International Association of Ports and Harbors (IAPH)

Port Community Systems

Benchmark Survey

IAPH Trade Facilitation and Port Community Systems Committee

June 2011

Foreword

As chairperson of the IAPH Trade Facilitation &Port Community Systems Committee, it is an honour for me to present this “Port Community Systems benchmark survey” which is the result of the effort of Committee members and the financial support of the IAPH Secretariat.

The main objective of this benchmarking is to identify successful Port Community Systems (PCS) projects, lessons learnt from experiences of advanced member ports and to identify common problems in order to keep IAPH members updated on the best options of PCS worldwide.

Although exchanging information electronically through a PCS reduces the need for paper documents and provides all sectors of the port with a high degree of certainty regarding the speedy movement of their cargoes, major obstacles have to be overcome for a successful implementation. This report presents a comparative analysis of some of the PCS existing models and identifies the benefits of its implementation as well as the main obstacles that had to be faced.

I am convinced that this survey may serve as a guide for those ports planning to implement a PCS in the future.

Finally, I would like to thank the effort and dedication of the experts and the PCS who kindly shared their experience with the IAPH community.

Frédéric Dagnet
Chairman
Trade Facilitation and Port Community Systems Committee

International Association of Ports and Harbors (IAPH)

Port Community Systems Benchmark survey

May 2011

Contents

1. Acknowledgements

This benchmark survey on Port Community systems was prepared by the IAPH Trade Facilitation and Port Community Systems (TF&PCS) Committee with the financial and administrative support of the IAPH Secretariat.

The survey is the result of the dedication and the work of the following experts chosen by the Committee:

Bert Cappuyns, from Portic, Barcelona, (Spain)
Olivier Jean-Degauchy, from SOGET (France)
Jerome Besancenot, from PORT of le Havre Authority (France)
Ole Krebs, from Maritime Cargo Processing Plc-Felixstowe, (United Kingdom)
Dominique Lebreton, Marseille Gyptis International (France)

The participating Systems have been the following:

Name of system	Name of company	Port	Web page
AP+	Soget SA	Le Havre (France)	www.soget.fr
AP+	Marseille Gyptis International SA	Marseille (France)	www.gyptis.fr
Container Logistics I nformation Service （Colins）	Ministry of Land, Infrastructure Transport and Tourism(MLIT)	Japan	www.mlit.go.jp
DAKOSY	DAKOSY	Hamburg (Germany)	http://www.dakosy.de
Destin8 (previously also known as FCP80 and then FCPS)	Maritime Cargo Processing plc (MCP plc)	Felixstowe (United Kingdom)	www.mcpplc.com
HiTS ver.3	Hakata Port Terminal Co.,Ltd.	Fukuoka (Japan)	http://www.hakatako-futo.co.jp
MAINSYS	Israel Ports Development & Assets Company Ltd (IPC)	Israel	http://eng.israports.co.il
NACCS (Air Naccs and Sea Naccs)	NACCS (Nippon Automated Cargo and Port Consolidated System, Inc.)	Japan	http://www.naccs.jp/
Nagoya United Terminal System （NUTS）	Nagoya Harbor Transportation Association Container Terminal Department	Nagoya (Japan)	www.nutsweb.com
Porthus.net *1986-2007 – Seagha 2007- Porthus.net*	Port-I-Com	Antwerp (Belgium)	www.porticom.be
Port-MIS PLISM	KL-Net Corp	Seoul (South Corea)	www.klnet.co.kr
Portbase	Portbase	Rotterdam (the Netherlands)	http://www.portbase.com
Portic	PORTIC BARCELONA S.A	Barcelona (Spain)	www.Portic.net

The TF&PCS Committee and the IAPH Secretariat would like to take this opportunity to specially thank the work of the experts and the PCS who kindly shared their experience with the IAPH community.

For further information or requests, please contact IAPH at info@iaphworldports.org

2. Introduction

As a result of the expansion of maritime transport in recent decades, flexible and fast exchange of information has become a key competitive factor be that in the logistics chain as a whole or between individual ports. Supply chains need to be supported by a wide range of advanced communication tools and new powerful, reliable and cost effective transport networks. The role of Ports, as intermodal and distribution centres, is crucial to the cost and reliability of the whole logistics chain. Shippers and carriers select individual ports not only based on their cargo handling but also on the Added Value services offered.

In this context, Port Community Systems (PCS) are platforms providing some of these added value services. A PCS can be defined as “a facility that allows all parties to lodge standardized information and documents at a single entry point to fulfil all trade and transit-related regulatory requirements" (Ports and Harbors magazine. November 2010).
The use of IT in Ports and PCS implementation processes have been monitored by IAPH, through its Trade Facilitation & Port Community Systems (TF&PCS) Committee, in recent years. One of the main aims of the TF&PCS Committee is to analyse the impact on port competitiveness of relevant developments on trade facilitation and port community systems and to monitor the work of international and regional organizations on these issues.

In 2006, the IAPH secretariat and the TF&PCS Committee undertook a report on the main features of PCS running at member ports. Its final aim, based on a questionnaire sent to all IAPH members, was to clarify the models of PCS running in that moment and to identify best practices.

The report was presented during the 2007 World Ports Conference. IAPH members showed a great interest and a deeper analysis was requested to the TF&PCS Committee and the IAPH Secretariat. This new PCS benchmark survey is the result of this request.

The main objective of this benchmarking is to identify successful PCS projects, lessons learnt from experiences of advanced member ports and to identify common problems in order to keep IAPH members updated on the best options of PCS worldwide. It will show best practices and highlight the true potential of PCS.

A selection of PCS was prepared by the TF&PCS Committee and the IAPH Secretariat. During 2010, thirteen systems were visited by experts chosen by the Committee. Most of these PCS are placed among the top 50 container ports *(2010 classification, Alphaliner*) and their success has been broadly recognized. All PCS have been benchmarked using a questionnaire that covers a wide range of features: services and procedures offered by PCS, business model, technology, security, management, legal framework, technical standards, benefits, lessons learnt and future plans. The experts visited the PCS for two days. On the first day, the questionnaire was answered and the port visited and, on the second day, the representative met the stakeholders involved in the PCS in order to get their feedback.

This report presents a comparative analysis of some of the PCS existing models. We hope the report will become a useful tool for IAPH ports all over the world, particularly in less developed countries, thanks to the information provided by this benchmark studyonPCS best practice.

3. Methodology

IAPH' TF&PCS Committee expert team started early 2009 the process to develop a methodology that was agreed in January 2010 during a workgroup meeting in Barcelona.

The methodology to process the Advanced PCS Benchmarking was composed of four components:

- Organisation
- Process
- Questionnaire
- Selected ports

i) Organisation
Under the aegis of the Chairman of IAPH TF & PCS Committee, the project management team was composed of the TF & PCS Committee secretariat in Barcelona and an expert team as from le Havre (Olivier Jean-Degauchy from SOGET &JérômeBesancenot from Port of le Havre Authority), Felixstowe (Ole Krebs from MCP), Barcelona (Bert Cappuyns from PORTIC) and Marseille (Dominique Lebreton from MGI)

ii) Process
The Secretariat of TF & PCS Committee secured a point of contact for each selected Port and Port Community System.

A two days mission was organised to assess the PCS on site by our PCS experts and a questionnaire was sent to each point of contact by the TF & PCS Committee Secretariat to prepare interviews with local stakeholders.

Each point of contact at the Port had the responsibility of organise local interviews and meetings according to format described hereinafter.

- Day One:
  - PCS operator
  - Port Authority Executives
  - Visit of the Port including Terminals and PCS in operations
- Day Two:
  - Customs
  - Trade Community: Shipping agents, Freight Forwarders, Terminal operators
  - Any other key stakeholders

At the end of each mission, the experts had a full day to prepare the draft report of the case study.

The expert team started on site assessment in February 2010 and ended in December 2010. An interim report was be provided for IAPH mid-term conference in Savannah, June 2010 and a workgroup meeting met in Le Havre early February 2011 to draft the final report.

iii) Questionnaire

The advanced PCS questionnaire was based upon UN/CEFACT Recommendation 33 case studies on Single Window and has been customized for in depth analysis of PCS. The template will provide information in the following areas:

- Background
- Establishment
- Services
- Operational Model
- Business Model
- Technology
- Security
- Change Management
- Legal framework
- Standards
- Benefits
- Lessons learned
- Futures plans
- Contact details

Background

- What motivated the establishment of your PCS?
- What year was it established?
- What is the current release of the PCS (number of releases and timeline)?

Establishment

- How did the PCS interface with already established systems?
- Did any other PCS model serve as inspiration or model?
- What methodology was followed in setting it up?
- Did you undertake a business process/procedures re-engineering?
- Was there a pilot project or pilot stakeholders?
- What kind of training for the users was required in the establishment and how was it organized?
- How long did it take the facility to become operational?
- Could you provide an organization chart?

Services

- What are the key features of the PCS?
- What services and transactions does the PCS provide?
- What processes/procedures are covered?
- What documents/information are covered?
- Does the PCS handle inland cargo tracking and tracing?
- How many transactions per day are handled?
- How many messages per day are handled?
- How many transactions (%) are done by interface and manual entry?
- Who are the stakeholders of the PCS?

- How many clients by type of stakeholders does the PCS have at the present time? What is the adoption rate?
- What percentage of the global supply chain is covered by the PCS?

Operational Model

- Which public and private agencies are involved in the facility?
- Does the PCS Operator only operate PCS or is it involved in other IT and consulting projects?
- Describe your partnership and relationship with Customs and other Government Agencies (OGAs)
- How many ports do you operate? Could you provide the list of ports?
- How many end users do you have per ports?

Business Model

- What is the equity structure of the PCS operator?
- How was it financed (government, private sector, Private-Public partnership)?
- What were the costs of establishment of the PCS?
- What was the difference between estimated costs and actual costs?
- What are the ongoing annual operational costs?
- What is the business model?
- Who are the customers of the PCS?
- What are the user fees (if any) and annual revenue? (fixed price per year, price per transaction, price per TEU, price per declaration, any other model)?
- How will the PCS be sustained over the coming years?
- Do the revenues generated cover operational costs or do they make a profit?
- Is the net income (if any) reinvested in the PCS?
- Is the PCS self financed and/or benefiting from public funding and grants?
- What is the percentage of other IT and consulting projects in your annual revenue?
- Do other activities finance the PCS operations?

Technology

- Do you outsource technology development
- Do you outsource your data center and telecoms operations?
- What technology is used?
- What type of interface is used for PCS (Web browser, 3rs party)?
- What kind of architecture has been implemented?
- How data are submitted (what type of format/language, What forms, combination – what kind of combination)?
- Where are data warehoused (government or private entity)?

Security

- Are you IS 27001 certified
- How do you manage security?
- Do you have a security plan?
- Did you implement a disaster recovery facility?
- Do you encrypt data?

- Do you use digital signature?
- Do you use a certification authority?
- Do you have access control to the PCS?
- What kind of information do you publish on your website?

Change Management

- Did you design and execute a change management strategy?
- Do you have a steering committee?
- How did you promote the PCS?
- How did you inform the stakeholders about the PCS progress?
- Do you provide any helpdesk or customer service?
- Do you have budget for change management?

Legal framework

- Is use of the PCS mandatory by port or customs regulation or voluntary?
- Do participants need to sign a contract with PCS in order to participate?
- Was specific legislation (or change of old legislation) necessary?
- How is the privacy of information protected?
- How data are protected?

Standards

- Did you implement any standards?
- What is the percentage of standards versus proprietary messages/datas in your PCS implementation?
- What is the role of international standards (UN/EDIFACT, UN/CEFACT, WCO Data Model etc) in your PCS?
- What is the role of international trade facilitation initiatives in your PCS (UN/CEFACT Recommendation 33, ISPS, World Bank LPI etc)?
- What are the technology standards used by the PCS platform?

Benefits

- What are the key benefits to the stakeholders (tangible/intangibles, direct/indirect)?
- What are the benefits by category of stakeholder (tangible/intangibles, direct/indirect)?
- What are the impact on Customs and OGAs operations?
- What problems did it solve?

Lessons Learned

- What were the crucial success factors?
- What were the greatest obstacles?
- What are the main lessons learned?

Future Plans

- What are the plans for further development of the PCS?
- Do you envision becoming a National Port Community System operator?
- Do you envision becoming a National Single Window?
- Do you have a research and development? If yes what are your research projects?
- What are the biggest obstacles to further development of the PCS?
- Do you intend to make agreements concerning PCS on the regional level?
- Do you or are you planning to have agreements for exchange of data with PCS running in your country?
- Do you or are you planning to have agreements for exchange of data with PCS running in other countries?

Source for further information and contact person

- Website
- Contact information

iv) Selected Ports

The TF&PCS Committee selected the following PCS operators or alternative platform to be benchmarked:

Europe:

- Felixstowe: MCP
- Hamburg: DAKOZY
- Rotterdam: PORTBASE
- Antwerp: PORTHUS
- Le Havre: SOGET
- Barcelona: PORTIC
- Valencia:PCS.NET
- Marseille: MGI

Middle East:

- Israel: MAINSYS

Asia:

- Japan: NACCS
- South Korea KLNET
- Shanghai METINFORM
- Honk Kong TRADELINK
- Malaysia: DAGANG NET
- Singapore: PORTNET
- India: NPA

4. Executive summary

Background & Establishment

The establishment of most PCS was based on a "consensus" within the logistic community to improve key processes. Port Communities in the European "Le Havre-Hamburg" range have been pioneers, getting into business in the early-mid eighties. A second wave embraced the main Asian and Mediterranean ports, in the late eighties and early nineties.

Analysing the experience from the participating PCS, the general model for interfacing has been to develop customized links to the principal systems within the network, such as Port Authorities and Customs, sometimes including also Terminal Operating Systems, and offer a standard EDI message broker to link operators, adding the web service option recently.

Regarding the set-up stage, all participating companies stated that no other PCS served as inspiration or model during this phase. A common belief existed that the system to be developed was in a certain sense "unique", responding to the specific needs of the Port community and tied to set of constraints and conditions. Pilots were an important part of this stage. The general tendency among PCS was to include a pilot before launching the system and to organise training sessions, most often in the format of specific sessions per stakeholder group (forwarders, ship agents, customs agents, etc.).

Processes re-engineering was also a crucial part of the initial phase. All PCS projects analysed incorporated a considerable process or procedure re-engineering effort. A key factor for that was the organisation of stakeholders into working groups. These groups met regularly to establish system requirements, process functionality, desired output formats, coding standards, On top of the work group structure, some kind of steering committee used to be in place.

As far as the PCS business model and corporate organisation is concerned, it is noted that even PCS with no profit aim did create an organisation that goes far beyond administering the platform and assisting users. We found departments responsible for business development, marketing, strategy, logistic know-how, research etc.

Services, Operational & Business models

The most frequent services offered by PCS are related to Terminal control (gate-in/gate-out) and reporting on container status changes. Almost all PCS had incorporated specific services to cover rail and/or barge traffic. A recent trend in PCS service offering is to include a growing number of web services, to cover specific client requirements or information needs. Track & trace for goods outside the port community has been addressed on a limited basis. However, there is a clear tendency in most PCS to work harder on the aspect of "added value".

The questionnaires showed that PCS stakeholders are, in most cases, their main users i.e.: Customs, Port Authority, Freight Forwarders, Shipping Lines and Agents, Terminal Operators and Customs Brokers. Multi-Port systems are the most common (6 PCS). Range is from 2 ports (Portbase) to 28 (KL-Net) and are mostly operated by private companies.

Regarding the equity structure of the PCS operator, it should be mentioned that most of systems are mainlypublic private partnerships or public systems. Just a minority are completely private. At the initial stage, the establishment and operational costs of PCS were financed by their shareholders. As far as the annual operational costs ranges from USD 1,5m to 100m.

