APEC
Transportation Working Group

Electronic Ports Manifest Project
(TPT 02/2001T)

Report prepared by

tranzteknik

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1 Introduction

1.1 Executive Summary

When international vessels call at ports they are often required to submit cargo declarations to both customs and port authorities. Since these documents share a large number of common data elements, the introduction of electronic systems and corresponding changes to business processes may offer an opportunity for improved efficiency. This study sets out to identify options for electronic manifest systems and processes that satisfy both harmonised customs and port requirements.

The benefits of electronic manifests include quicker processing of cargo information by ports and customs resulting in quicker vessel turn-around; a more consistent approach to cargo and vessel data reporting for shipping lines; increased confidence in the system of reporting and timeliness of responses for importers and exporters; flow-on benefits for consumers in the form of lower cost of goods; and increased knowledge of IT (Information Technology) and EDI (Electronic Data Interchange) in the community.

Preliminary investigations across several economies revealed that electronic manifest systems are already widely implemented in many APEC economies, especially at larger ports. The investigation also suggests that there are several ways to address the issue of harmonised customs and port manifests depending on local circumstances such as cultural preferences and access to communication and technology. Hence the approach taken for this study was to document a cross section of implementations at major ports in APEC and non-APEC economies. Factors that support the particular implementation's success and issues that inhibit the wider uptake of electronic messaging in each particular community were identified. Analysis on these success factors and issues resulted in the formulation of several best practice modules and recommendations. This approach allows ports to compare their own systems and processes against those of other leading ports and identify opportunities for improvement in specific areas by using the best practice modules.

1.1.1 Key Issues

Many small to medium ports and shipping lines in APEC still do not utilise electronic manifests or any other electronic documents during the import-export process. The reasons for this include high costs, reluctance to change familiar practices, the existence of more pressing issues, lack of IT expertise, inadequate IT and communication infrastructure and the lack of a clear strategy.

The lack of a unified set of standards and a structure to manage the development and enforcement of these standards on an ongoing basis is one of the key factors contributing to the inconsistent uptake of EDI within the marine freight industry.

Another important factor influencing the uptake of EDI in some economies is the lack of a clearly articulated strategy to unite the various port stakeholders. The rivalry between ports within some economies often stands in the way of opportunities to collaborate and develop systems that saves money and improves efficiency for all.

Several APEC economies are still grappling with the lack of a comprehensive legal framework to support electronic commerce. These legislations are needed to provide the legal backbone for technologies such as digital signatures, digital certificates, principles of non-repudiation and ensuring the validity of electronic documents. Without them, all electronic transactions must continue to be accompanied with paper documents.

For some economies, the problem is more fundamental. There is a lack of basic communication infrastructure needed to support electronic manifests and other electronic messages.

1.1.2 Success Factors & Best Practice Modules

This study also identifies a number of port communities that have successfully implemented integrated electronic messaging systems that addresses the data needs of customs, port authorities and other port community members.

The factors that contributed to their success include the availability of an IT-literate workforce and access to reliable communications infrastructure. For some, the use of 'open' Internet technologies was very important also because these technologies were more affordable to develop and operate than proprietary systems. Lower Internet communication costs were also an important factor.

To ensure a strong buy-in from the port community it is critical that there are structures in place to include ideas and contributions from the community in an ongoing manner so that the community develops the solution, for the community. Equally important is the ownership structure of the systems. Structures that include users of the system as owners create a strong self-interest to have the system succeed.

Another characteristic of successful implementations is that parties who do not add any value to the chain have rigorously sought to minimise their impact. Strong leadership and a close working relationship between government (customs) and other port entities also contribute towards successful implementations.

Finally, communities operating successful implementations tend to embrace a culture of ongoing improvement.

1.1.3 Recommendations

One of the key recommendations made in this study seeks to address the lack of a unified and enforceable set of global standards for the marine industry. While it is acknowledged that such an initiative requires concerted effort at a global level, the benefits of having such standards in place are so great that every opportunity to put forward this case must be taken. Addressing this issue will provide numerous opportunities to re-engineer and streamline the exchange of information between the stakeholders while greatly reducing the cost of international trade.

The study also recommends the continued support for standards based on EDIFACT because of the support it receives from most freight-related standard setting bodies today.

XML and ebXML technologies are acknowledged as a real opportunity for creating a unified, global set of standards and business processes that could result in a single global marketplace where all organisations, large and small can exchange messages via the Internet. However, these technologies and standards are still evolving rapidly and at this point in time, this study recommends its adoption only to augment traditional EDIFACT standards. Furthermore the structures for managing and enforcing these standards are also unstable which could impact the potential benefits of XML and ebXML.

Another key recommendation concerns the need for organisations within an economy to identify opportunities for collaboration. Initiatives arising out of any collaboration between ports in an economy and between the transportation industry and government (such as ‘single window to government’ initiatives covering customs, quarantine, other permit issuing authorities) will simplify and lower the cost of trade within that particular economy. Collaboration between customs authorities at an international level is another opportunity to create structures to minimise the amount of information reported repeatedly.

The final recommendation is for the TPT-WG to leverage the efforts going towards freight security initiatives to create a more streamlined, transparent and efficient transportation chain.

1.2 Electronic Messaging - The Bigger Picture

Electronic Port Manifests are now commonly used in major ports in most APEC economies. The benefits of electronic manifests are well documented. However, it must be noted from the outset that although the manifest is a very important document, it is but one of the many different types of messages exchanged between the various stakeholders of the port community in the course of facilitating trading activities.

Therefore this study will view the implementation status of electronic manifests at a port as just one of the indicators of the readiness and willingness of the port community to implement a much wider range of electronic messages between its various stakeholders. It will also be viewed as an indicator of the degree to which the particular port or economy is ready to implement paperless trading initiatives with other economies.

This approach has been adopted because the capability to accept electronic manifest is usually just one of the functions or messages supported when an EDI infrastructure platform is set up at a port. The high costs involved with implementing and maintaining EDI systems requires an acceptable Return of Investment (ROI) in the form of a range of EDI functions for users of the port.

Consequently, this report will cover electronic manifests but also touch on other EDI functions commonly used in the port environment.

1.3 Project Methodology

The methodology employed to meet the objectives of this project is described in this scetion. This methodology is represented schematically in Figure 1.

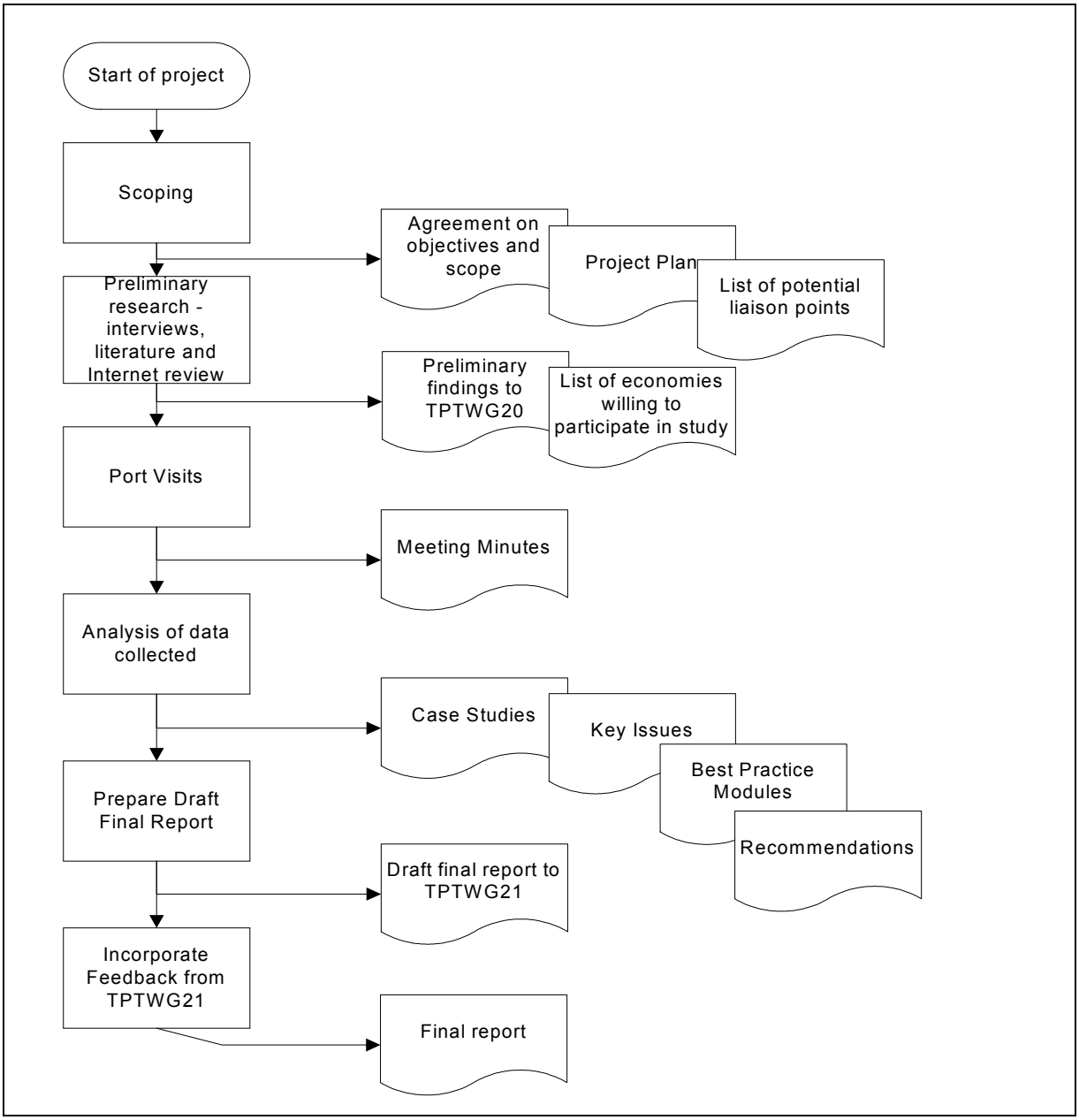

Figure 1: Project Methodology

1.3.1 Scoping

Tranzteknik believes that determining the scope of the project and realistic planning in the early stages was critical to the overall success of this project. The following topics were discussed and agreed upon at the start of this project:

- Determining the detailed scope of the project.
- Formulation of a project plan.
- Collation of a list of potential liaison points from within the TPT-WG to assist with this project.
- Ensuring an acceptable level of participation of individual economies, ports, customs and other organisations.

1.3.2 Preliminary research

The body of information covering paper-based and electronic-based port manifest and customs documents that already exists was leveraged to prepare this report. The sources for information gathering included:

- Survey of existing information including publications and websites sourced from within and outside of APEC economies, government and private sector organisations, including:
    - Work on common data elements in customs declarations performed by the APEC Subcommittee on Customs Procedures (SCCP) and the G7 Customs Experts Group.
    - SMDG (User Group for Shipping Lines and Container Terminals).
    - Eurotransportnet (Cooperation between North Western European Ports EDI providers).
    - United Nations International Computing Centre.
    - EUROMAR – an European Economic Interest Group committed to use of Information Technology in transportation, promoting interoperability and interconnectivity between various parties involved in marine transportation.
    - EDIShip (Shipping Lines EDI Initiative).
- Coordination with individual APEC economy TP-TWG representatives who arranged access to various government and private sector bodies including port authorities, shipping lines, terminal operators, customs authorities and related governing organisations.

- Phone and email interviews with key maritime and customs authorities, & major private sector organizations in the shipping industry in individual APEC economies. This helped ensure that the study produces current and relevant outcomes.

1.3.3 Port Visits

Port visits provided the opportunity for face-to-face meetings with port stakeholders which resulted in frank discussions that were not possible over the phone or email. These visits provided the consultant with multiple views of the real issues that impeded the uptake of electronic manifest and electronic processing in general as well as the initiatives being undertaken to tackle these issues.

Based on the information gathered during the preliminary research and the port visits, the challenges facing the objectives of this project were identified as key issues and the ramifications of these challenges on other components of the freight-chain were investigated. These were collated to form a broad picture of the current issues faced by economies in the APEC region.

The port visits also allowed the consultant to study the implementation of electronic systems at various ports and to develop case studies as well as a number of best practice modules.

1.3.4 Best practice modules and recommendations

The final phase of the project was focused on further developing the best practice modules as well as formulating a number of recommendations to help economies move forward.

The port visits helped to identify several excellent examples of the use of electronic commerce in a port environment. Some of these were developed into case studies demonstrating electronic manifest processing in different locations. However, it also became clear that no one solution fits all ports and economies needs. Therefore, by breaking down the case studies into best practice modules, interested economies now have the option of choosing only the modules that meet their requirements. It must be noted that any module that works well in one economy will not necessarily work in another economy. Economies are therefore advised to evaluate their needs and adopt the selected modules to local circumstances.

1.4 Contents

Section 1 is the Executive Summary

Section 2 details the objectives of this project, background information, a description of APEC, linkages between this project and other APEC initiatives and the expected benefits.

Section 3 discusses broad strategies that could be employed to encourage the use of electronic manifest and documents in marine freight.

Section 4 summarises the key issues that effect the implementation of electronic manifest and other documents in a port.

Section 5 provides an overview of current systems in several APEC ports. It covers the key issues affecting the uptake of electronic messaging in each of these ports. Case studies demonstrating examples of best practice in this area are included here.

Section 6 derives several best practice modules from the previous section.

Section 7 consists of a number of recommendations arising from the study of ports in the previous section and the identification of key issues and success factors.

Appendix A lists some of the main solution providers with capabilities in the electronic manifest and related messaging technologies. Economies or ports interested in implementing new EDI functionality or infrastructure must consider their individual requirements against the capabilities and experience of these solution providers.

Appendix B lists the organisations consulted to complete this report.

1.5 Glossary

ASC X12	Accredited Standards Committee X12 develops standards for cross-industry electronic exchange of business information
APEC	Asia Pacific Economic Cooperation
Carrier	Shipping Line
CUSCAR	Customs cargo report message
EbXML	e-business eXtensible Mark-up Language
EDI	Electronic Data Interchange
EDIFACT	Electronic Data Interchange for Administration, Commerce and Transport

EPV	Port Authority of Valparaiso
HS	Harmonized System Convention (WCO HS Codes)
IATA	International Air Transport Association
ICAO	International Civil Aviation Organisation
IFCSUM	Forwarding and Consolidation Summary Message
IMO	International Maritime Organisation
IT	Information Technology
OASIS	Organization for the Advancement of Structured Information Standards
PKCS	Port Klang Community System
SCCP	APEC Sub-Committee on Customs Practices
SME	Small to Medium Enterprises
SMDG	User Group for Shipping Lines and Container Terminals
TPT-WG	APEC Transportation Working Group
XML	eXtensible Mark-up Language
UNECE	United Nations Economic Commission for Europe
UN/CEFACT	United Nations Centre for Trade Facilitation and Electronic Business
UNCITRAL	United Nations Commission on International Trade Law
VAN	Value-added
VPA	Vancouver Port Authority
WCO	World Customs Organisation

2 Background

2.1 Why electronic port manifests?

- The uptake of electronic commerce offers considerable commercial benefits to transport operators. This in part is due to the cost savings gained through the reduction of errors and timesaving. The real benefit, however, lies in the opportunities to re-engineer and streamline business processes in conjunction with the implementation of electronic systems.

- Customs declarations and port manifests have a large number of common data elements. Therefore, the introduction of electronic systems in this area might offer an opportunity for streamlining processes by introducing a single document that satisfies both customs and port requirements.

- Ports corporations and authorities in Australia are finding it difficult to convince decision-makers in shipping companies to move from paper-based to electronic port manifests. With the added benefit of being able to fulfil two requirements at once shipping companies might be more willing to take up modern techniques.

- The preparation of a best practice model early on in the process of converting paper to electronic systems in the maritime industry could create a largely unified process in the APEC region. This would lead to additional benefits for the maritime industry.

- The presentation of an information session on technical options available for the implementation of electronic port manifests would assist in the development of technical expertise and capacities in APEC.

2.2 Objectives

- To identify options for the development of manifest systems and processes which satisfy both harmonised customs and port requirements and to assist in increasing the knowledge of member economies on the technical options available to implement electronic port manifests.

- Recommendations for best practice procedures will have to be suitable for use with both open networks (e.g. Internet) and secure networks (e.g. Value Added Networks). Options will focus upon use of the UN/EDIFACT international standard for electronic data interchange as well as evaluation of the use of eXtensible Markup Language (XML).

2.3 APEC

The Asia-Pacific Economic Cooperation (APEC) was established in 1989 in response to the growing interdependence among Asia-Pacific economies. Begun as an informal dialogue group, APEC has since become the primary regional vehicle for promoting open trade and practical economic cooperation. Its goal is to advance Asia-Pacific economic dynamism and sense of community. Today, APEC's 21 member economies include all the major economies of the region and the most dynamic, fastest growing economies in the world, accounting for nearly half of global trade. Further information on APEC can be obtained at http://www.apecsec.org.sg.

To achieve the goal of free trade and investment in the Asia Pacific region, APEC has established a number of sectoral working groups. A seamless and safe transportation system is important in the facilitation of trade, and in the provision of basic services throughout any society. The trade and social goals of APEC cannot be pursued without consideration being given to transport issues in the region. Thus, the Transportation Working Group (TPT-WG) has a key role to play in ensuring the advancement of APEC priorities. The TPT-WG's areas of work include the promotion of the implementation of new technologies (eg electronic commerce and paperless trading); harmonisation of standards; aviation, maritime and road safety; and human resources development. Further information on the TPT-WG can be obtained at http://www.apectptwg.org.au.

2.4 Project Context

1. This project pursues the objectives of the APEC Paperless Trading Initiative, which was endorsed by APEC Leaders in 1998 and included in the Blueprint for Action on Electronic Commerce. The Paperless Trading Initiative is a commitment by all economies to reduce or eliminate requirements for paper documents by 2005 (developed economies) and 2010 (developing economies) or as soon as possible thereafter.

2. The significance of electronic commerce was already highlighted at the 1997 meeting where leaders agreed that electronic commerce is one of the most important technological breakthroughs this decade and directed Ministers to undertake a work program on electronic commerce in the region.

3. This project is consistent with the objectives of the APEC Framework for Strengthening Economic Cooperation and Development, which is intended to reduce economic disparity among APEC economies, to improve the economic and social well being of people and to achieve sustainable growth. In November 1997 APEC Ministers reviewed progress achieved within the Framework and recognised that, "… an efficient, safe and integrated regional transportation system is critical to support growth."

4. At the APEC Transportation Ministers meeting in late June 1997 in Victoria, Canada, Ministers recognised that the ability to access and harness new technologies will be essential to the improvement of the transportation system of the region. They drew attention to the need to address the practical and economic applications of these new technologies and also noted that such technologies would enhance the speed and lower costs of intermodal cargo processing and port clearance.

5. Using electronic commerce to improve the efficiency of transportation systems has been of significant interest to the TPT-WG for several years and adoption of this type of technology as early as 1993 was included in the Working Group's Vision Statement and Policy Objectives. The project addresses action priorities 2,4, and 5 of the TPT-WG's electronic commerce collective action plan:

   2. Extend use of electronic messages for reporting manifest information to Port Authorities throughout all APEC economies;

   4. Examine the feasibility of establishing a 'single electronic window' for communication with export inspection authorities on matters related to the export clearance of goods;

   5. Remove any legal or institutional requirements for the use of paper documents in the processes associated with international trade and transport.

6. This project responds directly to the priorities of the APEC TPT-WG by meeting one of their obligations under the Osaka Action Agenda. Specific actions for the TPT-WG to carry out with regard to electronic commerce were stated in 1995 in Part One of the Osaka Action Agenda, Section C: Actions in Specific Areas, Area 3: Services, Transportation, items e and f:

"e. after completing in 1995, Phase II of the Transportation EDI Study identifying barriers to transportation industry use of EDI, initiate a pilot EDI trial program, and determine future direction in the adoption of EDI as widely as possible throughout the transportation sector in the region; and

f. seek to eliminate the requirement for paper documents (both regulatory and institutional) for the key messages relevant to international transport and trade as soon as practicable within the next 10 years." These items were subsequently incorporated into the TPT-WG Action Program.

7. This project supports the Osaka Action Agenda through the transfer of expertise to improve the efficient transportation of goods. The project also supports the objective of economic and technical cooperation between economies. It contributes to the TPT-WG electronic commerce work program.

2.5 Linkages

This project will complement the work already being undertaken in the TPT-WG to remove requirements for paper documents (both regulatory and institutional) for key messages relevant to international air and sea transport and trade. These requirements are a major impediment to the wider adoption to electronic commerce by businesses. The TPT-WG's work has expanded into the APEC Paperless Trading Initiative, which has been endorsed by Leaders in 1998 and was included into the APEC Blueprint for Action on Electronic Commerce. At their 2001 Meeting in Shanghai, Ministers welcomed the progress made in the area of electronic commerce. They urged members to enhance their cooperation in this area, especially on capacity building for developing member economies.

Paperless Trading is part of the work program of the APEC Electronic Commerce Steering Group (ECSG). The Chair's report of the 1999 ECSG Meeting in Auckland asked APEC forums such as TPT-WG, SCCP, TEL and WGTP to include, where relevant, paperless trading in their respective Collective Action Plans and to undertake activities, including joint-projects, which would contribute to the substitution of electronic techniques for paper documentation in international and cross-border trade transactions.

The proposed project would further build on the work already being undertaken in related projects including:

- Program to Assist the Implementation of Electronic Commerce for Commercial Messages (TPT-WG)

- Pilot E-Commerce Maritime Transport Project (TPT-WG)
- EDI Commercial Messages Pilot Project (TPT-WG)
- SME Survey (TEL-WG)
- Integrated Next Generation Electronic Commerce Environment (TEL-WG)
- Electronic Commerce Seminars (TEL-WG)
- EDI-Internet Pilot Project (TEL-WG)
- Internet & Electronic Commerce: Training on Java-Based Technology (HRD-WG)
- Program to support and encourage the adoption of appropriate electronic technology and processing the pursuit of paperless trading.

2.6 Expected Benefits

The benefits of the project will be widespread and will accrue to numerous institutions and businesses.

If the best practice recommendations from this project are implemented

- Port authorities and corporations will notice a significant reduction in vessel turnaround times, paperwork processing and clearances thus making ports more efficient.
- For shipping companies, consistency of approach with customs and other agencies will result in improved vessel movements and more competitive freight rates.
- Importers and Exporters will accrue benefits through greater confidence and efficiencies in time for document lodgement and scrutiny.
- Generally, the benefits for consumers will be similar to those for importers and exporters with respect to greater efficiency of shipping services and a flow-on effect through the economy.
- Increased knowledge of available technology will flow through into many areas of activity within the economy.

Other benefits of an integrated electronic manifest system include:

- Increased efficiency and speed in processing inward cargo because of the reduced amount of re-keying in of manifest data by port authorities, customs and other permit issuing agencies (PIA).
- Reduced errors and associated problems - staff can be redirected to services that increase value.
- Convenience – Import declaration can be submitted at anytime from any Internet-connected PC (by the customs brokers/freight forwarder/consignee).
- Reusability of data - Easy gathering of statistics for distribution to government agencies and trade organizations.
- Availability of management reports to help monitor operation and aid in decision making
- Advanced electronic submission of manifest information to customs is still considered the best way to address security concerns and still allow expedited release of legitimate freight.
- Automated customs processing including calculation of duties results in reduced manpower requirements.
- Reduced opportunity for fraud
- Changes to tariff rates, fees and codes are quickly and accurately accommodated.
- Convenience – Shipping lines can centralise their operations because they don't need presence in each port in a country.
- E-Manifest allows ports authorities to calculate revenues with ease

2.7 Benefits of electronic messaging to the port community

2.7.1 Shipping Lines

- Cost savings
- Reduced staffing/paperwork
- Better warehouse utilisation
- Customer service benefits
- Better quality data, available faster

- Electronic audit trail
- Neutrality (service standards, data protection, privacy issues)

2.7.2 Freight Forwarders

- Cost savings
- Reduced staffing/paperwork
- Better warehouse utilisation
- Customer service benefits
- Later 'close-out'
- Shipment 'pre-Clearance'
- Accurate shipment status (predictable pick-up)
- Neutrality (data protection, privacy Issues)
- Increased sales (Indirectly)

2.7.3 Shippers/Consignees

- Fast/reliable shipment (data Accuracy, later close-out, pre-clearance)
- Accurate shipment status
- Data privacy

2.7.4 Customs/Other Permit Issuing Agencies

- Cost savings
- Reduced staffing/paperwork
- Customer service benefits
- Faster clearance (pre-clearance)
- Better identification of 'target' shipments
- Accurate data (electronic delivery)
- Electronic evaluation
- Automatic handling of 'non-target' shipments

3 Strategies for increasing the use of e-manifests

This section looks at several fundamental strategies that forward the use of electronic messaging in the APEC marine freight environment. The issues related to meeting the data requirements of both ports and customs are addressed in Section 4 where the key issues that thwart these strategies are considered. Section 6 expands these fundamental strategies into best practice modules.

3.1 Increasing the electronic messaging capability of port communities

The ability to handle electronic documents (including manifests) is a key pre-requisite for the reduction of paper documents used in trade within APEC.

For most large ports, electronic processing of cargo manifests and other documents are considered essential for managing the high volume of cargo handled. However, smaller ports may find it difficult to justify investment in EDI infrastructure because revenues from port operations may be relatively lower. Often they face other operational problems that are more critical than the lack of EDI functionality. Consequently, the provision of this functionality may not receive a high enough priority to warrant any action.

Other factors, both positive and negative, that affect investment in this area are suggested below.

- To implement an effective system, a workforce competent in customs, port process and current eCommerce concepts is required. Small ports may not be able to justify the development or hiring of such skills. The costs are even higher if foreign expertise is required.

- Some ports and customs authorities have successfully utilised XML (eXtended Mark-up Language) and other 'open' technologies to implement effective yet affordable solutions. Examples of this are covered in Section 5. While the success of these organisations is very encouraging, economies must not underestimate the challenges associated with getting all the members of the port community to work together to ensure the success of such systems.

