operation Phase (mature), and corresponding principles and practical recommendations are provided for reference according to the current stage of the economy.

The Planning and Preparation Phase is the primary period, during which economies consider whether or not to issue or implement e-Manifest. The Enactment of Laws and Implementation Adjustment Phase is the period during which economies enact necessary regulations and begin to implement and as needed modify the new rules. The final part, Stable Operation Phase, describes economies in which the rules and regulations have already been carried out for many years to support trade security and facilitation of manifest processes.

5.2.1 Phase I: Planning and Preparation

- (i) Define a clear strategy target for e-Manifest and make a high-level and strong political commitment. The information of e-Manifest could tell the

potential risks which may exist in cargos and vessels, and the process in electronic way would change the current procedures. A clear strategy target would be helpful to achieve the results and balance the trade security and facilitation. In addition, the e-Manifest requires close cooperation among stakeholders from different industries. Strong political commitment could smooth such cooperation, especially when it meets the conflicts.

- (ii) Work closely with the industries of trade stakeholders and maintain constant open and in-depth consultations concerning the enactment of rules. Manifest is one of trade documents which involve in many trade roles in different procedures. It is essential to consult these trading parties engaged in and build a trust mechanism among the stakeholders of private and public sectors. Such regular cooperation mechanism would help identify the issues and solutions related with e-Manifest.
- (iii) Identify the financial requirements and potential availability of funds. This assessment could ensure that e-Manifest and related implementation plan are realistic and practical. Different economies could take more than one tailored funding option.
- (iv) Evaluate the current informationization level and upgrade the ICT infrastructures according to international standards and conventions. There are many instruments including the conventions, standards, and guidelines put forward by the international organizations, especially the WCO, such as the SAFE, Data Model and etc.
- (v) Comply with and optimize practical trade procedures. E-Manifest aims to improve the security of exit and entry for one economy and facilitate the trade procedures. Thus, the rules and relevant implementation of e-Manifest should make the current trade process safer, easier and less costly rather than a revolution for entirely new process. Data and documents should be kept to a minimum.
- (vi) Make an exhaustive plan for implementation based on the domestic reality.

5.2.2 Phase II: Enactment of Laws and Implementation Adjustment

- (i) Set phased goals for different implementation stages and test by conducting pilots. At the primary stage, propagation is important for public sectors to know the exact details of rules and the essential time and steps needed to prepare and change for implementation. At the same time, it is of necessity to set the reasonable time period for adjustment of rules or implementation. Government agencies could consider conducting a temporary test or setting a period for lenient implementation relatively so as to collect the real and full feedbacks from the stakeholders. It is also

meaningful to identify the main issues of the new rules during the implementation.

- (ii) Monitor and evaluate performance and progress regularly. This would help government agencies and private sectors to confirm whether the targets are achieved. Thus, it should be paid more attention to taking useful tools and measures to monitor and evaluate the whole progress regularly.
- (iii) Collect and analyze the feedback from the stakeholders and make adjustments in a timely manner. Based on the cooperation and communication mechanism referred in the previous content, the opinions from the stakeholders including the benefits and difficulties they have met should be collected overall and studied carefully. Those suggestions would figure out the next step for e-Manifest implementation and data exchange, and also wherever the rules still needs to be adjusted.
- (iv) Provide training and technical support, and keep the information transparent and updated among all the parties involved. There are various sized trading companies in different industries with kinds of demands for support. The information about the policy understanding and guidelines for implementation on the official website should be updated in time and regularly. It is also important to be accessed easily. Except for that, the training on site and technical guide for implementation could be integrated with more resources in outer area, such as the software vender, local agency office and even the ambassador overseas.

5.2.3 Phase III: Stable Operation

- (i) Review and evaluate overall and practical performance compared with the core targets set at the beginning.
- (ii) To communicate and share the knowledge and experiences among the domestic and overseas stakeholders. It is also helpful to support other member economies to improve their own readiness and promote the overall supply chain efficiency in APEC region.

5.3 Conclusion

Quality of laws and regulations, quality of declaration process, cooperation and coordination of stakeholders, informatization degree and standardization degree are quite important and influence the performance of e-Manifest exchange readiness of economies and the efficiency of the supply chain. Economies could take some tailored measures according to the different stage the economy is in, to efficiently facilitate the implementation of e-Manifest declaration and management, and improve the readiness for exchanging the

manifest data.

The exchange of manifest data should not be just limited within the trading stakeholders of one economy to improve the performance of e-Manifest mechanism and the efficiency of e-Manifest declaration and management. The exporting and importing side still need to create the same (or similar) set of manifest data separately and submit to the corresponding Customs for the notification of export and import cargos and safety control purpose, which requires duplicated information submitted and influences the smooth moving of cargos and thus the supply chain efficiency. Cross-border e-Manifest data exchange is being paid more and more attention to for reducing the burden of obligators (e. g. carrier, NVOCC) as well as ensuring more accurate information for government agencies at both sides, and it is quite essential to the improvement of global supply chain efficiency.

6 Improve Global Supply Chain Efficiency by Implementing Cross-border Data Exchange

6.1 Prospects of Global Supply Chains

A supply chain is a system of organizations, people, activities, information, and resources involved in moving a product or service from the supplier to the customer. As a result of the development of information technology and globalization, supply chains are not limited to domestic areas but can cover any and all regions. The concept of global supply chain has arisen. Supply chains are linked with value chains. The core to add more value is to improve the efficiency of supply chain. Improving the efficiency of global supply chains necessitates a greater focus on cross-border issues.

Mutual recognition is a broad concept whereby an action or decision taken or an authorization that has been properly granted by one Customs administration is recognized and accepted by another Customs administration.¹⁰ It can create the opportunity to avoid duplication of security controls and greatly contribute to the facilitation and control of goods moving in the international supply chain.

Bilateral or multilateral mutual recognition has been growing among many economies in the APEC region. Canada's Mutual Recognition Arrangements (MRAs) allow government Customs administrations to work together to improve their ability to target high risk shipments while expediting legitimate cargo. CBSA has signed MRAs with U.S. CBP, Japan Customs, Korea Customs Service, and Singapore Customs.

U.S. CBP coordinates with foreign Customs authorities through the recognition in each Container Security Initiative (CSI, which allows CBP working with host government Customs services, to examine high-risk maritime containerized cargo at foreign seaports) regarding how it will clear cargo that has been given a "Do Not Load" (DNL) message. There are currently 58 foreign ports participating in CSI. CBP has office station there and the container security officers work along sides of local Customs in major ocean ports. If a DNL message is issued and the container is in one of the CSI ports, one of the officers can go out and do that inspection pretty quickly, mitigating any risk prior to that being allowed to load on the vessel. DNL can be removed and the container can go on the vessel within 24 hours.

¹⁰ The SAFE Framework, June 2012

Mutual recognition enables Customs administrations to adopt a broader and more comprehensive view of the global supply chain and to eliminate redundant security controls.

6.2 Bottlenecks to Overcome for E-Manifest Data Exchange

6.2.1 Information Transparency

The trade document itself is the tool to exchange and share the information between different stakeholders in different procedures. Manifest is such a document required by Customs to exchange and share the information about the planned and actual status of vessels and cargos among the carriers, NVOCCs, and Customs.

What are the government agencies' development strategies on the international trade? What does the Customs really and mainly target for? How can those goals be reached by the current rules and requirements? How about the effects of those regulations? Most of the countries or regions have not provided an open platform, advisory mechanism or any efficient ways to discuss and share such information in public. Therefore, the trading parties, especially those who are closely related or required to comply with the rules and regulations, always find hard to get those answers.

It started from the 20th century to declare and manage the manifest in electronic way with the development of information technology. This history is not so long to let all the stakeholders understand and implement very well. Since 2002, some countries have begun to issue the new rules of advance manifest declaration. WCO also clarified the relation of security and facilitation in the SAFE report. Different economies have diverse views and foci concerning the balance between the security and trade facilitation. However, there are less direct, frank and efficient channels to have the trade stakeholders get this point.

From the viewpoint of the trade industry, traders, carriers, NVOCCs and freight forwarders all have totally different needs in complicated trade procedures. The essential objective of trade is to finish a deal with less cost and more benefits. The trading communities and related parties would like to see the procedures become more cost-effective and safe with the help of the developing information technology and other tools and skills of management. They worry about that all the government agencies will demand more and more data, regardless of whether it caters to risk assessment or not. The trade stakeholders also wonder the final and real use of the manifest and other related data they submit, since a lot of terms are used differently in different agencies.

During the trade process, every role has different responsibilities. Exporters know clearly about the cargos and most of main data related with trade; carriers know more details about the vessels; port authorities have better understanding about the dispatch schedules; etc. Thus, the access to data is entirely different. In the current rules of most economies, Customs requires collecting more and more data related with manifest from carriers or NVOCCs, including the details of cargos, specific contact information of consignors, etc. which the transmitter probably has no possession of. There are also some special requirements of the data transmitting facilities, which the transmitter may have trouble or difficulties to meet.

However, the government agencies and related public parties lack awareness of the trade industry's desires that Customs seek to get "data from people who have the data" and "design the mechanism to warn early security rather than collect and match all the data". Actually, the worse situation of information non-transparency also exists, and the rule makers even do not know about the exact details and workflows of trade process, the parties who hold and use what kind of data.

All of that could result in less industry support for enacting a new rule and also impede practical implementation of manifest related regulations.

6.2.2 Efficiency of Cooperation and Coordination

Usually, various cooperation mechanisms between government agencies and private parties now are common in most economies. Those mechanisms mainly focus on the opinions sharing routinely or problem coordinating and solving based on a general circumstance. It is rare to build a special group gathering experts or representatives from both public and private sectors to work on one issue, such as manifests. That would cause the inaccuracy of rules making, delay of updating feedback from stakeholders, more cost and time for adjustment, and the practical effects of implementation and management.

Besides, the efficiency of those existing communication mechanisms between the public and private sectors in different economies is not as satisfied as expected by all the stakeholders. It is lack of full representation from every industry involved with manifests and trade. The frequency of such cooperation or communication conventions is kept in same numbers without following the different stages of rules or regulations to be issued and implemented. Furthermore, the attendees in these meetings could not often talk and discuss frankly and freely.

Other supplementary ways or tools to improve and smooth the cooperation, such as the training, information open to the public and etc., have not been utilized fully.

The cooperation relationship among the different trading industries needs to be strengthened. It is lack of cooperation among the traders in different industries on working out the basic and common needs together to comply with requirements related with manifest. The proposals from different industries considering their own characteristics could increase resistance against pushing the rules or regulations reasonable and efficient.

Similarly, there is also space for improving the coordination between different government agencies related with manifest. The data included in the manifest actually is mainly generated from the Bill of Lading and the related dynamic status of transportation vehicles, which are used in many government agencies involved in the trade processes. Currently, when Customs collects the manifest data from carriers or NVOCCs, data sharing or exchange between the government agencies and during trade procedures is insufficient. There is also a lack of a joint scheme to provide low-risk trading entities who participate in trusted trade programs with additional facilitation benefits in customs procedures following manifest declaration, such as reducing the physical inspections or documentary requirements. It is a waste of data resources.

6.2.3 Trust and Recognition beyond Borders

Different economies are on the different stages of manifest management. Most economies have established the declaration and management mechanism of manifest. Several of them use the electronic way to submit and transmit the data, and a few began to carry out the advance manifest rules in recent years. The standards adopted and the definitions followed are quite different, although the WCO and other related international organizations made a lot of efforts to produce many conventions, standards and other related instruments. Those definitions and standards are on the very high level in order for all the different countries to comply with. Even if these economies all comply with those definitions, it does not mean their own definitions in practical are the same. It is the biggest problem for bilateral or multinational cooperation on manifest data sharing and exchange. That is why the actual implementation process across border is very hard and a lot of negotiations are also in discussions.

If two or more than two economies stand on the same ground related with manifest management, there are still gaps to be bridged in terms of mutual recognition of laws and regulations, especially concerning risk assessment and management systems. The risks one economy assesses may be very different from another economy's. It is crucial but difficult to make sure whether they have the same level of interests, and how to solve the differences beyond the border efficiently.

6.2.4 Security

The disputes between the public and private sectors on the extent to share or exchange manifest data exist all the time. For traders, the manifest contains the transaction details which are the commercial secrets; for carriers, their customers' information are also included in the manifest data; for the government agencies, the statistics of trade manifest shows the real general trade volume of one economy. Therefore, the manifest data is always sensitive in whatever sides. The key hurdle to overcome is how to determine what is rightful, compliant and reasonable manifest data content for sharing or exchange as well as who can access, use and transmit the data.

Data backup is another crucial and tough issue to solve. It is comparatively easy to keep the data safe within the fixed person, way of use and purpose in one nation. However, if it comes to agreement on sharing and exchanging manifest data among different parties across border, the risk to be attacked and disclosed by data hacker would be increased and the consensus on the a safe level of backup is also hard to be reached among different economies.

6.2.5 Compatibilities between Different ICT Levels

The large company such as the big shipping company commonly has integrated its own system to generate and transmit data over its global branch offices. During the manifest declaration, people only need to click one button, and the system could automatically send the manifest data required to the Customs system connected or even to the local offices or their shipping agencies overseas to finish the manifest data declaration. While the small and medium enterprises as small shipping companies, NVOCCs or freight forwarders have no such systems or infrastructures. The ordinary ways they deal with are via paper, fax, telephone or laptops with internet. They have to invest more money to buy the software and train their employees to learn how to log on and use the Customs official website or systems. Many Customs appoint the service providers to help SMEs facilitate the declaration process. It is also for the security reasons on the other hand. In this case the SMEs need to afford more cost, time and labor as well.

The integration is not enough to meet the demands for the internal systems of the government agencies. Apart from a few economies which have a Single Window or similar integrated platform, most economies have developed and implemented new systems for manifest declaration and management. Carriers and other data filers need to report not only the new data elements with the trade transaction process just happened but also the main data elements repetitively which may be transferred or collected from other related procedures. Moreover, the standards and languages used in different

government agencies systems are not uniform. It is also lack of choices available for different data filers to report data conveniently. Furthermore, that could also create barriers to bilateral and/or multinational data sharing and to seamless data exchange with different ICT infrastructures.

6.3 Recommendations

6.3.1 Co-research the Feasibility of E-Manifest Exchange among Stakeholders of Member Economies in the APEC Region

Through this research, there is still space to improve the readiness to exchange e-Manifest data among trading stakeholders wherever domestically and abroad. With the advance manifest declaration rules considered and proposed by more and more economies, the demands are increasing for acquiring the manifest data submitted directly from more stakeholders in the trade supply chain such as exporters in trading partner economies. The same demand from the export side is relatively less since most economies encourage exporting and put little restrictions on exit.

It is suggested co-studying in APEC region on whether there is any chance to exchange the manifest data or even an e-Manifest document among the stakeholders according to the roles in the trade process along with the trade supply chain happening rather than only between the corresponding parties in the same or similar role. It may reduce the current additional procedures for government agencies to collect and cross check the manifest data about the cargo and other related information from the importers who also need preparing and collecting data from the exporting parties.

Firstly, be aware of and identify the exact level of readiness to exchange e-Manifest nationwide based on the analysis of the laws and regulations, ICT infrastructure, standards and other conventions, process and procedures, coordination and cooperation. Then, share and discuss the evaluation results among member economies and cooperate on designing a reasonable and practical model for bilateral or regional exchanging of e-Manifest. Moreover, the phased plans for trial and implementation are also essential issues to discuss.

6.3.2 Establish Multilateral Public and Private Dialogues and Information Sharing Mechanisms

The targets for both facilitation and security by e-Manifest declaration and management all demand the involvement of private and public sectors. The

good communication mechanism could help solve the tough parts during the coordination and cooperation among the stakeholders representing different interests and requirements.

Escalate the current cooperation by establishing common vision and a roadmap on e-Manifest exchange. Through the joint training and seminars, keep the information transparent in public and private sectors and enhance mutual or multilateral understanding on the targets and practical implementation progress. Bridge the gaps and lay a foundation by entering into Bilateral Framework and setting up the working groups to push the conception on paper into the practical case.

6.3.3 Start with Practical Pilot Projects and Carry Forward

E-Manifest exchange is a bilateral term which needs time and money to fulfil a win-win harvest. The most tough and time-consuming issue is recognition and trust on the same ground beyond the borders. The feasible way would be to start small and practical pilot projects. For instance, choose one port from each nation or one area in the sub region which has large trade volume with each other. Then take the understanding of the rules and implementation status as the first step through the officer exchange programme and etc. Then design and test the tailored model for exchanging e-Manifest data by using some finished transactions between the trial ports. That model could be to unify the exporting data to produce the report for the export manifest declaration and the import manifest declaration transmitted directly or indirectly by the service providers to the import Customs and other related government agencies to crosscheck at the same time.

Equally, promoting those beyond border initiatives into long-term programs or cooperation is the real core of achievement. The strong and sustainable political willingness would give adequate support on infrastructure development, fund investment, training provided and efficient coordination.

6.4 Conclusion

Supply chains are often linked with value chains. To improve the efficiency of supply chain could produce more values. That is why cross-border issues are crucial to global supply chain. Better bilateral or multilateral mutual recognition enables stakeholders to adopt a broader and more comprehensive view of the global supply chain and to eliminate redundant security controls. However, e-Manifest data exchange asks for more wisdom and power to cross the barriers existing in information transparency, cooperation and coordination efficiency, trust and recognition beyond the borders, security and compatibilities between different ICT levels.

Thus, it is suggested in the future research launching joint-study on the feasible models or ways to exchange manifest data or even an e-Manifest document among stakeholders of member economies in APEC region, including multilateral cooperation or dialogue mechanism, even the physical infrastructure or platform construction etc.. Considering the practical impelling steps, a good start could begin from setting up a concrete workgroup formed by experts from APEC member economies in global trade supply chain and its facilitation field under the umbrella of public and private partnership cooperation and dialogue mechanism. Through regular meetings and supplementary workshops or seminars, work on the core issues covering legal framework, interconnectivities, standards and PKI mutual recognition, keep the information transparent and suggestions constructive between public and private sectors of APEC members, and enhance mutual or multilateral understanding on the targets and practical implementation progress.

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Appendix 1: Case Study Report

The United States

People's Republic of China

Republic of Korea

Appendix 2: Questionnaires (template)

Appendix 1: Case Study Report

In this appendix, three separated case study reports of the United States case, People's Republic of China case and Republic of Korea case are attached.

The United States is an example of a relatively mature advance e-Manifest regime, which has been in operation in one form or another since the early 2000s. As of 2014 the process and technical solutions for e-Manifest are very well established and the government's system is reported to operate very smoothly. China has been implementing e-Manifest since 1990s and issued new measures of administration of manifests on advance declaration which took effect on January 1, 2009. The new advance declaration measures are now in the transit period to be implemented nationwide. In Republic of Korea, Korea Customs Service (KCS) implemented Export Cargo Management System and Import Cargo Management System in 1997 and 1998 respectively. Korea Trade Network (KTNET), a customs network service provider, has developed a Manifest Consolidation System (MFCS) which helps community to consolidate manifest and share related information among the customs clearance chain. International trade and logistics community in Korea has greatly welcomed the Introduction of e-Manifest system and enjoyed the benefits of it. However, recent change of the regulation requiring advance filing of Manifest are becoming a challenge as the business practice and supporting system are not mature enough to follow the change. Advance filing to maritime import cargo has been planned but not executed for years. These three case study reports may provide helpful models for other member economies at different stages of e-Manifest program development.

The case study reports specify the laws and regulations related to e-Manifest, workflow and procedures of manifest declaration, ICT environment, standardization environment, commercial environment and relevant suggestions on the optimization of e-Manifest mechanism of these three typical countries, to provide practices of e-Manifest implementation.

In particular, Business Process Analysis (BPA) method has been used to analyze manifest declaration and management processes. BPA has been developed by UNESCAP/UNECE/UNNEXt in its "Guide to Business Process Analysis to Capture and Simplify Trade Procedures". It is drawn based on Unified Modeling Language (UML) which focuses on modeling business processes with two types of UML diagrams: the use case diagram and the activity diagram. The use case diagram illustrates the high-level business processes and actors associated with each of them, which shows the scope of the business process analysis project; the activity diagrams with process descriptions are then drawn as elaboration of each business process listed in the use case diagram to show the specific procedures and documents required

and information flows throughout the business process. BPA is used to understand the current situation, benchmark with other economies, raise issues and priorities for improvement and as a stepping stone for the creation of future better processes. To compare the procedures of e-Manifest declaration and management of these three economies, on the basis of manifest implementation situation, the whole process is divided into: 1) For import, four boundaries-Before Loading, Before Departure, After Departure, and After Arrival; 2) For export, three boundaries-Before Loading, Before Departure, and After Departure. The use case diagram and activity diagrams of each case study will be drawn under the process division to benchmark with each other.

I. The United States Case Study

1. Executive summary

The United States (US) is an example of a relatively mature advance electronic manifest (e-Manifest) regime, which has been in operation in one form or another since the early 2000s. This quick adoption was driven by border security concerns arising from the 2001 9/11 attacks on the US.

Although the US trade community initially expressed great concern in the 2000s about the additional costs and logistics challenges raised by requirements for advance e-Manifest filing, as of 2014 the process and technical solutions for e-Manifest are very well established and the government's system is reported to operate very smoothly. In fact some members of the trade community report that advance e-Manifest filing provides benefits in terms of greater efficiency and visibility in import/export processes.

Focusing on ocean trade, this case study seeks to explore the background of e-Manifest filing in the US, the development and characteristics of the government's e-Manifest system, step-by-step descriptions of e-Manifest and related filing procedures for imports/exports, a review of stakeholders' practical experiences and suggestions concerning e-Manifest, and recommendations that could further enhance e-Manifest in the US and in other APEC economies. Recommendations are based on data and feedback gathered by the research team through interviews with a variety of government and industry stakeholders in the US and a review of relevant informational documents produced by the US government and companies which conduct e-Manifest filing processes.¹

The successful U.S. e-Manifest implementation may provide a helpful model for other economies at earlier stages of e-Manifest program development. Given the variance in technical resource availability and trade/security characteristics among economies, not all lessons learned will be universally applicable, but some such as maintaining close communications with the trade community should be a key aspect of any economy's program.

Despite general consensus among government and industry stakeholders about the effective operation of e-Manifest processes in the US, some obligators urged enhancements in import and export processes to promote greater automation, visibility, support, and standardization that could optimize

¹ These companies, including carriers and non-vessel operating common carriers (NVOCC), are also labeled as "obligators of manifest declaration" in this case study.

efficiency. Key concerns include the elimination of the few remaining paper-based reporting requirements, greater visibility of cargo status for non-vessel operating common carriers (NVOCC), and greater standardization of reporting requirements across the APEC region.

To address these and related challenges, and to support the general advancement of e-Manifest practices in the APEC region, the following key actions are recommended:

- (i) Up-to-date instructional documentation and support staff should be made readily accessible to help new obligators learn how to do e-Manifest filing and stay on top of any procedural changes.
- (ii) Economies should seek to eliminate paper-based reporting and implement single window systems to enable efficient submission of manifest information to all interested parties.
- (iii) Cargo release information should be made available at the house bill of lading level so that NVOCCs do not need to wait for master bills to be released.
- (iv) A common e-Manifest exchange for the APEC region should be considered as a long-term goal to streamline manifest submission processes. In the near term, standardization across the APEC region of the types and timelines of data flows required for e-Manifest should be pursued as much as possible to simplify data collection and submission for obligators.

2. US Ocean Manifest Environmental Analysis

This chapter describes the key characteristics of ocean manifest submission activities in the US, including regulatory oversight, the development of e-Manifest solutions, and current usage trends.

2.1 US Ocean Manifest Declaration Oversight

2.1.1 Key Organizations for Ocean Manifest Declaration Oversight

The US Customs and Border Protection (CBP), part of the Department of Homeland Security (DHS), is the primary agency responsible for ensuring the smooth and secure flow of trade through all ocean, land, and air US ports of entry (POEs). Within CBP, the Office of International Trade is responsible for overseeing policies and programs governing the entry of goods into the US, and the Office's Automated Commercial Environment (ACE) Business Office works directly on issues concerning the development and deployment of e-Manifest-related capabilities through the ACE

Chart 2.1: CBP Logo



platform, through which all ocean manifest declarations have been made since 2012.

CBP’s policies with regard to US imports are designed to:

- Facilitate the smooth flow of imported cargo through US ports of entry. In Fiscal Year (FY) 2013,² CBP processed \$2.38 trillion in trade and nearly 25 million cargo containers³
- Enforce trade and customs laws designed to protect US consumers and business and to collect customs revenue. In FY2013 CBP collected \$42.5 billion in revenue, a six-percent increase over the \$39.4 billion in revenue collected in the previous year⁴
- Enforce import security laws designed to prevent weapons of mass destruction, illegal drugs, and other contraband from entering the United States

CBP emphasizes a risk management approach that segments importers into higher and lower risk pools and focuses trade enforcement and import security procedures on higher-risk imports, while expediting lower-risk flows. CBP’s “multi-layered approach” means that security screening and enforcement occur at multiple points in the import process, beginning before goods are loaded in foreign ports (pre-entry) and continuing after the time goods have been admitted into the US (post-entry).

Many CBP policies have significant implications for national security, and thus they often receive close scrutiny from the US Congress. Congress plays an active role in organizing, authorizing, and defining CBP’s international trade functions, as well as appropriating funding for and conducting oversight of its programs.

2.1.2 Legal Environment Pertaining to Maritime Import/Export Reporting

The following key regulations established the current US requirements for sending e-Manifest and importer security filings to CBP.⁵

Table 2.1: US Government Regulations for Ocean Manifest Reporting

Regulation	Function
Trade Act of 2002	The Trade Act of 2002 authorized appropriations for the ACE system, and required that importers and exporters submit advance cargo manifest information prior to cargo arriving at a US POE. CBP uses this advance cargo information to conduct risk-based targeting through the

² The US fiscal year runs from October 1 to September 30 of the following year

³ R. Gilkerlikowske, “Written testimony of CBP Commissioner R. Gil Kerlikowske for a House Committee on Appropriations, Subcommittee on Homeland Security hearing on CBP’s Fiscal Year 2015 Budget Request” (2 April 2014).

⁴ Ibid

⁵ “Frequently Asked Questions 24-hour Advance Vessel Manifest Rule,” CBP (16 December 2003).

	Automated Targeting System (ATS).
Security and Accountability for Every Port Act of 2006 (SAFE)	SAFE authorized cargo to be screened through ATS and further authorized DHS to require advanced electronic cargo data as needed to improve ATS targeting. Section 203 of the SAFE Ports Act requires maritime vessels to submit Importer Security Filings (ISF) and Additional Carrier Requirements. SAFE also authorized the Customs-Trade Partnership Against Terrorism (C-TPAT), a voluntary program that allows certain trade-related firms to be certified by CBP as having secured the integrity of their supply chains and therefore face a lower risk of inspections.
19 Code of Federal Regulations (CFR) §4.7 - 19 CFR 4.7 - Inward Foreign Manifest; Production On Demand; Contents And Form; Advance Filing Of Cargo Declaration	This rule stipulates the following: “...CBP must receive from the incoming carrier... the CBP-approved electronic equivalent of the vessel's Cargo Declaration (CBP Form 1302), 24 hours before the cargo is laden aboard the vessel at the foreign port... The electronic cargo declaration information must be transmitted through the CBP Automated Manifest System (AMS) or any electronic data interchange system approved by CBP to replace the AMS system for this purpose.” ⁶

Concerning the CBP-approved AMS system mentioned in 19 CFR 4.7, this role was originally played by CBP’s Automated Commercial System (ACS) for imports and the Automated Export System (AES) for exports. As noted above, in 2002 the Trade Act of 2002 authorized funding for the development of a new and more flexible and advanced system called ACE. Since then CBP has gradually worked to transition ACS and AES functionality to ACE. As of September 2012 all e-Manifest filing for ocean imports is conducted through ACE, and a pilot program for e-Manifest filing for ocean exports is expected to begin through ACE in January 2015.⁷

2.1.3 Impact and Benefits for E-Manifest Participants

(1) Security Benefits for Government

The ACE and AES programs are designed to promote seamless trade processing and collection of duties, taxes, and fees and to increase national security through accurate, available data. The dramatic streamlining and automation of formerly paper-based functions for processing of imports and resulting flow of detailed trade data has enabled CBP’s Partner Government Agencies (PGA) to take more regular and effective regulatory enforcement actions.

⁶ “19 CFR 4.7 - Inward foreign manifest; production on demand; contents and form; advance filing of cargo declaration,” Electronic Code of Federal Regulations (1 April 2014).

⁷ “CBP Update on ACE: Your Exports & AES Questions,” Integration Point (22 July 2014).

One such PGA example is the US Department of Agriculture (USDA) Food Safety and Inspection Service (FSIS), which reported that identification and control of illegal and ineligible agricultural products have increased as a result of access to international trade data found in ACE. Since its initial access to ACE in 2006, the amount of ineligible imported product intercepted annually rose from 97,000 pounds in FY 2005 to 3.6 million pounds in FY 2008.

Another example is the Consumer Products Safety Commission (CPSC), which has been testing a risk assessment pilot system utilizing data from ACE. By providing risk-scored information in near real time, CPSC staff has been able to coordinate more effectively and in 2012 stopped 3.6 million hazardous imported products from entering the US marketplace, more than twenty times the number of products identified by CPSC in 2007.⁸

(2) Efficiency Benefits for Obligators

Table 2.2 below lists benefits that CBP ascribes to e-Manifest filing through the ACE platform.

Table 2.2: Benefits of ACE Promoted by CBP⁹

System	Benefits
ACE	<ul style="list-style-type: none"> • Reduces paperwork for carriers by eliminating the paper manifest and decreasing the number of discrepancy reports and in bond documents. • Improves communication with CBP, leading to a shorter holding time for imported cargo. • Carriers, port authorities, and service bureaus can use e-Manifest data to facilitate functions such as accounting, billing, community delivery notification, and traffic control. ACE supports over 125 customizable reports providing access to CBP manifest, cargo, entry summary, finance, and compliance data. • Enables monthly, interest-free payment of duties and fees.

The industry perspective on the benefits of e-Manifest filing is not as solidly positive. Carriers, which are responsible for the master bill of lading, and non-vessel operating common carrier (NVOCC), which are responsible for house bills of lading, describe e-Manifest primarily as an additional burden and expense. However, costs aside, many obligators express overall satisfaction with the current US system for manifest declaration and appreciation for the extensive support that CBP provides to make the system work smoothly and reliably.

For carriers the ACE system represents a big improvement over the previous AMS system, because when there is problem with a manifest declaration the ACE system provides a very clear message to the carrier about what the

⁸ "ACEopedia," CBP (February 2014).

⁹ "Customs Automated Manifest Interface Requirements – Ocean ACE M1," CBP, November 2010.

problem is so that the carrier can fix it. Previously the carrier would only receive a hold message for CBP with no details, so they had to call CBP to find out what the problem was.¹⁰

Now that ACE is well established, the trade community would like to see the system optimized to provide greater opportunities for filing efficiency and visibility. For example NVOCCs are eager for ACE to support e-Manifest declarations for exports as this would benefit provide clearly documented proof of export that could be shared with clients. Currently a commodity filing can be done electronically for exports which provides schedule information about the ship's planned voyage. However, there is no documented confirmation of the ship actually leaving port. Enabling export e-Manifest would provide this proof.¹¹

2.1.4 Challenges Faced by CBP

Some US importers and some members of Congress have criticized CBP for prioritizing import security and trade enforcement over trade facilitation. For example, some participants in CBP's voluntary "trusted trader" programs such as C-TPAT argue that the benefits CBP provides to participants do not adequately justify the effort and expense of participation, which requires certification of their supply chains with CBP.¹²

In recent years questions were also raised about the "customs modernization" process through which the ACS system is being phased out in favor of the newer ACE system, a process which has taken much longer than expected and has substantially exceeded its original cost predictions. \$3.2 trillion had been spent on ACE development and deployment through January 2014.

However by late 2012 the transition from ACS to ACE was finally completed for all ocean cargo import reporting and the similar transition from AES to ACE for ocean cargo export e-Manifest filing is expected to begin in 2015. Based on planned appropriations, CBP expects to have sufficient funding to complete core trade functionality enhancements to ACE by the end of 2016, using Agile development to develop and deliver features iteratively and incrementally.

2.2 ICT Environment and E-Manifest Exchange Profile

2.2.1 Overview

24 hours before loading at a foreign port, carriers and NVOCCs submit electronic cargo manifests and other shipment data to CBP. Originally this information was submitted through CBP's ACS system, but in recent years this role has been shifting to ACE. CBP uses this advanced filing data to pre-clear cargo for admission, facilitate inflows, and target certain cargo for import

¹⁰ Interview with Orient Overseas Container Line (OOCL)(carrier) October 2014

¹¹ Interview with BDP International (NVOCC) October 2014

¹² Emmanuel Brunet-Jailly, "Beyond the Border Action Plan – A Context," *Canada-United States Law Journal* (March 2013): 275-283.

security and trade enforcement. Cargo may be subject to import security scanning and inspections in foreign ports prior to being loaded on US-bound ships and/or upon arrival at a US POE.

ACS began operating in 1984 and relies on old mainframe computer hardware and software factors which reportedly limit functionality and reliability. On the export side, the AES system was launched in 1996.

Chart 2.2: ACE Logo



CBP began ACE development in 2001 to begin replacing ACS. CBP's eventual goal is to completely replace ACS and AES with ACE to provide a single point-of-access and data management system covering the entire trade process for all US importers and exporters. On September 29, 2012, ACE became the only CBP-approved Electronic Data Interchange (EDI) for submitting ocean e-Manifests for imports. According to CBP, ACE will begin to support e-Manifest filing for exports in January 2015, starting with a pilot program for air cargo.

According to CBP's office of legislative affairs, as of August 2014 more than 23,000 importers, brokers, and carriers had established ACE trade user accounts¹³; and more than 68% of import duties and fees were being collected through ACE monthly statements.

2.2.2 Current Process Flows for Maritime Import/Export Reporting and Related Technology

(1) Imports

1) Overview

ACE is both an electronic imported merchandise inventory control system and a cargo release notification system, intended to speed the flow of cargo by eliminating the paper manifest and decreasing the number of discrepancy reports and in bond documents. ACE is interactive with other systems such as Automated Broker Interface (ABI)¹⁴ and the Cargo Selectivity system.¹⁵

ACE allows CBP to place and remove holds against bills of lading, specific containers, or entire manifests. It also allows designated PGAs such as the Food and Drug Administration (FDA) or Environmental Protection Agency (EPA) the ability to place holds or request that CBP place holds on their behalf. Holds prevent the carrier from releasing merchandise to the importer until the carrier has received hold removal notifications through ACE. An entry may be

¹³ "CBP - Automated Commercial Environment," last modified August 31, 2014, <https://itdashboard.gov/investment?buscid=314>.

¹⁴ ABI is the means by which brokers or importers, port authorities, and independent service bureaus transmit entry and release data electronically to CBP.

¹⁵ The Cargo Selectivity System is used to sort high risk cargo from low risk cargo and to determine the type of examination required. Cargo selectivity accepts data transmitted through ABI and compares it against established criteria. Automated Manifest System (AMS) or National In-bond entries processed through the Cargo Selectivity system are automatically posted to the appropriate bill of lading.

processed and the merchandise released by CBP, but the carrier cannot deliver that merchandise if a hold is present.

For the obligator of declaration, e-Manifest filing can be achieved through ACE via one of two primary methods:

- The obligator can purchase a software and communications package from a software vendor which will set up the required interface software. The obligator will have to be certified in ACE prior to submitting actual manifest data.
- The obligator can program its own software interface. This also requires ACE certification prior to submitting actual manifest data.

Direct participation in ACE requires that the obligator, whether the carrier or NVOCC, have a computer system capable of transmitting data to and receiving data from the CBP Data Center. ACE is designed to use standard technology readily available to large and small businesses.¹⁶

2) E-Manifest Filing Process

- (i) The carrier must transmit e-Manifest data to ACE 24 hours before cargo is laden aboard the vessel at a foreign port. Electronic manifests are forwarded to CBP's ATS, an Intranet-based enforcement and decision support tool. CBP officers screen imports by comparing cargo and conveyance information against intelligence from CBP's National Targeting Center (NTC) and other intelligence and law enforcement databases.
- (ii) In addition to the manifest, maritime vessels carrying container cargo must submit to ACE the Importer Security Filings (ISF) and Additional Carrier Requirements known collectively as "10 + 2" filings, as seen in the table below, which include ten data elements to be submitted by importers of record or a third party service provider such as a customs broker, plus two data elements to be submitted by carriers. Bulk cargo is exempt from these requirements, and break-bulk cargo requires only the ISF.

Table 2.3: Importer Security Filing Data

Importer
1. importer of record number
2. consignee number
3. seller name and address
4. buyer name and address
5. ship-to party name and address
6. manufacturer (supplier) name and address
7. country of origin
8. Harmonized Tariff Schedule (HTS) 6-digit classification

¹⁶“Customs Automated Manifest Interface Requirements – Ocean ACE M1,” CBP, November 2010.

9. container stuffing location
10. consolidator (stuffer) name and address
Carrier
1. the vessel stow plan ¹⁷
2. daily messages with information about any changes in container status

- (iii) The first eight importer data elements must be provided 24 hours prior to lading of the goods on a vessel. Information on the stuffing location and the consolidator must be filed as soon as possible, but no later than 24 hours before arrival in the United States. The bill of lading number is also required so that the ISF filing can be matched with the manifest. Regarding the carrier data, the vessel stow plan must be provided no later than 48 hours after departure, and container status messages must begin within 24 hours of creation or receipt of the container.

Vessel stow plan information is used primarily to identify unmanifested containers prior to arrival into the US. Vessel stow plans are also used to identify the specific physical location of dangerous goods and other high-risk containerized cargo aboard vessels. Container status messages are used to track the physical movement of cargo containers as they move through the supply chain.

As with e-Manifest filings, the obligator can use a third party service to transmit 10+2 data on their behalf or to develop a direct interface between with CBP using an approved ABI software provider.

- (iv) If the cargo declaration is received late or contains invalid entries then CBP will issue a “Do Not Load” message to the importer. CBP will coordinate with foreign Customs authorities in each Container Security Initiative (CSI)¹⁸ and non-CSI port regarding how it will clear cargo that has been given a "do not load" message. Foreign governments will perform inspections at CSI and non-CSI ports. Immediately after the foreign government notifies CBP that the shipment is cleared, CBP will remove the “do not load” message in ACE.

Furthermore CBP can issue monetary penalties of up to \$1 million to the carrier for each egregious violation of timeliness or invalid cargo descriptions under 19 US Code § 1436 – “Penalties for violations of arrival, reporting, entry, and clearance requirements”¹⁹ and to the NVOCC under

¹⁷ The vessel stow plan includes the vessel name, including international maritime organization (IMO) number; vessel operator; and voyage number.

¹⁸ CSI allows CBP working with host government Customs Services, to examine high-risk maritime containerized cargo at foreign seaports, before they are loaded on board vessels destined for the United States. There are currently 58 foreign ports participating in CSI.

¹⁹ “19 U.S.C. 1436 - Penalties For Violations Of Arrival, Reporting, Entry, And Clearance Requirements,” last modified 2011, <http://www.gpo.gov/fdsys/granule/USCODE-2011-title19/USCODE-2011-title19-chap4-subtitleIII-partII-sec1436/content-detail.html>.

19 Code of Federal Regulations (CFR) 113.64(c) "International carrier bond conditions"²⁰ and 19 CFR 4.7(b) "Electronic passenger and crew arrival manifests"²¹ and/or 19 CFR 4.7a(c) "Inward manifest; information required; alternative forms."²²

- (v) Once the manifest is on file, CBP sends an acceptance message to the carrier, NVOCC, port authority, or service bureau informing that confirms receipt of the manifest data. CBP will later also send Status Notification messages containing entry, examination, and release information for each shipment.
- (vi) The carrier can amend manifest data electronically during the layorder period²³ and throughout the online life of the bill of lading record. Carriers are not, however, exempt from regulatory provisions governing manifest amendments and may be subject to penalty for late filing. The 10+2 filing must be amended if there is a change or more accurate information becomes available before the goods enter the port of first arrival in the US.
- (vii) The CBP Cargo Selectivity system may designate a shipment for an intensive examination. An electronic release notification is transmitted immediately after examination results have been input.²⁴

(2) Exports

1) Overview

AES is a joint venture between CBP, the Foreign Trade Division of the Census Bureau (Department of Commerce), the Bureau of Industry and Security (Department of Commerce), the Directorate of Defense Trade Controls (Department of State), other federal agencies, and the export trade community.

AES is the central point through which export shipment data required by multiple PGAs is filed electronically to CBP via EDI. AES was designed to assure compliance with and enforcement of laws relating to exporting, improve trade statistics, reduce duplicate reporting to multiple PGAs, and improve customer service.

Currently AES functions are in the process of being integrated into the ACE platform. Beginning 1 May 2015 all electronic export e-Manifest data must be

²⁰ "19 CFR 113.64 - International Carrier Bond Conditions," last modified April 1, 2012,

<http://www.gpo.gov/fdsys/granule/CFR-2012-title19-vol1/CFR-2012-title19-vol1-sec113-64>.

²¹"19 CFR 4.7b - Electronic Passenger And Crew Arrival Manifests, " last modified April 1, 2012,

<http://www.gpo.gov/fdsys/granule/CFR-2012-title19-vol1/CFR-2012-title19-vol1-sec4-7b/content-detail.html>

²² "19 CFR 4.7a Inward manifest; information required; alternative forms," last modified April 1, 2012,

<http://www.gpo.gov/fdsys/pkg/CFR-2012-title19-vol1/pdf/CFR-2012-title19-vol1-sec4-7a.pdf>

²³ The layorder period is the period of time a cargo shipment may remain on the dock after discharge without an entry before it is consigned to CBP storage.

²⁴"Customs Automated Manifest Interface Requirements – Ocean ACE M1," CBP, November 2010.

transmitted via ACE.²⁵

On January 2014 a pilot program was announced for the Advance Export Information (AEI), which similar to the 10+2 rule for imports, will require the filing of 10-12 data elements pre-departure with the remaining data elements to be filed 5 days after departure/export. AEI functionality will be enabled in the new ACE platform after the pilot is successfully completed.²⁶

AES offers options for transmitting export shipment data. The following may be used:

- Software developed by the user
- Software purchased from a vendor
- AES Direct, a free internet application supported by the Census Bureau

CBP and the Census Bureau support AES participants by providing user assistance. When a company decides to join AES it must send a Letter of Intent to the Census Bureau. Upon receipt of the letter, a CBP Client Representative and a Census Bureau Client Representative will be assigned to serve as the company's technical advisor during development, testing and implementation.

As of August 2013, four ocean carriers were enrolled in CBP's AES Vessel Transportation Module (or VTM), which enables participants to file export manifests to CBP via EDI transmissions. Other ocean carriers can file their export manifests electronically (via email) to CBP as part of the ACE Export DIS (Document Imaging System) pilot project.

2) AES filing process

- (i) The export process begins when the exporter or its authorized agent makes shipping arrangements (booking) with the carrier.
- (ii) The exporter or the authorized agent transmits the commodity Electronic Export Information (EEI) information to CBP using AES. This information can come directly from the exporter or the authorized agent or through a service center or port authority. AES returns an Internal Transaction Number (ITN) as confirmation that the export documentation has been successfully filed.
- (iii) AES validates the data against editing tables and PGA requirement files and generates a confirmation message or error messages back to the filer.
- (iv) The carrier transmits the Receipt of Booking message when the booked cargo is received and the departure message following the actual departure of the vessel.

²⁵ William Delansky, "Export Processing In ACECESAC/MMM Session," CBP, March 18, 2014.

²⁶ Ibid

- (v) Within ten calendar days after departure, the carrier will transmit the entire export manifest electronically using AES. AES also validates the transportation data then generates either a confirmation message or an error message.
- (vi) Any error messages generated by AES must be corrected and the corrections transmitted to AES.

(3) Data Formats and Confidentiality

The following formats can be used for communication with ACE and AES:

- ANSI X.12
- CBP proprietary formats (Customs Automated Manifest Interface Requirements (CAMIR))
- Current ABI and ACE participants can use their existing mainframe connections for AES

E-Manifest and ISF data is treated as law enforcement sensitive when received by CBP because it is used for national security targeting purposes, and also may be considered confidential commercial information (subject to the Trade Secrets Act which prohibits the unauthorized disclosure of confidential commercial information). Therefore, CBP could claim the applicable legal exemptions to withhold this information from public disclosure even if requested under the Freedom of Information Act (FOIA), unless authorized by law or required by a court order. Any personally identifiable information collected by CBP is held securely with restricted access on a need to know basis in accordance with the Privacy Act.²⁷

2.2.3 E-Manifest Data Sharing with Other Economies

Currently ACE does not share e-Manifest data with other economies, in part due to differences in data requirements and electronic data formats across borders. CBP has indicated interest in exploring the development of a common platform for Customs administrations in different economies to share information and provide advance notice of risky shipments. This would reduce reporting costs for obligators and increase security.

For example, in the hypothetical situation that a Chinese company is exporting to the US, it would reduce costs if CBP could obtain the company's e-Manifest data reported to authorities in China instead of requiring the company advance filing of import data. However, a reciprocal arrangement might require CBP to send US companies' e-Manifest data to other economies, and such an action would require compliance with applicable US privacy laws and applicable

²⁷ "New Requirements for Maritime Cargo Carriers and Importers," CBP (2009).

agency policies.²⁸

2.3 Standardization Environment

Trade facilitation has been a priority issue for the United States and its international partners in organizations such as the World Trade Organization (WTO) and the World Customs Organization (WCO), and in free trade agreement negotiations (FTAs). The US and other WCO members are actively engaging in trade facilitation efforts, especially through encouraging the use of electronic systems to expedite the clearance of merchandise entries and to ensure effective customs controls.

- US officials are leading international efforts to implement WCO-developed best practices such as “single window” data systems so that importers can enter data, and multiple cross-border regulatory agencies can use the “window” to clear merchandise entries, as well as transportation carriers, equipment, and workers. The main standards being used by WCO are the web services EDI and XML.²⁹
- Import security also has become an important feature of international efforts, and the United States and its partners in the WCO have adopted new security protocols for tracking, inspecting, and screening containerized imports and exports.

Within the US, CBP’s standardization efforts have been focused on the development of the International Trade Data System (ITDS), which is being implemented through ACE. ITDS is an intergovernmental project to coordinate and standardize the collection of trade enforcement data by all federal PGAs that play a role in trade enforcement.

Chart 2.3: ITDS Concept Image



The goal is to build a “single window” for the electronic collection and distribution of standard government-wide import and export data for the use of PGAs with a role in trade enforcement such as the FDA or EPA. Under section

²⁸ “Report to Congress on the International Trade Data System,” CBP (December 2013).

²⁹ “Working towards the implementation of Single Window within APEC Economies,” Australian Customs Service (June 2007).

405 of the SAFE Port Act, all federal agencies that require documentation related to the importation or exportation of cargo are required to participate in the ACE once ITDS is fully operational. As of August 2012, 47 PGAs were involved in ITDS implementation, with the Treasury Department coordinating interagency participation and CBP responsible for building and managing ITDS.

On the international front, the SAFE Port Act requires the ITDS Board of Directors to ensure that the ITDS data requirements are also compatible with the WCO Data Model, which consists of standardized data requirements, data definitions, reporting codes, and “messages” for transmitting data from traders to governments. The WCO messages are a version of the UN/EDIFACT Customs messages (CUSCAR, CUSDEC, etc.) which are the functional equivalent to the entry, entry summary, and manifest messages currently required by CBP.

The current ITDS Standard Data Set conforms in part to WCO standards. CBP has recently worked with WCO and Canadian authorities to review the compatibility of ITDS data requirements with the WCO data model. However, CBP has not yet undertaken steps to implement the WCO standard messages within ACE. Implementation of WCO message standards is being considered after all other ACE functions are completed.³⁰

2.4 Commercial Environment

Despite the time and cost of complying with e-Manifest and ISF, obligators now see these rules as an opportunity to optimize inefficient business processes in their global trade management operations and create competitive advantages. For example, an industry rule of thumb estimates that the cost of each additional day in transit is equal to half of one percent of the value of goods. Improving supply chain speed by just one day would be worth \$500,000 per year for a company importing \$100 million annually. Thus, the challenge for US obligators is to maximize the potential benefits of ISF, while minimizing supply chain cost and disruption.

CBP estimates that the increase in costs of imported shipments as a result of ISF compliance will range between \$48 and \$390 per shipment, or between 0.13 and 1.03 percent of the value of the shipment. CBP estimated that the total annualized costs to the trade for 2009 to 2018 of this rule to be between \$890 million and \$6.6 billion at a 3-percent discount rate and between \$990 million and \$7.0 billion at a 7-percent discount rate.

Determining the best or most efficient process for providing the e-Manifest and ISF data to CBP remains a complex decision for obligators. Many software providers offer different solutions, although core functionality is typically similar. Some are stand-alone packages with just the basics to be in compliance.

³⁰“Report to Congress on the International Trade Data System,” CBP (December 2013).

Others are large, costly applications embedded with Customs Brokerage and Inventory Tracking solutions.³¹

In response to requests from the trade community, the Office of International Trade has assembled a list of companies/persons including Service Centers, Port Authorities and Software Vendors that offer ACE e-Manifest ocean data processing services to the trade community. Popular major vendors in this expanding market include Crimsonlogic, Descartes, and TradeTech.³²

3. Business Process Analysis

This section seeks to establish a clearer basis for comparison with other economies by examining in detail the steps and roles of each stakeholder in the submission of e-Manifests and other documentation required for the import and export of goods by ocean to and from the US.

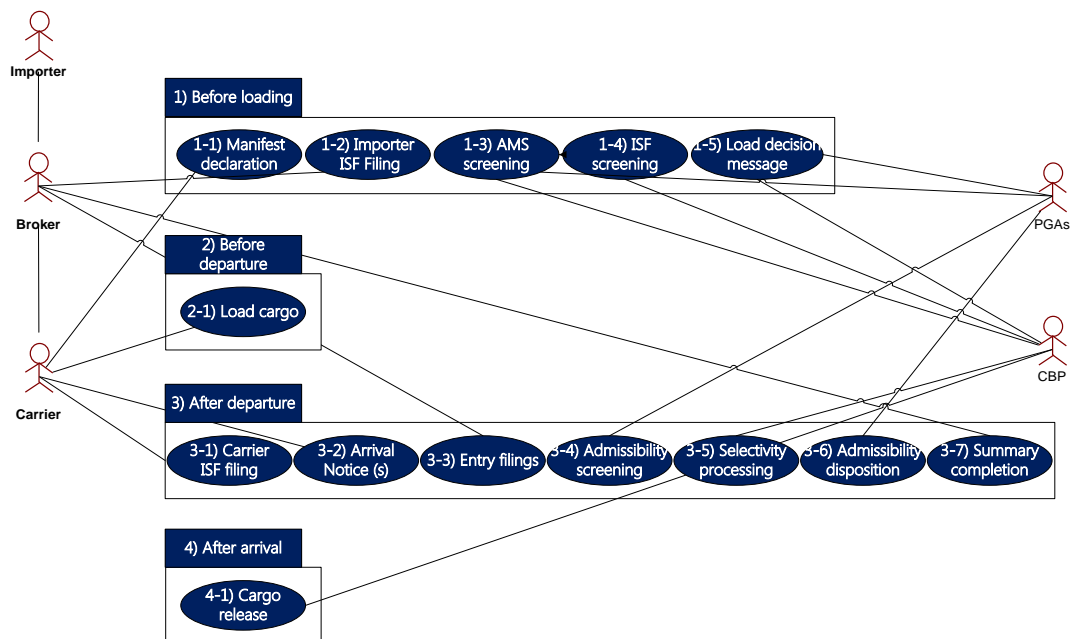
3.1 Import Process Flow

3.1.1 Overview Diagrams

(1) Use case

As seen in Chart 3.1 below, the use case for ocean imports to the US lays out the major tasks and the responsible parties. The carrier and customs broker play central roles by making the e-Manifest and ISF submissions, which are reviewed and approved or rejected by CBP with input from the PGAs.