Business models are based on a combination of subscription and transaction fee which may represent up to 40% of annual revenue. Most of PCS use a hybrid revenue stream model mixing:

1. annual or monthly subscription fee by services or for all services
2. fee per unit charge (tonnage, customs declaration, TEU, Barrel, vessel, hour…)
    a. or per service charge
    b. or per EDI transaction charge
3. fee per stakeholder

Other IT and consulting projects may represent up to 60% of PCS annual income. Most of PCS are self-financing and they are reinvesting their net income in developing new services and evolving existing ones.

User groups of PCS are customs, port authority, other governmental agencies, importers, exporters, freight forwarders, shipping agents and shipping lines, carriers, rail, truck and barge operators, terminal operators, empty depots, inland container depots, Bonded Warehouse operators, logistics operators, port services providers, banks.

Technology, standards and security

As far as technology is concerned, most PCS do not outsource their technology development or their data centre and telecoms operations. Data is warehoused mostly in the private sector.

The most common interface used is browser and the architecture implemented are n-Tier (3) and n-Tier (n). Moreover, respondents are predominantly moving with ‘Internet’ technology whilst retaining a small element of links to legacy systems as well as support of older message formats and transport mechanisms. The knock on effect is that of an extrapolated ascent in the use of system to system interfaces thus increasing non-human resource utilisation and the operational benefits this brings to the port community. It is interesting to note that UN Recommendation 33 is not seen as all that relevant in terms of PCS operations.

High level security measures have been implemented across all PCS, differentiating between protection of commercially sensitive data amongst the various stakeholders and general intrusion protection. All of the system operators indicated that intrusion protection had added a significant overhead to operating costs.

Change management & legal framework

The implementation of PCS is a huge organizational change within port communities. This is the reason why Change management is a crucial phase while implementing a PCS.

The compliance to current regulations is a key factor of success for PCS implementation. Most of PCS declared that specific legislation or change of legislation has been necessary. PCS become mandatory where the system has strong interaction with public bodies (customs, port authorities). Public bodies do not seem to strongly formalize the PCS usage by entering into a service level agreement or contract with PCS service providers..

Benefits, lessons learned and future plans

The main benefits declared during the interviews are based on the improvement of the quality and real-time exchange of information. The second benefit is the reduction of paper. By reducing the amount of paper used, processes and systems inside the ports are employed to further that objective and convert a majority of the paper chase to a digital and automated environment.

At an operational level, the respondents highlighted several benefits. Firstly, the use of PCS inside a port community brings a real improvement in the logistics flow (time reduction of the goods inside the ports). Secondly, regarding the information access, many respondents emphasizes the role of the PCS in providing access of the information. In addition, some respondents declared having measured a reduction of port administrative costs while using a PCS (one respondent estimates 18 million dollars savings using the PCS). The majority of respondents declared that the use of a PCS brings transparency and anticipation of the information on the goods planned to arrive at the port.

Regarding the lessons learned, it was established that the following factors were the key element for success:

1. Capacity of the operators to understand and know the daily logistics processes
2. Strong financial capacity
3. Neutrality and confidentiality of PCS operators
4. Involvement of all stakeholders of the logistics operation
5. Necessity for each parties to be sure that PCS would bring benefits to all and would bring business to the port community.
6. Involvement of public bodies.
7. Involvement of the private sector and Public–private partnership (PPP)

The main obstacles were the following:

1. Technical standards. In the early stage of PCS implementation, no technical standards were mature enough to interface the various PCS stakeholders.
2. Adaptation of the IT systems of the PCS partners.
3. Change management issues. Dissemination, training, involvement of pilot users are some key elements to answer to those issues

The majority of respondents answered that change management is the first point to take into account in PCS project. PCS have to take into account really strongly the impacts of the implementation on the current organizations.

From a project management point of view, the analysis of the answers shows that one key element is the functional analysis prior to technical developments. Operators have to focus on functional analysis and study of processes rather than technical developments.

From a financial perspective, some PCS operators emphasized the necessity to evaluate really accurately all potential costs to succeed. It is interesting to note that beyond the main benefits of a system (cost savings, paperless, standardization etc a PCS brings an improvement of the know-how inside the port community.

The most common plan for future developments was the enlargement of the scope of the PCS and providing services to stakeholders who were not users. Technical enhancements are the second subject identified. As PCS are IT systems, PCS operators always have to enhance and improve their systems to meet technological evolutions and users requirements that arise from these new technologies. Normalisation, documents management and e-learning are the other areas of technical further developments.

Development of new functionality was also identified, PCS operators continuously improve their systems to provide new functions to their users. Enhancing booking demands, Instructions, Traffic control and container tracking are key areas on which PCS operators are focusing development.

Public initiatives at all levels (EU, National, local) are also perceived as an obstacle to PCS future developments. Similarly stakeholders are identified as potential obstacles tooAs it appears difficult to gather all sectorial interests around the table to decide and define new procedures and/or processes shared by all stakeholders. Finally, investment required is also considered a significant obstacle by respondents.

At a large majority, PCS operators do not envisage to become National Single Window. However, a large majority of PCS operators do R&D in this area, which can mean that projects would soon be launched. Finally, it should be highlighted that either National, Regional or worldwide, agreements on data exchange with other PCS was one of the main future developments for a large majority of PCS operators.

5. Background

This chapter of the study dealt with issues related to the key drivers for setting up the PCS, the time the PCS has been in business and the major milestones of the PCS development (expressed as “releases” of the PCS).

5.1 Key drivers for PCS establishment

With respect to the key drivers that motivated the implementation of a PCS as expressed by the participating companies, they could generally be classified under three categories.

a) National government initiatives or National Customs projects , such as:
   - Government's port reform legislation in Israel that abolished traditional Port Authorities and created a national company to manage port assets.
   - On the initiative of South Korea’s Ministry of Land, Transport and Maritime affairs, facing a wide variety of work flows and document formats in the country’s 30 maritime ports, a company (KL Net) was founded to bring in standardisation

   These Port Community Systems were conceived as some sort of National Single Windows, including an important component of eGovernment from the start and adding services to the logistics community later on.

b) Logistics Community initiatives

   Some PCS were established based on a “consensus” within the logistic community of the port to improve key processes. One process that came out frequently was the gate-in/gate-out operation at container terminal, that - at first sight - seemed to be a simple pick-up or delivery of boxes, but has revealed itself to be complex and time-consuming because of specific requirements for information exchange, coordination and control, involving many parties and stakeholders.

   Those PCS typically started to operate at one port, but being a logistics community imitative, they quickly jumped over to other ports, as operators wanted to work with the same system everywhere they are present.

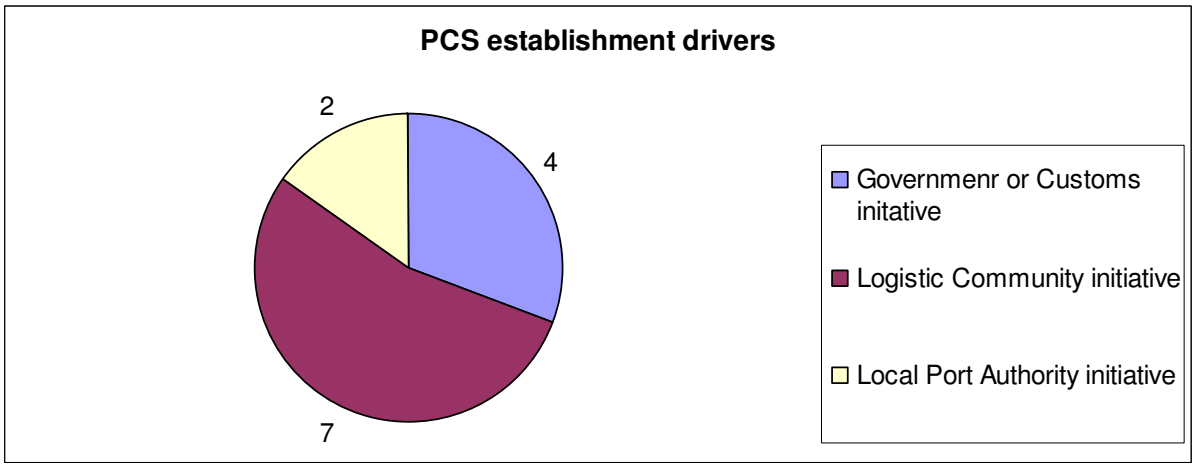
   The best examples of this scenario of establishment are AP+ in France and destin8 in the UK.

c) Local port authority initiatives

   Finally, some PCS were conceived within the strategic planning of some Port Authorities, and then “sold” to the logistics community and public administration.

They could move fast into business as they count with a powerful sponsor, but normally remained focused on the port where they saw the light, as Port Authorities consider PCS as a competitive edge over other national ports. Typical examples are Spanish PCS – each main port having created its own PCS, and forcing logistics operators to work with multiple systems. The exception on this scenario was Portbase of Rotterdam, as they manage to spread the system to neighbouring Amsterdam port (probably due to the specific weight of Rotterdam at port traffic level in the Netherlands)

Exhibit 1



5.2 Time in business

It can be safely stated that Port Communities in the "Le Havre-Hamburg" range have been pioneers with respect to PCS, getting into business in the early – to mid-eighties (almost 30 years of experience). Probably competitive pressures among ports in that area spurred the establishment of PCS within a 5 year time period In almost all leading ports of the area, with the exception of Rotterdam, that went through a couple of failed pilots before reaching the state of a mature PCS.A second wave embraced the main Asian and Mediterranean ports, in the late eighties and early nineties.

Since they have started business, most PCS have gone through different stages, marking milestones in PCS development. Those major release changes are linked by some PCS to adding new services or, expanding locations or performing a technical overhaul. In between, minor releases are scheduled to keep the system up to date, although claim to be evolving continuously.

6. Establishment

In the IAPH benchmark study, the chapter on "Establishment" intended to analyse in detail the process that were followed by the different PCS companies to set up the system and go live. To cover all the important issues, the questionnaires presented eight questions related to:

- the interface with already established Systems.
- Influence from other (existing) PCS.
- methodology for setting up the system
- the need of performing a business process/procedures analysis and/or re-engineering.
- the existence of pilot projects or pilot stakeholders.
- the training required for the users in the establishment and how was it organized.
- the time frame needed to become operational.
- the organisational structure of the company managing the PCS

6.1 Interfacing with already established systems

Analysing the experience from the participating PCS, we can conclude that the general model for interfacing has been to develop customized links to the predominant systems within the network, such as Port Authorities and Customs, sometimes including also Terminal Operating Systems, and offer a standard EDI message broker to link (private) operators (recently also adding the web service option). For those who cannot manage EDI, either web applications (for manual data entry) are offered, powered with upload facilities based on Excel files are provided, or web services. Finally, some PCS also use flat files to transmit master tables (vessel data, port call data, port codes, IMO codes etc.)

Only a minority of PCS have implanted EAI solutions (Marseille, Le Havre, Korea) to adapt client's message formats to the standard PCS messaging rules. Other ones like UK or Barcelona offer private EDI mapping services.

6.2 Influences from other PCS

Virtually all participating companies stated that they no other PCS served as inspiration or model during the set-up stage. One reason to explain this is probably related to the variety of circumstances and drivers that spurred the creation of each individual PCS. As such, at the time the PCS was created, a common belief existed that the system to be developed to serve a port community was in a certain sense "unique", responding to specific needs and tied to a set certain set of constraints and conditions.

Only later on, as PCS were reaching maturity, did we observe a change among the PCS companies towards a "closer relationship" model that sought to learn from each other's experience.

6.3 Methodology for system set-up

The questions about methodology have been answered by the participating PCS from an organisational viewpoint, focusing on project and control structures to deliver the PCS, touching only to a minor extent aspects of "system development methods". The common theme at PCS creation, has been to organise stakeholders of the (future) PCS into some kind of work groups, that met regularly to establish system requirements, process functionality, desired output formats, coding standards,. For this to happen, a consensus reaching process was established, within the constraints of existing public regulation – although in a certain number of cases, public regulation was adapted to allow PCS to get into business.

On top of the work group structure, some kind of steering committee used to be in place, typically composed of representatives from PCS' stakeholder groups, such as Port users associations, Port Authority, Customs, (sometimes) National Government, together with some member of company in charge of system set-up. The role of the steering committee normally focused on setting priorities - in terms of defining critical services to be developed by the PCS - performing project follow-up, resolving conflicts, and establishing plans for roll-out.

It's also significant to point out that - leaving apart the so-called National Single Windows PCS - a step-by-step approach has been adopted (for PCS: service-by-service approach), rather than designing the full system from the beginning. As said before, priorities for service were decided at the steering committee level, and service work groups were set up for the high priority service(s) implementation projects.

Finally, according to the participants' (2) comments on methodology for system development, UML based methodology came out as one of the best practices.

6.4 Performance of process/procedure re-engineering process.

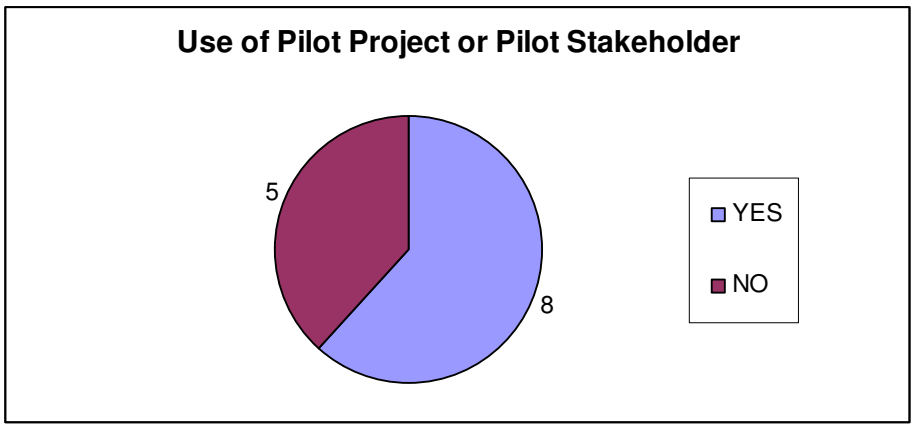
Considering the previous, it doesn't come as a surprise that almost all PCS projects incorporated a considerable process or procedure re-engineering effort, taking advantage of the interesting mix of experience and knowledge in port business and maritime affairs that was present in the work groups for preparing PCS set-up. In some cases, the re-engineering work was not in the original vision, but came out during project execution.

6.5 The existence of pilot projects or pilot stakeholders

The general tendency among PCS was to include a pilot – most of the times a pilot stakeholder – before launching the system, even though in some cases (i.e. Destin8, UK) it was just intendedas a proof of concept. Among those PCS that didn't work with pilots at the

beginning, some have incorporated this practice for new service launches (such as Portic, Barcelona)

Exhibit 2



6.6 What kind of training for the users was required in the establishment and how was it organized.

It has been common practice among PCS to organise training sessions before going live, although some PCS like Dakosy, Hamburg mentioned that "No extraordinary training was necessary, because most users were able to use their existing systems" – it was obviously a case where most of the PCS' clients were directly interfaced with their (legacy) system to the PCS, so therefore, not needing specific training.

According to the participating PCS, training has been provided most often in the format of specific sessions per stakeholder group (forwarders, ship agents, customs agents, etc.), although in some cases, training has also been provided in-house by a dedicated training team (i.e. Portbase, Rotterdam).

Worth mentioning also is the e-learning initiative championed by Portic, Barcelona,, providing best-in-class training experience, available on a 24X7 basis, with self-evaluation tools for the users.

6.7 Time frame needed to become operational.

The average time for PCS set-up ranged between 2,5 and 3 years, although time frame for national PCS operator has been somewhat longer. In some cases, time needed for going

live had been quite limited, as happened in KL Net, Korea (1 year), Portbase Rotterdam (15 months) or Dakosy, Hamburg (18 months).