- While the overall costs of EDI implementation and operations have fallen over recent years, the upfront costs can still be substantial and must not be under-estimated. Costs reductions have occurred mainly in the communications and hardware areas.

3.2 Enable more shipping companies to generate e-manifest

Over the years, all the large international carriers have developed extensive EDI capabilities allowing them to send electronic manifests and other documents in many formats based on the requirements of the authorities at major ports of call. However, even these large international carriers are reluctant to modify their systems to cope with new versions until a critical mass is achieved i.e. sufficient number of ports have migrated to the new version. Shipping lines are even less likely to cooperate if the authority collecting the data does not have a legal mandate to collect this information from the carriers. Given the costs associated with upgrading EDI interfaces with trading partners this situation is hardly surprising.

Smaller carriers may find it even more difficult to implement systems that comply with the many different standards, message formats and business processes in existence. For example, if a carrier calls at several ports within an economy and each port has a different system, the carrier will need to duplicate its effort to comply with each of these ports. Even when existing UN/EDIFACT standards and guidelines are used, disparate implementations may still be a source of grief.

Possible solutions to this situation include finding ways for small carriers to share costs and the use of ASP-based solutions. Such alternatives are needed to ensure these smaller carriers are not left behind in the race towards a more streamlined and paperless trading environment.

Another possible solution implemented by several APEC ports authorities is to provide carriers with financial incentives to use electronic rather than paper manifests. In some economies, the problem is addressed by legislating mandatory electronic manifests. This will only work successfully for a port if it is not in competition with another port where carriers have easier reporting options.

Innovative solutions are needed to enrol smaller carriers and agents to participate in electronic messaging. An example of such a solution is the DagangNet implementation of customs declarations in Malaysia. Once DagangNet completed implementation of its electronic messaging system at Port Klang, they implemented several 'EDI Shops' or 'Kedai EDI' at main business locations throughout the country. Here, small agents who were initially reluctant to invest in their own PC hardware were trained and guided in submitting manifests electronically. Once they realised the benefits of the system, they were willing to invest in the equipment needed to send electronic manifest from their own offices. This initiative was partly responsible for the rapid uptake of electronic manifest at the Port Klang Community System (PKCS). As more and more of these new users decide to invest in their own a PC and Internet connection, the Kedai EDI's will be phased out.

3.3 Collaborative approaches towards implementing electronic messaging

In some economies, competitive pressures between major ports have led each port to develop and operate separate EDI systems. Apart from the obvious inconvenience to other stakeholders (such as freight forwarders and carriers) of having to deal with different systems, the ports themselves are burdened with the high costs associated with updating and supporting multiple EDI data sets each time one of their major customers upgrades to a newer version. Given the effort needed for this activity, it's no surprise then that these systems seldom offer anything more than just basic functionality to their respective port communities.

One way to address the costs concerns about EDI systems faced by many organisations and to increase the per capita benefit from EDI investments is to share the costs over a larger user base. This could be achieved by getting stakeholders from several port communities to identify common operational processes that could be developed and operated collaboratively (see case study on Finland in Section 5). The money each participating port saves by sharing the costs of providing routine services can be reinvested in areas where true differentiation and value-adding is possible. It has been shown that such collaboration works best when each party is free to participate based on the expected benefits rather than forced to by legislation.

The concern about high costs has seen the emergence of new models for providing IT services to smaller ports without incurring exorbitant upfront costs. An example of this is the Application Service Provider (ASP) model. Here a suite of IT services used by port stakeholders are made available over the Internet by the service provider. Rather than invest in their own IT services, the port stakeholders use the services of the ASP on a user-pays basis. Apart from the obvious advantage of low upfront investment and no running costs for the ports, the ASP model also provides the added benefit of access to expensive software that would have been too expensive for small ports to buy themselves. Access to the latest versions of software is assured because upgrades and bug fixes are installed automatically and are transparent to the users.

An example of an ASP for the shipping industry is Portrade (see Section 6: Solution Providers). For the ports, Portrade's Port Management System consists of five components, namely Vessel Information Management System, Container Terminal Management System, Conventional Cargo Management System, Port Financial Management System and Port Resource Management System. Portrade claim that all their systems are capable of interfacing with external systems using EDI.

4 Key issues

The previous section described some basic approaches to increasing the use of electronic documents in the marine sector. This section will identify some of the key issues that impede the wider use of electronic messaging within the APEC marine freight environment.

4.1 Lack of standardisation

4.1.1 Shipping Industry

One of the main issues with the processing of sea cargo manifests is that electronic messaging standards for sea carriers, ports and related organisations are not unified to the same level as the air transportation industry. This has been a continued source of difficulty for customs and port authorities.

The levels of automation and adherence to standards vary widely among the carriers, ports and government authorities. For example, in some economies the prime difficulty for customs authorities with electronic systems is having to deal with each shipping line individually to work out data interchange interface details.

The fragmented usage of EDI in the maritime industry has impacts on every stage of the transportation chain. Take for example the ports and customs authorities' efforts to implement automated handling of electronic manifests. These have been impacted by the lack of a standard message format from the shipping lines. Any attempt to implement EDI messaging could potentially get expensive and drawn out because of the need to comply with so many different implementations of the same message. To complicate it further, there are more than one set of codes for basic information such as port codes.

International shipping lines that call at multiple ports are faced with the same problem – having to comply with the different requirements from different ports.

To deal with the different types of messages sent by shipping lines and the different standards used, many port authorities continue to develop separate message handling modules for each shipping line that use their ports. On the other hand, there are several dominant ports (usually established transhipment hubs) that have the clout to enforce their proprietary standards on shipping lines. However, even they may be loosing their dominance as neighbouring economies develop their own port infrastructure and compete to be the regional transhipment hub.

A concerted, global initiative is needed to encourage the shipping industry to work towards an enforceable and unified set of standards for the whole industry along the lines of the airline industry (IATA, International Air Transport Association and ICAO, International Civil Aviation Organisation). There are currently several bodies such as UN/EDIFACT Board (and it's International Transport Message Implementation Group), SMDG, (User Group for Shipping Lines and Container Terminals), industry groups like INTTRA and the International Maritime Organisation that in one way or another influence the development of standards for the marine industry. These efforts need to be consolidated in order to achieve uniformity in message standard and related business processes. Such an achievement will be a tremendous boost towards efforts to streamline the exchange of information and reduction in paper documents.

4.1.2 ebXML

The mission and vision of the ebXML group at their homepage www.ebXML.org offers the following:

> *To provide an open XML-based infrastructure enabling the global use of electronic business information in an interoperable, secure and consistent manner by all parties.*
>
> *The vision of ebXML is to enable a global electronic marketplace where enterprises of any size and in any geographical location can meet and conduct business with each other through the exchange of XML-based messages.*

The ebXML initiative is supported by many hundreds of large businesses from a variety of industries. It is overseen by OASIS (Organization for the Advancement of Structured Information Standards) and UN/CEFACT (United Nations Centre for Trade Facilitation and Electronic Business). With such credible backers there is little doubt that this initiative will succeed.

The implementation of ebXML standards for the international shipping and trade activities has the potential to transform marine transportation into a single cohesive global marketplace. However, this success will depend on the level of commitment of the different parties involved. If the current levels of commitment persist, then ebXML is destined to suffer the same fate as EDIFACT in this industry. A prerequisite to the success of ebXML is the support from all the major industry players, shipping lines, ports, governments and port operators.

As yet, not many examples of utilising ebXML in the marine sector have been published. The following initiatives are very promising:

1. The University of Hong Kong Centre for E-commerce Infrastructure Development (CECID) is developing an ebXML solution for the Marine Department to receive Dangerous Goods Manifests in XML form from shipping agents (http://xml.coverpages.org/ni2002-06-07-a.html).

2. The ebXML Business Process Project Team's Catalogue of Business Processes v1.0 (date May 11, 2001) contains several business processes pertaining to marine transportation including Shipment Instruction, Booking Confirmation, Create Freight Invoice, Customs Declaration (CUSDEC), Shipping Line to Customs (CUSCAR), Environment, Health and Safety Declaration (IFTDGN) and many more. http://www.ebxml.org/specs/bpPROC.pdf

For an overview of how ebXML works, the following articles are recommended:

1. *Understanding ebXML by David Mertz at http://www-106.ibm.com/developerworks/xml/library/x-ebxml/*

2. *Overview of XML by Madhu Siddalingaiah at http://dcb.sun.com/practices/webservices/overviews/overview_ebxml.jsp*

3. *ebXML home page – www.ebxml.org*

4.1.3 Security concerns as a driver for standardisation

Since September 11, 2002, authorities have been investigating ways of improving security of international freight while having a positive impact on efficiency. The security initiative may very well be the driver that pushes the marine freight industry to improve the end-to-end flow of information and transparency of the marine transport chain.

At the TPTWG 21 meeting in Brisbane in September 2002, the United States put forward an initiative named "Secure Trade in the APEC Region" (STAR). The objectives of this initiative include:

1. The implementation of a container security regime that would assure in-transit integrity of containers, help identify and examine high-risk containers, and provide advance electronic information including location as early as possible in the supply chain.

2. Implement by 2005 the Common Standards for Electronic Customs Reporting that provides for standardised customs data to target high-risk goods/containers and to facilitate trade.

3. Promote private-sector adoption of new, high standards of supply-chain security, as developed by the private sector and law enforcement officials.

The fulfilment of these objectives would require the establishment of structures for compliance to international standards within the marine industry. This may also be the driver for the establishment of a single unified and enforceable set of standards for electronic messaging within the industry.

4.2 Standardisation between customs authorities

Ongoing work is being done at international customs forums such as the APEC Sub-Committee on Customs Procedures (SCCP), the World Customs Organisation and the G7 Customs Working Group towards the adoption of World Customs Organisation's Harmonized System Convention (WCO HS Codes). This is an important step towards the standardisation of commodity codes used in international trade. The full adoption of these standards will allow international shipping lines to streamline their manifest submission practices at all ports and improve vessel turn-around times. Today not many economies have fully adopted these standards and hence the benefits have yet to be realised.

The WCO Customs Data Model acknowledges that there will be increase in the amount of customs to customs data exchange before the arrival of goods in order to facilitate a higher level of security as well as quicker release times[1]. In future this may be an opportunity to re-use data already reported electronically at the exporting economy as input into the supply chain of the importing economy, electronically extending and connecting two supply chains.

Several customs authorities from APEC economies have already began exchanging information successfully. One example is the weekly exchange of export consignment declaration information (CUSDEC D97A)[2] between South Korea and Malaysia. Although the exchange is limited in many respects (direct shipments only, 3 subsets of harmonized tariff codes, selected subset of declaration data etc.), it forms an excellent platform for the development of more comprehensive exchanges and should be commended.

[1] The WCO Customs Data Model, www.wcoomd.org/ie/en/Topics_Issues/FacilitationsCustomsProcedures/DataModelBackground.html

[2] Minutes of the 9th Inter-Networking Implementation Committee (IIC), AFACT Taipeh 2000 (http://www.twtec.org.tw/english/18thafact/Minutesdata/DOCFILE/IIC9_Minutes.doc).

The APEC SCCP also has ongoing initiatives to harmonise common data elements, data requirements and customs procedures amongst member economies. In a discussion paper called "Harmonised Trade Data Elements" dated August 07, 1997 put forward by Canada to the APEC SCCP, the benefits of such harmonisation are clearly articulated[3]. Of the many benefits listed, one is particularly relevant to this study in terms of reducing the number of times the same information is reported during the course of trade. The paper suggests that harmonised data elements are "a necessary precursor to the creation of 'optimal' value added EDI-based systems using a trader's transmission of a single stream of data to satisfy both government export and import requirements as well as those of the private sector (e.g. banks, transportation companies, insurance, etc.)."

4.3 Meeting Customs and Port requirements

4.3.1 Trade facilitation versus border protection priorities

Since the events of September 11, 2002, there has been heightened concern about border security for all economies. The threat of terrorists using ocean-going vessels to carry weapons of mass-destruction into a port is no longer unthinkable. Furthermore up until recently customs authorities may have only been able to physically check about 2% of cargo entering their economies. The rest are cleared based on analysis of pre-arrival declaration of the goods by the importer and the carrier.

In light of this threat, several significant counter-measures are being considered especially by economies that feel most threatened. These include the stationing of officials from the importing economy at foreign ports so that inspections can be carried before the cargo is loaded and before the ships leaves the port of the exporting economy. Safety procedures at the embarking ports have also been reviewed to ensure it meets the agreed standards. Another proposal being considered by some economies is to x-ray every inbound container.

While all these new measures will boost up border security, there is consensus that currently, the best way to address security concerns while allowing expedited release of legitimate freight is through pre-filing of manifest information by a carrier. The problem is that the carrier's information is based on what the shipper informs them[4].

Given these concerns, it is not surprising that when customs requirement for border security and community protection exists in competition with industry's requirement for expedited release of cargo, customs' requirements will prevail.

[3] "Harmonised Trade Data Elements", Discussion Paper for APEC SCCP, Senior Officials Meeting 1, Victoria, Canada, January 1997.

[4] "Border Security and Congress". Dec 28, 2001, International Federation of Customs Brokers, www.aacb.com

The new initiatives, such as the ones mentioned here being undertaken by customs authorities across the world, could add to the cost of international trade. Hence, it is extremely important that customs authorities do not use the current global security concerns as an excuse to reverse the many gains that have been made towards trade facilitation objectives. While everyone wants safe, effective and efficient border processes, the impact of any new costs on industry and international trade must be taken into account.

More than ever before, closer cooperation between customs authorities and businesses is now needed to investigate and identify ways to continue the momentum towards facilitation of efficient international trade practices while maintaining the momentum in our fight against terrorism.

Likewise, businesses must acknowledge that the world has changed irrevocably since September 11 and everyone must play their part to avoid the recurrence of a similar disaster. It is important that industry take a cooperative, supportive and proactive stance with customs authorities in the quest towards improved efficiencies in international trade.

It should be noted that one of the action items of APEC's Sub-Committee on Customs Practices (SCCP) has been to set up ongoing consultation processes with industry. [5] Such consultation may help identify strategies that minimise the negative impacts of the increased security measures on industry.

4.3.2 IFCSUM versus CUSCAR

In the project brief for this study, specific references are made to differentiate between the IFCSUM message (Forwarding and consolidation summary message) and the CUSCAR (Customs cargo report message). In some economies, shipping lines/agents are required to send the IFCSUM message to the port authorities and the CUSCAR message to the customs authorities. It has been argued that these messages contain many common elements and a single new message should be developed, encompassing the key elements of both these message so that both parties' requirements can be satisfied.

Requiring shipping lines to send separate but similar messages to each authority is clearly inefficient. However, the IFCSUM and CUSCAR messages were designed for different purposes.

[5] APEC SUB-COMMITTEE ON CUSTOMS PROCEDURES (SCCP), APEC Customs/Industry Symposium: Workshop I "Current SCCP Work Program APEC Business Perspectives" Montréal, Quebec, Canada, May 7-9, 1997

The CUSCAR message, which was specifically designed for customs declaration purposes has widespread acceptance by customs authorities and governing bodies as the de facto standard for the declaration of cargo information by carriers. customs authorities use this information for advanced pre-arrival screening and control purposes. It also serves as a counter check against the importer's declaration for discrepancies.

Major forums such as the WCO, APEC's SCCP, and G7 Customs Group have all endorsed the use of CUSCAR as the standard message for declarations by carriers[6]. From the survey of economies conducted for this study, the CUSCAR message was found to be quite common in its adoption within and outside APEC. Many customs authorities already have the systems and processes to deal with this message.

The IFCSUM message is designed for the carrier to provide consolidated cargo information to the port authority and other parties. Port authorities surveyed in this report that accepted this message used it primarily for invoicing and statistical purposes. Major shipping lines and shipping agents have automated the interchange of manifests through the use of the IFCSUM message.

The following table compares the data elements from each of these two messages. In reality, individual ports and customs authorities use different subsets of these data elements making a meaningful comparison difficult. Note also that this comparison is only indicative and does not take into account the sequence of data elements or iterations of segment groups.

[6] US Customs do not currently support the UN/EDIFACT CUSCAR format. Formats supported are the Customs Automated Manifest Interface Requirements (CAMIR) and the American National Standards Institute (ANSI) ASC X12

Table 1: Comparison between data elements of CUSCAR and IFCSUM EDIFACT messages

IFCSUM - D00A	CUSCAR - D00A
	AUT Authentication result
BGM Beginning of message	BGM Beginning of message
CNI Consignment information	CNI Consignment information
CNT Control total	CNT Control total
COM Communication contact	COM Communication contact
CPI Charge payment instructions	CPI Charge payment instructions
	CST Customs status of goods
CTA Contact information	CTA Contact information
CUX Currencies	CUX Currencies
DGS Dangerous goods	DGS Dangerous goods
DIM Dimensions	DIM Dimensions
DOC Document/message details	DOC Document/message details
DTM Date/time/period	DTM Date/time/period
EQA Attached equipment	
EQD Equipment details	EQD Equipment details
EQN Number of units	
FTX Free text	FTX Free text
GDS Nature of cargo	
GID Goods item details	GID Goods item details
GIN Goods identity number	
	GIS General indicator
GOR Governmental requirements	
HAN Handling instructions	HAN Handling instructions
ICD Insurance cover description	
LOC Place/location identification	LOC Place/location identification
MEA Measurements	MEA Measurements
MOA Monetary amount	MOA Monetary amount
NAD Name and address	NAD Name and address
	PAC Package
PCD Percentage details	
PCI Package identification	PCI Package identification
PIA Additional product id	
PRI Price details	
QTY Quantity	QTY Quantity
RFF Reference	RFF Reference
RNG Range details	RNG Range details
SEL Seal number	SEL Seal number
SEQ Sequence details	
SGP Split goods placement	SGP Split goods placement
TCC Transport charge/rate calculations	
TDT Details of transport	TDT Details of transport
TMD Transport movement details	TMD Transport movement details
TMP Temperature	TMP Temperature
TOD Terms of delivery or transport	
TPL Transport placement	
TSR Transport service requirements	TSR Transport service requirements
UNH Message header	UNH Message header
UNT Message trailer	UNT Message trailer
13 mismatches	**4 mismatches**

The survey of ports in the following section demonstrates that there are a variety of strategies to eliminate separate reporting of data by the carriers to satisfy both port and customs requirements that do not depend on the development of a new message standard. In some of the ports studied, a single manifest transmission from shipping lines/agents is achieved by generating a manifest message (often CUSCAR) to a central EDI database operated either by the port authority, customs or a third-party service provider. This system in turn passes on copies of this message in the appropriate format for each of the various authorities including port and customs. Likewise, the responses from each authority are channelled through the central system and back to each shipping line or agent. Where necessary the information already collected is supplemented with additional data but this still saves the parties from re-entering the entire data set more than once.

The case studies in Section 5 provide several options for consolidation of reporting of cargo information by carriers to port, customs and other authorities. The failure of authorities at any particular port or economy to adopt a similar strategy may imply a lack of the willingness by the parties to take a collaborative approach towards improving the efficiency of the existing system and processes. The issue is certainly not a technical one.

4.4 Collaboration & competition between ports

In some economies where there are several major ports servicing different regions, competition between ports is very intensive. It is not uncommon for ports to use lower costs, more efficient processes, faster turnaround and better road/rail connection to attract carriers from their competitors.

This competitive spirit may have arisen because these ports originated as state or local government entities. More recently, ‘corporatisation’ of state-owned ports has intensified the competition as this places more emphasis on the bottom line. The extent of this competition includes the provision of EDI services such as the processing of manifests and other documents so that vessels experience a faster turn-around time. For some port authorities, getting manifest data directly from the shipping lines rather than through another party is perceived as a good way to stay in touch with their customers.

The resultant situation where each port within an economy has its own systems to handle even the most common of processes such as manifests, dangerous goods and customs formalities is that there is duplication of effort and costs in the name of achieving competitive advantage.

From a shipping line's perspective, when each port's system supports a different standard of functionality, they too must cater for each of the different port systems or use paper-based documents. This is true even when dealing with ports within the same economy. Therefore the rationale of developing and maintaining separate systems to perform essentially the same function is questionable. This is one example where stakeholders in marine transportation, especially within an economy, could consider working together to lower cost and improve the efficiency of the whole marine freight industry in that economy.

Another negative impact of operating separate systems is that the costs involved with developing EDI systems preclude smaller ports from participating, forcing them to continue utilising paper-based systems.

While this report encourages competition, several EDI services in the transportation chain such as processing manifests are quite similar, routine and offer little opportunity for differentiation or competitive advantage. By identifying these processes, ports can decide which ones are suitable to be performed in a collaborative manner and which ones are suitable for differentiation and to be used competitively. An excellent example of such collaboration can be found in the Finland case study in Section 5. Similarly in the UK, nearly all ports are covered by the two main providers of EDI services. Both these service providers are based around major ports but their services are accessible to other small and large ports. One of these service providers Marine Cargo Processing is covered in the Section 5. Both these case studies also demonstrate how collaboration can lower the per capita port costs and deliver functionally rich systems.

Governments have an important role to play as leaders and facilitators in this exercise because the nation stands to become more competitive when individual stakeholders such as the custom authorities, shipping lines, ports and freight-forwarders put aside their individual interest in favour of national interests. Industry may not be able to achieve optimum results on its own due to the high level of fragmentation within the industry and competitive forces that preclude any cooperation.

4.5 Leadership – government and private sector roles

Many of today's successful port community systems were set up through joint funding from the private and public sector. In economies where such system have not been set up, ports surveyed indicated that there were no stakeholders either willing or capable of bringing together all the parties needed to design and build port-based EDI systems.

Hence, both the government and the private sector's role in leading and facilitating these initiatives are very important particularly in lesser-developed economies.

4.5.1 Apathy

Instead of a culture of ongoing improvement, a common attitude found during the survey of marine communities was – "If it's not broken, why fix it?" The presence of an overt and daunting threat that affects the whole community or industry seems to be the best catalyst to get the parties to start considering changing to more efficient processes. The single most important factor that contributes to poor practices in the maritime freight industry has been the lack of any clear drivers to change. Without a clear driver, many initiatives will be met with resistance or completely thrown out because these proposals are seen simply as extra costs without clear benefits or revenue generation potential.

The existence of a competing port within the same region that provides customers with an attractive alternative is a very strong incentive to implement efficiency measures. Port stakeholders will then perceive these measures as necessary for the survival of the port.

Often the success of these proposals will depend on how well the idea or proposal is 'sold' to the community. If a compelling story to support change is presented and a strong self-interest can be created for each party, the participants are more likely to see improvement as a necessity rather than an unnecessary luxury.

Another important driver to change is cost-savings to the stakeholders. This can be more difficult to demonstrate and hence to sell, but as organisations become more sensitive to profit levels, costs savings become an important strategy.

4.5.2 Payoffs from inefficient practices

Some parties within the port community may actually have a self-interest in maintaining the lack of transparency that currently exists. These parties may contribute to the inefficient processes in the existing scenario. For example, an inefficient port operator may actually benefit from the slow turn-around times because it is able to claim higher charges for cargo that remains in the port longer. The delays could in turn be blamed on other players such as customs or the port authority.

Without an electronic system in place that provides transparency it will be hard to monitor the flow of goods through the ports and inefficiencies will remain buried. The various stakeholders will continue blaming each other for the slow turn-around time but the ambiguity in the system will eliminate any hope of identifying the actual 'choke' points.

4.5.3 Government's role

Conflicting interests between various port stakeholders, the difficulty of managing the politics and dynamics of many different organisations, the risk of insufficient participation once the system is completed and the high cost involved in developing and operating port EDI systems are obvious deterrents to any private sector party taking the lead.

In these situations, it may be up to the government to intervene by putting the interest of the nation ahead of any particular group by:

- Removing legislation that require paper documents at ports and introducing comprehensive eCommerce legislation
- Encouraging participation in the system by providing financial incentives
- Arbitrating the costing model and subsequent ownership model of the system to ensure it remains neutral and committed to satisfying the community's requirement.
- Providing the initial capital needed to develop the solution

4.5.4 Data Collection

Ports tend to have limited power in making sure carriers report the type of data required, at the time required, especially if such reporting is not required by law in the economy concerned. This includes manifests and other electronic documents. In situations where competing ports are located close to each other carriers may choose to call at the port that has less reporting requirements, all other things being equal. Naturally, ports want to avoid irritating their customers by making demands for information.

Governments can assist in this regard by sharing the data collected by customs. Customs authorities are in a position to demand this information and it only takes a relatively small effort to have this information electronically passed on to other members of the port community. Any information that the carriers deem to be sensitive can be stripped out.

4.6 Social and cultural issues

One of the biggest impediments to smoother flow of cargo through ports is not related to IT. Rather it is the culture of corruption (giving and taking bribes) as a means of facilitating cargo movement through ports. This has the potential to create 'choke' points all along the transportation chain. It must be declared that this report does not seek to apportion blame or place moral judgement. Instead, we assert that this should be eliminated in order to experience the full benefit of modern EDI systems and other process enhancements.

The first step towards solving these problems is for both government and industry to acknowledge it and articulate its impact on the economy to all parties including the public. Lack of strong leadership and commitment in this regard has crippled any attempt at reform. A technical solution in itself will have no effect or may actually worsen the situation because the perpetrators will only find new ways to circumvent the system that attempts to eliminate opportunities for fraud.

To illustrate how corrupt practices have infiltrated attempts to modernise systems and processes at ports, several examples are provided:

Example 1: In one economy when a new customs system was implemented to provide more transparency to import declaration process and minimise the need for physical inspections, the problem was simply shifted to the IT department. IT staff allegedly corrupted declaration details of properly declared cargo causing it to appear as incorrectly declared cargo. This consequently caused the consignment to be flagged for physical inspection where inspectors could solicit for bribes to negotiate the cargo release.