Chart 3.1: Import Use Case



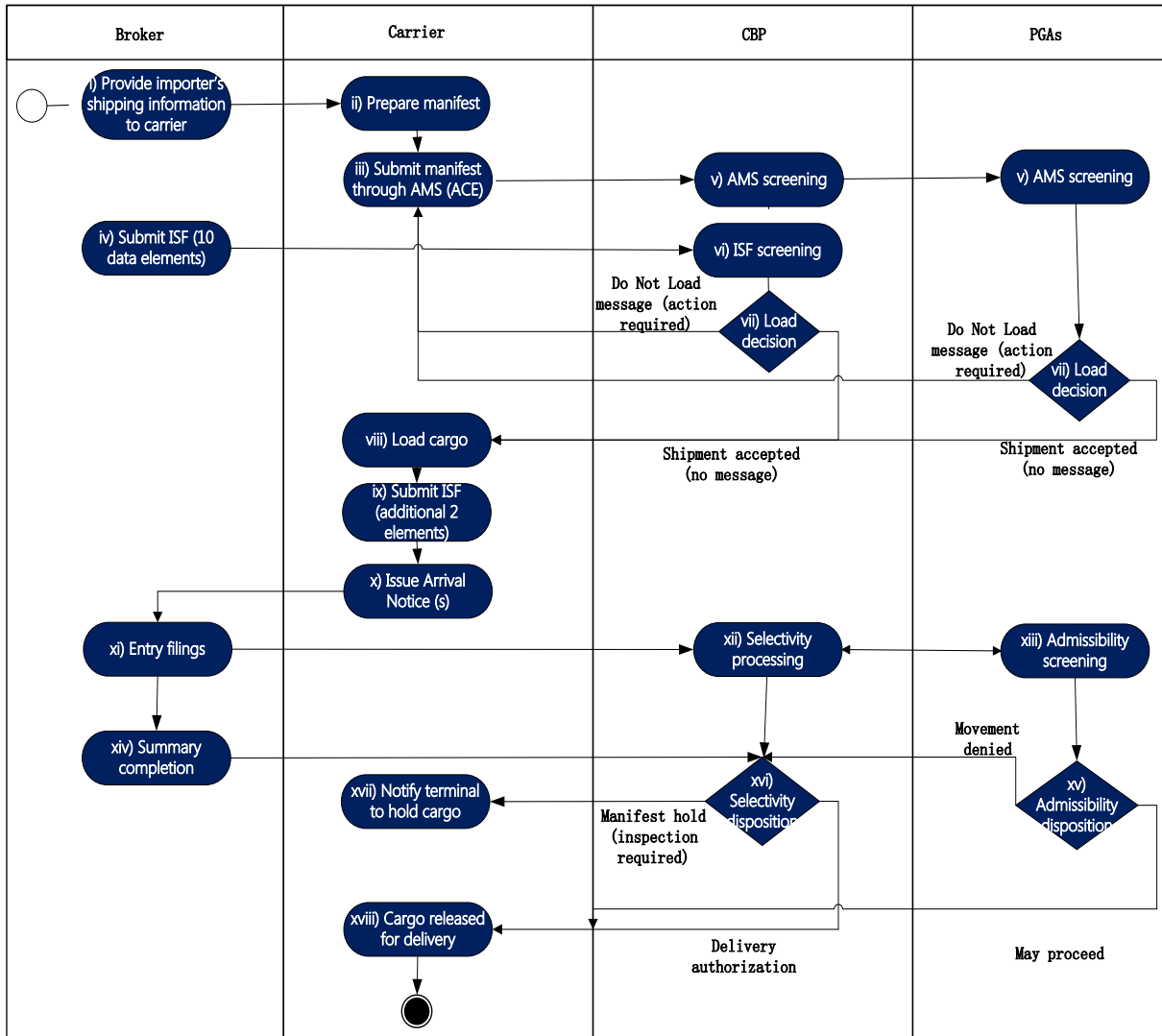
³¹ "Intelligent Cargo and Intelligent Network Port Logistics Chain Project," U.S. Trade and Development Agency (2011).

³² "Ace Emanifest - Ocean Data Processing Services," CBP (February 26, 2014).

(2) Complete Activity Diagram

Chart 3.2 below provides a high level view of all major steps in the import process as conducted by each of the four stakeholder groups.

Chart 3.2: Import Complete Process



3.1.2 Process Step Descriptions and Diagrams

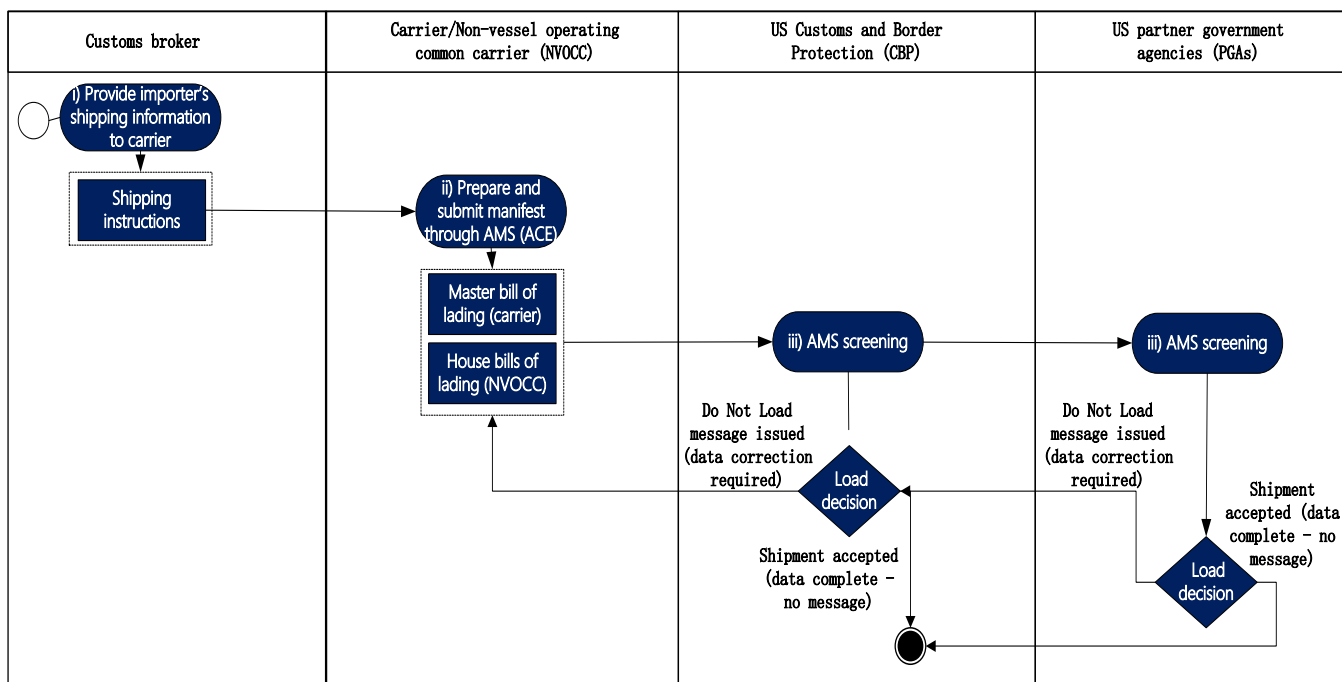
This section breaks down the import documentation submission process into key stages for detailed examination:³³

(1) Before Loading

Chart 3.3 below depicts the process for submitting the e-Manifest, which is focused on the carrier and if applicable NVOCCs.

³³ Steps for import and export are defined according to feedback from interviewees and the following report by the industry-led Advisory Committee on Commercial Operations of Customs and Border Protection (COAC): "COAC One US Government at the Border," Import Mapping Working Group (October 2014).

Chart 3.3: Import Manifest Declaration



1) Data gathering (Step i)

A customs broker, acting on behalf of importer, gathers shipping information needed for manifest and provides it to the carrier.

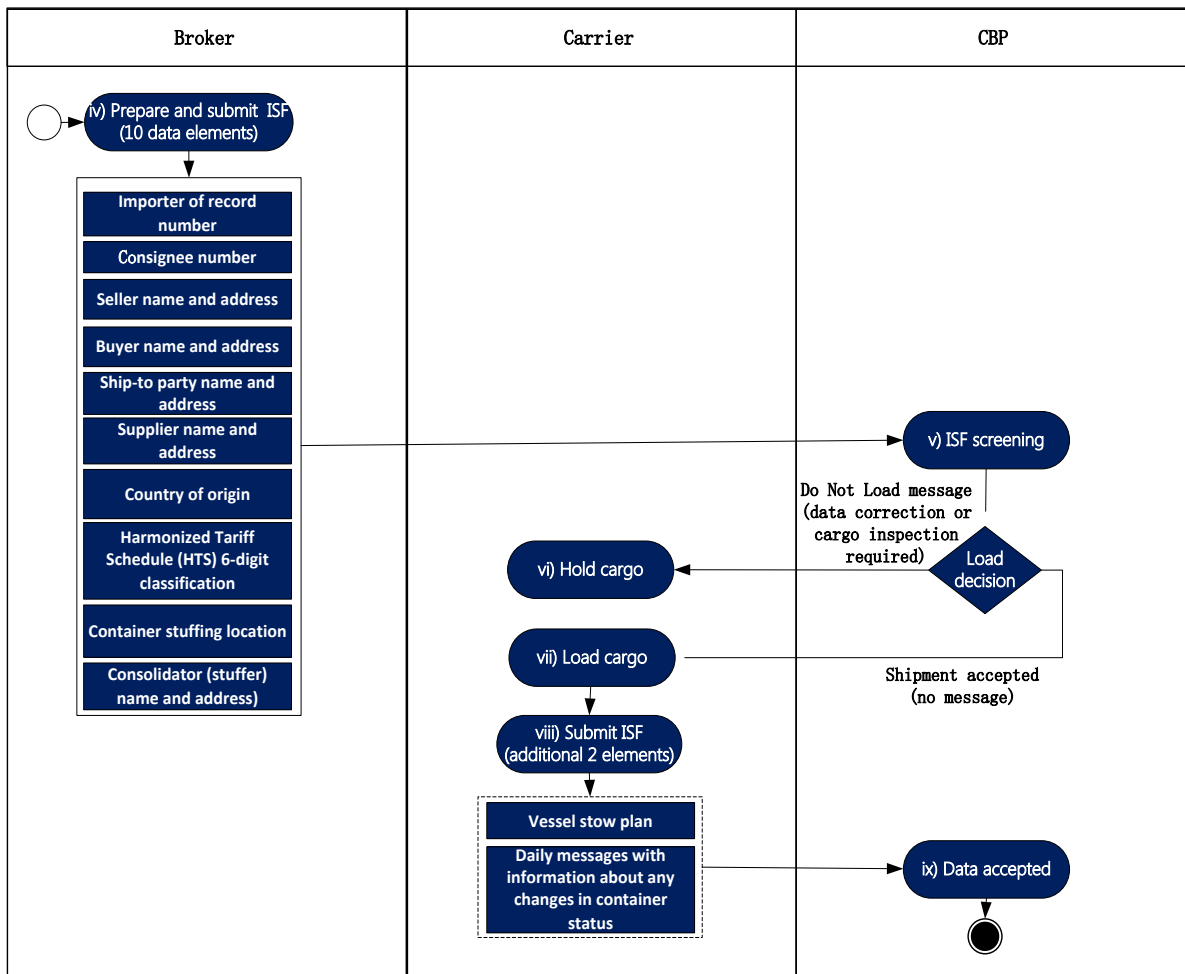
2) Manifest preparation and declaration (Step ii)

The carrier receives shipping information from the broker and prepares the manifest. The inbound carrier is required to transmit a manifest data set for Master Bill of Ladings, and House Bill of Ladings. Certain other parties such as NVOCCs may be authorized by US Customs and Border Protection (CBP) for the house manifest transmission. The Automated Manifest System (AMS) transmission via the ACE platform must take place 24 hours prior to loading at the port of origin.

3) AMS Screening (Step iii)

Manifest data is received and screened by the CBP Customs Targeting Analysis Center (CTAC). Additionally, several PGAs such as the EPA participate in CTAC, and have the ability to screen manifest data for their targeting purposes.

Chart 3.4: Import ISF



4) Importer Security Filing (Step iv)

The importer is responsible for ensuring the ISF is transmitted via ACE 24 hours prior to the loading of the container on the vessel. As seen above in Chart 3.4, in most cases the importer refers this filing to their US customs broker. In cases where the broker is filing the ISF, they will also have received from the foreign seller/supplier/manufacturer, their forwarding agent or the US importer the documents necessary to file, either the specific 10 data elements, or the actual commercial documents for customs clearance, which could include the commercial invoice, packing list, bill of lading and any documents required to affect customs release.

There are two primary ways to transmit ISF information to CBP:

- Most commonly the filer submits a “Unified” ISF, meaning the entry release and summary data are also transmitted when the ISF data is transmitted.
- Where the ISF was filed as a “Stand Alone” filing, the broker/importer will later separately transmit their entry release and summary data to CBP for selectivity processing and release.

5) ISF Screening (Step v)

The data, transmitted by the ISF filer, is matched against the information transmitted in AMS. If the bill of lading matches, a message is returned to the ISF filer stating "Accepted", "Bill on file". If the Bill does not match, or the manifest has not yet been filed, the ISF Filer receives a message stating "Accepted", "No Bill on File."

6) Load decision (Step vi)

Once the manifest and ISF information are transmitted, received and screened or targeted by CBP, CBP will decide to accept or reject the shipment. If CBP and the PGAs determine the data to be accurate, complete, and low risk, then no message is sent to the carrier, indicating the carrier may load. However, if there is inaccurate or incomplete information, then CBP and/or a PGA can issue a Do Not Load (DNL) message to the carrier, which requires the carrier/NVOCC to correct and resubmit the manifest data before the cargo can be loaded. In some cases, even if loading is approved, CBP may require the shipment be held at the destination US port for inspection.

(2) Before Departure

1) Container load on vessel (Step vii)

Once ISF screening is complete, all cargo is loaded onto the vessel with the exception of any cargo that has been issued a DNL.

(3) After Departure

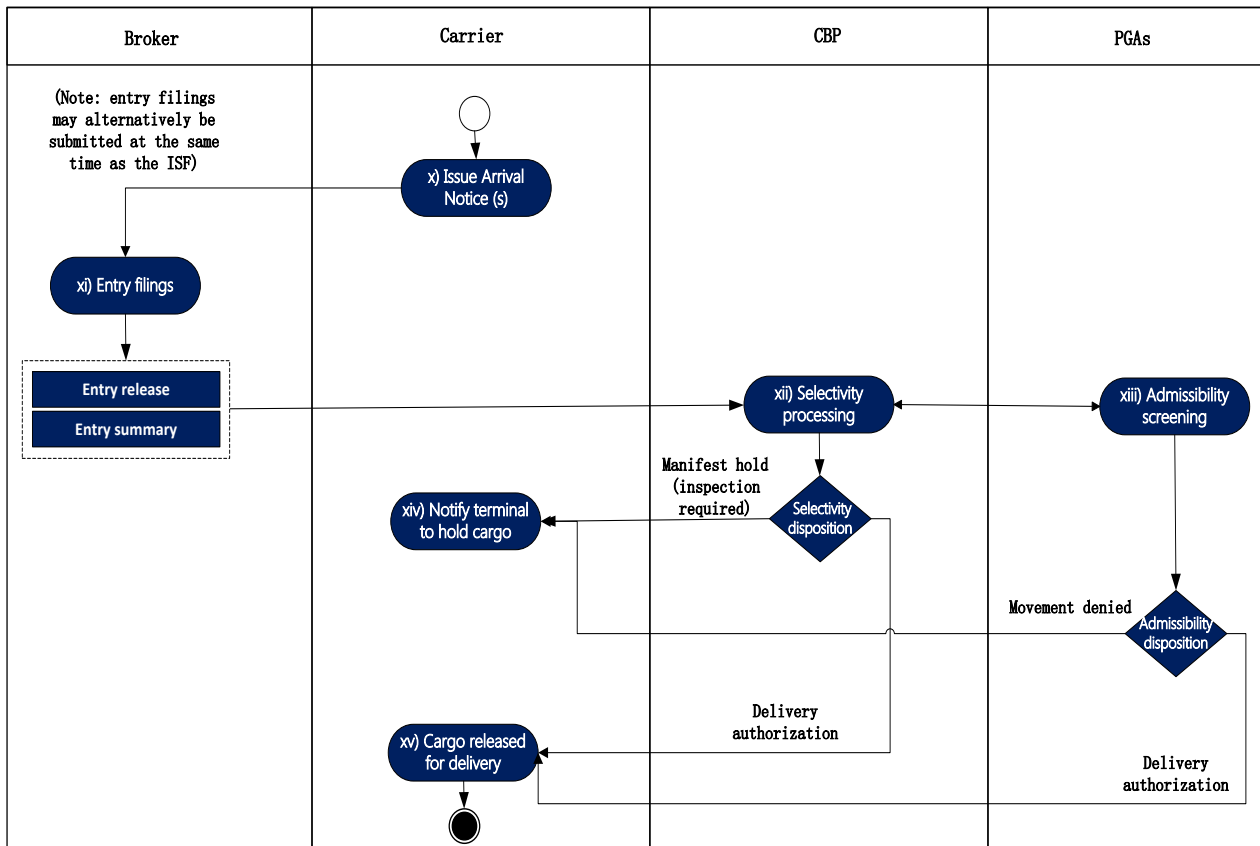
1) Carrier ISF filing (Step viii, ix)

After the Carrier has transmitted the AMS information to CBP, and CBP has responded if needed, the Carrier is required to transmit two ISF data elements, otherwise known as the +2:

- The Vessel Stow Plan (3 dimensional location where the container is loaded/stowed on ship) must be filed 48 hours of sailing from the last port before sailing to the US/Canada.
- The Container Status Message (CSM) must be sent within 24 hours of each CSM transaction. The bill of lading# is transmitted as part of the ISF filing.

Once this ISF data is received by CBP, the carrier's final reporting obligation to CBP is to submit a Container Status Message (CSM) within 24 hours of change in container status, such as an amendment to the manifest.

Chart 3.5: Import Entry



2) Arrival Notice(s) (Step x)

As pictured in Chart 3.5 above, some carriers or NVOCCs will issue an Arrival Notice as a courtesy to the Consignee or Notify party on the bill of lading. It is not mandatory and usually issued when freight charges are collect.

The Arrival Notice process can occur numerous times in the movement of a single container or shipment. Arrival Notices are sent 5 days from sailing or sooner for short transits. They are sent again 5 days before arrival at the port of discharge, and again as soon as departure from the discharge port to an inland destination if an intermodal bill of lading is issued.

Under the Ocean Shipping Reform Act (OSRA) unless an individual is listed on the bill of lading as either the Consignee, Notify, or also Notify party, they are not considered a “party to the contract” and are therefore not privy to information pertaining to a specific bill of lading. Customs brokers who therefore do not receive Arrival Notices will rely on the carrier’s website to track information pertaining to the vessel on which the bill of lading was loaded. Information available may include the Port of Discharge, Location, verification of carton count and other information that is required to be filed with the Customs Entry.

3) Entry filings (Step xi)

In most cases the broker will have made a Unified ISF filing in Step 4, and therefore completed the entry filings at that time. However, if the broker instead made a “Stand Alone” ISF filing, then at this time the broker reviews the shipment/import information received earlier for the ISF, and prepares and sends the entry release and entry summary forms at the same time to CBP via ACE. For ocean shipments, this submission must take place at least 8 hours prior to arrival of the vessel into port.

PGAs including the FDA, Department of Transportation (DOT), Animal and Plant Health Inspection Service (APHIS), and Federal Communications Commission (FCC) typically receive the entry information from CBP within minutes of filing by the broker. Each PGA reviews the information against its own requirements. For example imports of product subject to the Bioterrorism Act (BTA), including all shipments of food, must have certain data elements transmitted to FDA prior to arrival of the cargo.

After the Customs Broker has transmitted the completed entry summary data to CBP, the Broker will then arrange for the payment of the appropriate duties, taxes and fees to CBP.

4) Selectivity processing (Step xii)

When a “Unified” ISF is filed, the selectivity processing result is held in the CBP system until 5 days prior to arrival at the first port of entry. At this point, the filer does not need to do anything - the result of the processing is automatically reported. For “Stand Alone” cases, CBP now receives the entry release data transmitted and the information must be matched to the ISF.

5) Admissibility screening (Step xiii)

The PGAs review the entry data and submit the results of their admissibility screening electronically to CBP. Currently there is no information provided to the trade community on the results of a PGA admissibility screening other than by the FDA.

If data required by PGAs is not received, the carrier will get an A1 message (movement denied). If instead the carrier gets an A1 message (confirmation of data receipt), then it will next wait to receive the corresponding Delivery Authorization 1C message.

If a PGA does not issue a May Proceed message, the broker and the carrier will have no way of knowing about the PGA’s actions or intentions, unless CBP inspects cargo and issues a Manifest Hold on the PGA’s behalf.

(4) After Arrival

1) Cargo release or hold (Step xiv, xv)

Based on its own check of entry release data and input from PGAs, CBP decides whether or not to allow cargo release. When all required information has been submitted and all PGA requirements fulfilled, the carrier will receive the message to release cargo (Delivery Authorization 1C) – this finalizes the import process for the carrier. Alternatively, if a PGA or CBP requests a Manifest Hold, the carrier must inform the port terminal operator to place the cargo on hold.

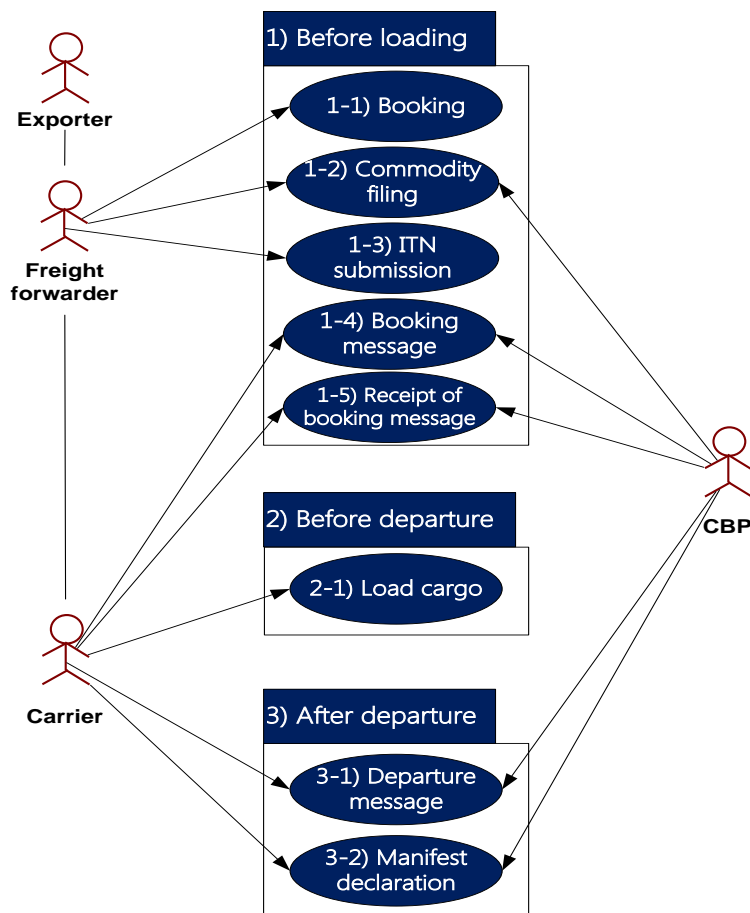
3.2 Export Process Flow

3.2.1 Overview Diagrams

(1) Use case

As seen in Chart 3.6 below, the use case for ocean exports from the US lays out the major tasks and the responsible parties. The carrier and freight forwarder play central roles by making the e-Manifest and commodity filings, which are reviewed and approved or rejected by CBP. Most PGAs are not as closely involved in this process as they are with imports.

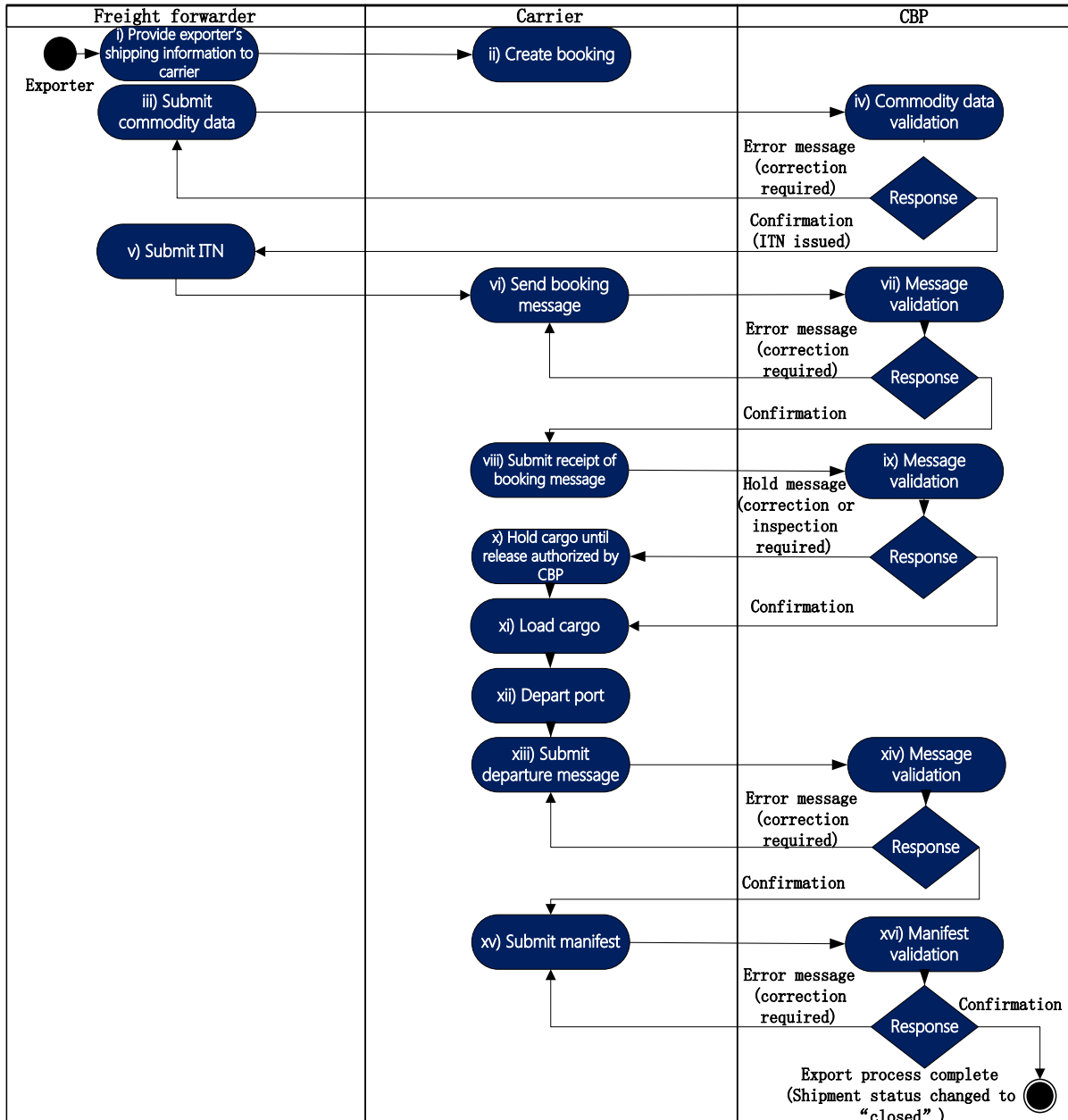
Chart 3.6: Export Use Case



(2) Complete Activity Diagram

Chart 3.7 below provides a high level view of all major steps in the export process as conducted by each of the three stakeholder groups.

Chart 3.7: Export Complete Process

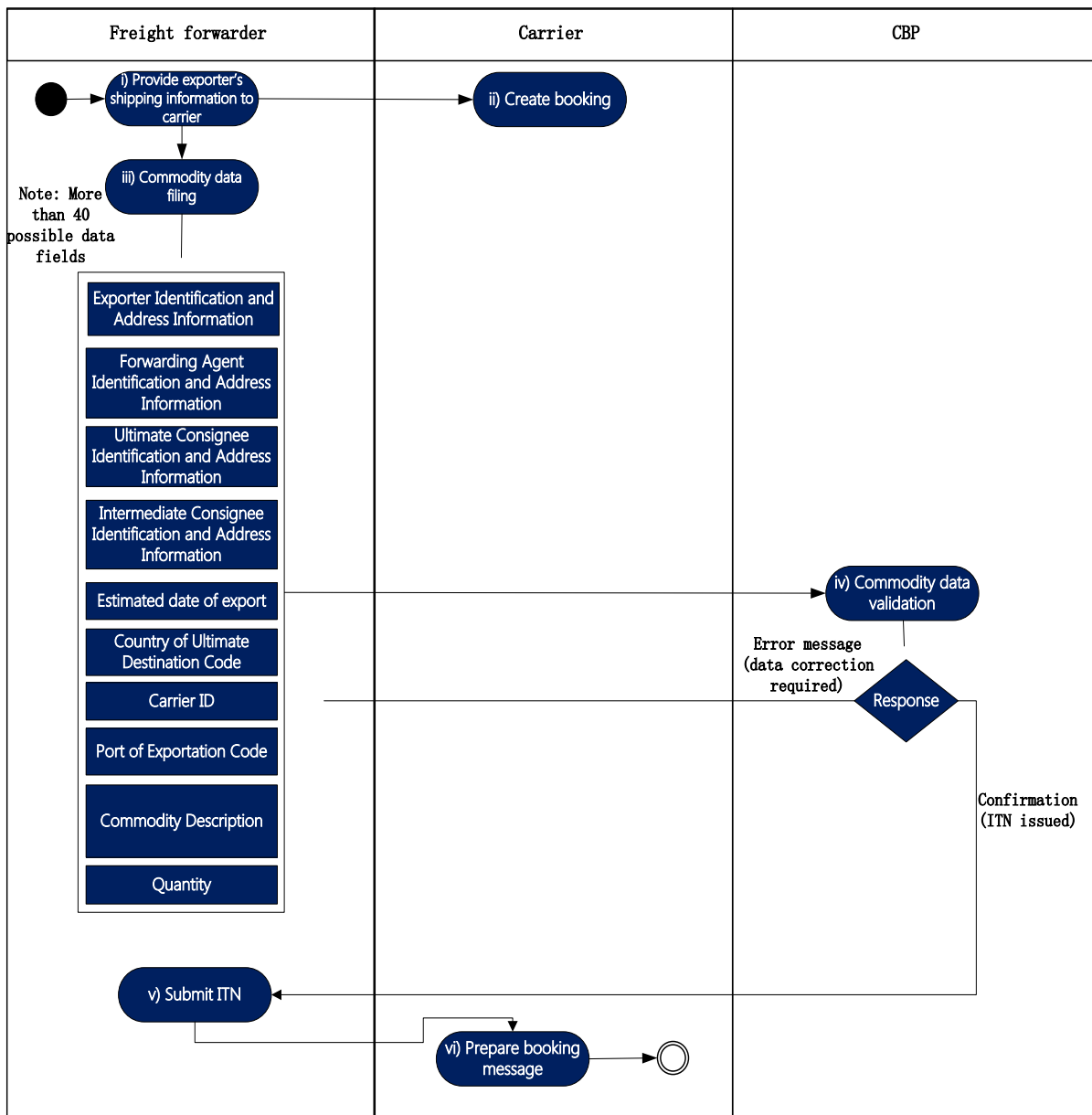


3.2.2 Process Step Descriptions and Diagrams

This section breaks down the export documentation submission process into key stages for detailed examination:

(1) Before Loading

Chart 3.8: Export Booking Creation Process



1) Booking (Steps i, ii)

As seen in Chart 3.8 above, the export process begins when the exporter or more likely a freight forwarder acting on its behalf submits shipping instructions to a carrier to arrange for transport. The carrier enters this booking information in its system.

2) Commodity filing (Steps iii, iv)

The freight forwarder transmits the commodity data (known formally as electronic export information (EEI)) to CBP through the Automated Export System (AES). The required commodity data elements are described in Table 3.1 below.

Table 3.1: Commodity Filing Data Elements³⁴

Data element	Description
Shipment Reference Number (SRN)	Used to report a filer-assigned, unique shipment reference number that allows for the identification of the shipment in their system.
Exporter Identification and Address Information	Name, address, and company contact information of the US principal party in interest, including location of origin of goods to be exported.
Forwarding Agent Identification and Address Information	These data elements are used to report the name, address, and company contact information of the freight forwarder if one is involved in the transaction.
Ultimate Consignee Identification and Address Information	These data elements are used to report the name, address, and company contact information (if known) of the person, party, or designee on the export license that is located abroad and actually receives the export shipment.
Intermediate Consignee Identification and Address Information	These data elements are used to report the name, address, and company contact information (if known) of the customs broker (if one is involved in the transaction) who acts in a foreign country as an agent for the principal party in interest or the ultimate consignee.
Filing Option Indicator	Used to indicate which filing option is being used to report the export shipment data (Pre-departure or Post-departure).
Estimated Date of Export	Used to report the date the merchandise is scheduled to leave the US.
Country of Ultimate Destination Code	Used to report the 2-character International Standards Organization (ISO) code for the country of ultimate destination.
Mode of Transportation (MOT) Code	Used to report the method of transportation by which the goods are being conveyed.
Carrier ID	Used to report the 4-character Standard Carrier Alpha Code (SCAC) to identify the carrier transporting the merchandise out of the US.
Conveyance Name/Carrier Name	Used to report the name of the conveyance.
Port of Exportation Code	Used to report the code of the CBP port of export.
Port of Unlading Code	Used to report the code of the foreign port of unlading.
US State of Origin Code	Used to report a 2-character postal abbreviation for the state in which the merchandise begins its journey to the port of export.

³⁴Automated Export System Trade Interface Requirement (AESTIR) Version 1.0. June 2004.

Related Company Indicator	Used to indicate if the shipment is between related parties. Parties are related if, during the fiscal year, either the exporter or foreign ultimate consignee owned 10% or more of the other's voting securities.
Foreign/Domestic Origin Indicator	Used to indicate if the commodity is of domestic or foreign production.
Routed Export Transaction Indicator	Used to indicate that the export shipment is a routed export transaction, which is a transaction in which the foreign consignee authorizes the US forwarder to facilitate the export of the items from the US.
Export Information Code (EIC)	Used to report the 2-character export information code.
Line Number	Used to report a unique line number for each commodity item included in a commodity shipment transaction.
Schedule B/Harmonized Tariff Schedule (HTS) Number	Used to report the 10-digit commodity classification number.
Commodity Description	Used to report the commercial description in sufficient detail to permit the verification of the commodity classification number.
Quantity/Unit of Measure (First)	Used to report the primary net quantity in the specified unit of measure and the unit of measure.
Quantity/Unit of Measure (Second)	Used when Schedule B requires two units of quantity to be reported.
Shipping Weight	Used to report the gross shipping weight in kilograms, including the weight of containers.
Value of Goods	Used to report the selling price or cost if not sold in US currency, including inland freight, insurance, and other charges to the US port of export.
License Code/License Exemption Code	Used to claim a type of license, permit, or license exemption, or to claim that "no license is required".
Export Control Classification Number (ECCN)	Used to report the Export Control Classification Number (ECCN) for merchandise.
Export License Number/Citation/Authorization Symbol	Used to report the license number or other symbol assigned by the licensing agency.
Directorate of Defense Trade Controls (DDTC) ITAR Exemption Number	Used to report the specific citation (exemption number) under the International Traffic in Arms Regulations (ITAR) that exempts the shipment from requirements for a license.
DDTC Registration Number	Used to report the number assigned by DDTC to persons who are required to register and have an authorization from DDTC (license or exemption) to export the article.

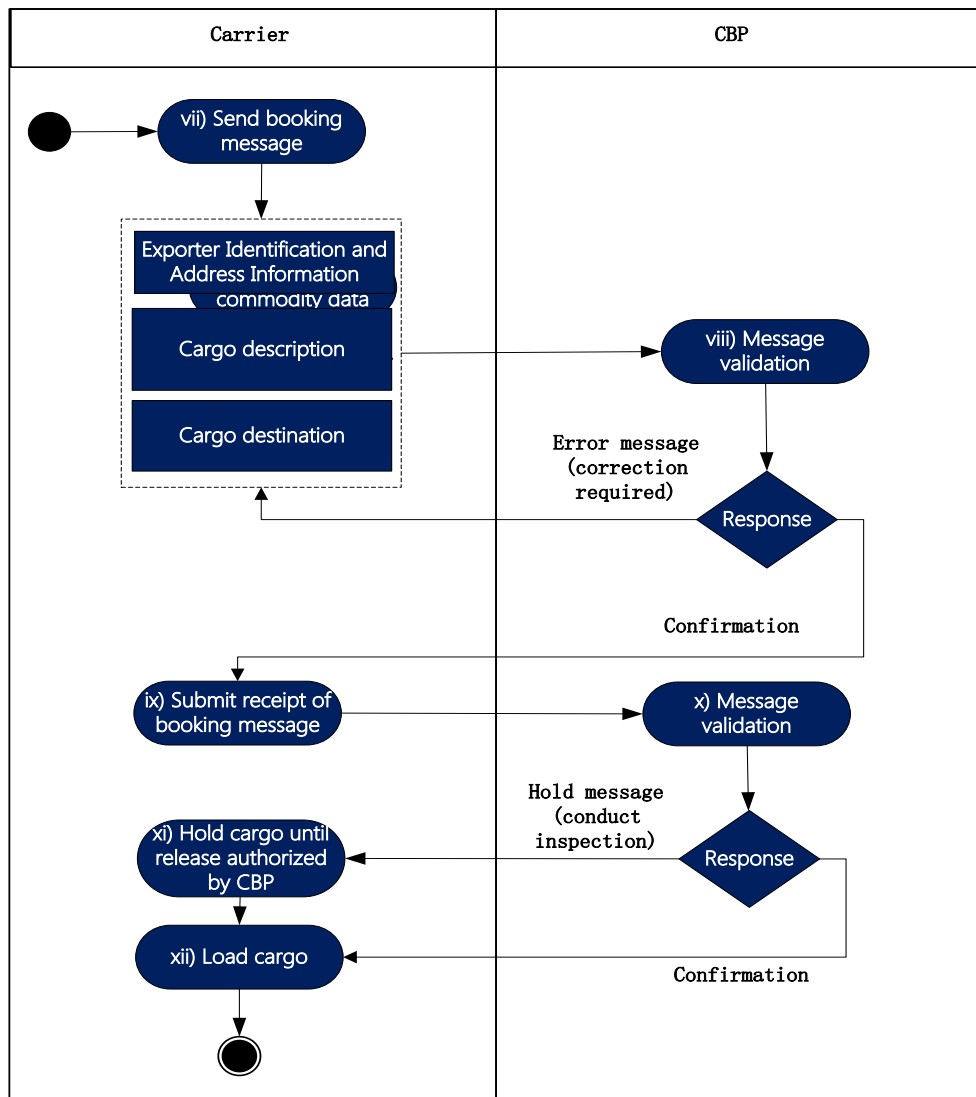
DDTC Significant Military Equipment (SME) Indicator	Used to designate articles on the USML for which special export controls are warranted because of their capacity for substantial military utility or capability.
DDTC Eligible Party Certification Indicator	Used to certify that the US exporter is an eligible party to participate in defense trade.
DDTC USML Category Code	Used to report the United States Munitions List (USML) category of the article being exported.
DDTC Unit of Measure (UOM)	Used to report the unit of measure covering the article being shipped.
DDTC Quantity	Used to report the quantity for the munitions article being shipped.
Transportation Reference Number (TRN)	Used to report the reservation number assigned by the ocean carrier to hold space for cargo being exported (i.e., the booking number).
Hazardous Material Indicator	Used to indicate that the shipment is hazardous as defined by the Department of Transportation.
Equipment Number	Used to report a container number for containerized shipments.
Seal Number	Used to report the identifying number of the CBP seal affixed to the equipment or container.
In bond Code	Used to indicate that the shipment is moving in-bond.
Entry Number	Used to report the Import Entry Number when the export transaction is to be used as proof of export.
Foreign Trade Zone Identifier	If merchandise is withdrawn from a Foreign Trade Zone for export, used to report the unique 5-character code assigned by the Foreign Trade Zone Board.
Used Self-propelled Vehicle Information	Used to report information regarding used self-propelled vehicles.

AES validates the data against editing tables and PGA requirement files and sends the freight forwarder a confirmation message if everything is in order or an error message if some data needs to be corrected or added. Error messages range in severity from “fatal”, indicating that there is a problem that the filer must correct immediately, to “informational”, indicating that there is a minor issue that requires no action. Once commodity data has been accepted for a shipment, AES generates and returns an Internal Transaction Number (ITN) to the filer as confirmation of successful filing.

3) Booking message preparation (Step v, vi)

The forwarder provides the ITN to the carrier, which the latter uses to prepare the booking message.

Chart 3.9: Export Cargo Release



4) Booking message submission (Steps vii, viii)

As depicted in Chart 3.9 above, the carrier must send the booking message, which includes information on the exporter, the cargo and the destination, to CBP via AES 72 hours prior to departure. Once received by CBP, AES validates the transmitted booking message and returns an electronic response to the carrier. Similar to the commodity filing, the response may vary from full acceptance to a “fatal” condition requiring an immediate correction.

5) Receipt of booking message submission (Steps ix-xi)

Upon the carrier’s receipt from the freight forwarder of the first piece of booked cargo (or last piece in the case of an NVOCC), the carrier will transmit a Receipt of Booking message through AES. If the carrier is participating in CBP’s optional automated VTM program the carrier transmits the message via EDI. Otherwise the carrier can use CBP’s Document Imaging System (DIS) to make an electronic copy of the paper form to send to CBP.

Once received by CBP, AES validates the transmitted Receipt of Booking message and returns an electronic response to the carrier. Similar to the other filings, a fatal condition will be noted when a critical condition has been encountered that requires immediate correction and retransmission, and a warning condition is noted when there is non-critical but incomplete and/or conflicting data.

If CBP determines that a verification examination of the cargo is required, AES will immediately return an electronic Hold Message to the carrier. When CBP has completed a required examination and determined that the cargo may be exported, a Release Message will be transmitted to the carrier.

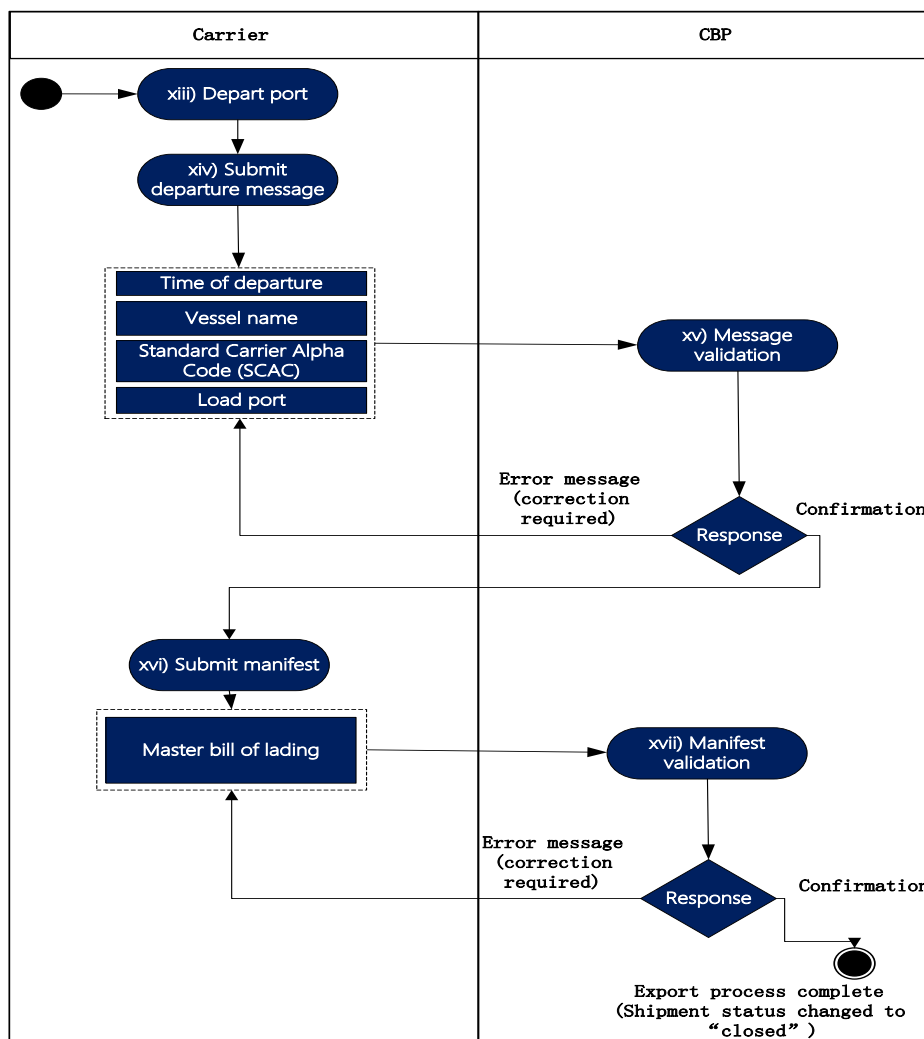
(2) Before Departure

1) Load cargo (Step xii)

If the carrier does not receive a Hold Message, or receives a Release Message, the cargo may be loaded on the vessel.

(3) After Departure

Chart 3.10: Export Manifest Declaration



1) Departure message (Steps xiii-xv)

The departure message notifies CBP that the vessel has departed the US port, providing data such as the date and time of departure, the vessel name, carrier's Standard Carrier Alpha Code (SCAC) and the load port. As depicted in Chart 3.10 above, the carrier will transmit the departure message via VTM to CBP no later than the first calendar day following the actual departure of the vessel. Similar to the other filings, a fatal condition will be noted when a critical condition has been encountered that requires immediate correction and retransmission, and a warning condition is noted when there is non-critical but incomplete and/or conflicting data.

2) Manifest declaration (Steps xvi, xvii)

Within ten calendar days after departure, the carriers will transmit the entire export manifest electronically using AES. In the case of NVOCCs, only paper submission is currently supported. AES validates the manifest and transportation data then generates either a confirmation message or an error message. Any errors messages generated by AES must be corrected and the corrections transmitted to AES.

Once received by CBP, AES validates the transmitted Manifest Message and returns an electronic response to the carrier. Similar to the other filings, a fatal condition will be noted when a critical condition has been encountered that requires immediate correction and retransmission, and a warning condition is noted when there is non-critical but incomplete and/or conflicting data.

AES will attempt to match the carrier's transportation data with the forwarder's commodity data using the Booking Control Number (SCAC + Booking Number):

- If a match is found, AES shall deem the vessel shipment status as "closed," marking the end of CBP's oversight of the export process. Certain information provided by the vessel carrier (Date of Export, Port of Export, Foreign Port of Unlading, SCAC Code, and Vessel Name) shall be added to the commodity data for the vessel shipment.
- If no match is found, AES shall deem the vessel shipment status as 'pending' (i.e., awaiting receipt of booking from a participating vessel carrier).

4. Key Challenges and Recommendations

Information gathered from literature and interview research for this study suggests that the e-Manifest systems and processes in the U.S. are very mature and functioning smoothly. However, the customs brokers and carriers interviewed pointed out several areas in the import and export processes

where greater automation, visibility, support, and standardization could enable considerable efficiency gains.

4.1 Key Challenges

4.1.1 Imports

(1) Automation and Visibility Limitations

Despite the general consensus amongst interviewees that the e-Manifest system for imports is very efficient, obligators noted a few areas where processes could be streamlined or made more transparent.

- (i) Currently CBP doesn't support automated cargo release for house bills of lading, only for master bills. In the current process, cargo release for consolidated and/or NVOCC cargo is handled only at the master bill level. For Container Freight Station (CFS) locations and NVOCC operators, there is no visibility at the house bill level to facilitate effective cargo release to support the consolidators or NVOCC's true customers (who have contracts of carriage with the NVOCC based on respective house bills), thereby resulting in delays in cargo release for the final importer.³⁵
- (ii) Some PGAs still require paper form reporting, which makes both trade sector reporting and PGA risk assessment efforts inefficient.
- (iii) Currently only the FDA provides guidance to brokers by entry line number to indicate whether or not the cargo in question has been approved for release or still under review. This allows immediate and accurate review by the importer and broker. It would be preferable if all PGAs identified the entry line item that is subject to additional review to ensure proper risk targeting.

Today the broker receives a generic manifest hold message, which does not allow immediate identification of the item under review. Furthermore, if the broker has not received a release, they do not know who might be holding the cargo. Nationwide standardization of hold processing in AMS and functionality improvements to provide visibility to the agency placing the hold would be help to speed up cargo release.

(2) Limited Instructional Support for Companies New to E-Manifest

The large carrier and NVOCC companies interviewed appeared satisfied with the support provided by CBP, but they are typically closely involved in CBP's industry-led Trade Support Network and have direct access to CBP personnel. For smaller companies, especially importers, access to information is more limited.

- (i) The background documents currently made available on CBP's website

³⁵ Interviews with UPS, OOCL October 2014

about the e-Manifest filing process are old and not very informative for new users.³⁶

- (ii) There is a need for closer customer support. Despite the existence of the CBP Trade Support Network, it is not clear who to talk to at CBP about questions concerning e-Manifest filing. The Trade Support Network is helpful on many topics, but in recent years it has not focused much on manifest declarations.³⁷

(3) Inconsistency in Manifest Data Requirements across Economies

Interviewees did not report any major problems with manifest processes across other economies, but carriers and NVOCCs did remark that there is significant variation in the kinds of manifest data that different economies require, which adds complexity to data collection and reporting for manifest declarations. For example, Japan requires the telephone numbers of the consignee and consignor in advance, which other countries do not require. In another example, the US requires the house and master bills of lading to be filed, but the EU only requires the master.³⁸

4.1.2 Exports

Export processes for e-Manifest began evolving more recently than the import side, and have not yet achieved quite the same level of efficiency and sophistication, especially where NVOCCs are concerned.

- (i) As the CBP's current 10-day post departure manifest filing regime imposes no hard reporting deadline for commodity filings similar to the 24 hour rule on the import side, the resulting variance in filing times amongst the often large numbers of NVOCC cargo shipments has proven to cause significant delays for the carrier to receive AES ITN information they need to submit booking messages and load cargo.
- (ii) Time-consuming paper-based reporting processes continue to be used. Most notably NVOCCS cannot yet file manifests electronically, and certain PGAs still require paper documentation. For example, the US Department of Agriculture requires the submission of paper export certificates that describe animal health or product safety, production, or processing methods, packaging, labeling, or specific attributes of food/food ingredients intended for certain international destinations.³⁹

4.2 Recommendations

In general most major challenges concerning e-Manifest filing have already been resolved in the US over the past decade, but the further enhancements

³⁶ Interview with MIQ October 2014

³⁷ Interview with MIQ October 2014

³⁸ Interviews with BDP, MIQ, OOCL October 2014

³⁹ Interview with BDP, consumer packaged goods manufacturer October 2014

suggested below would help to optimize the current system's potential, and better position it for coordination or maybe one day integration with systems in other APEC economies.

(1) Industry Support Enhancements

- (i) CBP should provide more and updated instructional documentation and/or webinars on its website to help smaller and new companies learn how to do e-Manifest filing and stay on top of any procedural changes.
- (ii) CBP should establish a central outreach/support program to provide an easy way for smaller companies without direct relationships with CBP to get their questions answered.

(2) E-Manifest Filing Technical Enhancements

- (i) It would greatly improve visibility of the manifest process for brokers if the ACE portal could provide a means of querying the "Manifested" bill of lading to see the manifest date and estimated date of loading.
- (ii) The scope and functionality of the single window ITDS system should be expanded as quickly as possible in order to consolidate PGA submissions and reviews and enable paperless, streamlined and centralized data exchange and trade operations. In cases where paper forms are still used due to international rules, the expanded use of DIS for document submission by both carriers and importers would help increase efficiency.
- (iii) For exports, CBP should implement electronic manifest declaration for NVOCCs. The transition to electronic filing should be done as soon as possible to speed up filing processes and provide NVOCCs with feedback from CBP on their declarations.⁴⁰

(3) E-Manifest Filing Process Enhancements

- (i) To avoid creating too great a reporting burden, the scope of manifest reporting should be limited so that carriers and NVOCCs are only required to provide CBP with the shipping information that they receive from clients as a part of normal business operations. They should not be required to provide information that is not normally in their possession, such as the economy of origin of goods.
- (ii) If CBP extends advanced electronic filing to the house bill level, it would be helpful if the deadline for the ocean export manifest is set 24 hours prior to vessel loading to mirror US import manifest regulations. This is already the filing deadline for US export shipments to EU countries and a number of other US trading partners such as China and Japan. If such a change is made, CBP may need to set the same deadline for the exporter/freight forwarder to file their EEI data so that the carrier can prepare the manifest

⁴⁰ Interview with BDP, consumer packaged goods manufacturer October 2014

in a timely manner.