6.8 Organisational structure of companies managing PCS

An interesting topic of the study was related to type of organisation that different PCS initiatives had considered to be adequate for running their platform. It is striking that even PCS with no profit objective did create an organisation that goes far beyond administering the platform and assisting users. We found departments responsible for business development, marketing, strategy, logistic know-how, research etc.

Furthermore, it is important to mention that most PCS have complemented their internal organisation, with a structure of advisory boards or work committees that integrate different stakeholder groups, public administration and PCS management team, maintaining in many cases organisational structures used during the set-up phase. Typical functions adopted by those boards is to review PCS operations, plan for new developments or resolve conflicts.

Touching the topic of staff members employed by the PCS, it was not always easy to obtain very precise numbers. Furthermore it is hard to reach final conclusions, without taking into account all factors such as client base, ports handled, service portfolio, customized development, service level agreement, office hours, training services, degree of outsourcing etc. Nevertheless, it seems that a minimum of 10 to 15 staff members are needed to set up a PCS, whereas only marginal staff increases are needed to expand the client base or number of ports handled, once the system reaches maturity. As such we observe that systems like Destin8 or AP+ have been growing their client base without proportional increases of staff level, and even big player like KL Net handling more than 6.000 clients have remained relatively small with only 150 employees.

7.Services

In the chapter on “Services” of the IAPH benchmark study, analysis focused on the service offer presented by PCS to their client base, and tried to determine some measure of usage rate and port process and port community coverage rate. The following questions were submitted to the participating companies:

- What are the key features of the PCS?
- What services and transactions does the PCS provide?
- What processes/procedures are covered?
- What documents/information is covered?
- Does the PCS handle inland cargo tracking and tracing?
- How many transactions per day are handled?
- How many messages per day are handled?
- How many transactions (%) are done by interface and manual entry?
- Who are the stakeholders of the PCS?
- How many clients by type of stakeholders does the PCS have at the present time?
- What percentage of the global supply chain is covered by the PCS?

7.1 What are the key features of the PCS?

The table below summarizes statements of participating PCS about what they consider “outstanding features” of the system. It is noticeable that features appearing most often were related to technical issues or port procedures, rather than to what matters most to PCS clients: added value to their (logistics) business .

Nevertheless, the study shows a clear tendency at most PCS to work harder on the aspect of “added value”.

Position	FeatureDescription	# times mentioned
1	B2B, internet based, available 24/7	6
2	Standardization&rationalization of procedures	3
3	Web services + EDI transactions	3
4	Integrate Government & private sector,	2
5	Added value: Smoother logistics, faster and more efficient operations, and therefore strengthening of competitive position of the port's clients	2
6	Paperlessprocedures	2
7	Increased supply chain traceability & security	2
8	Cost-effective (sponsored by the port)	2
9	Automation of administrative, customs and commercial procedures	1
10	Efficiency by re-use of data	1
11	Interoperability between users' information systems	1
12	Insures data quality and confidentiality	1

7.2 Services provided – processes covered by PCS

Although it was not always easy to interpret the answers of each PCS in order to determine the exact nature of the announced services, the following conclusions could be drawn from the study.

a) Service that has been offered most frequently - practically by all PCS are related to Terminal control (gate-in/gate-out) and reporting container status (Above all inside port terminals)

b) Behind that, we find a number of services used commonly, though not always, to be considered also as standard PCS offering:

- Vessel arrival/departure management: vessel schedules, call announcement, berth request
- Cargo loading/unloading: summary declarations, manifests, dangerous cargo declaration, loading & unloading lists, transhipments
- Customs clearance, ICS and ECS declaration
- Cargo transport, in/out the terminal
- Booking request & confirmation
- Shipping instructions & BL
- Basic information services (apart from container status): statistics, port directory, master tables

c) Moving to services that were included to a lesser extent, the following ones came out from the questionnaires:

- Truck/rail arrival pre-notification
- Customs/transit declarations
- Cargo (container) inspection
- Integration with international platforms such as Inttra and GT Nexus
- Billing/invoicing

d) Finally, though there seemed to be an import tendency to consolidate a quite similar service offering among different PCS, there were still a number of cases of very specific services offered only by 1 or 2 PCS. For example:

- Truck fleet scheduling and control system (including event reporting at client's warehouse facility), offered by Portic, Barcelona
- Baplies or stowage plans, offered by Mainsys, Israel and Dakosy, Hamburg
- Container damage/repair reports, offered by Dakosy Hamburg

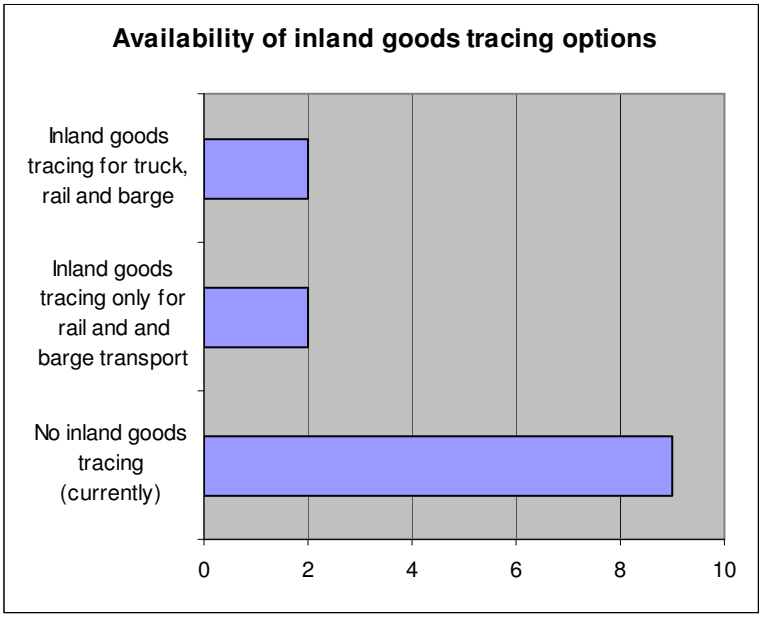
With respect to multimodal transport integration, almost all PCS had incorporated specific services to cover rail and barge traffic, whenever those options represented significant volume. Specific services included loading/unloading lists for train or barge and arrival and/or discharge notifications.

On the other side, considering coverage of different types of goods – containerised cargo, bulk, general cargo, vehicles, ro-ro, …,, it could be generally stated that most PCS were primarily focused on container handling. Some of them had also incorporated (part of) the vehicle transport chain, but almost none claimed to cover for all types of goods, with the exception of KL Net, Korea and Destin8, UK.

Finally, a recent trend in PCS service offering is to include a growing number of webservices, to cover specific client requirements or information needs. Examples:

- Consult permitted weight for trucks
- Consult cargo status
- Send sea service request.
- Consult expiry date of electronic container release

7.3 Handling of inland goods tracing



It can be concluded from the study that track&trace for goods outside the port community has only be addressed on a limited basis by PCS (Marseille, Hamburg, Barcelona), , either because no added value is perceived, because of lacking demand from clients or because of the complexity to implement this kind of services.

Similar conclusions could be reached on pre-arrival tracing (from the port community to the port of discharge), where only a minority of PCS (Antwerp, Hamburg, Barcelona), have services in place, mainly based on the integration with international carrier platforms, such as Inttra and GT Nexus. Other PCS (Le Havre, Korea, Rotterdam) are planning or implementing track & trace services, linking to foreign trading partners in key import- or export-related markets (i.e. China, Korea)

7.4 Message volumes / % of manual entry

In order to establish some measure of volume comparison between the different PCS, it was decided to focus on message volume, calculated on a monthly basis. We added also the information on the % of those messages that were generated though manual input.

It is noteworthy to state that many clients combine direct integration (to send original messages) and manual entry (to change or cancel messages) at the same time. For this reasons, the low usage percentage of data entry applications should lead to the conclusion they are only marginally important to PCS operations.

(*) In the case of eGovernment procedures, manual data entry is done in 100% of the cases.

PCS	messages/month (millions)	manual entry %
NACS	12,25	2%
Israel	6,5	2%
Le Havre	2,97	20%
Hamburg	2,75	20%
Rotterdam	2,64	80%
Barcelona	1,65	N/A
Antwerp	1	N/A
Marseille	0,88	20%
Korea	N/A	5% (*)
UK	N/A	5%
Nagoya	N/A	5%
Hakata	N/A	10%
Tokyo	N/A	N/A

7.5 Stakeholders / client volume

Stakeholders	Hakata	Nagoya	Tokyo	NACS	Marseille	Israel	Le Havre	UK	Barcelona	Hamburg	Korea	Antwerp	Rotterdam
Shippers	x	x	x	x	x	x	x	x	x	x	x	x	x
Truck companies	x	x	x			x	x	x	x	x	x		x
Terminals	x		x	x	x	x	x	x	x	x	x	x	x
Shipping Lines			x	x	x	x	x	x	x	x	x	x	x
Warehouses			x	x	x		x	x	x				
Freight Forwarders/Cust. Brokers	x	x	x	x	x	x	x	x	x	x	x	x	x
Consolidators				x	x		x		x				
Customs			x		x	x	x	x	x	x	x		x
Port Authorities				x	x		x	x	x	x	x	x	x
Depots						x	x		x				
National government agencies				x	x		x	x			x		x
Rail operators					x	x	x	x	x	x			x
Barge operators					x		x			x			x
Maritime Police				x			x			x			
Banks				x					**x**				
TOTAL NUMBER OF CLIENTS	**424**	**340**	**N/A**	**2158**	**382**	**500**	**465**	**700**	**278**	**2000**	**6058**	**N/A**	**1754**

Finally, we attach an overview of the different stakeholder groups, managed by each PCS, adding below information about the total number of clients. It has been a common theme throughout the IAPH study that adequate stakeholder leadership and management of stake holder's interests by the PCS companies have been a key factor to their success.

8. Operational model

Definition

The study aimed to define different operational models that are implemented by PCS operators. In that section the questionnaire presented six questions organized as follows:

- The relations of the PCS with Customs, other public agencies and private stakeholders,
- The coverage of the PCS
- The involvement of the PCS operator in other IT consulting projects

8.1 Relations with Customs, OGA and private stakeholders

The relations of the PCS with Customs, other public agencies and private stakeholders are the essential purpose of a Port Community System.

All Port Community Systems exchange data with their national Customs, directly or indirectly through the Port Authority or a National Service Provider (2 cases).

The formalization of the relationships with Customs depends on the structure of the PCS operator. Whereas private PCS operators have SLA or Contract with Customs, public or public owned PCS operators do not always formalize theses relations. Few PCS operators are under the control of the Ministry of Finance.

The relations with other Government Agencies depend of the services offered by the PCS. All PCS provide information to Government Agencies like Ministry of Health, Ministry of Agriculture, Ministry of Fisheries, Ministry of Environment, Ministry of Transport, Police, Fire Brigade, Coast Guards, Water Police, Port Authorities … The procedures required by these authorities are not always implemented by the PCS but should be seriously considered as likely requirements in a Single Window/National Single Window implementation.

Private stakeholders are very similar in each PCS: Shipping Companies and Agents, Freight Forwarders, Terminal Operators (container, roll-on, roll-off and bulk), Stevedores, Customs Brokers, Customs, Warehouse Operators, Inland Carriers (truck, barge, rail), Empty Container Depots, Container Freight Stations, Importers, Exporters, Non Vessel Operating Common Carrier, Inspection stations.

When provided, the repartition between these different stakeholders shows that Customs, Port Authority, Freight Forwarders, Shipping Lines and Agents, Terminal Operators, Customs Brokers are the main users of the PCS.

It appears difficult to setup a PCS without some or all of these stakeholders.

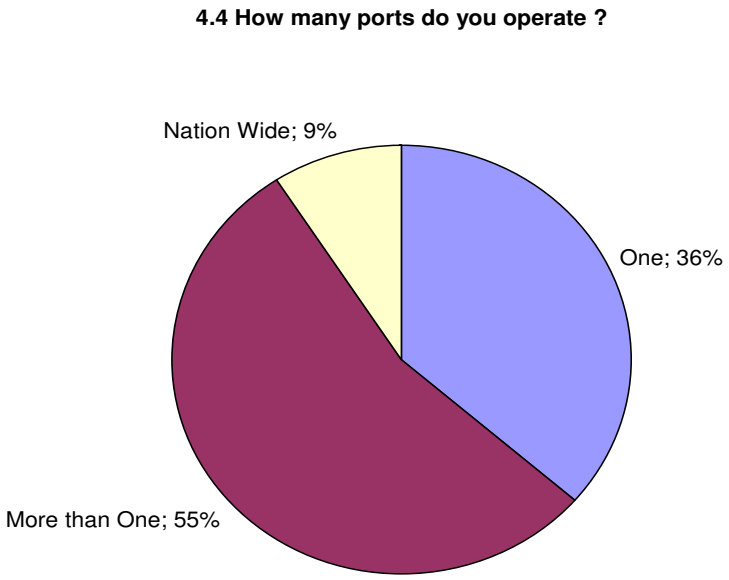
The role of importers and exporters (shippers and consignees) is less clear. Many PCS operators advert Importers and Exporters as regular users of their systems but not as information providers.

8.2. The Coverage of the PCS

In that section, the aim was to know the different coverage of the systems.

There are three main models:

1. National system
   The PCS covers all ports of a country
2. Multi-Port system
   PCS covers more than one port on one or more IT infrastructure
3. Mono-Port System
   PCS is managing one port and is dedicated



National systems cover all ports of a country, only one PCS (Japan) is concerned and is a public company.

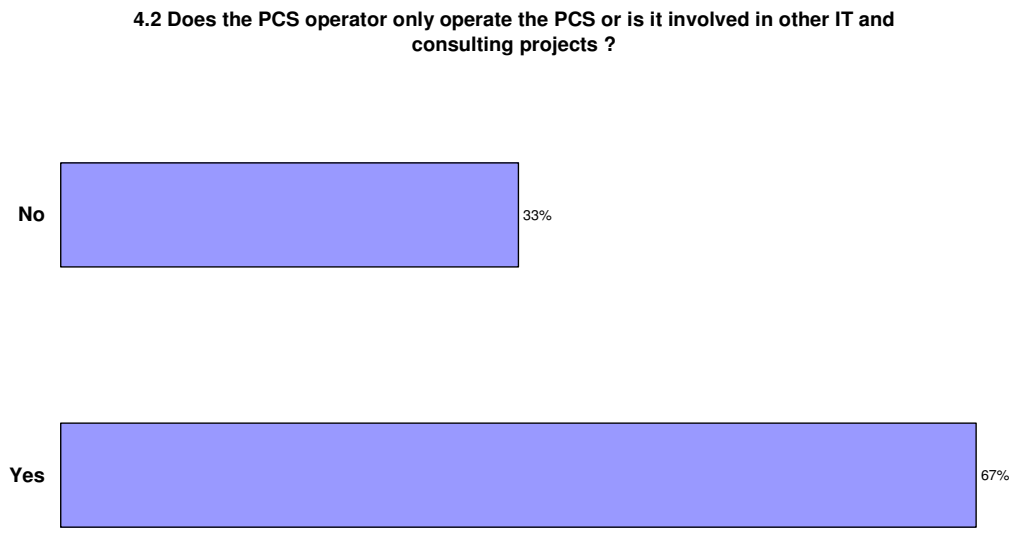
Multi-Port systems are the most common (6 PCS). Range is from 2 ports (Portbase) to 28 (KL-Net) and are mostly operated by private companies.

Mono-Port Systems come in second position (4 PCS).

The number of users is directly related to the number of ports managed by the PCS. In fact the number of users is very difficult to define since PCS are very often opened to a large audience.