Example 2: The industry's mistrust for the customs' officers was addressed by setting up a new entity to act as an arbitrator where discrepancies between industry and customs copies of the same declaration. This worked for a while but soon afterwards it became possible to illegally influence officers from the new arbitration body to expedite clearance. The net effect was simply adding an extra link in an already inefficient chain.

Example 3: In one economy the customs department insisted that the new system required its officers to manually either flag each shipment that was imported even though it was possible for the system to automatically clear a majority of the shipments without human intervention. This is an example where opportunities for fraud were deliberately built into the new system.

Any action to stamp out fraud must also include punitive action against exporters caught offering bribes to the local authorities. This will in turn encourage more honest exporters to develop trade with the relevant economies. A study by Johann Graf Lambsdorff[7] shows that the degree of corruption of importing countries affects the trade structure of exporting countries.

4.7 Lack of a legal framework for electronic trade

A common problem faced by economies that have taken the initiative to implement electronic messaging systems in the port environment is the lack of a supporting legal framework. Many archaic laws have mandatory requirements for paper-based manifest, bills of lading, customs declaration, dangerous goods and other government authority permits.

This is usually accompanied by an absence of e-Commerce laws needed to create a safe, reliable and predictable environment for trading electronically (digital signatures, digital certificates and amendments to a whole range of laws to cover digital transactions).

Despite the lack of eCommerce legislation, some port communities have gone ahead and implemented electronic processes for important documents such as manifests. While this has reduced re-keying of data, the paper documents continue to be used in parallel to comply with the laws. In some situations this has made the combined process more inefficient than when it was purely paper-based given that two systems now need to be maintained.

Economies that have yet to implement eCommerce legislation will do well to consult the Model Law on Electronic Commerce produced by the United Nations Commission on International Trade Law (UNCITRAL).

Nearly all the economies surveyed either already have the appropriate electronic laws in place or say that they are in the process of doing so. As such, the emphasis on this issue should focus more on how this new legal infrastructure will operate over the next few years.

[7] Exporters' Propensity to Pay Bribes, A Trade Perspective Johann Graf Lambsdorff, June 1999. http://www.gwdg.de/~jlambsd/Trade_Bribery.pdf

4.8 Lack of IT and communication infrastructure.

Several economies looking to implement electronic systems are stifled by the lack of basic IT and communication infrastructure. The infrastructure in the major cities and ports may be comparable to that in more developed economies. However, smaller ports and road borders may be located where the reliability of even basic infrastructure cannot be taken for granted. This is usually accompanied with the lack of a trained IT-literate workforce which makes any implementation even more difficult.

While the Internet has made many application more accessible to small-to-medium enterprises (SME) in developed economies, it has had limited success in economies where this technology is not widely available.

In some situations where electronic systems have been implemented, the costs may be prohibitive or the level of support may not be sufficient for smooth operations. For example, some port mission-critical systems may only receive support from between 9 – 5, excluding holidays. This is clearly not suitable for a port that operates on a 24 x 7 x 365 basis.

Another related issue is the lack of a mature electronic fund transfer services in some economies. This is often the backbone needed to support a whole range of other electronic transaction including those related to the movement of cargo.

4.9 Lack of a single window to government

Nearly all economies surveyed required several separate declarations to government departments during the import processes. While this study does focus on electronic manifest, the efficiencies gained through any automation in this area will be eroded if other interactions involving declarations to government are not considered with the view of creating a single-window to government or a single declaration.

This concept is also articulated in the 1997 APEC SCCP's Blueprint for APEC Customs modernisation[8].

This concept is also the topic of a paper by the United Nations Economic Commission for Europe, UNECE[9]. The document describes the burden faced by traders who need to prepare and deliver more and more information to various authorities. This is compounded by each authority having either distinct IT systems or paper-based systems. This results in non-tariff trade barriers that slow down trade.

[8] A Blueprint for APEC Customs modernisation, October 1997

[9] http://www.unece.org/cefact/docum/download/02bpsinwin.pdf

APEC economies have an excellent opportunity to improve not just the way electronic manifests are processed by customs and port authorities but transforming the way all declarations are handled through a single window.

4.10 Availability of a choice of service providers

Where an economy has just one government appointed EDI service provider for access to customs and government services, the lack of choice may give rise to animosity. Note that it may have been necessary to award exclusive rights to help the selected service provider recoup the high upfront investment incurred during initial systems and infrastructure development.

There is a risk that the freight community may resent the service provider's monopoly position especially if the community do not perceive they are receiving value for money or acceptable service levels. As users develop their own IT capability and as technology becomes cheaper, they may want more control over the way they access customs and other authorities. There may also be the perception that any organisation that has a captive customer base is inherently inefficient because they are not exposed to the competitive pressures. Furthermore, the service provider may in fact have developed an elitist attitude towards its customer as a result of its dominant and exclusive position. This would lead to further fragmentation within the industry and the loss of opportunities to broaden and consolidate the usage of EDI.

5 Survey of practices

The purpose of performing this survey of electronic messaging practices within and outside APEC is to enable economies to benchmark their own systems against external systems and identify opportunities for improvement.

While each economy will find that local circumstances influence the design of local processes, there is significant benefit in enquiring and understanding how other ports or economies have dealt with similar challenges. The information learnt can then be adapted to the local environment to facilitate the implementation of changes where appropriate.

Benchmarking own performance against other leading ports is a constructive and ongoing process. Tracking key performance indicators against agreed objectives enables economies to monitor the progress and effectiveness of their chosen strategies.

The amount of information that was collected during this survey varied based on the willingness of each economy to provide the requested information. Where sufficient information was collected, some import processes are illustrated using functional flow-chart. This visual description augments the textual descriptions provided. The functional flow diagram only show high-level data flows and is not intended to be exhaustive or complete. *Although every attempt has been made to document actual processes accurately the textual description and the data flow diagram may contain errors and omissions.*

The reader's attention is drawn to ports that are tagged as 'Case Studies'. The implementation of IT and EDI in these instances demonstrates effective strategies to overcome problems faced by the majority of other ports in APEC region.

5.1 Australia – Sydney Ports

5.1.1 Overview

In Sydney, as in all Australian ports, carriers are required to send separate manifests to the port authorities and customs - CUSCAR message to Customs and IFCSUM message to port authorities.

5.1.1.1 Port Authority System

The port authority of Sydney, Sydney Ports, operate the Integrated Port System (ShIPS) which is a computerised scheduling and booking system used to coordinate and monitor vessel movements. ShIPS cater for the sending and receiving of electronic manifest (IFCSUM), Dangerous Goods (IFTDGN) and Customs Notification of Arrival Messages (CUSREP). Shipping lines transmit manifest to ShIPS via Internet email.

5.1.1.2 Customs Authority Systems

The Australian Customs Services operate a centralised national system known as SEA Cargo Automation (SCA) that allows carriers arriving at any Australian port to submit documentation directly to the central customs host system. One of the benefits of this system is that carriers have been able to reduce or eliminate altogether the number of staff at each Australian port for the purpose of dealing with customs. Many have centralised their operations resulting in cost-savings. There have been corresponding gains in efficiencies for customs as well.

In its original form, the Australian Customs Services' SCA system was intended to accept the electronic manifest from the carrier and pass this information (without any sensitive information) to the Port Authorities manifest. This would require for carriers to submit manifest only to the customs service. This functionality was trialled in 1993 but abandoned soon after for various reasons.

5.1.2 Messages Supported

5.1.2.1 Sydney Ports

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

5.1.2.2 *Customs*

CUSREP	Vessel Arrival Notice (Shipping Line to Terminal)
CUSCAR	Cargo Manifest (Shipping Line to Terminal)
CUSDEC	General Customs Declaration on Export

5.1.3 Key Issues

Most Australian port stakeholders interviewed for this report indicated that they would support a system that, in principle, involves a single manifest transmission from the carrier and the subsequent redistribution of relevant subsets of this manifest to other parties such as the port authorities, customs, AQIS, terminal operators and other parties. This would have to be subject to the filtering of sensitive data depending on who the recipients are.

Despite this apparent support, the following issues must be considered:

5.1.3.1 *Lack of a collaborative approach*

Despite the original attempt to build such a system, the failure of the port community to implement a consolidated approach to data collection from the carriers could indicate a lack of coordination, communication and common will to make such an initiative succeed. There are several examples of successful implementations in other economies to indicate that there are no technical reasons for not implementing a more integrated data collection system.

5.1.3.2 *Competition between ports*

The current ownership structure of Australian ports creates an extremely competitive environment to operate in. While competition should be encouraged and will lead to better prices and efficiency in some areas for users, there may be opportunities for the ports to work together to handle fairly routine processes such as inward manifest processing and other EDI messages. These are opportunities for the improvement in efficiency, service and costs savings.

5.2 Canada – Vancouver Port

5.2.1 Overview

The Vancouver Port Authority (VPA) receives data from carriers from three sources.

1. Various container carriers send manifest and bill of lading data electronically.
2. Other carriers send paper copies of these documents directly.
3. Canada Customs have agreed to pass on a stamped copy of their documents provided the carrier has submitted an additional copy for that purpose.

Ultimately, the carrier is responsible to ensure that this information is sent to the Port Authority and is obliged to do so under the Canada Marine Act, The Vancouver Port Authority Fee Document and special memorandum under Canada Customs.

VPA is endeavouring to increase the number of carriers who send data electronically and to expand the options available to allow them to do so. This includes EDI, e-mail attachments and to assist in the development of scripts to pull specific data sets from customer databases for transmission to the Port. Their ultimate goal is to increase efficiency of data collection while minimizing the impact to the carriers. By doing this they can then provide more timely reports and forecasts back to the port's stakeholders.

VPA is constantly investigating solutions that will streamline and simplify the data transfer between all the port stakeholders. Their goal is to provide an easier and more efficient place to conduct business.

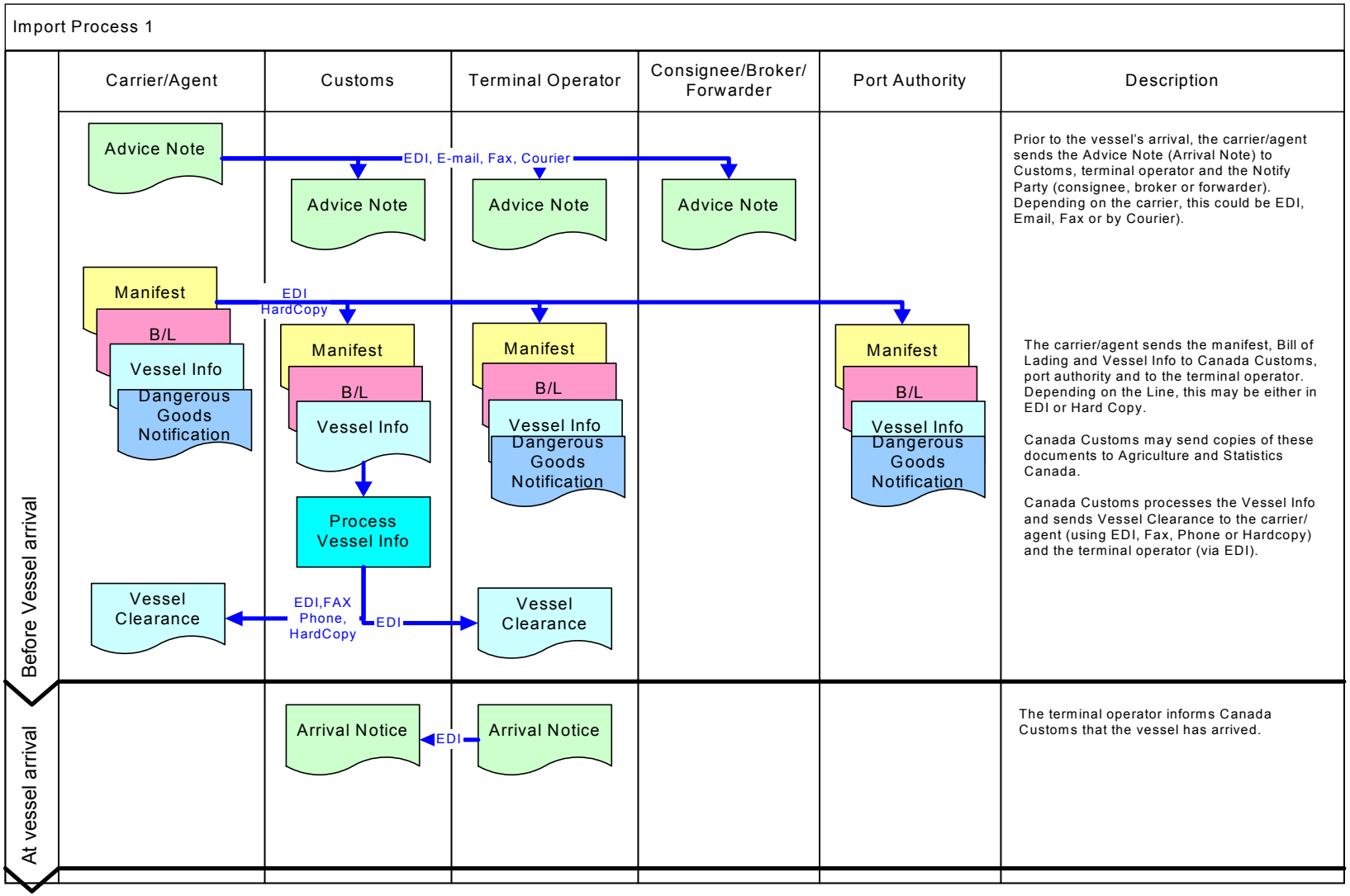

Figure 2: Vancouver – Vessel pre-arrival

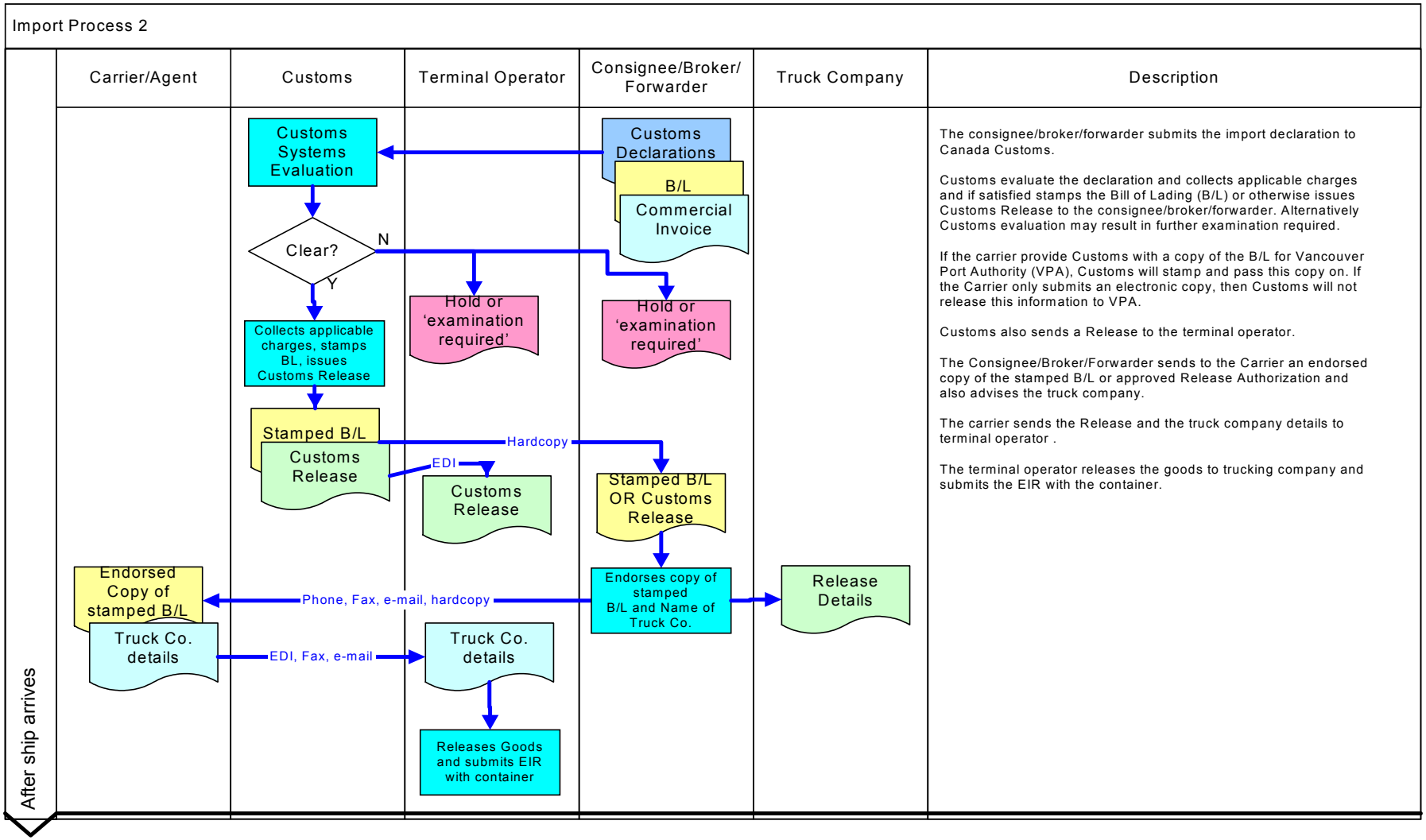

Figure 3: Vancouver – Post arrival

5.2.2 Communication Infrastructure

Communication between various port stakeholders are varied – EDI, FAX, Phone, Hardcopy, email attachment. This is because not all entities in the port community are capable of sending and receiving electronic documents.

The VPA operates a system to collect Manifest, dangerous goods and vessel information from carriers. This information is used internally for invoicing purposes, providing information to Statistics Canada and for reporting to internal and external VPA customers.

5.2.3 Message Supported.

The following electronic messages are used at the Port of Vancouver:

5.2.3.1 ANSI 311 Canadian Customs Information

Sent by the carrier to the Customs Canada as well as the Vancouver Port Authority.

The format maps to Canada Customs documents A6 Marine Vessel Report and A6A Marine Cargo Report.

5.2.3.2 Terminal Operation Report

Sent by the terminal operator to Vancouver Port Authority.

5.2.3.3 Vessel Operation Information

Sent by the terminal operator to VPA.

5.2.4 Key Issues

5.2.4.1 Information collection

Vancouver Port Authority is very conscious about balancing its role as a provider of shipping/trade facilities and its ability to collect information from port stakeholders, especially carriers. Antagonising the carriers with demands for information may result in some carriers opting to use other ports.

Given that their information needs are similar to that of Canada Customs VPA have explored the possibility of sharing data collection responsibilities. In general, shipping lines do not challenge customs reporting requirements. Furthermore, customs authorities are able to enforce their requirements as a prerequisite for clearance. Port authority reporting requirements on the other hand may be seen by carriers as non-essential and hence may be viewed as an inconvenience. Therefore, VPA believe they are more likely to get consistent and complete information if they can get this information through customs. This would also benefit the carriers as they only need to report once. Naturally, information that the carriers consider to be sensitive must first be removed.

Currently, customs do pass on stamped hardcopies of manifest from carriers to VPA if the carriers provide a copy for that purpose. Electronic copies are not shared.

5.2.4.2 Message standards

Because of its close proximity to the USA, VPA tends to follow message standards utilised by their American counterparts. The default standard utilised is the ANSI X.12 standard.

There may be an opportunity for VPA to start supporting the UN/EDIFACT standard that has a much wider global acceptance amongst carriers, customs authorities and port authorities as Canada Customs implements the G7 one-step and two-step processes based on the CUSCAR message (see next point). Supporting a worldwide standard may also increase the proportion of cargo reported electronically.

5.2.4.3 Silo mindset

There may be tendency for various stakeholders in the transportation chain to work in vertical silos, causing the industry to appear fragmented. All parties need to take on a broader, more horizontal perspective so that further efficiencies can be attained across all transport and logistic processes.

5.2.4.4 Lack of an integrated port information system

The lack of an integrated platform that allows each member of the port community communicate with each other in a paperless and efficient environment will limit the opportunities to re-engineer existing process. The use of EDI to achieve streamlining and efficiency must be seen as more than an opportunity to replace paper documents with equivalent electronic documents. It provides an opportunity to review the information needs of each port entity and to develop solutions that will be able to deliver these needs both now and in the future.

5.3 CASE STUDY: Chile –Port of Valparaiso

5.3.1 Overview

5.3.1.1 Customs initiatives

The Chilean Customs Authority has implemented a new system called ISIDORA to enable the management of customs process over the Internet. The features of the system include:

- Electronic documents, signatures and payments
- Simplified operations and transactions
- More selective inspections

Using the new system, carriers/agents send electronic manifests to the customs authorities who then pass a copy on to Port of Valparaiso (Empresa Portuaria Valparaiso, EPV). The system uses XML-formatted messages to exchange messages. Once this is fully implemented, the requirement for carrier/agents to provide 3 copies of paper declaration to the port authority and also to customs will be eliminated.

5.3.1.2 Port Authority initiatives

In 2001, EPV and other port community members implemented the Valparaiso Logistic Trade portal www.vlt.com. Using the new system, the EPV will be able to initiate all its operational process needed to handle a vessel and its cargo based on the electronic manifest. All message format used in the new system for exchange of messages between the port, customs, the agricultural inspection authority (SAG), trucking companies and shipping lines/agents are in XML format.

With this new system EPV endeavours to collect information from its source so that each subsequent party in the logistics chain is not required to collect and declare the same data repeatedly.

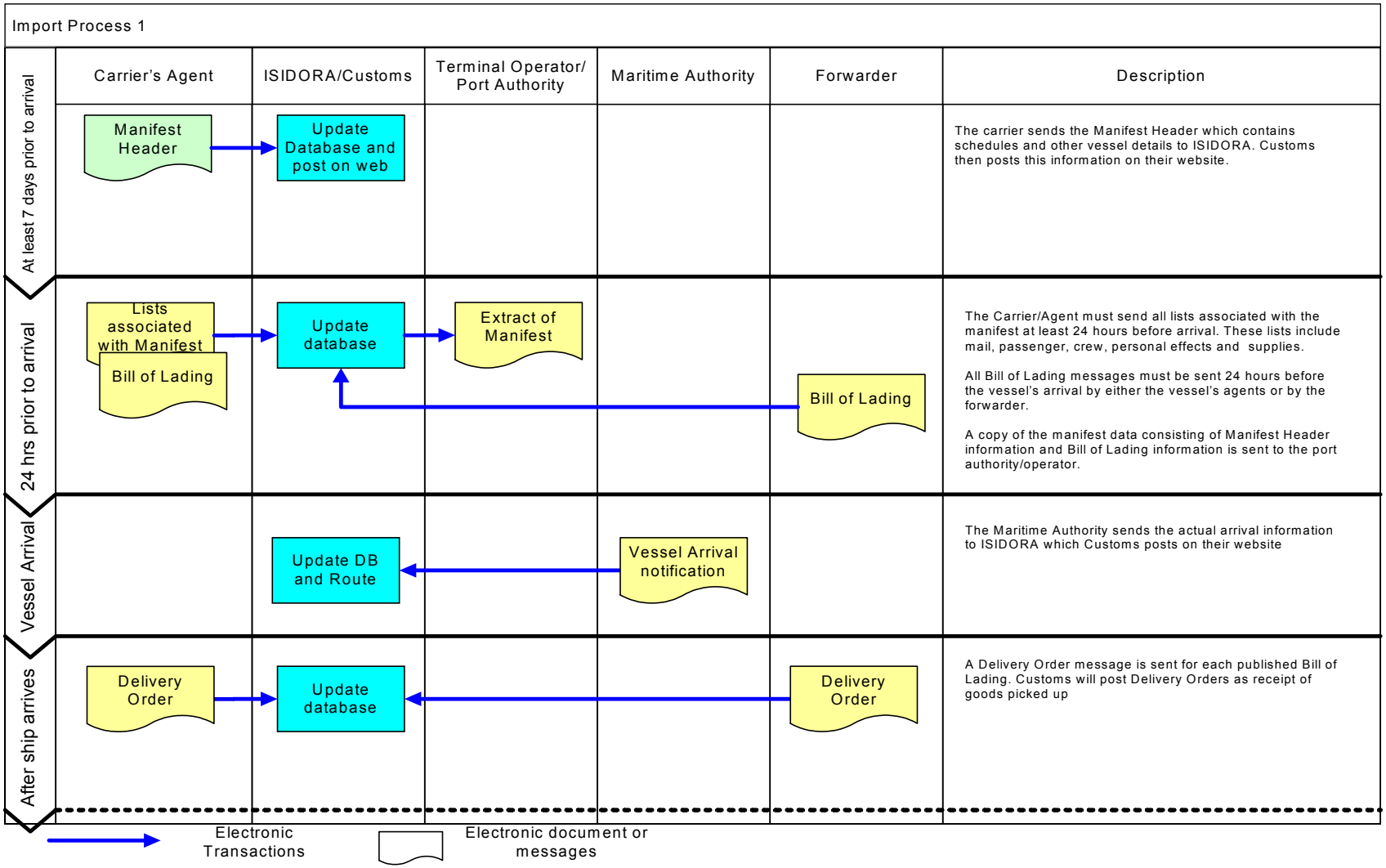

Figure 4: Valparaiso - Import Process

5.3.2 Background – Customs ISIDORA System

The project was developed in several stages, each delivering a specific module.

5.3.2.1 Module 1: Established the focus and the development scope.

Customs business operations were defined in this stage. Operational relationships allow understanding of the whole business. The customs services activity diagram was also built.

5.3.2.2 Module 2: Development of Base Software

Common functions and components were designed and built. These input/output interfaces enable parameter definition and management for validations and input validation rules.

5.3.2.3 Module 3: Manifests and others documents

Handling of manifests and others documents were designed and built. Common functions and components were designed and built. Data required from external users was defined and built.

5.3.3 Messages Supported

5.3.3.1 Manifest Header

This message includes the vessel schedule and it must be sent by the carrier's agents to customs at least 1 week before the estimated time of arrival to a Chilean port.Customs will publish the "Manifest Header" on their web site, from which all B/L's and voyage lists will be associated.