(4) Regional Synergy Enhancements

US obligators expressed support for the idea of a common e-Manifest exchange for the APEC region as beneficial to efficient trade, although this goal may be difficult to achieve due to varying regulatory priorities in each economy.⁴¹ In the nearer term it would be ideal to standardize across all economies the timeline of data flows and the kinds of data required for e-Manifest, so that the same data set could be submitted to every economy according to a similar schedule. For example, obligators would like CBP to use standard codes such as the United Nations Code for Trade and Transport Locations.⁴²

5. Appendix

5.1 Interviews Conducted

The following 8 phone and in-person interviews were conducted with US government and industry stakeholders over a period from September 2014 through October 2014.

Table 5.1: Interviews Conducted

Category	Organization	Date
Government	CBP	23/10/2014
Carriers	APL	22/10/2014
	Orient Overseas Container Line (OOCL)	9/10/2014
	World Shipping Council (WSC)	21/10/2014
Importers	American Association of Exporters and Importers (AAEI)	22/10/2014
	Major consumer packaged goods manufacturer	23/9/2014
	Raytheon	1/10/2014
NVOCCs/Customs brokers	BDP International	5/9/2014
	MIQ Logistics	1/10/2014
	UPS	2/10/2014

⁴¹Interview with UPS October 2014

⁴² Interview with UPS October 2014

II. People's Republic of China Case Study

1 Executive Summary

On February 1, 1999, the Administrative Measures of the General Administration of Customs of the People's Republic of China for Transmission of Electronic Data of Manifests was promulgated in the form of Decree No. 70 of the General Administration of Customs ("Decree No.70"), which stipulated that the agent of the vessel entering into border shall transmit the electronic manifest data to the Customs under the requirement of Customs within 24 hours after arrival at port; the agent of the vessel leaving the border shall transmit the electronic manifest data to Customs under the requirement of the Customs within 72 hours after departure.

With the continuous expansion of the scale of China's foreign trade and the development of international logistics, China Customs is faced with new situations and problems in the management of manifests. In order to advance the international trade safety and facilitation, enhance customs cooperation, adapt to the current international logistics development, improve customs declaration efficiency, and establish modern customs system with the risk management as the priority, China Customs has increasingly enhanced the management methods for the declaration of manifest and realized the change from the initial electronic declaration to the advance declaration by issuing Measures of the General Administration of Customs of the People's Republic of China for the Administration of Manifests of Inbound and Outbound Means of Transport-Decree of the General Administration of Customs of the People's Republic of China No.172 ("Decree No. 172") on January 1, 2009 (Decree No.70 was repealed simultaneously).

Decree No. 172 makes new specific regulations on the declaration of maritime manifests. It expands the scope of transmission parties of manifest from the agent of the vessel to the operator of inbound and outbound vessel, NVOCC, freight forwarder, and shipping agency company. The data items required by the new manifest declaration process are increased and are in accordance with the SAFE Framework of WCO. More contents are required to be declared, including the tally report and arrival report. In respect of transmission time limits, the new manifest declaration process requires the declaration shall be made in advance with main data of manifest declared before loading for both import and export. In the technical aspect of manifest declaration, the message format has been changed to XML in place of the original text format.

In the management of manifest, Customs is the constitutor and executer of relevant laws and regulations and it is also the main management institution of manifest data declaration; while in China, Chinese E-port and local E-ports

operate systems concerning manifest declaration, which provide the platform and channel for electronic transmission of manifest and its relevant data. According to the requirements of China's General Administration of Customs, the new customs manifest declaration and management system began to be used officially from June 28, 2014 as a replacement. The manifest declaration and management system has been put into use at local ports in succession. In the implementation of new manifest declaration, some ports like Shanghai and Guangzhou only require the declaration of Master Manifest; some ports such as Ningbo require the declaration of House Manifest; while some other ports like Dalian require the transmission of both Master and House Manifest.

Detailed business processes are further analyzed by BPA method. It is seen that e-Manifest and the advance declaration can enable the interconnection of electronic data, make the process of manifest declaration more standardized, improve the declaration efficiency and service quality, have the risks of the import and export cargos identified before they arrive at the port, get logistics data collected and integrated to supervise the cargos effectively and reduce customs clearance time. The e-Manifest declaration also brings some challenges in the meanwhile of providing convenience to the parties involved, such as higher requirements on information system, impacts on business processes, etc. In addition, as the regulations on the existing e-Manifest declaration mechanism and its implementation are not so perfect and the operation and maintenance of manifest declaration and management system needs to be improved, there are still problems to be solved, such as dehumanized rules' interference in transport and trade processes, lack of implementation details, imperfect system operation and maintenance mechanism and uncertainty in customs clearance operation. Suggestions are put forward to optimize the manifest declaration and management mechanism in China and improve its performance for future data exchange and information sharing globally:

- (i) Unify regulatory norms and law enforcement standards, and issue implementation details;
- (ii) Establish robust support system for new manifest declaration and management system;
- (iii) Attach importance on training and expand training scope;
- (iv) Set up reward and penalty mechanism;
- (v) Establish risk prevention system;
- (vi) Promote the sharing of manifest information;
- (vii) Promote the adoption of new manifest declaration and management system gradually.

2 Backgrounds

2.1 Volume of Trade to/from People's Republic of China

In recent years, China has issued a series of policies and measures to advance the development of foreign trade. The level of trade facilitation is increasingly improved; new modes of trade, such as cross-border electronic commerce, develop rapidly; more active opening strategies have been implemented and pilot free trade zones have been launched and operated, thus further improve the political and commercial environment of foreign trade development.

In 2013, total volume of trade in China surpassed the United States. China became the first power of trade in goods in the world. China's total volume of import and export of goods amounted to 4.16 trillion dollars, of which the export was 2.21 trillion dollars and the import was 1.95 trillion dollars. China does foreign trade with several countries and regions, which mainly are European Union, the United States, Association of Southeast Asian Nations (ASEAN), Hong Kong, China; Japan; Republic of Korea; Chinese Taipei; Russia and India. The specific volumes of trade are shown in Table 2.1.

Table 2.1 Main Countries and Regions Doing Trade with China and the Respective Trade Volume

Country or Region	Volume of trade (hundred million dollars)	% on a year-on-year basis	Volume of import (hundred million dollars)	% on a year-on-year basis
EU	3390	1.1	2200	3.7
The United States	3684	4.7	1512	14.8
ASEAN	2441	19.5	1996	1.9
Hong Kong, China	3848	19.0	162	-9.3
Japan	1503	-0.9	1623	-8.7
Republic of Korea	912	4.0	1831	8.5
Chinese Taipei	406	10.5	1566	18.5
Russia	496	12.6	396	-10.2
India	484	1.6	170	-9.6

China's import quantities and amounts of main commodities are shown in Table 2.2.

Table 2.2 Import Quantities and Amounts of Main Commodities and Their Respective Growth Rates in 2013

Commodity	Quantity (10 thousand tons)	% on a year-on-year basis	Amount (hundred million dollars)	% on a year-on-year basis
Cereal and cereal powder	1458	4.3	51	6.6
Soybean	6338	8.6	380	8.6
Edible vegetable oil	810	-4.2	81	-16.7
Iron ore and its concentrates	81931	10.2	1059	10.4
Aluminum oxide	383	-23.7	14	-22.7
Coal (incl. lignite)	32708	13.4	290	1.1
Crude oil	28192	4.0	2196	-0.5
Refined oil product	3959	-0.6	320	-3.2
Plastic in primary form	2462	3.9	491	6.3
Paper pulp	1685	2.4	114	3.7
Rolled steel	1408	3.1	170	-4.3
Unwrought copper and copper product	453	-2.5	353	-8.5

China's export quantities and amounts of main commodities are shown in Table 2.3.

Table 2.3 Export Quantities and Amounts of Main Commodities and Their Respective Growth Rates in 2013

Commodity	Unit	Quantity	% on a year-on-year basis	Amount (hundred million dollars)	% on a year-on-year basis
Coal (incl. lignite)	(10 thousand tons)	751.0	-19.1	11	-33.1
Rolled steel	(10 thousand tons)	6234.0	11.9	532	3.4
Textile yarns, fabric and	—	—	—	1069	11.7

products					
Garments and accessories	—	—	—	1770	11.3
Shoes	—	—	—	508	8.4
Furniture and parts	—	—	—	518	6.2
Automatic data processing equipments and components	(10 thousand pieces)	187050	2.0	1822	-1.7
Hand-held or car-mount radio telephone	(10 thousand pieces)	118582	16.9	951	17.3
Container	(10 thousand)	270	8.8	79	-6.4
Liquid crystal display panel	(10 thousand)	326577	3.1	359	-1.0
Automobile (incl. complete set of spare parts)	(10 thousand)	92	-6.7	120	-5.3

Over two thirds of total volume of international trade is carried out through sea transportation, while in China it accounts for 90%. The increase of the total trade volume on a year-on-year basis accelerates the development of China's ports. In 2013, ten ports in mainland China have a goods handling capacity of over 300 million tons and eleven ports possess a container throughput of over five million TEU. Ningbo-Zhoushan port, Shanghai port, Tianjin port, Guangzhou port, Suzhou port, Qingdao port, Tangshan port and Dalian port have entered into the global top ten ports with the largest goods handling capacity. Among the rest, the goods handling capacity of Ningbo-Zhoushan port in 2013 broke 800 million tons with the exact figure of 809.78 million tons, making that port rank the first in the world. As for the handling throughput of container, Shanghai port owned 33.617 million TEU in 2013, being the top of the world.⁴³

Goods handling capacities of main ports in China are shown in Table 2.4.

⁴³ http://www.guancha.cn/economy/2014_03_07_211721.shtml

Table 2.4 Goods Handling Capacities of Main Ports in China in 2013

Rank	Port	2013 (100 million tons)	2012 (100 million tons)	Year-on-year growth
1	Ningbo-Zhoushan port	8.0978	7.44	8.80%
2	Shanghai port	7.7600	7.36	5.50%
3	Tianjin port	5.0100	4.76	5.00%
4	Guangzhou port	4.5512	4.34	4.87%
5	Suzhou port	4.5430	4.28	9.30%
6	Qingdao port	4.5000	4.02	10.60%
7	Tangshan port	4.4620	3.64	22.40%
8	Dalian port	3.3340	3.74	10.10%
9	Yingkou port	3.3000	3.01	10.00%
10	Rizhou port	3.1800	2.84	12.05%

Container handling throughputs of main ports in China are shown in Table 2.5.

Table 2.5 Container Handling Throughputs of Main Ports in China in 2013

Rank	Port	2013 (10 thousand TEU)	2012 (10 thousand TEU)	Year-on-year growth %
1	Shanghai port	3361.70	3235.90	3.34
2	Shenzhen port	2327.80	2294.13	1.46
3	Ningbo-Zhoushan port	1732.68	1617.50	7.12
4	Qingdao port	1552.00	1450.00	7.00
5	Guangzhou port	1530.92	1474.36	3.83
6	Tianjin port	1300.00	1230.00	5.69
7	Dalian port	991.20	806.40	22.91
8	Xiamen port	800.79	720.17	11.20
9	Lianyungang port	548.80	502.00	9.30
10	Yingkou port	530.10	485.10	9.30

2.2 Overview of Manifest in China

2.2.1 Definition and Classification of Manifest

In order to advance the international trade safety and facilitation, enhance Customs cooperation, adapt to the current international logistics development , meet the need of unifying Customs enforcement, improve Customs declaration

efficiency, facilitate enterprises to go through the formalities, adapt to the businesses reform and development of Customs and establish modern Customs system with the risk management as the priority, China Customs, by collecting large quantities of basic data, has increasingly enhanced the management methods for the declaration of manifest, and realized the change from the initial electronic declaration to the advance declaration issued in Decree of the General Administration of Customs of the People's Republic of China No.172-Measures of the General Administration of Customs of the People's Republic of China for the Administration of Manifests of Inbound and Outbound Means of Transport (hereinafter referred to as "Decree No. 172").

China's manifest of inbound and outbound means of transport mainly refers to the carrier of information on goods, articles and passengers on board the inbound and outbound means of transport, including original manifest, advance manifest and load/passenger manifest. Among them, original manifest is used for import, and advance manifest and load manifest are used for export.

Original manifest: means the manifest transmitted by manifest transmission party to Customs carrying the information on goods, articles and passengers on board the inbound and outbound means of transport.

Advance manifest: means the manifest which reflects information on the expected goods, articles or passengers on board the inbound and outbound means of transport.

Load/passenger manifest: means the manifest which reflects information on the goods, articles or passengers actually on board the inbound and outbound means of transport.

Besides, Customs also requires the relevant information such as tally report and arrival report to be submitted so as to check the data of manifest.

2.2.2 Content of Manifest

According to the Announcement of the General Administration of Customs No.54, 2008: "Subject to the provisions of Decree No. 172, the General Administration of Customs formulates electronic data formats such as cargo manifest of inbound and outbound means of water and air transport." For the purpose of enhancing actual supervising and managing potency of Customs and guaranteeing the collection of national taxes, the Announcement of the General Administration of Customs No.70, 2010 adjusts electronic data formats such as cargo manifest of inbound and outbound means of water and air transport in accordance with the provisions of Decree No.172. The content of the data items includes Original Manifest Data Items, Tally Report Data Items, Arrival Report Data Items, Packing List Data Items, Advance Manifest Data Items, Load Manifest Data Items and etc.

On the basis of data items in the WCO SAFE framework, Decree No.172 stipulates that paper-form and electronic transmission manifest shall mainly include the following contents: vessel name, call sign, nationality, port of loading, port of destination, bill of lading, consignee or consignor, description of goods, packing, measurement of goods, quantity and weight of goods, container number, container size and so forth. Furthermore, the data of electronic manifest shall be true, normative and accurate, and as completely same as those on the paper-form manifest.

While declaring original manifest, advance manifest and loading manifest, the specific data items that must be filled out are as follows in Table 2.6 to Table 2.8.

Table 2.6 Mandatory Data Items of Original Manifest

Sequence No.	Name of Data Elements of China's Customs	WCO DATA MODEL or UNTDED NO.
1	Name of the manifest transmission party	256 Representative person name
2	Code of Customs at the departure place of means of transport	047 Customs office of exit, coded
3	Code of carrier	050 Carrier identification
4	Conveyance number	149 Conveyance reference number
5	Code of mode of transport	183 Mode/type of means of transport crossing the border, coded
6	Code of means of transport	167 Identification of means of transport crossing the border, coded
7	Name of means of transport	160 Identification of means of transport crossing the border
8	Loading time of the goods on board means of transport	031 Consignment loading date
9	Departure date and time of means of transport	156 Departure date and time
10	Master B/L No.	015 Transport document number
11	Code of discharge place	080 Place of discharge, coded
12	Code of payment method of transport charges	098 Transport charges method of payment, coded
13	Total number of freight	146 Total number of packages

	consignment	
14	Code of type of package	141 Type of packages identification
15	Total gross weight of goods	131 Total gross weight
16	Name of consignor	071 consignor-name
17	Sequence number of consignment item	006 Consignment item sequence number
18	Type of package of goods	141 Type of packages identification
19	Number of goods	139 Number of packages per commodity
20	Brief description of goods	138 Brief cargo description
21	Gross weight of goods	126 Gross weight item level

Table 2.7 Mandatory Data Items of Advance Manifest

Sequence No.	Name of Data Elements of China's Customs	WCO DATA MODEL or UNTDED No.
1	Name of the manifest transmission party	256 Representative person name
2	Code of Customs at the departure place of means of transport	047 Customs office of exit, coded
3	Code of carrier	050 Carrier identification
4	Conveyance number	149 Conveyance reference number
5	Code of mode of transport	183 Mode/type of means of transport crossing the border, coded
6	Code of means of transport	167 Identification of means of transport crossing the border, coded
7	Name of means of transport	160 Identification of means of transport crossing the border
8	Loading time of the goods on board means of transport	031 Consignment loading date
9	Master B/L No.	015 Transport document number
10	Code of place of loading	070 Place of loading, coded
11	Code of payment method of transport charges	098 Transport charges method of payment, coded
12	Total number of freight	146 Total number of packages

	consignment	
13	Code of type of package	141 Type of packages identification
14	Total gross weight of goods	131 Total gross weight
15	Name of consignor	071 consignor-name
16	Address of consignor (street, p.o. box)	239 Street and number/P.O.Box
17	Sequence number of consignment item	006 Consignment item sequence number
18	Type of package of goods	141 Type of packages identification
19	Number of goods	139 Number of packages per commodity
20	Brief description of goods	138 Brief cargo description
21	Gross weight of goods	126 Gross weight item level

Table 2.8 Mandatory Data Items of Loading Manifest

Sequence No.	Name of Data Elements of China's Customs	WCO DATA MODEL or UNTDED NO.
1	Code of carrier	050 Carrier identification
2	Conveyance number	149 Conveyance reference number
3	Code of mode of transport	183 Mode/type of means of transport crossing the border, coded
4	Code of means of transport	167 Identification of means of transport crossing the border, coded
5	Name of means of transport	160 Identification of means of transport crossing the border
6	Loading time of the goods on board means of transport	031 Consignment loading date
7	Master B/L No.	015 Transport document number
8	Code of place of loading	070 Place of loading, coded
9	Total number of freight consignment	146 Total number of packages
10	Code of type of package	141 Type of packages identification
11	Total gross weight of goods	131 Total gross weight

2.2.3 Transmission Subjects of Manifest

Manifest data consist of two types: the electronic manifest data and manifest-related electronic data. The subjects of transmission are classified as two types as well: parties which are obliged to transmit electronic manifest data (hereinafter referred to as "manifest transmission parties"), and parties which are obliged to transmit manifest-related electronic data (hereinafter referred to as "manifest-related electronic data transmission parties").

(1) Manifest Transmission Parties

General Administration of Customs stipulates that maritime manifest transmission parties mainly include the operator of inbound and outbound means of transport, NVOCC, freight forwarder, and shipping agency company.

- (i) Operator of inbound and outbound means of transport: mainly includes the owner of means of transport, tenant who are responsible for means of transport, and the captain;
- (ii) NVOCC: refers to the operator engaging in non-vessel business to organize shipments for individuals or corporations to get goods from the manufacturer or producer to a market, customer or final point of distribution. It can be non-vessel operating common carrier or the operator who owns vessels but carry on NVOCC business;
- (iii) Freight forwarder: refers to the operator who engages in import and export international transportation business in the maritime transport;
- (iv) Shipping agency company: refers to the agency enterprises of international navigation ships.

(2) Manifest-related Electronic Data Transmission Parties

Manifest-related electronic data transmission parties chiefly are managers of Customs-controlled premises, tally departments and consignors of export goods, among which managers of Customs-controlled premises are the operators who have registered with the Customs and are occupied in handling, storage, delivery, forwarding and other activities in respect of import and export goods; tally departments are the operators who count goods, inspect damages of goods, check the numbers, guide the stowage of goods, make relevant documents and other work at the port on behalf of the carrier, consignor and consignee.

The transmission parties of the following manifest-related electronic data are respectively:

- (i) Data transmission party of arrival report: manager of Customs-controlled premises;
- (ii) Data transmission party of tally report: tally departments and manager of

Customs-controlled premises;

- (iii) Application of the grouping of goods and articles, and port congestion diversion: manager of Customs-controlled premises;
- (iv) Transmission party of clearance declaration: operator of inbound and outbound means of transport;
- (v) Data transmission party of packing list: consignee of export goods.

(3) Registration of the Manifest Transmission Parties

Article 6 of Decree No. 172 stipulates that manifest transmission parties (as well as managers of Customs-controlled premises, tally departments and consignors of export goods) shall register with the Customs of the place of its business operation directly under the General Administration of Customs (also known as “regional Customs”) or authorized Customs house under that regional Customs.

“China’s import and export manifest management system of Customs” has the functions of declaration, check, comparison, confirmation and feedback of electronic manifest data and manifest-related electronic data through the electronic data exchange between the transmission parties and the Customs. Consequently, filling and registration work of the transmission parties is of particular importance and is the key precondition of the application of transmission parties for authorization of the system.

1) Register with the Customs of the place of its business operation

When the manifest transmission party applies for the registration and record, it shall apply to the Customs of the place of its business operation directly under the General Administration of Customs or authorized Customs house under that regional Customs. If the registration place of the enterprise differentiates with the actual business operation place, the transmission party shall register with the Customs in its actual business operation place. Otherwise, Customs will not put it on record.

Electronic networking connection and data sharing are implemented for the registration data; in other words, once the registration is accomplished in one place, then the relevant data will be available in the whole nation and there is no need for the transmission party to file a record in each port. If anything changes in the relevant content regarding the registration, the transmission party shall immediately apply to the Customs which it registered with for the alteration formalities of registration.⁴⁴

2) Registration of special enterprises

With regard to those shipping enterprises without artificial person domestically,

⁴⁴ Wenchang CUI, Three Notes in the Filing of Manifest Transmission Obligators [J], China Customs, 2011, 11: 46-47.

they cannot apply for the registration and the relevant manifest data shall be submitted by the inbound shipping agency enterprise which has registered with the Customs.

As for those manifest transmission parties which set up inbound affiliated agencies, the affiliated agencies shall register with the Customs of the place of its business operations directly under the General Administration of Customs or authorized Customs house under that regional Customs and then they can handle manifest transmission businesses.

2.2.4 Transmission Means of Manifest

Decree No. 172 stipulates that transmission means of manifest are predominated by electronic transmission; when manifest or manifest-related electronic data cannot be transmitted to the Customs owing to special circumstances such as computer failure, relevant documents in paper-form, upon agreement of the Customs, shall be presented to the Customs within the prescribed time limits.

Electronic manifest data shall be normative and accurate and as completely same as those on the paper-form manifests. At the present stage, all ports in China have adopted manifest management system and almost all transmission parties use electronic manifest when declaring manifest. With inbound and outbound manifest management as the main target, registration data of shipping enterprises, vessels and Customs-controlled premises as the basis, and the computer networks and port monitoring equipments as tools, the information from different channels and links, such as the dynamic information of manifest data, arrival report, tally report, and means of transport, is compared through the statutory advance declaration of the dynamic information of manifest and means of transport, and new logistics supervision model is established, realizing the Customs' whole process of tracking and monitoring for the information of goods.

2.2.5 Time Limits for the Transmission of Manifest

The Administrative Measures of the General Administration of Customs of the People's Republic of China for Transmission of Electronic Data of Manifests promulgated in the form of Decree No. 70 of the General Administration of Customs (hereinafter referred to as "Decree No.70") on 1 February 1999 stipulates that the agent of the vessel entering into border shall transmit the electronic manifest data to the Customs under the requirement of the Customs within 24 hours after arrival at port; the agent of the vessel leaving the border shall transmit the electronic manifest data to the Customs under the requirement of the Customs within 72 hours after departure.

In line with the actual demand of Customs' monitoring services, Decree No. 172 makes new specific regulations on the time limits of electronic data transmission of manifest of inbound and outbound means of transport,

combining with characteristics of various means of transport and taking factors from four aspects into consideration.

(1) Considerations

- (i) Refer to the time limits listed on the relevant provisions in the SAFE Framework;
- (ii) Take the actual requirements of Customs' internal operation process into account;
- (iii) Enterprises of different scales have different capacities of data transmission, thus there should be a suitable longest time limit to adapt to the transmission capacities of small enterprises;
- (iv) Meet the actual needs of data exchange among Customs in the globe.

(2) Time Limits for Data Transmission of Inbound Manifest of Means of Transport

- (i) As for inbound means of transport, twenty-four (24) hours before loading of goods and articles onto container vessels, and twenty-four (24) hours before arrival at the first inbound port of the non-container vessels, manifest transmission party shall transmit main data of the original manifest to the Customs.
- (ii) Tally department or manager of Customs-controlled premises shall, within six (6) hours of the accomplishment of unloading goods and articles from the inbound means of transport, deliver tally report in electronic data form to the Customs; when second tally is needed, tally report in electronic data form may be submitted to the Customs within twenty-four (24) hours of the accomplishment of unloading goods and articles from the inbound means of transport after receiving the consent of the Customs.
- (iii) Within two (2) hours as of the completion of unpacking of the grouped goods or articles, the tally department or the manager of the Customs-controlled premises shall submit to Customs, in electronic form, a tally report on the grouped goods or articles .

(3) Time Limits for Data Transmission of Outbound Manifest of Means of Transport

- (i) With regard to the outbound means of transport, before twenty-four (24) hours of loading of the container ship which is expected to load goods or articles, or two (2) hours before loading goods or articles on the non-container ship, the manifest transmission party shall transmit main data of advance manifest to the Customs.
- (ii) Manifest transmission parties shall transmit the electronic data of the load manifest to Customs 30 minutes before loading of goods or articles onto the means of transport.

- (iii) An operator of a means of transport shall inform Customs of the time of departure of the means of transport two (2) hours before its departure from the place with a Customs office.
- (iv) Within six (6) hours as of the departure of the outbound means of transport from the port of loading, the manager of the Customs-controlled premises or the tally department shall submit a tally report to Customs in electronic form.

2.3 Government and Public Sectors

In the declaration management of manifest, Customs is the constitutor and executer of relevant laws and regulations and it is also the main management institution of manifest data declaration; while in China, Chinese E-port and local E-ports operate system concerning manifest declaration, which provide the platform and channel for electronic transmission of manifest and its relevant data.

2.3.1 Customs

China Customs is an independent unit, and the General Administration of Customs is the leading body of China Customs as a ministry-level organization directly under the State Council P.R.C., centrally managing the nationwide Customs. China Customs applies vertical administration system with the organization structure of three levels: the General Administration of Customs, directly competent Customs and Customs houses or offices. With regard to division of powers or the authority of offices, the General Administration of Customs plays the role of competent department to make an overall arrangement of the nationwide Customs with its focus on the formulation of principles and policies; directly competent Customs serves as a link between the upper organs and the lower organs, which makes an overall arrangement of the various businesses within its jurisdiction and concentrates on the enforcement of policies, laws and regulations, daily management of systems and field operation specification; while Customs houses or offices are the executors and are responsible for specific Customs businesses.

In accordance with the provisions of the Customs Law of the People's Republic of China, China Customs has mainly four functions: supervision, taxation, smuggling suppression and formulation of Customs statistics. In addition, Customs also deal with other Customs services; for example, it performs its duties of clearance operations, tax administration, processing trade and bonded supervision, Customs statistics, cracking down on smuggling, administration of port and other obligations.

(1) Supervision

Implement supervision and administration for import and export goods, passenger's luggage and postal articles, inbound and outbound means of

transport and other matters so as to secure the legitimacy of inbound and outbound goods or articles.

(2) Taxation

Besides collecting tariff, it also collects domestic taxes and charges such as VAT, consumption tax and petrol duties and so forth on behalf of tax authorities.

(3) Smuggling Suppression

Investigate and seize acts as of commercial fraud or tariff evasion or escaping regulation; it enhances its efforts for investigating and seizing goods or articles which are prohibited for smuggling or limited for entering or leaving the border, especially drugs.

(4) Customs Statistics

2.3.2 E-port

E-port is the abbreviation of China Electronic Port Enforcement System. This system stores data of electronic original account in respect of various import and export businesses into the public data center by applying modern information technology and the help of national public telecommunication network. Government agencies can realize the exchange and sharing of information data at the E-port through their own port of the system.

At present there are China E-port and local E-ports.

(1) China E-port

China E-port is the national import and export unified information platform. It is a public data center for relevant ministries and commissions under the State Council to store data and electronic original account of information flow, capital flow, goods flow and other information regarding import and export businesses. It provides cross-ministry and cross-industry online verification of administrative law-enforcement data for agencies. It is also a portal for enterprises and intermediary service agencies to carry on import and export businesses. Presently, China E-port has networked with Customs, General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China (AQSIQ), State Administration of Taxation, State Administration of Foreign Exchange and other government agencies, providing businesses and functions such as customs declaration, processing trade, foreign exchange management and control, tax refund and so forth.

(2) Local E-ports

On May 10th, 2006, General Office of the State Council issued the Notification of the General Office of the State Council on Strengthening the Construction of Electronic Port, which required that local governments should list the construction of local E-port high on the agenda and regard it as the sole and

large local Customs clearance information platform.

Local E-port, as a constituent of China E-port, primarily provides one-stop and facilitation services for enterprises. Its functions of assistant regulation and enterprise service improve the efficiency of customs clearance and trade logistics and reduce enterprises' costs. According to relevant data, the occurrence of platform of local E-port substantially cuts the import and export logistics costs of each port down; as a result, an average of 100-250 Yuan is saved for each shipment of import and export goods and averagely customs clearance time is shorten for approximately four (4) hours. At the same time, original accounts of import and export information stored on the platform of local E-port also provide basis for daily supervision of relevant agencies and provide data sources as supports for the statistics and analysis of integrated data of port, realizing and unifying the effective supervision and efficient operation.⁴⁵

2.3.3 Functions of Customs and E-port in Manifest Declaration

Customs supervision business is the primary and most important constituent part of China E-port. Empowered by local Customs, the local branch of China E-port Data Center is responsible for user management and operation maintenance of vessel declaration system and manifest declaration system.

Manifest transmission party and manifest-related electronic data transmission party can transmit electronic data to the Customs through China E-port Data Center, National Customs Information Center or LAN of directly competent Customs (including local E-port).⁴⁶

To satisfy manifest transmission parties' needs for declaring manifest data to the Customs, China Customs authorizes E-port to design and develop enterprise intelligent mailbox system. This system is an integral safe data transmission system by combining CA identification and authentication technology with transmission protocol. The manifest transmission party generates standard message and send it to the designated file catalog of the intelligent mailbox, then the mailbox system takes the responsibility for safe pretreatment and logic check of the message and transmit it to the server of E-port system, thus transmitting the message to the Customs.

2.4 Logistics Service Sectors

Manifest transmission parties chiefly are the carrier, shipping agent, freight forwarder and NVOCC.

2.4.1 Carrier

⁴⁵ Zhujun XIE, Opinions on Establishment of Local E-ports [N]. China Inspection and Quarantine Times, 2006-02-13003.

⁴⁶ Biquan CHEN, Implementation of China's Customs Advance Manifest Declaration and Suggestions on its Improvement [J], Containerization, 2011, 09: 26-29.

Carriers refers to the transport enterprises which specialize in maritime, railway, highway and air cargo and passenger transport businesses, such as shipping company, railway or highway transport company, airline company etc. Generally, they have large quantities of tools of transport and provide transport service for the society.

Primary obligations of shipping carriers are as follows:

(1) Make the ship seaworthy

The carrier shall keep the ship in seaworthiness and properly equip the ship with sailors and suppliers.

(2) Take over and arrange the goods properly

The carrier shall take over goods under the agreement set out in the carriage contract and properly load, move, stow, transport, maintain, take care of and unload those goods.

(3) Deliver goods according to agreement

The carrier shall deliver the goods to the agreed arrival port along the agreed or conventional or geographical course.

(4) Immediately inform relevant conditions

If arrival port of goods changes owing to force majeure, the carrier shall take shipper's or consignee's interest and notify the shipper or consignee immediately. When goods arrive at the port of arrival, the carrier shall deliver arrival notice to the consignee within twenty-four (24) hours.

(5) Compensate for damages

The carrier shall assume corresponding responsibilities for damages, losses or delay delivery of goods occurring during the performance of carriage contract, except that carrier proves the damages, losses or delay delivery of goods is incurred by exemption grounds.

2.4.2 Shipping agent

Shipping agent refers to the person who accepts the commission of vessel operator or owner to deal with various businesses and formalities for the vessels at port. Shipping agent makes solicitation at port for the commissioning party, handle loading or unloading formalities at the port of shipment or destination, store goods and deliver goods to consignee, refresh fuel, fresh water and food for the vessel and also deal with vessel repairment, vessel inspection, container tracking management and other activities on behalf of the vessel operator or owner. Shipping agent is the agent of a vessel and remains a relationship of agent and principal with the vessel owner, lessee or operator.

(1) Registration of shipping agent with the Ministry of Transportation

In China, domestic shipping agents usually subject to the management of transportation authorities at or above county-level or its entrusted waterway transportation management department. International shipping agents are governed by competent authorities of transportation of the State Council and relevant competent departments for transportation of the local people's government. In line with the related provisions of the Regulations on the Administration of Domestic Waterway Transport, the newly established domestic waterway shipping agent shall, within 15 working days as of its registration of establishment, register with the department, which takes in charge of waterway transport management, of the municipal people's government in the place of its establishment. While for those enterprises which engage in international shipping agency services, they shall, within thirty (30) days as of their commencement of operation, register with the Ministry of Transportation with the qualification documents of business place and relevant persons responsible for the agency business. Till Oct. 31, 2014, the international shipping agency enterprises which have registered in China have reached up to 1,674.

(2) Role of Shipping Agent

Shipping agent generally plays a role as the bridge among the relevant parties and coordinates, provides professional services and reduces shipping costs for its clients.

1) Role as a bridge

Shipping agent can convey messages, such as cargo handling situations after the arrival of the ship, expected shipping date and dynamic statuses of ship among its clients, consignors/consignees, ports and Customs.

2) Coordination

Among various work in the shipping, or when disputes arise among main participants of manifest declaration, shipping agent can assist the carrier, port and consignor/consignee to properly settle issues.

3) Providing professional services

International shipping agent's duties are to deal with formalities for vessels entering or leaving port, deal with declaration formalities of vessel, containers and goods, collect freight and handle settlement on behalf of its clients, organize goods and other activities for its clients by taking advantage of its professional knowledge, experience and resources. International shipping agents are familiar with relevant laws and Customs of the port and it provides professional services for its clients through handling matters of vessels at the port on behalf of its clients.

4) Reducing costs

During accomplishing the matters commissioned, shipping agent can reasonably arrange various sorts of work to reduce the unnecessary costs for its clients.⁴⁷

(3) Main Businesses of Shipping Agent

The shipping agent, which has filed and registered, can accept the commission of owner or lessee or operator of a vessel and engage in the following businesses:

- (i) Handle formalities for vessels entering or leaving port, contact and arrange piloting, berthing and loading and unloading;
- (ii) Sign Bills of Lading and carriage contract and accept booking on behalf of its clients;
- (iii) Deal with declaration formalities of vessel, containers and goods;
- (iv) Canvass cargo, organize stowage, handle consignment and transit for cargo;
- (v) Collect freight and handle settlement on behalf of its clients;
- (vi) Handle maritime passenger transport business;
- (vii) Other relevant businesses.

2.4.3 Freight Forwarder

Freight forwarder refers to the operator who receives the trader's commission and thus provides services for that trader. Its obligations are to transport the goods being commissioned by its client from one place to another through the designated transportation approach; it is the company which collects and transports goods on behalf of transport companies (sea, land and air) and carries out cargo canvassing for its clients.

(1) Business Scope of Freight Forwarder

1) Serve the consignor

Freight forwarder handles any formalities required in different modes of goods transport for the consignor, including adopting the fastest means of transport with lowest cost, arranging appropriate goods package, selecting transport route; selecting reliable and efficient carrier and taking charge of the conclusion of carriage contract; procuring cargo insurance; arranging transportation of goods from the factory to the port; handling formalities of Customs and relevant documents and delivering goods to carrier; paying for freight and tariff in the name of consignor; and handling any foreign exchange transactions in respect of goods transport.

⁴⁷ Silin SHEN, Discussions on Business of International Shipping Agents [J], Securities & Futures of China, 2010, 03: 80-82.

2) Serve Customs

Deal with customs formalities for import and export commodities as the agent of Customs. In this case, freight forwarder does not only represent its clients but also stands for Customs. After receiving the acceptance of Customs, freight forwarder can handle customs formalities and be responsible for declaring exact amount, quantity and name of commodities so as to indemnify the government from any losses in respect of this aspect.

3) Serve the carrier

Freight forwarder can book space with the carrier without any delay and negotiate fair and reasonable expense for both consignor and carrier, arrange proper time for the delivery of goods and settle freight account and other issues on behalf of the consignor with the carrier.

(2) Characteristics of China's Freight Forwarder

Through over thirty years' development, services provided by China's freight forwarders have already been upgraded from traditional space-booking and customs clearance services to integral services of logistics, information flow and capital flow. Despite such development, China's freight forwarding industry, comparing with those in well developed countries, still takes on characteristics of that the scale of enterprises is small, functions are disperse, the model is backward and so on.

1) Provide whole-process trade services

Freight forwarder, as an intermediary service provider, serves the consignor, Customs and carrier at the same time. Most of its business sources come from its cooperation with other partners, such as booking space with shipping company, dealing with customs clearance and commodity inspection, storage, trailer, insurance and so forth. During the process of international trade, freight forwarder can provide whole-process trade services.

2) Large quantities with various scales

Freight forwarding industry has fierce competition and the number of freight forwarders has increased for several years, but they have different scales. There are thousands of freight forwarders at the main large ports, and small-scaled freight forwarders with less than 15 employees can be seen everywhere and even freight forwarding companies with only one or two employees still exist.⁴⁸

3) Multi-level agent and lack of unified industry standards

In China's freight forwarding industry, multi-level agent exists, including

⁴⁸ Guangqi LIU, Past, Present and Future of Freight Forwarding Industry-A Survey of Freight Forwarding Enterprises [J]. China Storage & Transport, 2013,11: 40-44.

first-level freight forwarder (can directly book space with carriers), and second-level freight forwarder and third-level freight forwarder (undertake freight forwarding business by means of attaching to the upper-level freight forwarder). Freight forwarding enterprises shall register with the Ministry of Commerce P.R.C. According to the statistics data from the Ministry of Commerce, by 2012, China's freight forwarding and logistics enterprises have already exceeded 3,000 with over two million employees while actual figures would at least double these figures.⁴⁹ The number of second-level and third-level freight forwarders without legal qualification is estimated to reach up to around 30,000. Formal and legal freight forwarding enterprises' registered capital is required to be five million Yuan; however, some of the second-level and third-level freight forwarders have registered in other types of companies but operated beyond their business scopes and some of them even do not carry out the business registration.

4) Serious homogeneous competition, high cost and low profits

China's freight forwarding industry lacks its own innovation. The enterprises provide almost the same services, thus homogeneous competition is serious and core-competitiveness is not strong. Fierce competition in the freight forwarding industry results in that freight forwarding enterprises provide services at pretty low prices and in defiance of profits in order to solicit business, leading to the high cost and low profits of freight forwarding industry.

2.4.4 NVOCC

NVOCC pays freight according to the freight rate of common carriers or the price in the service contract signed between NVOCC and the carrier, and collects freight from shippers on the basis of its own price rate of transport to earn freight differences. In the circumstance of through transportation, NVOCC also takes responsibility of arranging inland transport and paying charges for it. The international freight forwarder actually carries the goods as a NVOCC when providing international multimodal transport services.

NVOCC providing brokering services is an arising kind of transportation service in recent years. Such kind of NVOCC generally does not engage in specific operation and actual services. It carries on organization of transport, goods distribution, selection of means of transport and transport route and service improvement. Their incomes come from brokerage and the freight differences from "wholesale".

(1) Characteristics of the NVOCC in China

1) Uneven scale

There is no strict limit for NVOCCs' investment in fixed assets, thus the scale

⁴⁹ Guangqi LIU, Past, Present and Future of Freight Forwarding Industry-A Survey of Freight Forwarding Enterprises [J]. China Storage & Transport, 2013,11: 40-44.

of NVOCCs is quite different. There exist bogus companies with two or three employees and also world's top five hundred enterprises.

2) Highly depending on international trade

Ocean transport grows out of international trade, thus it naturally depends on it. In general, non-vessel operating industry develops rapidly during the stage where the international trade is booming; however, once international trade gains a sluggish growth, non-vessel operating industry will also get sagging.

3) Wide business scope

One important reason why non-vessel operating business separates from trade and shipping transport is that it can release the owner of cargo from inspection and quarantine, Customs, inland transport, storage, space-booking and other tedious matters so that the owner can put more efforts on production and the trade. Consequently, NVOCCs have to handle the matters which are not only tedious but also demand professional knowledge, such as declaration of Customs duty and tax, inspection and quarantine, dangerous goods declaration and inspection at port, arrangement of shipping route and so forth.

4) Low profits but great responsibilities

Profits of the NVOCC mainly come from the differences between the freight it pays to the vessel operating common carrier and the freight it collects from the owner of goods. In terms of the actual situations of market, freight difference generally remains 5% (ocean route) to 20% (near-sea shipping route) of the freight, and the absolute value maintains between 10-100 dollars per container.⁵⁰ Though the profits are not very high, the responsibilities are heavy. Very small oversight of NVOCC will bring huge loss to the shipper.

5) Highly relying on trusting relationship

As goods are completely under supervision of the actual carrier after goods are delivered to it, the NVOCC takes great responsibility for the shipper; as a result, it is very important that the owner of goods chooses what kind of NVOCC and the NVOCC chooses what kind of vessel operating common carrier. It is the reason that makes the non-vessel operating business become an industry that highly relies on trusting relationship. Each NVOCC has its proposed vessel operating common carrier, while every owner of goods only carries out business with one to three NVOCCs which have long-term cooperation relations with it.

(2) Business Scope of the NVOCC

Ministry of Transport regulates that the NVOCC is the carrier of the actual shipper, and it has ocean transport contract with the shipper. Its business

⁵⁰ Jia Li, *Deficiencies and Improvement of NVOCC Management System in China* [D], East China University of Political Science and Law, 2008.

scope includes concluding international cargo transport contract as a carrier with shippers; receiving and delivering goods as a carrier; issuing B/L or other carriage documents; collecting freight and other service charges; booking space and handling transshipment for the goods with operators of international shipping transport or other means of transport; paying freight or other transport fees; container devanning and container consolidation business; multimodal transport services and other relevant business; etc.

(3) Differences between China's NVOCC and Freight Forwarder

The NVOCC and freight forwarder are both not directly involved in the actual transport of goods; they only assume the responsibilities as an agent. Their main differences in respect of China's marine transport are regulatory authorities, power of issuing B/L, cash deposit, and applicable laws.

1) Regulatory authorities

The NVOCC shares the nature of service with the freight forwarder; however in China, the regulatory authority for freight forwarder is the Ministry of Commerce while the regulatory authority for NVOCC is the Ministry of Transport.

2) Power of issuing B/L

The B/L issued by NVOCC is a kind of CARRIER B/L (known as House B/L), while the B/L issued by China's international freight forwarder is only an agent B/L which has a lower legal status. The freight forwarder has no right to issue B/L as a carrier and to issue B/L on behalf of the carrier or the NVOCC. Once the freight forwarder issue any transport B/L by himself or on behalf of the carrier, the consignor will not be able to make the exchange settlement.

The document issued by freight forwarder is the transport document used for transportation certificate; while document issued by NVOCC is the B/L which is used for document of title and differs from the internal B/L and the aforementioned transportation certificate of freight forwarder.

3) Cash deposit

Once the registered capital of freight forwarder reaches a certain amount and it has registered with the Ministry of Commerce, it can issue the transportation certificate; while the NVOCC has to register with the Ministry of Transport and pay cash deposit of 800,000 Yuan.

4) Applicable laws

Relationship between the NVOCC and shipper is the relation of contract of cargo carriage by sea which is evidenced by B/L, so the provisions in respect of B/L and maritime transport in China's Maritime Law and international conventions are applicable; however the freight forwarder as a mere agent enters into a transport entrustment contract in written form with the original

shipper, so the relationship between the freight forwarder and the shipper is legal relation of the entrustment contract, and the provisions in respect of entrustment contract in China's Contract Law are applicable to this. At the same time, since there is no international convention stipulating freight forwarding, conflicts inevitably exist among each country's laws with regard to freight forwarding.

2.5 Key Laws and Regulations

In order to speed up the development of China's foreign trade, promote the security and facilitation of international trade, strengthen Customs' management of electronic data transmission of manifests, and increase the efficiency of customs clearance, China has promulgated a series of laws and regulations.

Decree No.70 had played an important role in strengthening the management of electronic data of manifests, increasing the efficiency of customs clearance, and facilitating customs procedures for enterprises since its implementation in 1999.

On September 1, 2004, the State Council passed the Implementing Regulations of Customs of the People's Republic of China on Administrative Punishment. The regulation stipulates that if electronic data of manifests fails to be transmitted to Customs within the prescribed time limit, electronic data transmitted is inaccurate or relevant electronic data fails to be stored within prescribed time limit, thus affecting Customs' supervision, a warning shall be given and a fine of 50,000 Yuan or below may be imposed and illegal gains shall be confiscated, if there is any.

In June 2005, 166 countries including China, officially signed the SAFE Framework put forward by WCO. Transmitting electronic cargo data in advance as an important part of SAFE Framework has been presented.

In recent years, with the continuous expansion of the scale of China's foreign trade and the development of international logistics, China Customs is faced with new situations and problems in the management of manifests. Decree No.70 which is only for the management of maritime and air manifests cannot meet the current demands of development. Local Customs has different demands for the management of manifests and the law enforcement and manifest operation are even different at different sites within the same Customs district. This influences the unified law enforcement of Customs and brings great risks. As a result, China drafted Decree No.172 and has implemented it since January 1, 2009. Decree No.70 was repealed simultaneously.

In addition, in Customs Law there are some provisions concerning transmission time limits of manifests and statutory transmission obligators; in the Civil Law, it stipulates that the mandatory shall exercise the rights of the

principal to the extent authorized by the principal, and the mandatory of the person in charge of the means of transport can become the subject of manifest data transmission; the Announcement of the General Administration of Customs on the Supervision of Export Container Cargo (No.549) requires that Customs shall start the arrival report submission function module before June 30, 2007; the Circular of the Supervision Department of the General Administration of Customs on Check of Inbound and Outbound Vessels by Ports and Tally stipulates that inbound and outbound vessels shall go through inbound and outbound formalities when arriving at or leaving the port and a manifest shall be collected by Customs.

The laws and regulations concerning manifest are summarized as follows, shown in Table 2.9.

Table 2.9 Laws and Regulations Related to Manifest

The Law or Regulation	Issuing Date	Enforcement Date	Purpose	Amendment/ Expiration Date
Customs Law of P. R. C	1987.1.22	1987.7.1	Safeguard national sovereignty and interests, strengthen Customs supervision and management, and promote foreign trade and scientific and cultural communications.	Amended, June 8,2000
Supervision Measures of Customs of P. R. C on Inbound and Outbound International Vessels and Cargos and Articles Carried	1991.8.23	1992.1.1	Promote the development of foreign trade and economy, facilitate entry-exit shipping, and strengthen Customs management of inbound and outbound vessels and the cargoes and articles carried.	Expired
Inspection Measures on	1995.3.21	1995.3.21	Strengthen management of international vessel entering	

International Vessels' Entering and Leaving Ports of P. R. C			and leaving ports of PRC, facilitate entry and exit of vessels, and improve efficacy of ports.	
Administrative Measures of the General Administration of Customs of P.R.C for Transmission of Electronic Data of Manifests (Decree No.70 of the General Administration of Customs)	1999.2.1	1999.3.1	Strengthen management of transmission of electronic data of manifests, increase efficiency of Customs clearance, and facilitate customs procedures for enterprises.	Expired, January1, 2009
Implementing Regulations of Customs of P. R. C on Administrative Punishment	2004.9.1	2004.11.1	Standardize administrative punishments, assure Customs to exercise official powers according to laws, and protect the legitimate rights and interests of citizens, legal persons and other institutions.	
Measures of the General Administration of Customs of P.R.C for the Administration of Manifests of Inbound and Outbound Means of	2008.3.28	2009.1.1	Meet the needs of current international logistics development and unification of customs law enforcement, promote international trade security and facilitation, and enhance the reform and development of customs operations.	

Transport (Decree No.172 of the General Administration of Customs)				
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In addition to the laws and regulations on manifest as stated above, the relevant announcements promulgated by the General Administration of Customs are as follows:

Table 2.10 Customs Announcement Related to Manifest

The Announcement	Release Date	Effective Date	Purpose
Announcement of the General Administration of Customs No.54, 2008 (Announcement on Promulgation of Electronic Data Format of Cargo Manifests of Inbound and Outbound Waterborne and Airborne Means of Transport)	2008.08.15	2008.08.15	In accordance with the provisions of Decree No. 172, the General Administration of Customs formulated the electronic data formats of cargo manifests for inbound and outbound waterborne and airborne means of transport.
Announcement of the General Administration of Customs No. 81, 2008 (Announcement on Promulgation of Electronic Transmission Messages of Cargo Manifests of Inbound and Outbound Waterborne and Airborne Means of Transport)	2008.11.11	2008.11.11	In accordance with Announcement No. 54, 2008, the General Administration of Customs formulated the formats of electronic transmission message of cargo manifests for inbound and outbound waterborne and airborne means of transport, including the structure definition, XML schema, and explanation for formulation of the electronic transmission messages of inbound and outbound cargo manifests of China Customs.

<p>Announcement of the General Administration of Customs No.97, 2008 (Announcement on Matters Regarding Transmission of Manifests of Cargos and Articles Carried by Inbound and Outbound Vessels</p>	<p>2008.12.30</p>	<p>2009.01. 01</p>	<p>In accordance with Decree No. 172, the General Administration of Customs announced matters regarding transmission of manifests of cargos and articles carried by inbound and outbound vessels.</p>
<p>Announcement of the General Administration of Customs No.22, 2009 (Announcement on Matters Regarding Transmission of Manifests and Manifest-related Electronic Data of Cargos and Articles Carried by Inbound and Outbound Means of Transport</p>	<p>2009.05.04</p>	<p>2009.05.04</p>	<p>In accordance with, Decree No. 172, the General Administration of Customs announced matters regarding transmission of manifests and relevant electronic data of cargos and goods carried by inbound and outbound vessels.</p>
<p>Announcement of the General Administration of Customs No.22, 2010 (Announcement on the Adjustment and Supplement of Electronic Data Formats of Cargo Manifests of Waterborne and Airborne Means of Transport)</p>	<p>2010.11.23</p>	<p>2010.11.23</p>	<p>In order to strengthen the actual effects of supervision of Customs and ensure that all the tax receivable of the state shall be collected and in accordance with Decree No. 172, it has been decided to adjust the electronic data formats of cargo manifests of waterborne and airborne means of transport and add some new data formats, including data items of application for the export cargos failing to be loaded, data items of application for change of allocation</p>

			of unloaded export cargos, and data items of approved document of international transfer.
Announcement of the General Administration of Customs No.77, 2010 (Announcement on Issuance of Version 1.1 of Message Format for Electronic Transmission of Cargo Manifests of Inbound and Outbound Waterborne and Airborne Means of Transport	2010.12.10	2010.12.10	In order to further improve the standards of electronic message formats of cargo manifests of inbound and outbound cargos carried by waterborne and airborne means of transport, the General Administration of Customs formulated Version 1.1 of Message Format of Electronic Transmission of Cargo Manifests of Inbound and Outbound Waterborne and Airborne Means of Transport, adding new contents on waterborne, airborne and international transfer transportation.
Announcement of the General Administration of Customs No.70, 2014 (Announcement on Matters Regarding Supervision of Inbound and Outbound Means of Transport and Management of Manifests	2014.09.23	2014.10.15	Effectively strengthen the actual supervision of Customs over inbound and outbound means of transport and cargos and articles, standardize the use of the management system of inbound and outbound means of transport and the management system of manifests, and ensure complete and effective transmission of data.

2.6 Standardization Enforcement

2.6.1 Business Standards

Business standards of China's manifest declaration are mainly stipulated in Decree No. 172. The Decree makes corresponding provisions for manifest content, transmission data, transmission parties, the means, process and time limits of manifest transmission with reference to SAFE Framework. In addition, the laws and regulations listed above also have corresponding provisions for the business standards of manifest declaration.

2.6.2 Technical Standards

Electronic manifest, as a kind of electronic document, follows the general characteristics of electronic documents in the process of standardization and basic structure.

In terms of document functions, electronic documents in logistics in China can be divided into: declaration form, inspection form, order form, load and unload message, and inventory; in terms of the content structure and format of documents, electronic documents in logistics can be classified as formatted flat files containing segment marks and fixed length, formatted flat files with segment marks and separators, formatted flat files without segment marks, formatted flat file without segment marks but with separators, XML format files and other files with special formats.