8.3 Involvement in other IT projects

In that section PCS operators indicate if they are or not involved in other IT projects.



The majority of PCS operators are involved in other IT projects, however, these projects are always in relation with their core activity, for example Customs procedures, logistics software, …

9. Business Model

Equity structure of the PCS operator

PCS operators (PSCOs) have a three fold equity structure typology:

i) Privately
ii) Public-private
iii) Public

As private operators, shareholders are port community associations such as shipping agents association, shipping line association, freight forwarder association, custom brokers association, terminal operators association, stevedoring association, and also chamber of commerce and banks.

Public sector shareholders ranges from Port Authority, Container terminal authority to Government owned corporation.

While public private partnerships are a standard in the current decade, PPP created for PCSOs in the 80's where pioneers such as SOGET. Also, it is important to mention that KTNET is the only PCSO listed on a trade exchange (KOSDAQ).

	Private	Public – Private	Public
DAKOSY	O		
PORTBASE			O
MCP	O		
SOGET		O	
MGI		O	
PORTIC		O	
MAINSYS			O
NACCS			O
KLNET		O	

How was it financed?

The initial stage of the PCS development, the establishment and operational costs of PCSOs were financed by their shareholders.

In case of government owned corporation, customs authority, port authority or Government were the primary source of financing even benefiting EU Financing in the case of PORTBASE.

Costs of establishment of the PCS

Establishment of the PCS ranges from under USD 1.4 million in the 80s for DAKOSY to USD 27 million for the PORTBASE, the most recent PCS in Europe and a top YEN 28 billion investment for NACCS.

Difference between estimated costs and actual costs

Most of PCSOs were on budget target for the establishment of their system except two operators with a USD 7m maximum gap. 2 PCSOs were not able to provide information.

What are the ongoing annual operational costs

On going annual operational costs ranges from USD 1,5m to 100m in the case of NACSS.

Business model

While Mainsys is providing the service free of charge to its users as part of the port authority service, business models are based on a combination of subscription and transaction fee.

Subscription fee may represent up to 40% of annual revenue in the case of MCP.

Some PCSOs are billing only carriers and customs brokers for the transaction fee.

Main client groups of the PCS

User groups of PCS are customs, port authority, other governmental agencies, importers, exporters, freight forwarders, shipping agents and shipping lines, carriers, rail, truck and barge operators, terminal operators, empty depots, inland container depots, Bonded Warehouse operators, logistics operators, port services providers, banks.

User fees (if any) and annual revenue. Is there a fixed price per year, price per transaction, price per TEU, price per declaration, any other model.

Except for MAINSYS where the users enjoys a service free of charge, all PCSOs use a hybrid revenue stream model mixing:

i) annual or monthly subscription fee by services or for all services

ii) fee per unit charge (tonnage, customs declaration, TEU, Barrel, vessel, hour…) or per service charge

or per EDI transaction charge

iii) fee per stakeholder

Annual revenue ranges for none for MAINSYS to YEN 86 Billion for NACSS

How will the PCS be sustained over the coming years.

Most of PCSOs are self-substaining, where by all development and infrastructure upgrades are funded from revenue streams while PORTBASE is looking to breakeven by 2016 and SOGET broke even in 1992

PCSOs will be developing new services, extending their customer base with new seaports and airports in their territory.

KLNET, PORTBASE and MAINSYS will be also benefiting from Public funding for budget support and SOGET for new projects.

Do the revenues generated cover operational costs or do they make a profit.

Profit strategy is three fold:

i) PCSO do not pursue profits objective such as NACSS where revenue just cover operational cost.

ii) PCSO are still in their breakeven target such as PORTBASE for 2016

iii) PCSO have a clear profit generation objective with a 35% margin for KLNET as listed company.

Is the net income (if any) reinvested in the PCS.

In any, All PCSOs are reinvesting their net income in the evolution of current services and development of new services.

Is the PCS self financed and/or benefiting from public funding and grants.

Most of PCS are self financed except PORTBASE and MAINSYS benefiting from Port Authority funding up to 100% in the case of MAINSYS for operations financing.

What is the percentage of other IT and consulting projects in your annual revenue?

Other IT and consulting projects may represent up to 60% of PCSOs annual revenue in the case of DAKOSY but most of time, revenue are generated by PCS operations.

Do other activities finance the PCS operations?

Except MGI from Marseille, no other activities finance PCS operations

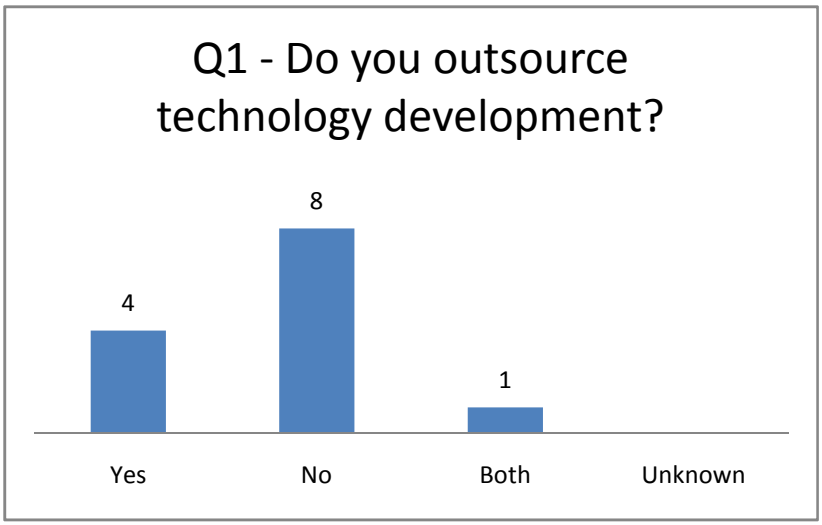
10. Technology

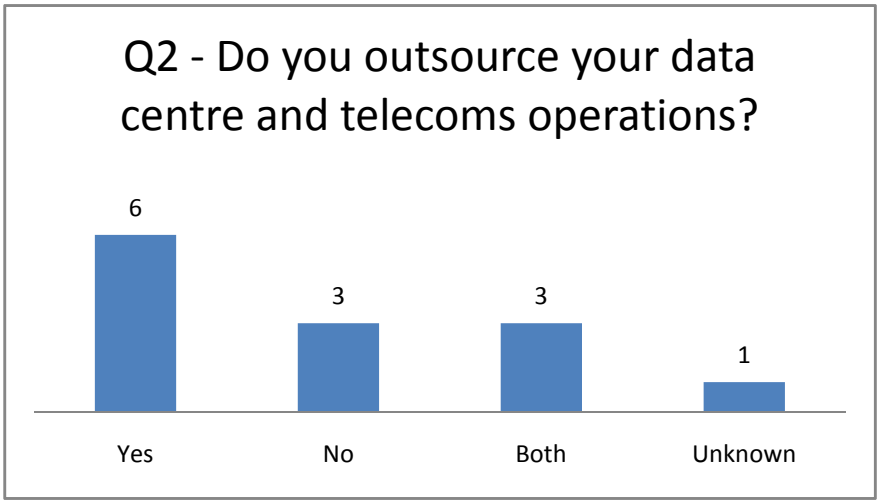
Definition

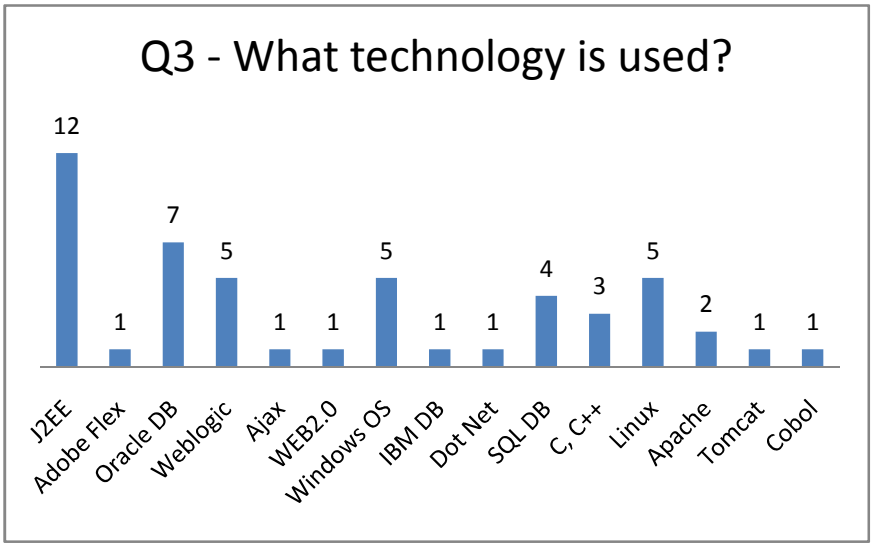
The study contained 7 very broad technical questions aimed at identifying common and by default best practice infrastructure and platform choice of the target port community systems. From this we can ascertain that respondents are predominantly moving with 'Internet' technology whilst retaining a small element of links to legacy systems as well as support of older message formats and transport mechanisms. This is reflected in the following summary of commonly used platform infrastructure, the majority of which are also PPI based operations:

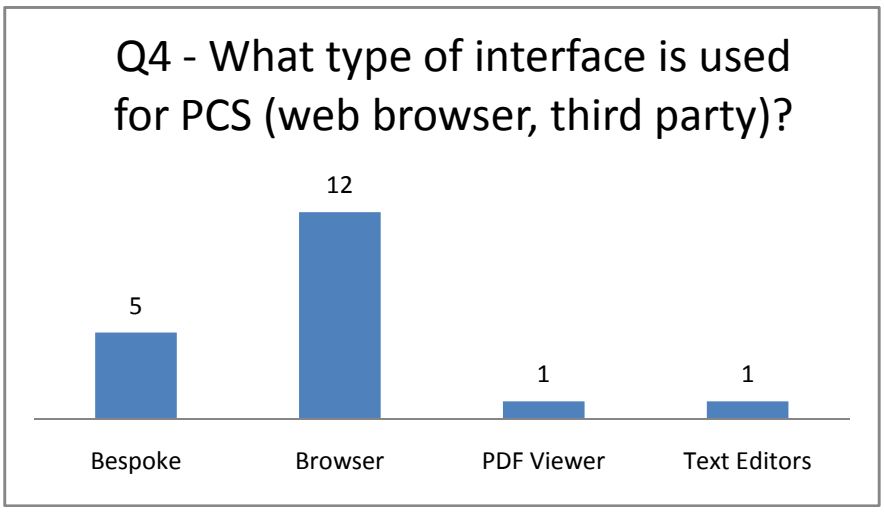
Applications: J2EE
System Architecture: Standard n-Tier (Presentation, Application, Data)
Server Architecture: Weblogic
Operating Systems: Window and Linux
Database: Oracle and Microsoft SQL
Interface: Web browser
Message types: EDIFACT, XML
Transport: Web forms, SMTP and FTP

A full breakdown of returns follows in tables Q1-7 below.

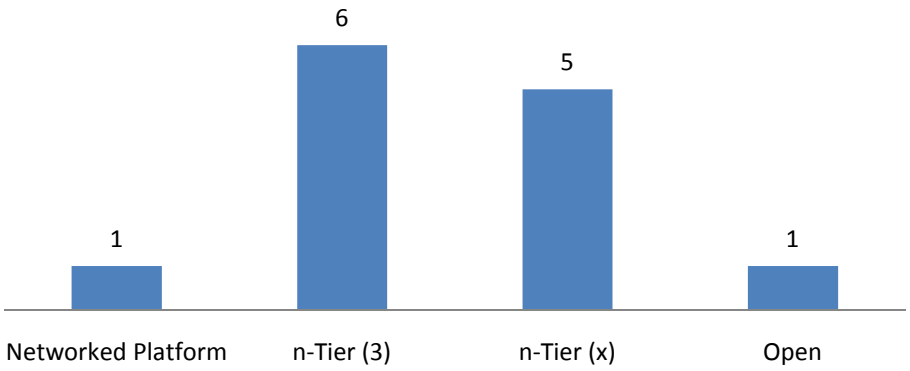



Q2 - Do you outsource your data centre and telecoms operations?
6
3
3
1
Yes
No
Both
Unknown

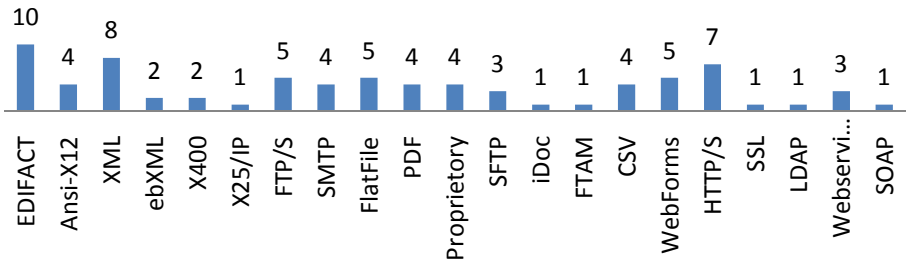

Q3 - What technology is used?
12
1
7
5
1
1
5
1
1
4
3
5
2
1
1
J2EE
Adobe Flex
Oracle DB
Weblogic
Ajax
WEB2.0
Windows OS
IBM DB
Dot Net
SQL DB
C, C++
Linux
Apache
Tomcat
Cobol


Q4 - What type of interface is used for PCS (web browser, third party)?
5
12
1
1
Bespoke
Browser
PDF Viewer
Text Editors

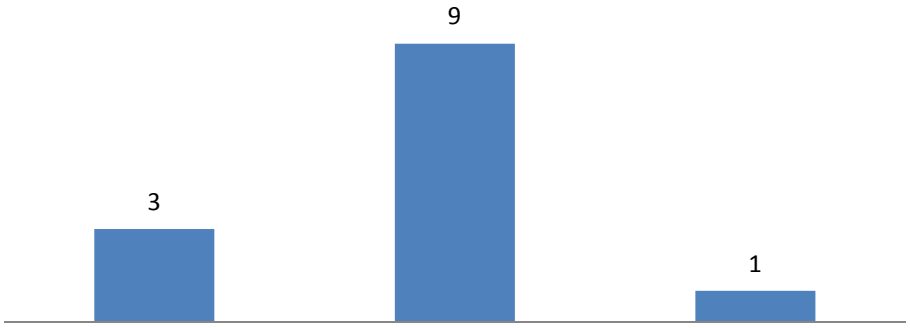
Q5 - What kind of architecture has been implemented?



Q6 - How are data submitted (what type of format/language, what forms, combination - what kind of combination).



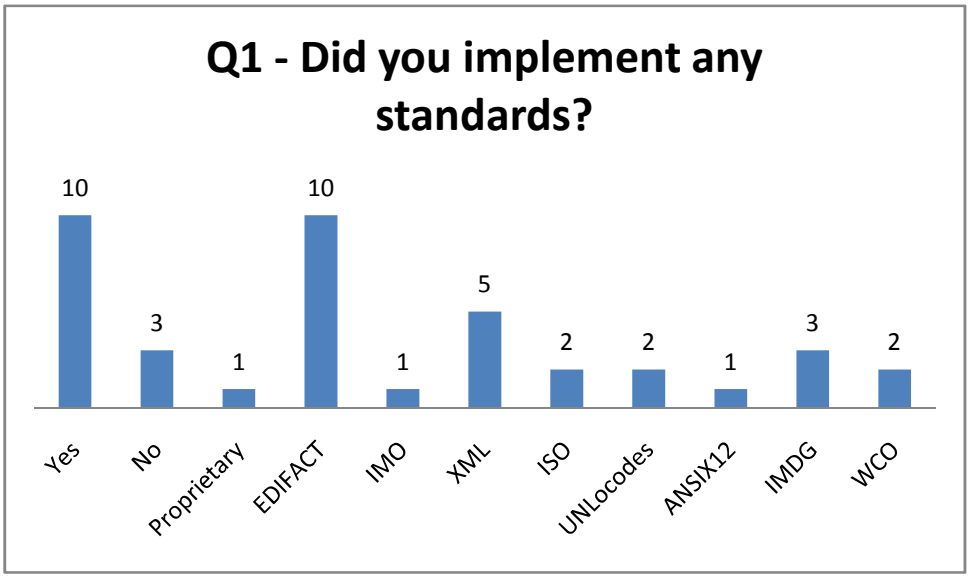
Q7 - Where is data warehoused (government or private sector)?