5.3.3.2 Lists associated to Manifests

This includes Mail, Passengers Lists, Crew, Personal effects, supplies lists. This must be sent at least 24 hours before the estimated time of arrival.

5.3.3.3 Vessel Arrival/Departure Information

This must be supplied to customs by the maritime authority for each vessel entering or leaving Chilean ports.

Customs will post this information on their web site.

5.3.3.4 *Bill of Lading*

Vessel's agents and freight forwarders must submit this to customs at least 24 hours before estimated arrival for incoming goods.

Bills of Lading (BL) must be sent in Spanish (preferably) or in English to avoid multiple translations.

Child BL's can be sent even before registration of the Master BL.

5.3.3.5 *Delivery Order*

Vessel's agents or freight forwarder must send the delivery order for each BL. customs will post each BL as receipt of goods picked up.

5.3.4 Communication and Solution Infrastructure

The customs Internet solution, ISIDORA was developed by TUXPAN. Group. The system uses the latest in 'open' Internet technologies including Java-based platform running on Linux operating system. By minimising the different types of technology used in the system, the Chilean customs Authority have been able to provide a flexible, modern and transparent system to the transportation community as well as to importers and exporters. Some of the systems technological features include:

- Unified Modelling Language (UML), Object Oriented Methodology, Oracle, Java 2 Enterprise Edition compliance, XML, Wireless technology and multi-layer architecture.
- The Use of Z3-Case® Tools.
- Digital signature.
- Redundant hardware.
- High availability of communications infrastructure.

The solution was developed and implemented by a work force educated in IT and customs procedures.

5.3.5 Key Success Factors

5.3.5.1 *Technology Selection*

The selection of 'open' Internet technologies that are flexible and affordable played an important role in the success of the system. For example, the use of XML instead of traditional EDI messaging helped reduce development timeframes and costs.

The use of open technologies has also helped minimise the total cost of ownership of the customs system.

5.3.5.2 *Philosophy of key players*

The customs authority has a clearly articulated strategy for minimising any unnecessary intervention without compromising their roles in revenue collection and border protection. They continuously seek to achieve these other roles through sophisticated risk management and other technologies. Behind this philosophy is the view that, as customs does not add value to these trade processes it must therefore seek to act as a facilitator wherever possible.

5.3.5.3 *Affordability and Accessibility of the system*

The ISIDORA system is made available to all users by the customs authority at no charge. Users only need to arrange their own Internet access to use the systems services. One of the factors enabling this affordability is the choice of an open and non-proprietary technology architecture.

5.3.6 Valparaiso Logistics Trade - Vlt.com

Since March 2001, the Port of Valparaiso (EPV) has been operating Valparaiso Logistic Trade (www.vlt.cl), an online information system of foreign commerce activities for the logistic management of cargo.

The www.vlt.cl web site gives exporters, importers, transport fleets, quay agents, custom agents, shippers and ship owners the possibility of obtaining information about related operations of cargo and vessels through a common channel via the Internet.

Real time Information on cargo status is made available instantaneously to users through the Internet. This facility is enabled through sophisticated cameras and temperature sensors systems connected to the net.

The platform also offers other services covering planning, cargo loading and tracking and industry statistics, as well as providing real-time cargo information to port workers, exporters, importers, agents and transport companies. The platform is a joint initiative by the Port of Valparaiso, the South Pacific port terminal, Chile's Exporters' Association and the Santiago Chamber of Commerce (CCS).

EPV differentiates itself from other ports by endeavouring to provide transparency all the through the logistics chain. By collecting data as close to the source as possible, they have been able to eliminate re-keying in of the same data several times. Each party on the chain can use the Web to check the information and update/add information as required.

5.4 P.R. China – Port of Tianjin

5.4.1 Overview

Tianjin Port is one of the nine ports in China that operate its own EDI Centre. The other ports are Shanghai, Qingdao, NingBo Dalian, Yantai, Lianyugang, Xiamen, Guangzhou and Shenzen. Each of these EDI Centres connect local freight companies, agencies and shippers to each other and to government agencies such as customs.

Currently in Tianjin port, 3 international container carriers are taking part in a trial involving sending the IFCSUM electronic manifests and BAPLIE message to the port EDI centre.

There are two distinct conditions that determine how the manifest messages are handled:

1. The carrier sends the manifest to the local shipping agent using the EDIFACT standard. As the local agent cannot handle this standard, it is passed through to the EDI Centre to be converted into the Ministry of Communications (MOC) standard and sent back to the agent. The agent's system can now understand the data and it is resubmitted to the EDI Centre where it is translated to another international standard (presumed to be EDIFACT) and submitted to the customs authority.

2. The carrier sends the manifest to the local shipping agent in the MOC standard. In this instance, the agent's system can understand the message and submits it to the EDI Centre where it is translated to another EDIFACT message format and submitted to the customs authority.

The customs authority in Tianjin supports UNSM CUSCAR message. The EDI centre also formats and sends the manifests data electronically to 2 other parties – the terminal operators and the tally agents (a private agency responsible for physically checking and counting the cargo to ensure it matches the declaration). These are also sent using the local proprietary formats.

For carriers that are not part of this trial or if the vessel belongs to COSCO, electronic manifests and bayplans are first sent to the local shipping agents in the MOC format. Shipping agents send this to the EDI Centre to be converted to UN/EDIFACT which is then sent to the customs authority.

Current legislation still requires shipping lines/agents to send hardcopy manifests to customs regardless of whether electronic ones are sent. Additionally, there are several other formalities where carriers must provide paper documents when it calls at the port including reporting to vessel supervisor, immigration and marine supervisor.

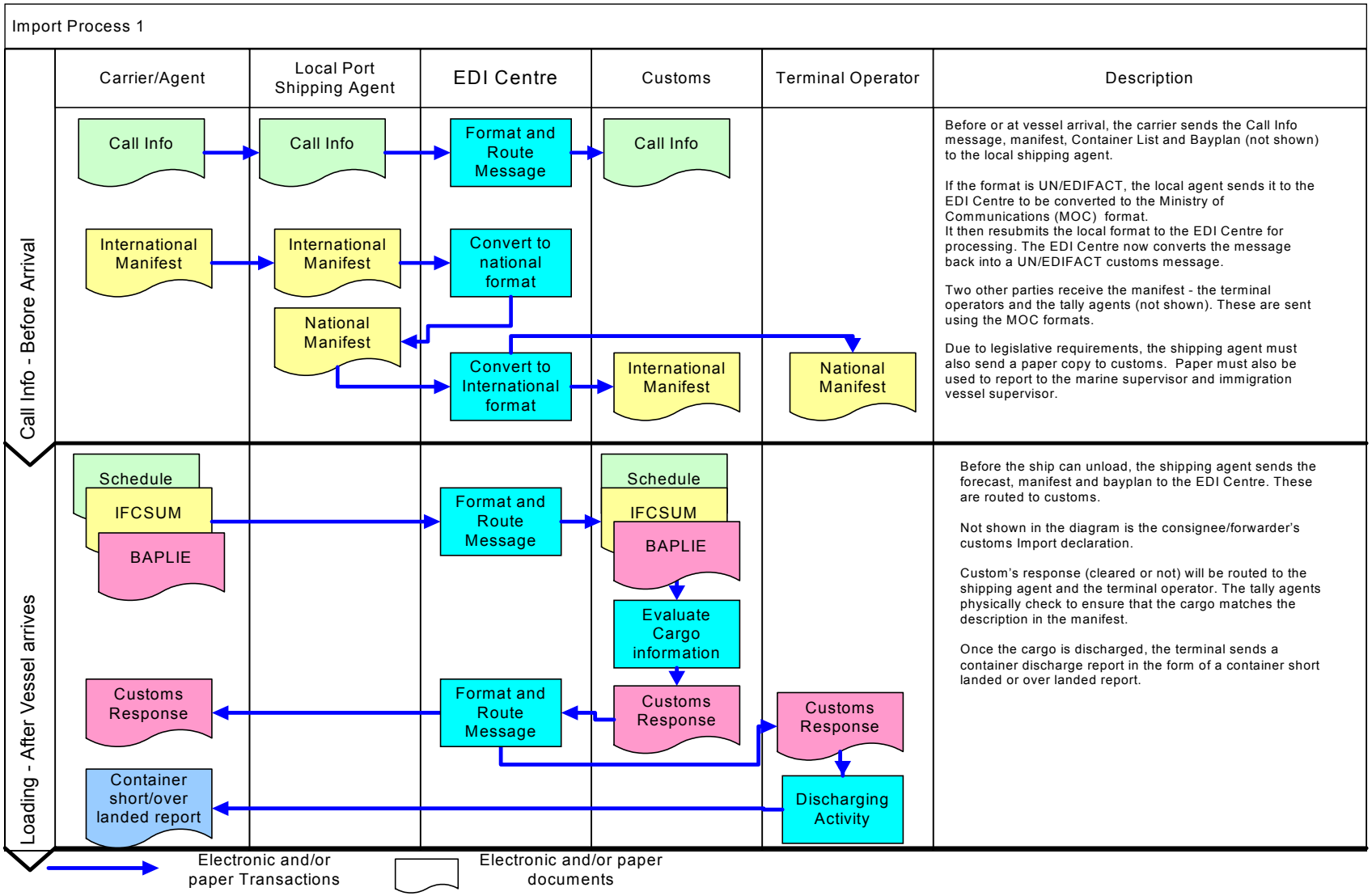

Figure 5: Tianjin – Import: Call Info and Loading

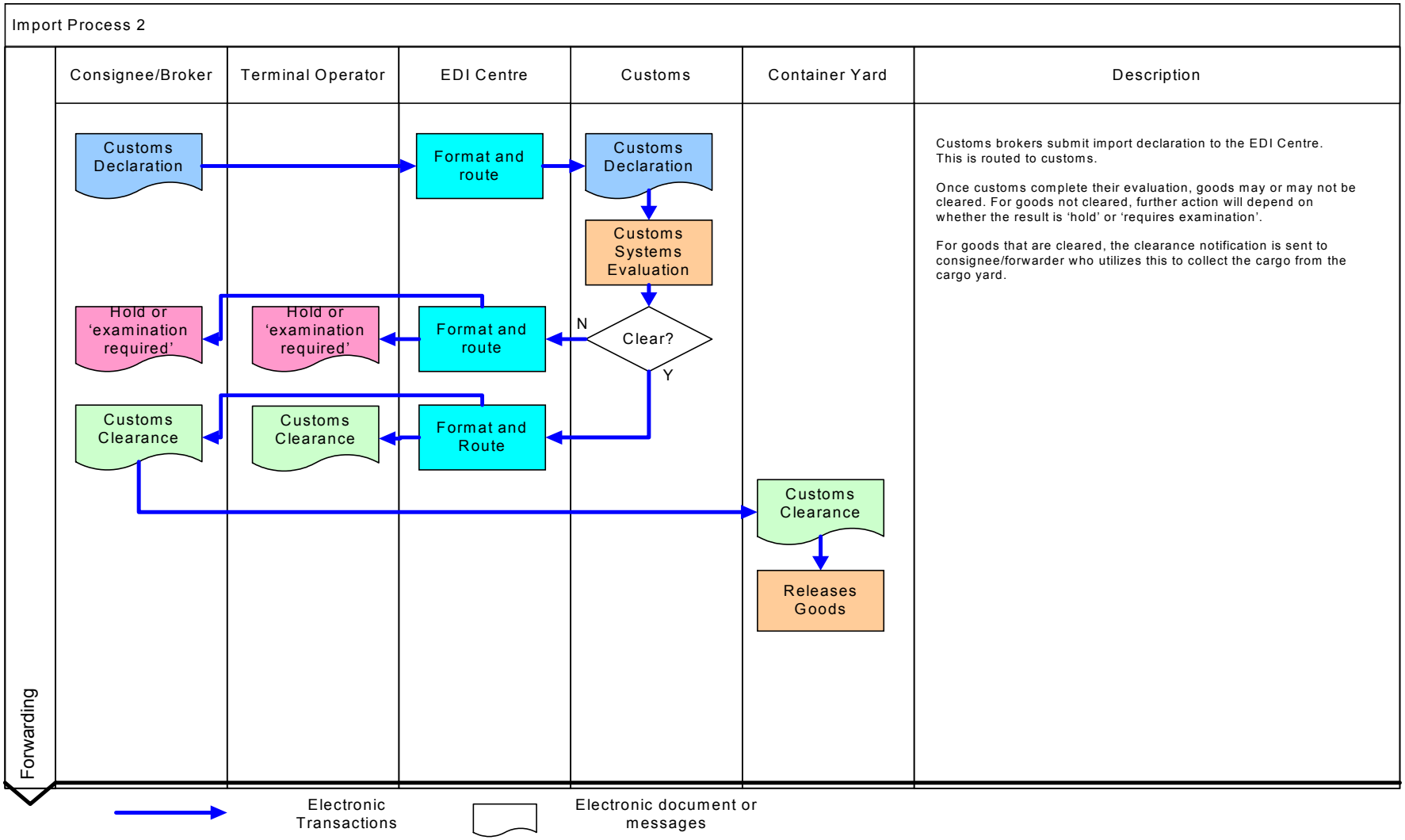

Figure 6: Tianjin Import Process - Forwarding

5.4.2 Communication Infrastructure

Tianjin's EDI Centre consists of a central AMTrix system. This system has a range of communication features, such as TCP/IP, DECnet, X.25 and X.400, integration to Web Servers and Lotus Notes

Currently remote users have dial-up and Internet access to the EDI Center's services.

Tianjin Port's core EDI Engine was developed using Amtrix, the advanced software messaging technology by Viewlocity (www.viewlocity.com).

5.4.3 Message Supported

Tianjin Port's EDI Centre brochure list the following UNSM messages as supported:

IFTSAI	Forwarding and transport schedule and availability information message
CALINF	Vessel call information message
VESDEP	Vessel departure message
IFCSUM	Forwarding and consolidation summary message
BAPLIE	Bayplan/stowage plan occupied and empty locations message
IFTDGN	Dangerous goods notification message
IFTIAG	Dangerous cargo list message
MOVINS	Stowage instruction message
COARRI	Container discharge/loading report message
COSTOR	Container stuffing/stripping order message
COSTCO	Container stuffing/stripping confirmation message
COEDOR	Container stock report message
CODECO	Container gate-in/gate-out report message
IFTMBF	Firm booking message
IFTMBC	Booking confirmation message

5.4.4 Key issues

1. Until legislation and operations are updated to remove the requirement for paper manifest and other documents for government and operational requirements, there will be very little incentive for members of the port community to take steps towards establishing a paperless trading environment.

2. The major ports operate their EDI centres independently of each other. Although all the EDI centres support UN/EDIFACT, there is a danger that they exist in isolation and will evolve differently based on local requirements. A structure to coordinate the development of a unified solution for all ports will help streamline the interface between ports and other stakeholders.

3. Electronic Funds Transfer over the Internet is not widespread in the marine freight environment. Concerns about the security of sensitive data transferred over the Internet are still an issue. Until the changes needed to increase confidence in electronic financial transactions are implemented, the paperless trading initiative will have limited success.

4. Extensive use of proprietary formats for communication between port entities (e.g. customs, terminal operators, tally agents), could act as a deterrent to move to EDIFACT standards. Strong incentives and high-level intervention will be needed before organizations are prepared to invest in educating, encouraging and finally enforcing the use UN/EDIFACT standard throughout the marine environment.

5. The America Chamber of Commerce PRC[10] in its 2002 White Paper lists several fundamental problems that affect the efficiency of transportation and logistics in China. These include regulatory restrictions, high costs, dominance by government-invested entities and business scope limitations. Unless these issues are addressed, technology solutions will only have limited benefit towards overall efficiency in the port.

[10] http://www.amcham-china.org.cn/publications/white/2002/en-25.htm

5.5 China, Hong Kong International Terminal

5.5.1 Overview

In Hong Kong, shipping lines generally need to send manifests to customs authorities only. Except in special cases, neither the port authority nor the terminal operators have any need for this information. Both these bodies use other operational data for calculating charges. Some terminal operators also extract manifest-related data from the Bayplan message.

Current shipping lines/agents are required to provide customs with the manifest in paper format. Tradelink, an established e-Commerce service provider to the trade and transportation sector in HK has recently completed an electronic manifest (E-MAN) system that is ready for implementation. However, carriers have been reluctant to take up this service (see below).

One of Hong Kong's main terminal operators, Hong Kong International Terminals (HIT) has been using EDI for over 10 years. The original systems were implemented using proprietary standards and HIT aim to phase these out as soon as possible in favour of UN/EDIFACT. Currently, the two UN/EDIFACT messages supported by HIT are COPARN (booking message) and BAPLIE (Bayplan).

This will soon be extended to include:

- Dangerous goods info
- Reefer container / cargo info

5.5.2 Messages supported

- Shipping line information
- Manifest demand
- Outstanding manifest advice
- Government query
- Query response
- Detention notice & acknowledgement
- Release voucher & acknowledgement

5.5.3 Key issues

1. In Marc Laperrouza's article, **Electronic Commerce in Hong Kong and the Prospects of Integration with South China**, he lists the following as issues in the uptake of EDI in Hong Kong:

   - Need to incorporate Chinese language in EDI transactions.
   - Lack of Government support.
   - Lack of standardisation and legal frameworks.
   - Hong Kong's organisational and societal culture.
   - Lack of critical mass of users.

2. These issues play a part in impeding the development of a comprehensive port eCommerce/EDI infrastructure but the lack of clear strategy and leadership to bring about an integrated port eCommerce and EDI plan should be of concern. Given that the shipping industry continues to be a significant contributor to Hong Kong's economy, the lack of a comprehensive plan could see Hong Kong lagging behind its competitors in this area.

3. Another important factor is the lack of willingness by some parties to change the processes that they are comfortable with and to adopt newer processes that will improve the overall effectiveness of trading in Hong Kong. A collaborative approach, taking into account each party's interests is required if Hong Kong is to achieve anything near the level of automation some of its regional competitors have achieved.

5.6 CASE STUDY: Finland – PortNet

5.6.1 Overview

PortNet is a virtual port community system for the Finnish ports. It provides a single administrative desk for entering information required from the shipping lines and ship agents. The information covers the advance arrival/sailing notices, the dangerous goods declarations, the cargo information either as customs manifest or as statistical cargo declaration. It also represents a single interface for retrieving the information for the port authorities, customs and the maritime administration. The system is also integrated with the other maritime administration systems. The new version of the system was introduced in 1999 and named Port@Net because it was entirely browser-based. Since then the system has been renamed PortNet.

PortNet replaces separate vessel and cargo notifications with one electronic document (electronic manifest). The electronic manifest is delivered to the PortNet system by using CUSCAR, CUSREP and IFTDGN messages. The content of the manifest is mainly related to customs issues and dangerous cargo but it also provides information for invoicing and statistical needs. The PortNet solution offers XML and EDIFACT data-transfer and retrieval.

5.6.2 Background

5.6.2.1 The PortNet Community

The Community was founded to gather together all those who had a common desire to resolve the traffic reporting problem in ports. The PortNet system is only an expression of this idea. The Community was founded in 1992 but became a more formalised organisation in 1998, after the common goals were set in a signed common protocol. Strictly speaking, PortNet Community is still not a legal entity but owns the application.

5.6.2.2 How it started

The PortNet community was originally formed in the early nineties as a result of a collaboration between The Ministry of Transport and Communication, 20 port authorities, the Finnish Ship brokers Association, the Finnish Maritime Administration and the National Board of Customs. The goals of PortNet were:

- Simplification of current procedures within the port communities
- Unified and harmonised procedures for all maritime related parties

- Joint IT systemBefore PortNet, the port community was filling 4 – 7 forms with roughly the same information for each arrival/departure. Apart from the time it took to perform this exercise, it also increased the risk of errors being introduced. The community decided to streamline the ports processes and managed to reduce the number of forms to 2 (because customs still required their own format). It was decided then that electronic collection and reporting of information was required. Further, it was realised that the most benefits would be achieved if advanced information about arrival and departures were available to the authorities.

5.6.2.3 How it developed

From the first version of Portnet, everything was financed, built and operated by the Portnet-community. The system depended on VT100 terminals on an IBM 370 main frame with high operating costs. Major requirements for development existed but changes were so expensive to implement that no development occurred during a number of years.

In 1998 it was realised that PortNet was not Y2K compliant. This triggered a completely new project called Port@Net because now the user interface was web-based. The name has been changed back to PortNet since.

5.6.3 Data Flows

The following functional data flow diagrams were constructed by Tranzteknik from information provided by the PortNet Community. It only shows high-level data flows and is not intended to be exhaustive or complete.

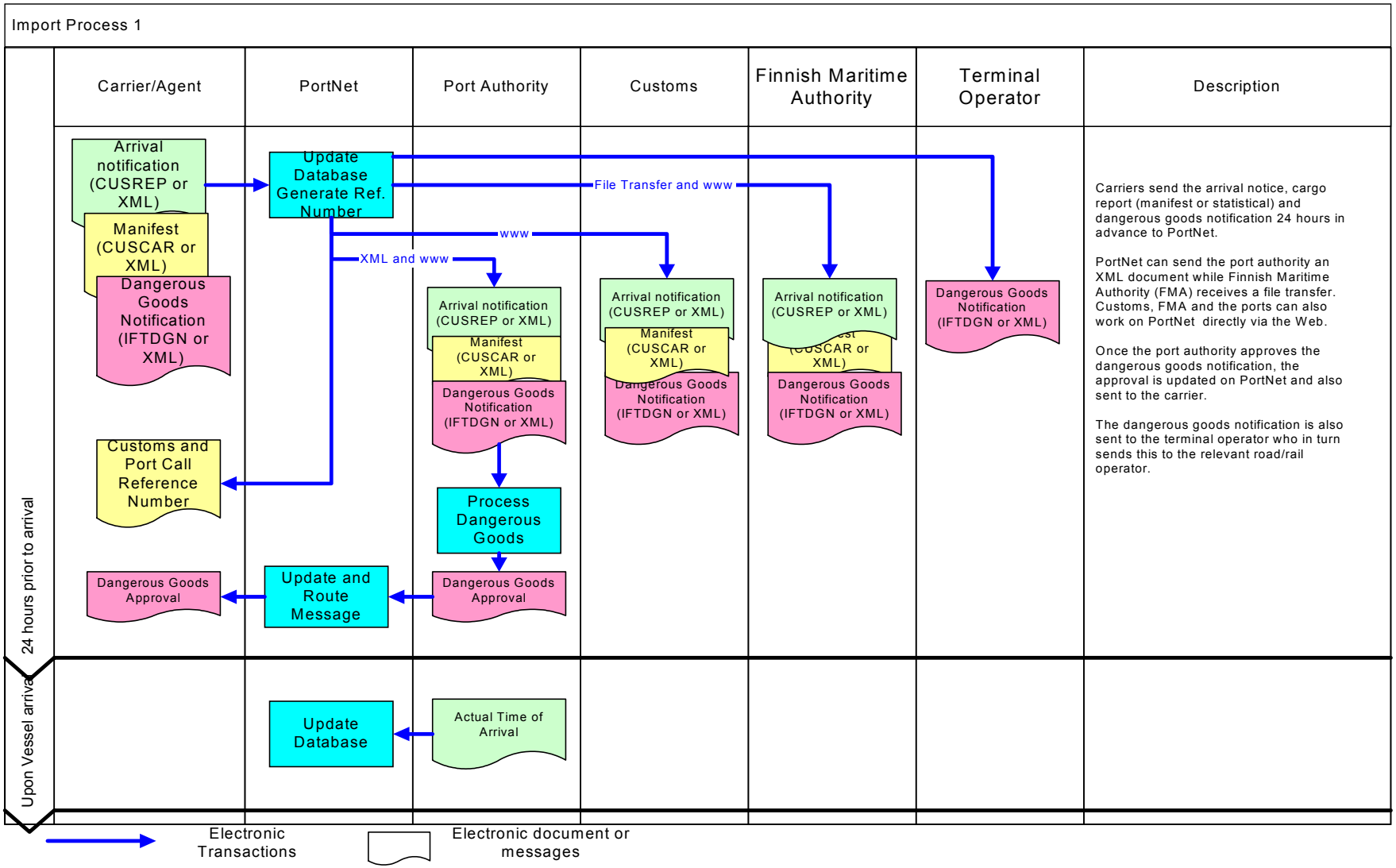

Figure 7: Finland's PortNet system - Import Process

5.6.4 Message Supported

The key players in this system are the shipping lines or their agents, customs, port authorities and the Finnish Maritime Administration.

5.6.4.1 Information from Shipping Lines

- Port Call Notifications
- Dangerous Goods Notifications
- Cargo Notifications for Statistics
- Manifests
- Waste disposal notifications

5.6.4.2 Information from Authorities

- Actual times of arrival & sailing
- Permissions for dangerous goods
- Decisions on fairway dues
- 'Freezing' of manifests
- Vessel data

5.6.5 System Benefits

5.6.5.1 Customs

- Clearance can be controlled by using pre-arrival information and risk analysis
- Clearance can be done at any time and in any place
- PortNet saves costs and time (less writing and copying, less travelling and less waiting)

5.6.5.2 Port Authorities

- Information available quickly, in the right form and easily.
- Allows improved reporting possibilities.
- Facilitates cooperation between participants.

- Provides benefit to all participants.

5.6.5.3 *Shipping Line*

- Reduction in paper documents.
- Reduction in errors.
- Updates entered centrally are automatically propagated.
- Quality of Dangerous Goods Notifiction improved.
- In-house processes simplified.

5.6.6 Communication and Solution Infrastructure

PortNet is an Internet/Extranet-based solution, hence users connect to the system using IP (Internet Protocol).