(1) Basic Structure of Electronic Document Format

The main components of an electronic document are:

- (i) Header: sender, receiver, time, message type, version;
- (ii) Body: document body, data relations (principal and subordinate relations, constraints, field type);
- (iii) End: end identifier of message.

(2) Standards for Manifest Electronic Message Format

In order to further improve the standards of electronic message formats for inbound and outbound maritime transport manifests, the General Administration of Customs stipulates that the format of manifest declaration is XML format and has formulated the electronic message format version 1.1 of maritime cargo manifests for inbound and outbound manifests which took effective on January 1, 2011, including: the Electronic Message XML Schema of Inbound and Outbound Waterborne and Airborne Cargo Manifests of China Customs and the Explanation for Formulation of Message Format Version 1.1 of Inbound and Outbound Waterborne and Airborne Cargo Manifests of China Customs.

The formulation and adoption of the standards of manifest declaration have not only standardized the business process and technical application of manifest declaration in China, improved the efficiency of manifest declaration, and realized domestic information sharing, but also have facilitated bilateral or multilateral data and information sharing by adopting international business process and technical standards and being in line with international practices.

3. Manifest Declaration Profile and the Implementation of E-Manifest

3.1 Overview

In 1993, the State Council started the implementation of Golden Customs Project, which was designed to promote the electronization of Customs declaration operation and replace the traditional declaration way so as to save time and cost of document transmission. On February 1, 1999, Decree No.70 was issued and took effect on March 1, 1999, which means that electronic declaration of manifests in China started. In 2001, the Golden Customs Project was official launched. On March 28, 2008, Decree No.172 was promulgated and officially became effective on January 1, 2009 and Decree No.70 was repealed simultaneously.

3.1.1 The Differences between Decree No.172 and Decree NO.70

The major differences between Decree No.172 and Decree NO.70 are as follows:

(1) Implementation of “Unified Registration and Filing” for Transmission Parties

Compared with Decree No. 70, Decree No. 172 has further defined the requirements of registration and filing and enlarged the scope of applicants for filing. “Manifest transmission parties, managers of Customs-controlled premises, tally departments and consignors of export goods shall register with the Customs of the place of its business operation directly under the General Administration of Customs (also known as ‘regional Customs’) or authorized Customs house under that regional Customs”. Detailed filing procedures are stipulated as well.

(2) Advance Declaration

In comparison with Decree No.70, there are some great changes in Decree No.172, whose articles have been increased from 13 to 39. Transmission time limits of electronic data of manifests at all the stages have been regulated and the original one-time transmission method has been changed. All the data generated from operations at all the links of logistics are collected, connected and integrated to form the manifest so that the information on manifest is more accurate and reliable.

(3) Manifest Redefinition

Decree No.172 redefined manifests and classified manifests according to inbound and outbound direction, including original manifest, advance manifest and load/passenger manifest.

(4) Unified Interpretation of Commonly Used Terms

Some commonly used terms concerning the management of manifests and related electronic data have been interpreted in a unified manner in Decree No.172.

(5)Format Definition of the Following Electronic Data

- (i) Original manifest (including main data and other data);
- (ii) Tally report;
- (iii) Application for the grouping of goods and articles;
- (iv) Tally report on grouped goods or articles;
- (v) Application for port congestion diversion;
- (vi) Arrival report on goods or articles diverted against port congestion;
- (vii) Packing list;
- (viii) Advance manifest (including main data and other data);
- (ix) Arrival report; and
- (x) Load/passenger manifest.

In addition, the modification of manifest was only regulated fundamentally in Decree No. 70. In order to regulate the modification of electronic manifest data and reduce the randomness of modifying manifests and the error rate of data transmission, special provisions have been brought into Decree No. 172, including initiative modification, modification after application, and modification after penalty, which has tightened management of modification and regulated the process effectively.

3.1.2 Brief Introduction of New Manifest Declaration and Management System

Since the implementation of Decree No. 172, China E-Port has developed a national unified manifest declaration and management system for enterprises and provides declaration services concerning manifests and related documents in the area of maritime and air transport.

(1) Transmission Mode of Manifest Declaration and Management System

The new manifest declaration and management system provides two transmission modes: the enterprise can choose to conduct the input and declaration of related documents, data query and receipt query at the interface client of the system; or it can also import and transmit the messages generated by its own ERP system through the mail box to Customs and receive the receipt of examination and supervision instructions from Customs.

(2) Functions of Manifest Declaration and Management System

The manifest declaration and management system provides functions of declaration and transmission of all documents required by Decree No. 172 and currently the data transmission for maritime and airborne means of transport has been established. The documents mainly include original manifest, advance manifest, arrival report, load manifest, packing list, tally report, application for the grouping of goods and articles, application for port congestion diversion, application for direct change of allocation of cargos, application for cargos failing to be loaded, application for allocation of empty containers of import and export , and etc..

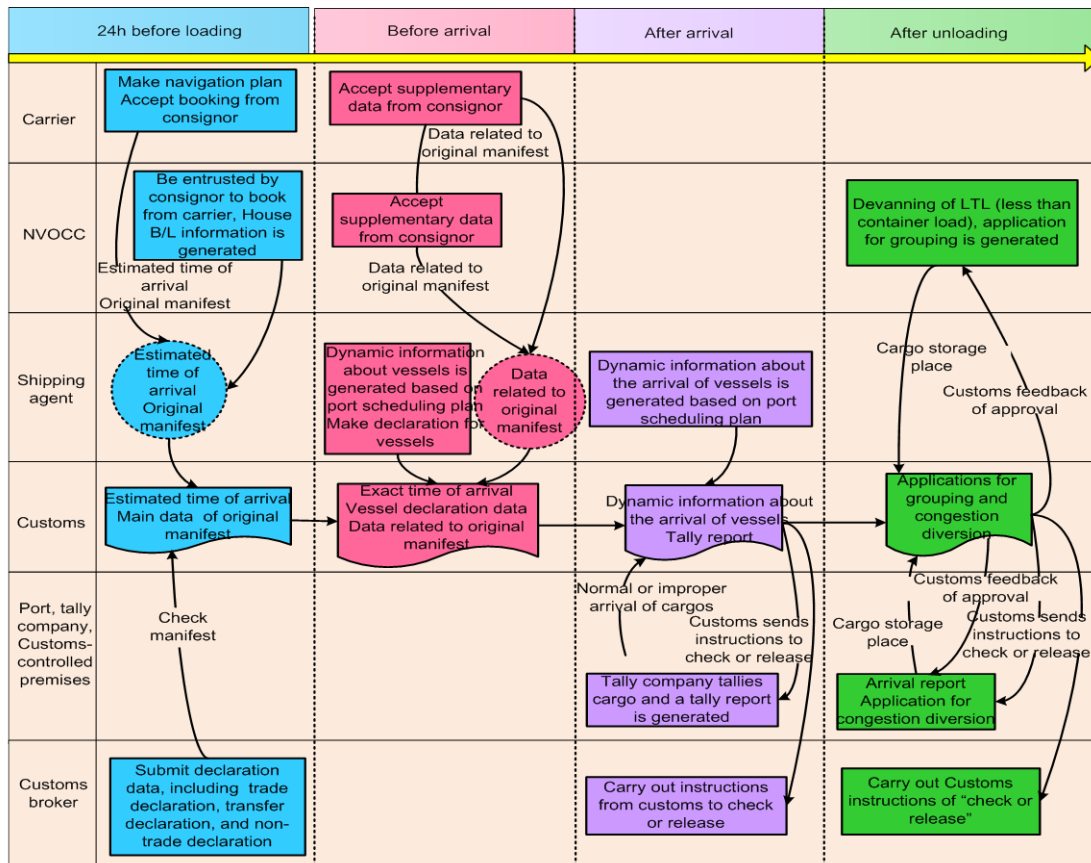
The logistics sectors and their agencies can declare original manifest, advance manifest, load manifest, application for the grouping of goods and articles, application for cargos failing to be loaded, etc. via the system. When the manifest data needs to be modified or deleted, the application for modification and deletion has to be sent. Managers of Customs-controlled premises can declare arrival report, application for port congestion diversion, and the application for deletion of these data via the system. The tally department can declare tally report and the application for deletion through this system.

3.2 Current Workflow for Maritime Import/Export

3.2.1 Imports

Import manifest declaration process is shown in Chart 3.1.

Chart 3.1 Import Manifest Declaration Process

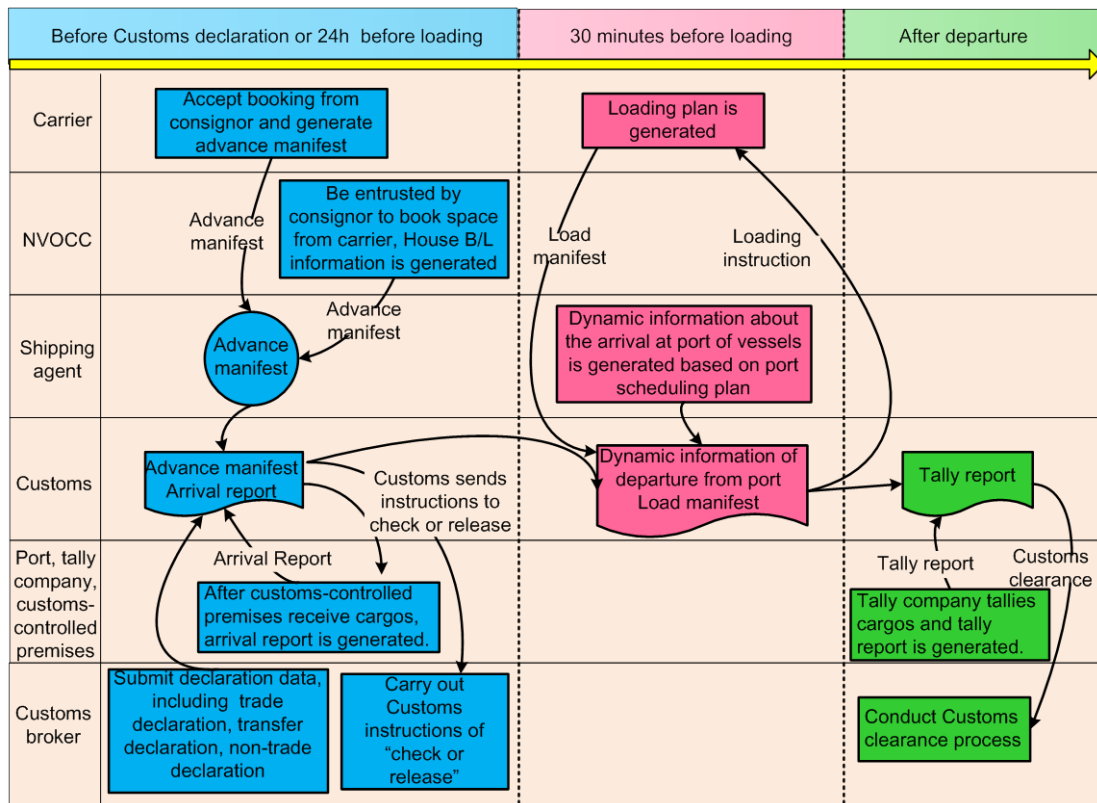


- (i) 24 hours before loading, the carrier accepts booking from the foreign export consignor or the NVOCC (entrusted by the foreign export consignor) books space from the carrier; the person in charge of the vessel declares the estimated time of arrival;
- (ii) Within the time limit prescribed by Customs, manifest transmission parties transmit main data of original manifest (Master B/L information and/or House B/L information) (the actual situations vary in different local ports, which will be described in details in section 2.3);
- (iii) The import enterprise can declare at Customs in advance. It usually entrusts a customs broker to submit customs declaration on behalf of it;
- (iv) The person in charge of the vessel reports the exact time of arrival;
- (v) The local shipping agent declares the dynamic information of the vessel according to the port scheduling plan;
- (vi) Before arrival, the export consignor can supplement other data related to original manifest; manifest transmission parties submit the data;
- (vii) When the ship arrives at the port, the shipping agent sends the arrival report to Customs;
- (viii) Customs sends the inspection order;
- (ix) The tally company tallies the cargos and delivers the tally report to Customs;
- (x) Customs checks the manifest and marks it with “normal arrival of cargos” or “improper arrival of cargos” according to tally report;
- (xi) After unloading, the NVOCC makes application for the grouping of goods and articles, or the port or the Customs-controlled premises send the application for port congestion diversion;
- (xii) Customs gives feedback of examination;
- (xiii) The customs declaration corresponding to the B/L marked “normal arrival of cargos” can be released.

3.2.2 Exports

Export manifest declaration process is shown in Chart 3.2.

Chart 3.2 Export Manifest Declaration Process



- (i) Before customs declaration or 24 hours before loading, the carrier accepts booking from the domestic consignor or the NVOCC (entrusted by the domestic consignor) books space from the carrier;
- (ii) Within the time limit prescribed by Customs, manifest transmission parties transmit data of advance manifest (Master B/L information and/or House B/L information) (the actual situations vary in different local ports, which will be described in details in section 2.3);
- (iii) The shipping agent imports the data and submits the advance manifest;
- (iv) Customs-controlled premises submit the arrival report to Customs;
- (v) The export enterprise declares at Customs. It usually entrusts a customs broker to submit customs declaration on behalf of it;
- (vi) If the arrival report and declaration data are compared to be consistent, the manifest is verified and the cargos are released;
- (vii) 30 minutes before loading, the shipping agent sends declares the dynamic information of the vessel of arrival according to the port scheduling plan;
- (viii) Customs sends the instruction of loading;
- (ix) The shipping agent submits the load manifest;
- (x) The tally company tallies the cargos and delivers the tally report to

Customs;

- (xi) Customs crosschecks the load manifest with tally report and customs clearance is operated by customs system.

3.2.3 Comparison with Previous Workflow

New manifest declaration process (stipulated in Decree No. 172) differs from the previous process of manifest declaration in manifest types, the time limits of manifest transmission, and the scope of manifest declaration.

(1) The Major Differences between the New Process of Import Manifest Declaration and the Previous One

The major differences between the new process of import manifest declaration and the previous process are shown in Table 3.1.

Table 3.1 Major Differences between New Process of Import Manifest Declaration and the Previous Process

Content	Previous Process	New Process
Time limits of transmission	Except for force majeure, the shipping agent shall transfer the electronic manifest data to Customs within 24 hours after the arrival of the vessel at the port.	If there are goods or articles on board the inbound vessel, manifest transmission parties shall transmit to Customs the main data of the original manifest by twenty-four (24) hours before loading onto container vessels, and twenty-four (24) hours before arrival at the first port of call within the Customs territory for non-container vessels.
Declaration scope	Import laden containers & import empty containers	Import laden containers, empty containers and international transfer containers

(2) The Major Differences between the New Process of Export Manifest Declaration and the Previous One

The major differences between the new process of export manifest declaration and the previous process are shown in Table 3.2.

Table 3.2 Major Differences between New Process of Export Manifest Declaration and the Previous Process

Content	Previous Process	New Process
Manifest type	When the vessel leaves the port and the tally report is consistent with the manifest data, the clean manifest for export laden containers and empty containers needs to be sent.	As the “clean manifest” is generated from the information and verified data from the key points in the export workflow, the declaration of clean manifest is cancelled.
Declaration scope		The load manifest data of export laden containers, empty containers and international transfer containers is required to be sent before the arrival of the vessel at the port.
Time limits of transmission	The shipping agent shall transmit the electronic manifest data to Customs within 72 hours after departure.	<p>Manifest transmission parties shall transmit to Customs the main data of the advance manifest in electronic form before going through customs declaration formalities;</p> <p>After Customs has received and accepted the transmitted main data of the advance manifest, manifest transmission parties shall transmit to Customs other data of the advance manifest by twenty-four (24) hours before loading onto container vessels, and two (2) hours before loading of goods or articles onto the non-container vessels;</p> <p>Manifest transmission parties shall transmit the electronic data of the load manifest to Customs 30 minutes before loading of goods or articles onto the vessel.</p>

(3) The Advantages of New Manifest Declaration Process

Compared with the original process, the new manifest declaration process has been improved in declaration content, time limits, technology standard and export manifest declaration.

1) Declaration content

In the aspect of declaration, the data items required by the new manifest declaration process are increased and more contents are required to be declared, including the tally report and the advance manifest, which is in line with the demand of the development of international logistics.

2) Time limits of transmission

In the aspect of transmission time limits, the new manifest declaration process requires the declaration shall be made in advance, which is the most striking difference between the new process and the original one. The major advantages of advance declaration are as follows:

- (i) The advance declaration of import and export manifest data can have the risks of the import and export cargos identified before they arrive at the port and can effectively reduce customs clearance time;
- (ii) The advance declaration can get logistics data collected and integrated to supervise the cargos effectively;
- (iii) The advance declaration can reduce the stranded cargos at the port, delay in delivery and jettison due to the improper loading.

3) Technology standard

In the technical aspect of manifest declaration, the message format has been changed to XML in place of the original text format.

4) Export manifest declaration

In the aspect of export manifest declaration, the new manifest declaration has cancelled clean manifest declaration and crosschecks load manifest with tally data in place of clean manifest to facilitate the declaration process.

3.3 Implementation of E-Manifest in China

Since Decree No. 172 was implemented in China in 2009, the operation business and management of manifest declaration have been significantly enhanced. According to the requirements of China's General Administration of Customs, the new Customs manifest declaration and management system began to be used officially from June 28, 2014 as a replacement. The manifests of all the container cargos entering China are required to be declared to China Customs 24 hours before loading at the loading port.

The manifest declaration and management system has been put into use at local ports in succession. For example, the corresponding manifest information system or information platform has been established in Shenzhen, Shanghai, Guangzhou, Ningbo, Dalian and other ports, which enables manifest data to be transmitted efficiently and timely between transmission parties and Customs through advanced technology, continuously improving the exchange rate of e-Manifest.

3.3.1 Current Implementation Situation of E-Manifest in Shenzhen

Shenzhen is one of pilot regions of switching to new manifest declaration and management system. Much preparatory work has been done at the early stage, including enterprise system switching, program upgrading, construction of transmission channels, Customs internal training, joint debugging and test, simulation running, etc. to fulfil the conditions of switching to the new system.

According to the promotion plan of Shenzhen Customs, the pilot running of new system began respectively at Shenzhen Dachanwan port in April, 2011 and Shenzhen Dapeng port in early September, 2012. The switching of manifest system is then determined based on these conditions of pilot running. Up to now, the new system runs smoothly at these two ports.

(1) Transmission Parties and the Relevant Procedures

The declaration of manifest in Shenzhen is mainly completed by the shipping agent and the relevant specific procedures are as follows:

- (i) Declaration of import manifest: The carrier accepts the space booking of foreign consignor; the local shipping agent generates and sends the original manifest; Customs reviews the manifest; the tally company generates the tally report; if the tally data is normal, the cargos corresponding to the Bill of Lading are released.
- (ii) Declaration of export manifest: The carrier accepts the space booking of domestic consignor; the consignor entrusts the customs broker to make declaration; the customs broker first enters the advance data on the third-party platform and then sends it to local shipping agent; the local shipping agent imports the data and then generates and sends the advance manifest; the arrival report is submitted by the port; the manifest is reviewed by Customs; the cargos corresponding to the Bill of Lading are released; the local shipping agent submits load manifest; the tally company reports the tally report; the report is reviewed by Customs; go through customs clearance procedures.

(2) Main Features

In actual operation, the declaration procedures of new manifest system at

Shenzhen Customs have the following features⁵¹:

- (i) No requirements for declaration 24 hours before loading;
- (ii) Adoption of operation mode of “one agency, one ship”;
- (iii) No requirements for dynamic declaration of vessels temporarily.

3.3.2 Current Implementation Situation of E-Manifest in Shanghai

Shanghai Customs began to accept the declaration of new manifest on June 3, 2014. In order to successfully complete the transport of goods and customs clearance procedures to meet the requirements of declaration for new manifest, the transmission party is required to provide accurate information of the following data items: name and address of consignor, name and address of consignee, name and address of notifying party for “To order” Bill of Lading, detailed description of goods, packaging type, numbers of package, gross weight, container number, container seal number, UN code for Hazard goods and IMDG code.

On June 28, 2014, the manifest system of Shanghai Customs has officially switched to the new manifest system (H2010). During the period of April 17, 2014 and June 27, 2014, the old manifest system (H883) operated in parallel with the new manifest system (H2010). However, the transmission time required by the new manifest system (H2010) had been strictly enforced since June 3, 2014.

(1) Transmission Parties

In Shanghai, at current stage, only Master Manifest is required to be declared. Local office of carrier or local shipping agency on behalf of the carrier can transmit manifest data to Customs. The manifest is generally declared through the system of Shanghai E&P International, INC.

In respect of export manifest, for the facilitation of shipping agency’s adapting to the changes in export business after the official adoption of new manifest declaration and management system, a new shipping agency’s advance manifest declaration system has been developed by Shanghai E&P International, INC. The system is designed to allow users to directly send the container information to shipping agency through the platform, ensuring the shipping agency to accurately generate the advance manifest and send it to Customs. At the same time, this system also has the function of copying the electronic packing list to the dock. In this case, the user only needs to make the pre-entry once and the information can be simultaneously sent to the shipping agency and the dock, to achieve the data safe, complete and consistent to ensure the success completion of a series of subsequent

⁵¹ Biquan CHEN, Declaration Procedures under Shenzhen Customs’ New Manifest System [J], Containerization, 2012, 11: 4-8.

businesses including containers' smooth arrival at the port, efficient customs declaration of export goods, etc.

In addition, some third-party service providers can also help deal with transmission parties' declaration requirements, and transmit the data to Shanghai E&P International, INC to submit the declaration data.

(2) Manifest Declaration Methods

There are mainly two means for manifest data transmission in Shanghai:

- (i) Input manifest data through the client of Client-Server system;
- (ii) Connect the declaration system through EDI interface to export the manifest data from the enterprises' systems.

3.3.3 Current Implementation Situation of E-Manifest in Ningbo

According to the requirements of General Administration of Customs, the import part of manifest declaration and management system was used in succession at Zhenhai Port, Meishan Port and Beilun and Daxie Port in Ningbo in 2013. By the end of June, 2014, the export part of the system had also been switched at these three ports. Meanwhile, Xiangshan Port started to use import part of manifest declaration and management system.

(1) Transmission Parties

Ningbo Customs doesn't require the declaration of Master Manifest; the shipping agency is responsible for the declaration of House Manifest. The freight forwarder sends the House B/L information to the shipping agency through Ningbo E-port, and then the shipping agency sends information to Customs through Ningbo E-port. When the shipping company declares manifest, it can transmit the House B/L information through the local shipping agency which is approved by the Ministry of Transport and gets registered at local Customs. The operator in charge of wharfs and Customs-controlled premises and the tally departments are required to transmit the arrival and tally reports.

(2) Manifest Declaration Methods

There are two ways of declaration: transmitting the data through the shipping agency's system, or directly logging in the website for declaration. The electronic declaration of manifest has been achieved at Ningbo E-port, but if the transmission party needs to change manifest data, the manifest in paper form is also required to be provided.

(3) Time Limits of Declaration

Previously, the import manifest was required to be declared within 48 hours after arrival; presently, the time limit of import manifest declaration is within 24 hours after arrival. In the future, 24 hours before arrival, and then 24 hours

before loading according to the requirements of Decree No. 172 will be achieved gradually.

For the export advance manifest, it is required to be declared within 15 days before loading; and the deadline of declaration of load manifest is half an hour before departure.

3.3.4 Current Implementation Situation of E-Manifest in Guangzhou

In Guangzhou, about 300,000 manifest declarations are handled each day. The declaration of data items is implemented according to Decree No. 172. The switching work of waterborne manifest declaration and management system and the management system of means of transport was completed in the inner harbor office of Guangzhou Customs on April 25, 2014, and this office has become the first affiliated Customs completing the new manifest system switching in Guangzhou Customs.

(1) Transmission Parties

In Guangzhou, only Master Manifest is required to be declared. The manifest is declared by the local shipping agency which is approved by the Ministry of Transport and gets registered at the local Customs. Guangzhou Customs requires all the manifest transmission parties to file on record in advance and assures their authorities. The transmission parties need to obtain China E-Port's IKEY for identity authentication, but it is not necessary to pay the deposit.

(2) Manifest Declaration Method

The Browser-Server way or EDI interface connection is allowed for declaration. For the sake of security certification, currently, Guangzhou Customs does not accept the connection of third-party service providers into the manifest declaration and management system; instead, it only accepts the declaration of shipping agencies and supports the access of shipping agencies' systems.

The manifest declaration is made fully electronically. The "modification/deletion" can also be operated in electronic way on the platform, but a paper version must be submitted to Customs for review meanwhile.

(3) Time Limits of Declaration

In terms of declaration time limits in Guangzhou, previously, the declaration of import manifest was made within 72 hours after arrival; for export it was within 72 hours before departure. Presently, the declaration has no specific time limits.

The on-line adoption of new manifest system will effectively improve the efficiency of customs clearance and logistics management, and providing high quality and convenient services for import and export enterprises in Guangzhou. However, as more data items including dangerous goods item are

required to be declared for the new manifest, the enterprises feel the procedures are too complicated and they may require some more time to adapt to it.

3.3.5 Current Implementation Situation of E-Manifest in Dalian

The new manifest declaration and management system was adopted in succession in Dalian in September, 2013. The declaration is made mainly through Dalian branch of China E-Port Data Center connected to Customs system. This branch provides a specific product for enterprises to declare.

At the same time, in order to meet the requirements of Customs supervision as well as individual needs of users at Dalian Port for data operation, Dalian Portnet Co. Ltd. (DPN) independently developed the new manifest support system for Dalian Customs. When declaring the manifest, the transmission party is required to submit the data twice: (1) the import and export manifests are sent to the E-port for customs clearance; (2) the same data is firstly sent to DPN, and then DPN sends the data to the wharf and tally company to conduct document business operation. The smooth transition from traditional manifest process to new manifest process is achieved through the switching of new manifest system and new manifest support system of DPN.

(1) Transmission Parties and Methods

According to the requirements of Dalian Customs, Master and House Manifest are required to be declared. The transmission parties must be put on records at Customs. The local shipping agencies (and some shipping companies) can transmit Master B/L data and House B/L data, and few freight forwarders can declare House B/L data. Customs will verify the consistency of Master and House B/L data. The system automatically compares the numbers of Master B/L and House B/L and verifies the data format; then the manual review is made. Whether the shipping company is put on records is checked through the declaration system as well. The electronic modification of manifest information is also achieved; in some other situations such as cargos failing to be loaded, modification in paper version is required.

(2) Time Limits of Declaration

The time limits of declaration will follow the requirements of time limits in Decree No.172 as well as Customs requirements gradually. At present, the requirements of time limits are relatively loose.

(3) Message Format and Data Content

The XML format is mainly used as the standard format of declaration in the new manifest system. Compared to the previous text format, it can provide better readability, easier scalability, more flexible data transmission and is consonant with international standards.

The data items have changed a little in length and format, and the number of data items has increased.

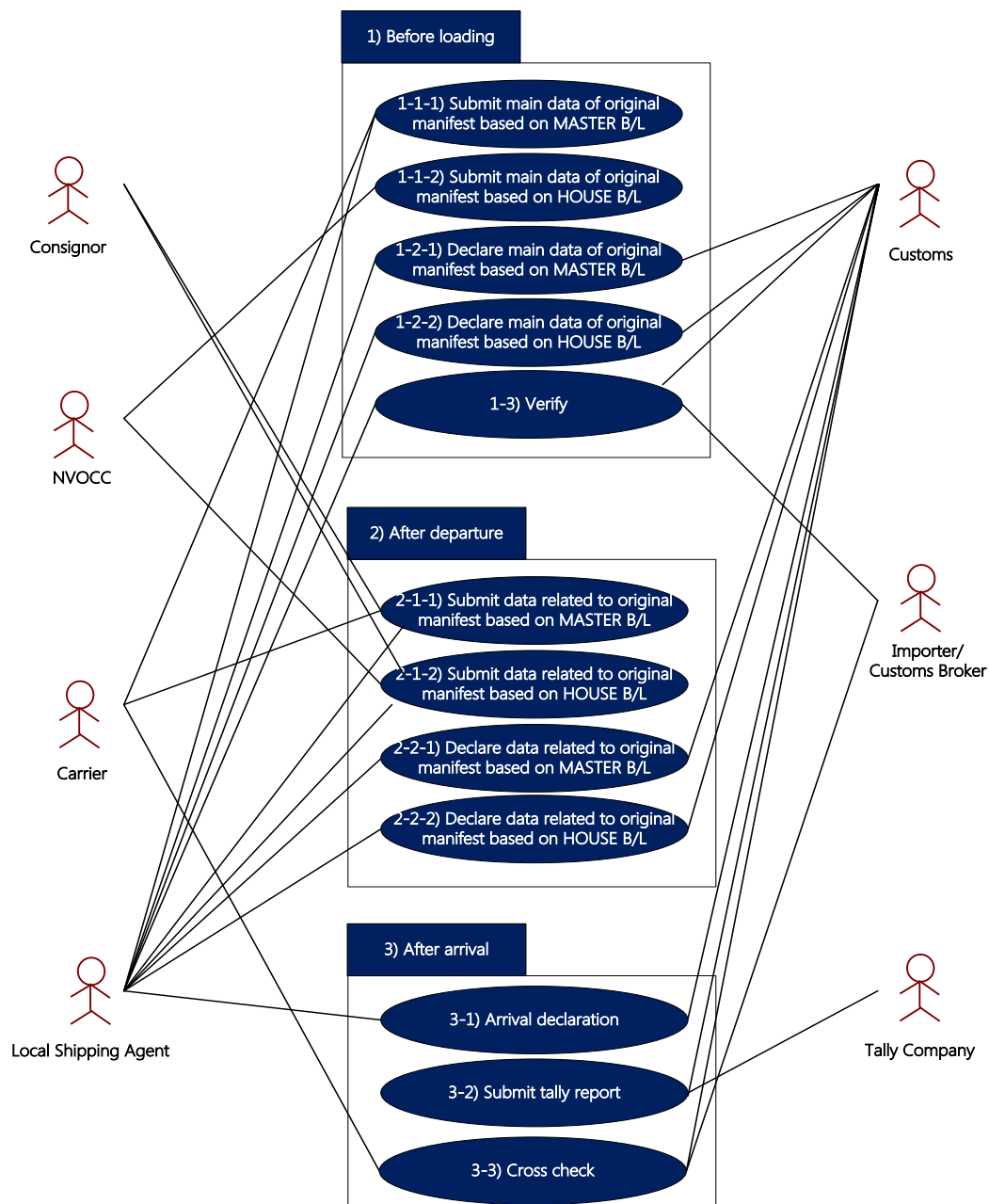
4 Business Process Analysis

4.1 Import

4.1.1 Use Case

The import use case diagram is shown as below, which illustrates the key processes and actors associated with each of them.

Chart 4.1 Import Use Case



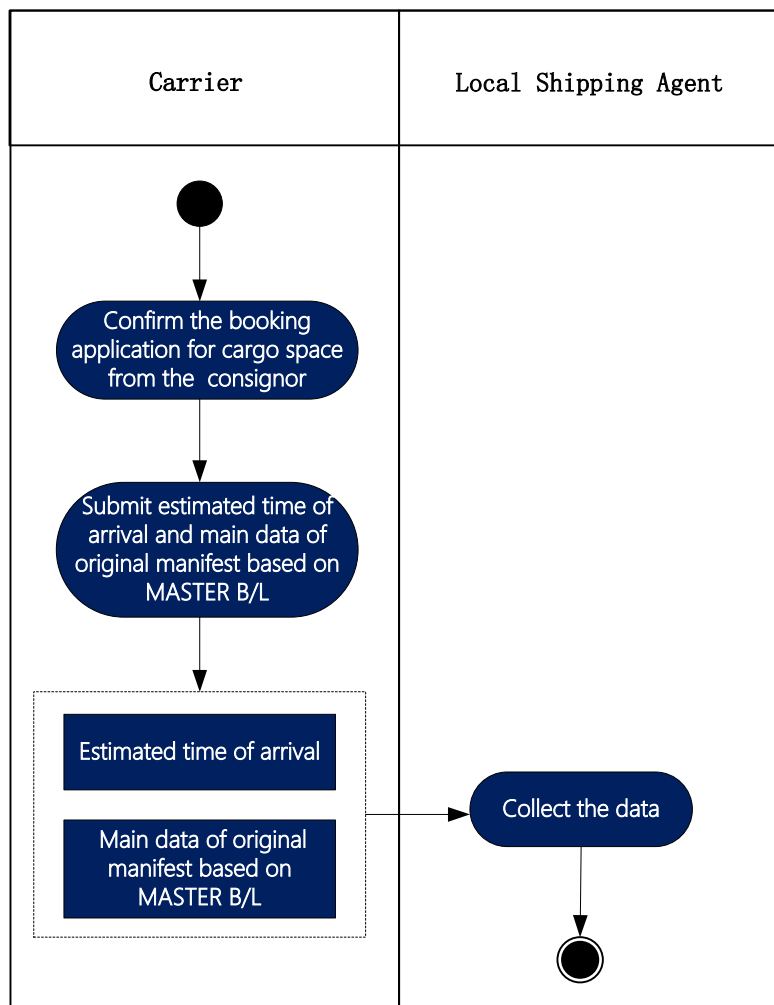
Each use case (each ellipse in the diagram) represents a core business process. The processes are divided into three boundaries (before loading, after departure and after arrival) according to the implementation situation of China case and the exact segments include: submit main data of original manifest based on Master/House B/L, declare main data of original manifest based on Master/House B/L, and verify the data before loading; submit data related to original manifest based on Master/House B/L, and declare data related to original manifest based on Master/House B/L before arrival; and declare arrival information, submit tally report and cross check the data after arrival.

4.1.2 Activity Diagrams

(1) Before Loading

1) Process 1-1-1: Submit main data of original manifest based on MASTER B/L

Chart 4.2 Submit Main Data of Original Manifest Based on MASTER B/L

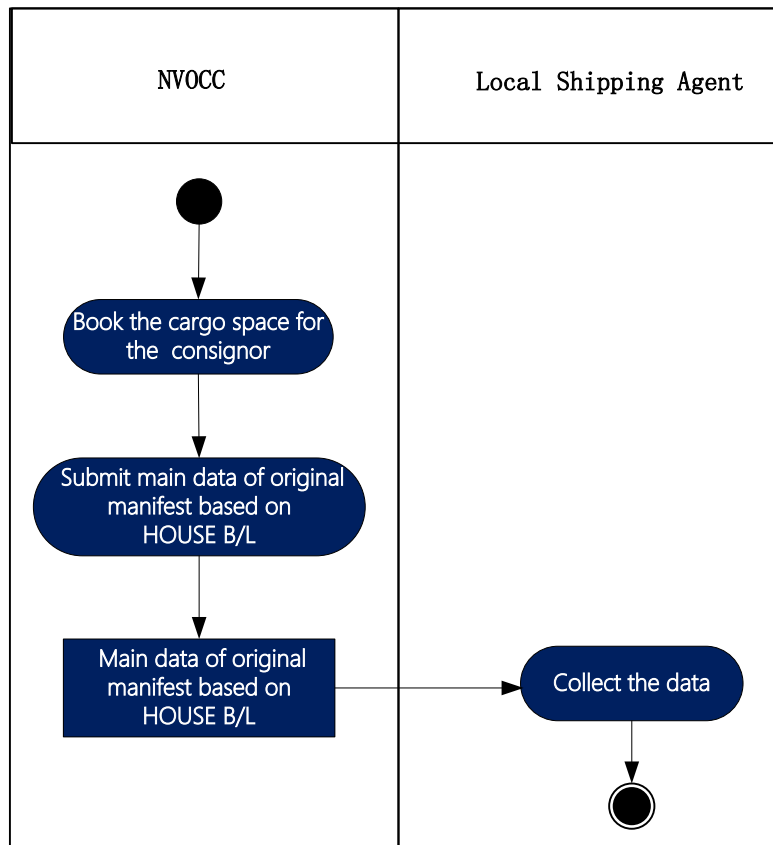


The carrier accepts booking from the consignor and confirms it. The main data of original manifest based on Master B/L is generated and the carrier submits

estimated time of arrival and main data of original manifest based on Master B/L to the local shipping agent at the port of destination. The shipping agent collects the data.

2) Process 1-1-2: Submit main data of original manifest based on HOUSE B/L

Chart 4.3 Submit Main Data of Original Manifest Based on HOUSE B/L

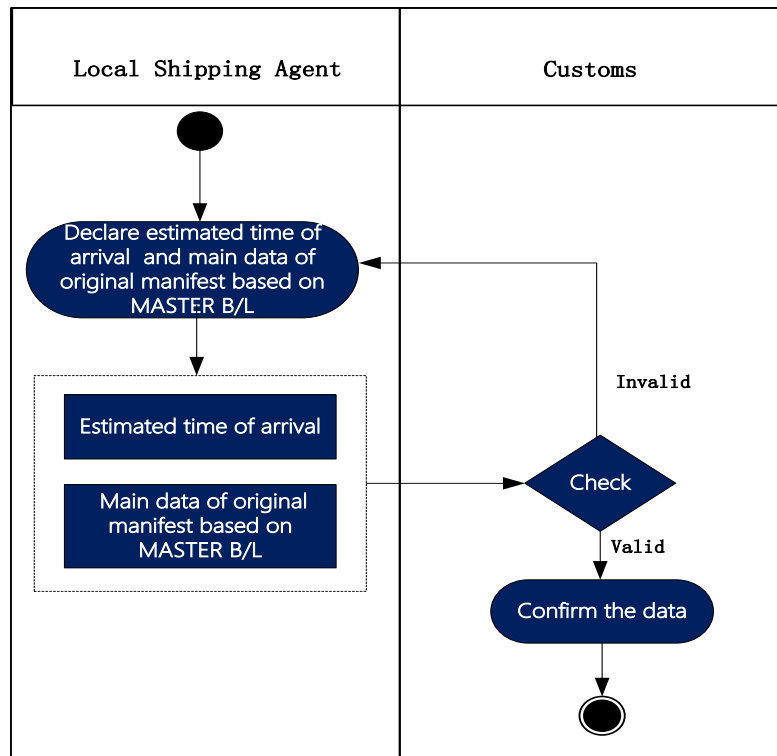


For the carriage of the cargo on the vessel under a shared space, or other negotiated volume of cargo, an NVOCC is entrusted by the consignor to book the cargo space and the main data of original manifest based on House B/L is generated. The NVOCC then submits the main data of original manifest based on House B/L to the local shipping agent and the agent collects the data.

As described in Section 3.3 “Implementation of E-Manifest in China”, based on the implementation situation and requirements on declaration of Master Manifest and House Manifest of different ports, process 1-1-1 is not required in some local ports such as Ningbo, while process 1-1-2 is not required in other ports like Shanghai and Guangzhou. The following processes related to the submission and declaration of Master B/L and House B/L information have the same manner and will be described with no more tautology.

3) Process 1-2-1: Declare main data of original manifest based on MASTER B/L

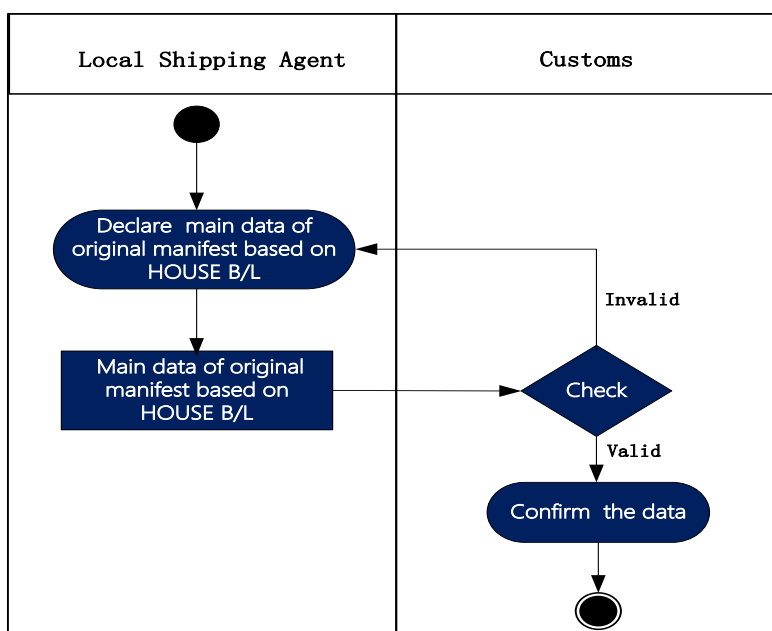
Chart 4.4 Declare Main Data of Original Manifest Based on MASTER B/L



The local shipping agent consigned by the carrier declares the estimated time of arrival and main data of original manifest based on Master B/L to Customs by 24 hours before loading. Customs checks the validity of the data. If it is valid, Customs confirms the data; if it is invalid, the local shipping agent checks and declares again.

4) Process 1-2-2: Declare main data of original manifest based on HOUSE B/L

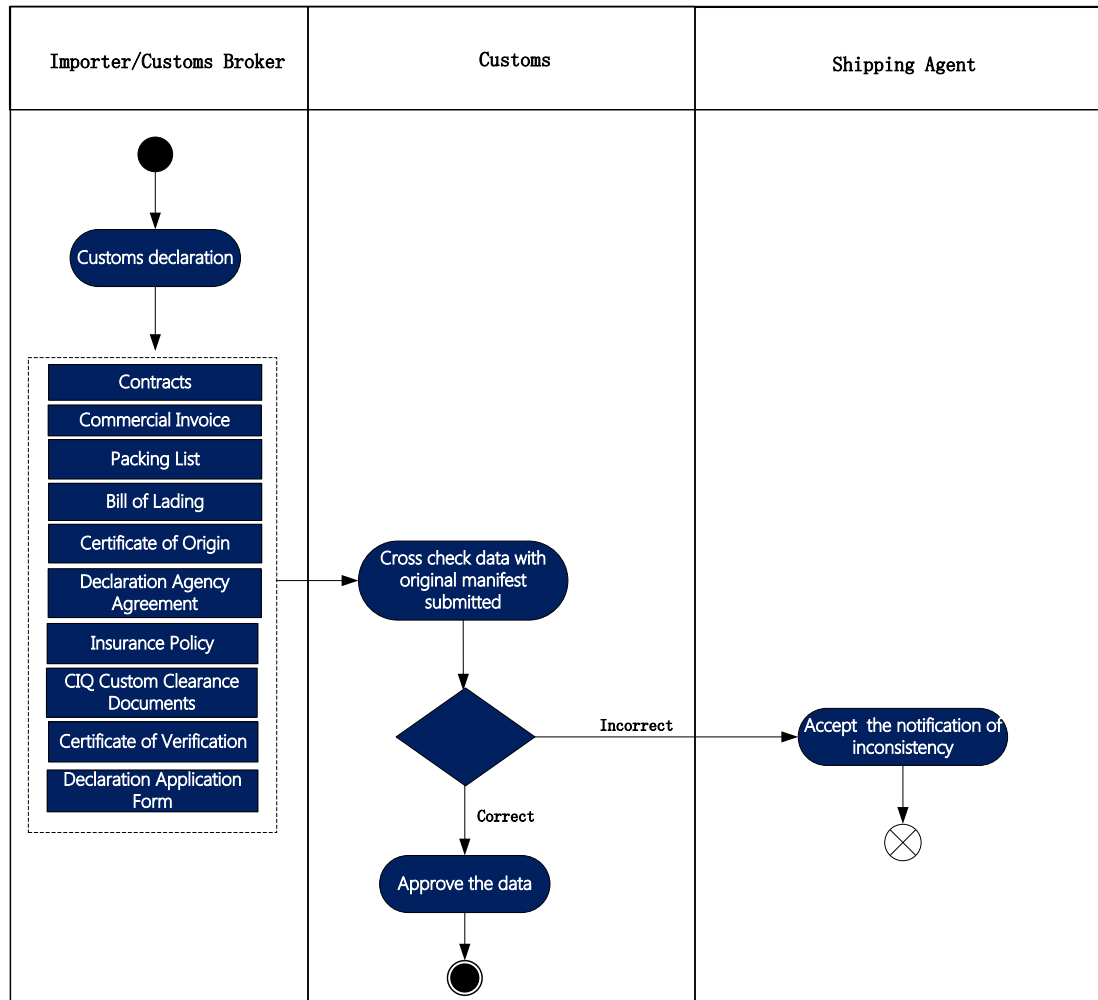
Chart 4.5 Declare Main Data of Original Manifest Based on HOUSE B/L



The local shipping agent consigned by the NVOCC declares main data of original manifest based on House B/L to Customs by 24 hours before loading. Customs checks the validity of the data. If it is valid, Customs confirms the data; if it is invalid, the local shipping agent checks and declares again.

5) Process 1-3: Verify

Chart 4.6 Verify



Only after Customs has received and accepted the transmitted main data of the original manifest may the importer (consignee) or its entrusted customs broker make declaration to Customs regarding the goods or articles. The importer or its entrusted customs broker submits the full set of documents including contracts, commercial invoice, packing list, Bill of Lading, etc. to make customs declaration. Customs cross checks the declaration data with transmitted main data of the original manifest. If the data is correct, it is approved; if it is incorrect, Customs will notify the inconsistency to the shipping agent.

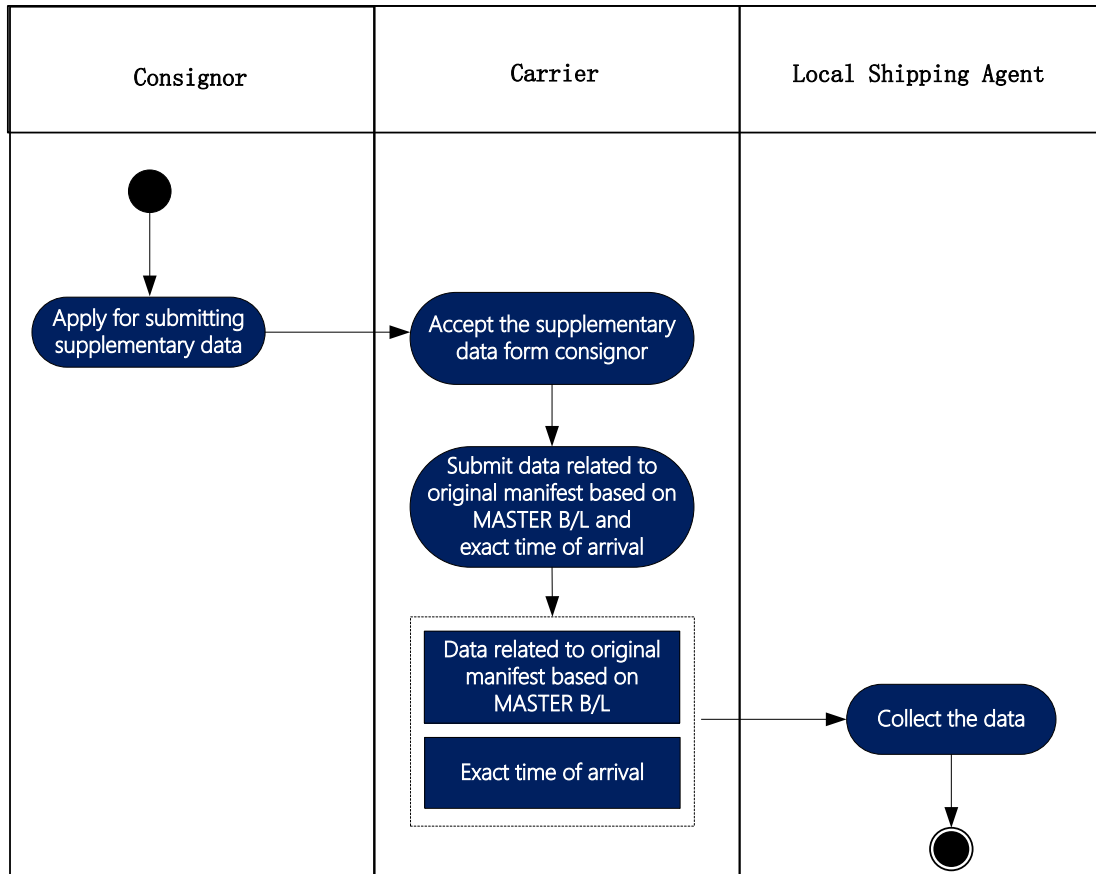
Where Customs finds in the original manifest goods or articles whose entry is prohibited by the Chinese government, Customs may notify the operator of the

vessel not to load nor to ship it into the Customs territory of China.⁵²

(2) After Departure

1) Process 2-1-1: Submit data related to original manifest based on MASTER B/L

Chart 4.7 Submit Data Related to Original Manifest Based on MASTER B/L



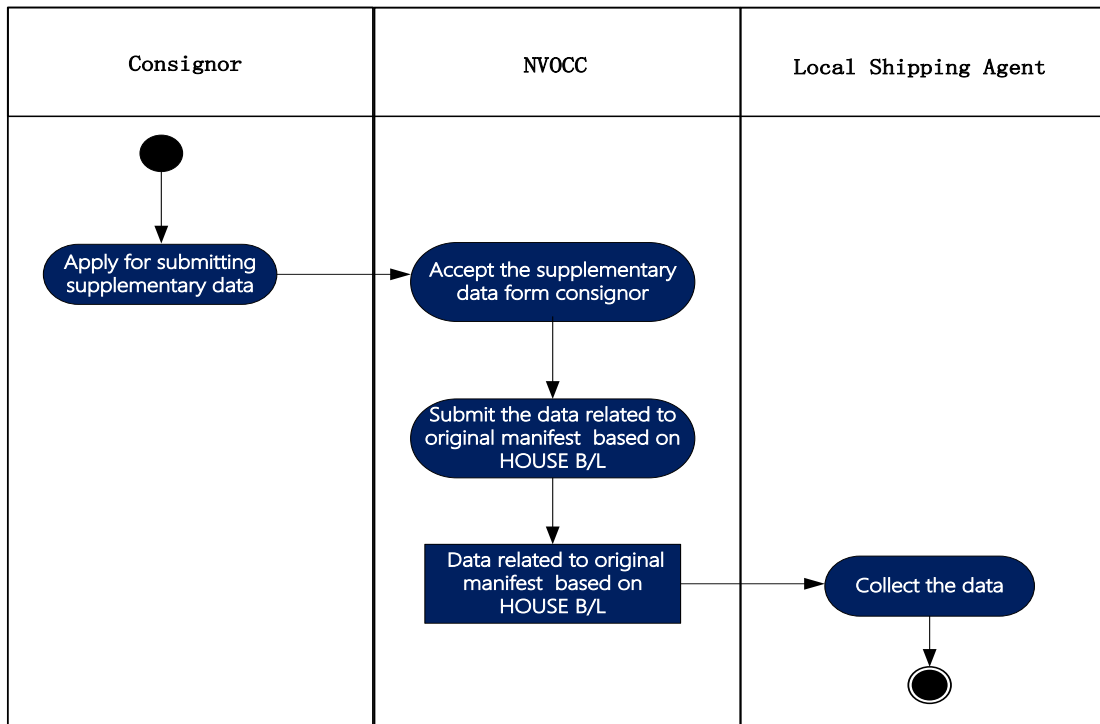
According to Decree No. 172, manifest transmission parties shall transmit to Customs other data of the original manifest before the goods or articles arrive at the port of destination; and before the vessel arrives at the port, the operator of the vessel shall inform Customs of the exact time of arrival at the port.

The consignor applies for submitting supplementary data first. The carrier accepts the supplementary data and submits data related to original manifest based on MASTER B/L and exact time of arrival to the local shipping agent. The shipping agent collects the data.

2) Process 2-1-2: Submit data related to original manifest based on HOUSE B/L

⁵² Decree of the General Administration of Customs of the People's Republic of China No.172, 2009.

