Asia-Pacific
Economic Cooperation

Advancing Free Trade
for Asia-Pacific Prosperity

Managing Port Data via a Single APEC Port Community Platform

APEC Transportation Working Group

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APEC Project: TPT 01 2018A

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1. INTRODUCTION

The APEC Maritime Experts Group (MEG) has contracted 1-Stop Connections to design and apply a survey to all economies to understand the need to exchange logistics information between APEC economies.

According to the contract, below is the description of the services:

a) To design, distribute, obtain relevant information and process a survey applied to all APEC economies in order to understand the capacity of the economies for being part of a port community system.

b) To participate in a full day workshop for solving some questions about the survey; to obtain impressions of the participants related to the capacity of the economies for making a single APEC port community system platform.

c) Finally, prepare a Summary Report that shows the project viability and recommendations to the project.

Below are the objectives of the contract:

a) To develop a workshop for members of the APEC economies: The workshop will be organized by APEC and APN, where participants can learn or review strategies to build an integrated management system for maritime port activities.

b) To prepare a Summary Report that contains the feasibility of the project, best practices, challenges and recommendations, which will be shared with all APEC economies.

c) To create a framework of awareness and commitment among all participants of the need and benefits of having critical information on a Single APEC Port Community System Platform.

Considering the above, the project consisted of the elaboration of a survey that was sent to APEC delegates where a set of questions were asked regarding the possibility to exchange port information between economies, following a workshop in order to discuss the results of the survey for the elaboration of the summary report.

The survey was designed in conjunction with the National Port Authority of Peru (APN) which is the Project Overseer for this contract. Once the platform and the structure of the survey was defined, along with the target population, the survey was launched and left open to collect answers for a period of nearly two months.

During the time of collection, invites and reminders were sent to all the delegates of the economies to participate in the survey.

In addition to the above, 1-Stop produced a pilot, where certain economies have filled a form with actual information of their ports. The objective of the pilot was to obtain a sample of the data to be shared by economies, in order to demonstrate that it is possible to develop a platform to exchange said information.

The results of the survey and the pilot were presented and discussed during the workshop organised by APN in Cusco on the 25th September 2019. During the mentioned workshop, the economies that were not able to complete the survey or the pilot had also the possibility to participate by filling a hard copy of the survey or participated via video conference in the Zoom platform. The talks were transmitted and made available to all economies and they were recorded to be accessed upon request.

The current document presents the information and results obtained from the application of the survey and the pilot, explaining the methodology applied and main conclusions and recommendations.

1.1 Document Ownership

This document belongs to APEC.

2. BACKGROUND AND OBJECTIVES

The Ministry of Transport and Communications of Perú through The National Port Authority of Perú has identified the need for economies to cooperate in the exchange of port information that can add value to the operations and save time and money to APEC economies.

The topic of exchanging information is widely discussed in the-port and maritime industry, and the effort of the economies to implement Port Community Systems (PCS) has been in past years an attempt to increase the collaboration of multiple actors in the supply chain in order to have a centralised place where information can be stored and, at the end of the day, used to enhance operations in the maritime and port logistic and supply chain.

However, since the logistics and supply chain involve many actors, the term PCS is often hard to define and also due to the recognised opposition of objectives between the actors, it is also often that the efforts to implement PCS systems leads to a failure.

Hence, APEC and the APN have taken a different approach. Both have recognised that in order to have success in the implementation of a platform to share and exchange information, it is important to identify first what is the information that economies are interested to know and also what information economies are allowed to share.

Therefore, the main objective of this study has been defined as purely to ***"understand the feasibility of data exchanging between economies and identifying what information is useful to obtain and possible to share between them"***.

As such, APEC has engaged 1-Stop Connections Property Limited which is an Australian company with more than 11 years in the market providing Information Technology (IT) solutions to the logistics chain, to analyse and define the feasibility and the development of a platform for a potential exchange of information.

2.1 Purpose of the study

According to the terms of reference and the subsequent contract for the project TPT 01 2018A, the purpose of the current study is:

- To encourage the networking for stronger port industry and better community.
- To promote development of APEC port industry by fostering a partnership among APEC industries.
- To encourage capacity building and information sharing.
- To encourage safety, security, efficiency and environmental and social responsibility in ports.
- To ensure the views of APEC port industry are presented to the competent authorities and member economies.

Moreover, 1-Stop has translated the above objectives into the following tactical goals for this project:

- To generate a survey that can be distributed among APEC economies, to understand the data that is possible to be exchanged between them, in terms of:
  - Information that can be made available from one economy to be used by another.
  - Information that would be of interest for one economy that could be sent by another.
  - Potential issues that would be required to be addressed if a platform is built to exchange information.

- To produce a pilot as a way to demonstrate that economies can or cannot exchange the information.
- To present the results of the survey and the pilot in the APEC Workshop organised by the National Port Authority of Peru (APN) in Cusco during October 2019.
- To compile the feedback received in the workshop and produce a Summary Report, including all the items above.

3. METHODOLOGY

The project was divided in 3 phases:

- **Phase 1:** Design and collection of answers for the survey and pilot
- **Phase 2:** Workshop to present and discuss results
- **Phase 3:** Generation of the summary report

Below are described as the project stages, activities and deliverables.

Stage 1: Project Plan

During the first stage of this project, the project team from both, the PO and the expert team was identified.

The expert team defined a project plan that was agreed with the PO including project scope, milestones and deliverables.

The team has also agreed on weekly catch up meetings and a format for documents and meeting minutes.

Stage 2: Survey definition

The project team has defined a draft of the survey including the questions to be answered by the delegates. In parallel, the PO has defined the set of delegates that responded to the survey. They became the target population.

The draft was then shared with the PO. A final version was produced based on the comments received. Then the survey was published using the selected platform (Survey Monkey).

Finally, the Project team defined a strategy to mitigate the risk of not having enough answers to consider the study as representative. In this sense, two actions were established:

1. To invite the members of APEC Port Services Network (APSN) to complete the survey, and

2. To print out a set of surveys and request the delegates to complete it during the workshop in September 2019.

Stage 3: Reponses collection

An email invite was sent to all the MEG and APSN delegates to complete the survey. A sample of the invite sent to the delegates can be found below:

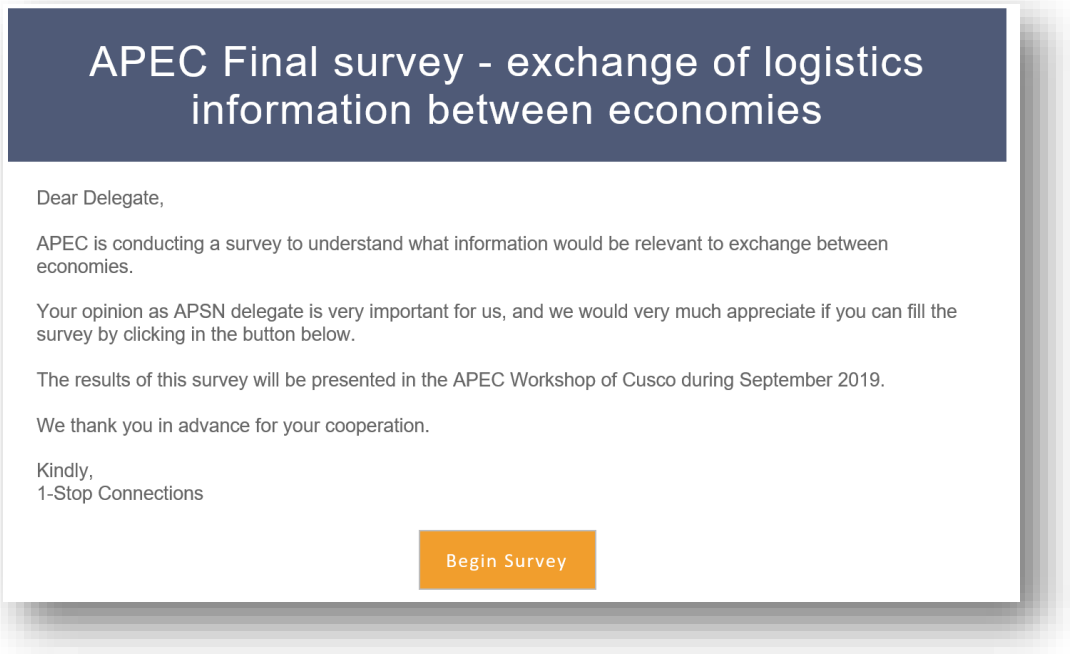


Image 1: Sample of email invite sent to APEC delegates

Also, three reminders were sent to the delegates during the time the survey was open for answers. A sample of the reminder can be found below:

Image 2: Sample of reminder email sent to APEC delegates

In addition, the feedback received from APEC and delegates was also included in the final version of the survey. A summary of the feedback and actions taken to include this feedback is shown below:

Feedback	Actions
a) Each economy might have difficulties to have requests by private port users such as shipping companies, freight forwarders, terminal operators, etc. within a short period of time. b) Each economy has several ports/terminals, and port-related information is scattered in various places/organizations, thus collection of the information would not be easy. c) Yet, various information items shown in the survey would be useful for the private port users in doing their businesses.	After receiving the feedback, a question was included to the final version of the survey to request information about possible issues that economies may have to exchange information. It was also added as one of the options to the survey, to ask the participants whether the information is owned by public or private sector. Another option added was to identify if the information is scattered between multiple actors.
As it is a common interest for APEC economies to examine the future of the APEC community system, it is one possible option that an ideal goal of the system in the long-term be discussed first, before the concrete system design/development. In this project, it would create good value if a basic (but future) direction of such system is shared among the economies.	During the workshop a segment was introduced to discuss the goal of a platform to exchange information. The result of this discussion will be explained in the "Workshop Analysis" section.
Broaden the scope of the system through: a) Sharing of information not only by the private sector, but also the government sector. (Sharing of MEG/TPTWG documents in the past, or sharing of other useful documents) b) Sharing of best practices by APEC economies (Public/ Private) c) Sharing of operational information on port/shipping activities (preferably on real-time or semi-real time basis) d) Discussions on specific utilization of information/data will generate a good value, such as emergency response, etc. Other ideas are expected in the discussion.	The objective has been broadened in the project after receiving this feedback. The idea is to exchange logistics information, not necessarily just within the public sector. However, it is important to mention that the goal of the current project is to establish whether is feasible or not to exchange information; therefore, it is necessary to first identify the viability of developing a platform.
Discussions on the basic direction/strategy of the system with how to utilize it, is in accordance with the APEC goal. In the workshop in September, it would be good achievement if we can have an opportunity to discuss and share the future goal as well as challenges ahead.	All these topics were included in the discussion of the workshop in September. The result of this discussion will be explained in the "Workshop Analysis" section.

a) Cuzco, Peru, is far from Asia, thus officials in Asia might have difficulties to join by themselves if they are busy. b) In order to secure the number of participants, one idea would be to introduce on-line meeting system as well as a meeting in Cuzco.	To mitigate this risk, video call facilities was included in the workshop to facilitate the participation of other economies. The talks and presentations of the workshop were broadcasted, and the presentations were recorded and are available for delegates' review.

Stage 4: Data analysis

The Project team has performed statistical analysis over the data and answers received, consolidating the results for each question asked as well as performing overall validations on the results obtained.

The results were compiled and shared with the PO to discuss the outcome of the survey. It was also defined to add new responses during the workshop as it was established in the mitigation actions.

The team has also generated preliminary conclusions based on the answers received within the survey.

Stage 5: Pilot

The PO and the expert team agreed to implement a pilot in the form of a proof of concept (POC). The idea of the pilot was through a form, to obtain real information sent by the economies that could demonstrate the viability of a future platform.

The scope of the pilot was not to obtain the complete set of data shared from economies, nor to build a platform to exchange information. The pilot was conceived to only receive information and store it in a place that can be shown to other economies.

The results of the pilot were also presented and discussed during the workshop.

Stage 6: Workshop

The workshop took place on the 25th September 2019 in the city of Cusco. More than 40 delegates from various APEC economies attended the event.

During the workshop hosted by the PO, the discussion was over the following topics:
a) Review of the project given by Mr. Carlos Molina Barrutia (National Port Authority of Perú)
b) Strategies to implement a PCS: A talk given by Mr. Greg Winstanley to discuss possible options available to implement platforms to allow logistics chain actors to integrate through data exchange.
c) Results of the survey and pilot: A presentation given by Mr. Andres Pinar to present and discuss the results of the project.

An agenda of the Workshop is presented in ***Appendix C: Event Agenda***.

In addition, and as it was mentioned before, the survey and the pilot were distributed in hard copy to the delegates attending the workshop and the answers were collected and compiled in the summary report.

Stage 7: Summary report

Finally, the summary report was obtained based on the results of the responses collected for the survey, the answers obtained from the application of the survey during the workshop and the feedback received during the discussion held throughout and after the workshop.

The summary report will be presented in a draft version for feedback of the PO and APEC and the final version will include the comments received.

The following image shows the project stages and main activities performed as part of each stage.

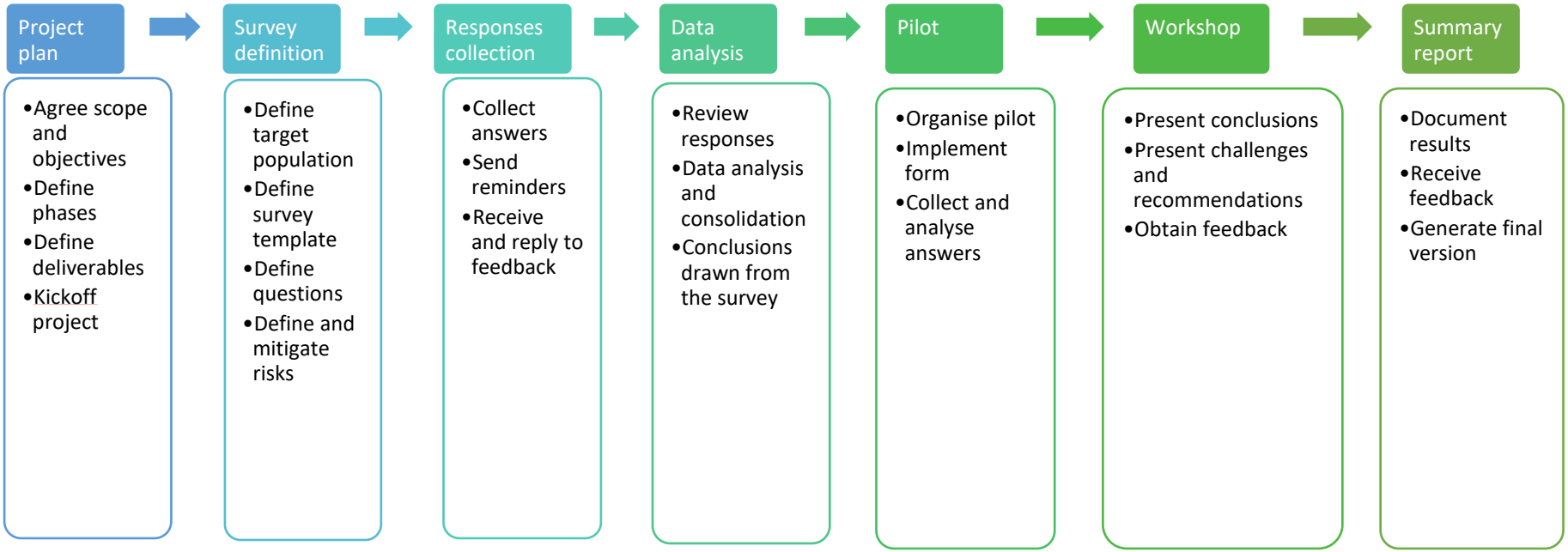


Image 3: Methodology applied in the project

3.1 Definitions

According to the Organisation for Economic Co-operation and Development (OECD), the following are the definition for statistical and target population:

Definition of statistical population

"Is the total membership or population or "universe" of a defined class of people, objects or events."[1] The statistical population defines the maximum population that could be reached to complete the survey.

Definition of target population

"A target population is the population outlined in the survey objects about which information is to be sought"[2] and a survey population is the population from which information can be obtained in the survey.

The target population is also known as the scope of the survey.

Target population for this study

Considering the definitions presented before, the target population for the current study has been defined as:

The APEC Delegates of the 21 economies members of the Maritime Expert Group (MEG) or the APEC Port Services Network (APSN).

3.2 Characteristics of the target population

The target population can be identified as user persona in the following way:

- Male or female
- Delegate of APEC
- Normally a representative of a public entity, such as a Port Authority or a Ministry related to the logistics and supply chain business (e.g. Ministry of Transport).
- The delegate has some knowledge of data ownership and information sharing within the economy.
- Belongs to one of the 21 APEC economies.

The survey and the pilot were focused on this target population. A list of all the members to whom the invite to the survey and the pilot was directed to, can be found in the **Section 2 "Participants contact list"**.

3.3 Size of the population

3.3.1 Statistical and Target population for this study

Considering the definition explained above, the current study has the following definitions:

[1] https://stats.oecd.org/glossary/detail.asp?ID=2079
[2] https://stats.oecd.org/glossary/detail.asp?ID=2079

3.3.2 Statistical population

All delegates for MEG and APSN members participating in APEC.

3.3.3 Target population

The survey was sent by email to 75 MEG delegates from the 21 APEC economies and was also sent by email to 48 APSN council members from the 21 APEC economies.

Therefore, the total size of the target population is **123 APEC Delegates**.

3.4 Variables of study

The table below shows the variables that were evaluated in this survey:

VARIABLE	DESCRIPTION
Delegate's information	Information of the delegate filling the survey including name, email address and economy represented.
Port information	Information of the ports that delegates consider would be viable to be exchanged (interesting to be received and available to be sent) with other economies.
Port terminal information	Information of the port terminals that delegates consider would be viable to be exchanged (interesting to be received and available to be sent) with other economies.
Port services information	Information of the ports services that delegates consider would be viable to be exchanged (interesting to be received and available to be sent) with other economies.
Topics to be addressed	The economies have expressed that there are some topics that are critical success factors in order to build a platform to exchange information.
Potential issues	This question tries to address potential problems that economies could have to obtain the information required to be exchange for the many reasons that could exist to do so.