PortNet has been implemented on web-centric 3-tier architecture with the following components:

- Java-client (for heavy users) and thin-client (occasional users)
- Mobile-client in pilot use (WML and HTML client)
- Web-server (Apache)
- Middleware and user management based on AtBusiness Solutions Framework (supporting J2EE application servers)
- Database-server (Oracle)
- EDI integration with various stakeholders' systems based on XML Integrator, a component of AtBusiness Solutions Framework

5.6.7 Key Success factors

1. While Finnish Ports and other entities are extremely competitive amongst themselves, the members of the marine community were willing to cooperate for the good of the whole industry.
2. EDI Management and the Finnish Maritime Authority played a large part in providing leadership to this initiative and educating the community on its benefits.

3. Finnish ports faced competition from other ports in the Baltic who have invested large sums to develop their marine sector. Finnish ports were at a disadvantage in this respect because of the high fairway dues charged. The existence of this driver to improve efficiency within the Finnish Maritime industry may have been one of the catalysts that made the PortNet opportunity very attractive.

5.6.8 System Developer

While the entire PortNet community was involved in its development, the following organisations were instrumental in providing business and technical expertise.

- EDI Management (www.edimanagement.com)
- AtBusiness Communications (www.atbusiness.fi)

5.7 Indonesia – Tanjung Priuk

5.7.1 Overview

The container terminals at Tanjung Priuk have been implementing several functions using EDI since the late 1990s. Currently, this is being expanded to the conventional terminal.

A new system is currently under development where carriers/agents have a single interface to the customs system in order to complete all formalities at the port. Once customs have examined the manifest, it is uploaded to the Port Community Portal. All other parties entitled to this data such as the port authority and terminal operator can then download data specific to their needs based on their access rights. From a data security aspect, closed user groups are given restricted access to selected data and trading partnership agreement principles are implemented. This system is due to start operations in October 2002.

5.7.2 Message Supported

The messages described refer to the current system operating at Koja Container Terminal and Jakarta International Container Terminal (JICT) as at July 1999.

5.7.2.1 Container Discharging

CUSREP	Vessel Arrival Notice (Shipping line to Terminal)
CUSCAR	Cargo Manifest (Shipping line to Terminal)

BAPLIE	Bay Plan (Shipping line to Terminal)
COARRI	Discharging Report (Terminal to Shipping line)

5.7.2.2 Container Delivery

CUSRES	Customs Release (Customs to Terminal)
IFCSUM	Shipping line Release (Shipping line to Terminals)
IFCSUM	Request for Delivery (Importer to Terminal)
CODECO	Container Gate Out Report (Terminal to Importer)

5.7.2.3 Container Receiving

COPARN	Container Announcement (Shipping line to Terminal)
APERAK	Container Acknowledgement (Terminal to Shipping line)
CODECO	Gate In Report (Terminal to Shipping line)
INVOIC	Storage Invoice

5.8 CASE STUDY: Malaysia – Port Klang[11]

5.8.1 Overview

The Port Klang Community System is an e-Commerce messaging system that was first launched in 1993. The key participants in this system are the port authority, customs, port operators, shipping agents, forwarding agents, freight forwarders and banks.

The primary objective of the system was to simplify the documentation procedures to such an extent that all duplication and redundancies are eliminated and, where possible, to capture information at source and route to all parties concerned. For instance, before a vessel calls at Port Klang the CUSREP (vessel information) message is sent by the shipping agent to PKCS and it is routed to the relevant parties (such as port operators, port authority, customs and other government agencies). Similarly the CUSCAR message (customs manifest) is sent by shipping agents to PKCS where it is routed to the port operators, port authority, customs and other government agencies. Likewise the CUSDEC message is sent by the forwarding agent and is routed to customs.

[11] Progress Report Of Malaysia to the 18th AFACT Meeting in Taipeh, MEC Secretariat, Malaysian Administrative Modernisation & Management Planning Unit, Stember 2000

PKCS is part of a wider Malaysian EDI Exchange Network called DagangNet. As such all the Port Community messages are routed through DagangNet.

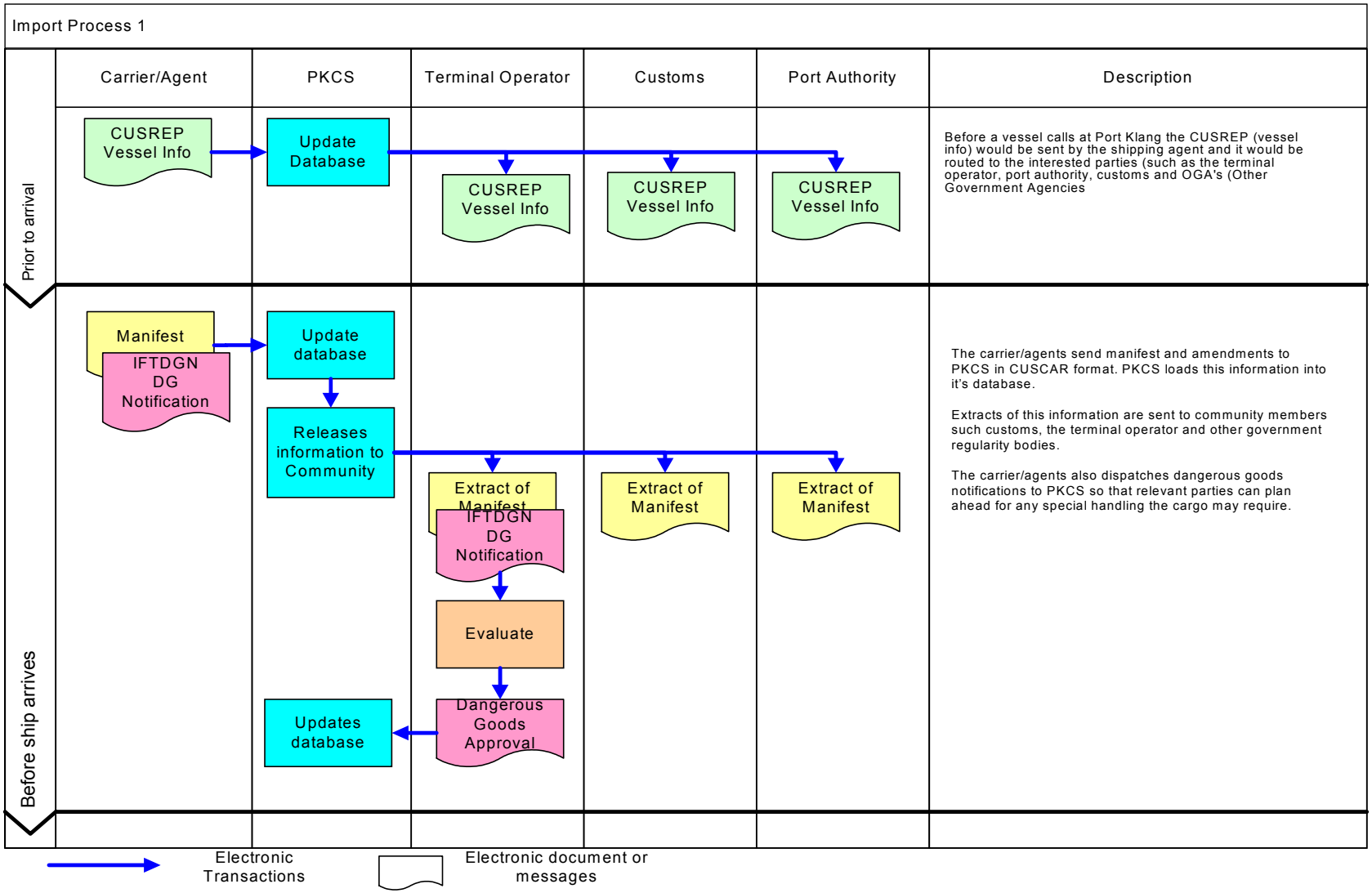

Figure 8: Port Klang – Vessel and Cargo Reporting

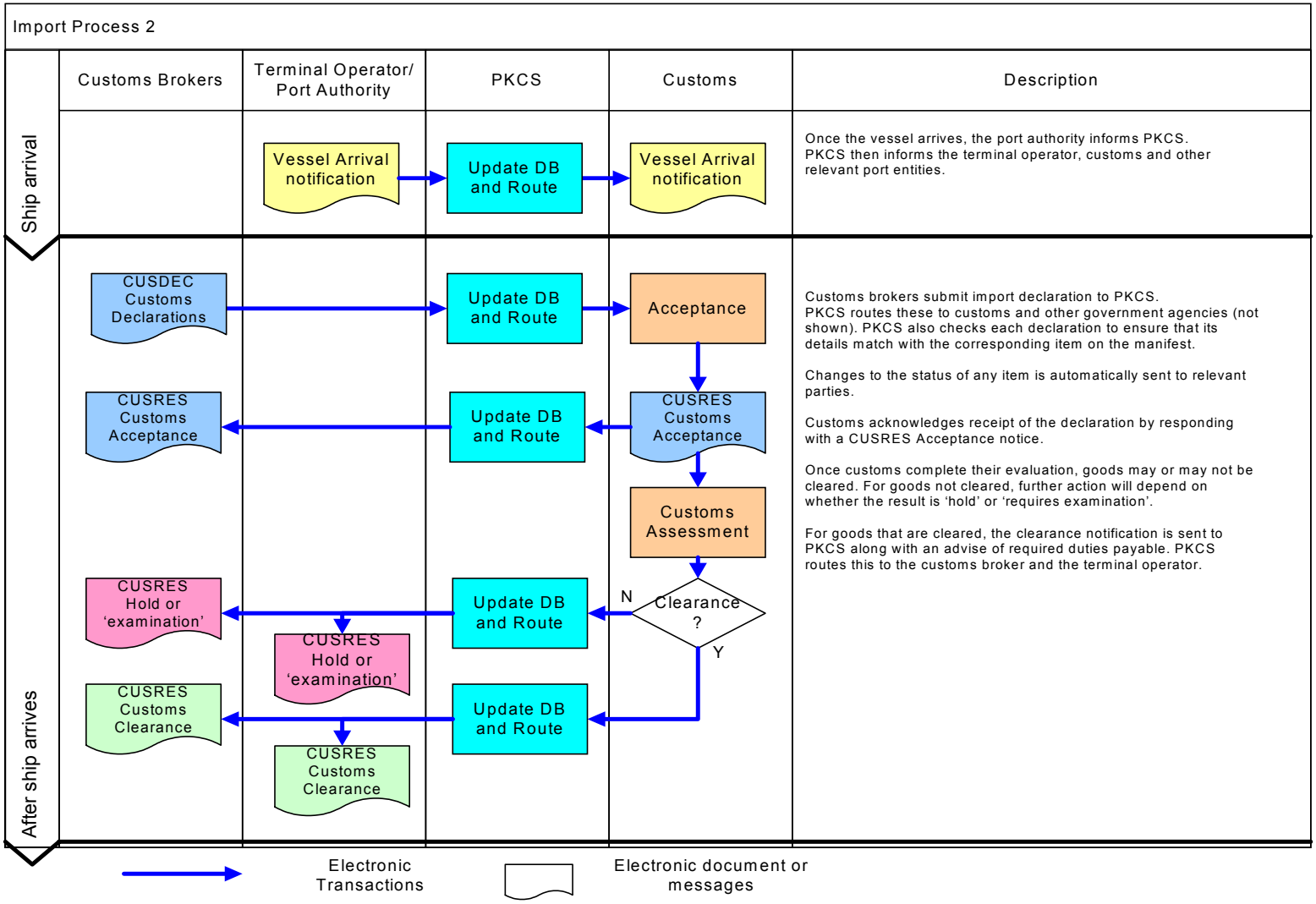

Figure 9: Port Klang – Customs Declaration

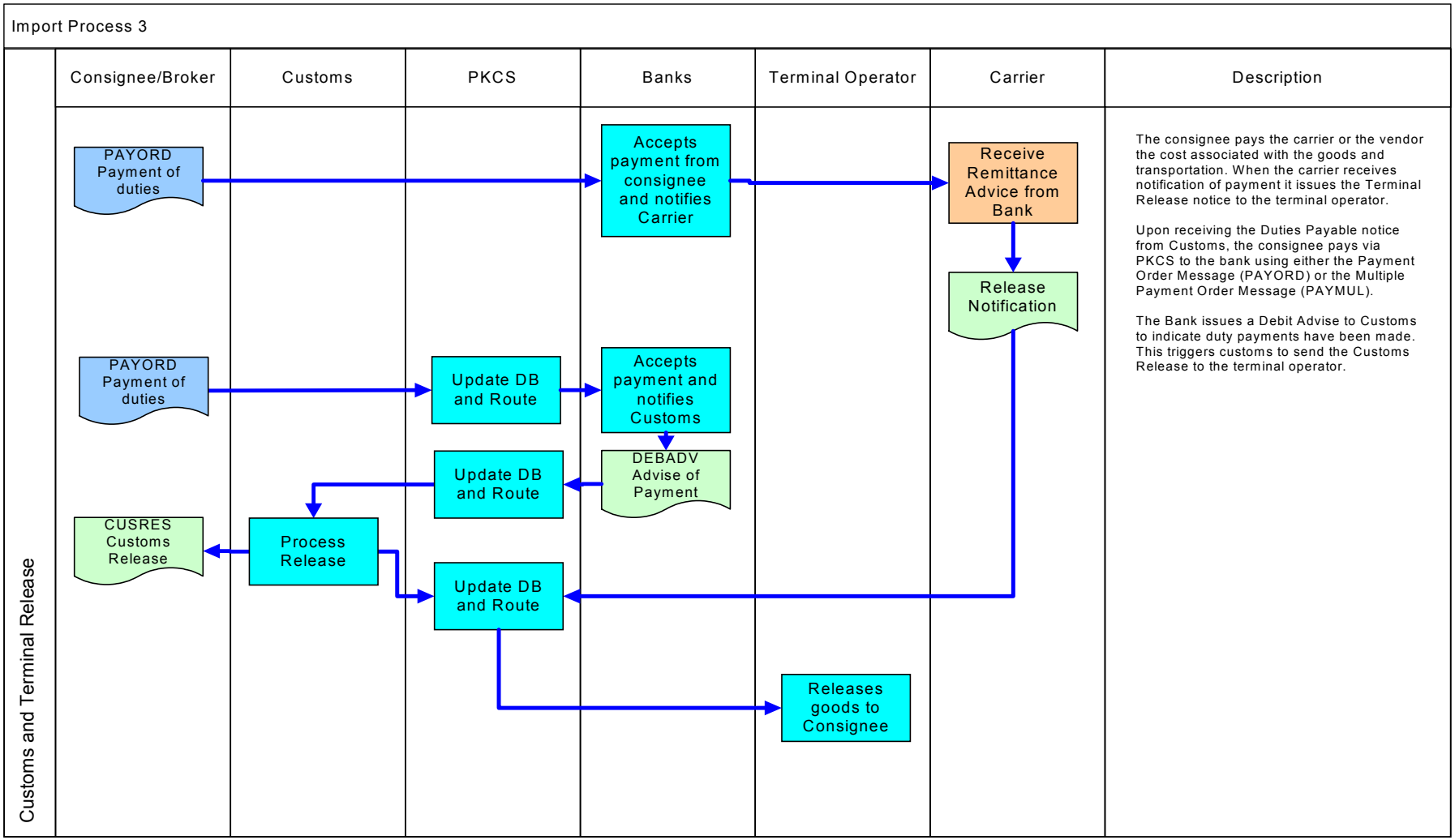

Figure 10: Port Klang – Terminal and Customs Release

5.8.2 Background

The original study team visited 'Felixstowe Port' to study the functionality of their system including the customs department. While the team found many desirable features in the FCPS, they could not adopt the system totally as the trade patterns and procedures (particularly within the EEC) were different.

The Malaysian government, under the Ministry of International Trade and Industry (MITI) was the main driving force in the implementation of EDI in the country. Port Klang was chosen as model for the port sector. The momentum created through the government's initiatives was one of PKCS' key success factors.

The minister of MITI is the chairman for the 'National EDI Implementation and Coordination Committee' (NEDIICC). Under the NEDIICC various implementation committees were set up. The Port Klang Authority (PKA) was asked to chair the PKCS_IC (Port Klang Community System Implementation Committee). This committee in turn has representatives of all the agencies and associations as members (such as customs, port operators, forwarding agents, shipping agents etc.). In the initial stages of implementation this committee met on a weekly basis (now it meets once in two months). The PKCS_IC is chaired by the CEO of PKA. This committee is responsible for policy decisions and resolving business issues. Under the PKCS_IC is the PKCS technical committee. This committee is represented by technical people from all concerned parties. It looks into the technical issues (such as the desired message to be used, specific requirement of the community etc.). In summary, there are three levels that oversee the operation of the system – the NEDIICC at the helm, the PKCS_IC for Port Klang and the PKCS technical committee.

In line with the government's 'Malaysia Incorporated' policy, whereby private sector participation was encouraged, the development and management of the software and network was awarded to a private company called 'Dagang Net Technology' (DNT). This company is represented in all the committees. In order to ensure the sustainability of this company, the government has given an exclusivity of 15 years for the customs documents to be sent through 'Dagang*Net' (the value added private network managed by this company). However the transmission charges (which is the main source of revenue) are subject to the approval of MITI. This company has appointed its business partners who develop the front-end software which is sold to the users. However the users are at liberty to develop their own software if they have their own IT personnel. Some of the main shipping lines have developed their own system.

5.8.3 Communications Infrastructure

Access to the Port Klang Community System is via the Internet and Intranet.

PKCS is not an isolated community system. It is one of the many nodes of DagangNet, the National EDI Network and Clearing House. DagangNet's other nodes include the KL International Airport Community System.

5.8.4 Messages Supported

The PKCS supports UN/EDIFACT message standard including the following messages:

CUSREP Vessel arrival notice (shipping line to terminal)

CUSCAR Cargo manifest (shipping line to terminal)

CUSDEC General customs declaration on export

IFTDGN Dangerous goods notification message

PAYORD Payment order message

CREADV Credit advice message

DEBADV Debit advice message

PAYMUL Multiple payment order message

SANCRT International movement of goods Governmental regulatory message

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

5.8.5 Key Success Factors

- Malaysia has excellent information and communication technology infrastructure using high quality fibre optic network at highly competitive rates by local telecommunication providers. PKCS specifically was developed by DagangNet who also operate a nation-wide data network.
- The rapid uptake of PKCS service was positively impacted by the confidence in the data security and data integrity aspects of the network

- The system was developed by an experienced team derived from all entities in the port community for the community. This ensured that services were well received and addressed the needs of the community.
- A comprehensive education and implementation plan ensured smooth participation in the PKCS.
- Malaysia has a relatively high level of IT literacy which makes the adoption of IT technology services less of a hurdle.
- The Malaysian Government's commitment in the form of policies, mandate and platforms for e-business was a strong driving force behind the success of PKCS.

5.9 Peru - Callao

5.9.1 Overview

Shipping lines/agents in Lima may send electronic pre-arrival manifest to customs but a paper copy must be provided once the ship arrives at Lima. A paper copy must also be supplied to the harbour master. An electronic link exists between the Callao Port Authority (ENAPU) and customs. When this link is available, customs transmits a copy of the manifest (in proprietary format) to the port authority. In these instances, the port authority must obtain a paper manifest from the carrier/agent. As a contingency, direct links to the carriers are being considered to minimise the disruption caused by possible failures in this link.

One process quite unique to Callao, is that customs brokers/importers must obtain a certificate of value from the valuation supervisor before goods are even loaded onto the vessel at the point of origin. This certificate is required by customs to complete import formalities, together with the import declaration and manifest. Customs assessments may result in one of 3 possible outcomes, each requiring a different level of intervention:

Green – The importer is required only to pay the required taxes for the goods to be released.

Amber – The importer is required to bring original copies of all documents pertaining to the goods imported to the customs office for further verification.

Red – Physical verification of original documents and physical inspection of the imported goods is required.

5.9.1.1 *Current Developments*

Customs are currently developing new systems and processes designed to simplify and speed up the import process. Features include:

1. Elimination of the Amber channel.
2. Elimination of requirements for brokers/importers to call at customs offices.
3. Elimination of paper forms and physical storage of importation documents (currently these are stored for 5 years).
4. A wider array of services and information available through the web.

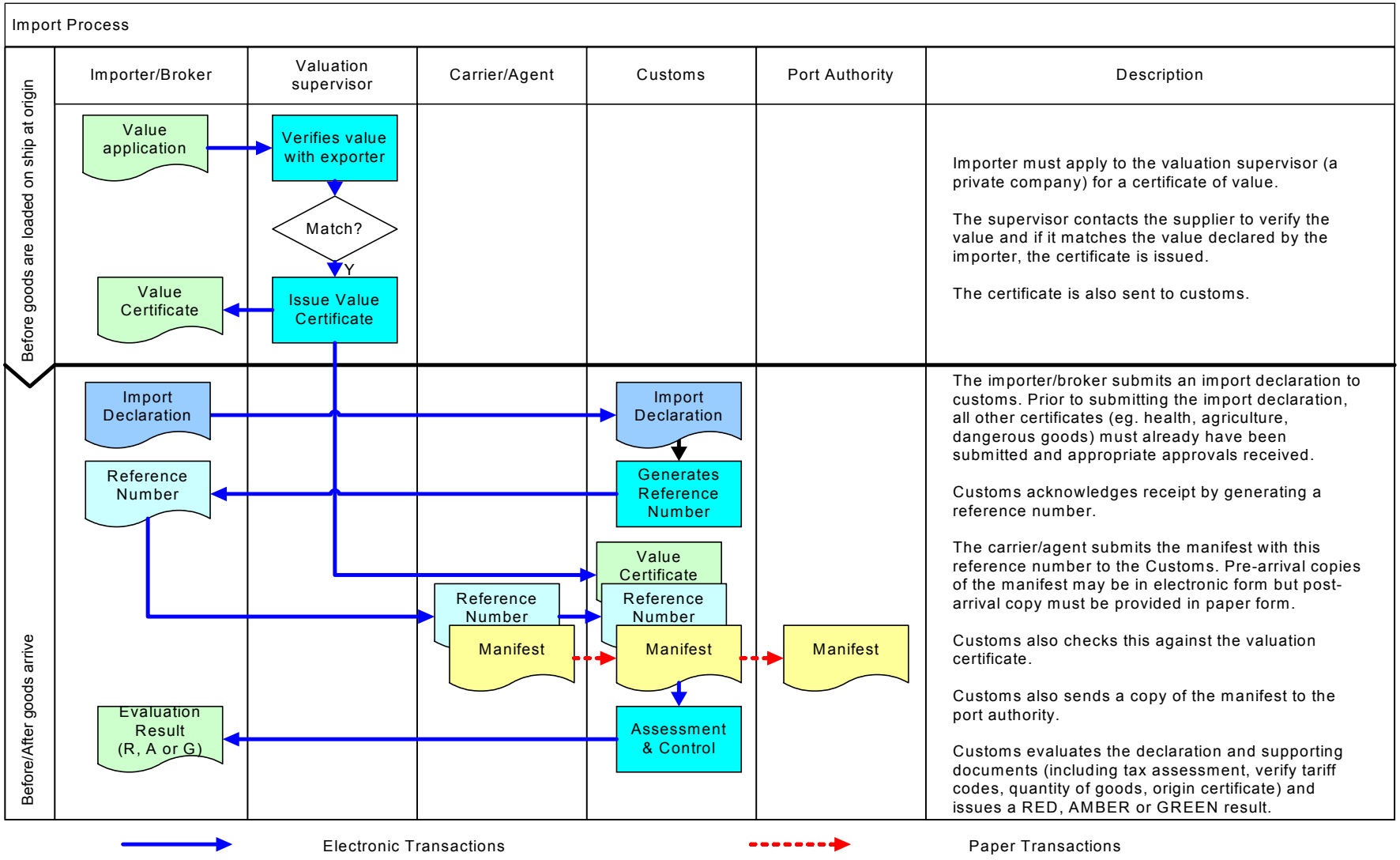

Figure 11: Callao – Pre-arrival

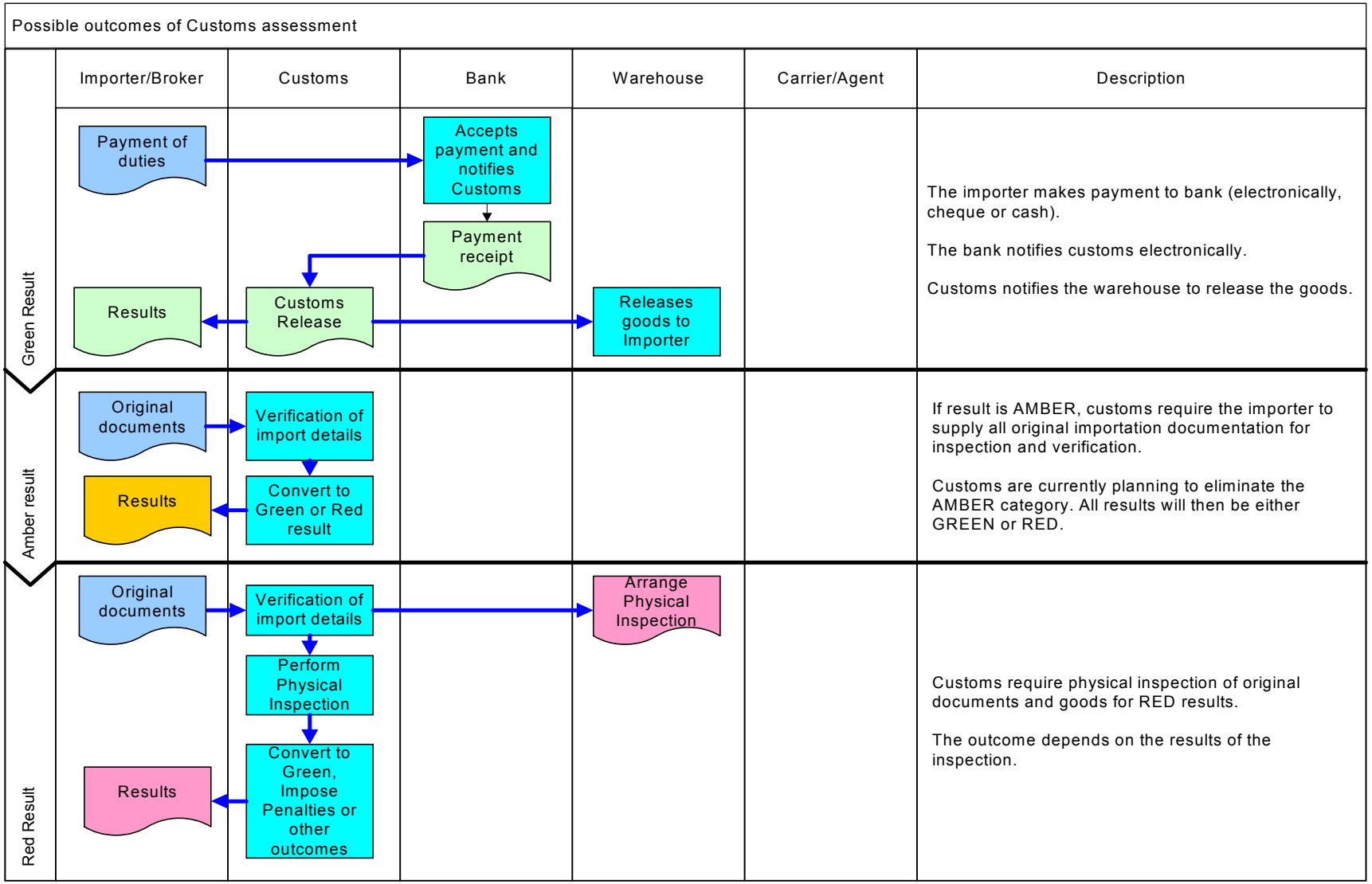

Figure 12: Callao – Customs Declaration and results

5.9.2 Messages supported

5.9.2.1 Import Value verification

Before the importer can instruct the vendor to even start shipping the goods, the importer must apply for a valuation certificate to be issued by the valuation supervisor. The valuation supervisor checks with the vendor in the country of origin and if this value matches the value declared by the importer, a certificate is issued. This certificate is provided to the importer and also transmitted to customs who require it for import clearance formalities. The messages between the importer, supervisor and customs are currently electronic using proprietary message format.