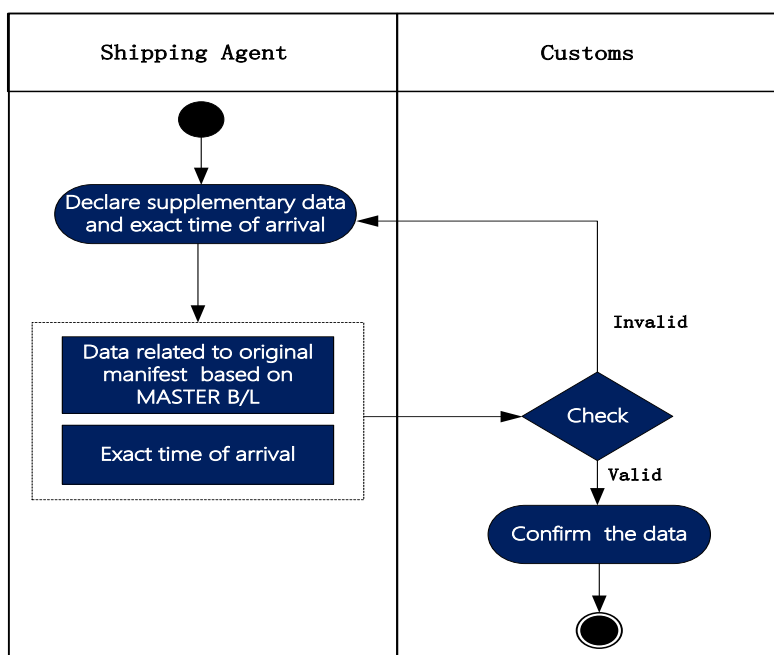
Chart 4.8 Submit Data Related to Original Manifest Based on HOUSE B/L



The consignor applies for submitting supplementary data first. The NVOCC accepts the supplementary data and submits data related to original manifest based on HOUSE B/L to its local shipping agent. The shipping agent collects the data.

3) Process 2-2-1: Declare data related to original manifest based on MASTER B/L

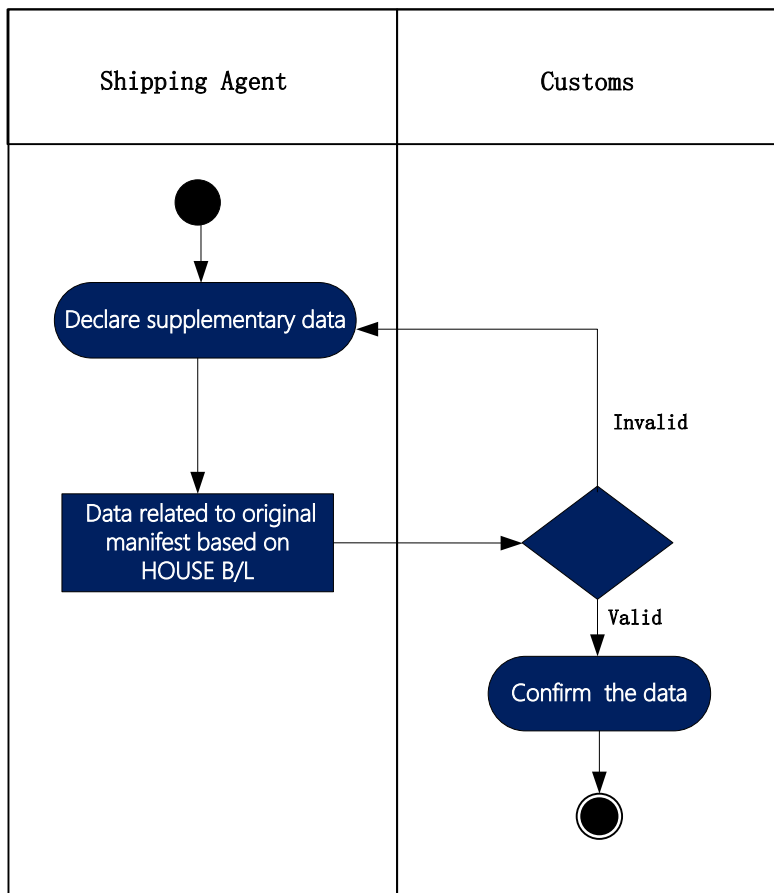
Chart 4.9 Declare Data Related to Original Manifest Based on MASTER B/L



The local shipping agent consigned by the carrier declares data related to original manifest based on Master B/L and exact time of arrival to Customs before arrival. Customs checks the validity of the data. If it is valid, Customs confirms the data; if it is invalid, the local shipping agent checks and declares again.

4) Process 2-2-2: Declare data related to original manifest based on HOUSE B/L

Chart 4.10 Declare Data Related to Original Manifest Based on HOUSE B/L

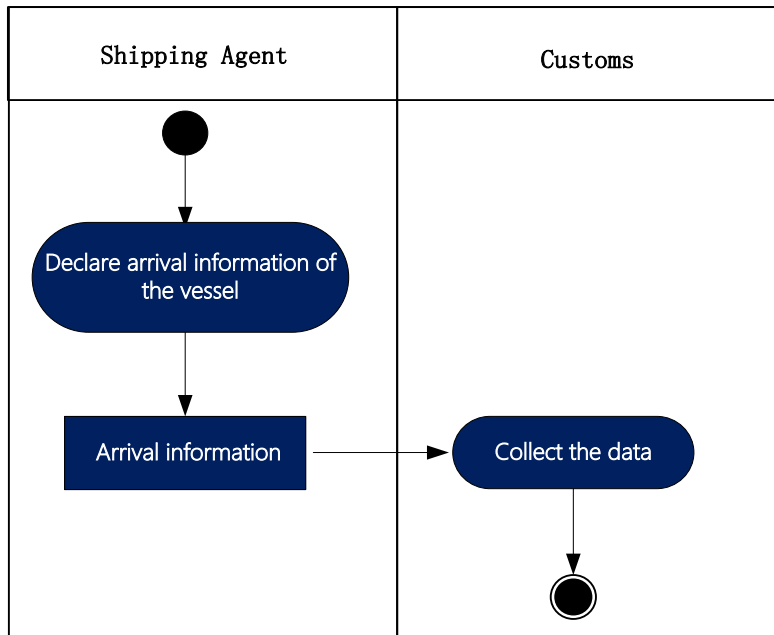


The local shipping agent consigned by the NVOCC declares data related to original manifest based on House B/L to Customs before arrival. Customs checks the validity of the data. If it is valid, Customs confirms the data; if it is invalid, the local shipping agent checks and declares again.

(3) After Arrival

1) Process 3-1: Arrival declaration

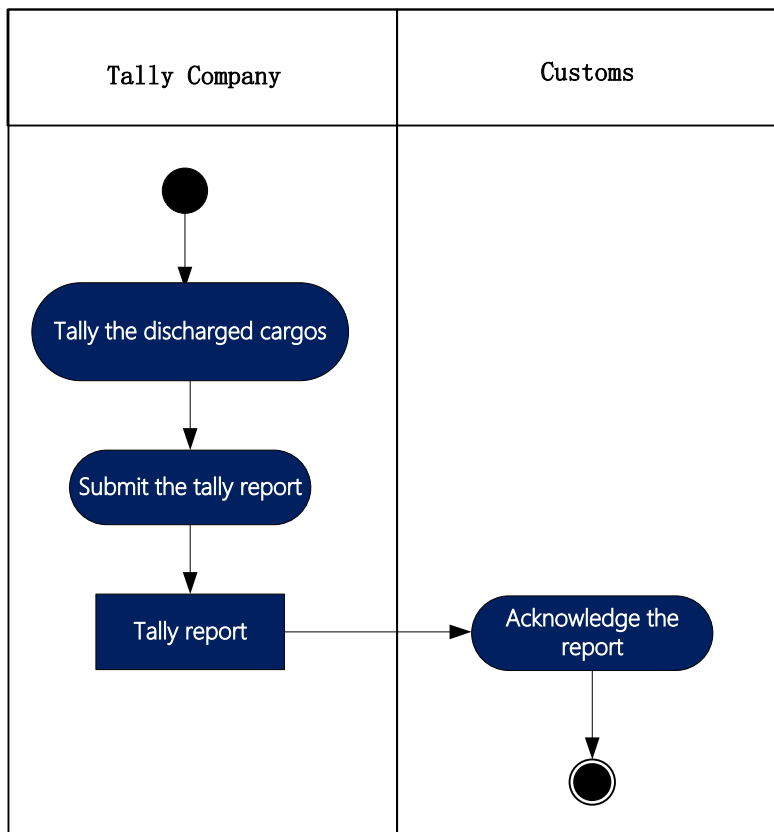
Chart 4.11 Arrival Declaration



When the vessel arrives at the place with a Customs office, the shipping agent consigned by the carrier makes arrival declaration to the Customs regarding the vessel. Customs collects the arrival information.

2) Process 3-2: Submit tally report

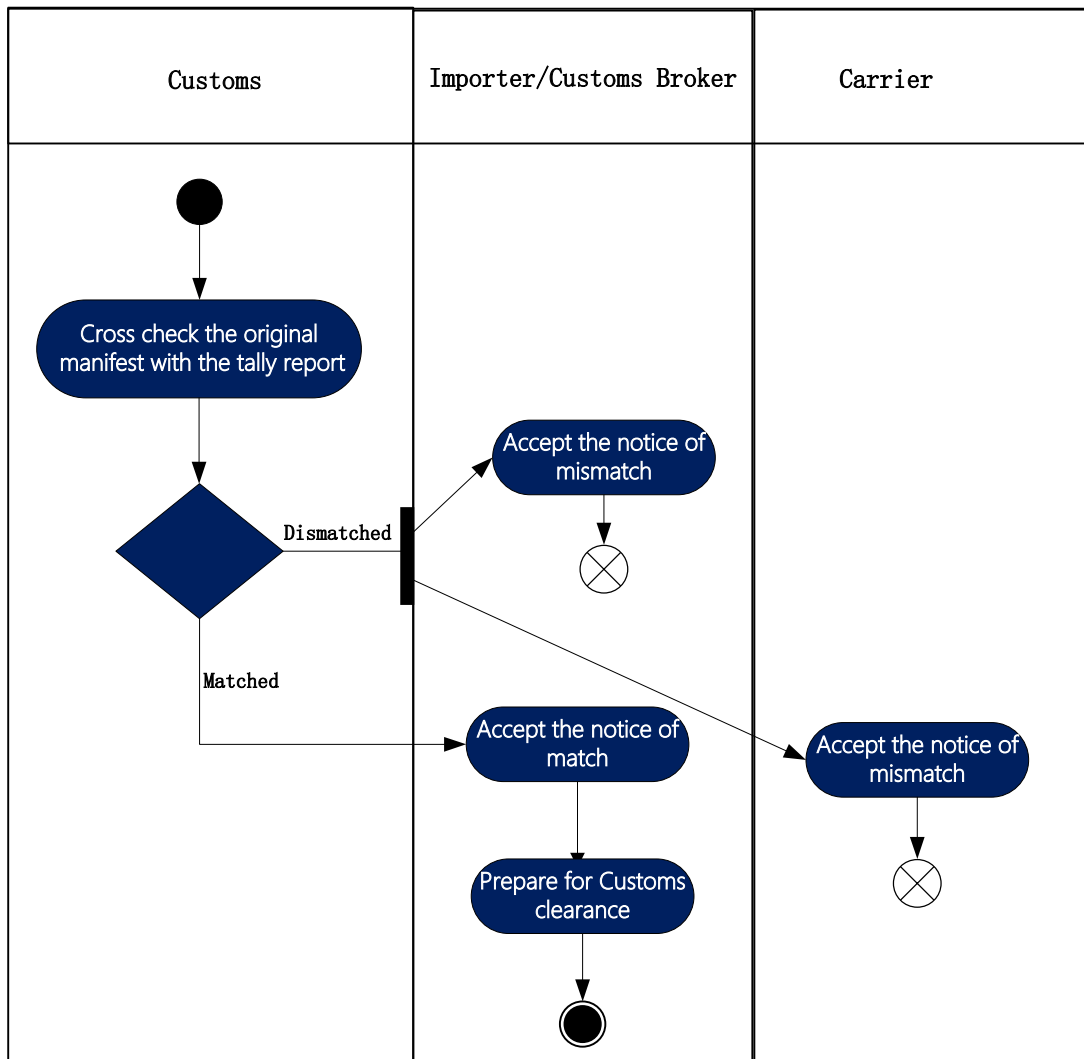
Chart 4.12 Submit Tally Report



The tally company tallies the goods and articles within six (6) hours as of the completion of discharge of goods and articles carried by the inbound vessel and submits a tally report to Customs in electronic form. Customs acknowledges the report.

3) Process 3-3: Cross check

Chart 4.13 Cross Check



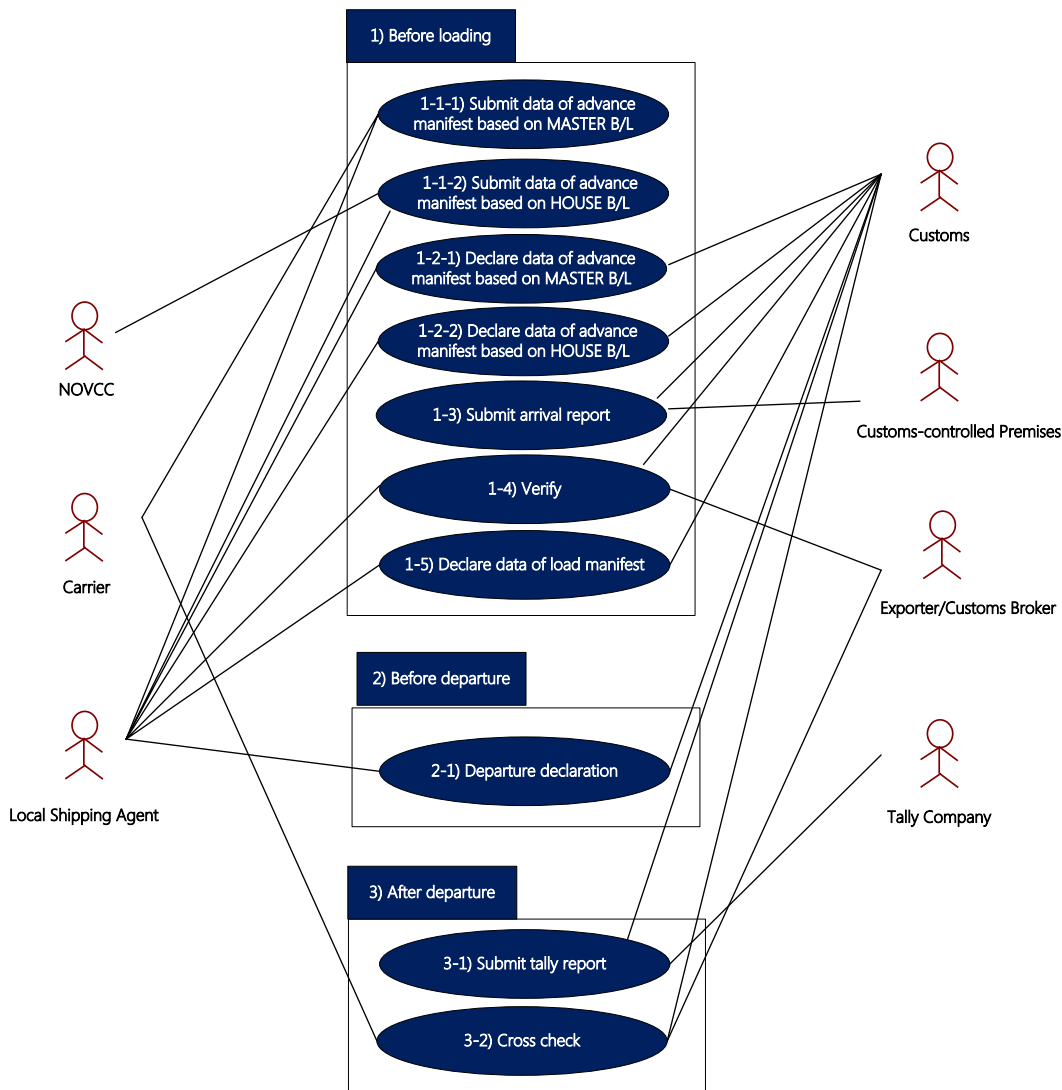
Customs matches the tally report against the original manifest and cross checks them. Where there is any inconsistency, Customs notifies the importer/customs broker and the carrier in electronic form. The importer/customs broker and carrier carry out Customs instructions. If all the information matches, the importer/customs broker can prepare for customs clearance procedures to release the cargos.

4.2 Export

4.2.1 Use Case

The export use case diagram is shown as below.

Chart 4.14 Export Use Case



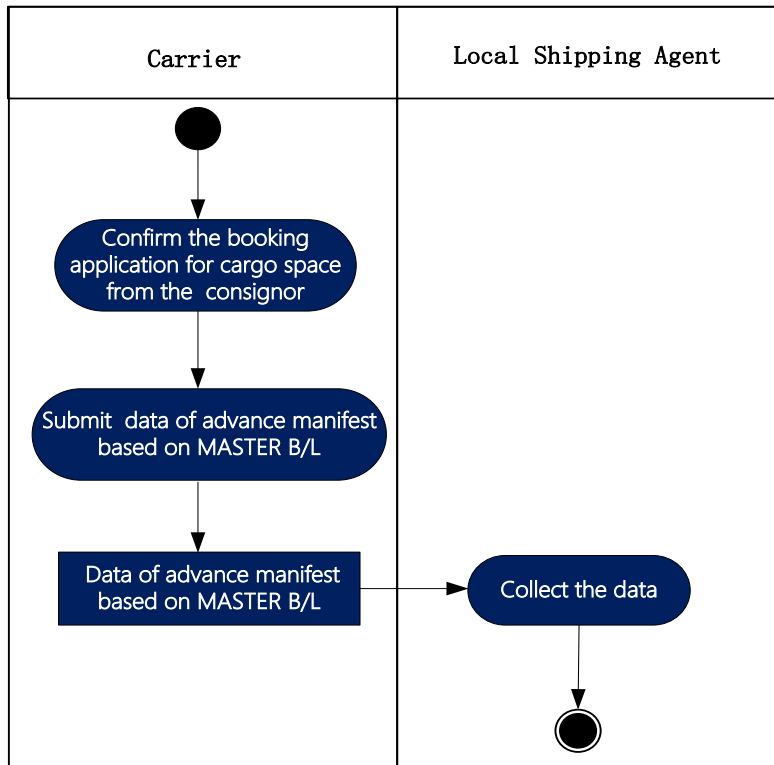
The core business processes of export manifest declaration are divided into three boundaries (before loading, before departure and after departure) according to the implementation situation of China case and the exact segments include: submit and declare data of advance manifest based on Master/House B/L, submit arrival report, verify the data, and declare data of load manifest before loading; declare departure information before departure; and submit tally report and cross check the data after departure.

4.2.2 Activity Diagrams

(1) Before Loading

1) Process 1-1-1: Submit data of advance manifest based on MASTER B/L

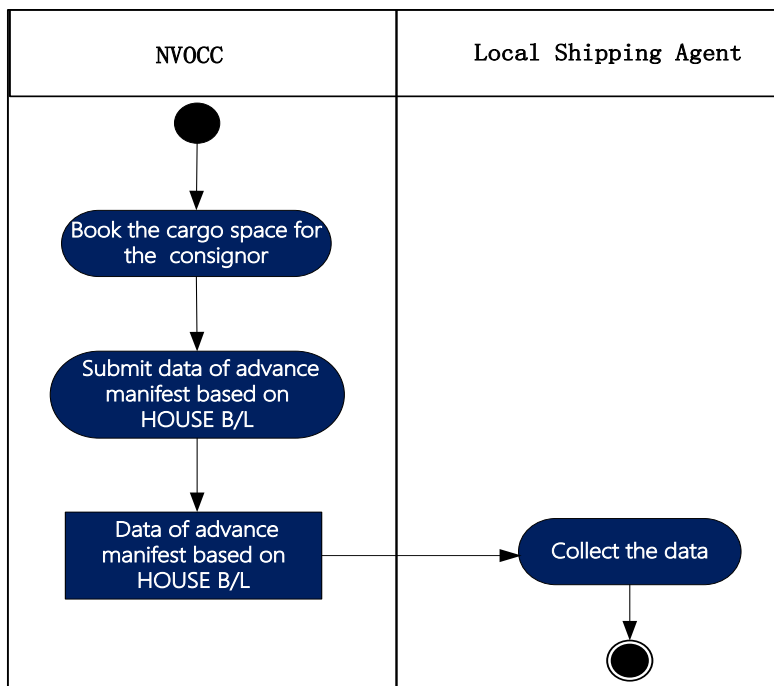
Chart 4.15 Submit Data of Advance Manifest Based on MASTER B/L



The carrier accepts booking from the domestic consignor and confirms it. Then it submits data of advance manifest based on Master B/L to the shipping agent. The shipping agent collects the data.

2) Process 1-1-2: Submit data of advance manifest based on HOUSE B/L

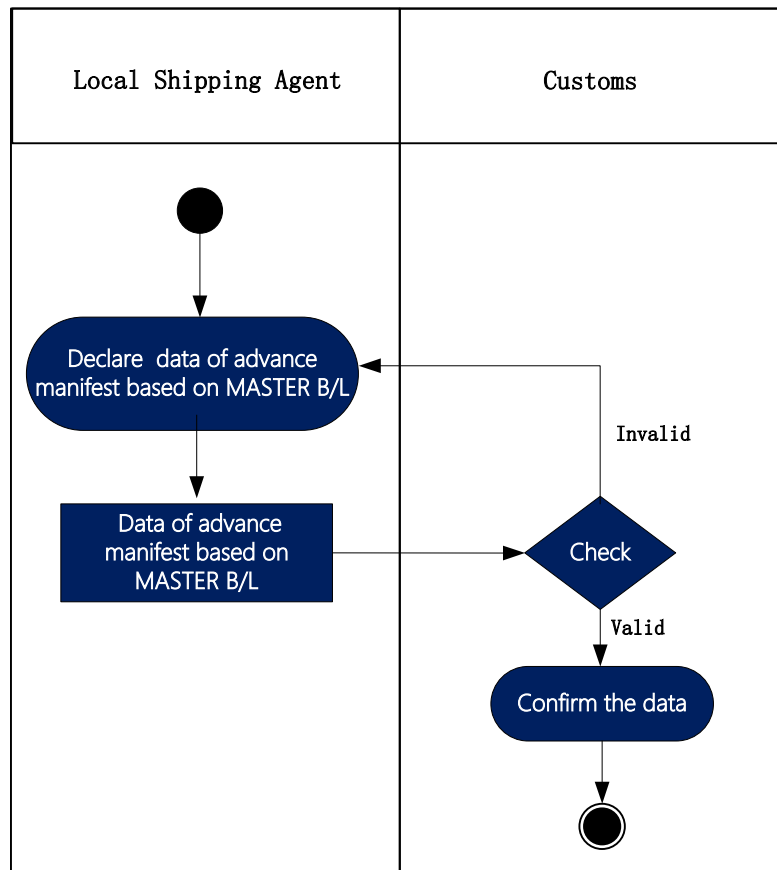
Chart 4.16 Submit Data of Advance Manifest Based on HOUSE B/L



For the carriage of the cargo on the vessel under a shared space, or other negotiated volume of cargo, an NVOCC is entrusted by the consignor to book the cargo space. The NVOCC submits the data of advance manifest based on House B/L to the local shipping agent and the agent collects the data.

3) Process 1-2-1: Declare data of advance manifest based on MASTER B/L

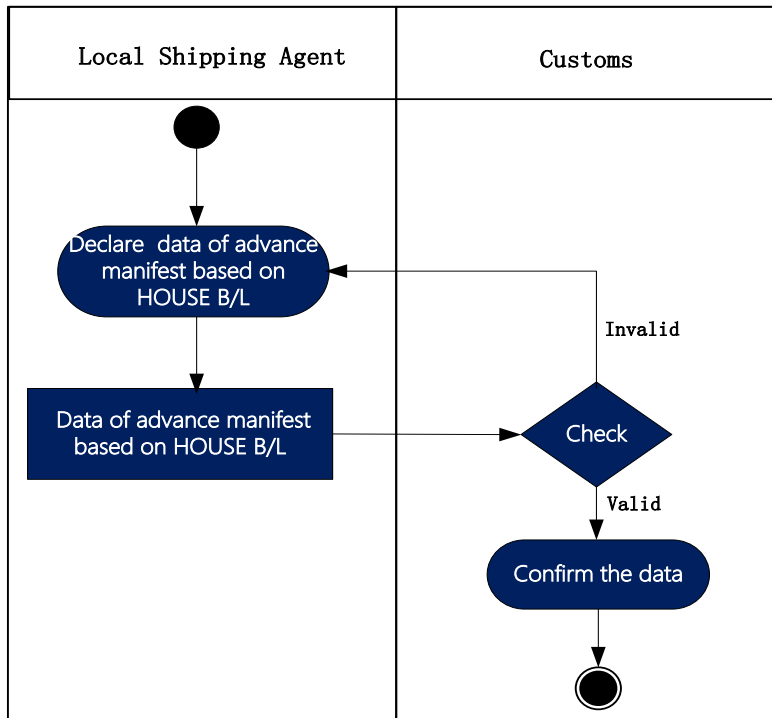
Chart 4.17 Declare Data of Advance Manifest Based on MASTER B/L



The shipping agent consigned by the carrier declares main data of the advance manifest based on Master B/L to Customs before going through customs declaration formalities for the goods or articles and other data of the advance manifest by 24 hours before loading. Customs checks the validity of the data. If it is valid, Customs confirms the data; if it is invalid, the shipping agent checks and declares again.

4) Process 1-2-2: Declare data of advance manifest based on HOUSE B/L

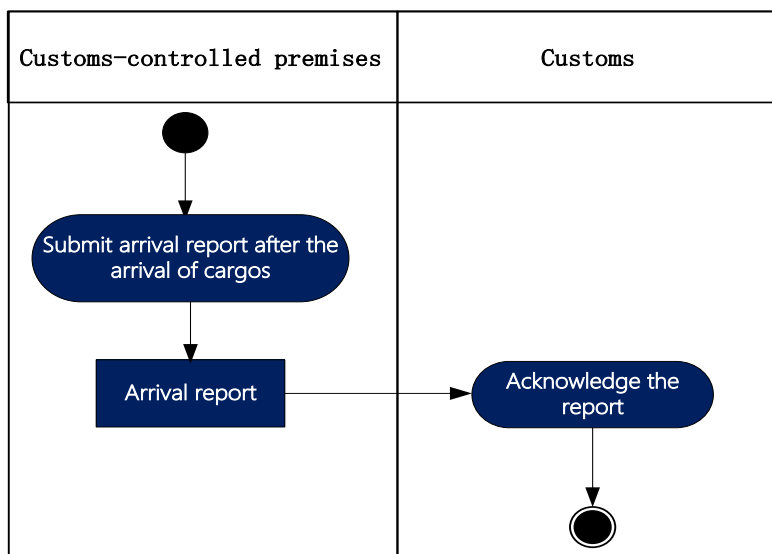
Chart 4.18 Declare Data of Advance Manifest Based on HOUSE B/L



The shipping agent consigned by the NVOCC declares main data of the advance manifest based on House B/L to Customs before going through customs declaration formalities for the goods or articles and other data of the advance manifest by 24 hours before loading. Customs checks the validity of the data. If it is valid, Customs confirms the data; if it is invalid, the shipping agent checks and declares again.

5) Process 1-3: Submit arrival report

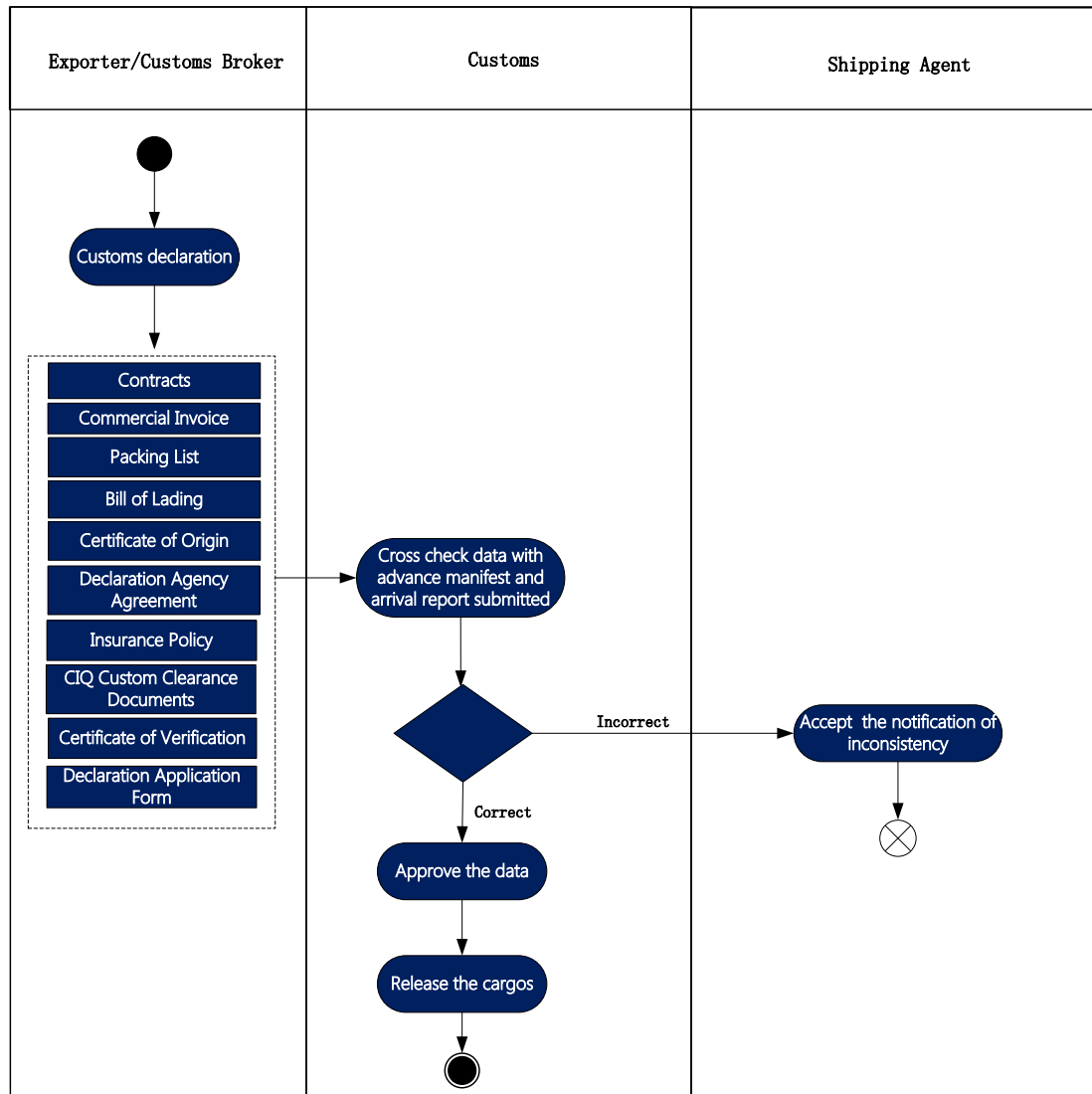
Chart 4.19 Submit Arrival Report



When outbound goods or articles arrive at Customs-controlled premises, the Customs-controlled premises submit to Customs an arrival report in electronic form. Customs acknowledges the report.

6) Process 1-4: Verify

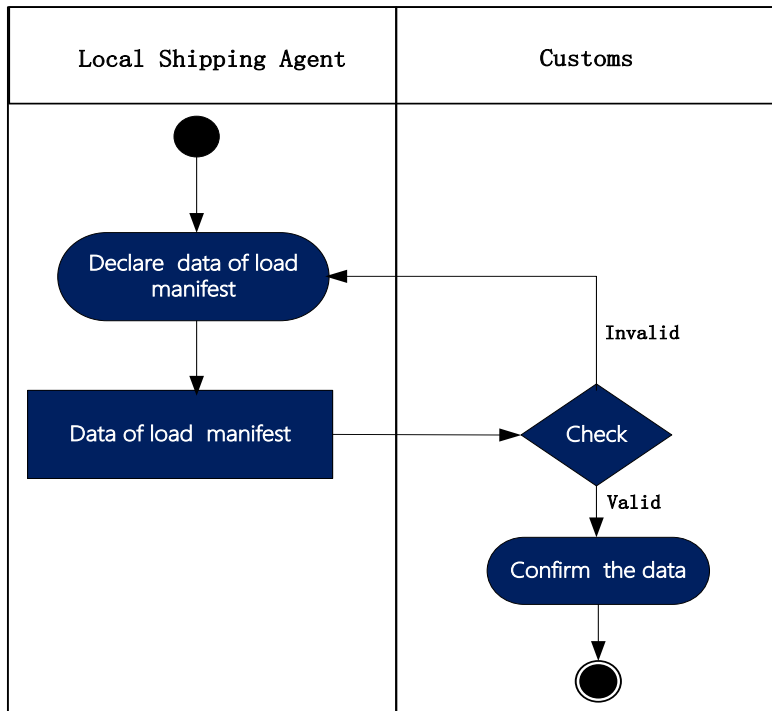
Chart 4.20 Verify



The exporter or its entrusted customs broker submits the full set of documents including contracts, commercial invoice, packing list, Bill of Lading, etc. to make customs declaration. Customs cross checks the declaration data with transmitted data of advance manifest and arrival report. If the data is correct, it is approved and the cargos are released; if it is incorrect, Customs will notify the inconsistency to the shipping agent and may carry out inspection formalities for the goods or articles.

7) Process 1-5: Declare data of load manifest

Chart 4.21 Declare Data of Load Manifest

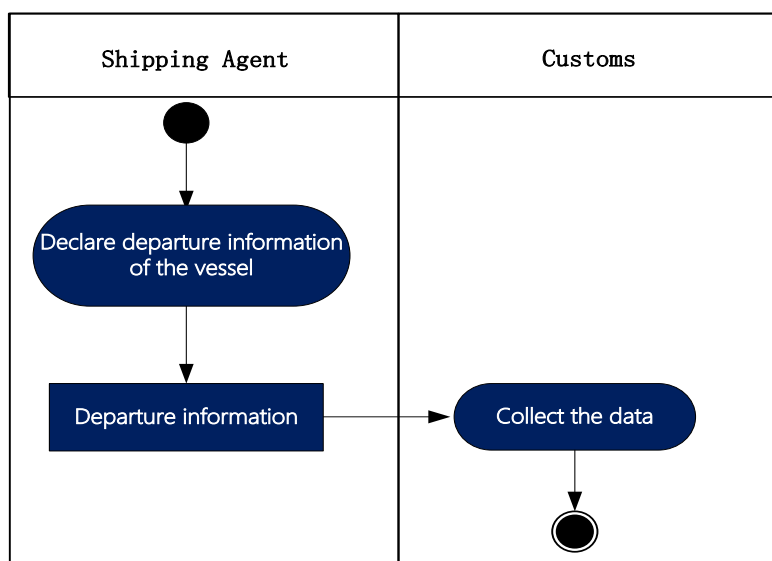


The shipping agent transmits the electronic data of the load manifest to Customs by 30 minutes before loading of goods or articles onto the vessel. Goods and articles listed in the load manifest shall be those that have been released by Customs. If it is valid, Customs confirms the data; if it is invalid, the shipping agent checks and declares again.

(2) Before Departure

1) Process 2-1: Departure declaration

Chart 4.22 Departure Declaration

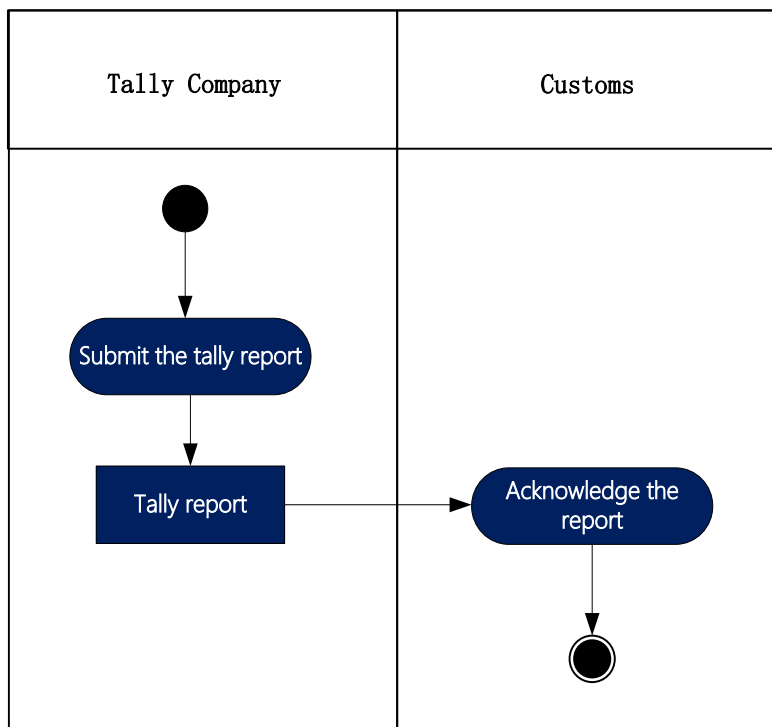


The shipping agent makes departure declaration and informs Customs of the time of departure of the vessel two (2) hours before its departure from the place with a Customs office. The operator of outbound vessel that is added on short notice shall inform Customs of the time of departure from the place with a Customs office before departure. Customs collects the departure information.

(3) After Departure

1) Process 3-1: Submit tally report

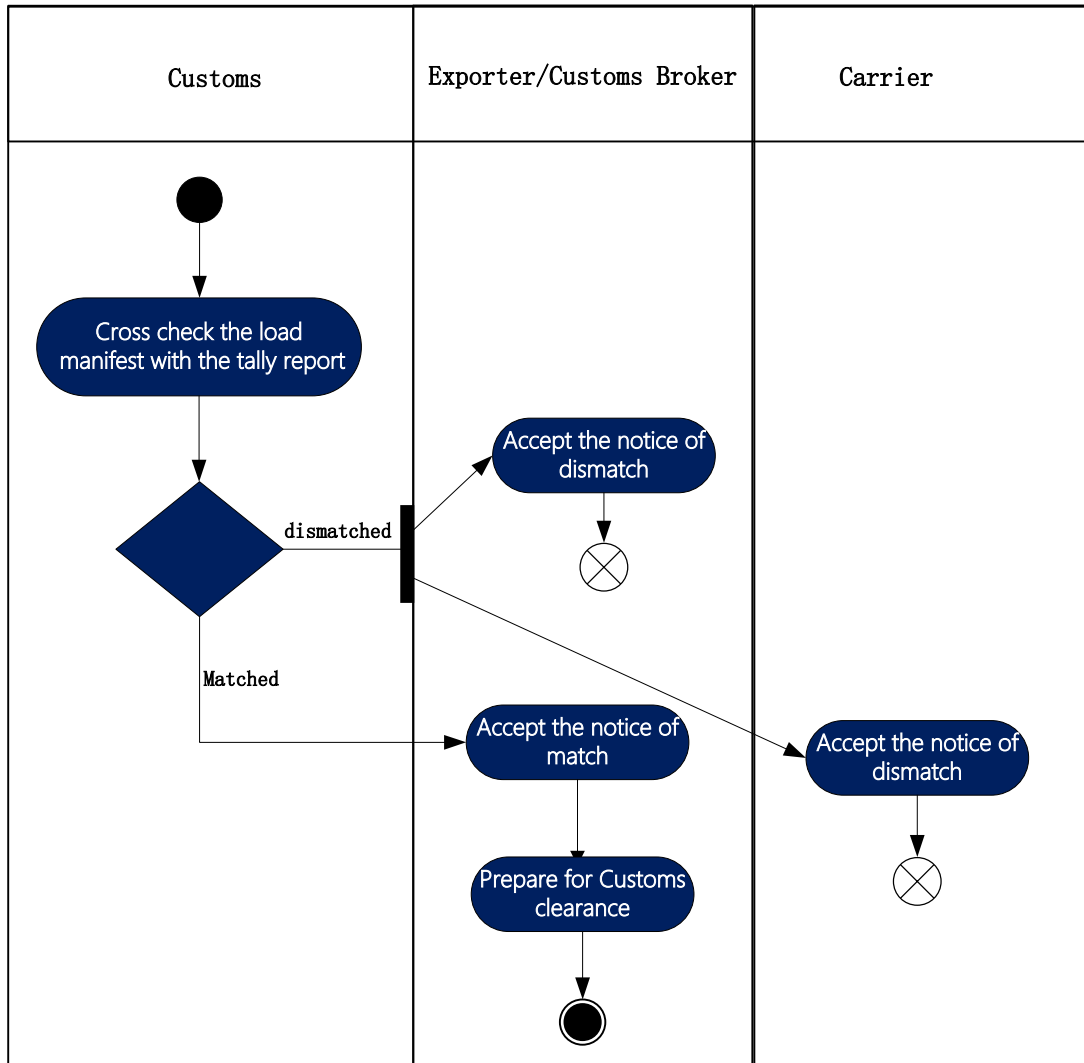
Chart 4.23 Submit Tally Report



Within six (6) hours as of the departure of the outbound vessel from the port of loading, the tally company submits a tally report to Customs in electronic form. Customs acknowledges the report.

2) Process 3-2: Cross check

Chart 4.24 Cross Check



Customs matches the tally report against the load manifest and cross checks them. Where there is any inconsistency, Customs notifies the exporter/customs broker and the carrier in electronic form. The exporter/customs broker and carrier carry out Customs instructions. If all the information matches, the exporter/customs broker can prepare for customs clearance procedures.

5 The Impacts of E-Manifest Declaration

5.1 Benefits of E-Manifest Declaration to Stakeholders

According to Decree No. 172, the scope of transmission parties is expanded and the prescribed declaration time is advanced. Previously, e-Manifest was transmitted only by shipping agencies, and the time limit of declaration was after arrival for import and after departure for export. In the new mode, the shipping company, NVOCC, freight forwarder, tally company and etc. (manifest transmission parties and manifest-related electronic data transmission parties)

which have registered at Customs can transmit the relevant data, and the enterprises shall submit manifest data to Customs before loading of goods. The participation of multiple manifest transmission enterprises improves the efficiency of operation, and the enterprises can handle cargo clearance procedures in advance by advance declaration. The advantages of e-Manifest and advance manifest declaration are obvious.

- (i) Enterprise can transmit e-Manifest data through the system port approved by Customs and receive verification feedback data from Customs, enabling the interconnection of electronic data;
- (ii) The e-Manifest declaration makes the process of manifest declaration more standardized, and improves the immediacy of original manifest declaration as well as the declaration efficiency and service quality;
- (iii) The e-Manifest declaration enables paperless business operation, and reduces manual entry work and the costs and errors in manual operation. The enterprise can complete the declaration, modification of manifest data, and quick inspection and release of empty containers via the system. As there is no need of submitting the on-site application documents in paper version, the efficiency of manifest declarations is improved;
- (iv) The e-Manifest declaration plays an actively promoting role in accelerating the clearance of goods, advancing the development of modern logistics and fighting against smuggling;
- (v) The e-Manifest declaration enables the system connection between the shipping agency system and Customs system, which improves service quality of shipping agencies and enhances their competitiveness.

5.2 Challenges of E-Manifest Declaration and Problems in the Implementation of Existing Mechanism

The e-Manifest declaration brings some challenges in the meanwhile of providing convenience to the parties involved, such as higher requirements on information system, impacts on business processes, etc. In addition, as the regulations on the existing e-Manifest declaration mechanism and its implementation are not so perfect and the operation and maintenance of manifest declaration and management system needs to be improved, there are still problems to be solved.

5.2.1 Challenges Brought to Stakeholders by E-Manifest Declaration

- (1) Challenges to Shipping Companies and Shipping Agents
 - (i) Have an impact on business processes and customer service. The declaration time must be advanced, and the requirements on the accuracy of data items are stricter. The convenient service model of “simultaneous declaration and loading” provided to customers can no longer move forward.

- (ii) Increase the needs for transmission channels of information systems and architectural data. The shipping company must restructure its manifest database and message module and build data transmission paths to make connection with nationwide agents.
- (iii) Bring additional formalities to go through with the wharf and tally company. If the shipping company revises manifest data, it is necessary to notify the wharf and tally company of modification to avoid the trouble of explaining to Customs.

(2) Challenges to Freight Forwarders

- (i) The freight forwarder needs to enhance the ability of management and coordination. The coordination between the shipping company and trader must be strengthened to prevent against assuming Customs inquiry responsibilities or punitive measures from the shipping company and trader because of discrepancies of manifest information.
- (ii) The freight forwarder needs to improve its information systems. According to Customs data standards, it is necessary to establish an application system with direct connection with E-ports and a data transmission path with shipping companies and customers.

(3) Challenges to wharf enterprises

- (i) The requirements on information system are higher. According to the requirements of new manifest rules, the relevant messages are required to be collected through the information system of the wharf, and the requirements on the timeliness are stricter.
- (ii) The operation process at the wharf is influenced. The operation process at the port has become one part of Customs supervision processes, and the freedom of operation at the wharf is greatly suppressed.

5.2.2 Problems in the Implementation of Existing E-Manifest Declaration Mechanism

(1) Dehumanized Rules' Interference in Transport and Trade Processes

In case of modification of electronic import manifest data beyond the time limit of transmission, the agent at the destination port must submit a written application to the local Customs at the destination port according to the regulations of China Customs. As a result, it is not possible to change the destination port timely during the process of transport according to the trade requirements. For the outbound goods, according to the requirements of China Customs, the electronic data of advance manifest must be transmitted 24 hours before loading and accurate information on cargo containers and goods must be provided without free alteration. In this case, the owner of cargo must prepare containers and goods in advance, resulting in the increase in goods storage costs and decrease in container turnover rate. For the transit goods,

they can be declared only after the goods actually arrive at the destination, which leads to the extension of goods transit time and the drop in container turnover rate.

(2) Lack of Implementation Details

Although a new logistics regulatory framework of China Customs is built in Decree No. 172 promulgated by General Administration of Customs, the implementation details have not been issued up to now. As a result, local Customs interpret this framework in their own ways in the implementation. As the implementation standards are different, the situation of “one Customs, one method” is formed. The overall efficiency of manifest declaration is seriously affected, leading to mismanagement and increase in business costs.

(3) Imperfect System Operation and Maintenance Mechanism

Although the construction of regional Customs clearance integration has been advanced in China, there are still problems in local or regional Customs systems, such as delayed data transmission, and low efficiency of overall manifest declaration process. Therefore, it is necessary to build an efficient system operation and maintenance mechanism suitable for Customs in China. Thus various system problems encountered by logistics operators in the clearance process can be solved timely, ensuring smooth operation of daily business.

(4) Uncertainty in Customs Clearance Operation

In the new manifest management and declaration system of some local Customs, House B/L is equated with grouping bill. When the House B/L is declared, the declaration fails with the words “For this bill, the cargos have been grouped” displayed in the system. In the system of some places, the owners of cargos are not allowed to make less than container loads (LCL) by themselves for international transit declaration. However, such business actually belongs to normal freight businesses. On this issue, no clear instructions are issued by the General Administration of Customs.

6 Suggestions

6.1 Unify regulatory norms and law enforcement standards, and issue implementation details

As the actual implementation of manifest declaration, business process and time limits is different at local Customs in China, the verification and modification processes are not definite. In view of this situation, the General Administration of Customs should establish the working group referring to the suggestions of local Customs and E-port to investigate the actual situation of local manifest declaration. Moreover, according to the actual situation, it

should unify the business process, provide flexible local interface for all types of enterprises as well as product services for small enterprises, unify the data standards (message standard, parameter dictionary, data sharing, etc.), improve operational process and streamline declaration process.

Meanwhile, the General Administration of Customs shall issue the implementation details of Decree No. 172 as soon as possible, to clearly define various terms, standardize the operation of message transmitter and local Customs and provide special operation specifications for special businesses; for example, under the premise of not violating the provisions of Customs risk management and control, the dangerous goods are allowed to be declared in the case of not arrival at port; the congestion diversion of cargos is allowed without the tally report; etc.⁵³

6.2 Establish robust support system for new manifest declaration and management system

It is necessary to build a unified support system (such as routine business, technical support teams, and emergency contact system) to standardize support process and improve communication mechanism. Thus the transmission parties can timely track the declaration information, and consult operational and technical issues.

6.3 Attach importance on training and expand training scope

Nowadays, in China, there are only two kinds of trainings: the internal training for Customs and the training for the carrier and other parties involved in declaration. Obviously, there are no trainings concerning the coordination of government departments and trading enterprises. It is necessary to attach importance to the coordination and training of various government departments and trading enterprises, fully enhancing the standardization and efficiency of declaration work.

6.4 Set up reward and penalty mechanism

The government should encourage the transmission parties to participate in the declaration and establish the appropriate system of rewards and penalties. For the behavior of violating the regulations on electronic data transmission, according to Article 22 of “Implementing Regulations of Customs of P. R. C on Administrative Punishment”, the punishments are as follows: If electronic data of manifests fails to be transmitted to Customs within the prescribed time limit, electronic data transmitted is inaccurate or relevant electronic data fails to be stored within prescribed time limit, thus affecting Customs’ supervision, a warning shall be given and a fine of 50,000 Yuan or below may be imposed and illegal gains shall be confiscated, if there is any. In addition, third item in

⁵³ Biquan CHEN, Implementation of China’s Customs Advance Manifest Declaration and Suggestions on its Improvement [J], Containerization, 2011, 09: 26-29.

Article 4 of Decree No.172 stipulates “for any party which fails to transmit manifest or manifest-related electronic data in accordance with the provisions of these Measures (i.e. Decree No.172), Customs may refuse to carry out entry/exit declaration formalities for the means of transport concerned unless those provisions are observed. China’s General Administration of Customs should support the implementation of manifest management, and establish more specific rules of rewards and penalties based on the aforementioned regulations, such as the amount of the fine respectively for first violence and second violence.

6.5 Establish risk prevention system

China’s General Administration of Customs emphasizes the establishment of a modern Customs system which takes the risk management as a key link in “The Second-step Development Strategy Plan of Modern Customs System”. Risk management must be based on a lot of basic data, especially the basic data from third-parties mutually verified with cargo declaration data. As the third-party basic data is mostly from every link of logistics operation, it is necessary to connect, verify and integrate the logistics data generated in links of logistics operation through manifest as the main line. General Administration of Customs should accelerate the establishment of risk management and control system, identify and prevent against manifest risks through using the advanced transmission of electronic manifest data, and control the risks through the follow-up clearance information and mutually verified data in links of logistics operation.

6.6 Promote the sharing of manifest information

Electronic data of manifest is transmitted mainly through the local E-port. As the information systems of local E-ports and local Customs are relatively independent, the manifest information is not shared, which increases management costs and risks. It is necessary to enhance the interconnection between Customs information systems and intensify the cooperation between ports and business transparency. In addition, General Administration of Customs should establish unified data interface, standards and parameters dictionary to provide convenience for manifest declaration, achieving information sharing and resource integration between local Customs.

At the same time, China should strengthen international cooperation, promulgate the appropriate policies and promote the electronic data sharing of manifests in APEC region, alleviating the pressure on carriers in declaration and improving the declaration efficiency.⁵⁴

⁵⁴ Biquan CHEN, Implementation of China’s Customs Advance Manifest Declaration and Suggestions on its Improvement [J], Containerization, 2011, 09: 26-29.

6.7 Promote the adoption of new manifest declaration and management system gradually

As the electronization of manifest declaration varies at different Customs and the local Customs needs to spend some time in adapting to the new manifest declaration and management system, the adoption of new system should be advanced step by step. Local Customs should determine the time of using the new system based on its own actual situation; it is not proper to jump to success. During the period of usage, local Customs should continuously improve the new system and ensure the unity of data dictionary and flexible switching of interfaces to improve work efficiency.

III. Republic of Korea Case Study

1 Executive Summary

With the introduction of Export and Import Cargo Management System of Korea Customs Service and Manifest Consolidation System (MFCS) of KTNET in 2007 and 2006 respectively, the performance of export and import logistics in port and Customs bonded areas have greatly improved in Korea.

The primary purpose of the Export and Import Cargo Management system is, of course, to monitor the movement of and to do assessment on the cargo by the total quantity of goods. The primary purpose of another key system, MFCS, is to automate the Manifest submission process consolidating Master Manifest and House Manifest that ocean carriers and freight forwarders submitted, to support the Cargo Management System of KCS. And another, but more important purpose is to store the information of Manifest submitted into the database of MFCS and share it with over 7,800 logistics service providers through the customs clearance chain process. So through the whole customs clearance chain, all the logistics stakeholders can view cargo information, do the cargo tracking and submit related information or make a report to KCS using the shared Manifest information in MFCS inherited from the original information that carriers and forwarders submitted.

Introduction of AMS has been a tough challenge for KCS. The launch of the AMS for air cargo had been postponed couple of times since its first announcement to launch AMS in December 2011 until its full enforcement in 2012 causing confusion and distrust of the stakeholders on the new policy. Expansion of AMS to maritime import cargo has been planned but not executed for years as the implementation of the AMS for maritime cargo is much challenging due to its complexity of stakeholder environment and data integrity. But still current regulation requires carriers to consolidate House Manifest into Master Manifest and submit them to KCS 24 hours before arrival of vessel.