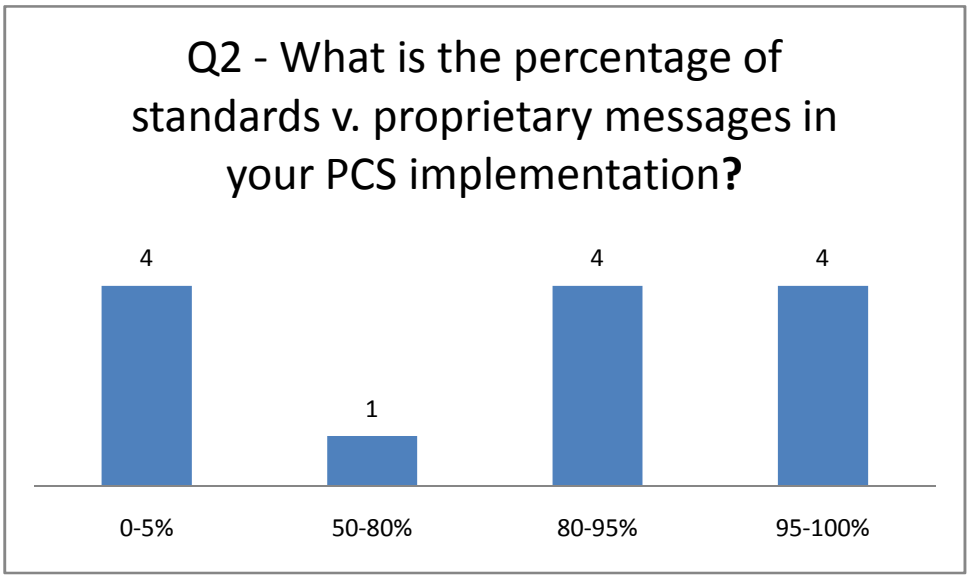


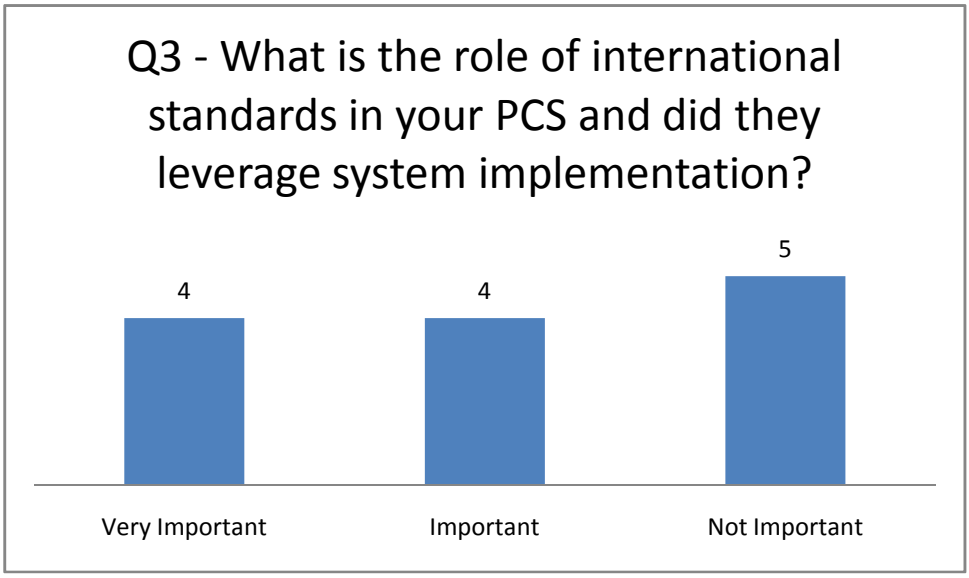
11. Standards

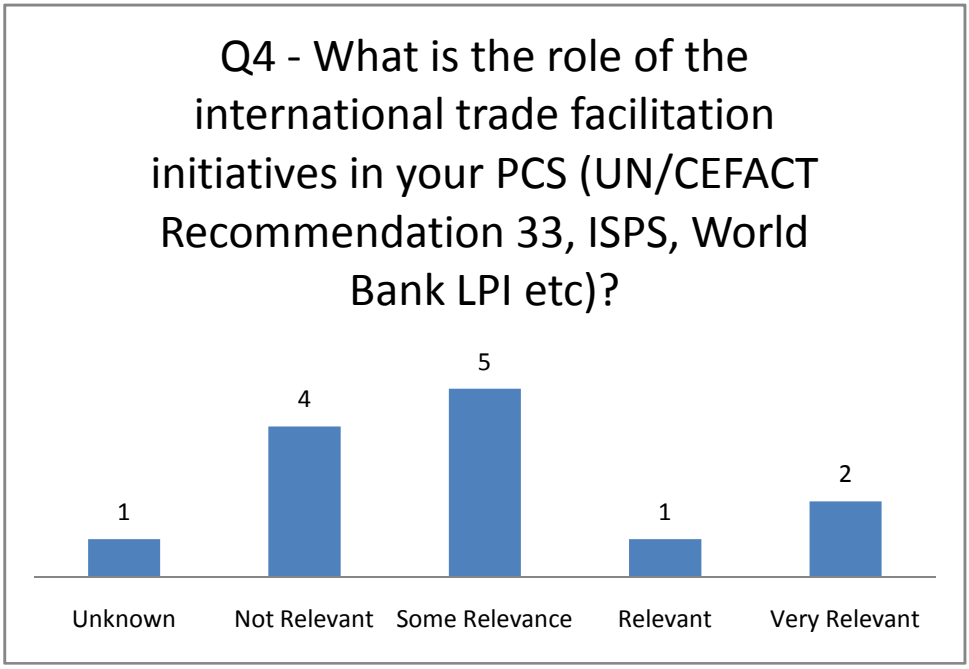
Definition

Again four very broad ranging questions that primarily attempts to signify the importance of standards being introduced and where this is the case a general uptake in the number of different stakeholders is evident. The knock on effect is that of an extrapolated ascent in the use of system to system interfaces thus increasing non-human resource utilisation and the operational benefits this brings to the port community. It is interesting to note that UN Recommendation 33 is not seen as all that relevant in terms of PCS operations.





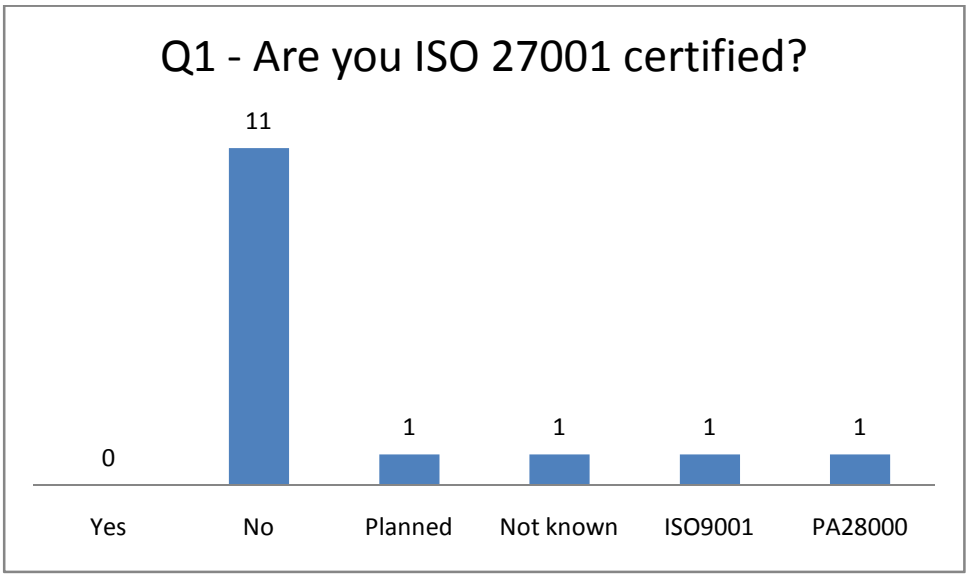

Q3 - What is the role of international standards in your PCS and did they leverage system implementation?
4
4
5
Very Important
Important
Not Important

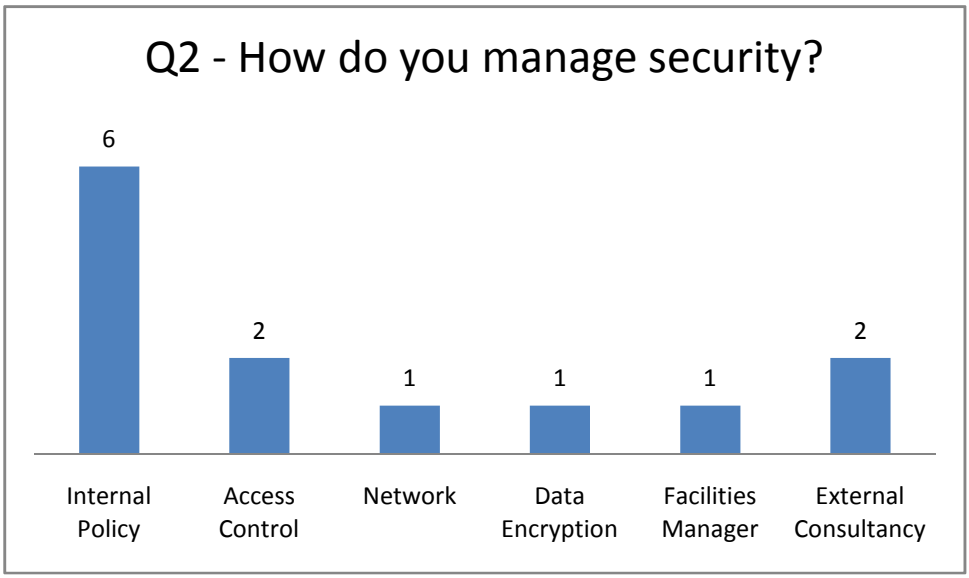

Q4 - What is the role of the international trade facilitation initiatives in your PCS (UN/CEFACT Recommendation 33, ISPS, World Bank LPI etc)?
1
4
5
1
2
Unknown
Not Relevant
Some Relevance
Relevant
Very Relevant

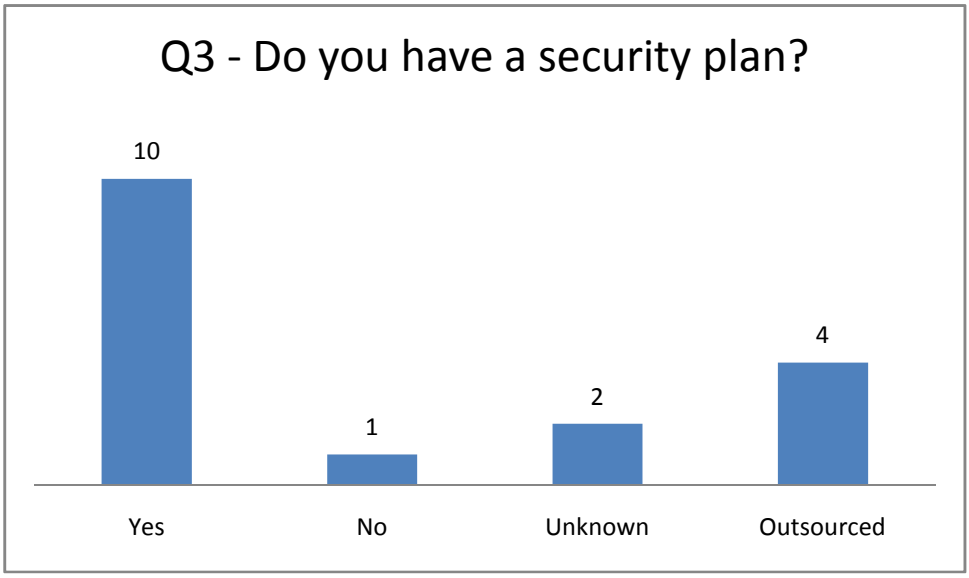
12. Security

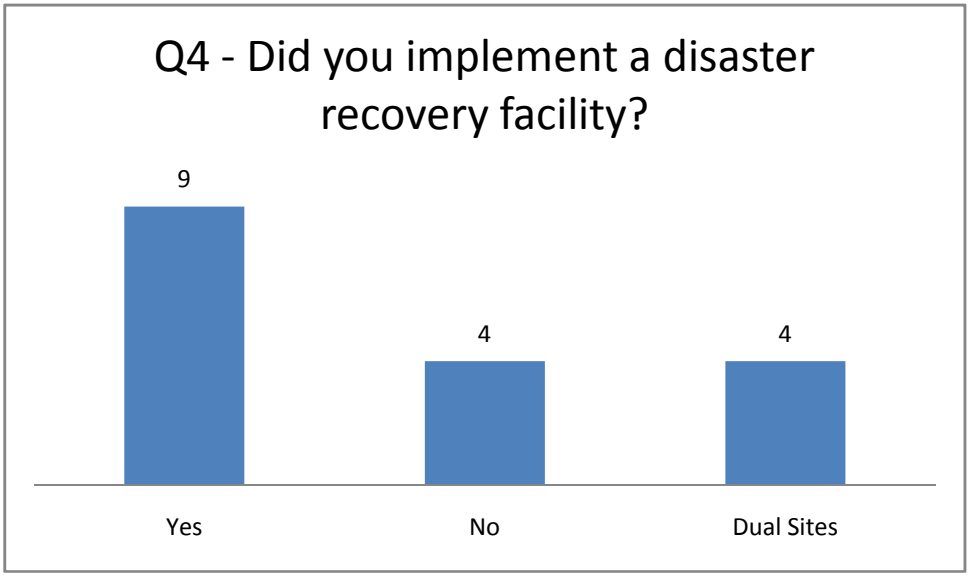
Definition

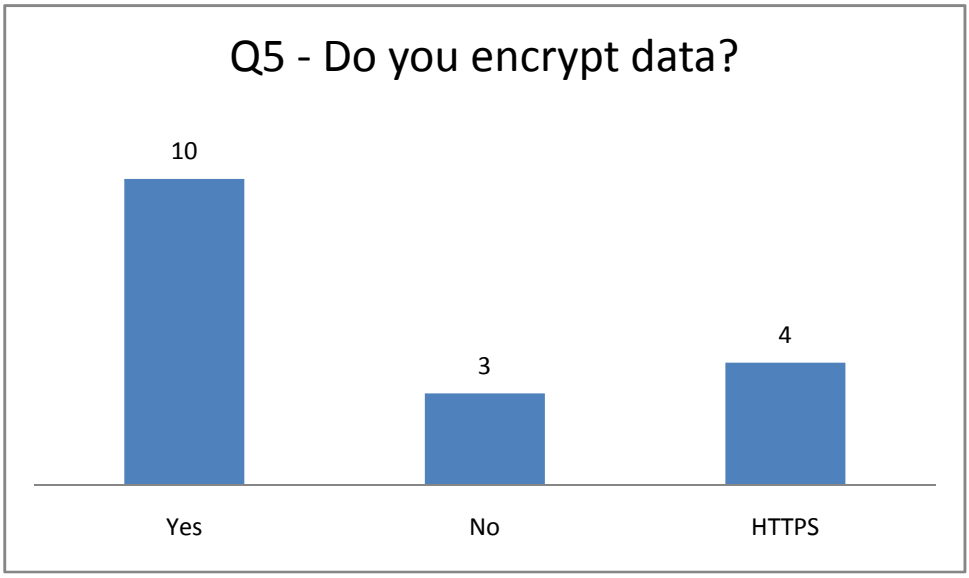
The 9 questions introduced in this section focus on system access, disaster recovery, information in the public domain and how these aspects are managed. The overriding emphasis is one of high level security measures being implemented across all of the systems and that this differentiates between protection of commercially sensitive data amongst the various stakeholders and general intrusion protection. All of the system operators indicated that intrusion protection had added a significant overhead to operating costs.