5.9.2.2 Customs declaration

Importers/brokers may submit their import declarations to customs and receive responses electronically. The responses typically consist of a reference number and a result indicating whether the Red, Amber or Green protocol is to be followed. A proprietary message format is used.

Importer/brokers must also submit a declaration to a privately-run agency who will act as an arbitrator in situations where a dispute occurs between the importer and customs.

5.9.2.3 Manifest

Shipping lines may submit electronic pre-arrival manifest to customs. In most cases when the link is available, customs will send this manifest on to the port authority. When the ship does arrive, a hard-copy manifest must be provided to customs and if necessary to the port authority as well.

5.9.2.4 Payment of duties

Importers can pay any taxes owed by electronic fund transfer. The bank concerned will inform customs once payment is made.

5.9.2.5 Customs release

Once the importer has completed all formalities and no taxes are owed, customs will notify the terminal to release the goods.

5.9.3 Communication Infrastructure

Currently 7 solution providers handle the majority of business needs with regards to customs transactions. Several large businesses have direct interfaces with customs.

Access to these customs services is via the Internet, dedicated terminals, dedicated lines to customs services and dial-up connections.

Internet access to port authority services is expected to increase in popularity over all other forms of access.

5.9.4 Key Issues

5.9.4.1 Redundant links in the transportation chain

Structures added to the transportation chain intended to minimise human intervention may have resulted in overly complex processes that complicate rather than simplify trade activity. For example, the need to submit import declaration to a privately run third-party in case of dispute between customs and the importer is an extra link in the trade chain. It is also another opportunity where errors could be introduced into the chain.

The activity requiring a third-party organisation to verify the value of the imports is another example of extra links in the chain. This process was originally set up as a temporary measure several years ago to facilitate transition to new customs procedures but it still continues to be mandatory for all imports over the value of US$2000.

5.9.4.2 Bureaucracy and confidence in the customs authority

All unnecessary intervention by customs during the import processes must be kept to a minimum in order to facilitate trade. However this approach can only be cultivated once a climate of trust exists between business and customs. The interrogation of advanced manifest information and other risk management technology may be very effective at controlling illegitimate consignments. Customs can reduce the level of physical inspection by building on their data and intelligence analysis capability to enable better targeting of suspect imports while expediting all legitimate imports.

The first wave of customs reforms was conducted between 1994 – 1998. This included certification to international standards (ISO 9000). More recently, the merger between the National Customs Agency (SUNAD) and the National Tax Authority (SUNAT) is expected to generate a second wave of reforms and significant enhancements of customs services.

5.9.4.3 *Lack of a reliable and affordable communication services*

While communication and IT services are satisfactory in Lima and other big cities, they are poor in most other locations. This can severely impact systems such as the customs systems that depend on reliable and instantaneous communication with all points of entry within the economy. The lack of reliable and affordable communication services including the Internet also means that users cannot easily access systems from remote locations. This will perpetuate the need for paper documents in these locations.

A related issue faced by some port entities and users is the lack of 24X7 support on the existing system. For example, when certain systems or links encounter problems on a Friday evening, they may not be addressed until Monday morning, severely impacting port operations.

5.9.4.4 *Dependence on post-arrival filing of manifest*

Although customs are capable of receiving pre-arrival manifest from carriers, other port entities (e.g. port authority, harbour master) only receive the manifest once the ship arrives. Without this information, all the relevant parties in the port are unable to commence any pre-arrival planning resulting in slower turn-around time for the vessel and its cargo.

5.10 Manila – Philippines

5.10.1 Overview

The major ports in Manila - Port of Manila and the Manila International Container Terminal – are operated by private entities on lease by the Port Authority of the Philippines.

Shipping lines transmit manifest information in either EDI, diskette or paper format to the port operators. Both Asian Terminals Inc (P&O Group) and ICTSI submit reports to the port authorities as well as collects port charges on behalf of the port authority. Currently these reports are in hardcopy.

Likewise, the port operators also submit the manifest information to the customs authorities in either electronic, diskette or paper format. Electronic submissions are in the CUSCAR format.

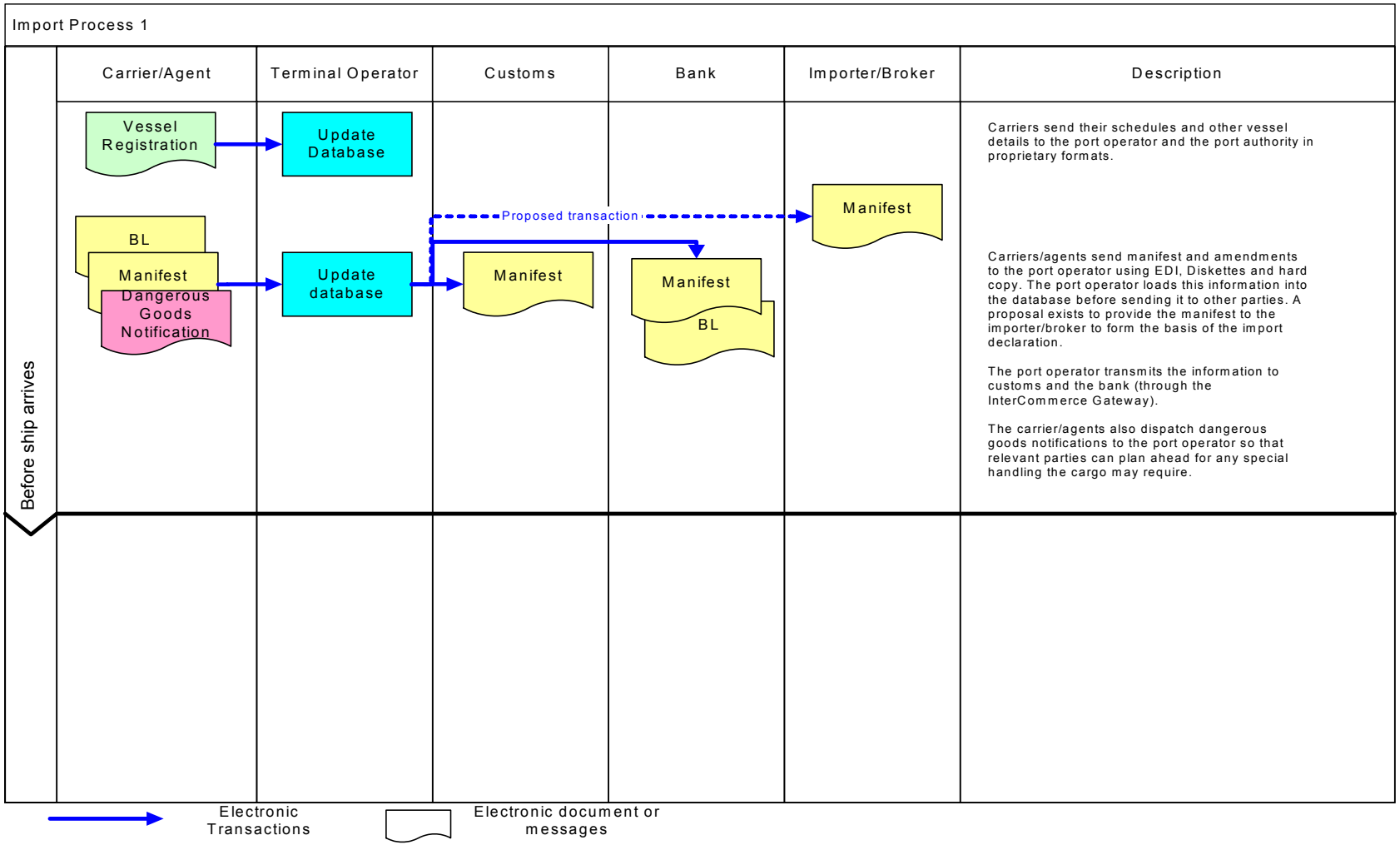

Figure 13: Manila – Pre-arrival

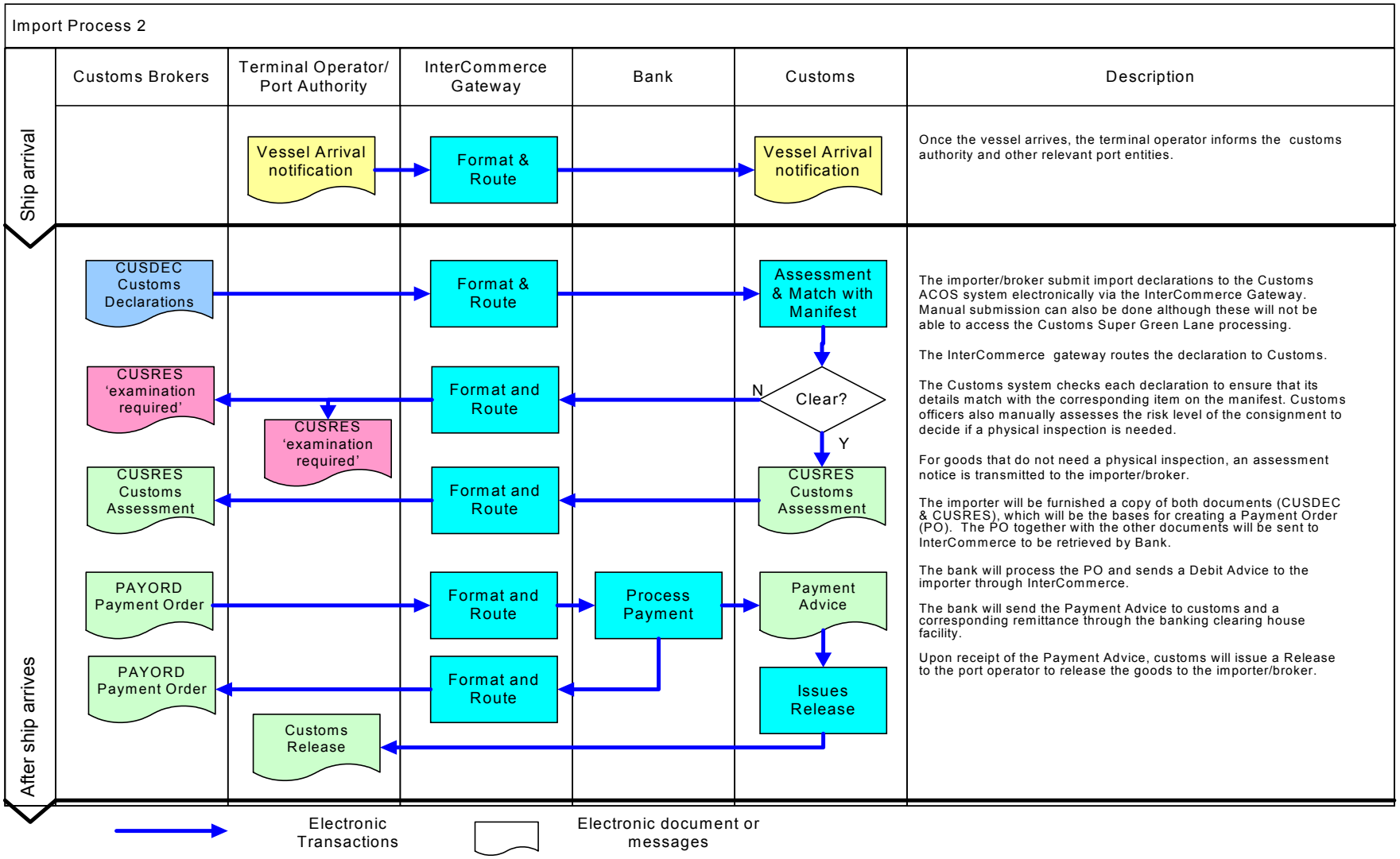

Figure 14: Manila – Post arrival

5.10.2 Communication Infrastructure

Users of the customs desktop system can currently submit documents to customs via dial-up, Internet/TCP/IP or leased line. There is also a facility for brokers/importers to prepare declarations as web forms on the Internet (ASP model) and the declaration will be submitted in EDIFACT format to customs. In either case, the declaration will be submitted to customs via the Intercommerce EDI Gateway. There is a proposal being considered to allow declaration to be submitted directly to customs with digital signature/certificates.

5.10.3 Message Supported

5.10.3.1 Import Declaration: CUSDEC.

For warehousing and consumption entries (transhipment entries under construction).

5.10.3.2 Final Assessment: CUSRES.

This response is automatically generated by the customs.

5.10.3.3 Cargo Release Instruction

Release message to the container freight station (CFS) authorising the release of goods to consignees.

5.10.3.4 Cargo Release Report

Action taken by CFS based on Release Instruction

5.10.3.5 Payment Order: PAYORD.

Based on the Final Assessment, the Importer is enabled to submit payment instructions directly to their bank to have their accounts debited and customs' account credited. There are plans afoot to use the same platform to facilitate Internet application for 'Electronic Bills presentation and Payment System', using digital signature.

5.10.3.6 Payment Advice - "PAS4" format.

This facility is still being piloted whereby banks are enabled to submit payment advice directly to customs for the subsequent matching of assessment against payment. Currently the PAS4 is generated (encoded) and submitted in batches every 3 – 4 hours by banks through the Philippines Clearing House. Matching of assessment against payment is still performed manually.

5.10.3.7 *Quota, Textile Export Clearance and Textile Visa.*

Application for Quota and Export Clearance and the transmission of Textile VISA to U.S. Customs.

5.10.4 Key Issues

5.10.4.1 *Multiple manifest formats*

The ability of recipients to receive and process data in multiple standards and versions may limit the use of electronic manifest. As the manifest is sent to the port operators, and there are multiple port operators in Manila alone, it may not be cost effective at this stage to develop software to handle all the different formats of manifests from the different shipping lines.

One possible option is for the port operators (and other port community members) to pool resources and develop a community system capable of handling many more formats. This may also lend strength to the port community to pressure shipping lines to conform to agreed International Standards.

This issue also highlights the impact of the lack of standardization in the shipping industry.

5.10.4.2 *Co-loaded cargo*

When shipping lines co-load cargo with other shipping lines, electronic manifests are not produced.

5.10.4.3 *Shipping Agents*

Due to cost considerations, many shipping agents do not have the capability to submit electronic manifest.

Depending on the number of manifests affected by this issue, it may be cost effective for either the port operators or a third party to develop desktop or ASP-based software on the Internet for small to medium shipping agents.

5.11 Thailand – Bangkok Seaport

5.11.1 Overview

5.11.1.1 Port Authority of Thailand

The Port Authority of Thailand (PAT) currently supports nearly 40 shipping lines with EDI connections.

All shipping lines/agents send both paper manifest and electronic manifest to the PAT. This is because operational and legislative requirements for paper documents still exist.

Officers at the Port Authority of Thailand compare the paper and electronic version to ensure that there are no discrepancies. This information is then sent to the Planning Department so that preparation for the arriving vessel can be stored.

Both electronic and paper manifest must be received at least 6 hours before vessel arrives. The shipping agents are then given a further 3 hours to make changes.

Although paper documents are still required by law, the electronic documents are a benefit because it can be loaded into PAT's system automatically. Prior to this, all data from paper manifest had to be manually keyed into the PAT host systems. Another improvement related to electronic manifest is the reduction of the number of copies of paper manifest from 5 to 2.

Once the PAT officer are satisfied that the paper and electronic version are alike, the manifest and container list are uploaded into PAT's host computer. This can then be accessed by all the operational areas of the port including the warehouses/yards.

Shipping agents send another document, the Loading List, to PAT in diskette form. This is loaded into the PAT's operation system which controls loading. Once loading is completed, a report is sent to the PAT host computer to generate billing information.

5.11.1.2 Customs Authority

The customs authority's data requirements are somewhat similar to that of the Port Authority of Thailand. These include Vessel Arrival, House Manifest from Freight Forwarder, Master Manifest from the carrier/agent and Container List from the carrier. However, despite the similarity in data requirements, each of these parties must make separate declarations to customs and the port authority.

Since 1999, the customs authority has been testing the exchange of this information electronically with 3 shipping lines. The system will not be fully implemented until the appropriate legislations are modified to accept electronic documentation as legal submissions. The legislation is currently being considered in Parliament and is expected to come into effect later this year.

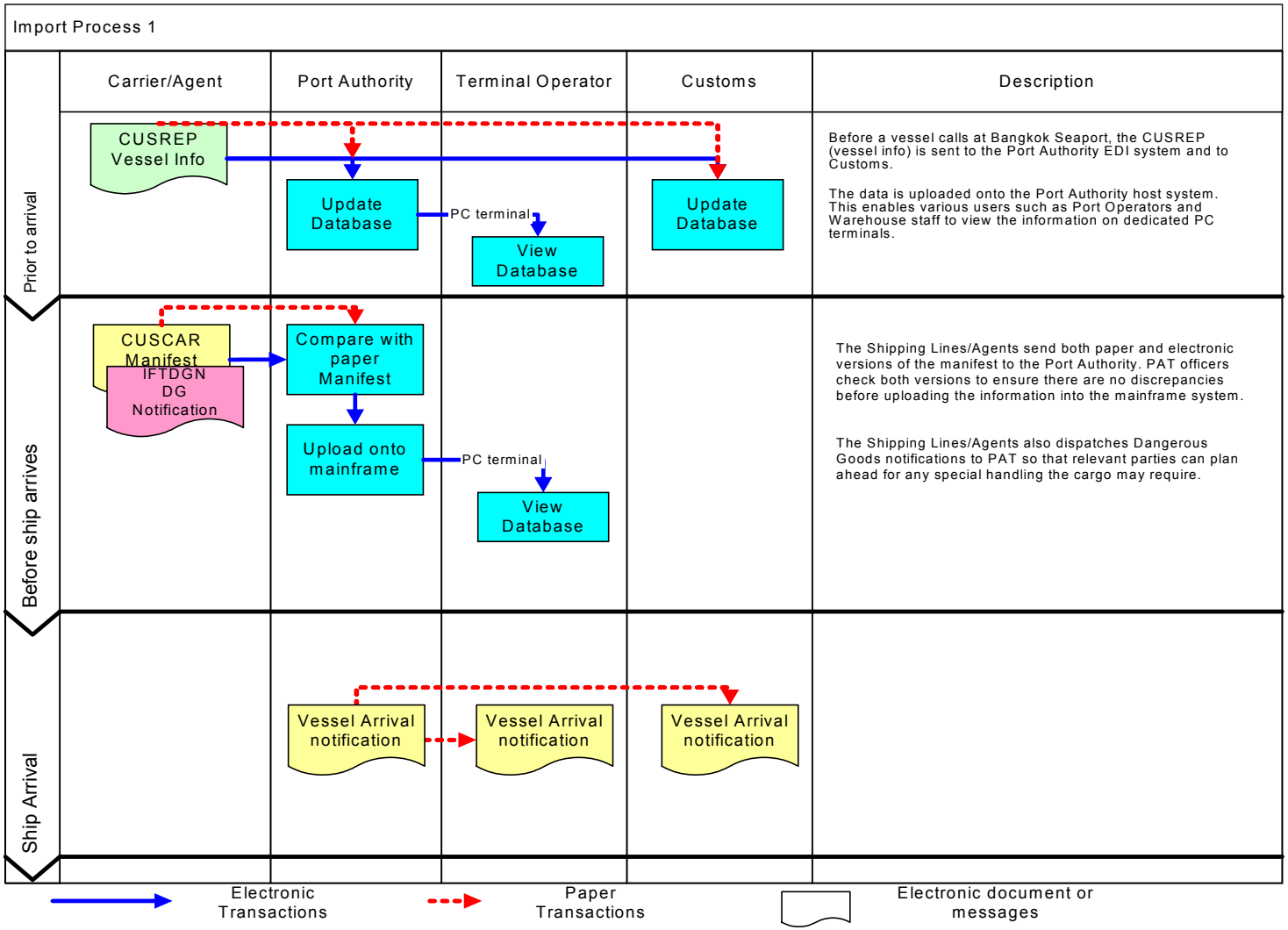

Figure 15: Bangkok Seaport – Pre-arrival

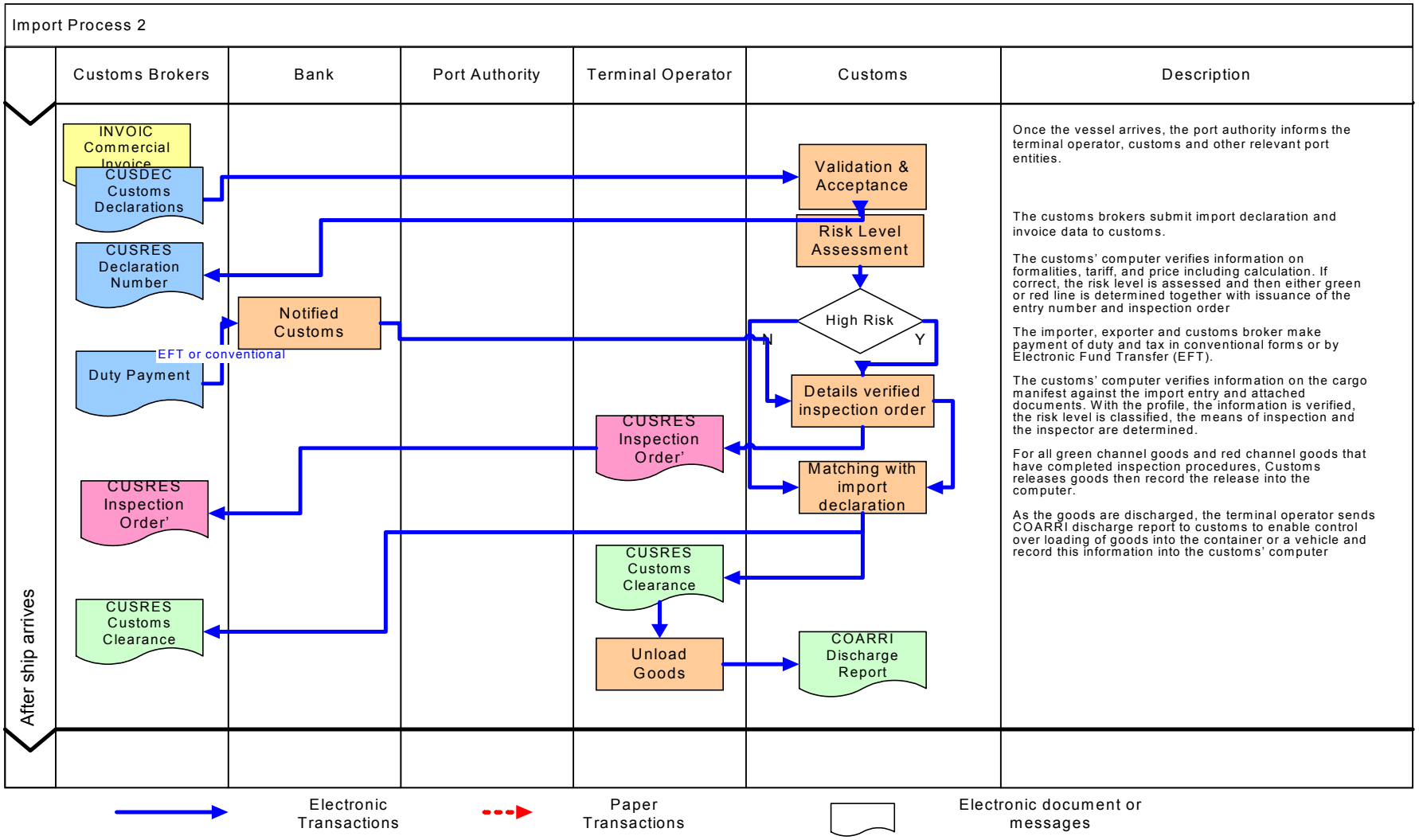

Figure 16: Bangkok Seaport – Post arrival

5.11.2 Messages supported

The Thai Customs Department has selected UN/EDIFACT as the standard format for the exchange of information between customs and EDI users as well as other related organizations. The Federation of Thai Electronic Data Interchange (FTEDI) and the Thai Industrial Standards Institute (TISI) oversee the approval of internationally accepted UN/EDIFACT standard messages submitted by the Customs EDI Working Group for usage in Thailand.