Below is the detail of the questions that were asked in the survey:

1. **Personal information.** The survey asked to identify the name and email of the person filling in the survey.

2. **Economy represented.** The survey asked to identify what economy was represented by the person filling in the survey.

3. **Port** information that can be made available. The below data was evaluated:
    a. Harbour size
    b. Railway size
    c. Harbour type
    d. Dry dock
    e. Vessel repair yard

f. Shelter
g. Bunkerage
h. Max Depth
i. Max Anchorage
j. Notifications to community
k. Tariffs and rates

4. **Port terminal** information that can be made available. The below data was evaluated:
    a. Terminal operator
    b. Terminal contact details
    c. Number of terminals
    d. Number of berths
    e. Length of Berths
    f. Max vessel length
    g. Max vessel depth
    h. Type of Cargo handled
    i. Vessel schedule
    j. Notifications to community
    k. Load and unload velocity
    l. Number of cranes
    m. Truck turnaround time
    n. Volume of Cargo handled
    o. Volume capacity

5. **Port services** information that can be made available. The below data was evaluated:
    a. Vessel repair
    b. Pilots
    c. Tugs
    d. Bunkerage
    e. Oil
    f. Water
    g. Food supplies
    h. Vessel supplies
    i. General/Liquid waste disposal or recovery

6. **Port** information that could be of interest for an economy. The below data was evaluated:
    a. Harbour size
    b. Railway size
    c. Harbour type
    d. Dry dock
    e. Vessel repair yard
    f. Shelter
    g. Bunkerage
    h. Max Depth
    i. Max Anchorage
    j. Notifications to community
    k. Tariffs and rates

7. **Port terminal** information that could be of interest for an economy. The below data was evaluated:
    a. Terminal operator
    b. Terminal contact details
    c. Number of terminals
    d. Number of berths
    e. Length of Berths
    f. Max vessel length
    g. Max vessel depth

h. Type of Cargo handled
i. Vessel schedule
j. Notifications to community
k. Load and unload velocity
l. Number of cranes
m. Truck turnaround time
n. Volume of Cargo handled
o. Volume capacity

8. **Port services** information that could be of interest for an economy. The below data was evaluated:
    a. Vessel repair
    b. Pilots
    c. Tugs
    d. Bunkerage
    e. Oil
    f. Water
    g. Food supplies
    h. Vessel supplies
    i. General/Liquid waste disposal or recovery

9. **Topics to be addressed**. The below data was evaluated:
    a. Security transferring information
    b. Ownership of the data
    c. Intellectual property
    d. Data confidentiality
    e. Keep data up to date
    f. Opportunity of information, i.e. if not receiving the information in an opportune way could impact the success of the implementation of a platform.
    g. System downtime
    h. Easy to use
    i. Automatic exchange of information
    j. Data hosting
    k. Mechanism of data transfer
    l. Mechanism to update data

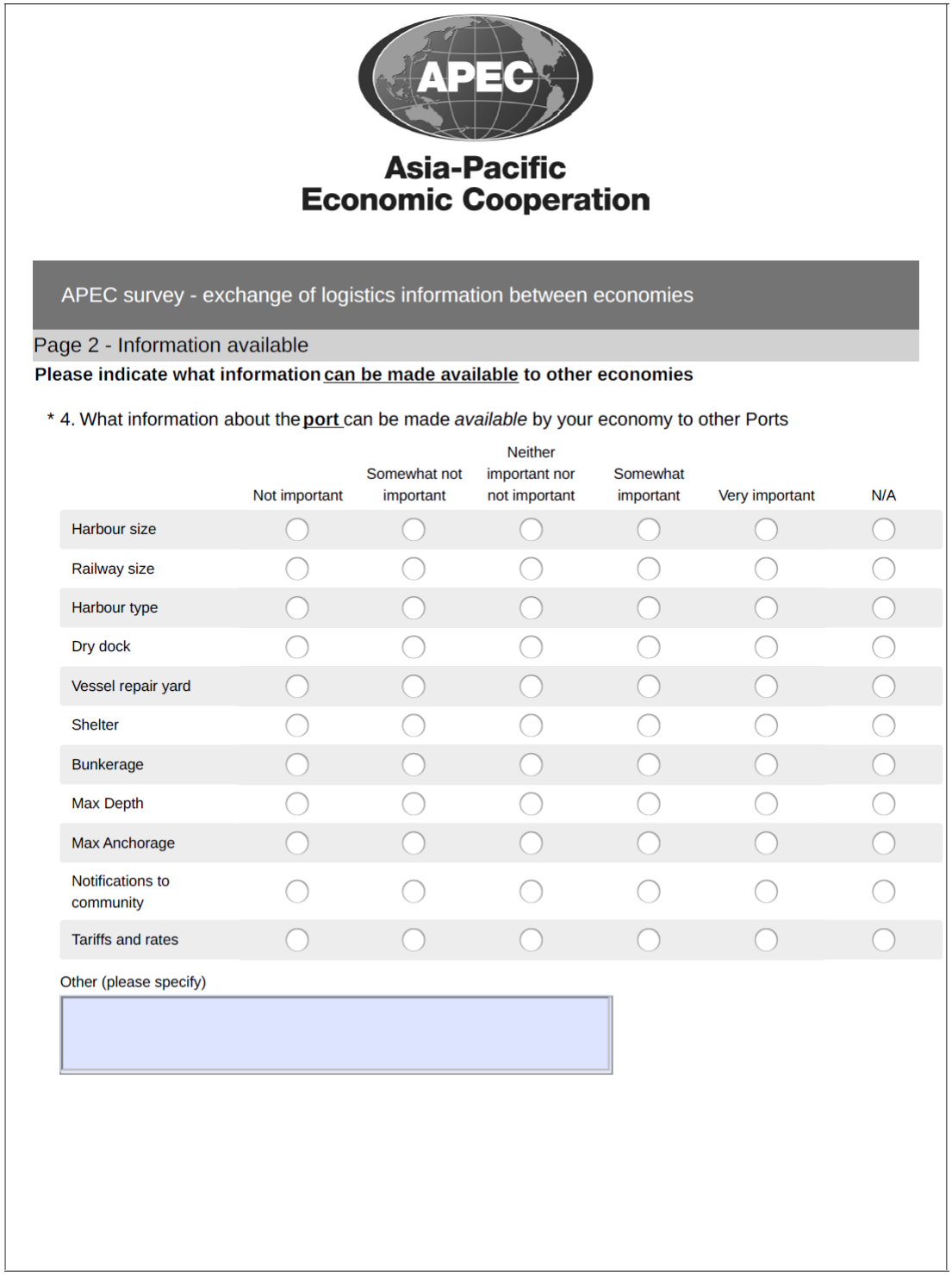
10. **Potential issues**. The below data was evaluated:
    a. Information is not available
    b. Infrastructure to exchange data not available
    c. Data is scattered between multiple stakeholders
    d. Data is owned by multiple stakeholders
    e. Stakeholders not willing to exchange information
    f. The investment to exchange information is too high
    g. Other criteria to classify commercially sensitive info

3.4.2 Sample of question of the survey

The survey was made available using the Survey Monkey platform, which is a specialised platform to send any kind of survey. The reasons for selecting this platform are: the survey can be sent by multiple channels, allows for filling of survey via internet connection and access to platforms website, and the results are stored in a centralised place to allow statistical analysis.

The survey was made available in the below link:
https://www.surveymonkey.com/r/final-apec-survey

Below is a sample of a question in the platform:



Asia-Pacific Economic Cooperation

APEC survey - exchange of logistics information between economies

Page 2 - Information available

Please indicate what information can be made available to other economies

* 4. What information about the **port** can be made *available* by your economy to other Ports

	Not important	Somewhat not important	Neither important nor not important	Somewhat important	Very important	N/A
Harbour size	○	○	○	○	○	○
Railway size	○	○	○	○	○	○
Harbour type	○	○	○	○	○	○
Dry dock	○	○	○	○	○	○
Vessel repair yard	○	○	○	○	○	○
Shelter	○	○	○	○	○	○
Bunkerage	○	○	○	○	○	○
Max Depth	○	○	○	○	○	○
Max Anchorage	○	○	○	○	○	○
Notifications to community	○	○	○	○	○	○
Tariffs and rates	○	○	○	○	○	○

Other (please specify)

Image 4: Sample of question of the survey

3.5 Statistical validation

Having sent the survey to 75 MEG delegates and 48 APSN council members, the statistical validation corresponds to a survey participation of 50% + 1, which is equivalent to an 8.7% margin of error with 95% confidence in the population[3]:

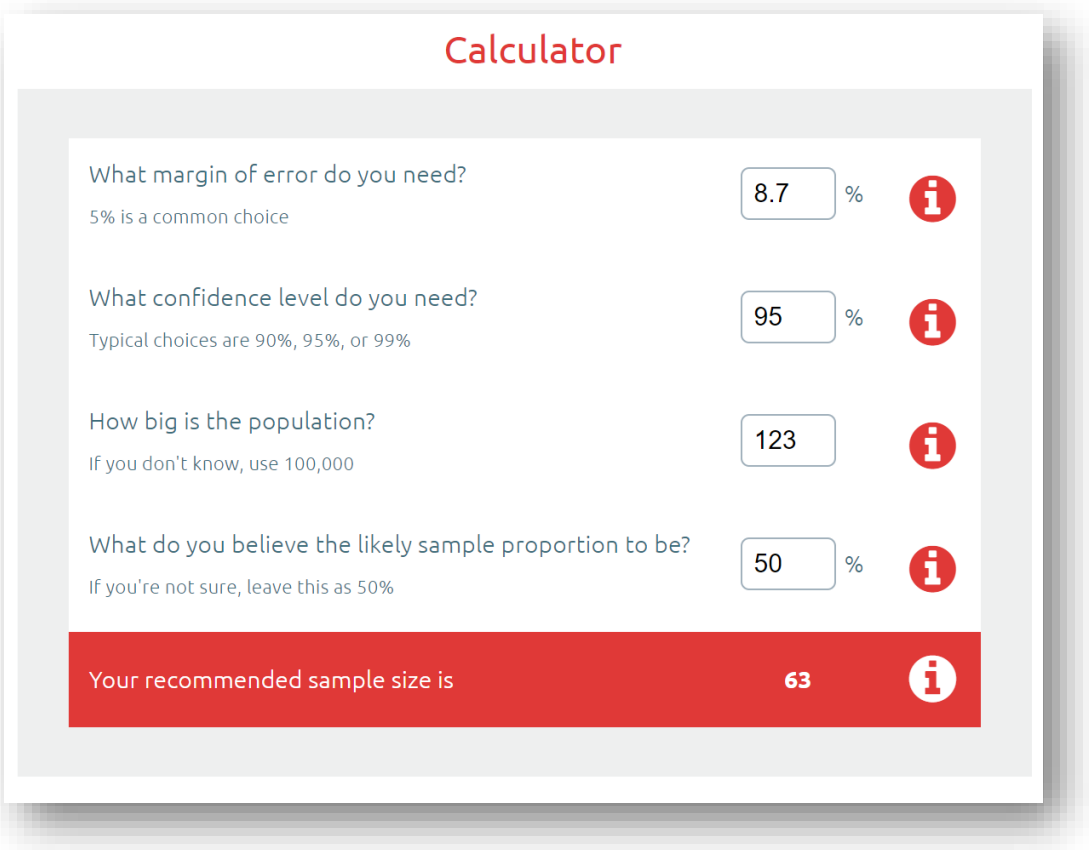


Image 5: Recommended sample size of the survey

Considering the size of the target population then the sample size would be:

- 38 MEG delegates
- 25 APSN council members

This equates to 63 answers to have a statistical validation.

The survey was completed by 24 people, so technically if we consider only the sample size figure, it cannot be considered representative for both MEG and APSN delegates because it would represent an error of 18%. However, it must be considered that the survey **was completed by delegates of 52% of the APEC economies**. This number is relevant because it can be considered representative from the point of view that **at least one member of 52% of the economies have filled at least one survey**. On

[3] https://select-statistics.co.uk/calculators/sample-size-calculator-population-proportion/

the other hand, it is possible that various delegates of one economy could have joined their answers into a single answer for the entire economy. Therefore, having one answer for the entire economy shows that the reality of that economy was reflected in the survey.

4. SUMMARY OF SPEAKER'S PRESENTATION

The workshop was held on September 25, 2019 in Cusco, Peru.. Below is a summary of the presentations held during the workshop.

Welcome speech

Mr. Guillermo Bouroncle, General Manager of the Port Authority of Peru was in charge to welcome all the APEC delegates attending the event and addressed welcoming remarks to all the delegations of the Maritime Expert Group and the APEC Port Services Network.

Keynote speech

Mr. Carlos Molina, Specialist 1st. grade of the General Manager office of the Port Authority of Peru delivered a keynote speech, addressing the importance of implementing mechanisms to encourage the collaboration between APEC economies and the benefits of having integration between them.

Strategies to implement a port community system to effectively exchange information

Mr. Greg Winstanley, Independent consultant and former General Manager for DP World terminal in Sydney for 16 years delivered a presentation to discuss the different strategies to implement a PCS system, discussing the advantages and disadvantages of them. Mr. Winstanley highlighted the importance of co-operation as the main tool to implement a PCS, stressing the fact that without collaboration, it is almost impossible to exchange information. He also explained the experience in Australia where port operators were the actors that drove the implementation of the PCS but including the public and private sector in multiple discussions to ensure that the view of all the actors was included in the final implementation.

Mr. Winstanley also mentioned how the PCS in Australia started with simple messages such as the Vessel Schedules, which were collated and shared with all port operators and the whole Port Community.

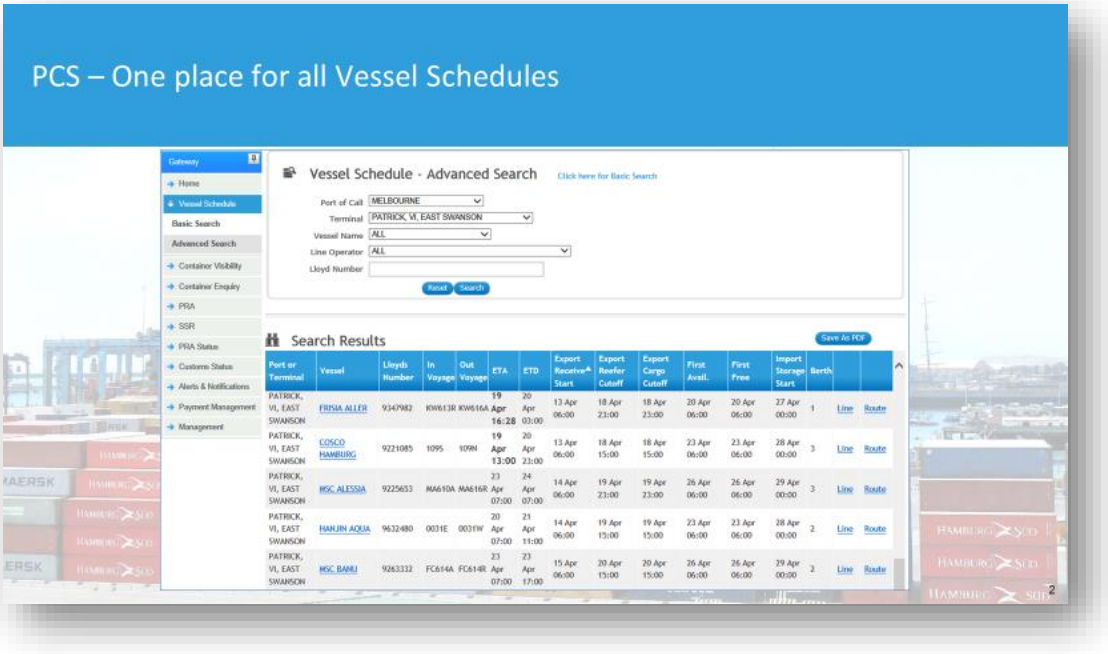


Image 6: Vessel schedule as a mechanism to start a PCS

Then it was also explained that the main reason to implement a PCS is to gain efficiencies by having visibility of information in an opportune way, reducing the complexity of the interactions between the many logistics actors into a single platform, like shown below:

Image 7: How a PCS can simplify the communication between logistics actors

Finally, Mr. Winstanley mentioned the components that an ideal PCS should have, where all the actors can benefit from multiple functions of a platform. However, he also explained that the strategy should be to build the different pieces in an iterative-evolutive manner, where the PCS is built introducing certain functions that can be incremented based on the requirements of the actors.