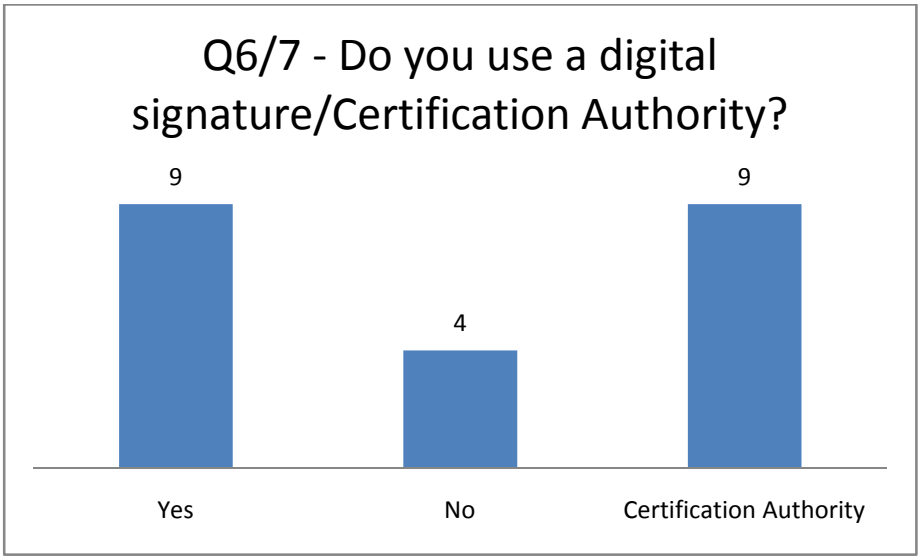


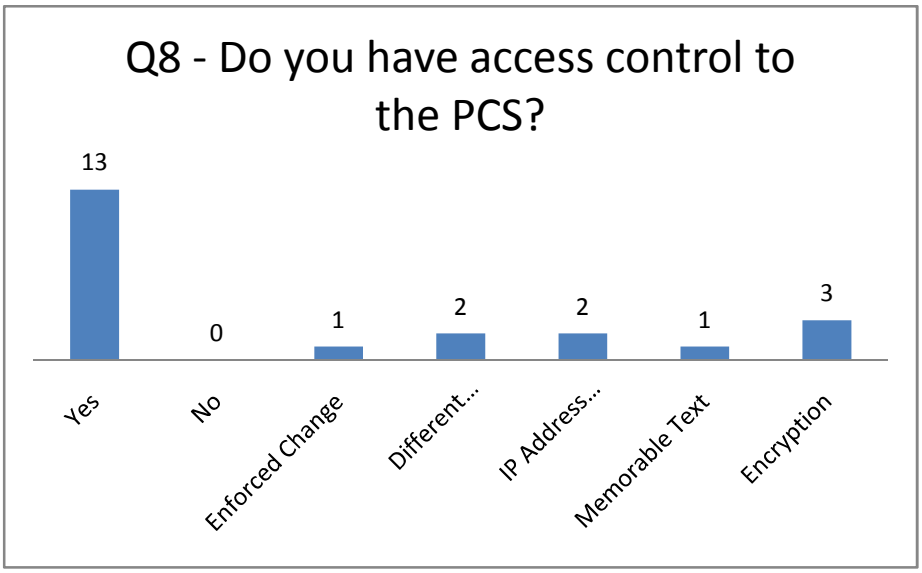


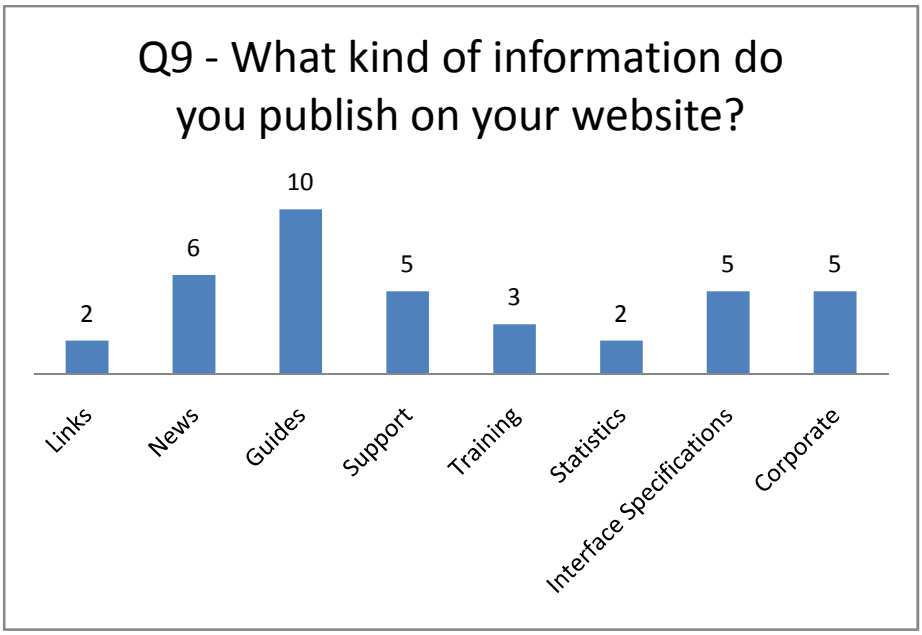

Q3 - Do you have a security plan?
10
1
2
4
Yes
No
Unknown
Outsourced


Q4 - Did you implement a disaster recovery facility?
9
4
4
Yes
No
Dual Sites


Q5 - Do you encrypt data?
10
3
4
Yes
No
HTTPS


Q6/7 - Do you use a digital signature/Certification Authority?
9
4
9
Yes
No
Certification Authority


Q8 - Do you have access control to the PCS?
13
0
1
2
2
1
3
Yes
No
Enforced Change
Different...
IP Address...
Memorable Text
Encryption


Q9 - What kind of information do you publish on your website?
2
6
10
5
3
2
5
5
Links
News
Guides
Support
Training
Statistics
Interface Specifications
Corporate

13. Change management

Definition:

Change management is a structured approach to shifting/transitioning individuals, teams, and organizations from a current state to a desired future state. It is an organizational process aimed at empowering employees to accept and embrace changes in their current business environment.

Source: Wikipedia

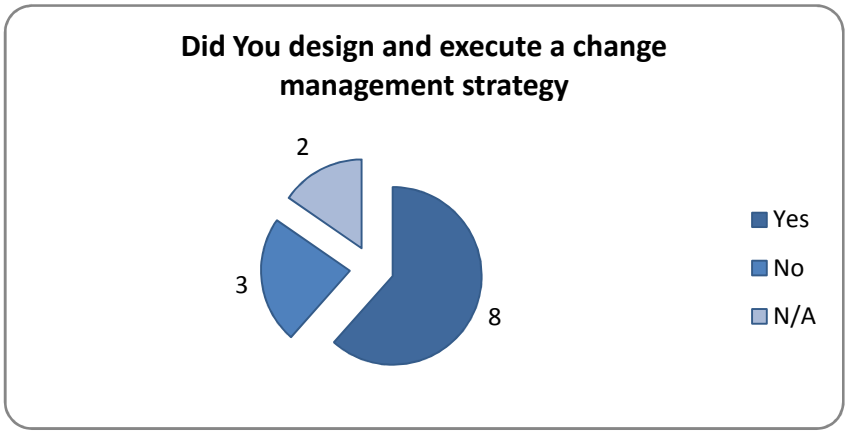
In the IAPH benchmark study, the context of the approach on that field was to see if the companies put into relief the importance of change management in the PCS implementation process.

In that paragraph, the questionnaires presented six questions in that framework related to:

- Operational
  - The execution of a change management plan
  - The help desk service
- Communication
  - The promotion of the PCS
  - Information on the PCS evolutions
- Existence of a budget for change management

At an operational level, most of the companies execute a change management plan.

Exhibit 1



Those figures show how important it is to plan training and communication to end users when implementing the PCS.

Most of the interviewees declared that the change management phase was critical when the system went live.

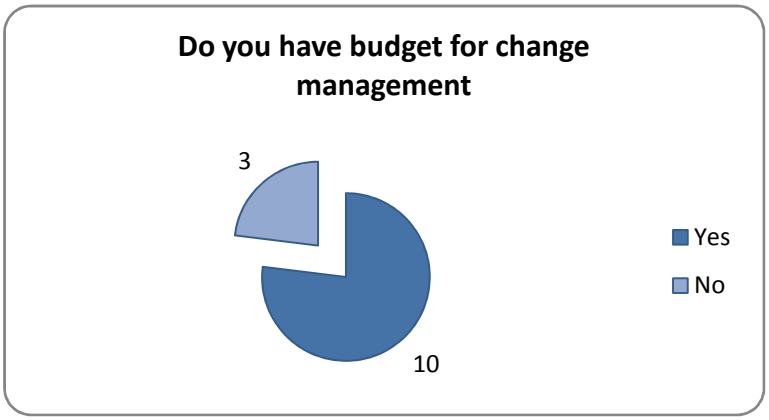
Respondents report that several organizational structures are in place to execute the change management process:

- Pilots testing phases,
- End users training,
- Dissemination to end users,
- Customers follow up.

Only one respondent (Portbase) declared having formalized an ITIL (Information Technology Infrastructure Library) process to follow its change management process.

Regarding the budget allocated to change management purpose, most of the companies declared having planned funds on that field to prepare either the implementation of the PCS or the implementation of new functionalities.

Exhibit 2



We can see from that figures that almost every companies budget change management issues. On that way, we could see that Change Management in the implementation of PCS system is totally part of the project and needs to raise planned funds.
Two of the 3 companies which donot have budget on change management are governmental funding companies (MLIT in Japan, IPC in Israel). For those two companies, the Change Management process is financially included in the operational management of the ministries on which they depend on.

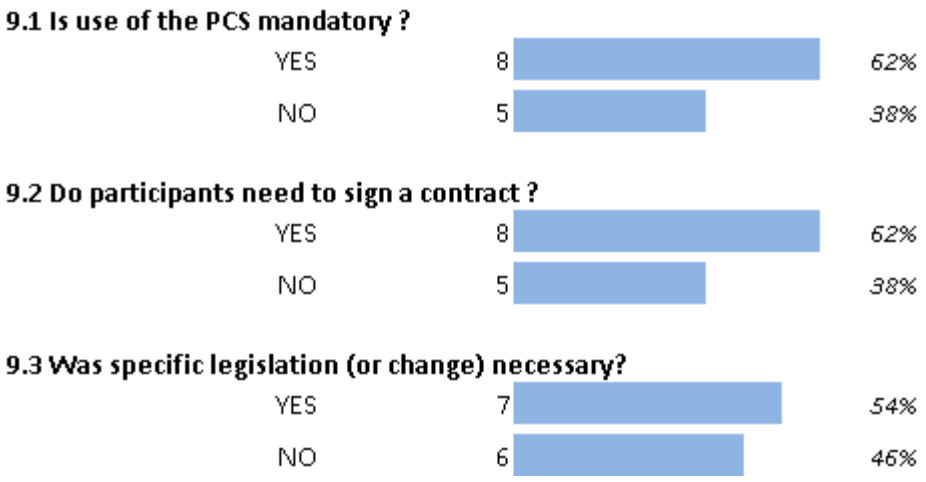
The implementation of Cargo Community System appears as a huge organizational change within port communities. That's why Change Management is a crucial needed phase while implementing a PCS.

14. Legal framework

Definition

In this section of the questionnaire, the respondents had to answer on the legal issues they had to face while installing a PCS within their communities.
The aim of that paragraph was to emphasize the needed change in the local or national laws and also to underline the role of regulations on PCS implementation.

Exhibit 3



Regarding the use of the system, 62% of respondents declared that the use is mandatory (or that the use become de-facto mandatory), and 38% answered that the use is based on volunteer basis.
Digging more on that issue, we could learn that when the system has strong interaction with public bodies (customs, port authorities), the use of PCS become mandatory.
In one hand, respondents emphasize that all field of activities, such as customs declaration, dangerous goods declaration become mandatory into the PCS.
On the other hand, all related private activities need to be promoted strongly to be used.

- ⇨ We can thus see that the involvement of customs and port authorities within the system is a key success factor of adoption.

Regarding the contractual aspect between end-users and PCS companies, 62% of respondents declared having signed a contract for the PCS usage.
That customer agreement charter contractualizes the usage of the PCS between the provider and its end-users.
If we focus on the 38% of companies which do not need a contract for customer agreement to use the PCS, all of them are operating in the Asian continent (Japan and Korea) except Israel. Moreover 3 out of 5 are public companies or directly belong to a ministry.

- ⇨ Public bodies donot seem to strongly formalize the PCS usage

Regarding the impact on legislation, 54% of respondents declared that a specific regulation or a change in current regulation was necessary while implementing a PCS.

For example in France, Customs directorate published an official bulletin (BOD 6676 of 2006, July, 10th) presenting the regulation for the usage of PCS in computerized port from Customs perspective.
Another example is Israel where the IPC Cy declared that a new regulation was necessary to accept digital stamp (electronic signature law).
Also, the majority of respondents declared that the one of major point regarding legal issue is to comply with national or local regulations.

- ⇨ The compliance to current regulations is a key factor of success for PCS implementation.

Regarding the protection of data by PCS operators, all respondents confirm that the PCS need to guarantee the confidentiality of data entered into the system.
The basic rule described by all PCS operators is that the information is transferred to another partner only if he has been designed by the owner of the information.

- ⇨ No heavy procedures are built for data protection. Commercial data are mostly protected by internal PCS functional rules.

Also, in every country, the privacy of the information for users is framed by national regulation on protection of personal data.

The implementation of a PCS has to take into account and comply with existing regulations. A PCS is a tool aiming to facilitate the communication between shareholders but also helping users performing their daily operations.