The e-Manifest could bring a number of values to stakeholders. Controlling and monitoring of cargo and enhancing cargo security to controlling agencies and information sharing through a Customs value chain. So when designing the e-Manifest system, enough consideration should be given to maximize the value that e-Manifest can bring to community.

One of the concerns of the obligator is that when they are sending out the goods to importing economy, they have to make a declaration again to the controlling agency of importing economy as well as to that of exporting

economy with very similar data set. So the harmonization of these redundancy requirements across the border could streamline the process reducing the burden of the obligator as well as ensuring more accurate information for controlling agencies at both sides.

2 Republic of Korea Maritime Trade Background

2.1 Definition⁵⁵

The definition of terms used in this report provides that:

- "Manifest" is a list of goods comprising cargo carried in a sea transport (in this report, only sea transportation will be discussed)-unit with the Master B/L information remarked by ocean carriers, written and compiled in accordance with the "Message Implementation Guide" issued by the Korea Customs Service (KCS). It is called "Consolidated Cargo Manifest" if forwarders remark the House B/L list.
- "Person Obligated to Submit Manifests": Ocean and air carriers are obliged to submit manifests for export and import cargo, and are legally responsible for any breach of submission deadlines as well as the content, accuracy and completeness of submitted data. Local freight forwarders take responsibility of compiling and correcting export House B/L data as an entity in charge of compiling consolidated cargo manifests. With regard to consolidated cargo, carriers should collect and compile House B/L data from freight forwarders (including those who handle consolidated cargo in the country of exportation) and submit it after final verification to the KCS in accordance with the "Message Implementation Guide". Carriers can entrust the task of manifest compiling and submission to message broker as authorized by the KCS according to the Article 327-3 of the Customs Law.
- "Master B/L" is the bill of lading issued by ocean carriers.
- "House B/L" is the bill of lading that forwarders issue directly to shippers.
- "Electronic document" is electronic data designed for transmission between computers, written and compiled in accordance with the "Message Implementation Guide" issued by the KCS.

2.2 Volume of RoK Maritime Trade

In Korea the number of B/L for imported cargos (which is equivalent to the number of Manifest) has increased sharply by 16% from 2010 to 2013 regardless of the stagnation in 2011 and 2012 while the incremental of export B/L number remains at 2% at the same period of time. There seems no

⁵⁵ Definitions in this section are from "Guidance for the Korea Advance Manifest System" distributed by Korea Customs Service.

correlation between the number of B/L and the value of international trade.

Table 2.1: Marine Cargo Import to Korea

Destination	Period	the Number of B/L	Weight	Rate of Increase/Decrease(B/L)
Asia	2010	9,075,612	191,160,546	
	2011	9,454,607	193,531,561	4%
	2012	10,332,937	190,604,390	9%
	2013	11,537,958	192,685,515	12%
North America	2010	5,162,855	45,374,609	
	2011	6,937,753	53,860,855	34%
	2012	8,617,415	48,109,652	24%
	2013	10,886,363	43,318,256	26%
Europe	2010	930,178	38,314,194	
	2011	1,107,524	41,777,464	19%
	2012	1,314,171	50,343,072	19%
	2013	1,679,526	53,018,489	28%
Australia, New Zealand	2010	424,723	107,792,071	
	2011	409,865	113,022,853	-3%
	2012	344,444	115,649,869	-16%
	2013	315,650	119,636,450	-8%
Middle East	2010	54,778	136,699,321	
	2011	60,111	150,949,672	10%
	2012	61,947	151,451,212	3%
	2013	87,642	154,177,584	41%
Central and South America	2010	53,309	29,707,556	
	2011	80,083	34,322,925	50%
	2012	79,158	35,343,350	-1%
	2013	86,040	34,206,849	9%
Africa	2010	6,387	9,037,224	
	2011	7,856	10,028,327	23%
	2012	9,895	10,393,035	26%
	2013	10,395	8,677,392	5%
Oceania	2010	181	7,083	
	2011	228	14,614	26%
	2012	341	21,964	50%
	2013	502	71,427	47%

Table 2.2: Marine Cargo Export from Korea

Destination	Period	the Number of B/L	Weight	Rate of Increase/Decrease(B/L)
Asia	2010	4,612,410	140,169,338	

	2011	4,641,474	165,920,006	1%
	2012	4,716,797	166,447,674	2%
	2013	5,073,997	166,945,764	8%
North America	2010	1,571,209	21,875,935	
	2011	1,481,810	22,429,281	-6%
	2012	1,301,010	24,034,262	-12%
	2013	1,330,392	23,444,588	2%
Europe	2010	809,727	14,784,343	
	2011	882,858	18,200,411	9%
	2012	872,567	17,040,165	-1%
	2013	876,475	18,423,070	0%
Central and South America	2010	266,348	14,468,346	
	2011	310,415	14,990,630	17%
	2012	338,335	15,276,662	9%
	2013	344,491	15,435,021	2%
Middle East	2010	240,300	9,667,236	
	2011	241,646	12,714,506	1%
	2012	262,434	10,614,676	9%
	2013	266,188	8,990,874	1%
Australia, New Zealand	2010	140,518	8,466,086	
	2011	194,660	9,641,339	39%
	2012	215,116	9,401,238	11%
	2013	179,653	9,300,461	-16%
Africa	2010	30,605	5,506,570	
	2011	42,736	6,456,506	40%
	2012	42,139	4,669,796	-1%
	2013	27,404	4,246,971	-35%
Oceania	2010	4,476	397,866	
	2011	4,588	310,541	3%
	2012	4,594	373,157	0%
	2013	3,838	544,476	-16%

Table 2.3: Summary of Marine Cargo Import to Korea

Year (Import)	the Number of B/L	Rate (B/L)	Value (USD 1,000)	Rate (Value)
2010	15,708,023		425,212,160	
2011	18,058,027	15%	524,413,090	23%
2012	20,760,308	15%	519,584,473	-1%
2013	24,604,076	19%	515,585,519	-1%
Average		16%		16%

Table 2.4: Summary of Marine Cargo Export from Korea

Year (Export)	the Number of B/L	Rate (B/L)	Value (USD 1,000)	Rate (Value)
2010	7,675,593		466,383,762	
2011	7,800,187	2%	555,213,656	19%
2012	7,752,992	-1%	547,869,792	-1%
2013	8,102,438	5%	559,632,434	2%
average		2%		16%

2.3 Key Organizations in Charge of Maritime Import/Export Regulation in RoK

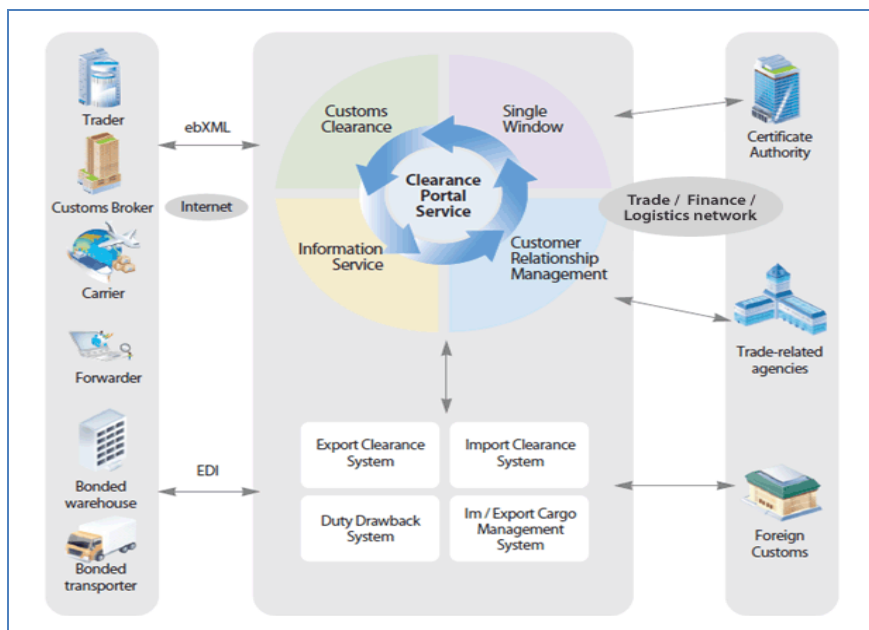
In Korea, there are 31 international sea ports (15 central government owned and 16 local government owned) and 26 domestic sea ports. The Korea Customs Service and port authorities are the main agencies responsible for regulatory procedures of international trade through sea ports of entry.

2.3.1 Korea Customs Service (KCS)

The mission of KCS is “Strong economy, the border and Customs protection for a safe society”. The mission statement is simplified with 3Ps:

- Protection: Protect the national finance and economy;
- Prevention: Prevent the inflow of detrimental elements to the safety of the society and the life of citizens;
- Promotion: Promote the lawful international trades and the traffic of travelers.

Chart 2.1: UNI-PASS System and Information Flow



UNI-PASS is an Internet Clearance Portal System to provide a convenient and cost effective solution for customs clearance developed by KCS. UNI-PASS refers to 7 main modules among the Korea Customs administration systems. They are Import Clearance, Export Clearance, Duty Collection, Import Cargo Management, Export Cargo Management, Duty Drawback, and Single Window Modules.

According to the KCS, there are 4 benefits of UNI-PASS as below:

1) Substantial Drop in Clearance Time

- Export clearance in 1.5 Minutes
- Import clearance in 1.5 hours

(Recommendation of UNCTAD for import clearance is 4 hours)

2) Reduce Logistics Cost

(i) Savings in cost and workforce by:

- Computerizing Customs procedures and electronic clearance network
- Simplifying Customs process and providing paperless environment

(ii) Increase national competitiveness and business productivity by :

- Speeding-up cargo processing
- Increasing corporate competitiveness

3) Increase Transparency & Revenue

(i) High transparency, accountability and responsiveness in Customs administration by:

- Automating and computerizing inspector allocation
- No person to person meeting, and result is opened to the public

(ii) Increase National Revenue

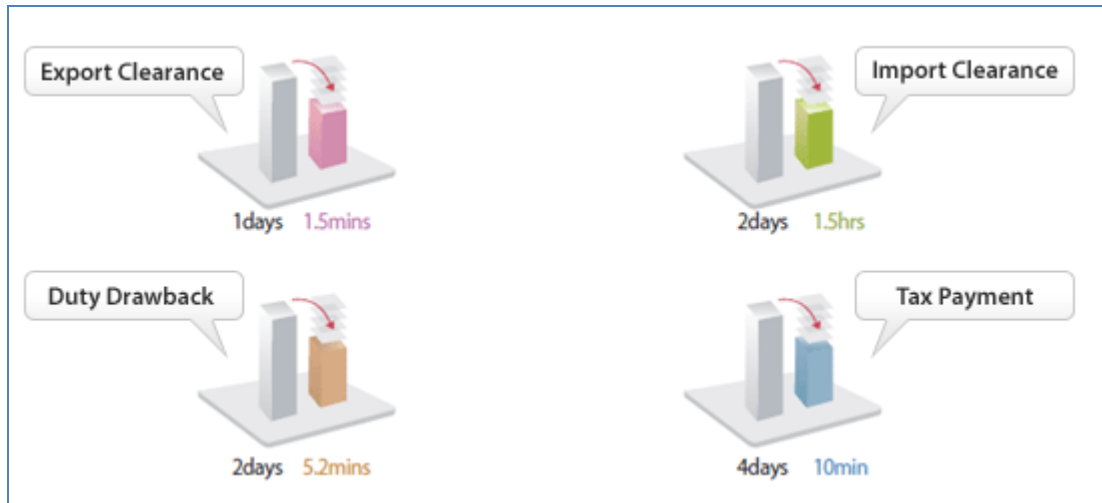
- Detection of illegal trade and smuggling activities
- Prevention of tax evasion

4) One-Stop Service, Anytime and Anywhere

Linkage to e-Clearance Network

- Single cyber community: Linking organizations such as government authorities, Customs, banks, traders, agents and carriers
- Requirement verification, tax payment, drawback and tax bill issuing services etc. through computer network

Chart 2.2: Benefits of UNI-PASS in Clearance Time



2.3.2 11 Port Authorities and Ports and Harbor Bureau of Ministry of Oceans and Fisheries

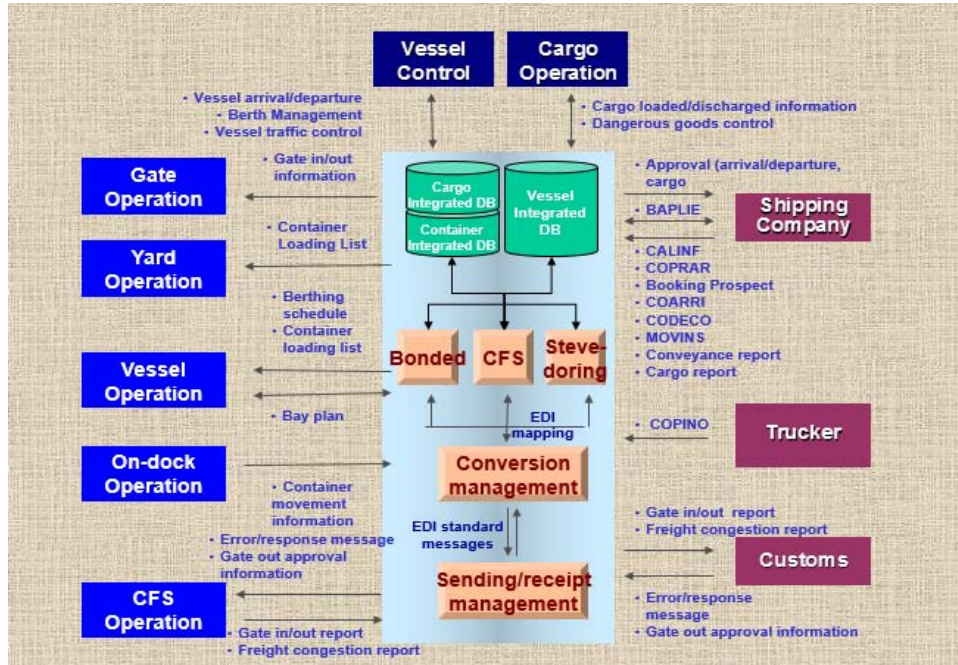
There is no single independent authority which governs operation of all Korean ports and harbors which are under the Ministry of Oceans and Fisheries (MOF). Ports and Harbors Bureau of the MOF is in charge of port policy, port investment and port and neighboring area development. Under the MOF, there are eleven port authorities in charge of ports operation. Currently there are 28 Korean ports operating Port-MIS (Management Information System) connecting stakeholders of the port operations such as ocean carriers, agents and terminal operators. MOF developed the SP-IDC (Shipping & Port - Internet Data Center) which collects and integrates scattered data in each Port-MIS and provides processed data to stakeholders including policy makers. In the Annual Report⁵⁶ of the Ministry, the benefits of Port-MIS have been analyzed as below:

- Simplified process: harmonize documents from 75 to 22
- Abolishing paper document: USD 22 Million and cut down 3.5 Million paper submissions
- Decreased number of port offices handling applications: USD 11 Million
- Manpower saving: USD 27 Million
- E-Payment system on port use fee: USD 12 Million
- Integrated port and shipping DB system: USD 8 Million
- Information sharing among government agencies (Port Authority, Customs, Immigration office, Quarantine station and Maritime police): USD 15 Million

⁵⁶ Annual logistics cost saving (1999–2003), Annual Report, Ministry of Maritime Affairs and Fishery (currently MOF).

- Reduced vessel standby time: 4 hours/vessel
- Container handling time by automated gate operation: 12 hours

Chart 2.3: Port-MIS of ROK



3 Legal Environment Pertaining to Maritime Import/Export Reporting

3.1 Key Policies and Regulations

The following key regulations established the current requirements for sending e-Manifest to KCS and Port Authorities of ROK.

Table 3.1: Key Regulations Regarding Manifest

Org.	Law/Regulation	Document	Obligator	Form
MOF	Harbor Act Article 30 and Enforcement Decree Article 20; Regulation on the use of (international) trade port facilities and fee	Cargo In & Out Report (Consolidation of Cargo In/Out Report and Container In/Out Report in 2005.Oct.17)	Ocean carrier, consignor and etc	EDI (same as Manifest)
	Regulation on the use of (international) trade port facilities and fee, Article 17 and 18	Cargo Summary Sheet	Ocean carrier, consignor and etc	EDI
KCS	Customs Act Article 135~137, Enforcement Decree Article 157, 158, 160 and 163, and Reg	Manifest	Ocean carrier and forwarder	EDI

	ulation on Arrival, Departure, Discharging and Loading of Bonded Cargo			
	Same as above	Discharging Cargo Declaration	Ocean carrier	EDI
	Same as above	Discharging/Loading Result Report	Inspection company	EDI

3.2 Introduction of Advance Manifest

From 2012, the Korea Customs Service (KCS) is requiring electronic advance manifest for cargo being carried into and out of the Customs territory of Korea. Submittal of information to the Korea Manifest System (KMS) is as below:

- Goods imported via air transportation into Korea
- Goods exported via air or ocean transportation from Korea

Korea Customs has launched the Korea Manifest system in an effort to control illegal or counterfeit exports, improve import clearance procedures and become aligned with international standards.

Timing requirements for sending shipment data to the KMS varies depending on which mode of transportation is used to carry the goods:

- Short haul inbound flights (with a duration less than four hours) must be filed upon departure;
- Long haul inbound flights (with a duration over four hours) must be filed at least 4 hours prior to arrival into Korea;
- Export air cargo must be filed 30 minutes prior to loading;
- Containerized Maritime export cargo (except short sea shipping) must be filed at least 24 hours prior to loading at the port of departure;
- Bulk / Break bulk maritime export cargo (except short sea shipping) must be filed prior to departure;
- Short Sea shipping maritime export cargo must be filed at least 30 minutes prior to departure.

It is the responsibility of the forwarder/NVOCC to submit manifest data to the Master carriers directly but it is the responsibility of the parties tendering cargo to the carrier to provide accurate information at the time of shipping instruction submission.

Carriers will need to receive the following information to submit a filing with the time limits specified:

- Shipper name and address
- Consignee name and address

- Precise goods description
- Type of packages
- Number of packages
- Container number (if applicable)
- Seal number (if applicable)
- Gross mass (kg)
- Export Good Permit Number (EPN)

Legal basis under the provisions of the Customs Act related to the Advance Manifest System (hereinafter referred to as “the AMS”) is stated below:

- (Article 135, Clause 2) If it is required for going through rapid entry and customs clearance procedure, and conducting efficient supervision and control, the collector of customs (hereinafter referred to as “customs collector”) may have the shipping or aviation company to which the ship or aircraft entering into the port submit the list of passengers, manifest, etc. prior to the entry, under the conditions as prescribed by the Commissioner of the Korea Customs Service.
- (Article 136, Clause 2) When a foreign trade vessel or aircraft desires to depart from an open port, the captain thereof shall, prior to departure, obtain a departure permit from customs collector. The captain of a vessel or aircraft shall submit a list of goods boarded at the open port.
- (Article 140, Clause 2) When goods are to be loaded to or unloaded from any foreign trade vessels or aircraft, a declaration thereon shall be made to customs collector and confirmation thereon shall be obtained on the spot from customs officers.

Essential particulars related to the AMS, including timeline of submission, specification templates, preparation method and application for corrections should comply with the “Notification of Loading and Unloading Procedure of Entry and Departure for Bonded Cargo (2011-7, March 18, 2011)” by the KCS.

Based on the WCO SAFE Framework and in consideration of special circumstance of short-flight or short-sea-shipping and capability of concerned logistics entities, due date of submission defined by the KCS is as following:

Table 3.2: KAMS Timeline of Submission

Type		Deadline
SEA	Import	(Principle) At least 24 hours before commencement of loading at the port of loading.
		(Short sea shipping) Before departure at the port of loading
		(Bulk) At least 4 hours before arrival at the port of entry

	Export	(Principle) At least 24 hours before commencement of loading (Short sea shipping) Prior to loading, 30 minutes before departure (Bulk, Transit cargo) Before departure
AIR	Import	(Principle) At least 4 hours before arrival (Short haul) Before departure at the airport of loading (more specifically, at time of “wheels up” of aircraft) (Express Cargo) At least 1 hour before arrival
	Export	Prior to loading, 30 minutes before departure

* “Wheels up” is the moment when an airplane’s wheels reach its body after takeoff

The scope of short-haul-flight areas is limited to China; Chinese Taipei; Hong Kong, China; Japan; and far-Eastern Russia.

In case of export sea cargo, The Philippines, Viet Nam, Cambodia, Thailand, Indonesia, Malaysia, and Singapore are also regarded as short-sea-shipping areas.

3.3 Challenges Faced by KCS

Introduction of AMS for air cargo has been a tough challenge for KCS. The launch of the AMS had been postponed couple of times since its first announcement to launch AMS in December 2011 until its full enforcement in 2012 causing confusion and distrust of the stakeholders. Expansion of AMS to maritime import cargo has been planned but not executed for years as the implementation of the AMS for maritime cargo is much challenging due to its complexity of stakeholder environment and data integrity.

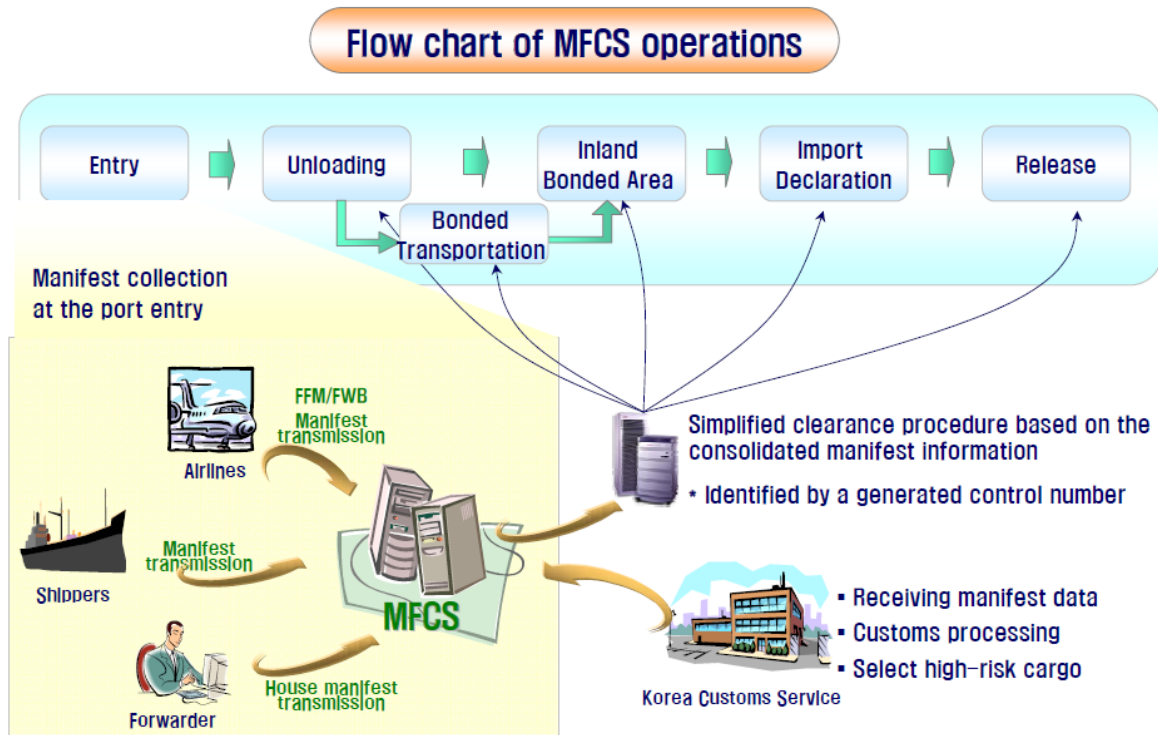
4 ICT Environment and E-Manifest Exchange Profile

4.1 Overview

In 1996, KCS started the development of Export and Import Cargo Management System using EDI technology and implemented Export Cargo Management System and Import Cargo Management System in 1997 and 1998 respectively.

To support the Cargo Management System of KCS, Korea Trade Network (KTNET), a customs network service provider, has developed a Manifest Consolidation System (MFCS) which helps community to consolidate manifest and share related information among the customs clearance chain.

Chart 4.1: MFCS Operation Flow Chart



The main functions of MFCS can be summarized as below:

1) Manifest consolidation

- Receive Master Manifest from carriers and consolidate with House Manifest received from forwarder/NVOCC
- Validate the Manifest before submitting to KCS

2) Cargo control number management

- Create unique cargo control number combining i) Manifest reference no. ii) Master B/L sequence no. and iii) House B/L sequence no.

3) Infrastructure for information sharing

- By using unique cargo control number, share the consolidated information among KCS, carriers, warehouse, forwarder, tally, customs broker and other stakeholders through whole customs clearance chain

According to KTNET, as of December 2013 more than 7,800 carriers, forwarders, NVOCC and customs brokers have established user accounts in MFCS.

4.2 Current Process Flows for Maritime Import/Export Reporting and Related Technology

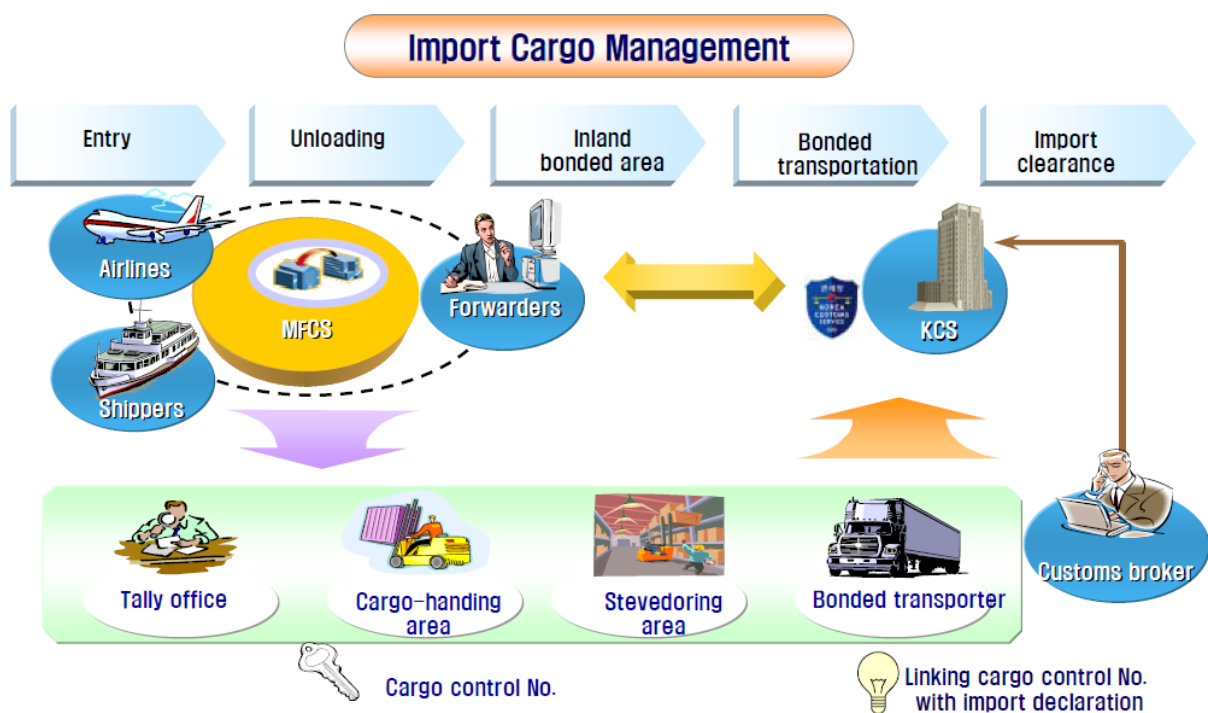
4.2.1 Imports

(1) Overview

Despite the Advance Manifest System introduction announcement made by KCS in 2012, the AMS has not been implemented to maritime cargo until now. But still current regulation requires carriers to consolidate House Manifest into Master Manifest and submit them to KCS 24 hours before arrival of vessel.

In the beginning, the purpose of development of MFCS was more on the cargo control rather than security. So through the whole customs clearance chain, all the logistics stakeholders can view cargo information and submit related information or report based on the shared Manifest information in MFCS inherited from the original information that carriers and forwarders provided.

Chart 4.2: Import Cargo Flow



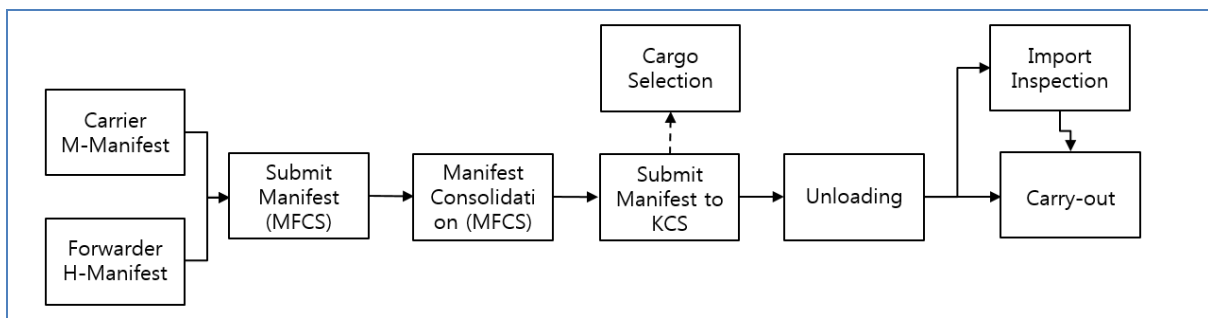
(2) E-Manifest Filing Process

- (i) The carriers transmit Master Manifest data to MFCS and Forwarders submit House Manifest based on the House Bill of Lading information they received from overseas partner to MFCS. MFCS consolidate Master and House Manifest automatically. The carrier must transmit consolidated e-Manifest data to KCS 24 hours before vessel arrival for a long distance cargo while it is before arrival of vessel for a short distance cargo.
- (ii) Based on the Manifest submitted, KCS selects cargo to be inspected. In fact, as received Manifest does not contain as much valuable information

as import declaration for risk management, most of dangerous or suspicious cargo selection occurs after the declaration submission process.

- (iii) The carrier transmits unloading report with unloading place in it to KCS based on Master Manifest.
- (iv) If the cargo is selected at the cargo selection process, after unloading from the vessel, the cargo is moved to inspection area and inspected.
- (v) Once the cargo moves into and out of bonded warehouse, the warehouse reports the cargo carry-in and carry-out with Manifest reference number and Bill of Lading number.

Chart 4.3: E-Manifest Filing Flow for Import

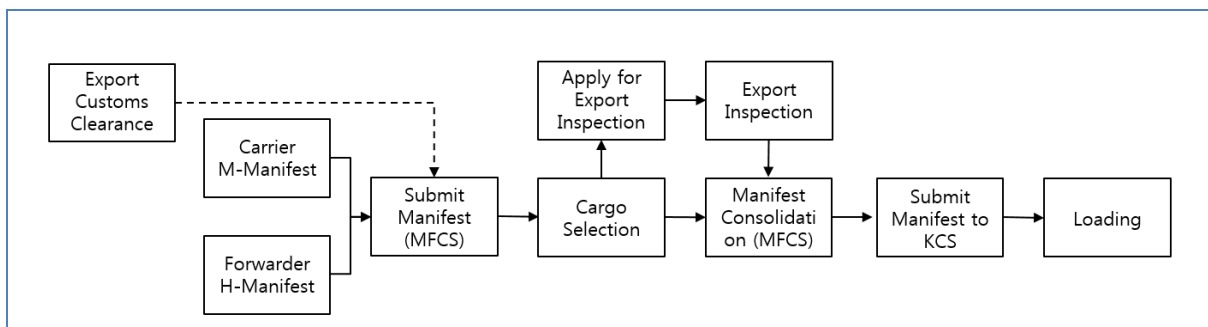


4.2.2 Exports

(1) Overview

Because of the strong government policy for the export promotion, the regulatory control of export process is very much simplified compared to that of import process. Unlike Manifest filing process for inbound cargo, in case of outbound cargo, Customs export declaration must be submitted before the outbound Manifest filing. And this difference makes a different point of cargo selection to be inspected. Export Customs declaration can be applied one month before the loading of cargo and this period can be extended to one year. In practice, sometimes the declaration is made even before the production of exported item.

Chart 4.4: E-Manifest Filing Flow for Export



(2) Manifest Filing Process for Outbound Cargo

- (i) The exporter or authorized customs broker requests export declaration of a cargo and get an acceptance from KCS.
- (ii) Carrier submits electronic Master Manifest to MFCS and Forwarder (or NVOCC) submits electronic House Manifest to MFCS each. The outbound Manifest must contain the export clearance reference number in it. Electronic Manifest must be submitted 24 hours before loading for a long distance cargo and 30 minutes before loading for a short distance cargo. In case of a bulk cargo and a transshipment cargo, due time is before departure.
- (iii) The risk management system of KCS validates the information and selects cargos to be inspected by utilizing the declaration information of cargos.
- (iv) If a cargo is selected to be inspected, exporter can notify KCS when the cargo can be inspected. On the day, a cargo shall be moved to a bonded inspection area by exporter or its authorized agent and KCS conducts physical inspection.
- (v) When all the inspection is over or if no inspection is required, all the subsequent House Manifests are consolidated under one Master Manifest and consolidated Manifest is filed to KCS system by MFCS.
- (vi) Once the Manifest is accepted, carrier loads the cargo.

4.2.3 Data Formats and Confidentiality

Since its introduction, EDIFACT based KEDIFACT message was used as a standard message format for the electronic Manifest filing. However, various industry or private standard was also supported by MFCS. In 2012, KCS introduced WCO DM (Data Modeling) based XML format for electronic Manifest. As obligators are tend to stick to its legacy format, KTNET provides message translation service changing received KEDIFACT or other private standard messages into KCS XML format and send it to KCS.

In between KCS and MFCS, ebXML is used as a communication protocol and all the messages are encrypted in between them. For obligators, various security measures such as ebXML, VPN, SSL and leased line are provided by KTNET as an optional service.

4.3 E-Manifest Data Sharing with Other Economies

Currently KCS does not share e-Manifest data with other economies. However, KCS provide cargo status information in bonded area based on unique Manifest reference number.

However, KCS has been conducting a number of cross-border customs clearance information exchange project with other countries such as Malaysia,

Belgium and the Philippines.

5 Commercial Environment

In its early stage of MFCS, Obligators have to purchase stand-alone solution or develop its own in-house system to communicate with MFCS. In 2000, MFCS has migrated to internet based platform where obligators can conduct electronic Manifest filing. However, most of obligators still prefer to use its own legacy system for filing as the legacy system provides other logistics management functions such as Bill of Lading management and customer management. For the filing, obligators and other stakeholders using MFCS have to pay transaction fee to KTNET.

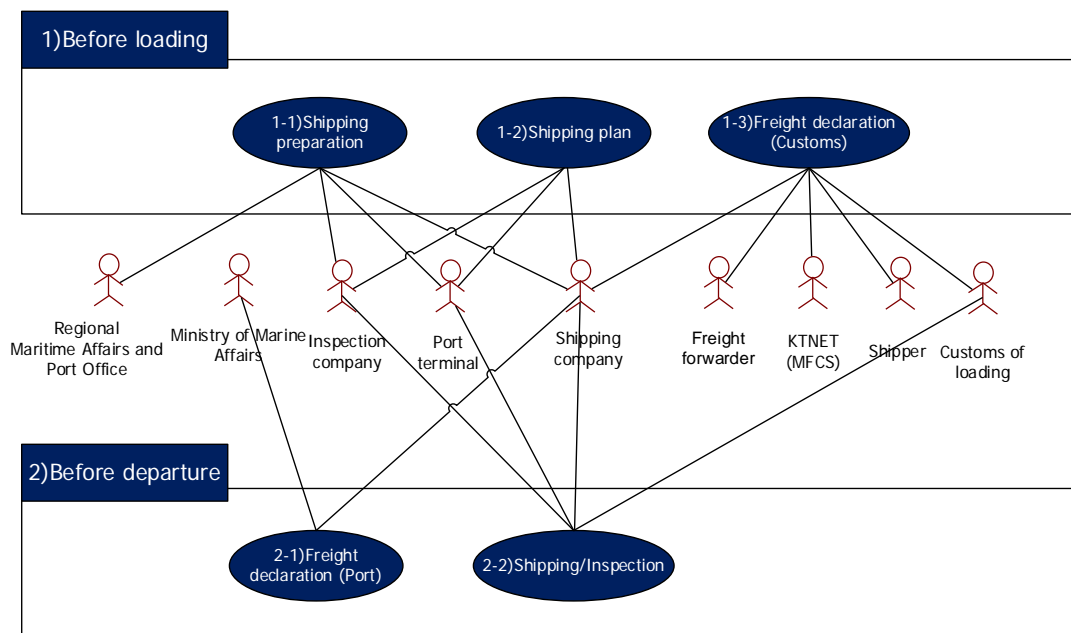
6 Business Process Analysis

6.1 Export Process Flow

6.1.1 Use Case

As seen in Chart 6.1 below, there are Three (3) responsible government agencies involved in the ocean export process flow; Ministry of Marine Affairs (or Ministry of Transportation), Regional Maritime Affairs and Port Office and Customs. The difference is that Ministry of Marine Affairs has more concern on vessel and port management while Customs has more concern on cargo.

Chart 6.1: Export Use Case



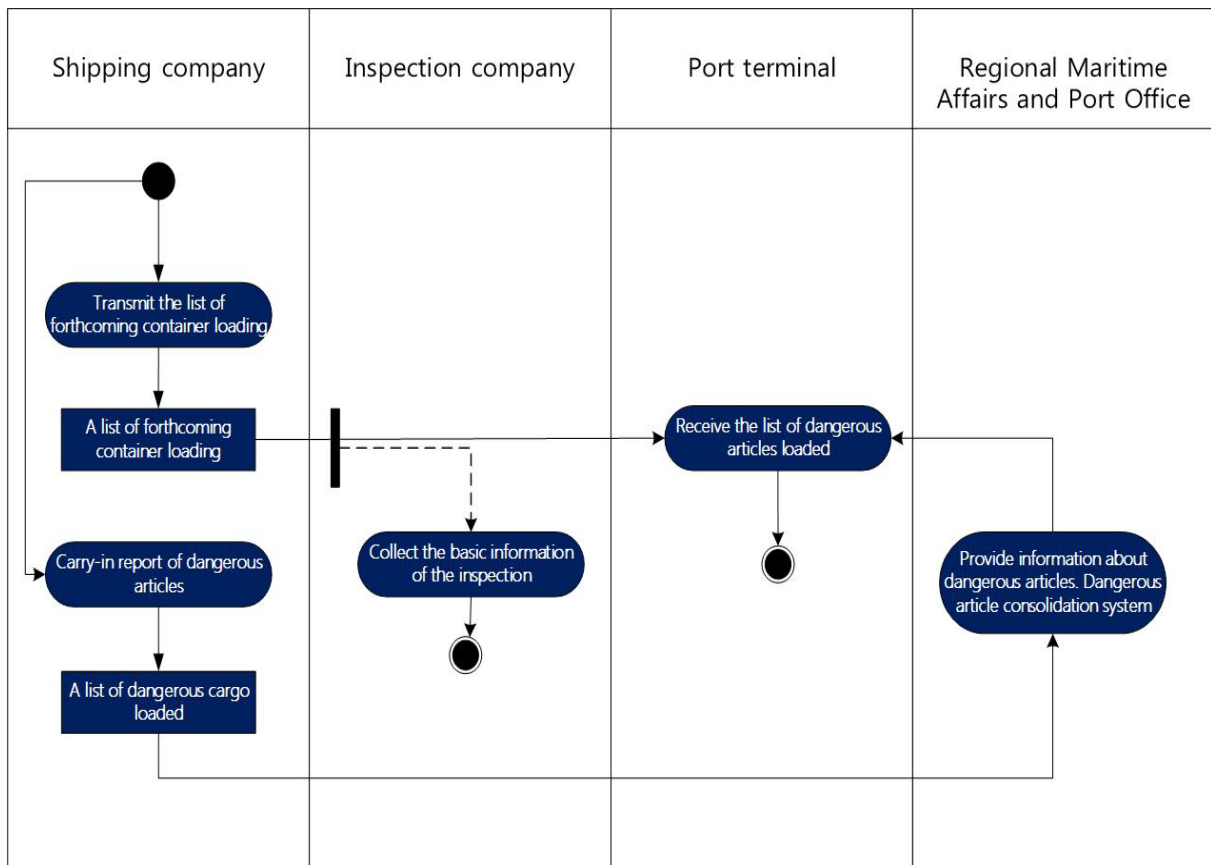
6.1.2 Process Area 1: Before Loading

(1) Core Business Process Area 1-1: Shipping Preparation

“Shipping reservation” is the first process under “Before loading” process area. This core business process requires the participation from:

- Shipping company
- Inspection company
- Port terminal
- Regional Maritime Affairs and Port Office (Dangerous article consolidation system)

Chart 6.2: “Shipping Reservation” Activity Diagram



The shipping preparation work in the port export distribution process is defined as below.

Work title	<ul style="list-style-type: none"> ▪ Before loading
Work procedure	<ul style="list-style-type: none"> ▪ 1-1. Shipping preparation ▪ 1-1-1. Shipping reservation

Definition of work procedure by unit	<ul style="list-style-type: none"> ▪ To export articles via ship transport, send a shipment request after confirming the shipping schedule.
Scope of work procedure by unit	Shipping schedule confirmation ↓ Shipping booking ↓ Establish a shipping plan ↓ Send/submit a shipping request.
Supervising organization	<ul style="list-style-type: none"> ▪ Shipper
Related organization	<ul style="list-style-type: none"> ▪ Forwarder ▪ Shipping company
Form	<ul style="list-style-type: none"> ▪ Shipping schedule ▪ Shipping request (S/R) ▪ Packing list ▪ Commercial invoice ▪ Certificate of accepted inspection of the containers carrying dangerous articles

(2) Core Business Process Area 1-2: Shipping Plan

“Shipping plan” is a process under “Before loading” process area. This core business process requires the participation from:

- Shipping company
- Inspection company
- Port terminal(Cargo company)

Chart 6.2: “Submit a Loading List” Activity Diagram

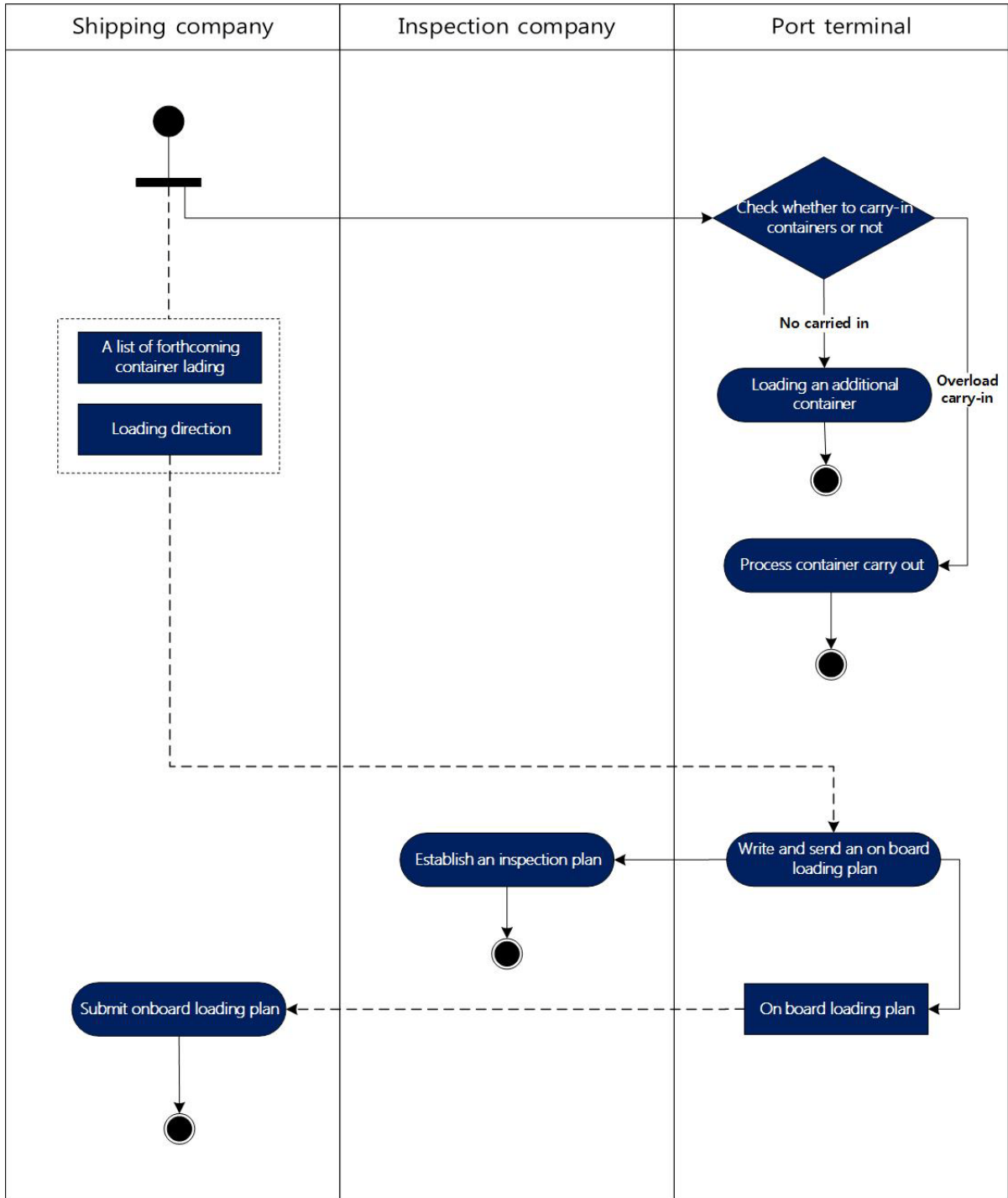
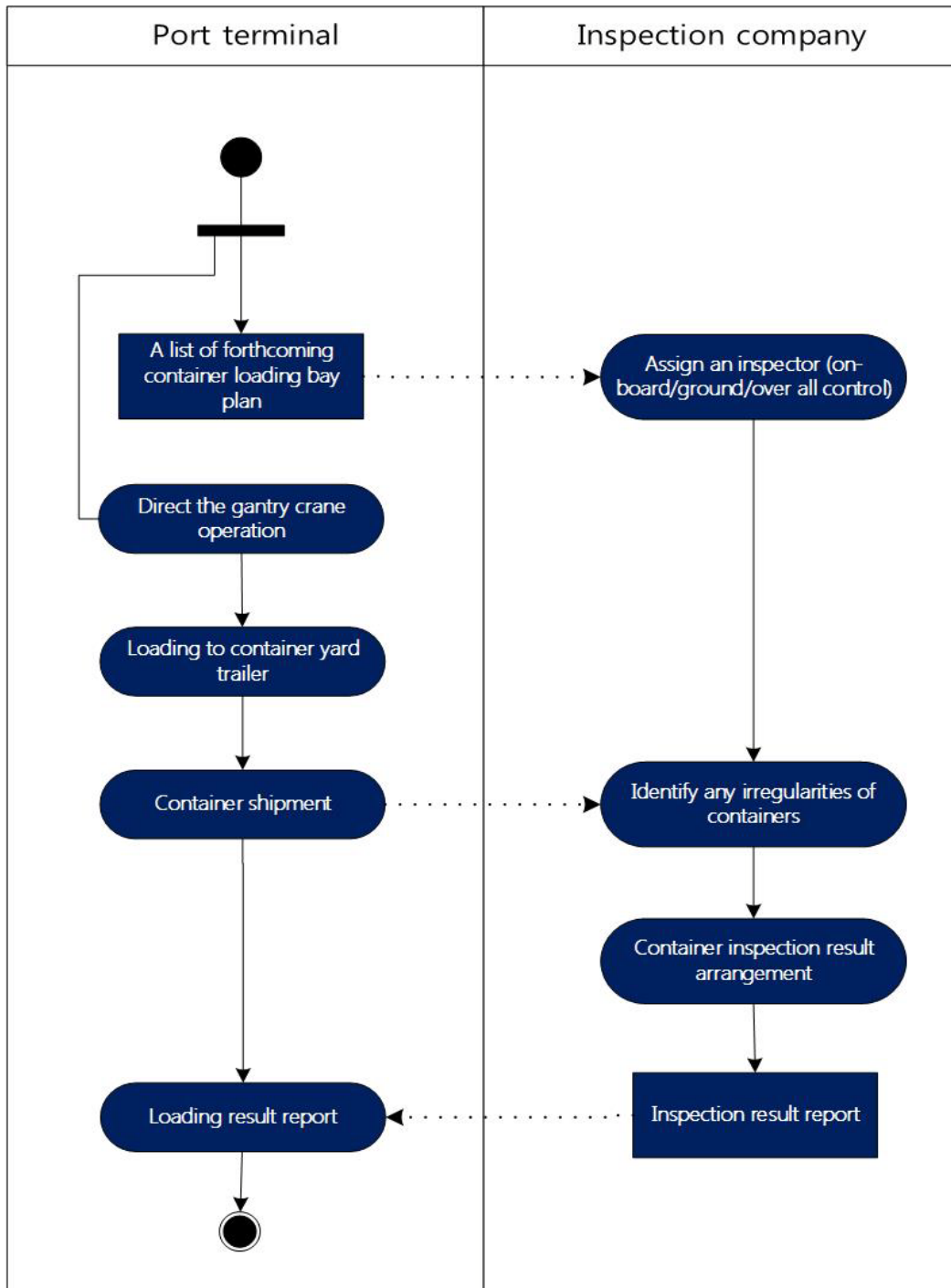


Chart 6.3: “Shipping Operation Plan” Activity Diagram



The shipping plan work in the port export distribution process is defined as below.