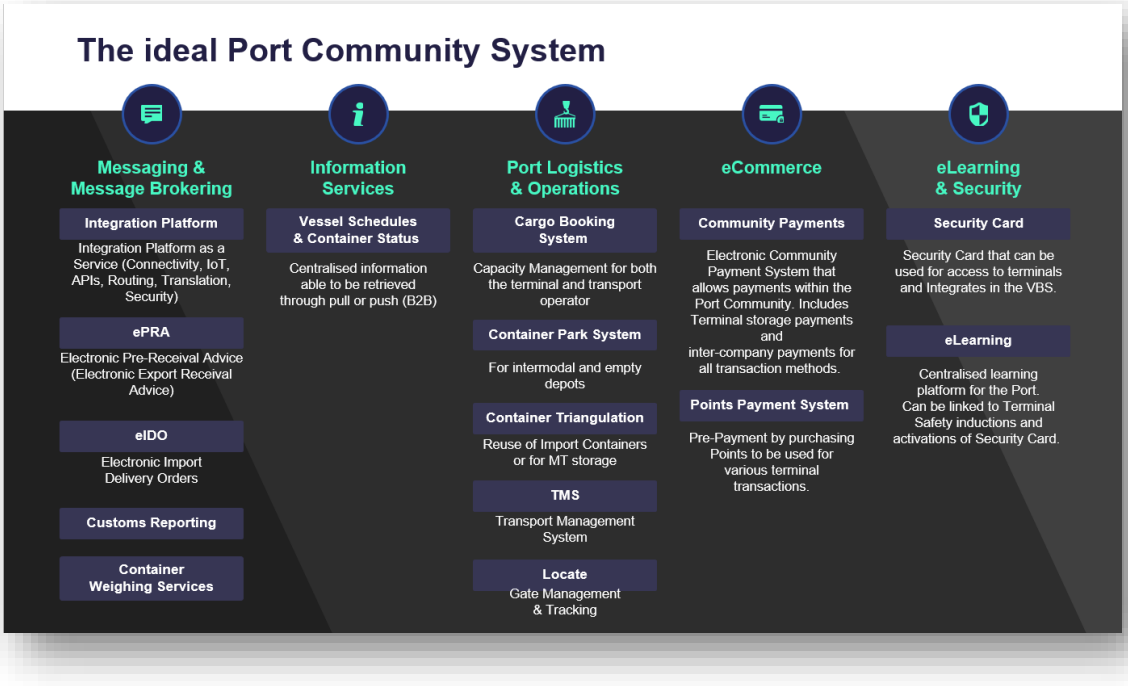


Image 8: The ideal PCS – a sample of modules.

Results of the Survey, Pilot and conclusions of Project TPT 01 2018A

Mr. Andres Pinar, consultant of 1-Stop Connections with more than 10 years of experience working in the logistics industry delivered a presentation that showed the results of the application of the survey and the pilot for Project TPT 01 2018A. Mr. Pinar presented the project's scope and objectives, and explained the main results of the application of the survey obtained until the date of the workshop. After that, he showed the results of the pilot applied to finally comment on the main conclusion, recommendations and next steps of the project.

The workshop also included a round of questions and answers where the project, results and conclusions were discussed with the delegates participating in the workshop.

4.1 Steps to manage port data via a single APEC Port Community Platform

According to the results obtained in the survey which are shown in the Section "Results of the Survey" in this document, and also according to the panel of experts who participated in the project and the workshop in Cusco, the following can be recommended as the steps to implement a Port Community Platform:

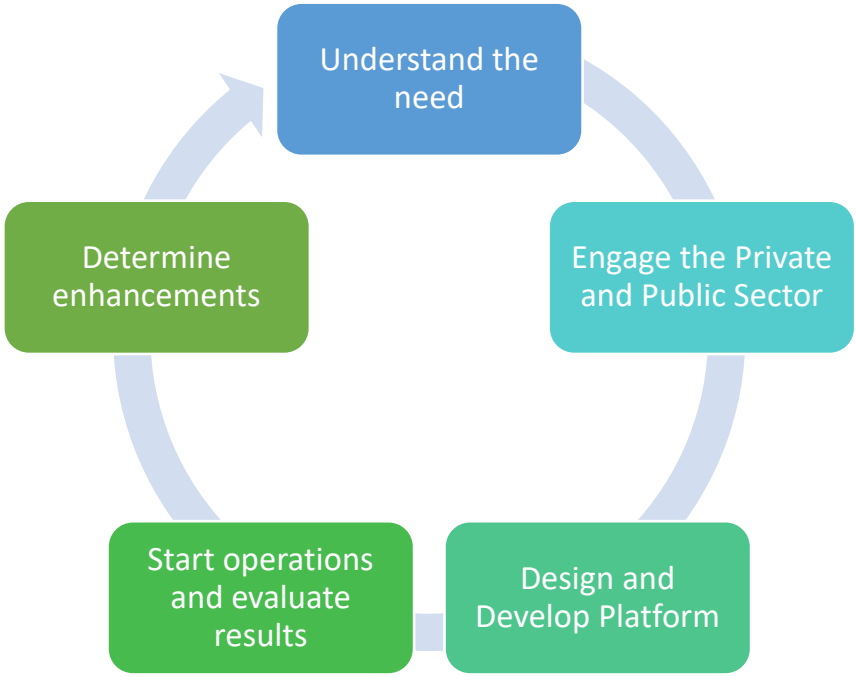


Image 9: Cycle to implement a single APEC Port Community Platform.

4.1.1 Understand the need

The first step undertaken by APEC is precisely what has been discussed in the current project TPT 01 2018A, that is to understand the need to exchange the information by analysing:

- If the APEC economies are interested in sharing information and if it will be useful for them to build a platform, and
- If it is viable to build the platform, i.e. if the information to be exchanged is available.

At this step, it is also important to determine the risks and challenges that will need to be mitigated and addressed in order to recognise the potential problems that economies may have to opt-in to this platform.

4.1.2 Engage Private and Public Sector

It has been identified that the information is owned by multiple actors in the supply chain. This implies that those actors must also be considered when implementing a solution.

It must be determined in detail:

- The benefits for participants utilising the platform, and
- How to facilitate incentives for those who can collaborate with the information to participate in the platform e.g. offering information available to organisations that opt in to participate in the platform).

4.1.3 Design and Develop Platform

The next step is to define the design of the platform, which include:

- Design of the services that will be available and information that will be exchanged.
- Design of the functions that the platform will have for both front-end (interfaces to the user) and back-end (administration of the platform).
- Design of the infrastructure, including the system architecture and physical components (such as servers and other network components)
- Prioritise what services and functions will be built in the first stage, considering the needs defined by the economies. The idea is to implement first the services that could bring more benefits to the economies.

Once the design has been defined, the next step is to build the platform in a first iteration. This will allow to implement a first version that could allow the sharing of information and economies will be invited to participate (both, private and public sector).

4.1.4 Start Operations and evaluate results

The platform starts operations after being developed and economies will start registering to start consuming and delivering information. It is required in this stage to have close communication with the actors that will participate in this first version of the platform to understand:

- What has worked well for them
- What did not work for them
- What challenges they are facing
- What enhancements can be introduced to the platform in a subsequent version

4.1.1 Determine enhancements

After the enhancements have been determined, they need to be evaluated to define if it is viable to implement them in the next phase. The feasible enhancements will be included in the next version of the platform. This will be the input to the next iteration of the platform.

5. EXECUTIVE SUMMARY

The executive summary section will show the main results obtained from the application of the survey and pilot as well as the main conclusions drawn in the workshop.

As a way to summarise the results and the workshop, three sections were included that contain the overall view of the main milestones of this project: the survey, the pilot and the workshop.

Main Results of the Survey

Overall, the survey applied included answers from 11 out of the 21 APEC economies. The results of the survey indicate that, in general, there is agreement between economies that sharing information is valuable and it would bring efficiencies in the business processes of the economies.

At the same time, it is important to address issues that would prevent economies from participating in a platform to share information, these are:

a) The main metric for this project establishes that there is an agreement between economies that the information is relevant to be shared. On average, the economies agree that it is important to make information available to other economies, **with a score of 77%**. Additionally, the economies agree that it is relevant to receive information from other economies, **with a score of 71%**.

b) The need to involve public and private sector: Since the information is scattered between actors of the logistics and supply chain, and often times these actors are private companies, it is important to provide them with mechanisms and incentives to participate in the platform.

c) Address maintainability of the platform: Our understanding is that the implementation of the platform will fail if it required significant resources to maintain it. Hence, it is required to analyse options to reduce the effort to keep the information up to date.

d) Support economies with resources to automate: Related to the point above, since the current level of maturity in the technology allows to implement solutions where economies can automate the sharing of information, the survey shows that it is important to address this topic to avoid manual intervention that could lead not only to additional effort, but also potential errors in the information that could lead to a lack of reliability in the platform.

Main Results of the Pilot

The most obvious result of applying a pilot is the fact that economies were able to send the information to a platform that, although it did not have a full scope which can show additional challenges to overcome, it demonstrated that it is feasible to exchange information and build a platform to bring economies to collaborate.

It is also worth mentioning that the pilot only explored the dimension of receiving but not the sending of information (it is recommended to obtain the view before building the platform). So, it is required to validate with the APEC economies that the information stored in the pilot can be consumed and is useful to provide efficiencies in their logistics processes.

Main conclusions of the Workshop

The workshop was an instance to discuss the objective of the platform and validate if there is intention to participate in it. Generally, economies have mentioned that it is necessary to collaborate. As an example, feedback received from the Canadian delegate indicated that today, economies do not consider the exchange of information as something essential because they can perform the processes with the information they currently have, however, if they are presented with new information that can be useful to bring efficiencies, then, they will be willing to participate.

In this sense, the main conclusions from the workshop were:

a) The set of information that is the most valuable for economies must be defined. This will allow to motivate public and private sector to participate and therefore other economies will be incentivised to participate.

b) Build the platform in an “agile” way, which means that after defining the information that could produce the biggest impact in the economies, a first version can be built with the minimum viable product which is a product with just enough features to satisfy early adopter in order to provide feedback for future development.

c) Learn from past experiences. A delegate in the workshop mentioned that a similar initiative was designed in the past to try to build a similar platform and it did not progress because the economies were not prepared to collaborate and also because the technology was not mature enough to enable the exchange of information. Therefore, it is required to incorporate the learning of this experience to avoid making the same mistakes.

5.1 Results of the survey

In this section, analysis of the questions asked, and the answers received from the economies are provided.

5.1.1 Question 1: Economy represented

In total, 24 answers were received from 11 of the 21 APEC economies. The biggest participation was from Peru with 42%.

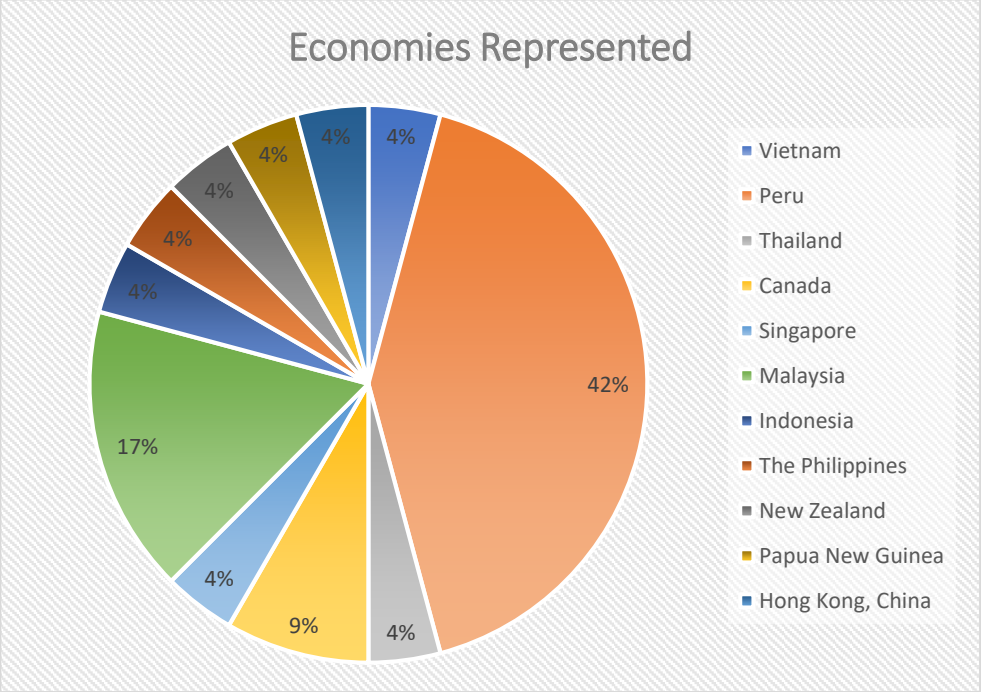


Image 10: Economies represented.

Below is the table with the economies that have and have not participated in the survey:

Participant Economies	Non-participant economies
Canada	Australia
Hong Kong, China	Brunei Darussalam
Indonesia	Chile
Malaysia	Japan
New Zealand	Korea
Papua New Guinea	The United States of America

Peru	Chinese Taipei
The Philippines	China
Singapore	Mexico
Thailand	Russia
Viet Nam	

5.1.2 Question 2: Port data available

The question about what port information can be made available to other economies, the delegates replied in the following order of importance – Top 5:

Ranking	Item	Score
1	Harbour type	105 (87%)
2	Harbour size	97 (81%)
3	Bunkerage	97 (81%)
4	Max Anchorage	95 (79%)
5	Tariffs and rates	90 (75%)

The following graph shows the score indicated by all delegates for each item out of a maximum of 120.

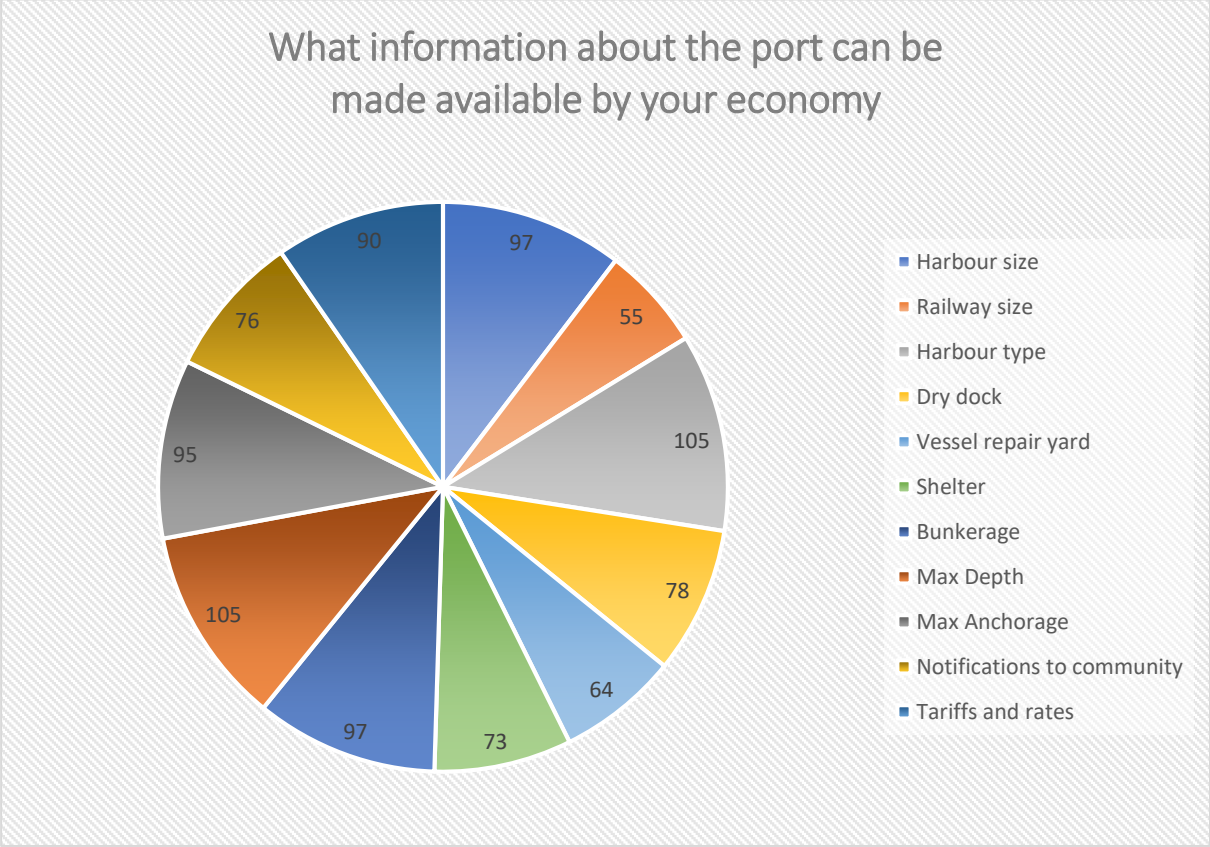


Image 11: Graph with port information that can be made available.

Therefore, except for Railway Size (55%), all of the other information is feasible to be exchanged with more than 60% of importance.

5.1.3 Question 3: Terminal data available

The question about what terminal information can be made available to other economies, the delegates replied in the following order of importance – Top 5:

Ranking	Item	Score
1	Type of Cargo handled	107 (89%)
2	Max Vessel depth	106 (88%)
3	Length of Berths	106 (88%)
4	Max Vessel Length	105 (87.5%)
5	Volume Capacity	105 (87.5%)

The following graph shows the score indicated by all delegates for each item out of a maximum of 120.