5.11.2.1 Port Authority of Thailand

BAPLIE	Bayplan/stowage plan occupied and empty locations message
CUSCAR	Customs cargo report message (house & master).
CUSREP	Customs conveyance report message.
COARRI	Container discharge/loading report message.
CODECO	Container gate-in/gate-out report message.

5.11.2.2 Customs Authority

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

Some of the EDI documents mentioned above are in the test phase.

5.11.3 Communication infrastructure

The key EDI service providers involved in communication with the port authority and customs are Tradesiam and the Communication Authority of Thailand. There are several VAN's that operate in Thailand including, EXIMNET, TIFFA EDI Services, NYK Transport Services (Thailand), P Square EDI Group, General Electric Commerce Services, Thai Trade Net and Sikor E-business.

The Port Authority of Thailand uses the GE Desktop software for handling EDI messages.

5.11.4 Message Standard Supported

Both the Port Authority of Thailand and the Thai Customs Department under the Ministry of Finance, has selected UN/EDIFACT as the standard format for the exchange of information between the Thai Customs Department and trading partners as well as other related organizations. Trading partners or system users who do not support UN/EDIFACT standard (such as ANSI X.12, TDCC, and Cargo Imp) must convert their EDI documents into UN/EDIFACT standard before sending them to the Customs Department.

5.11.5 Key issues

1. There is a view from shipping agency groups that basic procedures and processes for the handling of containerised vessels need to be improved at Bangkok seaport. Only once these basic procedures are improved can the benefits of EDI and e-Commerce investments be fully realised. Therefore, investment in EDI is seen as secondary to other fundamental issues faced at this port.

2. Until the Electronic Transaction Act comes into effect, any attempt to introduce EDI will be hampered by the need to continue using paper documents. These laws will allow many electronic transactions to be treated as the legal equivalent of current paper based documents.

3. Many smaller shipping lines/agents do not have in-house expertise to implement IT system capable of using EDI to communicate with other port stakeholders. None of the current systems offer simplified Internet interfaces for port users. Local EDI service providers argue that their VAN-based solutions are more economical and affordable than Thai Internet services because of high ISP costs. If this claim is true, the government must act to make the Internet more accessible and affordable to small business in order to ensure they are not disadvantaged.

4. Currently the customs authority and port authority require the shipping lines to submit both the master manifest and the house manifest. This means that the carrier/agents must obtain the house manifest from the various freight forwarders, consolidate these and submit them. The agents claim that this is an unnecessary inconvenience because the authorities could obtain the house manifest directly from the freight-forwarders or any other party more likely to have this information.

5.12 CASE STUDY – Felixstowe Cargo Processing System

Felixstowe Cargo Processing System (FCPS) was launched at Felixstowe in 1984. It was originally designed to link clearing and forwarding agents with the customs systems.

FCPS is now used by more than 450 port and terminal operators, shipping lines, shipping and forwarding agents and road/rail operators, as well as customs and other government agencies. It has been designed by the trade, for the trade, and greatly reduces paper flow.

For consistency with other sections of this report, the following overview only describes FCPS imports processes. Corresponding descriptions on how FCPS handles Exports, Transhipments and other processes may be obtained directly from Marine Cargo Processing Plc (MCP).

5.12.1 Overview[12]

The FCPS imports system was introduced in 1984, following a development period of almost four years. Much of the system's success stems from the fact that it was designed by port users for port users. This approach has continued and MCP consults with the various sectors of the port when new or enhanced functionality is being developed, to ensure that the finished product meets the users' requirements.

The system is based on the import manifest information which is sent to FCPS by the shipping line or agent, usually using Electronic Data Interchange (EDI). This method of transferring data has been used since FCPS was implemented, initially using simple but efficient proprietary messages. The introduction of UN/EDIFACT, however, has led to the development of transport related messages to agreed international standards and FCPS additionally accommodates a number of these, including the Customs Cargo Report message, CUSCAR, which is extensively used by shipping lines to transfer manifest information.

[12] Source: Documentation provided by MCP plc.

An extract of the manifest received from the shipping line or agent is passed direct from FCPS to the relevant wharfinger or terminal operator's own computer to form the basis of their container handling/park location system. The manifest is also immediately made available to customs and other official bodies in order that they can identify items requiring their attention at the earliest possible stage. These organisations are able to notify other sectors of the community of their inspection and other checks through FCPS, using facilities designed specifically for them.

The introduction of the FCPS imports system, together with the enhancements made since then, has enabled much of the documentation which formerly circulated around the port to be dispensed with. Since FCPS receives information on events from the various sectors of the port community immediately they take place, the system is proactive, sending updates to all interested/nominated parties without the need for paper, while at the same time adding value to the central store of information. This also reduces the need for users to make enquiries through the system, although there are a number of sophisticated enquiry facilities should they wish to do so.

5.12.2 Principal Features[13]

- Vessel registration up to eight weeks prior to arrival
- Manifest information by shipping/line agents in advance of arrival
- FCL, LCL (groupage), RO-RO and general cargo
- Splitting or amalgamation of consignments
- Pre-entry of customs' declarations up to seven days in advance of arrival
- Paperless release to hauliers
- Real-time wharfinger information
- Manifests and associated amendments
- Customs' release notes
- Bonded removal documents
- Ships' out-turn/discharge reports and amendments
- Local transhipment documentation
- Lines' commercial release

[13] Source: MCP plc.

- Acceptance of rent/storage charges
- Delivery instructions to transport operators (road/rail)
- Import delivery advice
- Import arrivals
- Import discharge list
- Customs examination/sealing requirements
- Port Health, Customs Preventive Department and other government departments' activities
- Requests to out-turn in sheds/warehouses (devanning)
- Shed/warehouse out-turn reports and amendments
- Hazardous goods reporting

5.12.3 IT and Communication infrastructure

FCPS current system resides on a Bull mainframe computer and can be accessed through dedicated or dial-up (ISDN) connections using TCP/IP based emulation software on PCs as well as through a browser.

5.12.3.1 Destin8

MCP has launched a new version of the Cargo Processing System called Destin8. It is browser based which makes navigating simple and familiar while supporting multiple languages. The system was developed using CASE tools and object-oriented technology. As all the Destin8 software runs on the server, updates are immediately available to all users as soon as they are loaded centrally.

The new system will run on an IBM AS/400 platform which provides stability as well as security. However, it has been written to enable deployment on a number of different platforms.

In addition to the browser interface, a wide range of other communication methods will be provided - by fax, e-mail, hardcopy, pager, EDI or system to system.

The document database is Lotus Notes. This means that the system keeps a complete record of the transaction showing what action was taken, when and by whom

Features and benefits of Destin8 can be found MCP's website www.mcpplc.com.

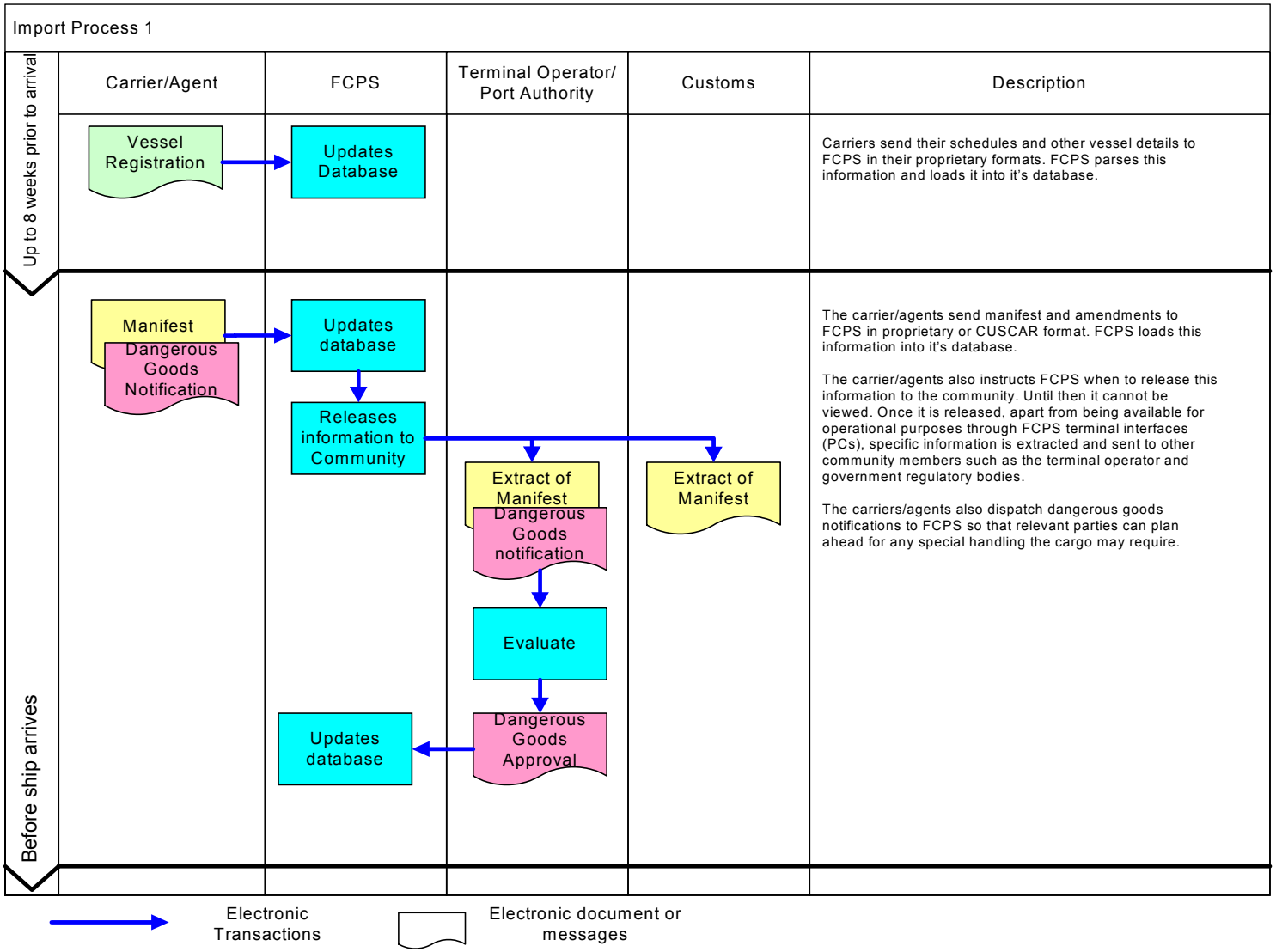

Figure 17: Import Process for FCPS – Pre-arrival

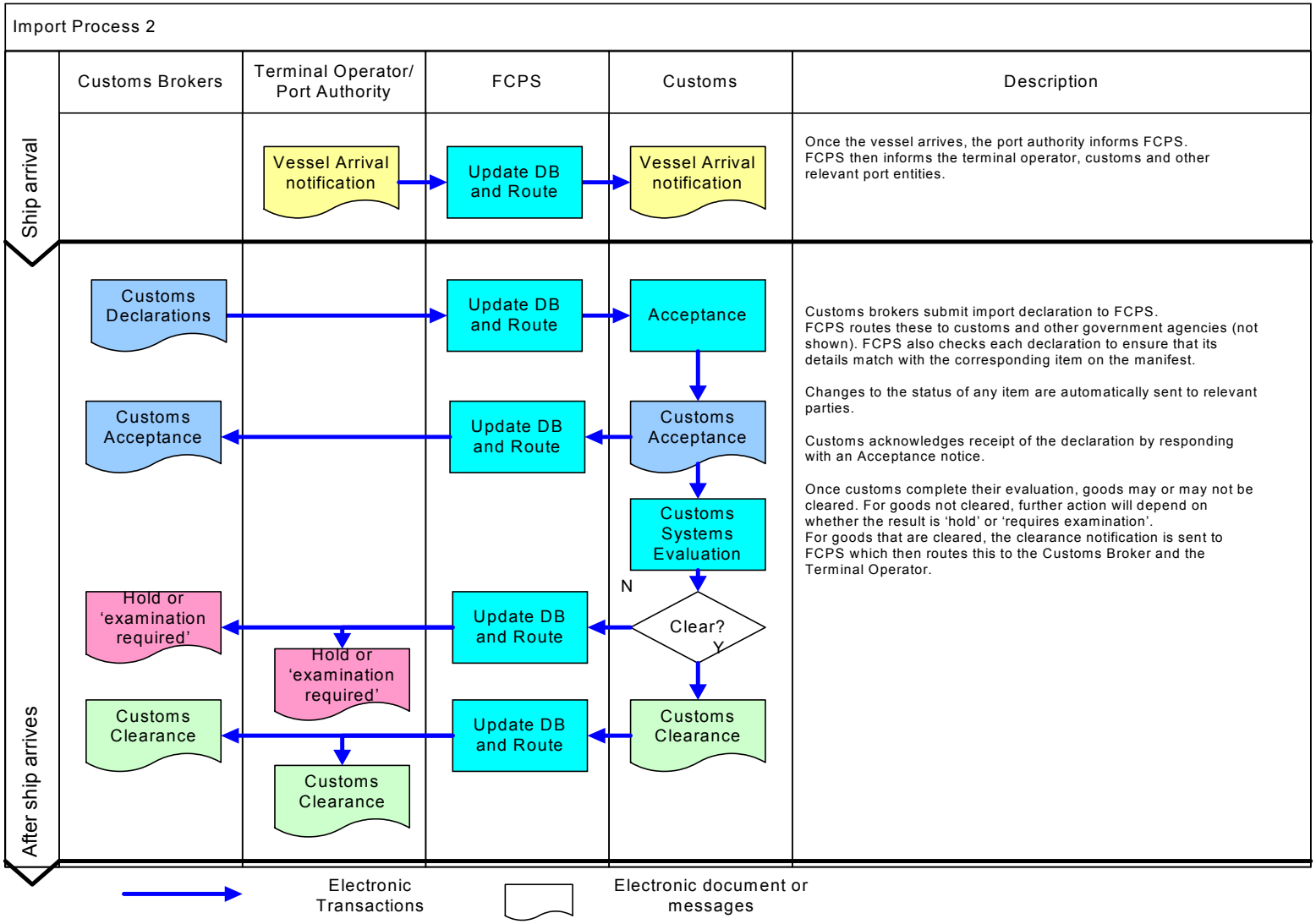

Figure 18: Import Process for FCPS – Post-arrival

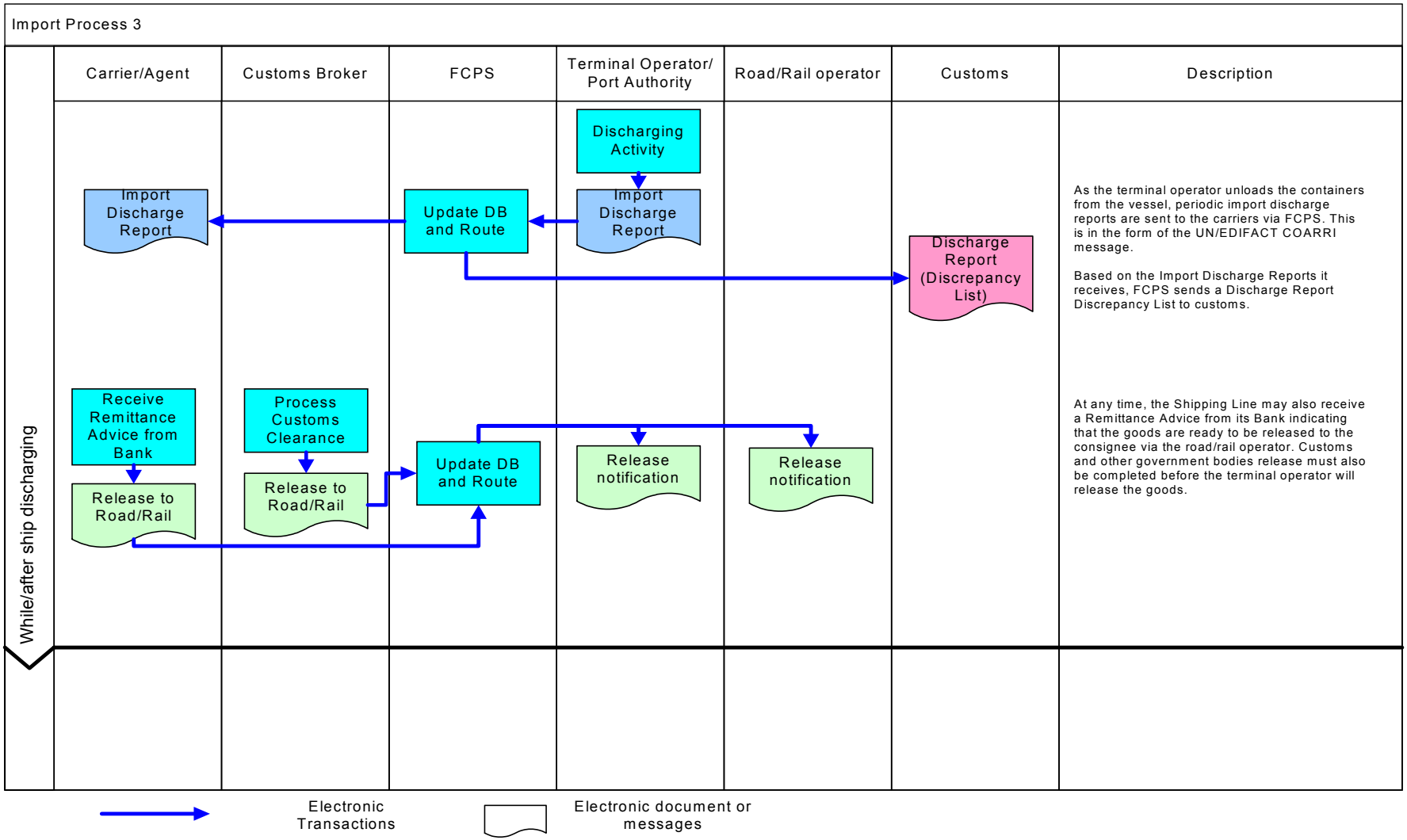

Figure 19: Import Process for FCPS – Discharging

5.12.4 Critical Factors for Success

Success factors fall into four main areas:

5.12.4.1 Development

- Address business needs
- Customs involvement at senior level
- Involvement of terminals (container/general)
- Involvement of other business users (Trade Sectors/Associations)
- Intuitive design
- Minimal change to existing systems
- Offer share participation

5.12.4.2 Implementation

- High visibility pilot
- Training is key
- Phase implementation (big benefits first)
- Get critical mass of users ASAP

5.12.4.3 Business/Revenue Model

- Annual subscriptions
- Transaction/unit charges (in line with value benefit)
- Standard tariff for all users
- Volume discounts
- Aim to make profits for development/dividends

5.12.4.4 Demonstrable Benefits

- Availability of real-time information
- Improved equipment usage/dwell times
- Faster turn round of vessels through better planning capability

- Internal systems efficiency
- Better customer service
- Security (physical/information)
- Easy access to information
- Speed of information - manifests
- Anti-smuggling functions
- Reduced documentation
- More efficient use of manpower resources
- Improved customer service
- Better utilisation of resources
- Reduced capital expenditure
- Increased profitability

5.13 US Customs – Sea Automated Manifest System (Sea AMS)

5.13.1 Overview

The US Customs has operated an Automated Manifest System (AMS) since 1986.

Participants in this system include direct discharge sea carriers, port authorities, and service bureaus.

Shipping lines transmit manifest data to Customs and receive responses for themselves only. Service bureaus (shipping agents) may transmit and receive data for multiple client carriers. They are required to maintain a firewall system to separate each client carrier's data. In addition port authorities may also transmit data and receive responses for clients. The difference between the two is that a service bureau may be as little as an office while a port authority is a legally constituted entity involved with the transportation of merchandise within a port. In addition, port authorities receive downloaded information that service bureaus do not. They receive copies of every automated manifest for every AMS carrier calling at their ports, and release notifications for every AMS carrier's bills. Also port authorities receive advance notifications on AMS shipments moving under bond from other customs ports to their ports. Finally, port authorities receive a download of hazardous materials and their containers destined for the port. This information is extracted from the AMS manifest information. Port authorities use this extra information to schedule deliveries for the shipments.

Currently there are about 18 port authorities actively participating in sea AMS. A few ports and terminal operators receive manifests directly from shipping lines.

5.13.2 Messages Supported[14]

5.13.2.1 Auto Arrival

Approved carriers can electronically ‘arrive’ their own vessels at discharge ports.

[14] http://www.customs.ustreas.gov/imp-exp2/auto-sys/ams.htm#AMSSEA

5.13.2.2 *Secondary Notify Party*

Shipping lines can designate up to two additional AMS participants per bill of lading to receive status notifications. They can update bills of lading with arrival and export data for cargo moving on a paperless master in-bond, and request Permits to Transfer electronically for in-port cargo movements.

5.13.2.3 *Port Authority Interface*

Port Authorities play a major role within the cargo release network. Port authorities receive manifest information for AMS vessels calling at their ports, as well as bill of lading status reports. In addition, they receive information on in-bond bills enroute to the ports, reports of non-AMS shipment releases, and reports of hazardous material shipments transiting the ports. This allows them to make the information available to all concerned parties.

5.13.2.4 *Paperless Master In-bond (MIB) Reporting*

Shipping lines approved as paperless MIB participants can transmit bill of lading and in-bond data and receive electronic authorization to move the shipment in-bond to a paperless destination port without preparing a Record of In-bond Movement. Paperless reporting can be done for Immediate Transportation (IT), Transportation and Exportation (T&E), and Immediate Export (IE) cargo movements. Additionally, participants can electronically update these movements with arrival and export data.

5.13.3 Communications Infrastructure

Customs provides free dial-up connections at 9600 baud. Participants must procure the necessary equipment and software and are responsible for all costs. Dedicated service is also available through participant-provided leased lines. The option to use leased lines is at the discretion of the participant, as long as communications protocol is compatible with customs.

5.13.4 Message Standard Supported

The Sea AMS system allows the participants to transmit and receive manifest data in 2 formats: Customs Automated Manifest Interface Requirements (CAMIR), the Customs in-house system, and the American National Standards Institute (ANSI) ASC X12, the transportation industry formats. AMS has never developed an EDIFACT format.

U.S. Customs is actively developing a new automated system, called Automated Commercial Environment (ACE). The participants in this system will be set up as clients and transmit and receive information through a single web portal. There will be a CUSCAR component in the ACE manifest.

6 Best Practice Modules

The survey of ports covered in this study has identified several best practice modules that are consistent with the objectives of this study. These objectives being, to identify options for development of manifest systems and processes which satisfy both harmonised customs and port requirements and to assist in increasing the knowledge of member economies on the technical options available to implement electronic port manifests.

This approach to identify best practice modules rather than recommend any particular port for APEC economies to emulate is based on the premise that not all attributes of a successful implementation may be suitable to be transferred to another port or economy. Furthermore, this may not be feasible from a financial or cultural perspective. Breaking down implementations into best practice modules allows economies to choose specific modules that suit their needs.

While these modules were found to very effective within their existing environments, it must be noted that they may need to be adapted to local conditions in order to maximise their potential benefits.

Case studies are suggested after each best practice module as guidelines only. Their inclusion does not imply that other ports do not also employ similar or superior practices.

6.1.1 Collaboration between ports

In economies with more than one port, there are significant benefits and synergies to be had from the implementation of comprehensive electronic information systems in a collaborative manner. By identifying common requirements and pooling resources, port communities are able to streamline common processes and positively impact the efficiency of the whole supply chain.

The benefits of such collaboration include lower costs for each port due to the economies of scale and superior functionality through the pooling of expertise. An added benefit is the simplification of access to the ports services for trading partners because they need to use just one interface to access all the ports within an economy.

Case study: Finland

6.1.2 Collaboration between port stakeholders and customs authorities

This module refers to the building of a collaborative working relationship between port stakeholders and customs. The establishment of this relationship will enable both parties to identify opportunities to work together towards the greater good of the community.

The streamlining of cargo declarations by carriers to port and customs authorities is one area where both parties can collaborate. Options for achieving this outcome are outlined in Section 5. By focussing on the development of a strong working relationship, the actual opportunities for collaboration are not restricted to any particular business process.

Case studies: Felixstowe, Port Klang & Finland

6.1.3 Leadership and clear strategies

The successful implementation of solutions involving a significant shift from paper-based processes requires strong leadership. Unless at least one stakeholder is willing to champion the new solution and educate the other stakeholders of its benefits, it is unlikely the initiative will take off.

Ports with successful electronic solutions started with a strong commitment, a clearly articulated strategy and a solid plan of action. The strategy should build on any existing state eCommerce initiative to maximise its momentum.

Case Studies: Port Klang.

6.1.4 Flexible message translation capability

The most commonly used EDI standards in the marine industry are UN/EDIFACT and ANSI X.12. Outside the US, the dominant standard is UN/EDIFACT. Over the years, many concerns have emerged over the effectiveness of these standards towards creating an environment where organisations of all sizes can exchange structured messages electronically with each other.

One of the main concerns with UN/EDIFACT has been the disparity between the simplification in interoperability it was expected to bring and the real-life complexities of incompatible implementations, even of the same standard. The experience of UN/EDIFACT for many small to medium organisations has been that of high costs, time-consuming maintenance, the need for specialised software and staff and limited number of compatible trading partners.

Given that standards tend to change regularly and the emergence of new technologies such as XML and Web Services, for a solution to be effective it must incorporate agility and flexibility into it's message translation capability. Systems that are rigid and are not capable of supporting multiple formats will inhibit uptake of electronic messaging.

Case study: Finland

6.1.5 Comprehensive legal infrastructure for electronic commerce and trade

A solid legal grounding for electronic commerce is a prerequisite to the successful uptake of EDI. The Model Law on Electronic Commerce produced by the United Nations Commission on International Trade Law (UNCITRAL) is a good starting point for the establishment of the necessary legal framework.