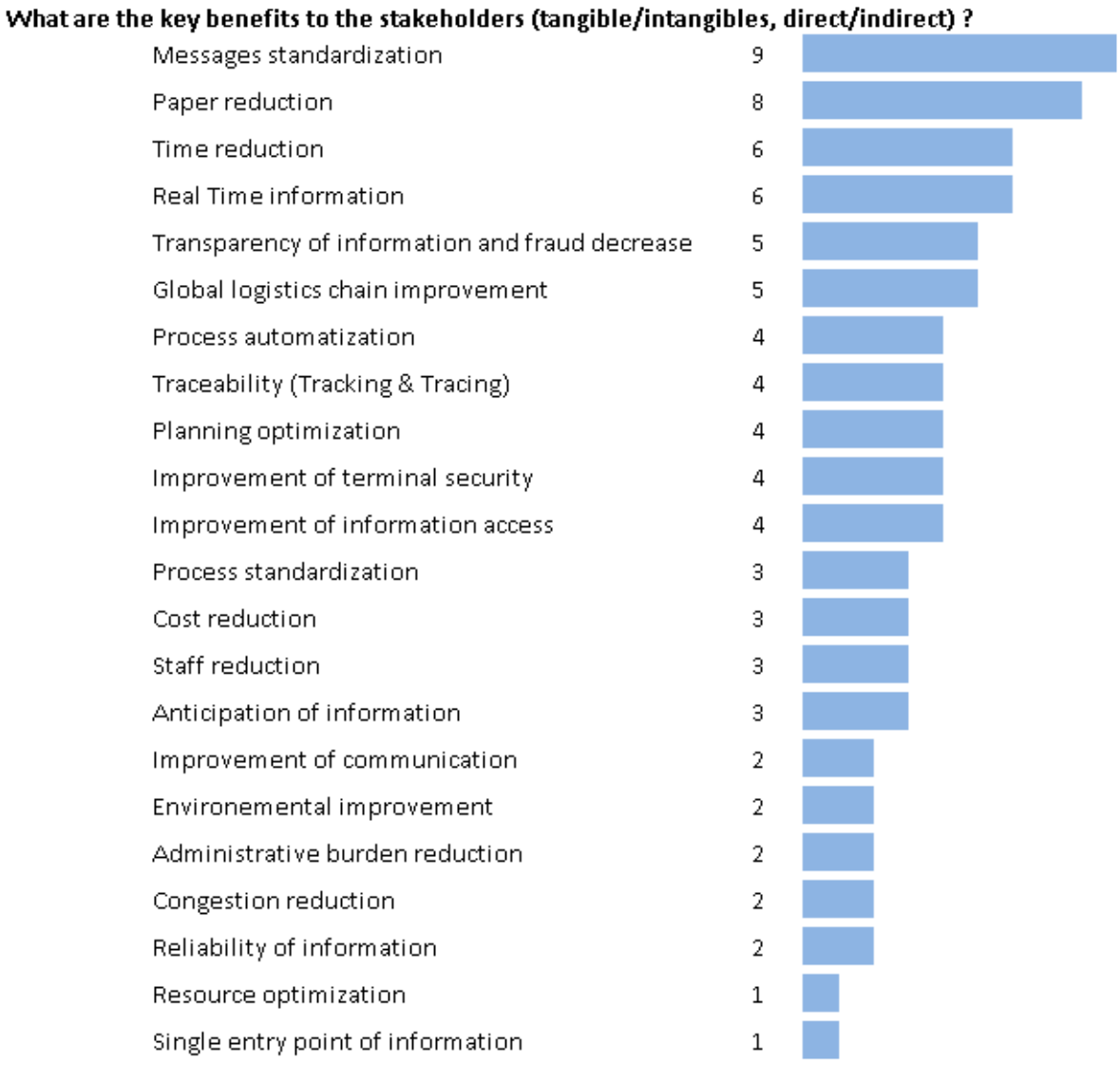
15. Benefits

Definition

In this section, the benchmark study concentrates on the main added-value brought by the system from customers' perspectives.

The open questions on that part allow us to determine various fields of answers.

Exhibit 4



What we saw from the respondents is that the main benefits declared during the interviews are based on the improvement of the quality of information.

The main benefits declared by the majority of the respondents are "messages standardization" and "paper reduction".

We can thus emphasize here the role of IT applied to port operation. The main benefit given is based on the standardization of EDI messages. As the main objective of a PCS is to link

the different stakeholders of the port logistics chain, the harmonization of data transmission is then a necessity while implementing a PCS.

The second benefit that appears shows that PCS induces the reduction of paper while using a PCS inside a port community.
By reducing the amount of paper used, processes and systems inside the ports are employed to further that objective and convert a majority of forms to digital aspect.

Those two points underline the role of EDI within the maritime transportation industry. The definition of EDI indeed relies on two major concepts:

- Electronic document replacing paper ones,
- Exchange of document under standardize format.

At an operational level, the respondents highlight several benefits. First, the use of PCS inside a port community brings a real improvement in the logistics flow (time reduction of the goods inside the ports). That important data is to link to another benefit: “global logistics chain improvement”.
Second, regarding the information access, lot of respondents emphasizes the role of the PCS in the access of the information:

- Access to real time information
- Transparency of the information
- Tracing and tracking of the goods.

Third, some respondents declared having measured a reduction of port administrative costs while using a PCS (one of a respondent estimates 18 million dollars savings using the PCS). Beyond that particular figure, we can notice that the use of PCS inside ports brings tremendous productivity benefits.

We could conclude from the answers is that the shipping industry today needs more and more data exchange between its stakeholders. That’s why the use of computerized procedures, the improvement of the access to the information is today a necessity in the ports of the 21st century.

One important point to note is the declared benefits for public bodies and especially for Customs.
The majority of respondents declared that the use of a PCS inside the ports brings transparency and anticipation of the information on the goods planned to arrive inside the port.

16. Lessons learned

Definition

In this section, the study wanted to gather information on the main success factors but also the greatest obstacles PCS operators face when they implement PCS inside their port communities.

In that area, the questionnaire was divided in three questions:

- What were the crucial success factors that made it happen?
- What were the greatest obstacles?
- What are the main lessons learned?

16.1 Crucial success factors

Logistics procedures know-how was also emphasized in the PCS implementation. If it is true that IT is a tool aiming at improving logistics flow, the main success factor is the capacity of the operators to understand and know the daily logistics processes.
So, working on the process and having a strategic view on system requirements helps the operators to design a system “by the trade for the trade”.

Earlier was presented the cost of development of each PCS. These costs are not easily quantifiable as the vary significantly and are subject to local requirements, in essence this means that strong financial capacity is necessary to implement the PCS project.

As the core element of the PCS is the relationship between public bodies and private companies, the neutrality of PCS operators is necessary in order to go live. Some respondents answered that the confidentiality and neutrality is a success factor.

In the definition of the PCS is the notion of community!
That is why the involvement of all stakeholders of the logistics operation is declared as one of the most important factor of success in a PCS project. More, one key element is the necessity for each parties to be sure that PCS would bring benefits to all and would bring business to the port community.

And finally, regarding success factors, most of the respondents declared that the involvement of the public bodies was necessary to push the system into production. (One example is the involvement of French Customs in the implementation of AP+ system or the one of Port Authorities in Spanish or Israel PCS).
In some ports communities, the introduction of mandatory measures was necessary to encourage the usage the PCS.
Also, private sector has a tremendous weight in the adoption of the system. PCS are made to meet customers’ requirements, thus we could see that one big challenge is the continuous involvement of future users within the project. Private sectors intervened to define the system requirements through different forms, for example:

- “Telematic forum” in Barcelona (Spain),

- "Open groups" in Hamburg (Germany),
- "Pilots operations" in Marseille (France) and in Japan Ports (NACCS),
- "Expert groups" in Marseille (France),
- Port Users Associations in the UK

Thus, Public–private partnership (PPP) appears as a key element and a success factor for PCS implementation.

The implementation of a PCS is more than technical issues. It appears as human issues (personal involvements). Moreover the Public-Private Partnership needs to be strong to succeed.

16.2 Greatest obstacles

We could analyze the answers of respondents in two main areas:

- Technical field,
- Change management obstacles.

Regarding the technical obstacles, lot of respondents declared that in the early stage of PCS implementation, no technical standards were mature enough to interface the various PCS stakeholders.
As in a majority of integration projects, the adaptation of the IT systems of the PCS partners is a condition of success. Thus once again, the involvement of all parties is necessary to succeed.

Change management issues appear really crucial in that framework. It is said in the answers we got that the major issue to overcome is resistance to change barriers.
Introducing a PCS within the port communities stimulates a lot of questions by people who will work with:

- Why change?
- What to change?
- Whom to change?
- How to change?

The challenge here is thus to answer to that kinds of questions implementing a robust change management plan. Dissemination, training, involvement of pilot users are some key elements to answer to those issues.

16.3 Main lessons learnt

To echo back the last point, the majority of respondents answered that change management is the first point to take into account in PCS project.
The testimonies we could have on that reveal the importance of the necessity to accompany the future users all along the change process:

PCS implementation is “a change management project, not an IT project”; or again here “not a technological issues but human issues”; “training, change management […] are the key lessons”; “all people to tow one rope in the same direction”; “human side of the project”.
Those testimonies show up that PCS have to take into account really strongly the impacts of the implementation on the current organizations.

From a project management point of view, the analysis of the answers shows that one key element is the functional analysis prior to technical developments: “90% analyzing and moderating, 10% implementation”. Once again, we can conclude that installing a PCS within a community needs to be prepared. Also, operators have to focus on functional analysis and study of processes rather than technical developments.

From a financial perspective, some PCS operators emphasize the necessity to evaluate really accurately all potential costs to succeed.

Finally, one respondent answers from the axis of empowerment of people stating that a Port Community System “empowers key stakeholders and their staff”.
It sounds interesting to see that beyond the main benefits coming with the system (cost savings, paperless, standardization…); PCS brings him an improvement of the know-how inside the port community.

17. Future Plans

Definition

In that section of the questionnaire, the respondents had to answer on the future plans they have to improve their systems.

The main subjects are:

- Further development of the PCS
- PCS operator position on single window
- Communications with other PCS

17.1 Further development of the PCS

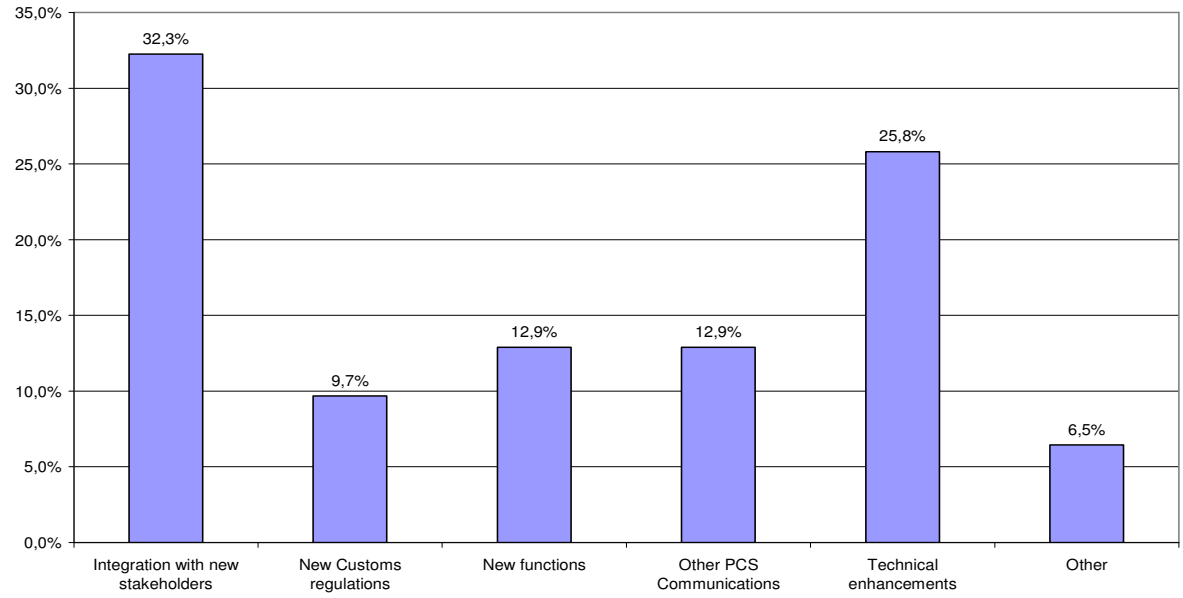
Two questions were about further development of PCS.

PCS operators had to describe further developments and the main obstacles that PCS operators are facing to develop their system.

Further developments have been analyzed and classified into six main subjects.

1. Integration with new stakeholders
2. Technical enhancements
3. New functions
4. Other PCS communications
5. New Customs Regulations
6. Other

What are the plans for further development of the PCS ?



Integration with new stakeholders

New stakeholders differ from one PCS to another since the scope of each PCS is not the same, but the aim is really to enlarge the scope of the PCS and to provide services to stakeholders who are not users now.

Inland carriers (hauliers, barges, rail), banks (and insurances), Portals (INTTRA, GT NEXUS, …) , shippers, ports and national/port single windows are identified to become new users or stakeholders.

Technical enhancements

Technical enhancements are the second subject identified. As PCS are IT systems, PCS operators always have to enhance and improve their systems to meet technological evolutions and users requirements that arise from these new technologies.

Cloud computing is identified and could become a subject in PCS implementation.

Normalisation, documents management and e-learning are the other axes of technical further developments.

New functions

News functions that are identified by respondents differ also from one PCS to another. In fact, PCS operators continuously improve their systems to provide new functions to their users.

Booking demands, Instructions, Traffic control and container tracking are the new functions on which PCS operators are going to implement.

Other PCS Communications
The communication with other PCS is an important subject that is identified by PCS operators.

PCS have a specific role to play in global supply chain. Exchange of data and information between PCS, in the same country or in different countries, is a way to improve supply chain visibility, traceability, fluidity and security.

New Customs regulations
New Customs regulations implementation by PCS operators is made mandatory by the involvement of PCS with Customs.

If Customs modify rules, regulations or if customs law is amended, the PCS must be updated to meet these new requirements.

That's the reason why PCS operators identify New Customs Regulations to be further developments.

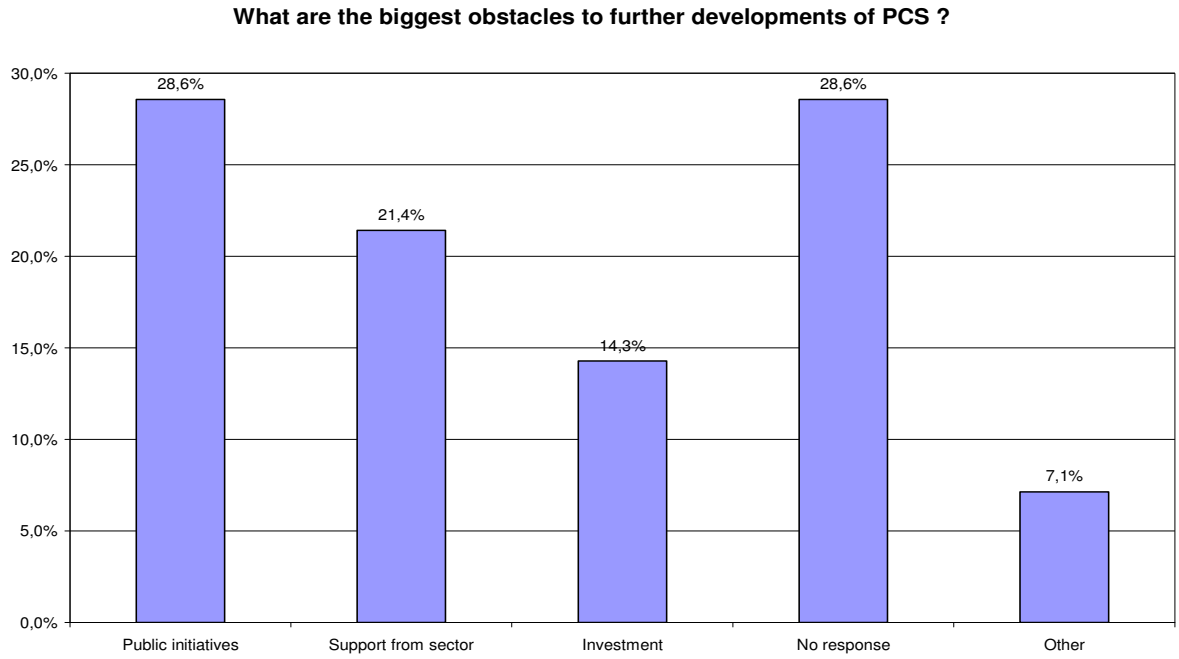
Other
The too vague responses (international projects) or "under discussion" responses have been identified like "other".

17.2 Main obstacles to further developments

Main obstacles have been classified into 5 categories. It is surprisingthat 28.6% of responses were the lack of response.

1. Public Initiatives
2. Support from sector
3. Investment
4. No response

5. Other



Public initiatives

Public initiatives at all levels (EU, National, local) appear to be the main obstacle to PCS development.