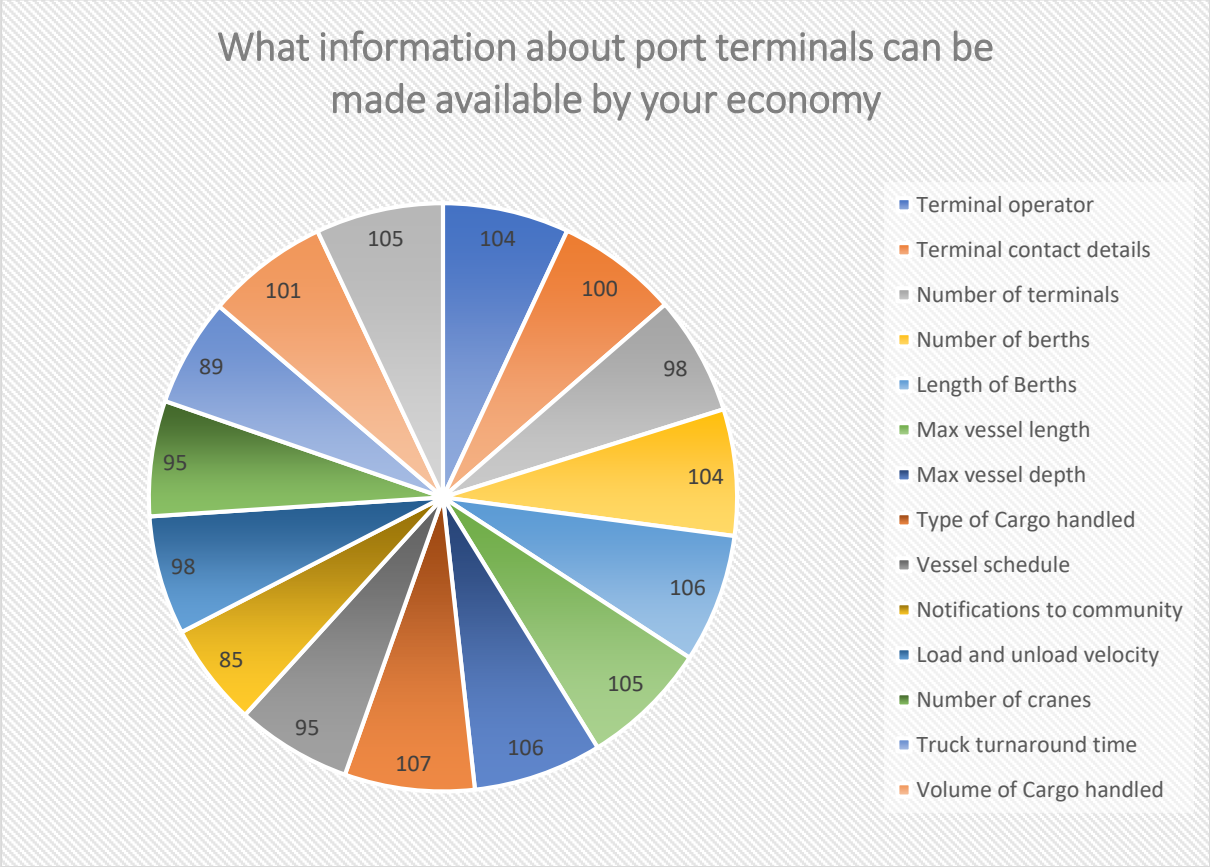


Image 12: Graph with terminal information that can be made available.

In this case, all of the information is feasible to be exchanged, since all delegates indicated that all the items can be made available with more than 70% of importance.

5.1.4 Question 4: Port services data available

The question about what terminal information can be made available to other economies, the delegates replied in the following order of importance – Top 5:

Ranking	Item	Score
1	Tugs	103 (85.8%)
2	Pilots	102 (85%)
3	Bunkerage	99 (83%)
4	General/Liquid waste disposal or recovery	99 (83%)
5	Water	99 (83%)

The following graph shows the score indicated by all delegates for each item out of a maximum of 120.

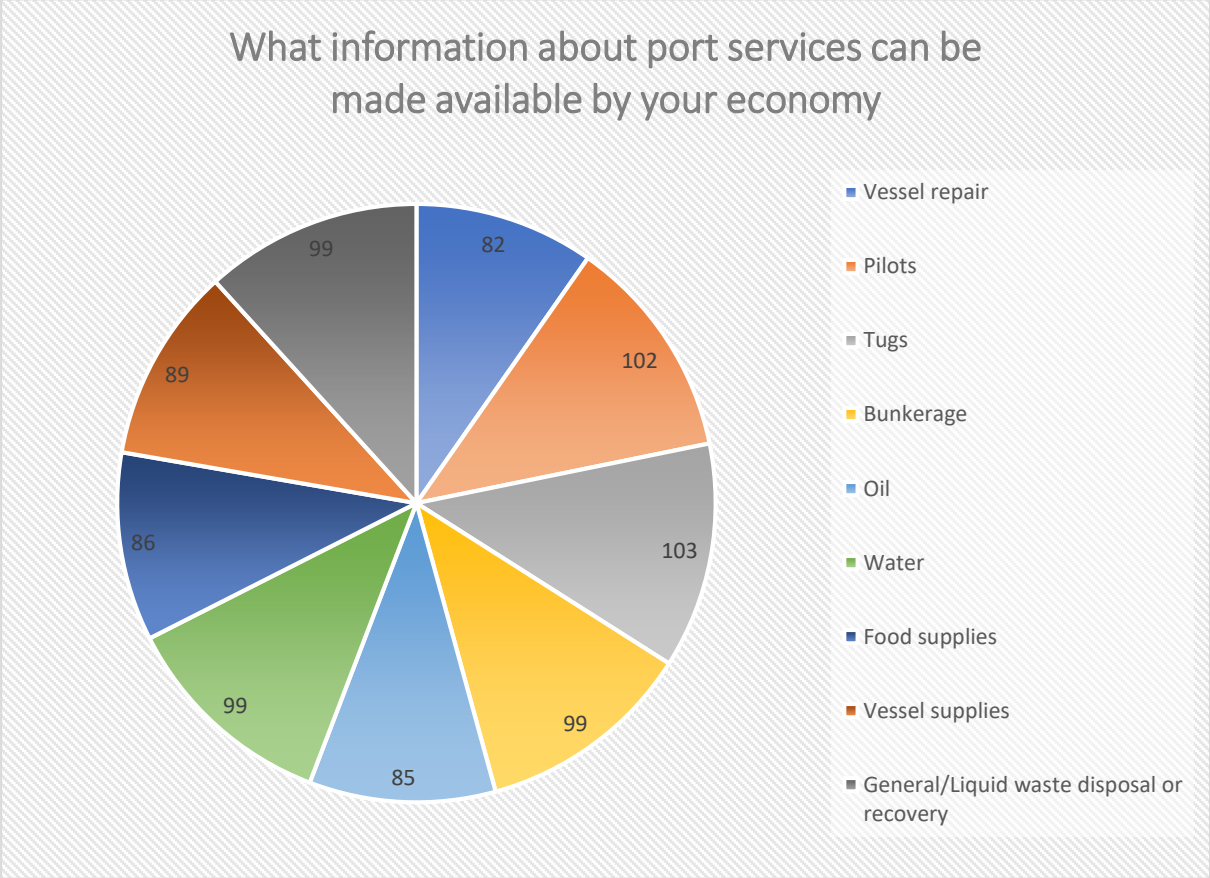


Image 13: Graph with port service information that can be made available.

All data related to port services information is feasible to be exchanged since economies mentioned that all data can be made available with 68% or more of importance.

5.1.5 Question 5: Port data required

Regarding the question about what port information would be interesting to be received, the delegates replied in the following order of importance – Top 5:

Ranking	Item	Score
1	Tariffs and rates	91 (76%)
2	Max Depth	91 (76%)
3	Max Anchorage	90 (75%)
4	Harbour size	89 (74%)
5	Harbour type	88 (73%)

The following graph shows the score indicated by all delegates for each item out of a maximum of 120.

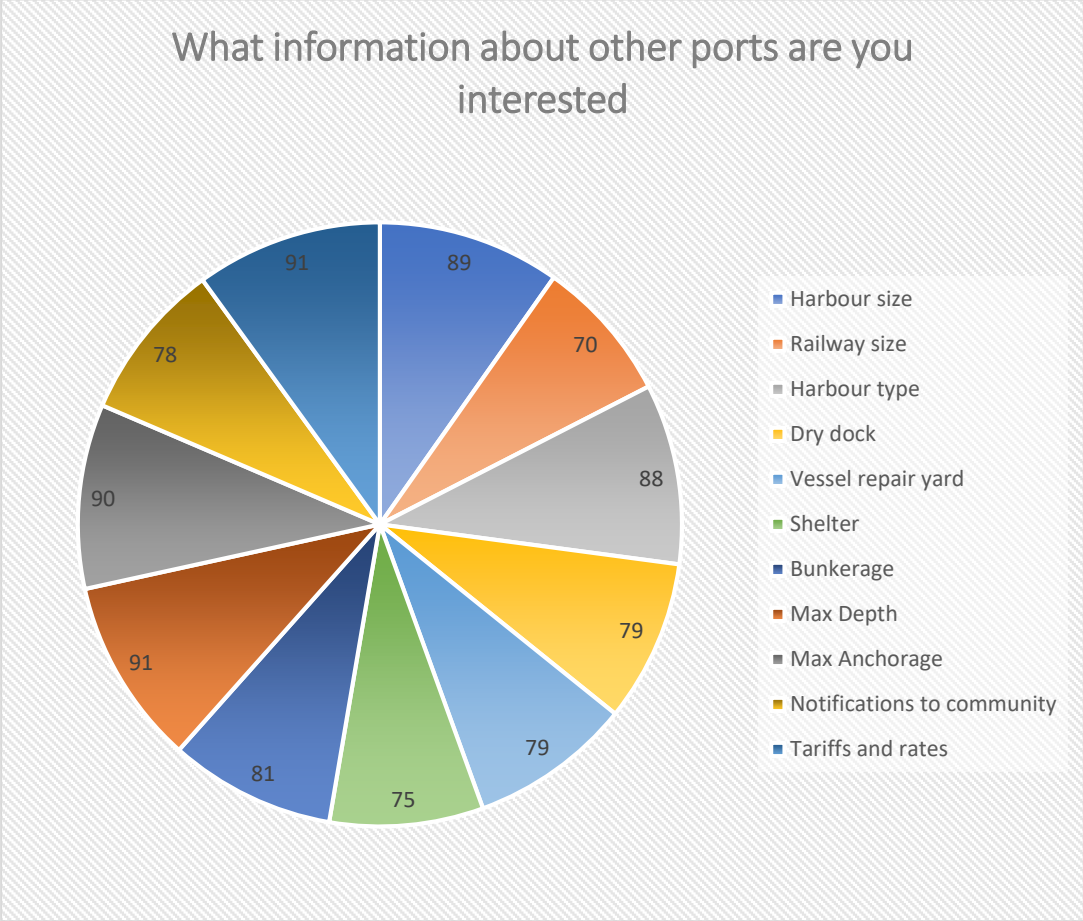


Image 14: Graph with port information that can be required.

Except for Railway size, all port data is important to be received (more than 60% of importance).

5.1.6 Question 6: Terminal data required

Regarding the question about what terminal information would be interesting to be received, the delegates replied in the following order of importance – Top 5:

Ranking	Item	Score
1	Max vessel length	93 (77%)
2	Max vessel depth	93 (77%)
3	Volume capacity	91 (76%)
4	Type of cargo handled	90 (75%)
5	Vessel schedule	90 (75%)

The following graph shows the score indicated by all delegates for each item out of a maximum of 120.

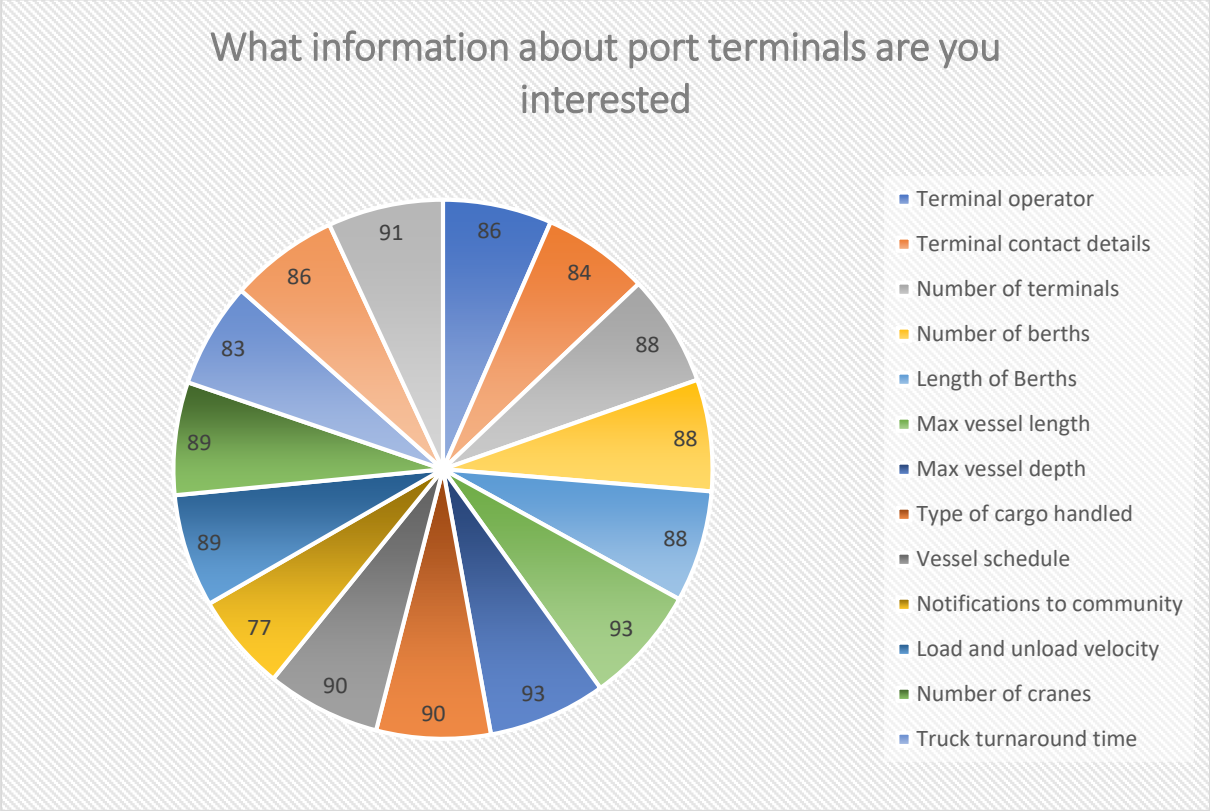


Image 15: Graph with terminal information that can be required.

Hence, it can be concluded that all terminal information would be interesting to be received (more than 60% importance).

5.1.7 Question 7: Port services data required

Regarding the question about what port services information would be interesting to be received, the delegates replied in the following order of importance – Top 5

Ranking	Item	Score
1	Tugs	90 (75%)
2	Pilots	89 (74%)
3	Bunkerage	88 (73%)
4	Vessel repair	83 (69%)
5	Oil	82 (68%)
5	Water	82 (68%)

The following graph shows the score indicated by all delegates for each item out of a maximum of 120.

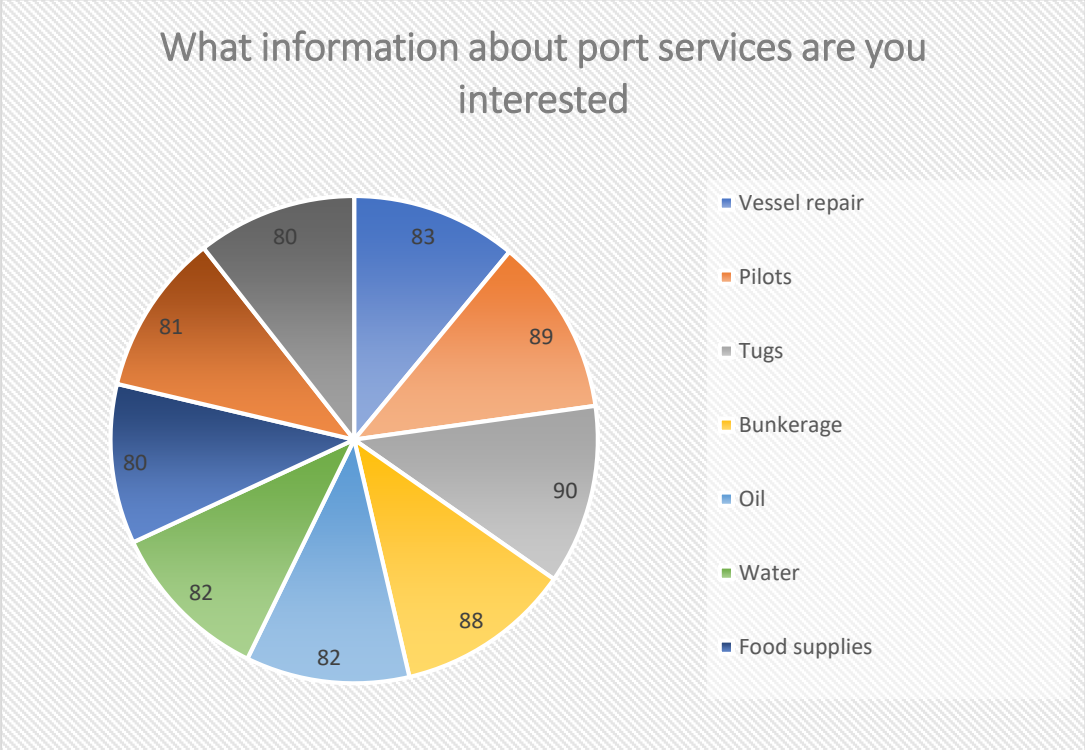


Image 16: Graph with port services information that can be required.

Therefore, the delegates have indicated that all port services information would be interesting to be received (more than 60% importance).