The removal of legal and institutional requirements for paper documents is critical to the successful adoption of electronic manifests within an economy.

Case Study: Port Klang, Port of Felixstowe, Finland, Port of Valparaiso

6.1.6 Structure of ownership of service provider

The ownership structure of port information services infrastructure is another factor that influences the level of uptake of electronic services such as electronic manifests. Structures that are owned and operated by the members of the community ensure that they have a vested interest in the system's success.

There is also a perception that solutions developed by the port community better meet the requirements of the community rather than one prescribed by an external entity. Having said this, it must be noted here that there are many successful solutions developed and operated by third-party solutions providers through close cooperation with community members.

Case Study: Felixstowe, Finland

6.1.7 Use of 'open' technologies

The costs related to the implementation and operation of large-scale solutions such as cargo community systems should not be underestimated. However using technologies that are open, non-proprietary and flexible can dramatically reduce these costs and support faster development cycles. These technologies include object-oriented design methodology, Internet-based platforms, Linux[15] (a free, open-source operating system), XML and rapid development platforms such as Java™.

The decision of whether to use multiple Intel™ servers or mainframes depends on the size of the overall implementation and also on the amount of funds available upfront[16].

These technologies are also more easily accessible compared to proprietary technologies and offer a wider base of staff to choose from. These factors contribute towards lowering the total cost of ownership of 'open' systems.

Case study: Port of Valparaiso

6.1.8 Central repository of data

The creation of a central repository of vessel and cargo data within port communities (or even across multiple port communities) will greatly reduce the need for the same information to be declared by multiple parties. A central data repository also allows for greater transparency of information and track & trace capabilities. This model allows for the continuous improvement of the flow of information related to cargo movement.

The common alternative to using a central repository in a port community information system is to use a message switch. This is usually a gateway with data translation capability so that messages are received in a format that is understood by the recipient's internal systems. While this is a significant advancement over paper-based systems, it does not offer as many opportunities to reengineer inefficient processes nor does it provide any significant improvement in transparency. Since the information pertaining to the cargo and vessel is stored over several different systems, a user attempting to trace a container may need to query multiple systems albeit from the same terminal.

[15] The Role of Linux in Reducing the Cost of Enterprise Computing by Gillen, Kusnetsky & McLarnon, 2001. www.idc.com

[16] Linux delives On the Big Iron by Mark Hall, May 2002.
www.computerworld.com/hardwaretopics/hardware/story/0,10801,70944,00.html

Opponents to the central data repository model often cite data security issues. However, there are excellent working examples demonstrating how current technology and appropriate processes to secure sensitive information can be used to ensure data security is not compromised.

Case Study: Port of Felixstowe

6.1.9 Port community forums

Port communities that have successfully addressed the issues related to the inefficient flow of information, including manifests, tend to have structures where different stakeholders can exchange views, concerns and ideas for continuous improvement. Members of these ports understand their inter-dependence and the need for collaborative improvement. This is in sharp contrast to other port communities where stakeholders are oblivious to each other concerns and requirements and choose to work within their own silos.

Case Study: Port Klang, Port of Felixstowe

6.1.10 Internet Access and Communication Infrastructure

The impact of any electronic solution in the port environment can only be as effective as it's accessibility. Solutions where the Internet is one of the access channels are likely to have the widest coverage and the lowest cost although this is dependent on the quality of the particular economy's communication infrastructure. Along with lower communication costs, Internet-based solutions only require users to invest in low-cost hardware i.e. personal computers and modems.

Case Study: Port Klang

6.1.11 Cost of services

Another aspect of accessibility is the cost of the actual services offered online. Authorities commonly use financial incentives to encourage the adoption of online services over traditional paper-based services. In at least one case surveyed, the customs authority's decision to not charge for online services greatly encouraged the adoption of electronic declarations.

Case Study: Port of Valparaiso

6.1.12 Provision of logistics services

In some port communities the electronic systems that manage the supply chains have been extended to capture data from as close as possible to its source and deliver data to as close as possible to its destination i.e. aiming to achieve an end-to-end transparent flow of information.

This has a significant impact on reducing the amount of re-keying in of data related to cargo moving through supply chains and providing a continuous chain of information from origin to destination. In effect this calls for the port community to play a much wider role in providing logistics services.

Case study: Port of Valparaiso

7 Recommendations

Based on the issues and success factors identified in a cross section of APEC and non-APEC ports, the following recommendations are put forward for the consideration of the TPT-WG.

7.1.1 Support for UN/EDIFACT standards

At present, most international organisations responsible for setting freight-related standard support UN/EDIFACT message formats for EDI. These organisations include WCO, SMDG, APEC SCCP, and IMO. Although there has been some concern about the effectiveness of EDI for small to medium enterprises, the use of UN/EDIFACT messages in transportation has been increasing in recent years[17]. As such, it is recommended that economies support EDIFACT standard messages as their primary standard for inter-organisational or international interoperability.

7.1.2 Support for XML and ebXML technology

While XML and ebXML hold the promise of interoperability between organisations of all sizes in all parts of the world, these standards and their related technologies are still in a state of constant flux and have not yet reached levels of maturity or stability suitable for widespread deployment[18]. It is recommended that economies incorporate XML technology into their current port information systems to augment the more widely accepted EDIFACT standard. This will ensure the widest possible coverage in terms of inter-operability and also provide opportunities to train and familiarise local staff with these new technologies.

Several of the ports surveyed in this study were found to use XML very effectively and in a cost-effective manner for the exchange of data between various port stakeholders.

It is also recommended that the TPT-WG identify and sponsor pilot projects to demonstrate the use of ebXML standards for electronic document exchange between APEC port stakeholders. This has the added benefit of increasing the competence level of port communities' in this new technology.

[17] EDIFACT Working Group Meeting minutes, Washington D.C. US, March 2001

[18] Government and Finance Industry urges caution on XML, Alan Kotok, www.xml.com., April 2002

7.1.3 Consolidation of freight-related standards

It is recommended that APEC TPT-WG take a leading role in working with various standard setting organisations in the marine industry to discuss how a comprehensive, unified set of standards covering all aspects of EDI can be developed, managed and enforced along the lines of the air transport industry. The TPT-WG will need to dialogue with other regional and global forums to generate sufficient momentum towards this effort.

To this end, the TPT-WG's attention is drawn to the efforts of the 'e-business MoU' consisting of the International Electrotechnical Commission, the International Organization for Standardization, the International Telecommunication Union and the United Nations Economic Commission for Europe[19].

This MoU establishes a cooperative coordination mechanism to produce mutually supportive data interchange and interoperability standards for business transactions as well as product design and manufacturing to meet industry and user needs. It aims to minimise the risk of divergent and competitive approaches to standardisation and avoid duplication of efforts and confusion among end users.

7.1.4 Consolidation of marine EDI capability within each economy

It is recommended that in economies where this doesn't already exist, the TPT-WG encourage economies to create structures for collaboration between port communities in order to improve their collective capability in the area of EDI. This will contribute towards achieving a uniformed interface to other modes of transport, customers and authorities. It will also enable the marine industry to improve efficiency, simplify trade procedures, reduce cost and improve the competitiveness of the whole economy.

7.1.5 Collaboration with customs bodies

Transportation processes at ports are inextricably linked to customs activities. Customs bodies around the world, through forums such as WCO, APEC SCCP and G7 Customs group, have made significant progress towards agreement on EDIFACT message standards, harmonisation of data elements and business processes. It is recommended that the TPT-WG encourage the transport sector in each economy to collaborate with customs in order to achieve a higher degree of information sharing and integration.

[19] http://www.itu.int/ITU-T/e-business/mou/index.html

It is recommended that the TPT-WG support initiatives to promote the exchange of cargo data between customs authorities. Successful implementations of such initiatives may in the long-term reduce the number of times the same information needs to be declared.

It is also recommended that the TPT-WG encourage economies to implement 'single window to government' initiatives covering customs and other government agency formalities.

7.1.6 Collaboration within the shipping industry

It is recommended that the TPT-WG facilitate discussion sessions between ports authorities, Cargo Community System operators and shipping lines/agents and other port stakeholders in this region so that a joint APEC-wide approach can be adopted with regards to EDI standards and business processes.

This initiative could be based on the European Commission's MarNet[20] project that aimed to improve inter-regional interconnectivity and interoperability of EDI Port Community Systems, integrate tracing and tracking, demonstrate the implementation of EDI in non-automated ports using common building blocks, demonstrate the functionalities of a maritime information system integrating small, medium and large-size ports and demonstrate the possibility to improve Short Sea Shipping.

One of the subprojects of MarNet was to set up EDI exchange of manifests in the short sea trade between shipping agents in different European ports.

This port discussion group initiative could be built on the alliance already created through the PAN ASIA E-Commerce Alliance[21].

7.1.7 Leveraging on Security Initiatives

It is recommended that the TPT-WG use the current climate of high security concerns to initiate programs that will provide end-to-end transparency in the marine freight chain. Security initiatives will not only bring integrity to the security regime of international marine freight transportation but also provide a valuable source of information to facilitate opportunities to improve efficiency and transparency in international trade.

20 http://europa.eu.int/comm/transport/extra/final_reports/waterborne/Marnet.pdf
21 http://www.tradelink.com.hk/news.htm#pr10

Appendix A

Solutions Providers

APEC Electronic Ports Manifest
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8 Solutions Providers

This section provides a list of solution providers that can assist economies with implementation of port and/or customs manifest systems. Most solution providers endeavour to provide an integrated and comprehensive set of solutions to address all aspects of port operations and interaction with other entities in the transportation chain. As such manifest processing tends to be a small part of any of the solutions offered.

Inclusion of any solution provider in this section does not constitute endorsement or recommendation by the authors of this report. These vendors are included here based either on their actual track record or their stated capability in the area of marine EDI. **Economies, ports or other entities must perform their own evaluation to determine the suitability of the vendors' services to their individual requirements and/or verify vendors' capabilities before making any commitment to engage their services. Note also that this list is not exhaustive.**

8.1 Advanced PC Products Limited

8.1.1 Solution: Advanced Port Management System

The Advanced Port Management system is a comprehensive suite of software modules, which fully integrate to provide a total port logistics solution incorporating Container Terminal Management, Depot Management, Vanning and Devanning operations, as well as Break Bulk and Contract Warehousing.

Since the late 80's their solutions have been exchanging formatted files containing "cargo" information, for use in the Import and Export of cargo at Port and Terminal operations, using E-Commerce. The solutions include electronic "Customs Releases", clearances by other Agencies and links to Agents, Shippers and the Haulage industry.

APMS solutions support the EDIFACT message standards as well as the "local" derivations of these messages. Sophisticated translation technology allows sender and receiver to translate the information into any format they prefer to use. Checks and warnings prevent the sending and receiving of incorrect information.

This information is presented to the Sender's or Receiver's systems as required.

8.1.2 Clients

Thamesport, UK
Port of Napier, NZ
Squamish Terminal, Canada

8.1.3 Contact

Advanced PC Products
P.O. Box 1161, Napier
New Zealand
Tel: +64-6-835-3074
Fax: +64-6-835-3078
Email: annc@apcp.com
http://www.apcp.com/ports.htm

8.2 CMC Limited

8.2.1 Solutions: Mach and CALM

MACH (MArine Container Handling) is a highly versatile and flexible product, which caters to all the diverse needs of a Container Terminal developed by the Ports and Cargo Group at CMC limited. MACH is a comprehensive and integrated system with highly user friendly GUI, client server architecture and configurable color schemes. Its 'Planning' systems assist the planners in making optimal plans to minimise turn around times of vessels and its 'Operations' flexible enough to cater to any contingencies. MACH runs on Windows and UNIX and effortlessly supports the terminal needs even up to millions of TEUs. MACH is web-enabled and the relevant screens can be made available on the WWW as per the customer's requirements.

CALM (CArgo Logistics Management) system computerizes the RO-RO operations, Bulk, Break-bulk operations of a cargo terminal. This application software integrates all the core functions of Terminals such as Cargo Documentation, Cargo Operations, Storage Area Planning, Labour Management, EDI, Executive Information System and Invoicing. CALM software helps ports in, Warehouse Management, Cargo Inventory Control, Timely and accurate Cargo Accountal, Automatic Invoice Generation, effective and easier EIS reporting.

8.2.1.1 *EDI - Electronic Data Interchange*

Both MACH and CALM have EDI modules that takes care of the electronic data transfer (in terms of messages) between MACH/CALM and the external trading partners like shipping agents, clearing and forwarding houses, customs etc. The MACH & CALM EDI module acts as an interface between the EDI engine and the various other modules. The EDI Engine sends and receives messages in both standard formats such as the UN/EDIFACT as well as other proprietary formats. The features supported include

- Definition of external EDI Partners and agreements
- Support for various UN/EDIFACT and in-house/proprietary formats
- Automatic receipt and processing of electronic messages
- Status monitoring of all incoming and outgoing messages
- Facility to correct errors in the received message
- Authentic, consistent and one-time electronic entry of data
- Support for various protocols like FTP, E-Mail etc

8.2.2 Clients

Penang Port, Malaysia
Port of Fujairah, UAE
Port of Tanjung Pelepas, Malaysia
Port of Felixstowe, UK
BLG, Bremerhaven, Germany
Jawaharlal Nehru Port
Mumbai Port
Paradip Port Trust

8.2.3 Contact

B Vishal Biyani
Sr. Executive - International Business Development
Ports & Cargo Group
CMC Limited
CMC Centre, Gachibowli
Hyderabad - 500 019.
INDIA

Phone : 0091-40-3000401/501 Extn. 2536
Fax : 0091-40-3000167/509
Email : vishal@pnc.cmcltd.com
Web-site : www.cmcltd.com/ports

8.3 DagangNet

The Dagang Net Group of Companies (Dagang Net) evolved from Electronic Data Interchange (M) Sdn Bhd (EDIM), Malaysia's leading e-commerce service provider, has been in business since 1989.

Dagang Net has the proven expertise and experience in:

- E-commerce community inter-organisational system integration.
- Business process re-engineering and change management.
- Applications and systems development.
- Facility and network management.
- Internet commerce and multimedia services

DagangNet own and operate:

- Dagang Net - The national clearing centre for electronic data interchange (EDI) messages in Malaysia
- A Frame Relay/ATM Wide Area Network with nationwide nodes.
- An international business communication gateway

Credentials:

- National Port Exchange (NPE)
- eDeclare
- Electronic Payment
- Port Klang Community System (PKCS)
- Port Klang Free Commercial Zone-Net System (FCZ-Net SYSTEM)
- Kuala Lumpur International Airport Community System (KLIACS)
- Cement Industries Of Malaysia (CIMA)'s PSN Net
- Jusco Electronic Retail Community
- Medipro Electronic Manufacturing Community
- Ministry Of International Trade & Industry's MITI-Net System
- Department Of Veterinary Services' DVS-Net System
- SIRIM-JTM*EDI - Type Approval And Permit Information system (TAPIS)
- Malaysian Timber & Industry Board's MTIB-Net System

8.3.1 Contact

DagangNet
20th Floor, Wisma Semantan,
Jalan Gelanggang, Bukit Damansara,
50490 Kuala Lumpur.
Tel : 603-2723-2723
Fax: 603-2723-2727
careline@dagangnet.commailto:careline@dagangnet.com
www.dagangnet.com

8.4 Flagship Technologies

8.4.1 Solution: SHIPS

SHIPS is one of the world's leading commercially available software systems for steamship lines and their agents. SHIPS provides support for Ro/Ro, Containerized and Break Bulk Operations and spans the full range of user requirements.

The first installations of SHIPS began in the UK in the early 1980s. Since these early installations, SHIPS has been successfully installed in locations around the world including Australia, New Zealand, Canada, the United States, Norway and the Far East.

Since its inception SHIPS has continually been enhanced to keep pace with the ever changing world of hardware, computer interfaces and specific user requirements, and Flagship is committed to expanding its product line and providing its clients with the highest level of support.

Flagship's shipping software development team is staffed by multilingual professionals with extensive experience in the development of custom designs for the ocean shipping industry.

8.4.2 Contact:

Flagship Technologies, Inc.
15825 Shady Grove Road, Suite 60,
Rockville, MD 20850
USA
Tel: 301-926-7377
Fax: 301-926-5267
Email: office@flagship.com
http://www.flagship.com/contact.htm

8.5 OY EDI Management (Finland) Ltd

OY EDI Management (Finland) Ltd is part of the VTKK Group Ltd, a state-owned information technology enterprise in Finland. VTKK Group Ltd has more than 1000 employees and the turnover in 1994 was more than 620 MFIM.

OY EDI Management focuses on offering electronic commerce solution for international Finnish companies. They have been the leading EDI consultancy company in Finland over the last six years and since January 1995 they have been the Finnish distributor of GE Information Services value added network and products.

One of the key projects in the maritime sector has been the Portnet project. The Finnish Portnet project started in 1992 with the overall goal to create a national maritime traffic information system for all Finnish ports and the parties involved with maritime traffic. Therefore the main interest groups of the project have been the Finnish ports, the maritime service companies and the authorities.

The project has been funded by the Ministry of Transport and Communications, the major Finnish Ports and stevedoring companies, the National Board of Customs, the National Board of Navigation and the National Board of Waters and Environment. Oy EDI Management Finland Ltd has been the project leader.

The main goals of the project have been to simplify the current procedures, to create a uniform functional model and to define and create a system solution suitable for all the parties and by achieving these goals to gain cost and other benefits.

8.5.1 Contact

Oy EDI Management Finland Ltd
P.O. Box 166 (Sinikalliontie 10), 02631 Espoo
Tel: +358 9 4391 000
Fax: +358 9 4391 0043
Email: seppo.auvinen@edimanagement.com
www.edimanagement.com

8.6 Maritime Cargo Processing Plc

Maritime Cargo Processing Plc was set up to manage, market and develop the port community system known as the Felixstowe Port Control and Customs Clearance System (FCPS).

FCPS was first implemented in Felixstowe in January 1984 and now services thirteen locations, including ports, Inland Container Depots (ICDs) and an airport. Introduced to help speed the flow of imports and exports, the system has proved extremely successful and a large proportion of official and commercial documentation which commonly gives rise to delays has been eliminated. In addition to the work associated with running the FCPS system, MCP are involved in other assignments.

Typical Project Assignments include:

- Analysis of the local Customs and trade practices in Southern China. Made recommendations concerning the introduction of Simplified Procedures for Customs and the development of a Port Community EDI System, including a high level description of functionality, to assist with the development of the Port of Yantian;

- Organised and participated in a seminar on behalf of Yantian International Containers Terminal Ltd to assist in the development of the new Port of Yantian, China. The seminar, co-sponsored by the Customs Co-operation Council, was aimed specifically at the Customs Department of the People's Republic of China and detailed international trends in the areas of Customs controls and an environment of trade facilitation;

- Undertaking study for development and introduction of a community system for the ports of Malaysia. The consultants were commissioned by EDI (Malaysia) to produce a functional specification for imports and a high level specification for exports, using Structural Systems Analysis and Design Methods (SSADM). Final presentation to the community of Port Klang, including Customs;

- Undertaking a study for the introduction and development of a computer based information system for the Office D'Exploitation des Ports (ODEP), Casablanca, Morocco. The Consultants were commissioned by the World Bank to undertake a study of the existing port information system and make proposals for its development, to report on the progress of Customs operations and to examine the feasibility of inter-connection between systems of all sectors of the port community.

8.6.1 Contact

Maritime Cargo Processing plc
The Chapel
Maybush Lane
Felixstowe
Suffolk IP11 7LL
United Kingdom
Tel: +44 1394 600200
Fax: +44 1394 600222
Email: alanlong@mcpplc.com
www.mcpplc.com

8.7 Portrade dotcom Sdn Bhd

8.7.1 Solutions

For sea port operators, Portrade has the Integrated Port Management System consisting of five components, namely Vessel Information Management System, Container Terminal Management System, Conventional Cargo Management System, Port Financial Management System and Port Resource Management System.

For Shipping Agents, Portrade has the Shipping Agent Management System consisting of five modules, namely Vessel Schedule, Cargo/Container Booking, Cargo/Container Tracking, Financial Management module.

Portrade are in the process of developing computerised applications for Freight Forwarding business. All their products are developed using web-based technology.

8.7.2 Application Service Provider (ASP)

Portrade's products are web-based that can be offered efficiently via the ASP model. The ASP model means that Portrade will host applications using their own hardware. Companies will then subscribe to use their application, accessible via the Internet without having to buy the application. A charge to the subscriber is applied on a monthly basis based on either usage and/or a fixed charge.

8.7.3 Clients

The following are our clients in Malaysia:

Kuching Port Authority
Sabah Port Authority (consisting of six separate ports)
Rejang Port Authority
Bintulu Port Sdn Bhd
Penang Port Sdn Bhd
Lumut Maritime Sdn Bhd

8.7.4 Contact

Portrade dotcom Sdn Bhd
F07, 1st Floor, 2300 Century Square
Jalan Usahawan
63000 Cyberjaya, Selangor, Malaysia
Tel: 60-3-83183388
Fax: 60-3-83181866
Email: info@portrade.com
website www.portrade.com

8.8 TUXPAN Enterprises

TUXPAN ENTERPRISES was born with the formation of TUXPAN Ingeniería Ltda. in 1993, Viña del Mar. The formation of TUXPAN was in answer to the needs of a market in evolution that needs to solve its organizational, technological and information management problems. TUXPAN presented its solutions based on new ideas and knowledge of state-of-the-art technologies in organizational analysis and modeling, business process redesign and rational incorporation of IT.

8.8.1 Clients:

8.8.1.1 Shipping – Maritime – Port Industries

CSAV – Compañía Sudamericana de Vapores S.A.
CCNI – Compañía Chilena de Navegación Interoceánica S.A.
SAAM – Sudamericana Agencias Aéreas y Marítimas S.A.
AGUNSA – Agencias Universales S.A.
COSAN – Logística Integral S.A.
EMPREMAR – Empresa Marítima del Estado
Empresa Portuaria Valparaíso
Empresa Portuaria San Antonio
Empresa Portuaria Iquique
Empresa Portuaria Antofagasta
Sociedad Portuaria de Cartagena de Indias, Colombia

8.8.1.2 Public Corporations

TGR – Tesorería General de la República
BCN – Biblioteca del Congreso Nacional
SAG – Servicio Agrícola y Ganadero
JUNAEB – Junta Nacional de Auxilio Escolar y Becas
ISP – Instituto de Salud Pública
SECTRA – Secretaría de Transportes MIDEPLAN
SUBTEL – Subsecretaría de Telecomunicaciones
SERNAPESCA – Servicio Nacional de Pesca
BECH – Banco del Estado de Chile
MINEDUC – Ministerio de Educación
ADUANAS – Servicio Nacional de Aduanas

TUXPAN also has clients who are industrial and service companies

8.8.2 Contact

Tuxpan Enterprises
Los Castaños 357, Viña del Mar
CP 2531678 – CHILE
Phone/Fax: +56 - 32 - 680 906* +56 - 2 - 3332098
E-Mail: tuxpan@tuxpan.cl & ventas@tuxpan.cl
www.tuxpan.com
www.ttigroup.net

8.9 UNISYS

Unisys is a worldwide information technology services and solutions company. With precision thinking and relentless execution, our people drive our clients' business visions forward. We help clients in more than 100 countries quickly and efficiently achieve competitive advantage.

8.9.1 Combined expertise in

- Systems integration
- Outsourcing
- Infrastructure
- Server technology
- Consulting

8.9.2 Serving six primary vertical markets worldwide

- Financial services
- Public Sector
- Communications
- Transportation
- Commercial
- Media

Unisys recently added an important new public sector client, the Philippine Ports Authority (PPA), which is embarking on a mission-critical management information systems project to be implemented in almost all the country's ports interconnected in a nationwide inter-port network. A project of similar scope was successfully completed previously for Philippine Customs.

8.9.3 Contact

Tony Tissington, Director, Public Sector, Unisys Philippines
Phone: +63 (2) 811-7777
E-mail: tony.tissington@ph.unisys.com

Appendix B

List of Organisations Consulted

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9 List of Organisations Consulted

9.1 Australia

P&O Ports Limited
Shipping Australia Limited
Port of Brisbane Corporation
Sydney Ports Corporation
TEDIS Pty Ltd
Tradegate ECA
Australian Customs Services
Hobart Ports Corporation

9.2 Canada

Vancouver Port Authority
Canada Customs and revenue Agency
Novacomm Inc
Transport Canada

9.3 Chile

Servicio Nacional de Aduanas
Empresa Portuaria Valparaiso
Tuxpan

9.4 P.R. China

Port of Tianjin Information Centre
Waterborne Transportation Institute, Ministry of Communication

9.5 Finland

Finnish Maritime Administration
Atbusiness Communication Oy
EDI Management
Viking Line
National Board of Customs
Finnish Port Association
Port of Helsinki

9.6 Hong Kong, China

Hong Kong International Terminals Limited
Hong Kong Customs & Excise Department
Marine Department, Hong Kong
Tradelink Electronic Commerce Ltd

9.7 Indonesia

PT EDI Indonesia

9.8 Malaysia

Port of Tanjung Pelepas
Dagangnet
Port Klang Authority

9.9 New Zealand

Centreport, Wellington
New Zealand Customs Services
Ports of Auckland Limited
Advanced PC Produced Limited

9.10 Peru

General Office of Budget & Planning, Min. of Transportation, Communications, Housing and Construction
Superintendencia Nacional de Aduanas
Ascinsa Monitoreando
ENAPU SA

9.11 Philippines

Philippines Ports Authority
InterCommerce Network Services
UNISYS

9.12 Singapore

Maritime and Port Authority of Singapore

9.13 Thailand

Communication Authority of Thailand
Evergreen Star (Thailand) Co. Ltd
Office of the Maritime Promotion Commission
Port Authority of Thailand
Thai Customs Bureau
TradeSiam Co. Ltd
Harbour Department, Port of Bangkok
Thai International Freight Forwarders Association

9.14 United Kingdom

Marine Cargo Processing plc

9.15 USA

Port of Houston Authority
US Customs