Work title	<ul style="list-style-type: none"> ▪ Before loading
Work procedure	<ul style="list-style-type: none"> ▪ 1-2. Shipping plan ▪ 1-2-1. Submit a loading list ▪ 1-2-2. Shipping operation plan

Definition of work procedure by unit	1-2-1. Submit a loading list	Shipping company sends the shipping information that is relevant to shipping cargos (cargo manifest, Bay Plan, a list of forthcoming container loading, a list of dangerous cargo, ship specification, shipping schedule, etc.) to the cargo company and inspection company.
	1-2-2. Shipping operation plan	Transportation company and inspection company make an operation sequence table and establish an inspection plan after receiving the shipping information from the shipping company.
Scope of work procedure by unit	1-2-1. Submit a loading list	Write a shipping information ↓ Send to the cargo company and inspection company
	1-2-2. Shipping operation plan	Receive the cargo information ↓ Write an operation schedule ↓ Write a basic data of inspection
Supervising organization	1-2-1. Submit a loading list	<ul style="list-style-type: none"> ▪ Port terminal ▪ Inspection company
	1-2-2. Shipping operation plan	<ul style="list-style-type: none"> ▪ Port terminal ▪ Inspection company
Related organization	1-2-1. Submit a loading list	<ul style="list-style-type: none"> ▪ Shipping company
	1-2-2. Shipping operation plan	<ul style="list-style-type: none"> ▪ Shipping company
Form	<ul style="list-style-type: none"> ▪ On board loading diagram ▪ A list of forthcoming container loading ▪ Detailed procedure for loading 	

(3) Core Business Process Area 1-3: Freight Declaration

“Freight declaration” is a process under “Before loading” process area. This core business process requires the participation from:

Related organization (KTNET MFCS)

- Office of Customs Administration
- Shipper
- Forwarder
- Shipping company

Chart 6.4: “Master/House Manifest Submission/Correction” Activity Diagram

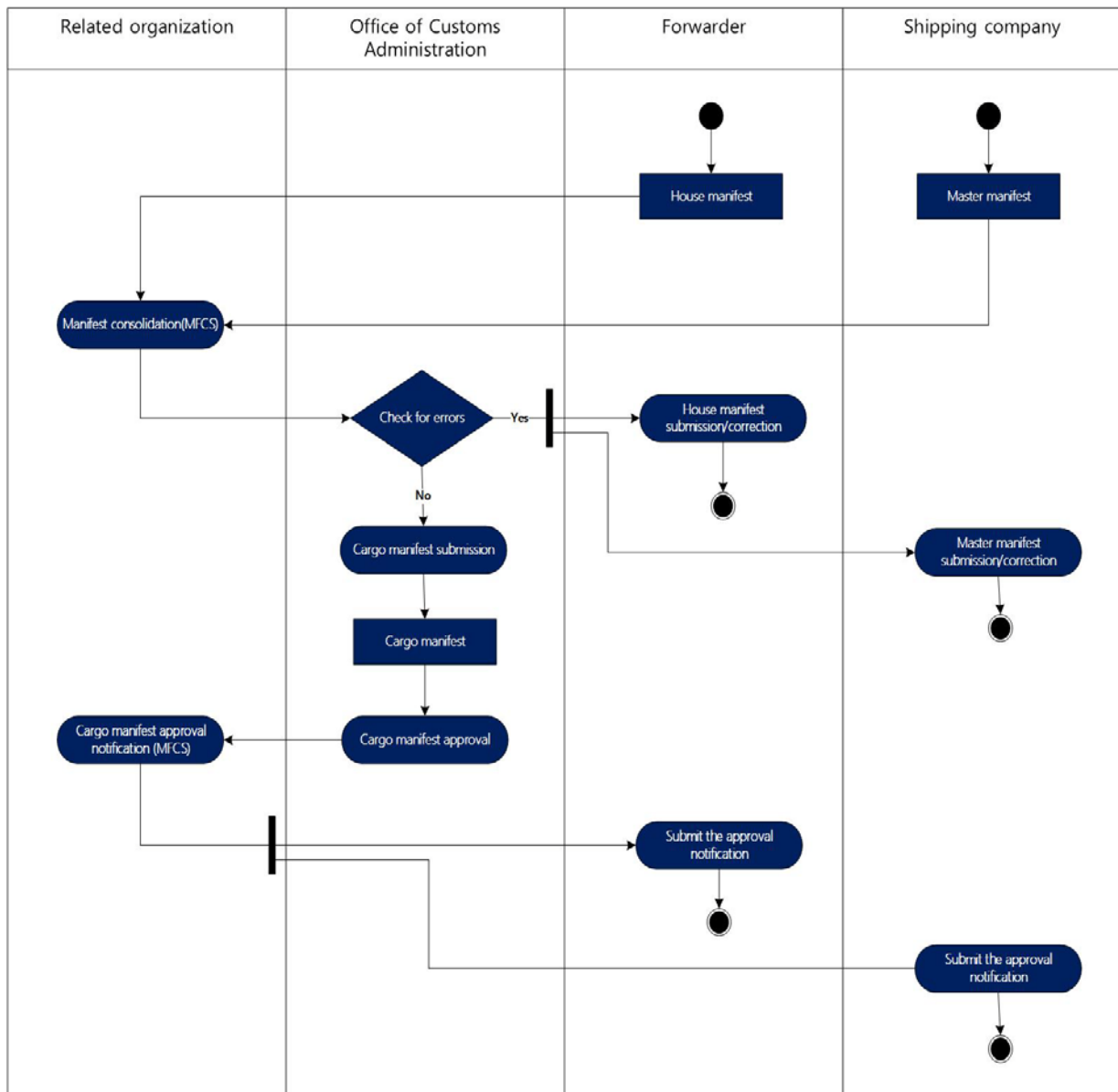
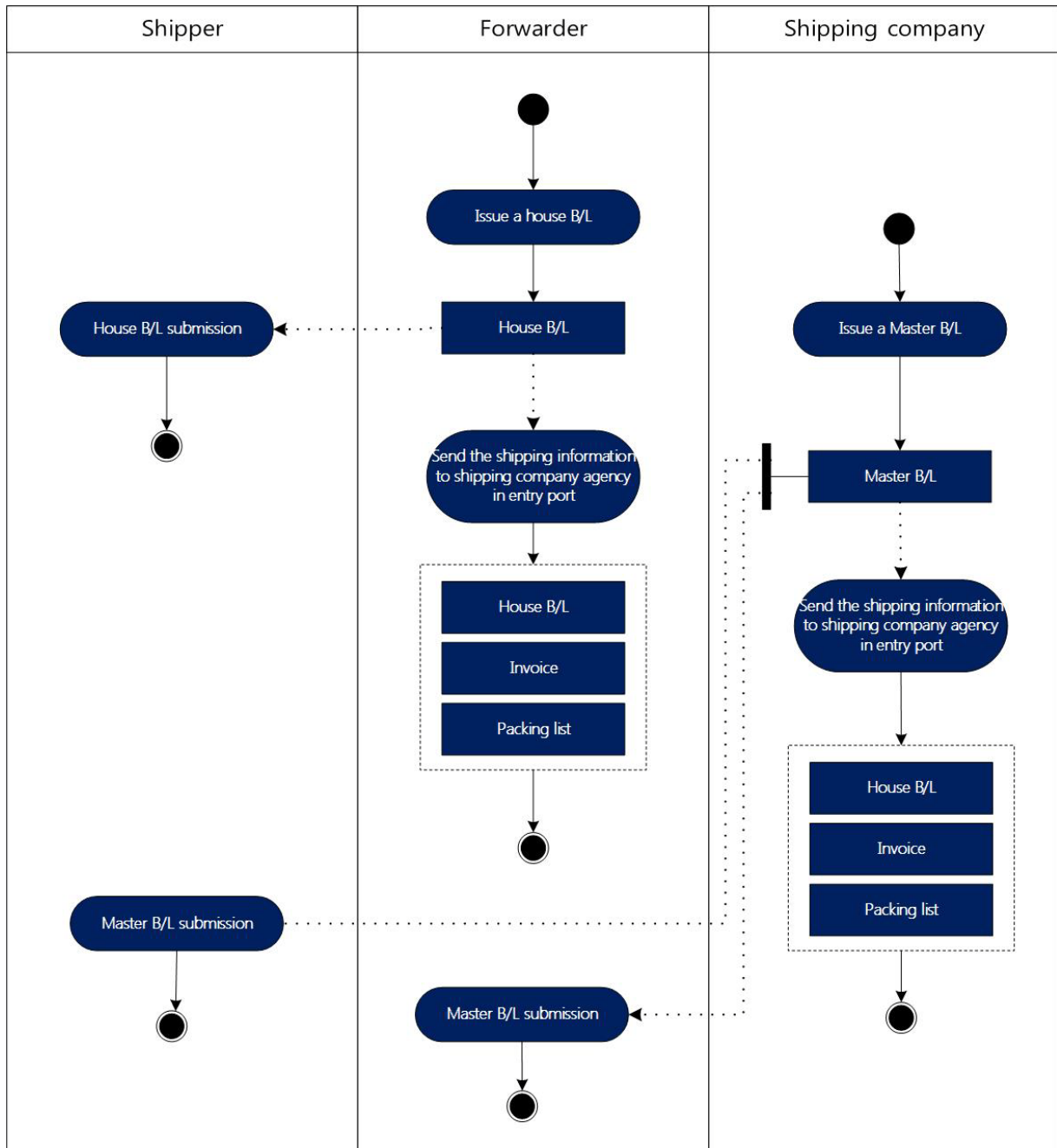


Chart 6.5: “Issue Shipping Document” Activity Diagram



The Freight declaration work in the port export distribution process is defined as below.

Work title	<ul style="list-style-type: none"> ▪ Before loading
Work procedure	<ul style="list-style-type: none"> ▪ 1-3. Freight declaration ▪ 1-3-1. Master manifest submission/correction ▪ 1-3-2. House manifest submission/correction ▪ 1-3-3. Issue shipping document

Definition of work procedure by unit	1-3-1. 1-3-2. Master/ House manifest submission/ correction	<ul style="list-style-type: none"> ▪ Ocean carrier and freight forwarder report Master Manifest and House Manifest with specifications of the loaded cargo and special cargo (dangerous cargo-frozen cargo) based on the list of export clearing to the Office of Customs Administration to obtain the customs examination/approval through MFCS (Manifest Consolidation System) of KTNET. ▪ Report the shipping manifest correction in case of correcting the shipping manifest specifications after obtaining the export shipping manifest approval. ▪ Once approved by Customs, the notification is delivered to obligator through MFCS
	1-3-3. Issue shipping documents	<ul style="list-style-type: none"> ▪ Shipping company issues a Master BL to a shipper and/or forwarder, forwarder issues a House B/L to the actual shipper. ▪ Send the shipping documents, such as shipping schedule and/or cargo manifest to the shipper and/or forwarder and the shipping company and/or operation agent.
Scope of work procedure by unit	1-3-1. 1-3-2. Master/ House Manifest submission/ correction	<p>Master/House Manifest submission/correction</p> <p style="text-align: center;">↓</p> <p style="text-align: center;">Master/House Manifest consolidation</p> <p style="text-align: center;">↓</p> <p style="text-align: center;">Examination</p> <p style="text-align: center;">↓</p> <p style="text-align: center;">Approval</p>
	1-3-3. Issue shipping documents	<p style="text-align: center;">Issue a Master B/L</p> <p style="text-align: center;">↓</p> <p style="text-align: center;">Issue a House B/L</p>
Supervising organization	1-3-1. 1-3-2. Master/ House manifest submission/ correction	<ul style="list-style-type: none"> ▪ Shipper ▪ Forwarder
	1-3-3. Issue shipping documents	<ul style="list-style-type: none"> ▪ Ocean carrier ▪ Forwarder

Related organization	1-3-1. 1-3-2. Master/ House manifest submission/ correction	<ul style="list-style-type: none"> ▪ Office of Customs Administration
	1-3-3. Issue shipping documents	<ul style="list-style-type: none"> ▪ Forwarder ▪ Shipper ▪ Shipping company
Form	<ul style="list-style-type: none"> ▪ Export Master/House Manifest (A list of dangerous articles) ▪ Export consolidation cargo shipping manifest ▪ The status of cargo/container carry-out ▪ A copy of Master/House B/L, Invoice and Packing List 	

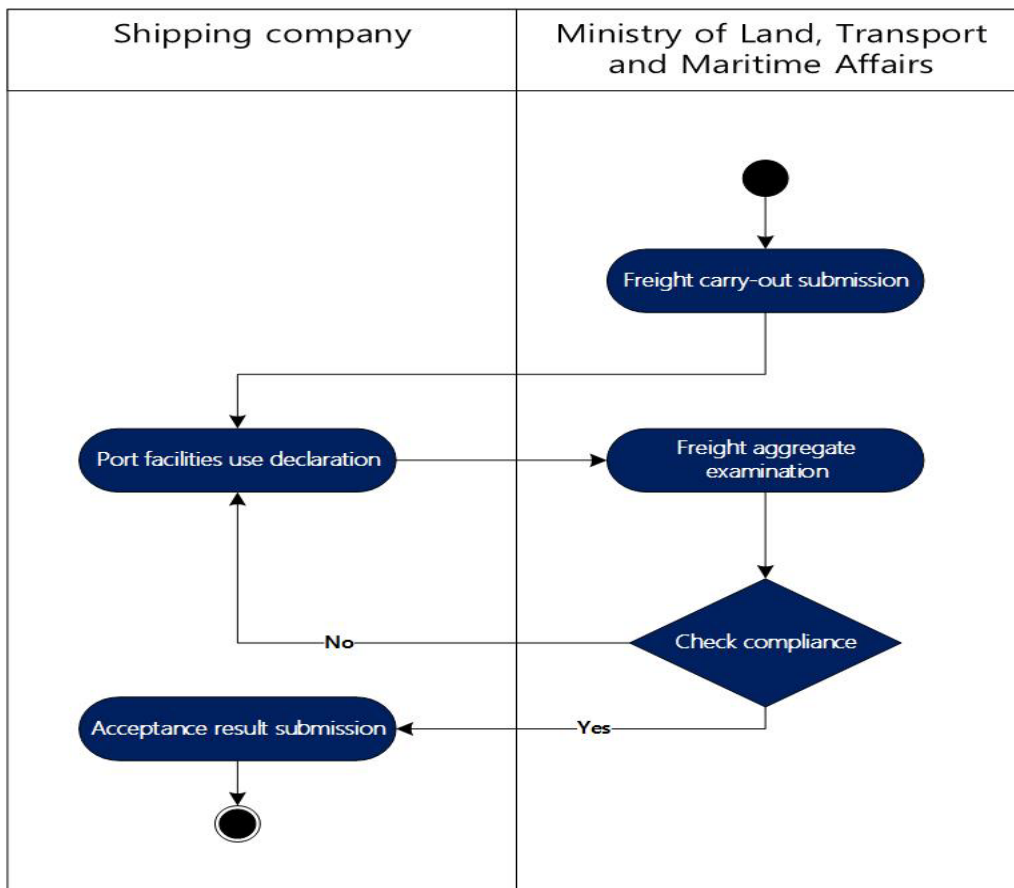
6.1.3 Process Area 2: Before Departure

(1) Core Business Process Area 2-1: Freight Declaration

“Freight declaration” is a first process under “Before departure” process area. This core business process requires the participation from:

- Shipping company
- Ministry of Land, Transport and Maritime Affairs

Chart 6.6: “Carry in/out Declaration” Activity Diagram



The carry in/out declaration work in the port export distribution process is defined as below.

Work title	<ul style="list-style-type: none"> ▪ Before departure 	
Work procedure	<ul style="list-style-type: none"> ▪ 2-1. Freight declaration ▪ 2-1-1. Carry in/out declaration 	
Definition of work procedure by unit	2-1-1. Carry in/out declaration	<ul style="list-style-type: none"> ▪ Shipping company reports the status of cargo/container carry-in/out, submits the cargo summary sheet the Ministry of Land, Transport and Maritime Affairs notified, and submits a use declaration form of port facilities. ▪ The Ministry of Land, Transport and Maritime Affairs charges the freight rate and related taxes from the shipping company based on the report and forms the shipping company submitted. ▪ Shipping company pays the container regional development tax to local government
Scope of work procedure by unit	2-1-1. Carry in/out declaration	<p style="text-align: center;">Carry-in/out report ↓ Use declaration of port facilities ↓ Aggregate cargo examination ↓ Accept the carry-in/out report submitted ↓ Charge for port dues - Make a payment</p>
Supervising organization	2-1-1. Carry in/out declaration	<ul style="list-style-type: none"> ▪ Shipper
Related organization	2-1-1. Carry in/out declaration	<ul style="list-style-type: none"> ▪ Ministry of Land, Transport and Maritime Affairs
Form	<ul style="list-style-type: none"> ▪ The status of cargo/container carry-out ▪ Use declaration form of port facilities ▪ Regional development tax (container) ▪ Container Loading List 	

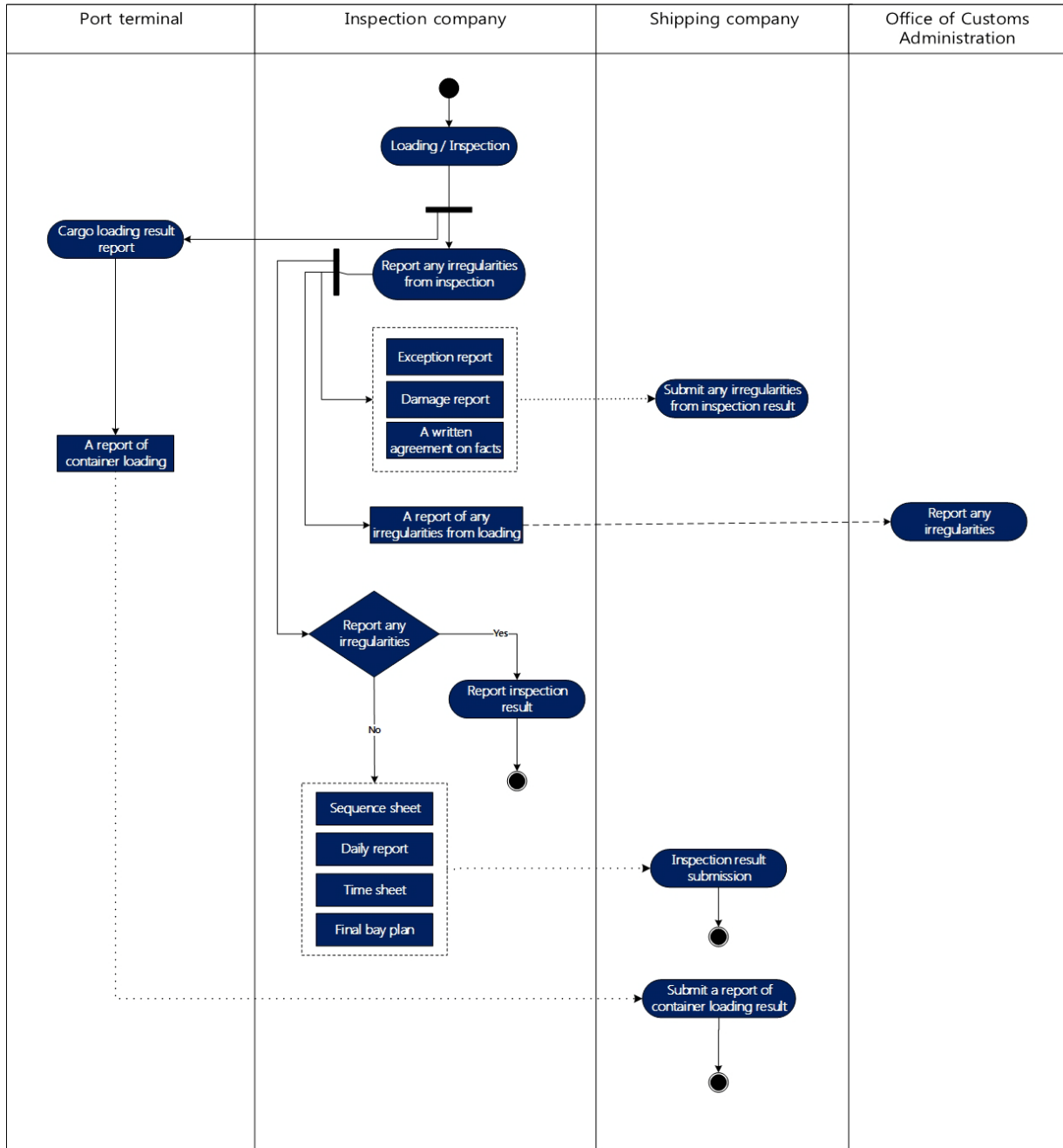
(2) Core Business Process Area 2-2: Shipping/Inspection

“Shipping/Inspection” is a business process under “Before departure” process area. This core business process requires the participation from:

- Shipping company

- Inspection company
- Port terminal
- Office of Customs Administration

Chart 6.7: “Loading/Inspection” & “Loading Result Report” Activity Diagram



The Shipping/Inspection work in the port export distribution process is defined as below.

Work title	<ul style="list-style-type: none"> ▪ Before departure 	
Work procedure	<ul style="list-style-type: none"> ▪ 2-2. Shipping/Inspection ▪ 2-2-1. Loading/Inspection ▪ 2-2-2. Loading result report 	
Definition of work procedure by unit	2-2-1. Loading/Inspection	<ul style="list-style-type: none"> ▪ Implement the loading operation based on the loading information received from the shipping company. ▪ Implement the inspection/metage based on the loading information received from the shipping company.
	2-2-2. Loading result report	<ul style="list-style-type: none"> ▪ Shipping company receives the final loading operation result report from a cargo company and inspection company. The Office of Customs Administration receives the report of any irregularities from loading results from the inspection company (cargos heading to the U.S.).
Scope of work procedure by unit	2-2-1. Loading/Inspection	Implement the Gantry crane order ↓ Load containers in a yard trailer ↓ Load containers using gantry cranes.
		Prepare the basic information for inspection ↓ Main line inspection ↓ identify any irregularities
	2-2-2. Loading result report	Final Bay Plan, write a container loading report, deliver to the shipping company ↓ deliver the inspection result report to the shipping company and the Office of Customs Administration
Supervising organization	2-2-1. Loading/Inspection	<ul style="list-style-type: none"> ▪ Port terminal (Cargo company) ▪ Inspection company
	2-2-2. Loading result report	<ul style="list-style-type: none"> ▪ Port terminal (Cargo company) ▪ Inspection company

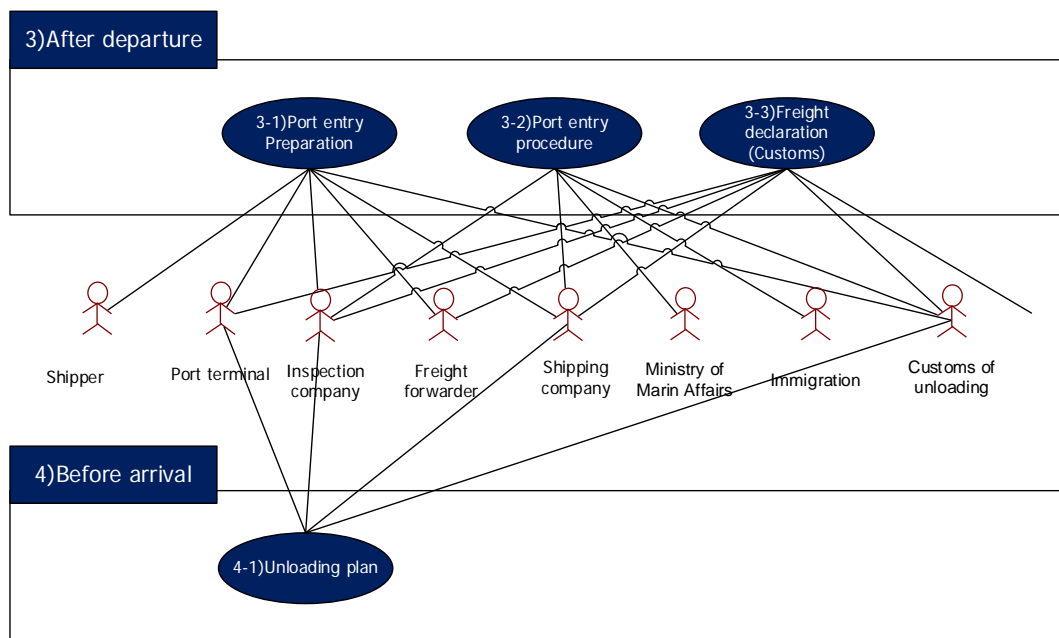
Related organization	2-2-1. Loading/Inspection	
	2-2-2. Loading result report	<ul style="list-style-type: none"> ▪ Shipping company ▪ Office of Customs Administration
Form	<ul style="list-style-type: none"> ▪ Damage Report ▪ Exception Report ▪ Final Bay Plan ▪ Sequence Sheet ▪ Container loading report ▪ A report of irregularities from the loading results. ▪ Daily Working Report 	

6.2 Import Process Flow

6.2.1 Use Case

As seen in Chart 6.8 below, there are three (3) responsible government agencies involved in the ocean import process flow; Ministry of Marine Affairs (or Ministry of Transportation), Immigration and Customs office. As is the case, Ministry of Marine Affairs has more concern on vessel and port entry than others while Customs has more concern on cargo.

Chart 6.8: Import Use Case



6.2.2 Process Area 3: After Departure

(1) Core Business Process Area 3-1: Port Entry Preparation

“Port entry preparation” is a first process under “After departure” process area.

This core business process requires the participation from:

- Shipper
- Forwarder
- Shipping Company
- Port terminal
- Office Customs administration

Chart 6.9: “Obtain Cargo Information” Activity Diagram

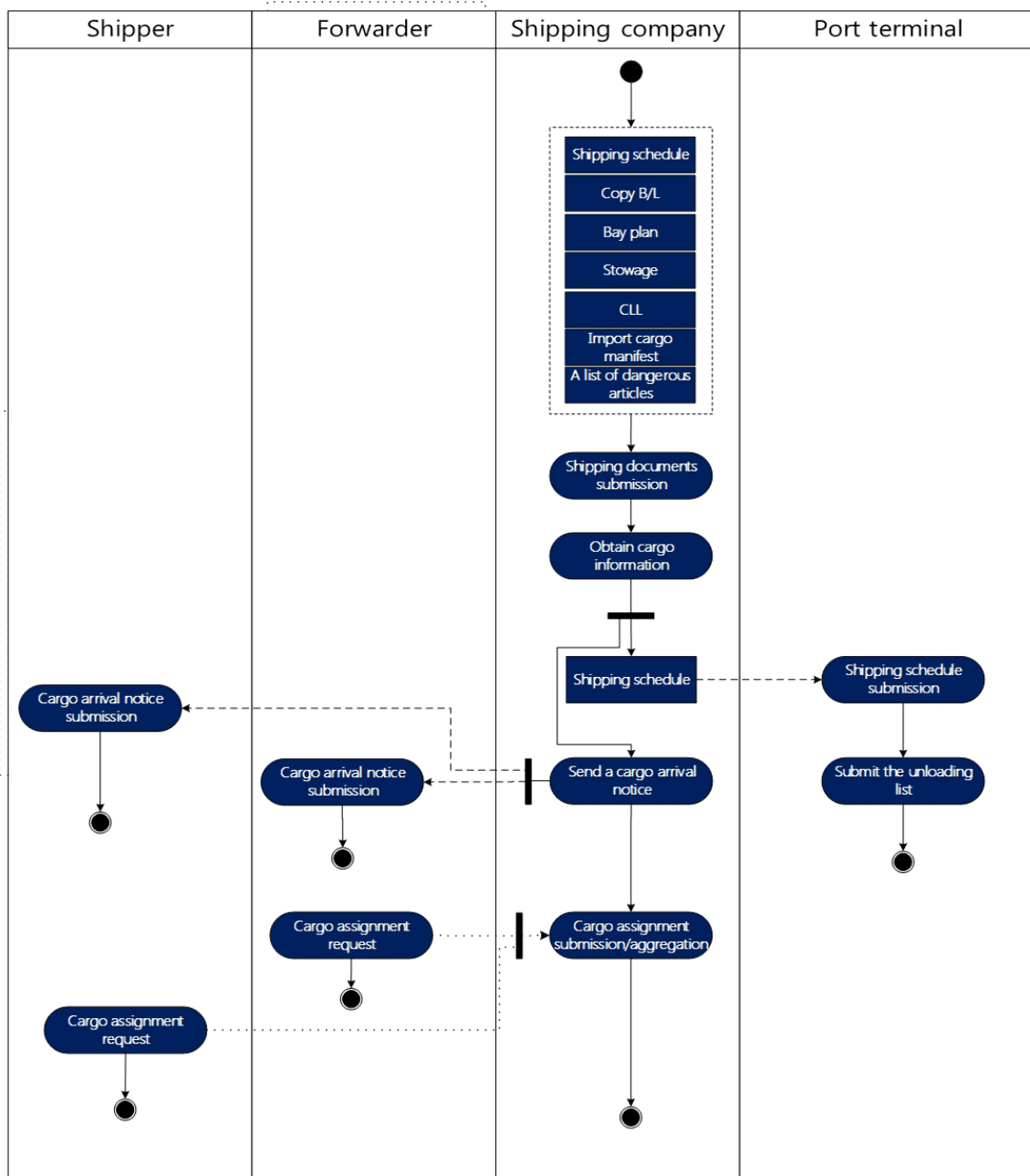
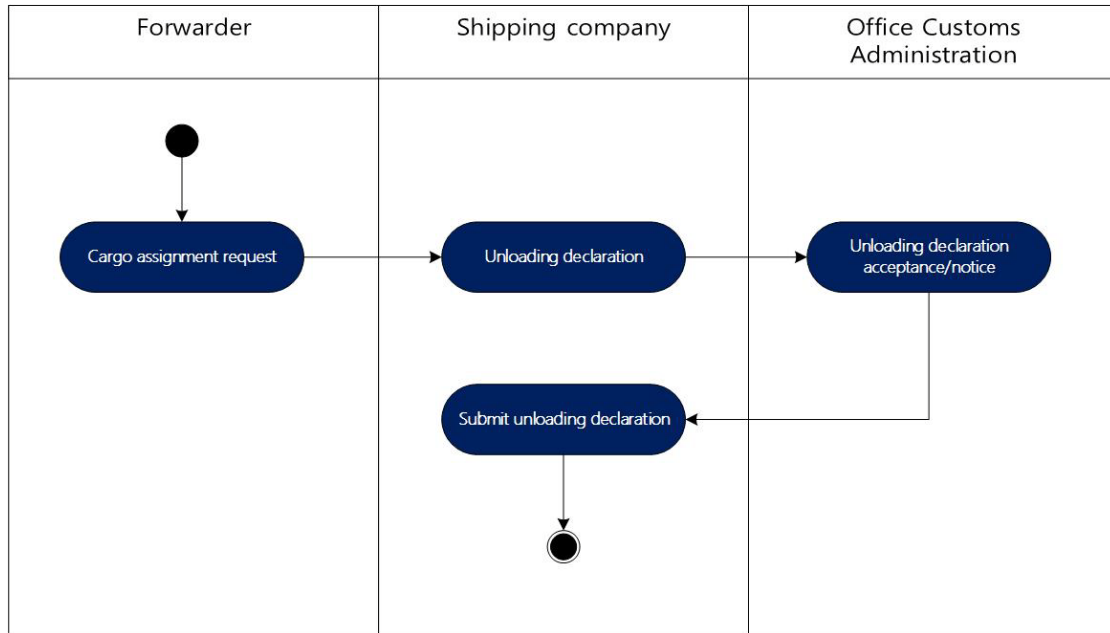


Chart 6.10: “Cargo Assignment Request” Activity Diagram



The Port entry preparation work in the port export distribution process is defined as below.

Work title	<ul style="list-style-type: none"> ▪ After departure 	
Work procedure	<ul style="list-style-type: none"> ▪ 3-1. Port entry preparation ▪ 3-1-1. Obtain cargo information ▪ 3-1-2. Cargo assignment request 	
Definition of work procedure by unit	3-1-1 Obtain cargo information	<ul style="list-style-type: none"> ▪ Shipping company obtains the Bay Plan, Stowage Plan, Hatch List, and other cargo information of forthcoming to the destination port from the port of loading, and send the information to the port terminal.
	3-1-2. Cargo assignment request	<ul style="list-style-type: none"> ▪ When the shipper receives the cargo arrival notice, shipper assigns the assigned location and notifies the assignment contents to the shipping company.
Scope of work procedure by unit	3-1-1 Obtain cargo information	Obtain cargo information ↓ ship schedule submission

	3-1-2. Cargo assignment request	<p>Send the import cargo arrival notice</p> <p style="text-align: center;">↓</p> <p style="text-align: center;">Cargo arrival notice submission</p> <p style="text-align: center;">↓</p> <p style="text-align: center;">Request for cargo assignment</p> <p style="text-align: center;">↓</p> <p style="text-align: center;">Cargo assignment submission/aggregation</p>
Supervising organization	3-1-1 Obtain cargo information	<ul style="list-style-type: none"> ▪ Shipping company
	3-1-2. Cargo assignment request	<ul style="list-style-type: none"> ▪ Forwarder ▪ shipper
Related organization	3-1-1 Obtain cargo information	<ul style="list-style-type: none"> ▪ Port terminal
	3-1-2. Cargo assignment request	<ul style="list-style-type: none"> ▪ Shipping company
Form	<ul style="list-style-type: none"> ▪ Shipping schedule ▪ Import freight manifest ▪ A list of dangerous articles ▪ Bay Plan ▪ Stowage Plan ▪ CLL ▪ Copy B/L ▪ Arrival Notice 	

(2) Core Business Process Area 3-2: Port Entry Procedure

“Port entry procedure” is a business process under “After departure” process area. This core business process requires the participation from:

- Shipping company
- Office Customs Administration
- Ministry of Land, Transport and Maritime Affairs
- Immigration Office

Chart 6.11: “Port Entry Declaration” Activity Diagram

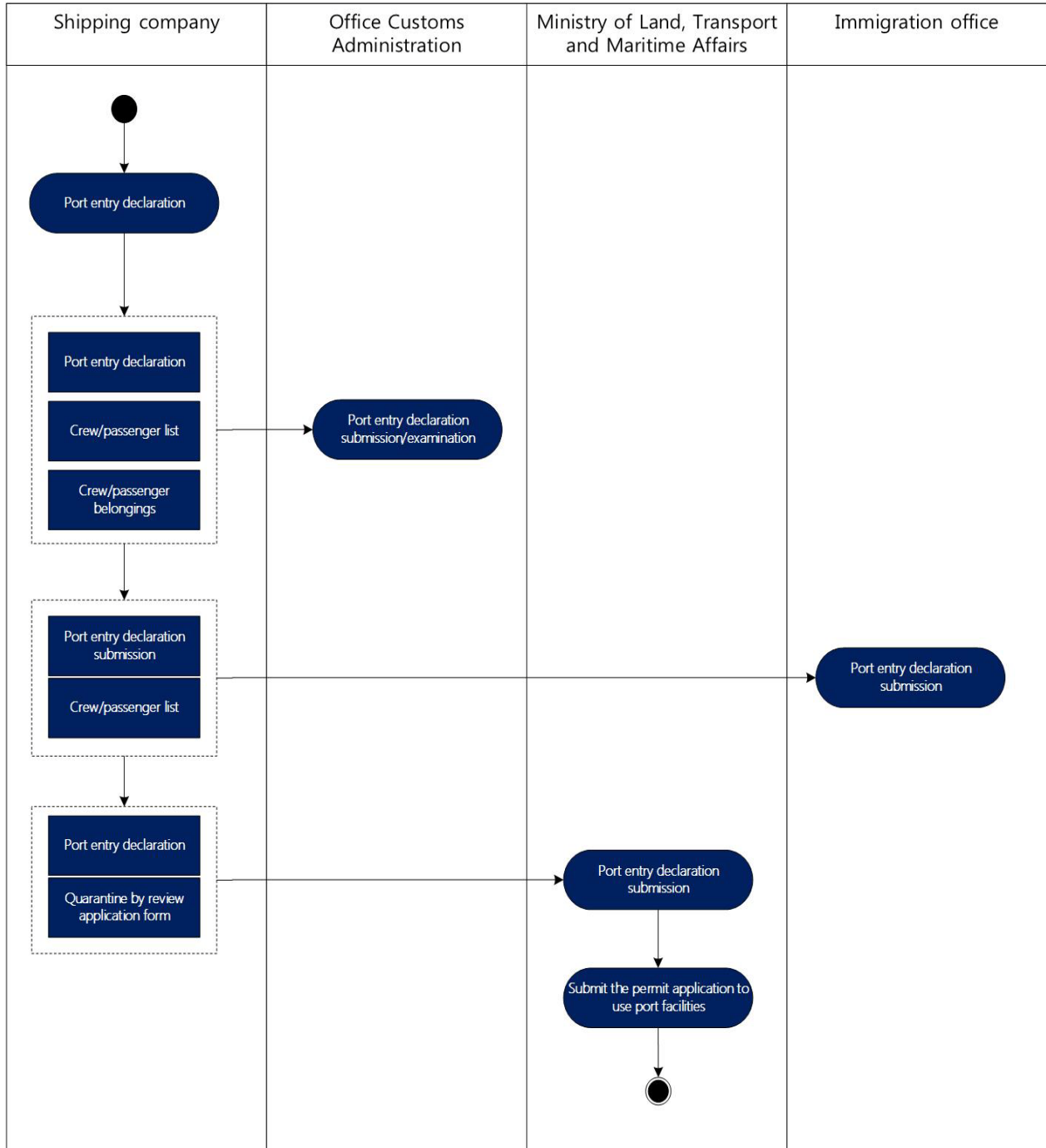
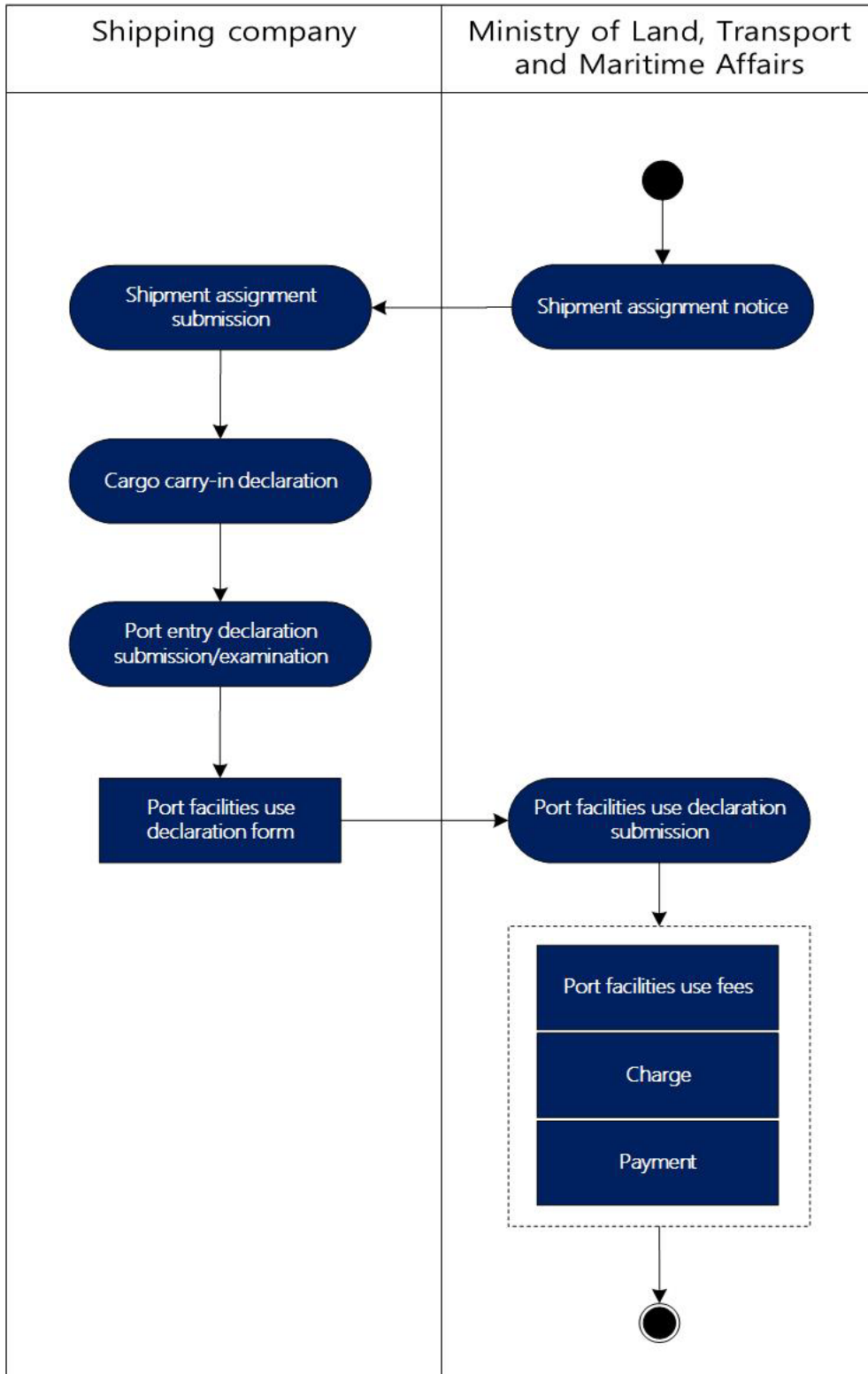


Chart 6.12: “Shipment Assignment Notice” & “Port Facilities Use Declaration” Activity

Diagram



The Port entry procedure work in the port export distribution process is defined as below.

Work title	<ul style="list-style-type: none"> ▪ After departure 	
Work procedure	<ul style="list-style-type: none"> ▪ 3-2. Port entry procedure ▪ 3-2-1. Port entry declaration ▪ 3-2-2. Shipment assignment notice ▪ 3-2-3. Port facilities use declaration 	
Definition of work procedure by unit	3-2-1. Port entry declaration	<ul style="list-style-type: none"> ▪ Submit the port entry declaration form to the Office of Customs Administration, the Ministry of Land, Transport and Maritime Affairs and obtain the port entry approval before entering to the port.
	3-2-2. Shipment assignment notice	<ul style="list-style-type: none"> ▪ Submit and declare the permit (application) to use port facilities, and notify the ship assignment through the shipment meeting simultaneously upon port entry declaration.
	3-2-3. Port facilities use declaration	<ul style="list-style-type: none"> ▪ Shipping company reports the carry-in status of cargo and container, submit the cargo summary sheet from the Ministry of Land, Transport and Maritime Affairs. The Ministry of Land, Transport and Maritime Affairs charges related taxes, such as cargo fees based on the forms and reports the shipping company submitted.
Scope of work procedure by unit	3-2-1. Port entry declaration	<p style="text-align: center;">Port entry declaration ↓ Submit the port entry declaration form/examination ↓ Port entry declaration submission ↓ Entry declaration submission</p>
	3-2-2. Shipment assignment notice	<p style="text-align: center;">Apply for the permit to use port facilities ↓ Submit a permit application to use port facilities ↓ Shipment assignment notice ↓ Submit a shipment assignment</p>

	3-2-3. Port facilities use declaration	<p style="text-align: center;">Cargo carry-in declaration ↓ Submit a cargo carry-in declaration ↓ Port facilities use declaration ↓ Submit a port facilities use declaration</p>
Supervising organization	3-2-1. Port entry declaration	<ul style="list-style-type: none"> ▪ Shipping company
	3-2-2. Shipment assignment notice	<ul style="list-style-type: none"> ▪ Shipping company
	3-2-3. Port facilities use declaration	<ul style="list-style-type: none"> ▪ Shipping company
Related organization	3-2-1. Port entry declaration	<ul style="list-style-type: none"> ▪ Office of Customs Administration ▪ Quarantine service ▪ Ministry Justice ▪ Ministry of Land, Transport and Maritime Affairs
	3-2-2. Shipment assignment notice	<ul style="list-style-type: none"> ▪ Ministry of Land, Transport and Maritime Affairs
	3-2-3. Port facilities use declaration	<ul style="list-style-type: none"> ▪ Ministry of Land, Transport and Maritime Affairs
Form	<ul style="list-style-type: none"> ▪ Port entry declaration ▪ Passenger/crew list ▪ Belongings/ship stores list ▪ A written permission (application) to use port facilities ▪ The status of cargo/container carry-in ▪ Use declaration form of port facilities. ▪ Report of carrying-in dangerous articles ▪ Quarantine by review application form 	

(3) Core Business Process Area 3-3: Freight Declaration

“Freight declaration” is a business process under “After departure” process area. This core business process requires the participation from:

- Forwarder

- Shipping Company
- Office Customs Administration
- Inspection company
- Related organization (KTNET MFCS)

Chart 6.13: “Cargo Manifest Declaration” Activity Diagram

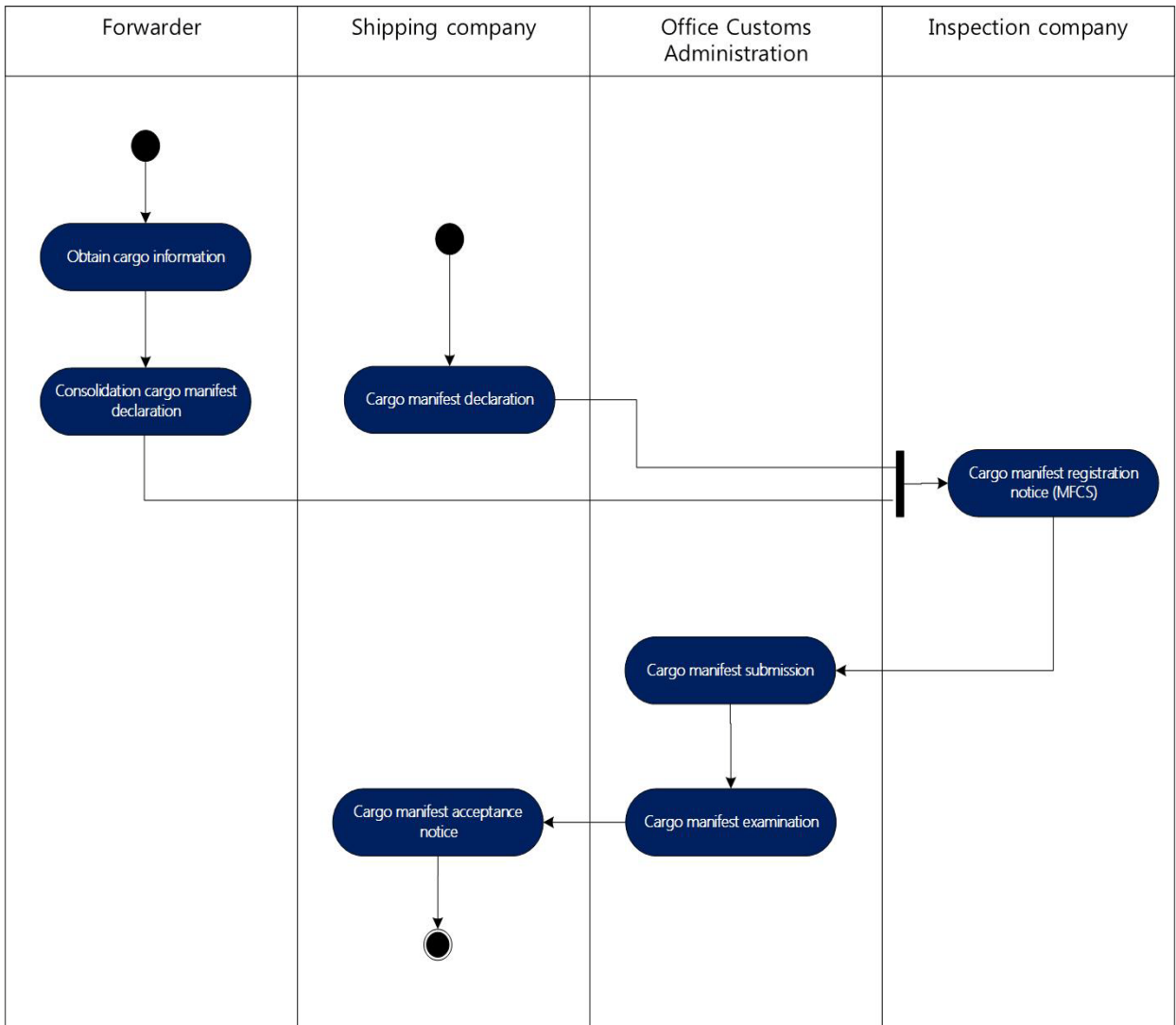
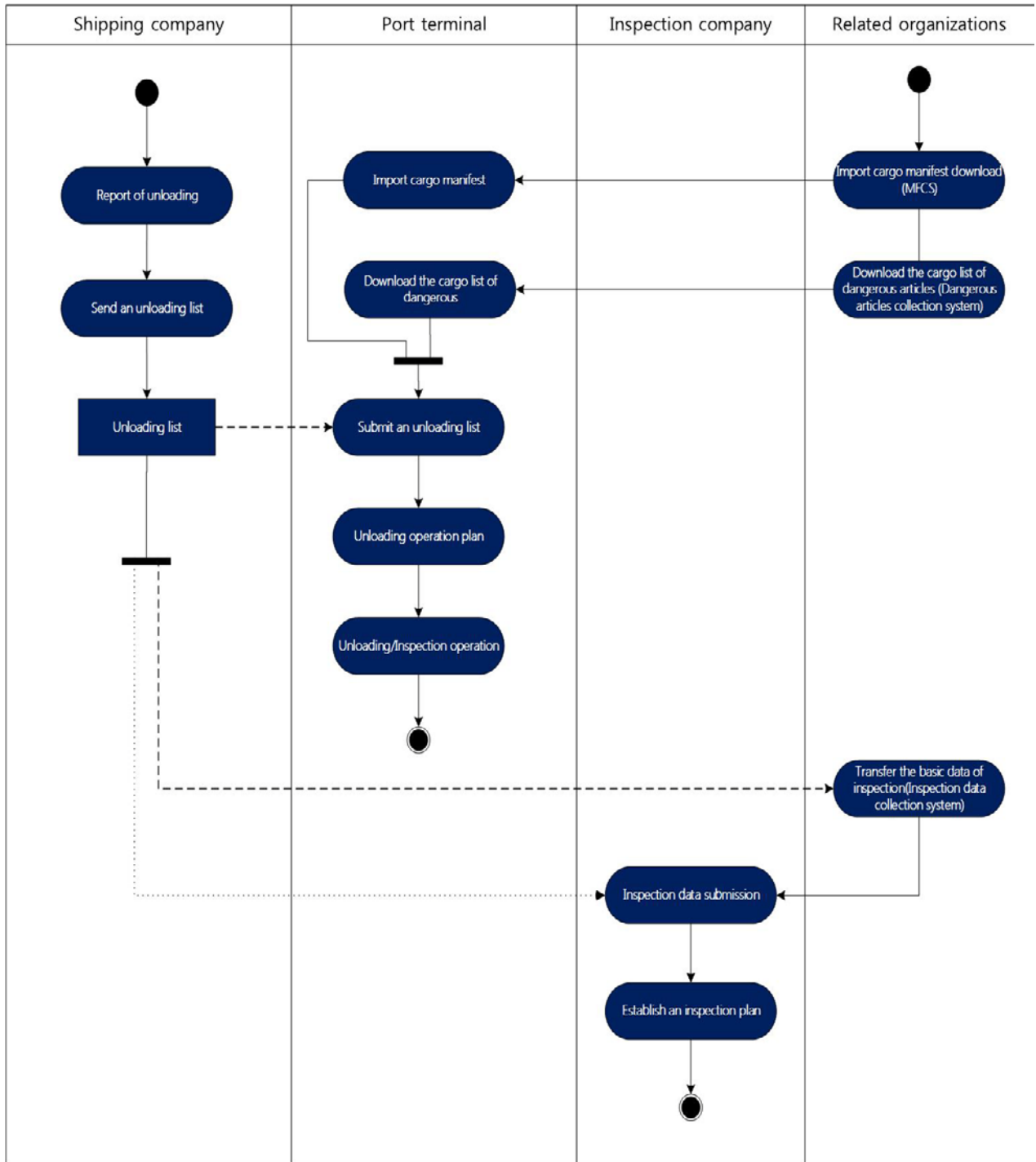


Chart 6.14: “Unloading Declaration” Activity Diagram



The freight declaration work in the port export distribution process is defined as below.

Work title	<ul style="list-style-type: none"> ▪ After departure 	
Work procedure	<ul style="list-style-type: none"> ▪ 3-3. Freight declaration ▪ 3-3-1. Cargo manifest declaration ▪ 3-3-2. Unloading declaration 	
Definition of work procedure by unit	3-3-1. Cargo manifest declaration	<ul style="list-style-type: none"> ▪ Shipping company writes, collects, and submits the import cargo manifest regarding the cargo loaded on the ship, and forwarder writes, collects, submit consolidation cargo manifest regarding the cargo loaded on the ship to the Customs office. ▪ The Office of Customs and Administration examines the cargo manifests submitted by the shipping company and forwarder, and notifies the acceptance result.
	3-3-2. Unloading declaration	<ul style="list-style-type: none"> ▪ Shipping company writes the cargo assignment contents on the unloading declaration form and submits the form to the Office of Customs and Administration after declaring the import cargo manifest. The Office of Customs Administration notifies the final unloading permit after examining and accepting the unloading declaration.
Scope of work procedure by unit	3-3-1. Cargo manifest declaration	Consolidation cargo manifest declaration ↓ Cargo manifest declaration ↓ Cargo manifest submission ↓ Cargo manifest examination ↓ Cargo manifest acceptance notice.