5.1.8 Question 8: Challenges to be addressed

According to the delegates, all challenges indicated in the question are applicable to the economies (more than 60% of importance for all of them), but the main ones are – Top 5:

Ranking	Item	Score
1	Automatic exchange of information	92 (77%)
2	Keep data up to date	92 (77%)
3	Opportunity of information	91 (76%)
4	Easy to use	90 (75%)
5	Mechanism to update data	89 (74%)

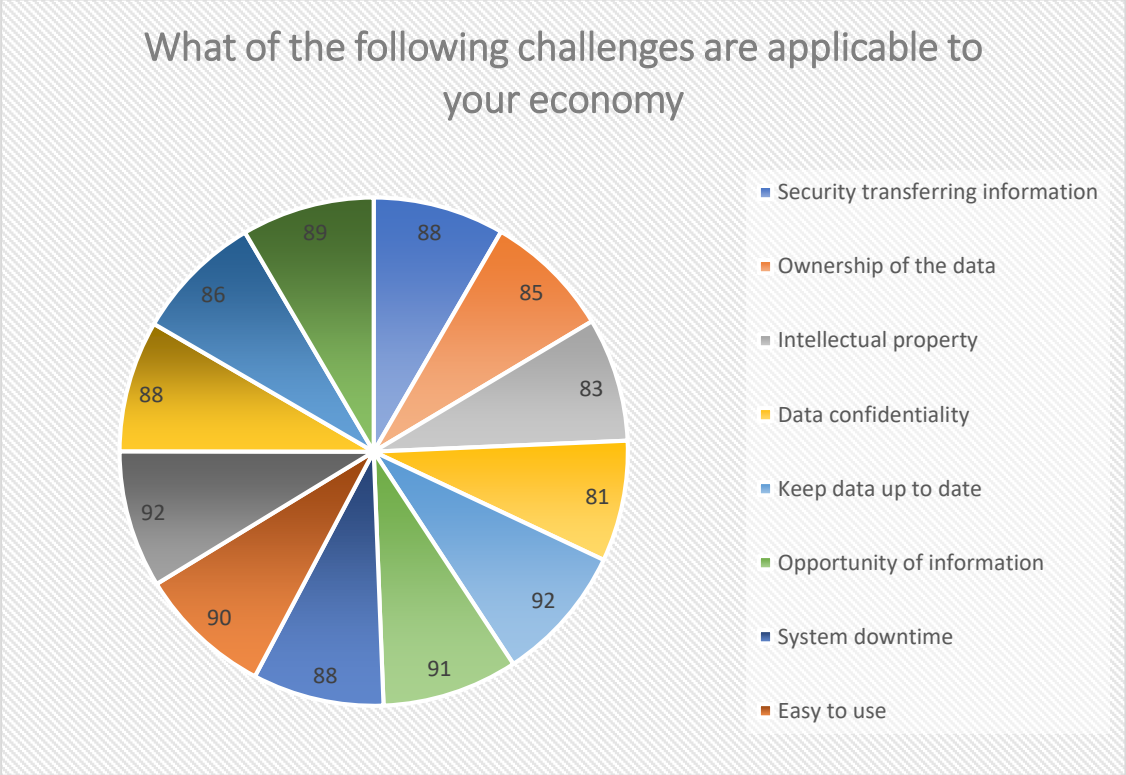


Image 17: Graph with challenges applicable to economies.

In essence, the economies have expressed that:

a) There is a common agreement that to share information is fairly important and relevant to improve the processes with a high score (more than 70%).

b) It is required to implement mechanism to support the automatic obtention of the information from their operating systems to populate the exchanging platform. This will be considerable support to avoid manually updating of information, which would require additional resources to support the platform.

c) The reliability of the platform is based on how up to date the information is maintained, therefore, it is critical to have the most recent information to build the trust in the platform.

d) In the same way, any exchange of information must be done in an opportune way, (i.e. considering the technology standards) it would be expected that after the information is produced by the stakeholder in their operating system, this should be transmitted to the platform and to the other economies at a reasonable time (seconds or minutes).

e) Usability (i.e. how easy is the platform to be used) has also been identified as an important factor. It should be easy to add and store information, but also to visualise the information to maintain the platform.

f) Another item highlighted by the economies is the hosting of the information. Since the information could be owned by private and public organisations, it is important to define where the information will be stored, making sure that there are no legal constraints to host the information in any place

in particular. Nowadays, technology based on the cloud[4] allows to store and scale infrastructure easily to avoid on-premise infrastructure cost. This kind of technology could be used but it must be validated with each economy.

g) Finally, security is another challenge that will need to be addressed. Since the information will be shared through the Internet, it is important to ensure that the information is viewed by the stakeholders who are allowed access and not others. Security mechanisms such as encryption of information, passwords and roles to access information, among others must be defined before developing the platform.

5.2 Results of the pilot

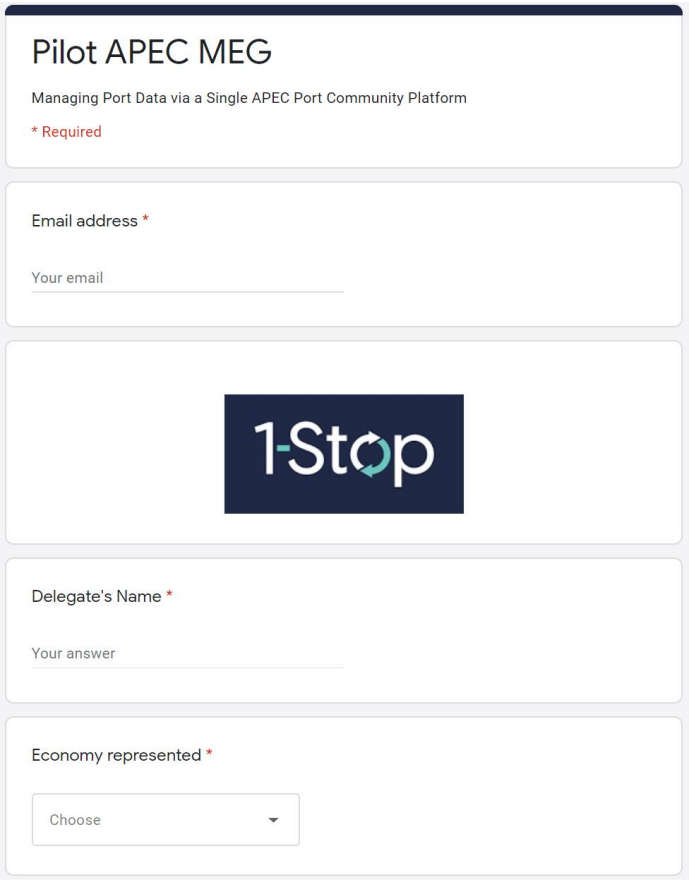
As mentioned before, the pilot was used as a mechanism to demonstrate that is possible to exchange information between economies.

5.2.1 Pilot design

Below is the URL where the pilot can be found:

https://forms.gle/eR2NkV8end71hx68A

And below is a sample of the information requested in the pilot:



[4] https://www.cloudflare.com/learning/cloud/what-is-the-cloud/

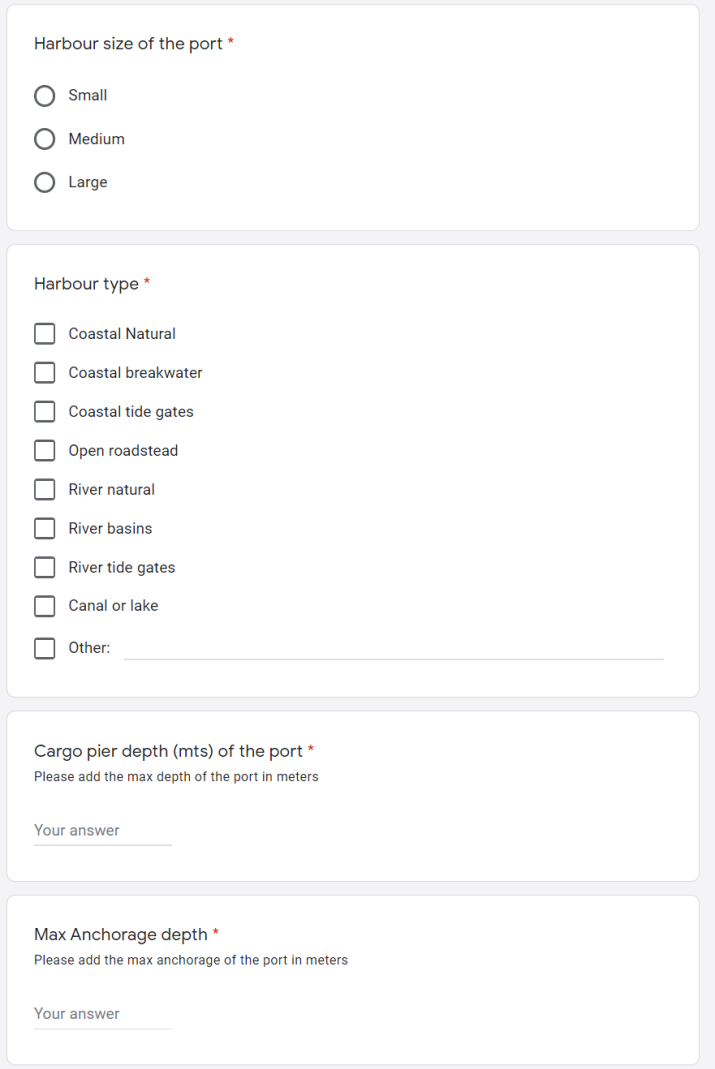


Image 18: Sample of the pilot applied.

5.2.2 Pilot scope

In scope of the pilot

As explained before in this document, the pilot was intended to be a mechanism to validate that the exchange of information is viable between economies, and to demonstrate that the technology allows to implement a platform to share information.

The pilot was done utilising Google Forms, which is a mechanism to simulate a portal where economies would have to fill a form to update the information of their port, terminal or port services.

Out of scope of the pilot

The objective of the pilot was not to:

a) Validate that all the information for all ports was sent. Economies were requested to send a sample of the information for some ports, not all of them.

b) Validate automation. The economies did not use any mechanism to extract the information from other systems to input it into the platform. The form was filled manually.

5.2.3 Results

The pilot was made available from August 20 – 29, 2019, a total collection period of 40 days. During that period, 14 answers were received from 7 economies, these are:

- Canada
- Indonesia
- Malaysia
- The Philippines
- Thailand
- Papua New Guinea
- Peru

The image below shows a sample of the information collected during the pilot.

D	E	F	G	H	I
Economy represented	Port Name	Harbour size of the port	Harbour type	Cargo pier depth (mts) (	Max Anchorage depth
The Philippines	PMO NCR-SOUTH	Large	Coastal breakwater	12	12
Papua New Guinea	Port Moresby	Medium	Coastal Natural	10	20
Peru	Callao	Medium	Coastal breakwater	15	15
Canada	Vancouver Fraser Port Authority	Large	Coastal Natural;River natural	16	60
Indonesia	Tanjung Priok	Large	Coastal breakwater	16	30
Thailand	Lame Chabang Port	Small	Coastal Natural	16	16
Thailand	Lame Chabang Port	Small	Coastal Natural	16	16
Thailand	Bangkok Port	Small	River natural	8.23	9.1
Peru	Callao	Large	Coastal breakwater	16	50
Peru	PERU LNG Melchorita	Small	Open roadstead	15	28
The Philippines	South Harbor	Large	Coastal breakwater	13.5	13.5
Malaysia	PENANG PORT	Medium	Coastal Natural	10	1
Peru	CALLAO	Large	Coastal breakwater	16	50
Peru	NO NAME SUPPLIED	Small	Coastal Natural	20	50

Image 19: Sample of the information collected during the pilot.

5.2.4 Feedback received during the pilot

In general, the feedback received during the pilot indicated that:

- The owners of the information are not necessarily the APEC delegates, some of the ports must adhere to the initiative in order to have the updated information.
- It was relatively easy to add the information, but to keep it up to date, it will require support because some economies do not have resources to continue updating over time.

5.3 Workshop analysis

In addition to the summary described in the section 4 Summary of speaker's presentation, below is a detailed analysis of the topics discussed in the workshop.

5.3.1 Strategies to implement a port community system to effectively exchange information – Mr. Greg Winstanley

Co-operation

Port Community Systems (PCS) attempt to cover the entire Port Community, but the starting point needs to be where most of the information is collected - at the Port and more specifically, at the individual terminals within the Port.

Most ports will consist of multiple Concession holders or Stevedoring Companies. These enterprises or Port Operators will more than likely use different internal systems, known as Terminal Operating Systems (TOS).

For any PCS to get off the ground, the Port Operators need to be able to cooperate in sharing information via a nominated third-party organisation.

Co-operation is the key as the failed history of PCS attempts in Australia shows.

In the case of Australia, the Port Operators were the Stevedores/Concession Holders who ran the facilities at the port. At the time, the Australian PCS was initiated, these were Patrick Stevedoring and P&O Ports Australia who were later purchased by DP World Australia.

The individual terminal Port Operators are the ones with the most to gain from the implementation of a PCS, so it makes sense that they should drive the PCS implementation. The efficiency and productivity gains at a terminal far outweigh the cost of the PCS implementation. The cost savings and revenue increases for each terminal can be very substantial. For example, the combined revenue gain for the Australian terminals is in the order of $150M a year. The cost savings to the community and the economy are incalculable given to massive efficiency gains over time.

These two Port Operators began setting up their own third-party PCS Provider in 2002 and formally created a new private company called 1-Stop Connections (PCS Provided) in 2003. Their aim was to solve port congestion and increase productivity for their container terminals across Australia and, in doing so, improved the productivity across the whole port community and greater container supply chain.

The PCS started with simple messages, such as the Vessel Schedules, which were collated and shared with all port operators and the whole Port Community.

What is a PCS?

"A Port Community System is an open computer system or portal that allows the supply chain participants to rapidly and securely find and exchange information related to the port's logistics."

The original cooperation between the Port Operators led to more PCS functions such as Container Visibility information that was shared with the community via the PCS website. Access to the PCS was via a yearly subscription model.

Benefits and savings

Benefits and savings internally were achieved by having a single organisation instead of all Concession Holders performing individual development.

Each Concession Holder could still use their own Terminal Operating System (TOS) so there was no need to have to buy any new systems or develop new message formats.

Daily operational people were not affected and there was no additional training required in new systems or screens. They continued to use their TOS as normal but in the background much of the data was integrated with the PCS.

Accurate and timely messaging from all Shipping Lines and from previous Ports (e.g. BAPLIE data) is entered via the TOS and then sent to the PCS to be shared with the community.

Other benefits are:

a) Data accuracy is increased dramatically because the data in electronic versions of paper-based documents can be cross checked before the documents are submitted.

b) Cross checking of vessel details and discharge ports from vessel routing data

c) Cross checking of hazardous details against IMDG code sets.

d) Huge time savings because handwritten documents can be hard to read or even illegible causing transcription mistakes.

e) A rare event today, but in the past, containers were loaded onto the wrong ship and ended up in the wrong place with associated costs of returning it.

f) Wrong refrigeration temperatures were assigned to a container because in paper-based ERA's, it was not possible to cross-check if the temperature was in the correct range for the specified commodity.

Purpose of a PCS

Exterior stakeholders started to get valued information such as Vessel Berthing and Scheduling and other container events (Container Gate In, Gate Out, Load and Discharge) from the PCS.

In the case of containers, a portal was developed to give data transparency of each container which lead to a dramatic reduction in futile truck trips. Other data benefits such as container size, type and weights allowed correct selection of truck type to transport the container.

Over time, more and more port community participants were connected and started to exchange information. Today, the PCS can quickly answer questions that previously required a huge amount of time and effort. Here are some examples of questions that can now be answered by the PCS and where the data can come from.

Start Up

As there are so many Terminal and Port Operating Systems (TOS) globally, it was important that the chosen PCS Provider can connect the various platforms and integrate the different messaging formats and data so that it could be shared with any part of the Port Community.

As the basic start-up was successful, the next steps or modules gained a lot of external interest as benefits were seen by all.

The challenge was what would be the next piece that could bring all the stakeholders in the community together via the PCS and enhance the transparency and benefits to all.

Growth and Technology pushing advanced PCS

The catalyst for a PCS was growth and technology which created demand from the community. Vessels quickly became larger and technology advanced quickly to keep up with growth.

The Port Community was faced with moving larger amounts of freight within the same or in cases reduced time frames.

As these events developed, it triggered the growth of the PCS as information needed to be faster and accurate.

The industry overall has become very sophisticated while the PCS provided a simple way for all to operate in a more informed manner.

The Port Community could introduce accurate planning based on the information and the speed in which everyone could pass documentation through the system where it ended up with those that needed it.

Cargo owners can now virtually access their goods as soon as they are discharged from the vessel, and exporters can secure their payments as they close the doors of the container.

In the past, cargo was not available until the last container/cargo was discharged from the Vessel.

Today, using the PCS with data directly from the TOS, transport operators can see the estimated discharge time and make a pickup booking accordingly.

Where can a PCS make a difference?

Terminals have reduced dwell times of cargo in the yard which effectively increases the footprint of the yard because the containers are quickly delivered making room for export receivals or more container discharges from the ship.

An example was a Terminal[5] which had a deemed capacity of 900,000 TEU, and with the applied use of the PCS, it produced a throughput of 1.3M TEU. No extra land was required, in fact, a section was closed off and used for another purpose.

Technology certainly played its part, but the PCS allowed so much forward planning that it was the driver of success.

[5] DP World West Swanson Container Terminal in Melbourne Australia.

Economies Capabilities

A real positive of the PCS is the fact that benefits come from any part of the structure. If a Port is not as advanced or as large as others by just having basic functionality, it will produce savings and create efficiencies.

The PCS is modular enough that it can be gradually implemented. A smaller terminal can exchange basic information, but any level of connectivity will have time savings and efficiency gains.

PCS should also have the capability to service more than the one Port in any economy.

Australia has the same independent PCS in all ports. All Stevedore/Concession Holders, although competitors, use the same system although they can independently configure it to adapt to their enterprise through background business rules.

The smaller or less developed Ports can turn these business rules on as they develop. This will then allow them to grow their PCS as required. For example, a Terminal[6] in Australia initially implemented the Vehicle Booking System with just the Vessel Schedule data. No other data integration was done at the time. This was enough to get them started and introduce value into their landside to yard business process. Now, 8 months later, they are investigating further integration between the PCS and their TOS to achieve additional efficiencies.

Modules and where is Australia now

Today, Australia is in a position that can identify cargo at point of loading, know what Vessel it is coming on, where it is stowed, when it will be discharged, when storage will start, if it is clear of holds, what trucker is picking it up, what day and time this will take place, where the empty will go back to and when it goes in and out of all gates along with many other steps and all shared in the Port Community.