Public initiatives and/or regulations do not always take into account that a PCS is running in a port and provide services to private stakeholders and public bodies (customs, agencies …). The new initiatives do not take full advantage of having such tool in place and may complicate procedures or processes which could be simplified thanks to the PCS.

Support from sector

The stakeholders are identified as potential obstacles. It appears difficult to have all stakeholders around the table to decide and define new procedures and/or processes shared by all stakeholders.

The multiplicity of stakeholders and the increasing functional scope of PCS make such community decisions more and more difficult.

Services provided by PCS may be seen by some stakeholders as competitive advantages given “free of charge” to their local competitors while these stakeholders had invested money to get these services by themselves.

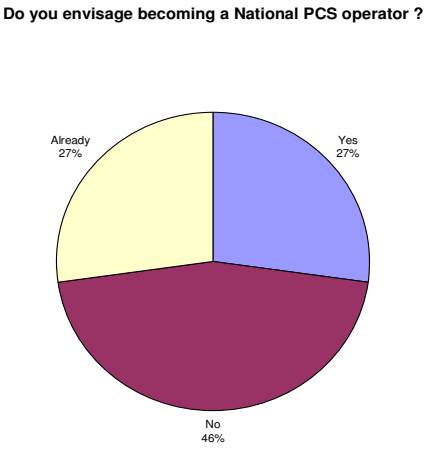
Investment

Investment needed is the last obstacle given by respondents. As PCS must always be enhanced and up to date, investment can be seen as an obstacle.

17.3 PCS operator position on single windows

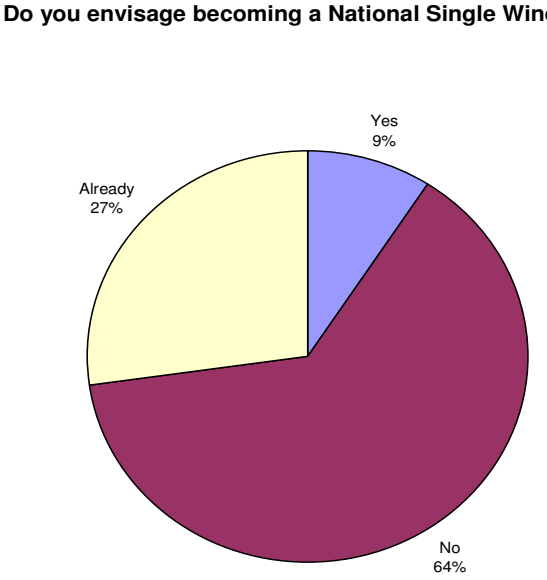
This section was divided into three questions on PCS, National Single Window and Research and Development in NSW.

National PCS operator



At a slim majority, PCS operators are or would like to become national PCS operator. PCS operators which are already national operators are public companies.***National Single Window***

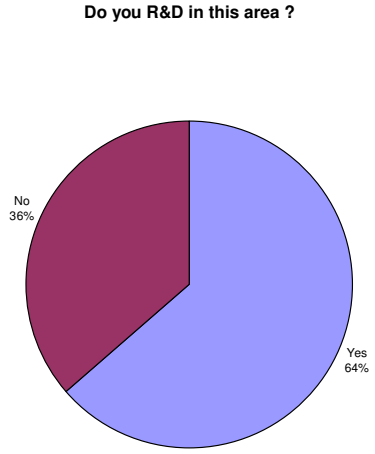
In this question, the PCS operator had to define if it had projects to become a National Single Window.



At a large majority, PCS operators do not want to become National Single Window. Operators which are already NSW are public companies.

That means that PCS operators are specialised in logistics areas (port, airport) and do not see their systems becoming national administrative single window.

But, and this is very interesting, a large majority of PCS operators do R&D in this area, which can mean that projects would soon be launched.



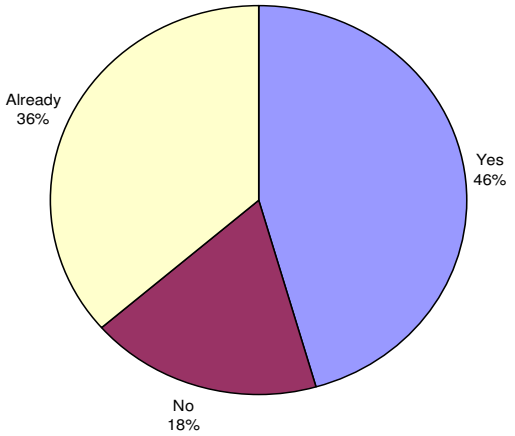
17.4 Communications with other PCS

In this section, PCS operators could indicate the relations they had or intend to have with other PCS at a national, regional or worldwide level.

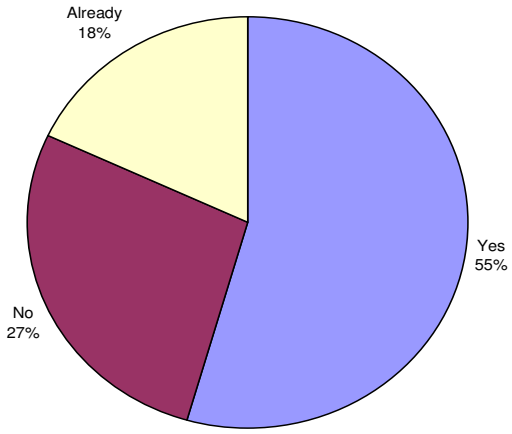
Either National, Regional or worldwide, agreements on data exchange with other PCS is very important for a large majority of PCS operators.

Data exchanges between PCS operators at all levels will improve fluidity, traceability and security of the global supply chain.

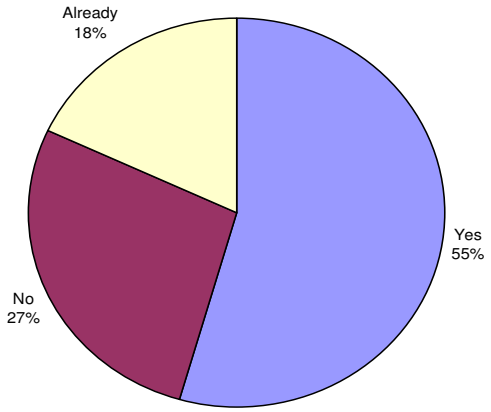
Do you or are you planning to have arrangements for exchange of data with PCS running in your country ?



Do you intend to make agreements concerning PCS on the regional level?



Do you or are you planning to have agreements for exchange of data with PCS running in other countries ?



18. Conclusions

The communication of information throughout a port is essential to its smooth operation. Whilst port community systems have been a part of the industry for some time now it is evident that the implementation of such practices holds even more value in the current economic climate.

Existing port community systems handle and process huge volumes of data and information relating to international trade, providing the electronic exchange of information between all port sectors, including shipping lines, terminal operators, customs, and road and rail hauliers. The benefits are quite simple; it brings all the ports stakeholders together thus streamlining the communication process and making the handling of cargo more efficient.

A port cluster consists of all economic activities related to the arrival of ships and cargoes in the port region and includes all the stakeholders of a port community. As these become an increasingly popular way of operating, the sharing of information will be more important than ever. Having a system in place that streamlines the way companies within the cluster communicate is invaluable. However, it very much depends on whether the system is efficient and whether it is proven to work and as the benchmark findings shows; those port operators that invest in technology to ensure they are ready for this transition will inevitably be the best placed for the long-term.

A port community system does, we believe, make a considerable contribution to the ability of any port to compete effectively with its rivals in the region. It offers a proven and effective means of exchanging information with and between its customers reduces the need for paper documents and provides all sectors of the port with a high degree of certainty regarding the speedy movement of their cargoes. Through the early provision of manifest and booking data, electronically, it enables imports, exports and transhipments, to be processed in advance of their arrival and gives the port the ability to pre-plan in a way that is not otherwise possible.

It also provide ports with an opportunity to communicate with customers through a single interface, providing them with real time message based status information direct to their corporate systems. Many of the PCS operators include all of the world's major carriers and electronic links have been established with them, so the level of investment required by them to communicate with port community systems would be minimal. Predominantly those PCSs

participating in the study were specifically designed (by its users) to deal with the core processes of their port community and because they often do not attempt to go outside of these boundaries they can be implemented in a very short timescale given a number of pre-requisites highlighted in above have been fulfilled. The experts conducting this benchmark study are therefore confident that a PCS can provide the solution for which many ports have been seeking for a number of years.

19.Further steps

Moving towards Phase 2 of the PCS Benchmark survey

The Port Community Systems Benchmarking survey provided best practices from 13 advanced PCS in the world. Initially the IAPH TF & PCS committee targeted 16 Port Community Systems but a number of significant Asian PCS declined to participate inthe survey.

The IAPH TF & PCS committee will propose during the World Port Conference in Busan in May 2011 to launch a phase II to benchmark PCS in Asia such PCS in China, Hong Kong, Singapore, Malaysia, Taiwan, India and others from Europe, Africa, Latin America and the Caribbean that just been created the last two years. In particular Asian PCS return on experience on moving from a PCS operator to a National Single operator would be a of significant benefit to the IAPH membership.

Annex:
Questionnaire

Organization Identity and Basic Details

A.	Point of contact Position (Job Title) Telephone Number Fax Number Email address	
B.	Name of Company Address Website Address	
C.	Type of organization (e.g. public limited company, limited company) Name of ultimate parent company	
D.	Name of Port Community System	

1. Background

1.1	What motivated the establishment of your PCS e.g. key drivers.	
1.2	What year was it established.	
1.3	What is the current release of the PCS? (number of releases and timeline)	-

2.	**Establishment**

2.1	How did the PCS interface with already established Systems?	
2.2	Did any other PCS model serve as inspiration or model?	
2.3	What methodology was followed in setting it up?	
2.4	Did you undertake a business process/procedures and/or re-engineering?	
2.5	Was there a pilot project or pilot stakeholders?	

2.6	What kind of training for the users was required in the establishment and how was it organized?	
2.7	How long did it take the facility to become operational?	
2.8	Could you provide an organization chart?	-

3.	**Services**

3.1	What are the key features of the PCS?	
3.2	What services and transactions does the PCS provide?	
3.3	What processes/procedures are covered?	
3.4	What documents/information is covered?	
3.5	Does the PCS handle inland cargo tracking and tracing?	
3.6	How many transactions per day are handled?	
3.7	How many messages per day are handled?	
3.8	How many transactions (%) are done by interface and manual entry?	

3.9	Who are the stakeholders of the PCS?	
3.10	How many clients by type of stakeholders does the PCS have at the present time? What is the adoption rate i.e. 100% PCS or split?	
3.11	What percentage of the global supply chain is covered by the PCS?	

4.	**Operational Model**

4.1	Which public and private agencies are involved in the facility?	
4.2	Does the PCS operator only operate the PCS or is it involved in other IT and consulting projects.	
4.3	Describe your partnership and relationship with Customs and other Government Agencies (OGA's) i.e. are there MOU's and SLA's in place.	
4.4	How many ports do you operate? Could you provide a list of the ports?	
4.5	How many end users do you have per port?	

4.6	Who can submit data (importer, exporter, agents, customs brokers etc)?	

5.	**Business Model**

5.1	What is the equity structure of the PCS operator?	
5.2	How was it financed (government, private sector, private-public partnership)?	
5.3	What were the costs of establishment of the PCS?	
5.4	What was the difference between estimated costs and actual costs?	
5.5	What are the ongoing annual operational costs?	
5.6	What is the business model?	
5.7	Who are the main client groups of the PCS and what is their percentage contribution?	
5.8	What are the user fees (if any) and annual revenue? Is there a fixed price per year, price per transaction, price per TEU, price per declaration, any other model?	

5.9	How will the PCS be sustained over the coming years?	
5.10	Do the revenues generated cover operational costs or do they make a profit.	
5.11	Is the net income (if any) reinvested in the PCS?	
5.12	Is the PCS self financed and/or benefiting from public funding and grants.	
5.13	What is the percentage of other IT and consulting projects in your annual revenue?	
5.14	Do other activities finance the PCS operations?	

6.	**Technology**

6.1	Do you outsource technology development?	
6.2	Do you outsource your data centre and telecoms operations?	
6.3	What technology is used?	
6.4	What type of interface is used for PCS (web browser, third party)?	

6.5	What kind of architecture has been implemented?	
6.6	How data are submitted (what type of format/language, what forms, combination – what kind of combination)?	
6.7	Where data is warehoused (government or private sector)?	

7.	**Security**

7.1	Are you ISO 27001 certified?	
7.2	How do you manage security?	
7.3	Do you have a security plan?	
7.4	Did you implement a disaster recovery facility?	
7.5	Do you encrypt data?	
7.6	Do you use a digital signature?	
7.7	Do you use a certification authority?	

7.8	Do you have access control to the PCS?	
7.9	What kind of information do you publish on your website?	

8.	**Change Management**

8.1	Did you design and execute a change management strategy?	
8.2	Do you have a Steering Committee?	
8.3	How did you promote the PCS?	
8.4	How did you inform the stakeholders about the PCS progress?	
8.5	Do you provide any helpdesk or customer service?	
8.6	Do you have budget for change management?	

9.	**Legal Framework**

9.1	Is use of the PCS mandatory by port or customs regulation or voluntary?	
9.2	Do participants need to sign a contract with PCS in order to participate?	-
9.3	Was specific legislation (or change of old legislation) necessary?	
9.4	How is the privacy of information protected?	
9.5	How is the data ownership protected?	

10. Standards

10.1	Did you implement any standards?	
10.2	What is the percentage of standards verses proprietary messages / data in your PCS implementation?	
10.3	What is the role of international standards (UN/EDIFACT, UN/CEFACT, WCO Data Model etc) in your PCS and did they leverage system implementation?	⇨
10.4	What is the role of the international trade facilitation initiatives in your PCS (UN/CEFACT Recommendation 33, ISPS, World Bank LPI etc)?	

11.	**Benefits**

11.1	What are the key benefits to the stakeholders (tangible/intangibles, direct/indirect).	
11.2	What are the benefits by category of stakeholder (tangible/intangibles, direct/indirect)	
11.3	What is the impact on Customs and OGA's operations?	
11.4	What problems did it resolve? (Be more precise)	
11.5	What are the benefits for non-users e.g. importers and exporters?	

12.	**Lessons Learned**

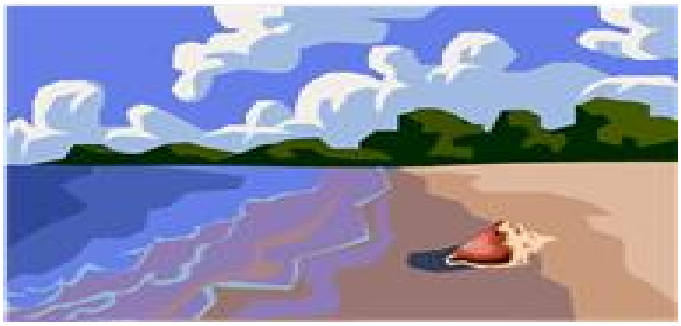
12.1	What were the crucial successes factors that made it happen?	
12.2	What were the greatest obstacles?	
12.3	What are the main lessons learned?	

13. Future Plans

13.1	What are the plans for further development of the PCS?	
13.2	Do you envisage becoming a National Port Community System operator?	
13.3	Do you envisage becoming a National Single Window?	
13.4	Do you do R&D in this area? If yes, what are your research projects?	
13.5	What are the biggest obstacles to further development of the PCS?	
13.6	Do you intend to make agreements concerning PCS on the regional level?	
13.7	Do you or are you planning to have arrangements for exchange of data with PCS running in your country.	
13.8	Do you or are you planning to have agreements for exchange of data with PCS running in other countries.	

Port Environment Committee

Report on the Survey Results of Water Quality Issues in Ports



International Association of Ports and Harbors (IAPH)

January 2011