	3-3-2. Unloading declaration	Unloading declaration ↓ Accept/notify unloading declaration ↓ Unloading declaration acceptance
Supervising organization	3-3-1. Cargo manifest declaration	<ul style="list-style-type: none"> ▪ Shipping company ▪ Forwarder
	3-3-2. Unloading declaration	<ul style="list-style-type: none"> ▪ Shipping company
Related organization	3-3-1. Cargo manifest declaration	<ul style="list-style-type: none"> ▪ Office of Customs and Administration
	3-3-2. Unloading declaration	<ul style="list-style-type: none"> ▪ Office of Customs and Administration
Form	<ul style="list-style-type: none"> ▪ Import (consolidation) cargo manifest ▪ Unloading declaration form 	

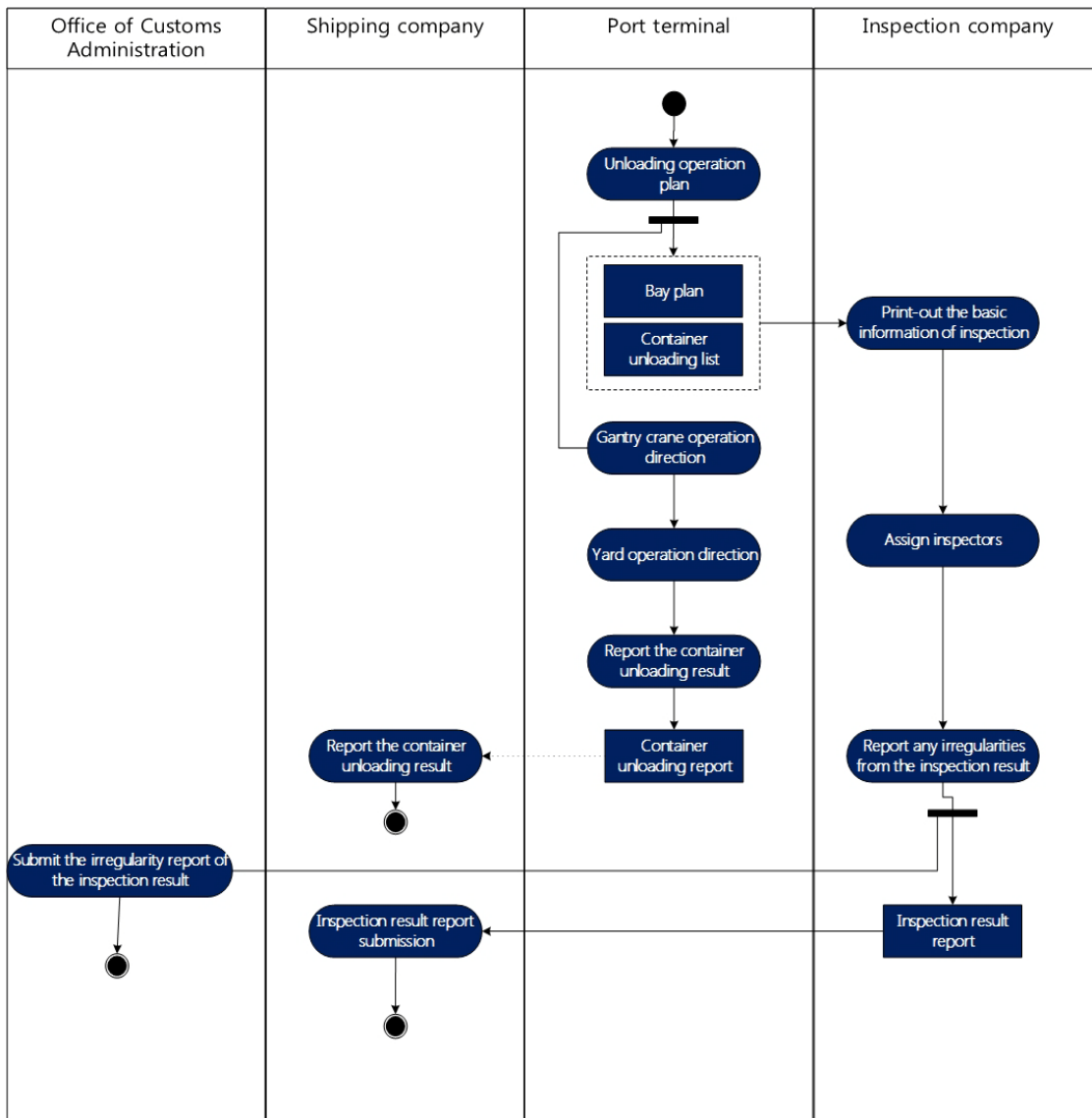
6.2.3 Process Area 4: Before Arrival

(1) Core Business Process Area 4-1: Unloading Plan

“Unloading plan” is a business process under “Before arrival” process area. This core business process requires the participation from:

- Related Organizations
- Office of Customs and Administration
- Bonded area(CY, ICD)
- Shipping company
- Port Terminal
- Inspection Company

Chart 6.15: “Unloading Operation Plan” Activity Diagram



The unloading plan work in the port export distribution process is defined as below.

Work title	<ul style="list-style-type: none"> ▪ Before Arrival
Work procedure	<ul style="list-style-type: none"> ▪ 4-1. Unloading plan ▪ 4-1-1. Submit the unloading list ▪ 4-1-2. Unloading operation plan

Definition of work procedure by unit	4-1-1. Submit the unloading list	<ul style="list-style-type: none"> Receive the unloading information (cargo manifest, Bay Plan, CLL, etc.) from the shipping company and agents in abroad at the shipping location, and send the information to the inspection company and port terminal.
	4-1-2. Unloading operation plan	<ul style="list-style-type: none"> Port terminal and inspections receive the unloading information from the shipping company and establish unloading plan and inspection plan, such as a work procedure table.
Scope of work procedure by unit	4-1-1. Submit the unloading list	<p>Import cargo manifest submission</p> <p style="text-align: center;">↓</p> <p style="text-align: center;">Send the unloading list</p> <p style="text-align: center;">↓</p> <p style="text-align: center;">Unloading manifest submission</p> <p style="text-align: center;">↓</p> <p style="text-align: center;">Download the list of dangerous articles.</p>
	4-1-2. Unloading operation plan	<p style="text-align: center;">Unloading operation planning</p> <p style="text-align: center;">↓</p> <p style="text-align: center;">Submit inspection data</p> <p style="text-align: center;">↓</p> <p style="text-align: center;">Establish an inspection plan</p>
Supervising organization	4-1-1. Submit the unloading list	<ul style="list-style-type: none"> Shipping company
	4-1-2. Unloading operation plan	<ul style="list-style-type: none"> Port terminal Inspection company
Related organization	4-1-1. Submit the unloading list	<ul style="list-style-type: none"> Port terminal Inspection company
	4-1-2. Unloading operation plan	

Form	<ul style="list-style-type: none"> ▪ Bay Plan ▪ Cargo manifest ▪ A cargo list of dangerous articles ▪ Final Bay Plan ▪ A list of container unloading ▪ Sequence Sheet ▪ Daily Working Report ▪ Time Sheet ▪ Damage Report ▪ Exception Report ▪ Inspection result report ▪ Unloading result report
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7 Key Challenges and Recommendations

International trade and logistics community in Korea has greatly welcomed the Introduction of e-Manifest system and enjoyed the benefit of it. Tracking of cargo and information inheritance and sharing among the stakeholders are the beauty of the system. However, recent change of the regulation requiring advance filing of Manifest are becoming a challenge as the business practice and supporting system are not mature enough to follow the change. It is anticipated that with the growing demand for the advance Manifest filing in many countries, the environment will mature enough that benefits will overrun the cost incurred from the changed regulation.

7.1 Key Challenges

7.1.1 Imports

At this moment, the community is quite satisfied with the current e-Manifest environment and maximized efficiency. Korea is anticipating an introduction of Advance filing of Manifest for inbound ocean cargo soon and it will probably ease the burden of importing side as current NVOCC may not need to file the Manifest anymore. However, from the experience of advance filing on air cargo, one challenge is expected from a foreseen upcoming new regulation. It is about the responsibility of the cargo handling and filing especially when the filing is failed or information quality could not meet the required level of the controlling agency. As the importing side is not responsible for the filing but has to handle inbound cargo, the appropriate filing from the exporting side causes trouble and cost for importing side.

7.1.2 Exports

With the introduction of advance filing rule in overseas, export sides do advance filing twice: one for Korean controlling agency and the other for

controlling agency in importing economy. As the advance filing rules are not harmonized among the countries, exporting party are confronting the complicated barrier of each importing economies and they have to prepare multiple advance filing rule solutions for different regions.

7.2 Recommendations

It is a general consensus that e-Manifest brings huge benefits with improved border control efficiency to public sectors as well as to private sectors. However, different rules and standards set by each economy are becoming a burden to an exporting side. It is the role of international bodies, such as UN and APEC, to coordinate and harmonize the trade and logistics regulations for trade facilitation. And recent Advance Manifest filing rules are focusing on the cargo security but not on the cargo efficiency. So more concern should be given to the private sectors so that newly introduced paperless trade and logistics system could help them enhance the efficiency as well as meeting the regulatory requirements.

Appendix 2: Questionnaires



**Asia-Pacific
Economic Cooperation**

**Enhancing the Global Supply Chain Efficiency by E-Manifest Exchange in APEC Region
CTI 15 2013T (ECSG)**

The Survey of Current Situation of Manifest Declarations (maritime) in the APEC Region (For Government)

In order to have a better understanding of the current situation of manifest declaration mechanisms in the APEC region, including the legal framework and standardization environment, information communication and technology (ICT) environment, etc., our project team humbly requests your participation in the following survey. Your information will be greatly valued and of course will be kept strictly confidential. Please reply to this questionnaire before

_____ (date) and contact
_____ (contact person) by _____ (email).

Filing Instructions :

- 1. Please mark "X" for the appropriate options or write down the answers in the space provided.*
- 2. Every question only has one choice if there is no special explanation.*
- 3. Please answer all questions.*

The Scope of this Survey:

This survey mainly focuses on maritime manifest declarations.

Concepts in the Questionnaire :

- 1. The obligator of declaration : According to the laws or regulations issued by the government sector (e.g. Customs), the person who is required to submit the manifest data within a time limit.*
- 2. E-Manifest declaration : the obligator of declaration submits documents and information through information systems to the related government sector (e.g. Customs). The whole process is electronic.*

3. *Paper manifest declaration: the obligator of declaration submits documents to the related government sector (e.g. Customs) himself or by mail and/or fax.*

4. *Manifest declaration system: the information system opened to obligators of declaration to declare manifest data, and for the related government sector (e.g. Customs) to verify the content, accuracy, and completeness of declared manifest.*

Basic Information

Economy		Government sector	
Name		Position	
Telephone and e-mail address			
The proportion of your sector's employees related to manifest services			
The total number of obligators of declaration under the management of your government sector			
The major business activities of your sector related to manifest declaration			

Which mechanism for manifest declaration has your economy already implemented?

Please write down the implementation time.

Implemented e-Manifest declaration for Master Bill of Lading (hereinafter referred to as B/L) information in _____(Year) _____(Month); for House B/L information in _____(Year)_____ (Month)

(Please continue to answer section 1, 2, and 3.)

Implemented paper manifest declaration for Master B/L information in _____(Year) _____(Month); for House B/L information in _____(Year)_____ (Month)

(Please continue to answer section 1 and 3.)

(Begin)

Section 1 The status quo of implementation of manifest declaration

1. Legal enforcement

1-1. The government sector(s) responsible for enacting laws and regulations related to manifest declarations in your economy is (are): *(you can choose more than one option)*

1. Customs

2. Foreign

Trade Department

3.Commerce Department

4.Transportation

Department

5.Homeland Security Department

6.Other_____

The name of the specific institution is:

1-2. If the laws and regulations are enacted by more than one sector, which sector is in charge?

_____ (Please write down the number in question 1-1); the supporting organization is _____ (Please write down the number in question 1-1)

1-3. The government sector(s) which implement laws and regulations related to *import* manifest declarations in your economy is (are): (you can choose more than one option)

1.Customs

2.Foreign

Trade Department

3.Commerce Department

4.Transportation

Department

5.Homeland Security Department

6.Other_____

The name of the specific institution is:

1-4. The government sector(s) which implement laws and regulations related to *export* manifest declarations in your economy is (are): (you can choose more than one option)

1.Customs

2.Foreign

Trade Department

3.Commerce Department

4.Transportation

Department

5.Homeland Security Department

6.Other_____

The name of the specific institution is:

1-5. If the laws and regulations related to *import* manifest declarations are implemented by more than one sector, which sector is in charge ?

_____ (Please write down the number in question 1-3); The supporting organization is _____ (Please write down the number in question 1-3)

1-6. If the laws and regulations related to *export* manifest declarations are implemented by more than one sector, which sector is in charge ?

_____ (Please write down the number in question 1-4); The supporting organization is _____ (Please write down the number in question 1-4)

1-7. Has your economy enacted and implemented any laws and regulations related to *e-Manifest* declarations?

(If you choose yes, please write down the document name and issuing date)

Yes, only for Master B/L information declaration

Yes, only for House B/L information declaration

Yes, for Master B/L information and House B/L information declaration

No

1-8. What new laws and regulations related to manifest declarations is your economy planning to enact (e.g. declaration process, service, ICT)?

1-9. What are your economy's measures for the implementation of laws and regulations?

2. Workflow and procedures for manifest declarations

A. Import manifest declarations

2A-1. The amount of import manifest declarations received daily in your economy is _____, of which _____ are submitted electronically. The amount processed daily is _____.

2A-2. The obligator(s) of declaration for import *master* manifest data in your economy is (are): *(you can choose more than one option)*

Carrier

Shipping agent

NVOCC (Non-vessel owning common carrier)

Freight forwarder

Importer

Customs broker

Other logistics enterprises _____

Other _____

2A-3. The obligator(s) of declaration for import *house* manifest data in your economy is (are): *(you can choose more than one option)*

Carrier

Shipping agent

NVOCC (Non-vessel owning common carrier)

Freight forwarder

Importer

Customs broker

Other logistics enterprises _____

Other _____

None, our economy doesn't require to declare House B/L information

2A-4. For obligators of declaration of import manifest data, does your economy require them to set local branches or register in your own economy?

Yes, they must be domestic registered enterprises or agents.

No, they can be either foreign or domestic registered enterprises or agents.

Other _____

2A-5. The time limit for import manifest declarations is:

(you can choose more than one option; please fill in specific number of hours on the line)

_____ hours(h) before loading at loading port

_____ hours(h) before departure at loading port

_____ hours(h) before arrival at destination port

When declaring at Customs of destination port

Within _____ hours(h) after arrival at destination port

Other time limit requested by Customs _____

2A-6. Which kinds of goods is (are) required to be declared in advance if import manifests are required to pre-declare (declare at loading port)?

(you can choose more than one option)

Imported cargo

Tranship cargo

Transit cargo

FROB (Freight Remaining On Board)

Other _____

2A-7. If import manifests are required to pre-declare (declare at loading port), does your economy require to declare manifest information again at the destination port?

Yes, submit partial information of import manifest at the destination port

Yes, re-declare at the destination port

No, there is no requirement to declare again

2A-8. What are the required data and data that is of particular concern to your economy for import manifest declarations? What kinds of data cannot be modified?

(Please put "X" or numbers in the following choices)

<p>The required data for import manifest declarations <i>(you can choose more than one option)</i></p>	<p>Data that is of particular concern to your economy <i>(please write down the numbers)</i></p>	<p>Data that cannot be modified <i>(please write down the numbers)</i></p>
<p><input type="checkbox"/>1. Master B/L number</p> <p><input type="checkbox"/>2. House B/L number</p> <p><input type="checkbox"/>3. Manufacturer name and address</p> <p><input type="checkbox"/>4. Consignee name and address</p> <p><input type="checkbox"/>5. Consigner name and address</p> <p><input type="checkbox"/>6. For "To order" B/L, provide name and address of notify party</p> <p><input type="checkbox"/>7. Reference number of importer according to Customs</p> <p><input type="checkbox"/>8. Detailed description of goods</p> <p><input type="checkbox"/>9. Package type</p> <p><input type="checkbox"/>10. Shipping mark</p> <p><input type="checkbox"/>11. Numbers of package</p> <p><input type="checkbox"/>12. Gross weight</p> <p><input type="checkbox"/>13. Country/region of origin</p> <p><input type="checkbox"/>14. Container number</p> <p><input type="checkbox"/>15. Seal number</p> <p><input type="checkbox"/>16. Means of transport</p> <p><input type="checkbox"/>17. Vessel</p> <p><input type="checkbox"/>18. Voyage</p> <p><input type="checkbox"/>19. Freight delivery method</p> <p><input type="checkbox"/>20. Estimated departure time and date</p> <p><input type="checkbox"/>21. Transit place</p> <p><input type="checkbox"/>22. Estimated date and time of arrival at the first port in the economy</p> <p><input type="checkbox"/>23. Estimated date and time of arrival at discharging port</p> <p><input type="checkbox"/>24. The Customs tariff code</p> <p><input type="checkbox"/>25. UN code for Hazard goods</p> <p><input type="checkbox"/>26. IMDG code</p> <p><input type="checkbox"/>27. Other _____</p>		

2A-9. Based on the procedure of import manifest declaration in your economy, please fill in the blanks:

Reviewing process <i>(please mark "X" if the option is available in your economy)</i>	Reviewing method	Average labour time	Average costs	Passing rate (%)
<input type="checkbox"/> Check if the data submitted from multiple obligators of declaration is consistent	<input type="checkbox"/> Manually	_____person(s) _____h	_____dollars	
	<input type="checkbox"/> Information system automatic check	_____h		
<input type="checkbox"/> Examine manifest data	<input type="checkbox"/> Manually	_____person(s) _____h	_____dollars	
	<input type="checkbox"/> Information system automatic audit	_____h		
<input type="checkbox"/> Report the examination result	<input type="checkbox"/> Manually	_____person(s) _____h	_____dollars	
	<input type="checkbox"/> Information system automatic feedback	_____h		

2A-10. Is the process for reviewing modified import manifests the same process as described in the 2A-9 above?

- Yes
 No *(please add the following procedures)*

Procedures for checking the modified manifest	Reviewing method	Average labour time	Average costs	Passing rate (%)
1.			_____dollars	

B.Export manifest declarations

2B-1. The amount of export manifest declarations received daily in your economy is _____, of which _____ are submitted electronically.

The amount processed daily is _____

2B-2. The obligator(s) of declaration for export *master* manifest data in your economy is (are): *(you can choose more than one option)*

- Carrier
 - Shipping agent
- NVOCC (Non-vessel owning common carrier) Freight forwarder
- Shipper
 - Customs broker
- Other logistics enterprises _____ Other _____

2B-3. The obligator(s) of declaration for export *house* manifest data in your economy is (are): *(you can choose more than one option)*

- Carrier
 - Shipping agent
- NVOCC (Non-vessel owning common carrier) Freight forwarder
- Shipper
 - Customs broker
- Other logistics enterprises _____ Other _____
- None, our economy doesn't require to declare House B/L information

2B-4. What are the required data and data that is of particular concern to your economy for export manifest declarations? What kinds of data cannot be modified?

(Please put "X" or numbers in the following choices)

The required data for export manifest declarations	Data that is of particular concern to your economy	Data that cannot be modified
--	--	------------------------------

<i>(you can choose more than one option)</i>	<i>(please write down the numbers)</i>	<i>(please write down the numbers)</i>
<input type="checkbox"/> 1.Consignee name and address <input type="checkbox"/> 2.Consigner name and address <input type="checkbox"/> 3.Tax payment code <input type="checkbox"/> 4. Detailed description of goods <input type="checkbox"/> 5.Package type <input type="checkbox"/> 6.Shipping mark <input type="checkbox"/> 7.Numbers of package <input type="checkbox"/> 8.Gross weight <input type="checkbox"/> 9. Country/region of origin <input type="checkbox"/> 10.Container number <input type="checkbox"/> 11.Seal number <input type="checkbox"/> 12.Departure date <input type="checkbox"/> 13.Departure port <input type="checkbox"/> 14.Destination economy <input type="checkbox"/> 15.Discharging port <input type="checkbox"/> 16.The Customs tariff code <input type="checkbox"/> 17.Other_____		

2B-5. Based on the procedure of export manifest declarations in your economy, please

fill in the blanks:

Reviewing process <i>(please mark "X" if the option is available in your economy)</i>	Reviewing method	Average labor time	Average costs	Passing rate(%)
<input type="checkbox"/> Check if the data submitted from multiple obligators of declaration is consistent	<input type="checkbox"/> Manually	_____person(s) _____h	_____dollars	
	<input type="checkbox"/> Information system automatic check	_____h		
<input type="checkbox"/> Examine manifest data	<input type="checkbox"/> Manually	_____person(s) _____h	_____dollars	

	<input type="checkbox"/> Information system automatic audit	_____h		
<input type="checkbox"/> Report the examination result	<input type="checkbox"/> Manually	_____person(s) _____h	_____dollars	
	<input type="checkbox"/> Information system automatic feedback	_____h		

2B-6. Is the process for reviewing modified export manifests the same process as described in the 2B-5 above?

Yes

No (please add the following procedures)

Procedures for checking the modified manifest	Reviewing method	Average labor time	Average costs	Passing rate (%)
1.			_____dollars	

3. Standardization enforcement

3-1. Please mark "X" to indicate what kinds of standards have been adopted by your economy for manifest declarations.

(you can choose more than one option)

No.	Standard Term	Details
1	Data	<input type="checkbox"/> Data set <input type="checkbox"/> Document format <input type="checkbox"/> Syntax rules <input type="checkbox"/> Other_____
2	Business	<input type="checkbox"/> Management of obligators of declaration <input type="checkbox"/> Declaration procedures <input type="checkbox"/> Service evaluation

		<input type="checkbox"/> Other_____
3	Management	<input type="checkbox"/> Qualification of obligators of declaration <input type="checkbox"/> Filing management <input type="checkbox"/> Obligor enterprise rating <input type="checkbox"/> Other_____

3-2. What are the drawbacks to standardization of manifest declarations in your economy?

4. Coordination of stakeholders in manifest declaration

4-1. Has your economy designated a specific department for processing complaints and consulting about manifest declarations?

- Yes, the department is _____.
- No.

4-2. What means of expressing complaints and/or seeking consultation about manifest declarations are provided in your economy? (you can choose more than one option)

- Service hotline Online service Email Other_____

4-3. What means of expressing complaints and/or seeking consultation about manifest declarations are provided in your economy *for foreign enterprises filling manifest from overseas?* (you can choose more than one option)

- Multi-language service hotline 24-hour service hotline
- Online service Email
- Other_____

4-4. What kinds of help have government agencies provided to support manifest declarations? *(you can choose more than one option)*

- Policy interpretation Training in operational procedures
- Financial support Information system construction
- Other _____
- _____

4-5. If the implementation of manifest declaration mechanism in your economy results from cooperation amongst multiple government sectors, what kind of communication model is used to coordinate and cooperate? *(you can choose more than one option)*

- Periodic joint conferences Teleconferences, video conferences, and etc.
- Regular reports Set special work group or committee
- Other _____
- _____

*If your economy has implemented the mechanism of **e-Manifest declaration**, please continue to answer section 2 and 3.*

*If your economy has implemented the mechanism of **paper manifest declaration**, please continue to answer section 3(on page 13) .*

Section 2 The status quo of implementation of **e-Manifest declaration**

1. ICT environment

Is the system of **import** manifest declaration the same as that of **export** manifest declaration in your economy?

- Yes *(Please answer Part A-system of import manifest declaration, the export system is the same.)*

1B -5. Based on your knowledge about the system of export manifest declaration in your economy, please read the descriptions and fill in the blanks:

No.	Index	Explanation of index	Value
1	Technical error rate of the export manifest declaration system	The proportion of technical error which has happened in total declaration within one year (%)	
2	The stability of the import manifest declaration system	The number of days that the system of export manifest declaration has operated normally within one year (days)	
3	The integration of the export manifest system	The integration of the system of export manifest with other Customs related systems (%)	

2. Standardization of e-Manifest declarations

2-1. Please mark "X" to indicate what kinds of standards have been adopted by your economy for e-Manifest declarations . (you can choose more than one option)

No.	Standard Term	Details
1	System	<input type="checkbox"/> Interface specification <input type="checkbox"/> Interconnection <input type="checkbox"/> Other _____ _____
2	Safety	<input type="checkbox"/> E-signature & PKI <input type="checkbox"/> Authorization management <input type="checkbox"/> Other _____ _____

Section 3 Insight and Suggestions

3-1. What are the major reasons that your economy has not implemented e-Manifest declaration yet? *(you can choose more than one option)*

(If your economy has implemented e-Manifest declaration, please skip this question and answer question 3-2 directly)

- No such related laws and regulations, lack of support from national level
- Weak information infrastructure and lack of facilities to carry out e-Manifest declaration
- Incomplete standardization system, hard to enact and implement the criteria for e-Manifest declaration
- Lack of knowledge about implementation procedures
- Lack of financial budget
- Other _____

3-2. To optimize the manifest declarations, please rank the priority of the following aspects from 1-10. The higher the score is, the higher priority it has.

(If you have other suggestions, please enter them under the "other" option)

- Laws and regulations _____ ICT _____
- Standardization _____ Personnel training _____
- Procedures optimization _____
- Services provided (commercial services, public services, and etc.) _____
- Other _____

3-3. Based on the current status of manifest declarations, do you have any suggestions about optimizing the mechanisms of manifest declaration?

3-4. Would your economy be interested in support for developing a mechanism for

e-Manifest exchanges from renowned and respected independent international organizations?

Yes

No

3-5. What is your sector's opinion on e-Manifest exchange in the APEC region?

Implementation would decrease redundant information and repeated input, speed up the information exchange, and improve the efficiency of trade supply chain.

It is hard to achieve. Policies, regulations, laws, declaration procedures, and commercial environments in each economy are too different to coordinate.

It is very hard to achieve, as unified code criteria is required, and each economy also needs to perfect the information infrastructure and laws and regulations.

3-6. Do you have any suggestions about e-Manifest exchange in the APEC region and improving the efficiency of the e-Manifest exchange and supply chain?

(End)

Thank you for your precious opinion.



**Asia-Pacific
Economic Cooperation**

**Enhancing the Global Supply Chain Efficiency by E-Manifest Exchange in APEC Region
CTI 15 2013T (ECSG)**

The Survey of Current Situation of Manifest Declarations (maritime) in the APEC Region (For Obligator of Declaration)

In order to have a better understanding of the current situation of manifest declaration mechanisms in the APEC region, including the legal framework and standardization environment, information communication and technology (ICT) environment, etc., our project team humbly requests your participation in the following survey. Your information will be greatly valued and of course will be kept strictly confidential. Please reply to this questionnaire before

_____ (date) and contact
_____ (contact person) by _____ (email).

Filing Instructions :

- 1. Please mark "X" for the appropriate options or write down the answers in the space provided.*
- 2. Every question only has one choice if there is no special explanation.*
- 3. Please answer all questions.*

The Scope of this Survey:

This survey mainly focuses on maritime manifest declarations.

Concepts in the Questionnaire :

- 5. The obligator of declaration : According to the laws or regulations issued by the government sector (e.g. Customs), the person who is required to submit the manifest data within a time limit.*
- 6. E-Manifest declaration : the obligator of declaration submits documents and information through information systems to the related government sector (e.g. Customs). The whole process is electronic.*

7. Paper manifest declaration: the obligator of declaration submits documents to the related government sector (e.g. Customs) himself or by mail and/or fax.

8. Manifest declaration system: the information system opened to obligators of declaration to declare manifest data, and for the related government sector (e.g. Customs) to verify the content, accuracy, and completeness of declared manifest.

Basic Information

Economy		Enterprise name	
Name		Position	
Telephone and e-mail address			
Type of enterprise		<input type="checkbox"/> Carrier <input type="checkbox"/> Shipping agent <input type="checkbox"/> NVOCC (Non-vessel owning common carrier) <input type="checkbox"/> Freight forwarder	

Which mechanism for manifest declaration has your economy already implemented?

Please write down the implementation time.

Implemented e-Manifest declaration for Master Bill of Lading (hereinafter referred to as B/L) information in _____ (Year) _____ (Month); for House B/L information in _____ (Year) _____ (Month)

(Please continue to answer section 1,2, and 3.)

Implemented paper manifest declaration for Master B/L information in _____ (Year) _____ (Month); for House B/L information in _____ (Year) _____ (Month)

(Please continue to answer section 1 and 3.)

(Begin)

Section 1 The status quo of implementation of manifest declarations

5. Legal enforcement

1-1. Please read the following description of local legal system structures, and choose the description that best matches your domestic legal system from the following 5 options.

Specific description	Strongly agree	Agree	Unsure	Disagree	Strongly disagree
Existing laws and regulations about manifest declaration are mature and function well					
Laws and regulations related to manifest declaration have been well implemented					
Laws and regulations related to manifest declaration have been implemented, are					

stable, and don't fluctuate frequently.					
Existing laws and regulations for manifest declaration match enterprise's requests very well, and make data reporting more standardized and convenient.					

1-2. Does your economy enact and implement laws and regulations related to *e-Manifest* declaration? *(If you choose yes, please write down the document name and issuing date)*

Yes, only for Master B/L information declaration

Yes, only for House B/L information declaration

Yes, for Master B/L information and House B/L information declaration

No

6. Workflow and procedures for manifest declarations

A. **Import** manifest declarations

2A-1. What kinds of data does your enterprise need to submit during import manifest declarations?

Master B/L information

House B/L information

Doesn't take part in the declaration process directly; provides related data.

Other _____

2A-2. Which methods are used by your enterprise in the manifest declaration?

(you can choose more than one option)

Paper document submission

Private information system

Government information platform

System provided by third-party electronic service provider

Common carrier's system

Other _____

2A-3. The time limit for import manifest declaration is:

(you can choose more than one option; please fill in specific number of hours on the line)

_____ hours(h) before loading at loading port

_____ hours(h) before departure at loading port

_____ hours(h) before arrival at destination port

When declaring at Customs of destination port

Within _____ hours(h) after arrival at destination port

Other time limit requested by Customs _____

2A-4. Please mark the data that must be declared in import manifest declarations; if any information is missing, please add it.

Please choose data items which are most commonly rejected for inaccuracy or incompleteness, and those items that are acquired from the exporter/export freight forwarder, and add them to the right side of the form.

No.	Data items	Sub-items <i>(you can choose more than one option)</i>	Items which are most commonly rejected for inaccuracy or incompleteness <i>(write down the numbers)</i>	Items necessary to acquire from exporter/ export freight forwarder <i>(write down the numbers)</i>
1	Stakeholders	<input type="checkbox"/> 1. Consignee/consigner <input type="checkbox"/> 2. Freight forwarder <input type="checkbox"/> 3. Carrier <input type="checkbox"/> 4. Container terminal <input type="checkbox"/> 5. Intermediate carrier <input type="checkbox"/> 6. Consolidator/devanning party <input type="checkbox"/> 7. Intermediate consignee <input type="checkbox"/> 8. Notify party <input type="checkbox"/> 9. Issuer of the bill of lading (B/L) <input type="checkbox"/> 10. Law enforcement <input type="checkbox"/> 11. Other _____		
2	Time	<input type="checkbox"/> 1. Estimated date and time of arrival at the		

		first port in the economy <input type="checkbox"/> 2. Date and time of departure <input type="checkbox"/> 3. Estimated date and time of arrival at discharging port <input type="checkbox"/> 4. Other _____		
3	Place	<input type="checkbox"/> 1. Departure port <input type="checkbox"/> 2. Discharging port <input type="checkbox"/> 3. Place of transshipment <input type="checkbox"/> 4. Passing economy <input type="checkbox"/> 5. Delivery destination <input type="checkbox"/> 6. Other _____		
4	Goods	<input type="checkbox"/> 1. Description of goods <input type="checkbox"/> 2. Number of packages <input type="checkbox"/> 3. Package type <input type="checkbox"/> 4. Measure <input type="checkbox"/> 5. Gross weight <input type="checkbox"/> 6. UN number for hazard class <input type="checkbox"/> 7. Shipping mark <input type="checkbox"/> 8. HS tariff code <input type="checkbox"/> 9. UCR consignment code <input type="checkbox"/> 10. Consignment value <input type="checkbox"/> 11. Country/region of origin <input type="checkbox"/> 12. Other _____		
5	Transportation	<input type="checkbox"/> 1. Means of transport <input type="checkbox"/> 2. Number of conveyance <input type="checkbox"/> 3. Voyage number <input type="checkbox"/> 4. Master B/L number <input type="checkbox"/> 5. House B/L number <input type="checkbox"/> 6. Container number <input type="checkbox"/> 7. Seal number <input type="checkbox"/> 8. Means of payment <input type="checkbox"/> 9. Other _____		

2A-5. Based on the declaration process for import manifest, please fill in the following form.

Declaration process <i>(please mark "X" if the option is available in actual process)</i>	Related parties	Number of required staff	Average time	Longest time required	Shortest time required	Average cost
<input type="checkbox"/> Prepare import manifest data	Data provider: <input type="checkbox"/> Importer <input type="checkbox"/> Import freight	_____ persons	_____ h	_____ h (Reasons: _____)	_____ h	_____ dollars

	forwarder <input type="checkbox"/> Exporter <input type="checkbox"/> Export freight forwarder <input type="checkbox"/> Private data <input type="checkbox"/> Other _____			_____)		
<input type="checkbox"/> Submit import manifest data (Please choose submission method) <input type="checkbox"/> Paper <input type="checkbox"/> Electronic	Department in charge: <input type="checkbox"/> Customs <input type="checkbox"/> Port <input type="checkbox"/> Other _____	_____ persons	_____ h	_____ h (Reasons: _____)	_____ h	_____ dollars
<input type="checkbox"/> Wait for feedback from government			Average waiting time: _____ h	Longest waiting time: _____ h	Shortest waiting time: _____ h	
<input type="checkbox"/> Re-submit import manifest data to import Customs when arriving at the destination port, despite having submitted manifest data at the loading port (Please choose what needs to be re-submitted) <input type="checkbox"/> All the required import manifest data <input type="checkbox"/> Partial information, mainly including: _____	Department in charge: <input type="checkbox"/> Customs <input type="checkbox"/> Port <input type="checkbox"/> Other _____	_____ persons	_____ h	_____ h (Reasons: _____)	_____ h	_____ dollars

2A-6. Please consider the process situation when you need to modify the import manifest data and fill in the following form.

Modifying data process (please mark "X" if the option is available in actual process)	Related parties	Number of required staff	Average time	Longest required time	Shortest required time	Average cost
<input type="checkbox"/> Submit modification application request (Please choose the	Department in charge: <input type="checkbox"/> Customs	_____ persons	_____ h	_____ h (Reasons: _____)	_____ h	_____ dollars

<i>submission method for modification applications)</i> <input type="checkbox"/> Paper <input type="checkbox"/> Submit paper application request only when the time limit for declaration is exceeded <input type="checkbox"/> Electronic	<input type="checkbox"/> Port <input type="checkbox"/> Other _____			_____)		
<input type="checkbox"/> Prepare the import manifest data that needs to be modified. <i>(Please list the data items which need modification)</i> _____ _____	Data provider: <input type="checkbox"/> Importer <input type="checkbox"/> Import freight forwarder <input type="checkbox"/> Exporter <input type="checkbox"/> Export freight forwarder <input type="checkbox"/> Private data <input type="checkbox"/> Other _____	_____ persons	_____ h	_____ h (Reasons: _____)	_____ h	_____ dollars
<input type="checkbox"/> Submit import manifest data which needs to be modified <i>(Please choose submission method)</i> <input type="checkbox"/> Paper <input type="checkbox"/> Submit paper documents only when the time limit for declaration is exceeded <input type="checkbox"/> Electronic	Department in charge: <input type="checkbox"/> Customs <input type="checkbox"/> Port <input type="checkbox"/> Other _____	_____	_____ h	_____ h (Reasons: _____)	_____ h	_____ dollars
<input type="checkbox"/> Wait for feedback from government			Average waiting time: ____ h	Longest waiting time: ____ h	Shortest waiting time ____ h	_____ dollars

2A-7. If your enterprise has already declared its import manifest in advance (declared at the loading port), when the goods arrive at port of destination, does Customs provide any services to improve the convenience for your enterprise at Customs declaration?

Yes (please answer following questions)

No, only regular steps

What kind of convenience measures are provided?	Average saved time (h)	Average saved cost (\$)
<input type="checkbox"/> Goods are exempted from examination		
<input type="checkbox"/> Part of goods are exempted from examination		

<input type="checkbox"/> Goods are released instantly when arrival		
<input type="checkbox"/> Other _____		

B.Export manifest declarations

2B-1. What kinds of data does your enterprise need to submit during export manifest declarations?

- Master B/L information House B/L information
- Doesn't take part in the declaration process directly; provides related data.
- Other _____

2B-2. Which methods are used by your enterprise in the manifest declaration?

(you can choose more than one option)

- Paper document submission Private information system
- Government information platform
- System provided by third-party electronic service provider
- Common carrier's system
- Other _____

2B-3. Please mark the data that must be declared in export manifest declarations; if any information is missing, please add it.

Please choose data items which are most commonly rejected for inaccuracy or incompleteness, and those items that are acquired from the exporter, and fill them in right side of the form.

No.	Data items	Sub-items <i>(you can choose more than one option)</i>	Items which are most commonly rejected for inaccuracy or incompleteness <i>(write down the numbers)</i>	Items necessary to acquire from exporter <i>(write down the numbers)</i>
1	Stakeholders	<input type="checkbox"/> 1.Consignee/consigner <input type="checkbox"/> 2.Freight forwarder <input type="checkbox"/> 3.Carrier <input type="checkbox"/> 4.Container terminal		

		<input type="checkbox"/> 5. Intermediate carrier <input type="checkbox"/> 6. Consolidator/devanning party <input type="checkbox"/> 7. Intermediate consignee <input type="checkbox"/> 8. Notify party <input type="checkbox"/> 9. Issuer of the bill of lading (B/L) <input type="checkbox"/> 10. Law enforcement <input type="checkbox"/> 11. Other _____		
2	Time	<input type="checkbox"/> 1. Date and time of departure <input type="checkbox"/> 2. Estimated departure date <input type="checkbox"/> 3. Other _____		
3	Place	<input type="checkbox"/> 1. Departure port <input type="checkbox"/> 2. First arrival port <input type="checkbox"/> 3. Place of transshipment <input type="checkbox"/> 4. Passing economy <input type="checkbox"/> 5. Delivery destination <input type="checkbox"/> 6. Other _____		
4	Goods	<input type="checkbox"/> 1. Description of goods <input type="checkbox"/> 2. Number of packages <input type="checkbox"/> 3. Package type <input type="checkbox"/> 4. Measure <input type="checkbox"/> 5. Gross weight <input type="checkbox"/> 6. UN number for hazard class <input type="checkbox"/> 7. Shipping mark <input type="checkbox"/> 8. HS tariff code <input type="checkbox"/> 9. UCR consignment code <input type="checkbox"/> 10. Consignment value <input type="checkbox"/> 11. Country/region of origin <input type="checkbox"/> 12. Other _____		
5	Transportation	<input type="checkbox"/> 1. Means of transport <input type="checkbox"/> 2. Number of conveyance <input type="checkbox"/> 3. Voyage number <input type="checkbox"/> 4. Master B/L number <input type="checkbox"/> 5. House B/L number <input type="checkbox"/> 6. Container number <input type="checkbox"/> 7. Seal number <input type="checkbox"/> 8. Means of payment <input type="checkbox"/> 9. Other _____		

2B-4. Based on the declaration process for export manifest, please fill in the following form.

Declaration process	Related parties	Number of	Average time	Longest time	Shortest time	Average cost
---------------------	-----------------	-----------	--------------	--------------	---------------	--------------

<i>(please mark "X" if the option is available in actual process)</i>		required staff		required	required	
<input type="checkbox"/> Prepare export manifest data	Data provider: <input type="checkbox"/> Exporter <input type="checkbox"/> Export freight forwarder <input type="checkbox"/> Private data <input type="checkbox"/> Other _____	_____ persons	_____ h	_____ h (Reasons: _____)	_____ h	_____ dollars
<input type="checkbox"/> Submit export manifest data <i>(Please choose submission method)</i> <input type="checkbox"/> Paper <input type="checkbox"/> Electronic	Department in charge: <input type="checkbox"/> Customs <input type="checkbox"/> Port <input type="checkbox"/> Other _____	_____ persons	_____ h	_____ h (Reasons: _____)	_____ h	_____ dollars
<input type="checkbox"/> Wait for feedback from government			Average waiting time: ___ h	Longest waiting time: ___ h	Shortest waiting time: ___ h	
<input type="checkbox"/> Adding declaration data based on the actual loading situation <i>(Please choose submission method)</i> <input type="checkbox"/> Paper <input type="checkbox"/> Electronic	Department in charge: <input type="checkbox"/> Customs <input type="checkbox"/> Port <input type="checkbox"/> Other _____	_____ persons	_____ h	_____ h (Reasons: _____)	_____ h	_____ dollars

2B-5. Please consider the process situation when you need to modify the export manifest data and fill in the following form.

Modifying data process <i>(please mark "X" if the option is available in actual process)</i>	Related parties	Number of required staff	Average time	Longest required time	Shortest required time	Average cost
<input type="checkbox"/> Submit modification application request <i>(Please choose the submission method for modification applications)</i> <input type="checkbox"/> Paper <input type="checkbox"/> Submit paper	Department in charge: <input type="checkbox"/> Customs <input type="checkbox"/> Port <input type="checkbox"/> Other _____	_____ persons	_____ h	_____ h (Reasons: _____)	_____ h	_____ dollars

application request only when the time limit for declaration is exceeded <input type="checkbox"/> Electronic						
<input type="checkbox"/> Prepare the export manifest data that needs to be modified. <i>(Please list the data items which need modification)</i> _____	Data provider: <input type="checkbox"/> Importer <input type="checkbox"/> Import freight forwarder <input type="checkbox"/> Exporter <input type="checkbox"/> Export freight forwarder <input type="checkbox"/> Private data <input type="checkbox"/> Other_____	_____ persons	_____ h	_____ h (Reasons: _____)	_____ h	_____ dollars
<input type="checkbox"/> submit export manifest data which needs to be modified <i>(Please choose submission method)</i> <input type="checkbox"/> Paper <input type="checkbox"/> Submit paper documents only when the time limit for declaration is exceeded <input type="checkbox"/> Electronic	Department in charge: <input type="checkbox"/> Customs <input type="checkbox"/> Port <input type="checkbox"/> Other_____	_____	_____ h	_____ h (Reasons: _____)	_____ h	_____ dollars
<input type="checkbox"/> Wait for feedback from government			Average waiting time: ____ h	Longest waiting time: ____ h	Shortest waiting time ____ h	_____ dollars

7. Standardization enforcement

3-1. Please mark "X" to indicate what kinds of standards have been adopted by your enterprise for manifest declarations .

(you can choose more than one option)

No.	Standard Term	Details
1	Data	<input type="checkbox"/> Data set <input type="checkbox"/> Document format <input type="checkbox"/> Syntax rules <input type="checkbox"/> Other_____

2	Business	<input type="checkbox"/> Management of obligators of declaration <input type="checkbox"/> Declaration procedures <input type="checkbox"/> Other _____ <input type="checkbox"/> Service evaluation
3	Management	<input type="checkbox"/> Qualification of obligators of declaration <input type="checkbox"/> Filing management <input type="checkbox"/> Other _____ <input type="checkbox"/> Obligor enterprise rating

8. Coordination of stakeholders in manifest declaration

4-1. What work does your enterprise do for manifest declaration?

(you can choose more than one option)

- Establish manifest declaration information system
- Management process adjustment Operational staff training
- Other _____

4-2. What kind of support does your enterprise want to receive from the government?

(you can choose more than one option)

- Policy interpretation Training in operational procedures
- Financial support Information system construction
- Other _____

4-3. Has your enterprise ever reported problems with the manifest/e-Manifest declaration process?

- No
- Yes *(you can choose more than one option)*
 - About declaration process
 - About service quality
 - About information system
 - Other _____

4-4. What methods would be used when your enterprise reports a problem during the declaration process. *(you can choose more than one option)*

Service hotline Online service Email Other _____

4-5. How long does it take to receive feedback after reporting a problem?

Three working days Five working days Half a month One month
 Other _____
 No feedback

4-6. Is your enterprise satisfied with government responses to complaints or requests for consultation?

Very satisfied Satisfied Neither satisfied nor dissatisfied
 Dissatisfied Very dissatisfied

If your economy has implemented e-Manifest declarations, please continue to answer sections 2 and 3.

If your economy has only implemented paper manifest declarations, please continue to answer section 3(on page 15).

Section 2 Status quo of implementation of e-Manifest declarations

1. ICT environment

1-1. When did your enterprise start using information systems to do manifest declarations? _____(year)

1-2. Which functions could the manifest declaration system bring to your enterprise?

(you can choose more than one option)

Automatic check for data and format mistakes
 The notification of data safety precaution Statistics
 Feedback through SMS or E-mail Other _____

1-3. What problems has your enterprise faced when using an e-Manifest declaration

system? (you can choose more than one option)

- Manifest information exchanges slowly Data format is not compatible
- Error rate is high within data exchange process
- Information can't be shared Information security problem
- Other _____

1-4. Based on the manifest declaration system currently in use, please read the following description and enter the most appropriate response below.

Factors	Description	Strongly agree	Agree	Unsure	Disagree	Strongly disagree
Speed of data exchange in manifest declaration system	Data exchange in manifest declaration system is fast and efficient					
Stability level of manifest declaration system	Manifest declaration system is safe and reliable					
Technical error rate of manifest declaration system	There are few mistakes in e-Manifest declaration system					
Accuracy rate in manifest data transmission process	Data transmission in e-Manifest declaration is very accurate					
Convenience level of manifest data transmission process	The description of the e-Manifest declaration process is clear, system is very easy to use					

2. Standardization of e-Manifest declarations

2-1. Based on your awareness, please mark "X" to indicate what kinds of standards have been adopted by your economy for e-Manifest declarations . (you can choose more than one option)

No.	Standard Term	Details

1	System	<input type="checkbox"/> Interface specification <input type="checkbox"/> Interconnection <input type="checkbox"/> Other_____
2	Safety	<input type="checkbox"/> E-signature & PKI <input type="checkbox"/> Authorization management <input type="checkbox"/> Other_____

Section 3 Insight and Suggestions

3-1. If your enterprise still submits paper documents in manifest declaration, does your enterprise support declaring manifests through information systems?

(If your economy has implemented e-Manifest declaration, please skip this question and answer question 3-2 directly)

- Support. Implementation would reduce the demand for paper documents and also can enhance information transmission efficiency.
- Neutral. Implementation would enhance efficiency, however, it could increase costs through information system installing and staff training.
- Oppose. Existing paper manifest declaration doesn't represent any inconvenience for enterprises.

3-2. To optimize the manifest declaration, please rank the priority of the following aspects from 1-10. The higher the score is, the higher priority it has.

(If you have other suggestions, please enter them under the "other" option)

- Laws and regulations_____ ICT_____
- Standardization_____ Personnel training_____
- Procedures optimization _____
- Services provided (commercial services, public services, and etc.) _____
- Other_____

3-3. Based on the status quo of manifest declaration, do you have any suggestions about

optimizing the mechanisms for manifest declaration?

3-4. Would your enterprise be interested in support for developing a mechanism for e-Manifest exchanges from independent international organizations that have credibility and influence?

Yes No

3-5. What is your enterprise's opinion on e-Manifest exchange in the APEC region?

Implementation would decrease redundant information and repeated input, speed up the information exchange, and improve the efficiency of trade supply chain.

It is hard to achieve. Policies, regulations, laws, declaration procedures, and commercial environments in each economy are too different to coordinate.

It is very hard to achieve, as unified code criteria is required, and each economy also needs to perfect the information infrastructure and laws and regulations.

3-6. Do you have any suggestions about e-Manifest exchange in the APEC region and improving the efficiency of the e-Manifest exchange and supply chain?

(End)

Thank you for your precious opinion.



**Asia-Pacific
Economic Cooperation**

**Enhancing the Global Supply Chain Efficiency by E-Manifest Exchange in APEC Region
CTI 15 2013T (ECSG)**

The Survey of Current Situation of Manifest Declarations (maritime) in the APEC Region (For Relevant Parties)

In order to have a better understanding of the current situation of manifest declaration mechanisms in the APEC region, including the legal framework and standardization environment, information communication and technology (ICT) environment, etc., our project team humbly requests your participation in the following survey. Your information will be greatly valued and of course will be kept strictly confidential. Please reply to this questionnaire before

_____ (date) and contact
_____ (contact person) by _____ (email).

Filing Instructions :

- 1. Please mark "X" for the appropriate options or write down the answers in the space provided.*
- 2. Every question only has one choice if there is no special explanation.*
- 3. Please answer all questions.*

The Scope of this Survey:

This survey mainly focuses on maritime manifest declarations.

Concepts in the Questionnaire :

9. The obligator of declaration : According to the laws or regulations issued by the government sector (e.g. Customs), the person who is required to submit the manifest data within a time limit.

10. E-Manifest declaration : the obligator of declaration submits documents and information through information systems to the related government sector (e.g. Customs). The whole process is electronic.

11. Paper manifest declaration: the obligator of declaration submits documents to the related government sector (e.g. Customs) himself or by mail and/or fax.

Basic Information

Economy		Enterprise name	
Name		Position	
Telephone and e-mail address			
Type of enterprise		Traders	

(Begin)

1. The role of your enterprise in international trade activities:

Importer Exporter Participate in import activities as well as export activities

2. Does your enterprise participate in the manifest declaration process directly?

Yes, we submit manifest data to Customs or other related institutions directly

No, we submit related information to obligators of declaration, and let them declare.

Other _____

3. If your enterprise has taken part in the manifest declaration process before, what kind of manifest did your enterprise declare? *(you can choose more than one option)*

Export manifest

Import manifest; the time limit for declaration is:

(you can choose more than one option; please fill in specific number of hours on the line)

_____ hours(h) before loading at loading port

_____ hours(h) before departure at loading port

_____ hours(h) before arrival at destination port

When declaring at Customs of destination port

Within _____ hours(h) after arrival at destination port

Other time limit requested by Customs _____

4. Based on the actual *import manifest declaration* situation, please fill in the following table.

Major data	Offer data to (please mark "X" if the option is available in your enterprise)	The data items offered (write down the numbers)	Means	Number of required staff	Average preparing time	Average cost
1. Manufacturer name and address	<input type="checkbox"/> Freight forwarder <input type="checkbox"/> Shipping agent <input type="checkbox"/> Customs <input type="checkbox"/> Customs broker <input type="checkbox"/> Other _____		<input type="checkbox"/> Paper <input type="checkbox"/> Electronic	_____	_____h	_____dollars
2. Consignee name and address						
3. Consigner name and address						
4. Reference number of importer according to Customs						
5. Detailed description about goods						
6. Package type			<input type="checkbox"/> Paper <input type="checkbox"/> Electronic	_____	_____h	_____dollars
7. Shipping mark						
8. Numbers of package						
9. Gross weight						
10. Country/region of origin						
11. The Customs tariff code			<input type="checkbox"/> Paper <input type="checkbox"/> Electronic	_____	_____h	_____dollars
12. Other _____						

5. Based on the actual *export manifest declaration* situation, please fill in the following table.

Major data	Offer data to (please mark "X" if the option is available in your enterprise)	The data items offered (write down the numbers)	Means	Number of required staff	Average preparing time	Average cost
1. Consignee name and address	<input type="checkbox"/> Freight forwarder		<input type="checkbox"/> Paper <input type="checkbox"/> Electronic	_____	_____h	_____dollars
2. Consigner						

name and address 3.Tax payment code 4.Detailed description of goods 5. Package type 6.Shipping mark 7.Numbers of package 8. Gross weight 9. Country/region of origin 10. The Customs tariff code 11. Other_____	<input type="checkbox"/> Shipping agent		<input type="checkbox"/> Paper <input type="checkbox"/> Electronic	_____	_____h	___dollars
	<input type="checkbox"/> Customs		<input type="checkbox"/> Paper <input type="checkbox"/> Electronic	_____	_____h	___dollars
	<input type="checkbox"/> Customs broker		<input type="checkbox"/> Paper <input type="checkbox"/> Electronic	_____	_____h	___dollars
	<input type="checkbox"/> Other_____		<input type="checkbox"/> Paper <input type="checkbox"/> Electronic	_____	_____h	___dollars

6. What difficulties has your enterprize had in the declaration process? *(you can choose more than one option)*

- Some information needs to be submitted repeatedly
- If the enterprize has to do manifest declaration in advance, there is little time to prepare data, thus, mistakes can easily occur.
- Allowed an agent to do the declaration, and the cost was (is) relatively high
- Paper documents are still used in manifest declaration and efficiency is quite low
- Other_____

7. If your enterprise still submits paper documents in manifest declarations, does your enterprise support declaring a manifest through an information system?

(If your economy has implemented e-Manifest declaration, please skip this question and continue to answer question 8)

- Support. Implementation could reduce the demand for paper documents and could enhance information transmission efficiency.
- Neutral. Implementation could enhance efficiency; however, it could increase the cost of information system installation and staff training.
- Oppose. Existing paper manifest declaration doesn't represent any inconvenience for enterprises.

8. What is your enterprise's opinion on e-Manifest exchange in the APEC region?

- Implementation would decrease redundant information and repeated input, speed up the information exchange, and improve the efficiency of trade supply chain.
- It is hard to achieve. Policies, regulations, laws, declaration procedures, and commercial environments in each economy are too different to coordinate.
- It is very hard to achieve, as unified code criteria is required, and each economy also needs to perfect the information infrastructure and laws and regulations.

(End)

Thank you for your precious opinion.