Stakeholders can pay all charges via their office, Customs clearance can be instantaneous, and Shippers know exactly where their goods are. Carriers can pre plan and utilise their fleet in a manner that has seen 30% reduction in trucks needed.

Shipping Lines have more control on equipment. Customs can conduct covert exercises and apply holds at any time.

Stakeholders are continually looking for further enhancements for all parties within the PCS.

The pleasing part of further development is that all stakeholders are involved and drive advancement via constant engagement.

In summary, you don't need to outlay millions of dollars to start up. You can do this module by module and the savings each module gives funds the next section.

Some sections have fees however, again, they are set by the operator or concession holder of that Port. But any fee must be justified by efficiency savings to those paying.

Summary of Questions and Answers

Q1: How do you transition from paper-based documents to electronic documents?

[6] AAT Fisherman Island Container Terminal – Australian Amalgamated Terminal at Fisherman Island in Brisbane Queensland.

To transition from paper to electronic, it is required to define options to implement multiple ways to transmit the electronic documents. This should be accompanied with options for multiple transport protocols to send the electronic document. For example – as an email attachment, ftp file transfer, APIs, web service, etc.
Then, it is required to inform the community communicating to the industry in as many ways as possible the new process, for example by email to known community participants, via group associations e.g. Maritime Associations, via flyers at the port, etc.
Providing user guides or other mechanisms to explain how to use a system or how to send documents electronically.
Providing Frequently Asked Questions to allow users to troubleshoot the main issues they may have.
Provide a transition plan to full electronic documentation by incentivising those with electronic documentation that can be critical to the system, for example by giving them preferential access to the information, faster turn-around, etc.

Q2: How can eLearning be incorporated into the PCS?

1. eLearning provides a way for people in the port community to complete various training and then complete a test or quiz to gauge their understanding.
2. For example, Safety induction training can be done online. Each terminal facility will have a different induction course. People must complete the course and pass the test before being allowed to enter the terminal.
3. Other courses can be provided on how to use various modules of the PCS.
4. In fact, any online training can be added to the eLearning module of the PCS such as truck driver training on dangerous goods handling or new employee induction training at a terminal.

Q3: Who has been the leading stakeholder in the implementation process of the Port Community System?

The stevedores, DP World Australia and Patrick, provided the initial financial resources to 1-Stop Connections to develop various systems to share and exchange data with the whole international container supply chains in Australia. 1-Stop is the main electronic conduit of information between the main container terminals and the container supply chains.

Electronic information is exchanged with Shipping Lines, freight forwarders, customers' brokers, truck and rail transport operators, various port authorities and government agencies including Australian Customs and Border Protection.

Additionally, over 100 supply chain software providers, within the supply chain services sector, exchanges data with and through 1-Stop's systems to other Port Community Participants.

Q4: Who invested in the CAPEX to create the PCS?

Patrick Stevedores
DP World Australia (originally P&O Ports who were bought by DP World)

Q5: Does the PCS apply fees for the use of the system? What kind of fees are being applied?
Yes, there are fees applied. The fees charged vary depending on the use of the platform. A sample of the possible fees are shown below:

- One-time subscription,
- Monthly subscription,
- Yearly subscription,

- One-time installation fees,
- Transaction,
- License fee,
- Freight/container volumes,
- Queries

Q6: Is the use of PCS mandatory?

Yes, certain types of data can only be delivered electronically to the Container Terminals. For example; Truck appointments must use the PCS, the Export Pre-receival Advice and Import Delivery Advice must be electronic exchanged either through EDI messages of via the PCS website forms.

Note: The analysis of the topics discussed in the presentation of Mr. Andres Pinar will be presented in subsequent sections of this document.

Image 20: Session of the Workshop in Cusco.

Image 21: Session of the Workshop in Cusco.

Image 22: Session of the Workshop in Cusco.

5.4 Project viability

Based on the answers received to the survey, the information obtained in the pilot and the feedback received during the period that the survey was open, in the workshop and after the workshop, the team of experts have established the following statements regarding the project viability:

1. The consultants have determined that it is feasible to build a platform to allow the exchange of information between APEC economies. This platform has demonstrated that it will increase collaboration and it will bring efficiencies to the economies that participate in this exchange. This is notwithstanding the potential challenges and risks that must be taken into consideration before developing said platform.

2. It is foreseen that the benefits of implementing the platform would outweigh the drawbacks, since the efficiencies will bring savings in the logistics industry that should be bigger than the cost of building the platform. As an example, having port information in advance would allow the owner of the cargo to make decisions in advance to send or not cargo to another economy. However, one of the main challenges of a future phase of the project will be to build a business case to support the benefits and quantify them, which could be hard to determine, as sometimes it may not be trivial to determine the savings. For example, one saving could be related to saving time processing information that currently is not available. However, to quantify the benefits would imply to determine how many hours are saved in processing this information.

3. Some economies may not be interested in joining the platform, therefore there is a chance that the information will be incomplete. Therefore, it is recommended to define incentives to those economies that may not be willing to join the platform from the initial implementation. This is particularly important to ensure the obtention of the critical information to allow the successful operation of the platform. As an example, Singapore being a big transhipment cargo hub, the information generated by that economy could be critical for other ports like The Philippines, Thailand or Australia. Therefore, special incentives must be defined to have Singapore joining the platform if not at the beginning, soon after it is released.

4. In terms of technology, the panel of experts have defined that the current available technology is able to provide all the elements that would allow the implementation of this platform. The platform based on the cloud, software as a service (SaaS)[7], the exchange of information via APIs[8] and especially the cost and scalability offered by these kind of solutions, offer today a very good scenario to implement the platform without having to spend a considerable amount of money and resources.

5. It is important to mention that the approach to implement a SaaS platform is essentially different from a traditional implementation of a PCS in the sense that a platform can be implemented with a small scope that can be expanded based on the findings of the first implementation. In addition, the SaaS provide the option to create a framework where economies (clients of the platform) can gradually join to access the services they need (and only those), thus reducing the effort and cost required to build a big system.

[7] https://searchcloudcomputing.techtarget.com/definition/Software-as-a-Service
[8] https://www.techopedia.com/definition/24407/application-programming-interface-api

5.5 Risk Analysis

The below table shows the main risks identified during the project:

Risk and description	Impact	Mitigation
Security and visibility of information. The information must be accessed only by the system role and profile that is supposed to be the recipient of it and nobody else. The transmission channel must avoid data leakage or hacking.	The platform will lose credibility and trust within economies. Economies will not rely on the use of the platform and could affect their participation.	Define and implement security measures to avoid those issues. Establish a contingency plan in order to manage any potential data loss situation.
Availability of resources to build and maintain the platform. This relates to monetary and human resources to define the requirements and to manage the platform.	Resources will be required to manage the operations of the platform and to make any subsequent decisions for future phases. The lack of resources could lead to failure in implementing the required functionality for APEC economies or wrong requirements. In addition, it is necessary to have an administrator of the system to control the adequate operation of the system.	Encourage one economy to hold the system along or with the APEC, for at least 1 year. Engage APEC representatives to be the appointed resources to support the project and the operation of the platform. To avoid unnecessary costs, define a reduced scope to build the MVP (Minimum viable product) which can be increased in functionality in subsequent phases.
Private sector and non-APEC delegates collaboration. Information incomplete or non-sustainable.	Without the participation of stakeholders who own the information, there is a possibility that the information will be incomplete.	Identify key actors/economies that own information critical to other actors/economies. Define incentives, whether subsidising the cost or offering support to include or extract information to/from the platform, for at least one year.

Lack of standardisation. The data could be stored in systems or managed in a non-structured manner.	If data is not standardised: ▪ Could make it difficult to be exchanged. For example, the data can be in different metrics or a special format. ▪ It may not have any meaning for an actor that is using that information.	Use a simple and reliable system that all economies can use without problem. From a point of view of the data, it is required to have a common understanding on the meaning of it.

5.6 Best practices

Based on the experience of the expert panel, team the following best practices should be applied:

1. Establish an initiative to implement a robust, reliable but simple system that provides the services required to economies to start exchanging the required information.

2. Avoid using a "big bang" approach. Try to implement a reduced scope and discover the need while the platform is being built. Use the principle of "fail fast" to avoid unnecessary cost. To do this, it must be defined the scope for one phase, define a backlog of features (applying the principle of Agile methodology) and build the features with more value added. Then after the first phase has been released, prioritise what will be built in the second phase. According to our experience, this kind of systems must be built implementing the absolutely necessary functions and then grow it from there. In such a way, if in the worst-case scenario, the economies are not interested in participating, the cost will be minimized.

3. Define a business case to determine benefits before building the platform. As part of the next phase of the project, the scope could be to define the platform, functions, benefits and cost. In such a way, APEC will have full understanding of what will be developed before investing in the platform.

4. Identify early adopters and incentives for them. Particularly the owners of the critical information must be engaged from the very beginning and offer them incentives to join the platform. An alternative plan could be defined if the critical actors are not interested in joining.

5. Finally, a sample of the history of how 1-Stop has implemented the PCS system in Australia can be found in the ***"Appendix D: PCS the Australian experience"***.

5.7 Challenges

The main challenges identified in the project are related to:

- The port, terminal and services data are scattered among multiple stakeholders. Those stakeholders are often private organisations that need to be incentivised to exchange information. It is necessary to elaborate a strategy to involve the private sector.

- Information can be commercially sensitive. A way to mitigate this is to sign contract between economies to address the sensitivity of the information and to include mechanisms to address data leaking.
- Some economies have manifested that they may not have an infrastructure available to exchange data. Therefore, this issue must be solved in a centralised way. The platform can be a de-centralized platform, but the management must be done in a centralised way.
- Quantify the benefits of the platform, including the savings that economies will have when they opt-in to the platform. This is important to help economies that may not be willing to participate to reconsider.

5.8 Conclusions

A summary of the results obtained can be found in the graph below:

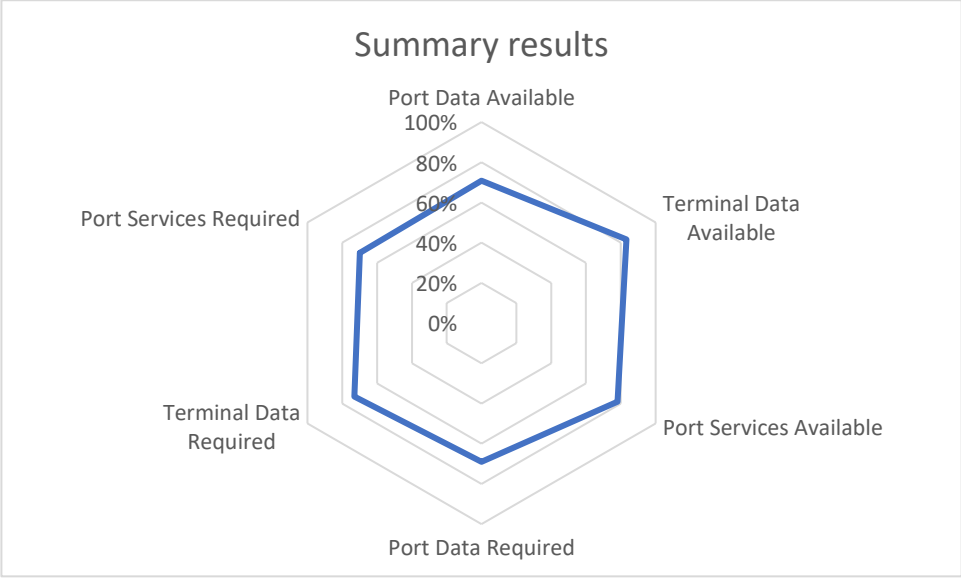


Image 23: Summary results.

1. The statistical analysis of the answers to the survey lead to the following conclusions:
    a. Out of the 52% economies that participated in the survey, 70% agree that sharing information is important to the development of the economies.
    b. Also, the economies consider that the most relevant **data that can be made available**, in order of importance, is:
        i. Terminal Data - Type of Cargo handled (Score 107)
        ii. Terminal Data - Max Vessel depth (Score 106)

iii. Terminal Data - Length of Berths (Score 106)

iv. Terminal Data - Max Vessel Length (Score 105)

v. Terminal Data - Volume Capacity (Score 105)

vi. Port Data - Harbour type (Score 105)

c. The order of importance **data required** from other economies is:

i. Terminal Data - Max vessel length (Score 93)

ii. Terminal Data - Max vessel depth (Score 93)

iii. Terminal Data - Volume capacity (Score 91)

iv. Port Data - Tariffs and rates (Score 91)

v. Port Data - Max Depth (Score 91)

2. Additionally, after analyzing the results of the pilot applied to all economies, we conclude the following:

a. The pilot demonstrates that it is feasible to exchange information between economies.

b. Delegates from 7 economies have sent information from 11 ports. The ports sent were:

i. Bangkok (Thailand)

ii. Callao (Peru)

iii. Laem Chabang (Thailand)

iv. Penang (Malaysia)

v. Melchorita (Peru)

vi. PMO NCR South (The Philippines)

vii. Port Moresby (Papua New Guinea)

viii. Tanjung Priok (Indonesia)

ix. Vancouver (Canada)

x. South Harbour (The Philippines)

xi. Antamina Dry port (Peru)

c. The information that **was filled by all 11 delegates** and sent to the pilot was:

i. Harbour size

ii. Harbour type

iii. Cargo pier depth of the port

iv. Max anchorage depth

v. Type of Cargo handled

vi. Availability of anchorage in the port

vii. Size of the port's dry dock

viii. Availability of ship repairs

ix. Availability of food supply

x. Availability of water supply

xi. Quantity of berths

xii. Max vessel length

xiii. Max vessel draft

As it can be observed, the economies have shown great interest and see a great value in sharing and obtaining information from other economies, with an average of 70% for each question.

Based on the answers to the survey, below are the main *technical findings*:

1. 52% of economies replied to all the questions of the survey **at least one time**. Considering the 123 APEC delegates (target population), only 20% of delegates replied to the survey. This means that it is required to check the reasons why other economies are not interested in participating in the implementation of a platform and also to validate with the economies that have expressed interest if the information gathered from the survey is sufficient for implementing a robust set of information at least for a first version of the platform. As mentioned earlier, the reason to consider this a significant number is because economies could have joined the answers of multiple delegates into one single answer for the economy.

2. The economies that have participated agree that:

    a) The information can be made available with more than 70% of importance. This indicates that it is feasible to make available the information of Port, Terminals and Services, taking into consideration the challenges already described.

    b) The information is required in the following order of importance: Terminal information, Port Services and Port data. These could become indicators for establishing a priority order in the implementation, to develop first the information that is more useful for economies and ideally, have other economies adhering to the platform once implemented.

Below are the main conclusions obtained from the survey and the workshop:

1. The platform must consider different alternatives to cater to different realities in terms of use of technology. As an example, alternatives can be provided to make it easier for economies to exchange information, such as flat files, CSV files, XML files, APIs, or even manual update.

2. Where possible, economies should aim to automate the mechanism to obtain the information from the operating systems and standardise the data to avoid unnecessary maintenance. Obviously, this will imply that APEC should consider within the project to build a platform, multiple projects to assist the economies to implement a mechanism to extract the information from those systems and inject it into the platform.

3. It is necessary to implement a strategy to incorporate private entities that are in some cases the owners of the data and incentives to do so. The best incentive could be to visualise information, but also monetary benefits could be required. As an example, the platform could be financed by charging a subscription fee that could be waived to organisations which information could be considered strategic.

4. It is important to provide all possible guarantees to address information security to avoid data glitches or information leaking where information can be sensitive. Different technologies can be applied in this sense, such as the use of HTTPS traffic, i.e. secured encrypted traffic. Other example can be the use of security tokens to ensure that the sessions in the platform expire if they become inactive. Finally, mechanisms of authentication based on OAuth 2.0[9] where the client has to establish an authorisation protocol to access data are these days available to address potential security issues.

5.9 Recommendations

According to the results obtained in the survey and the workshop, the panel of consultants makes the following recommendations:

1. Implement a second phase of the project to include at least the top 3 information for each topic based on the answers given by the economies. The second phase of the project should be based on:
   a) Establishing a business case to build the platform.
   b) Determine in detail what are the requirements to the platform:
      i. from a functional perspective to establish the features required
      ii. from a non-functional perspective to establish infrastructure requirements, maintainability, usability, security, etc.
   c) Produce a detailed design of the platform, including all the standard information technology artefacts and models to have an understanding of the scope of the platform.
   d) Alternatively, the development, testing and implementation of the platform can start immediately or can be left to another project after the design has been finalised.

2. Start with a small set of information and grow this set of information over time, to validate what is used in the platform. The strategy for implementation should incorporate an analysis of the priority to implement, i.e. the first version of the platform must implement the services that are more critical to economies such as, the ones that provide the biggest value added to the business processes with the lowest cost or effort to implement. After the first version has been released, it is necessary to evaluate the feedback obtained in the first phase before proceeding to implement a subsequent one. More details on this iterative-incremental approach can be found in the section ***"Steps to manage port data via a single APEC Port Community Platform".***

3. Start with the economies that have shown interest, i.e. the ones who participated in the pilot. This list includes:

   a) Canada
   b) Indonesia
   c) Malaysia
   d) The Philippines

[9] https://oauth.net/2/

e) Thailand
f) Papua New Guinea
g) Peru

It is also recommended to implement mechanisms to offer incentives to the early adopters and also to the stakeholders within the economies that are the owners of the information. In addition, it is recommended to define mechanisms to fund the development and operation of the platform, whether in asking for a subscription or transaction fee or by having a centralised funding provided by APEC. In our experience, the development could be funded by APEC, but the recurrent operation could be funded by the participant economies.

4. As it was mentioned in the conclusion, it is recommended to build the platform using technology "as-a-service", i.e. based in the cloud to avoid additional infrastructure or services cost. This also provides options for scalability, to add new economies as they opt-in. It is recommended to use state-of-the-art technology such as APIs where possible, since this a standard in the industry to exchange information that offers embedded security and standardisation.

5. Have a de-centralised platform, i.e. each economy should subscribe to the services required by them, selecting the services from the economies that are required for them, to avoid unnecessary traffic of data.

6. Address all the challenges that economies have mentioned in the survey, especially the ones that have been marked as critical in this study (more information can be found in the section ***"Question 8: Challenges to be addressed"***, i.e.,

   a) Mechanisms to update and automatically exchange information in an opportune manner.
   b) Build a platform that is easy to use and maintain.
   c) Build a secure platform that mitigates any risk in data leaking or hacking.
   d) Provide clarity on where the data will be hosted, including the creation of contracts between the economies and the platform provider to store and manage the information.

6. FINAL OVERVIEW

To finalise, 1-Stop as expert panel would like to deliver a view of what should be the approach to build the platform. This has been discussed during the workshop for all the economies. The idea is to use the same paradigm utilised by companies like Uber or Netflix.

Netflix is not in the business of producing all the movies, but they provide a platform where all the movies can be accessed. In the same way, Uber is not in the business of owning cars, but they provide a platform for car owners to join and work with their cars.

In a similar way, one economy could provide the framework where private and public organisations can join and adhere to information services that can be extracted from it or stored in it. The platform should provide the infrastructure, the framework and the contract to opt-in to information and the economies will be able to decide what to do with that information and how it can contribute to their business processes.

Certainly, some actors will not have the capabilities to build their policies, infrastructure or automation to feed or obtain information. In this case, APEC could contact some economies to provide the others with some guidance on how to implement technology to enable them to participate, if required.

The approach recommended is to implement the system in a phased manner, establishing clear goals and objectives for each stage and evaluating the outcomes of each phase before proceeding to implement the next one. It is also recommended to implement a simple system that does not imply to spend a massive effort but to keep a manageable and simple scope and expand it based on the feedback obtained from the economies using the system and the other ones willing to join.

The other point to consider is that it will be required for some economies to review the policies to ensure that the private sector or other actors owning the information, participate in the platform. Depending on the legal framework of the economy and the capabilities of the authorities, some economies may be able to mandate the exchange of information, whereas other economies will need to create mechanism to promote the use of the platform.

6.1 A proposal for platform – Conceptual view

From a high-level view of a potential implementation of the system, the platform has been envisaged as a hub that can concentrate atomic information services. The information can be built in a gradual basis, adding functionality according to the needs defined by the participants and economies willing to participate.

Each economy will cooperate with information that would be added to this platform in the form of a service (API) and they would consume other services that would be published. Economies willing to participate would have to transform their services into a standard format that would be exchanged, to ensure that the information can be consumed by other economies.

The platform itself will be just a repository of services, where information will be requested and consumed. The below picture explains the concept of the platform:

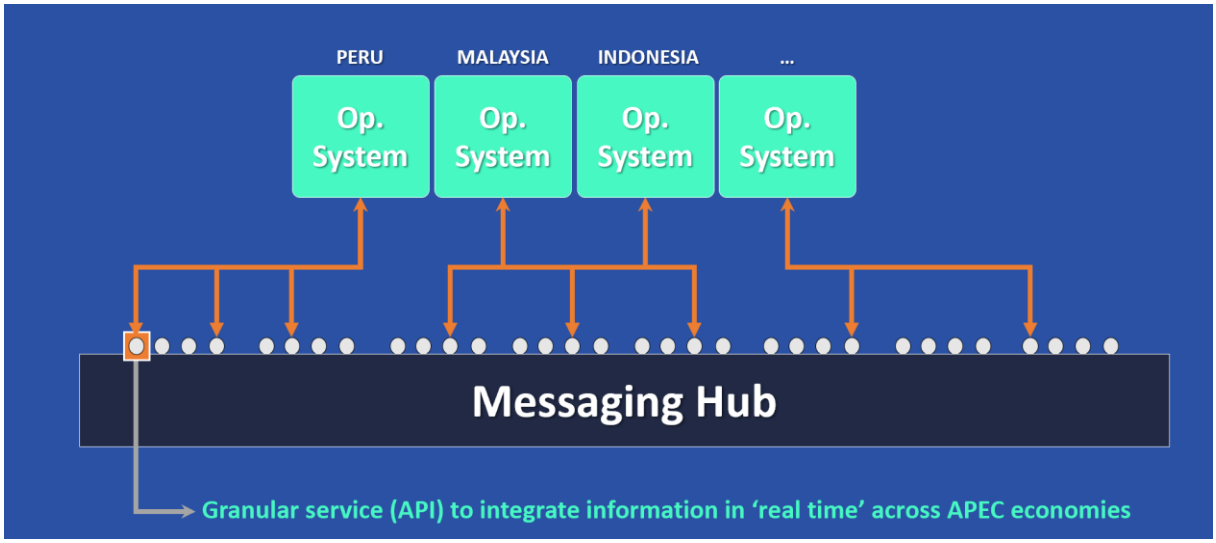


Image 24: The platform to exchange information – High level concept.

Therefore, each economy would have their own operating systems that will not be impacted by this platform, but they will consume the information required to consolidate the services consumed by other economies.

6.1.1 Administration

From the perspective of administration, it is recommended to have an IT vendor in charge of it, to reduce the risk and complexity of the task. Potentially the same company could have the role to engage the economies in conjunction with the APEC sponsor of this initiative. The role of the vendor would be:

1. To implement the services
2. To provide support to economies to be able to transform the information into the standard format
3. To keep an updated service catalog with all the information available to be consumed by other economies.
4. To maintain the platform to ensure its correct functioning.

6.1.2 Cost estimate

Although the cost depends on the quantity of services and technical details, such as formats accepted or mechanism of transmission, as part of this consultancy it is provided a high-level estimate to give an idea of the level of investment required. Thus, the table below shows an initial cost estimate for this platform:

Item	Description	Estimated Cost	Estimated Duration
Platform Requirements and Analysis	This is the stage to define the functional and non-functional requirements as well as a detailed infrastructure and functional design of the platform	US$ 43,000	20 days

Initial development – Phase 1	The scope of this first phase will be defined in detail during the next stage, but for the purpose of this estimate is considering 80-man days.	US$ 86,000	66 days
On-going cost	Monthly cost to maintain the platform. This includes the infrastructure cost to implement an instance of the platform and make it available to all economies, as well as support 24 x 7.	US$ 10,000 – US$ 15,000 per month	N/A

7. APPENDICES

7.1 Appendix A: Participants contact list

Below is the list with of participants of the workshop:

	Economy	*Participants*
1	Australia	3
2	Canada	2
3	China	2
4	Chinese Taipei	1
5	Indonesia	1
6	Japan (virtual)	1
7	Korea	1
8	Malaysia	2
9	Perú	20
10	Singapore	1
11	Thailand	2
12	The Philippines	2
13	Viet Nam	2
	TOTAL	40

7.2 Appendix B: Experts contact list

Below is the list of experts and consultants that have participated in the workshop:

Name	Email	Gender	Organization
Greg Winstanley	g.winstanley@outlook.com.au	M	Independent consultant
Andres Pinar	apinar@1-stop.biz	M	1-Stop Connections Pty Ltd
Tony Latella	tlatella@1-stop.biz	M	1-Stop Connections Pty Ltd

7.3 Appendix C: Event Agenda

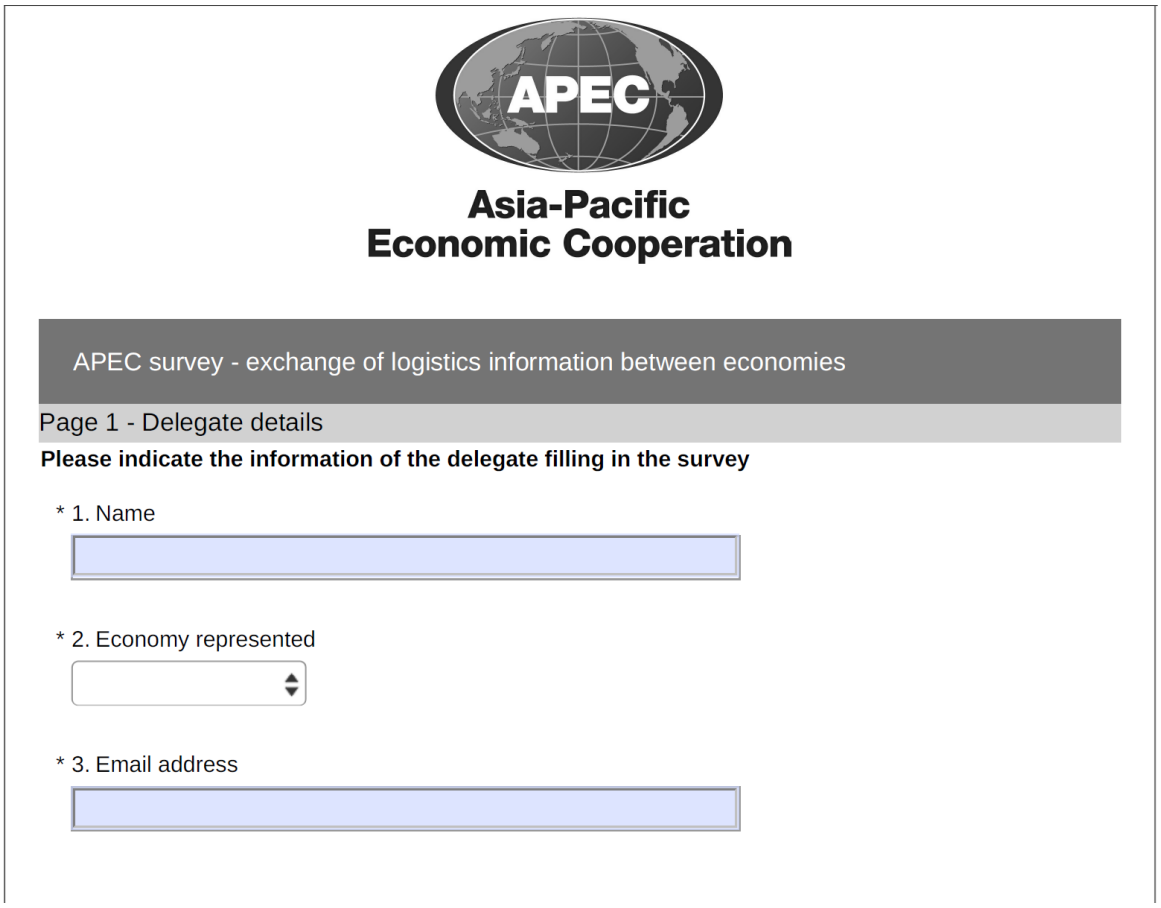
Below is the program with the topics discussed in the workshop:

TIME	SCHEDULE
08:30 - 09:00	Accreditation of participants (check in)
09:00 - 09:15	**Welcome speech** Mr. Guillermo Bouroncle Calixto *General Manager of the APN - Project Overseer*
09:15 – 09:30	**Keynote speech** "Workshop on Managing Port Data via a Single APEC Port Community Platform" Mr. Carlos Molina Barrutia *Specialist 1st. grade of the General Manager office*
09:30 - 09:45	Break
09:45 - 10:15	**Development of the National Port Authority of Perú project:** ▪ Survey of the project ▪ Pilot of the project
10:15 - 10:45	Coffee Break/Spare time
10:45 - 11:15	**Strategies to implement a port community system to effectively exchange information** Greg Winstanley *Independent consultant (Past General Manager of DP World terminal in Sydney for 16 years)*
11:15 - 11:45	Round of questions *Moderators: Mr. Carlos Molina*
11:45 - 12:15	Presentation of: ▪ Results of Survey Mr. Andres Pinar *1-Stop Consultant*
12:15 – 12:45	Conclusions ▪ Lead Consultant – Mr. Andres Pinar – *1-Stop*
12:45 - 13:15	Final Questions ▪ Lead Consultant Mr. Andres Pinar *1-Stop Consultant* ▪ Project Overseer – Mr. Guillermo Bouroncle Calixto – *General Manager of the APN* ▪ Final Wrap Up
14:00 - 15:00	Lunch time
15:00 – 17:30	Cultural visit - Sacsayhuaman

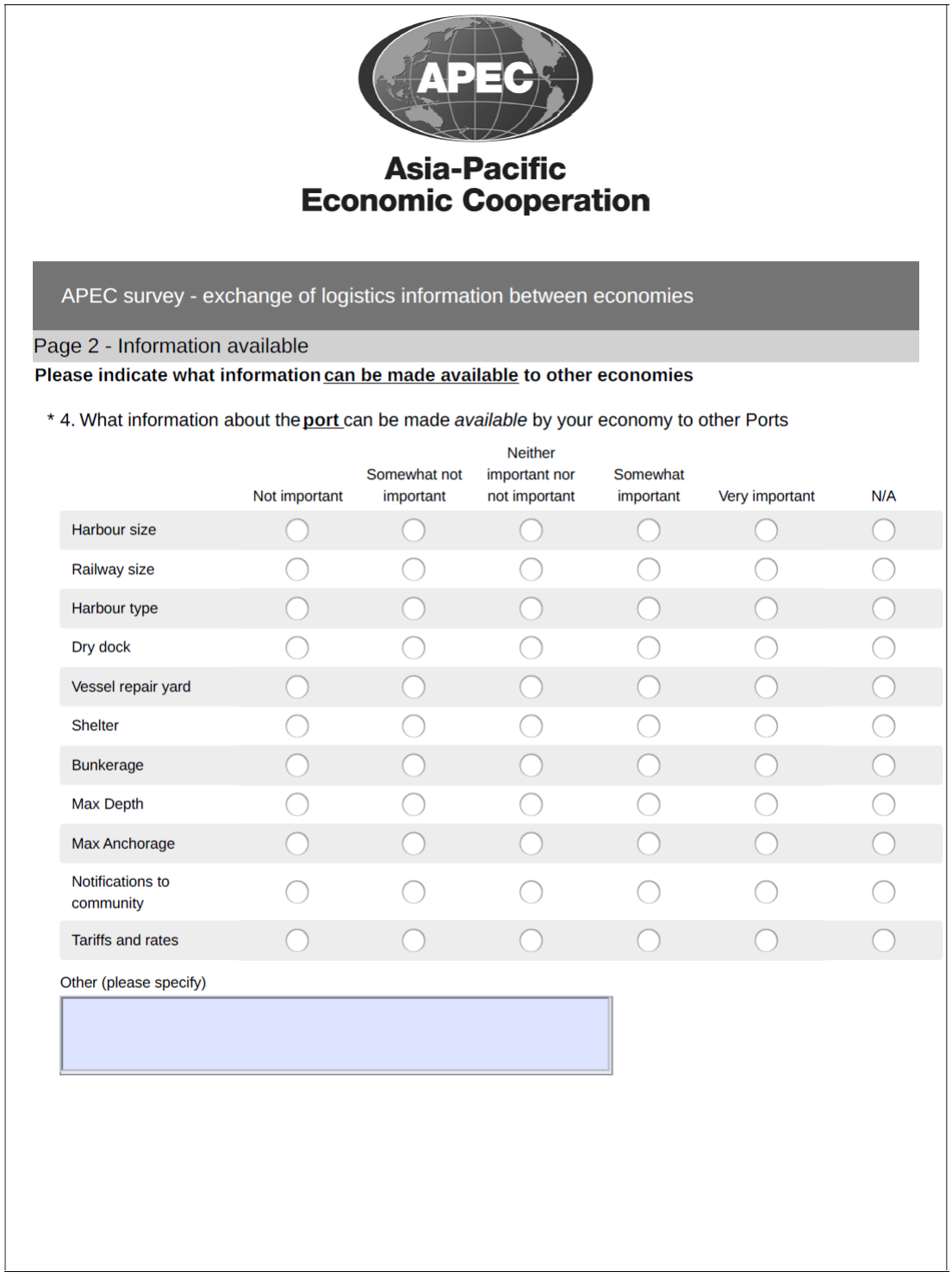
7.4 Detailed survey design

Below is shown the survey designed for this project, including all the questions and options:

7.4.1 Page 1: Delegate details



7.4.2 Page 2: Information available



Asia-Pacific Economic Cooperation

APEC survey - exchange of logistics information between economies

Page 2 - Information available

Please indicate what information can be made available to other economies

* 4. What information about the **port** can be made *available* by your economy to other Ports

	Not important	Somewhat not important	Neither important nor not important	Somewhat important	Very important	N/A
Harbour size	○	○	○	○	○	○
Railway size	○	○	○	○	○	○
Harbour type	○	○	○	○	○	○
Dry dock	○	○	○	○	○	○
Vessel repair yard	○	○	○	○	○	○
Shelter	○	○	○	○	○	○
Bunkerage	○	○	○	○	○	○
Max Depth	○	○	○	○	○	○
Max Anchorage	○	○	○	○	○	○
Notifications to community	○	○	○	○	○	○
Tariffs and rates	○	○	○	○	○	○

Other (please specify)

* 5. What information about **port terminals** can be made *available* by your economy to other Ports

	Not important	Somewhat not important	Neither important nor not important	Somewhat important	Very Important	N/A
Terminal operator	◯	◯	◯	◯	◯	◯
Terminal contact details	◯	◯	◯	◯	◯	◯
Number of terminals	◯	◯	◯	◯	◯	◯
Number of berths	◯	◯	◯	◯	◯	◯
Length of Berths	◯	◯	◯	◯	◯	◯
Max vessel length	◯	◯	◯	◯	◯	◯
Max vessel depth	◯	◯	◯	◯	◯	◯
Type of Cargo handled	◯	◯	◯	◯	◯	◯
Vessel schedule	◯	◯	◯	◯	◯	◯
Notifications to community	◯	◯	◯	◯	◯	◯
Load and unload velocity	◯	◯	◯	◯	◯	◯
Number of cranes	◯	◯	◯	◯	◯	◯
Truck turnaround time	◯	◯	◯	◯	◯	◯
Volume of Cargo handled	◯	◯	◯	◯	◯	◯
Volume capacity	◯	◯	◯	◯	◯	◯

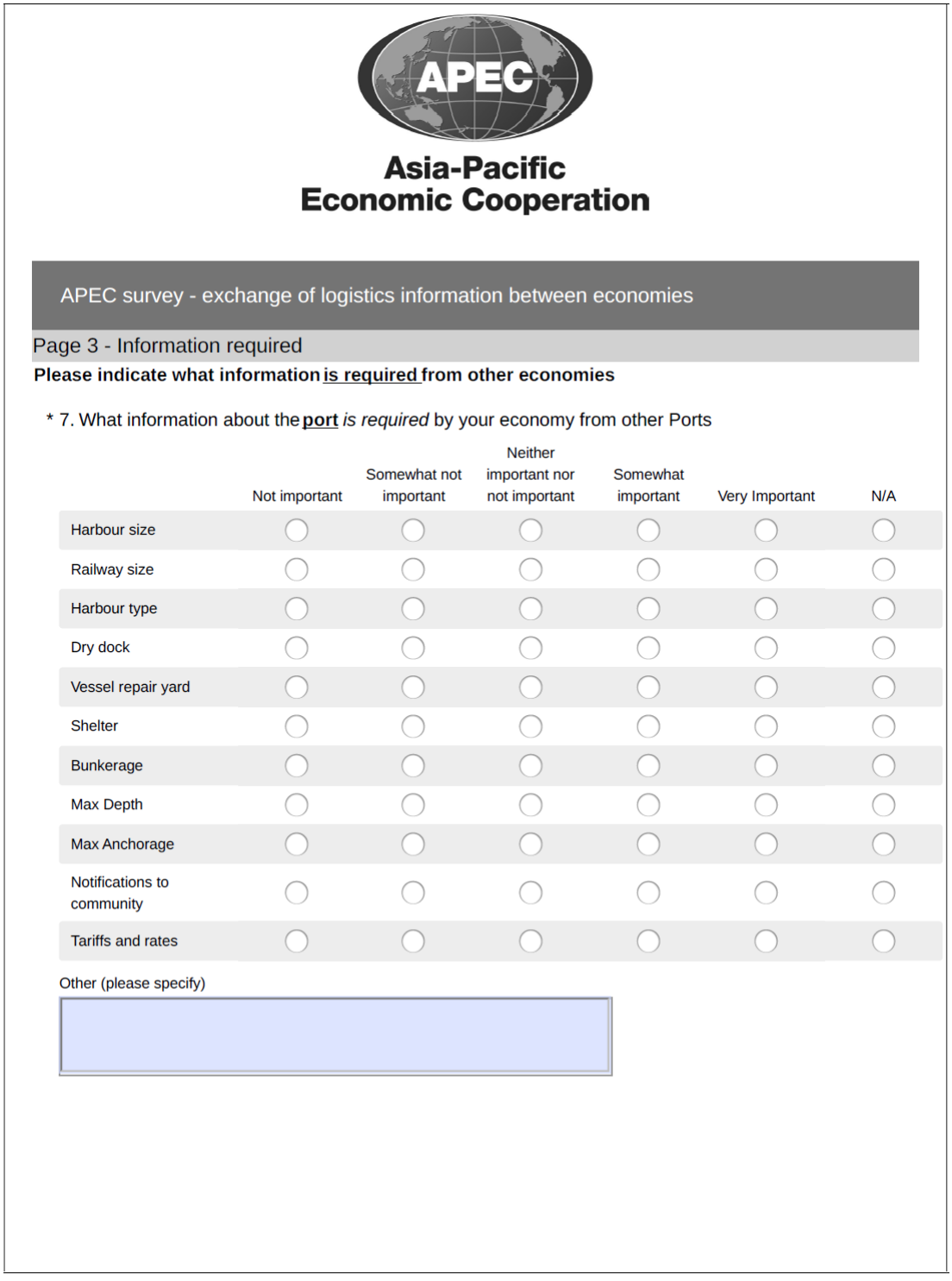
Other (please specify)

* 6. What information about **port services** can be made *available* by your economy to other Ports

	Not important	Somewhat not important	Neither important nor not important	Somewhat important	Very Important	N/A
Vessel repair	◯	◯	◯	◯	◯	◯
Pilots	◯	◯	◯	◯	◯	◯
Tugs	◯	◯	◯	◯	◯	◯
Bunkerage	◯	◯	◯	◯	◯	◯
Oil	◯	◯	◯	◯	◯	◯
Water	◯	◯	◯	◯	◯	◯
Food supplies	◯	◯	◯	◯	◯	◯
Vessel supplies	◯	◯	◯	◯	◯	◯
General/Liquid waste disposal or recovery	◯	◯	◯	◯	◯	◯

Other (please specify)

7.4.1 Page 3: Information required



Asia-Pacific Economic Cooperation

APEC survey - exchange of logistics information between economies

Page 3 - Information required

Please indicate what information is required from other economies

* 7. What information about the **port** *is required* by your economy from other Ports

	Not important	Somewhat not important	Neither important nor not important	Somewhat important	Very Important	N/A
Harbour size	◯	◯	◯	◯	◯	◯
Railway size	◯	◯	◯	◯	◯	◯
Harbour type	◯	◯	◯	◯	◯	◯
Dry dock	◯	◯	◯	◯	◯	◯
Vessel repair yard	◯	◯	◯	◯	◯	◯
Shelter	◯	◯	◯	◯	◯	◯
Bunkerage	◯	◯	◯	◯	◯	◯
Max Depth	◯	◯	◯	◯	◯	◯
Max Anchorage	◯	◯	◯	◯	◯	◯
Notifications to community	◯	◯	◯	◯	◯	◯
Tariffs and rates	◯	◯	◯	◯	◯	◯

Other (please specify)

* 8. What information about **port terminals** *is required* by your economy from other Ports

	Not important	Somewhat not important	Neither important nor not important	Somewhat important	Very Important	N/A
Terminal operator	◯	◯	◯	◯	◯	◯
Terminal contact details	◯	◯	◯	◯	◯	◯
Number of terminals	◯	◯	◯	◯	◯	◯
Number of berths	◯	◯	◯	◯	◯	◯
Length of Berths	◯	◯	◯	◯	◯	◯
Max vessel length	◯	◯	◯	◯	◯	◯
Max vessel depth	◯	◯	◯	◯	◯	◯
Type of cargo handled	◯	◯	◯	◯	◯	◯
Vessel schedule	◯	◯	◯	◯	◯	◯
Notifications to community	◯	◯	◯	◯	◯	◯
Load and unload velocity	◯	◯	◯	◯	◯	◯
Number of cranes	◯	◯	◯	◯	◯	◯
Truck turnaround time	◯	◯	◯	◯	◯	◯
Volume of cargo handled	◯	◯	◯	◯	◯	◯
Volume capacity	◯	◯	◯	◯	◯	◯

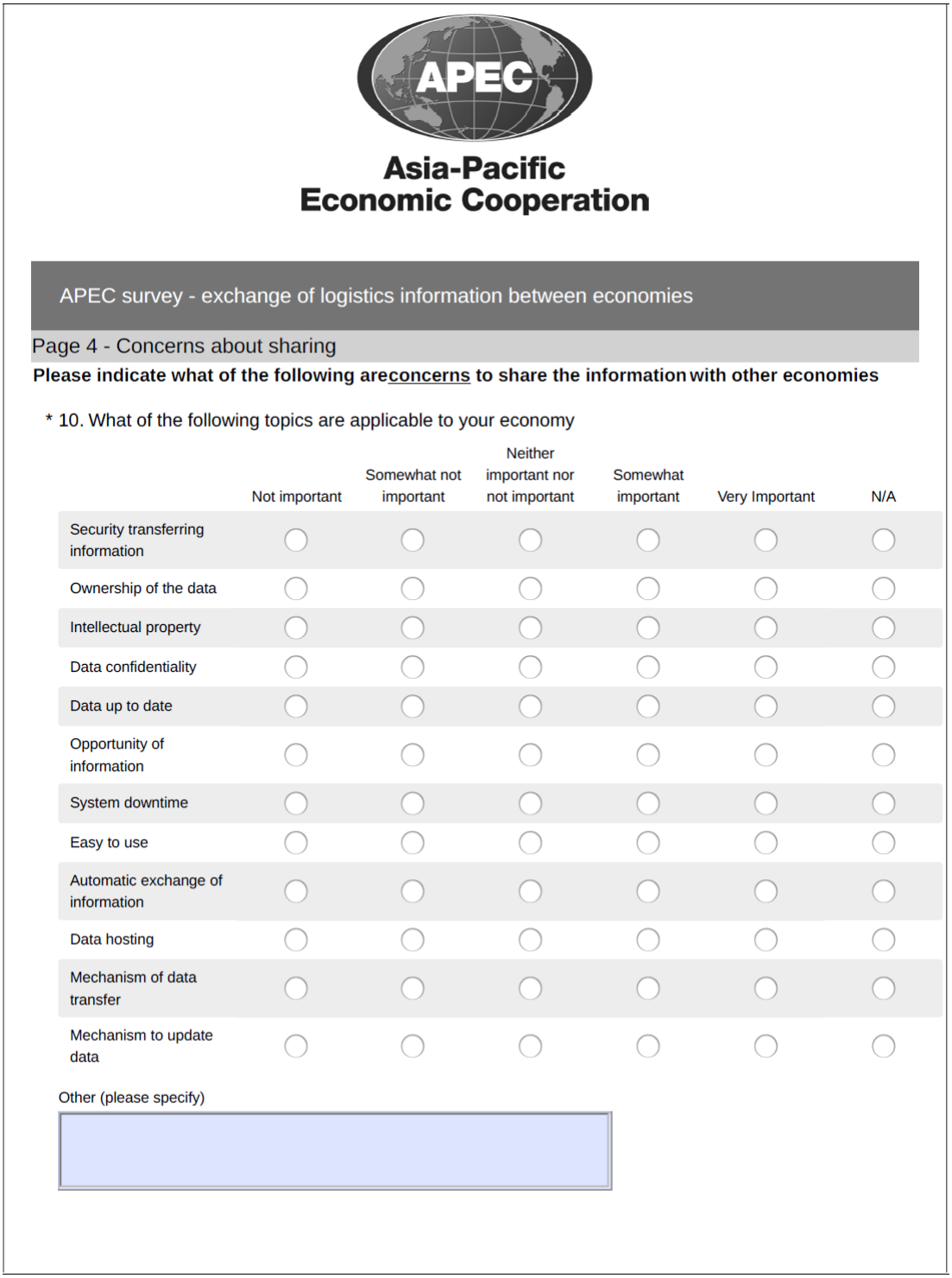
Other (please specify)

* 9. What information about **port services** *is required* by your economy from other Ports

	Not important	Somewhat not important	Neither important nor not important	Somewhat important	Very Important	N/A
Vessel repair	◯	◯	◯	◯	◯	◯
Pilots	◯	◯	◯	◯	◯	◯
Tugs	◯	◯	◯	◯	◯	◯
Bunkerage	◯	◯	◯	◯	◯	◯
Oil	◯	◯	◯	◯	◯	◯
Water	◯	◯	◯	◯	◯	◯
Food supplies	◯	◯	◯	◯	◯	◯
Vessel supplies	◯	◯	◯	◯	◯	◯
General/Liquid waste disposal or recovery	◯	◯	◯	◯	◯	◯

Other (please specify)

7.4.1 Page 4: Concerns to be addressed



Asia-Pacific
Economic Cooperation

APEC survey - exchange of logistics information between economies

Page 4 - Concerns about sharing

Please indicate what of the following are concerns to share the information with other economies

* 10. What of the following topics are applicable to your economy

	Not important	Somewhat not important	Neither important nor not important	Somewhat important	Very Important	N/A
Security transferring information	○	○	○	○	○	○
Ownership of the data	○	○	○	○	○	○
Intellectual property	○	○	○	○	○	○
Data confidentiality	○	○	○	○	○	○
Data up to date	○	○	○	○	○	○
Opportunity of information	○	○	○	○	○	○
System downtime	○	○	○	○	○	○
Easy to use	○	○	○	○	○	○
Automatic exchange of information	○	○	○	○	○	○
Data hosting	○	○	○	○	○	○
Mechanism of data transfer	○	○	○	○	○	○
Mechanism to update data	○	○	○	○	○	○

Other (please specify)

7.5 Appendix D: Implementation of a PCS the Australian experience

Various attempts were made in Australia to develop a PCS and most have failed: -

First attempt 1985-1989 – TradeGate

The first contender to become a PCS in Australia was Tradegate. Tradegate was an independent, not-for-profit industry organisation owned by members of the international trade and transport community (including shipping lines, stevedores, consolidators, airlines, customs brokers, freight forwarders, depots, container parks, transport companies, importers and exporter) and relevant associations. Tradegate did not provided either the network (outsourced to CSIRONet based on IBM platforms) or the services for the system itself but was operating as a management company, designed to enter into a contract with a network provider; represent the interests of its users in the management of the network; market the network; encourage development of services; and participate in the development of services. In 1990 Tradegate signed a contract with the Australian Customs Service (Customs) and was granted the exclusive marketing of all Customs' electronic commerce Services.

Some reasons given for Tradegate's failure to become a PCS include:

- Conflict of interest amongst governance team, i.e. not all members were committed to Tradegate's success.
- "Tradegate's [value added network] solution was clunky".
- Some ports dropped their support of Tradegate.
- Tradegate no longer exists, however, some of their IT systems continue to provide various services through an employee buy-out company called CommercePlus.

Second attempt 1989 – Port of Melbourne

The Port of Melbourne was attracted by the PCS of Felixstowe and wanted to develop and use a similar one. They worked in collaboration with Tradegate and tried to establish the 'Tradegate Express' with the use of IBM's mainframe system. This initiative fell short of its initial expectations and was quickly abandoned.

Third Attempt 2002 – 1-Stop Connections

In preparation for Customs launch of a new IT platform known as its Cargo Management Re-engineering (CMR) project (now known as ICS – Integrated Cargo System) the stevedores (P&O Ports and Patrick at the time) developed the private company '1-Stop Connections'. 1-Stop is now owned by DP World Australia and Patrick, the 2 largest container terminal operators in Australia, but 1-Stop has separate Board of directors.

In doing so, the stevedores managed to build an efficient IT interface with the Supply Chain Participants to overcome any potential deficiencies caused by other IT platforms (customs, government etc.). 1-Stop connects directly to the Australian Customs Services (Integrated Cargo System). 1-Stop provides an electronic messaging exchange platform (CargoConnect) between many Supply Chain Participants.

'1-Stop Connections' has grown substantially since then and nowadays offers a wide range of electronic services in Sydney, Fremantle, Brisbane and Melbourne with systems deployed at every container facility within these ports.

1-Stop continues to expand overseas with the beginnings of a PCS in New Zealand (Auckland, Napier, Christchurch-Port of Lyttleton) and Manila.

1-Stop is also expanding to incorporate and share information with container parks and Intermodal Terminals with its Modal and Vehicle Booking System products.

1-Stop is the only nation-wide PCS operating today and continues to improve the efficiency of the container supply chain.

Fourth Attempt 2003 – Sydney Ports

Sydney Ports Corporations attempted to develop a PCS in 2003 but it was quickly abandoned.

2005 – Launch of Australian Customs Integrated Cargo System (ICS)

Since the late 1980s the Australian Customs Service (ACS) had an electronic capability to exchange information. In early 2000 ACS embarked on its Cargo Management Re-engineering project (CMR) to rebuild and modernise its existing systems at a cost rumoured to be in excess of $400M AU. In 2005 they launched a new customs management system called 'Integrated Cargo System' (ICS) based on the development of new software and hardware. The system witnessed significant problems when launched and eventually port operations in Australia stopped for three weeks in total. This new ICS platform moved from a reliance on Tradegate's propriety 'value added network' to an open internet protocol. All documentation was processed electronically, and EDI messages exchanged between customs, customs brokers and terminal operators were encrypted. This system continues to operate today and is an integral part of Australia's electronic data exchange for trade clearance.

Fifth Attempt 2007 – Port of Melbourne

In 2005, the Victorian Freight and Logistics Council's (VFLC) Freight Intermodal Efficiency Group, together with the Transport and Logistics Industry Round Table and key Victorian government departments, launched the Business Activity Harmonisation Study (BAHS) aiming to improve international containerised cargo supply chains in the Port of Melbourne. A key commendation of the BAHS was the extensive use of IT systems to increase the efficiency of Port of Melbourne. In turn, Port of Melbourne initiated the development of a local Port Community System in 2007. Anecdotal evidence suggests that the attempt was unsuccessful because the IT systems of the
Port of Melbourne were highly ineffective.

Sixth Attempt 2009 – PortBIS

In 2009 Tradegate (and later on Commerce Plus) tried to develop and operate a Port Community System for the Port of Sydney under the name PortBIS. This arose as a direct result of feedback from importers and freight forwarders about the difficulties they faced in obtaining information about their containers/cargoes. PortBIS was designed to gather data from multiple information sources and provide that information either via a web browser or as an automated electronic message. That is, the output of PortBIS would be in a single electronic format making it economical to automate. The PortBIS pilot demonstration project was available in January 2009.

The pilot adopted these key principles:

- Obtain data from the source e.g. vessel arrivals and departures from Sydney Ports Corporation.
- Wherever possible, use existing data to keep costs low.
- Use industry agreed standards.
- Adopt a holistic outlook, not an individual port outlook.
- Avoid re-inventing the wheel.

Eventually PortBIS never became operational for multiple reasons.

- The major shipping lines CMA-CGM and MSC did not support the development of the PortBIS.
- PortBIS was unable to connect with the stevedores.
- Tradegate at that time was confronted with multiple internal dysfunctions.