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Asia-Pacific Model E-port Network Visualisation of Sea Freight Logistics

Phase 1 – Findings & Recommendations

Part Ⅰ

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1. Executive Summary

Background

The APMEN Visualisation of Sea Freight Logistics Phase I project was commissioned to improve the visibility, integrity and transparency of cross-border trade in the Asia-Pacific by automating the exchange of Sea Freight data between APMEN members and using GS1 Global Data Standards.

The first phase of this project was undertaken with the support and active participation from the following organisations – Asia-Pacific Model E-port Network(APMEN) and its members (NSW Ports, Xiamen E-port and Shanghai E-port), DP World, GS1 Australia, GS1 China, GS1 Hong Kong, and GS1 Global Office.

Project Objectives

Given the aim to improve the visibility, integrity and transparency of cross-border trade within APEC economies by automating the exchange of data related to container movements between APMEN members, the objectives for this project included:

- Develop comprehensive GS1 Global Data Standards to support the exchange of critical Sea Freight data between ports and other key stakeholders including Freight Forwarders, Cargo Owners, Logistics providers and Government Agencies

- Test the suitability of GS1 Global Data Standards through the use of Standards-Compliant platforms

- Develop recommendations for APMEN regarding the use and implementation of Global Data Standards for Sea Freight Visibility.

"It is suggested that the next step is to promote the model within APMEN members to improve the efficiency of data connectivity between other member ports in the future."

Wayne Q. Y. Gu, Shanghai ePorts – Easipass

Project Overview

The initial challenge of the project was to map and review the end to end processes for both imports and exports between participating ports. Through this process of mapping exercise, the project team identified common process "events" which were deemed critical, and which would trigger the exchange of Sea Freight data between participants for improved visibility.

For each critical event, data standards were developed to capture information about these events as the basis for the data exchange. Data attributes such as Container ID, Vessel ID, Voyage ID, Actual and Expected Departure and Arrival times, etc. were agreed and aligned to the GS1 EPCIS Standards. GS1 EPCIS is a global data standard that enables physical supply chain events (i.e. a container being loaded on a vessel) to be defined and for event data to be captured and shared.

A single technical platform (ezTrack – an EPCIS Compliant Cloud-Based Traceability solution) was used for Phase 1. The platform was first configured specifically to meet the process and data requirements for the project. Participants then recorded actual event data for each critical event onto this platform which enabled data exchange and reporting.

The scope of Phase 1 involved the tracking of inbound and outbound containers between three ports – NSW Ports in Australia, Shanghai ePort and Xiamen ePort in China using the ezTrack solution. The Phase 1 pilot project was completed over a three-month timeframe with data collected over a seven-week period. Through ongoing fortnightly meetings participants reviewed data captured, and identified opportunities for further development of data standards as well as other process related considerations for data exchange.

This report, developed in collaboration with all project participants, is the final deliverable of Phase 1 containing findings and recommendations.

Summary of Key Findings

The Phase 1 pilot project demonstrated that common data standards and event definitions can be readily applied to capture movements of vessels and containers through major sea ports and this information can both be captured by and shared with the participants.

These can be summarised as follows:

- The exchange of critical Sea Freight data between ports is feasible both from a business and technical perspective

- This exchange of data between ports can deliver benefits to participants; including:

  - greater transparency in container movements

  - improved planning of port operations through increased visibility

  - more efficient track and trace operations

  - better access to data for port management systems

  - better customer service support to port community stakeholders.

- GS1 Global Data Standards support the exchange of critical Sea Freight between ports, and provide a foundation for further pilots and implementation through:

  - agreed global data definitions to define critical Sea Fright data

  - appropriate framework for event management and data exchange

  - global reach and implementation support by GS1 for APMEN members

  - availability of "off-the-shelf" technical solutions to facilitate implementation

  - ongoing development and improvement of standards by GS1

- Data Security and Access controls must always be a paramount consideration in the implementation of critical Sea Freight data exchanges between ports

The success of the project relied on the cooperation and collaboration of the three major ports with the support of APMEN Operational Center and the relevant GS1 organisations. This is seen as a critical component for future phases of implementations.

"Feedback from DP World is that the data capture was relatively simple as all fields which were required exist in a single terminal operating system."

Jonathan Lafforgue, General Manager Operation & Environment, NSW Ports

Recommendations

Based on the successful conclusion of Phase 1, the project team recommends project progression to Phase 2.

The aim of Phase 2 would be to build on Phase 1 outcomes in the following areas:

- Automate the capture and event data sharing processes using EPCIS Version 2 capabilities for RESTfull/JSON APIs

- Carry out data sharing processes using a decentralised network of interoperable EPCIS compliant platforms

- review the potential to enhance data standards in the following areas:

  - addition of further critical Sea Freight events

  - data attributes to define Container contents

  - address both planned and unplanned (i.e. trans-shipment) movements

- Extend participation to other key stakeholder groups

  - Container Terminal Operators

  - other ports in APMEN member economies

  - Transport and Logistics Providers

  - Cargo Owners

- Explore via the use of pre-defined queries and detailed data analysis with the view to improving early warning systems, vessel tracking at sea, improved track and trace and the strengthening of regulatory and operational effectiveness

- Further assess technical and policy requirements regarding data security and privacy.

A detailed scoping session with identified participants and other interested parties is recommended to agree on a detail project scope, project timelines and project funding.

"It is necessary to achieve inter-port information connectivity through the world's prevailing standards, which is the foundation of realisation of the 'global e-port community'."

2. Introduction

Background

At the 22nd APEC Economic Leaders Meeting (AELM) in November 2014, the APEC leaders endorsed the initiative of establishing Asia-Pacific Model E-Port Network (APMEN). In August 2015, APMEN and APMEN Operational Centre (AOC) were officially inaugurated in Shanghai. Since its establishment, APMEN has been very active in promoting trade facilitation and supply chain connectivity in the Asia-Pacific region.

The overarching objective of APMEN is to promote supply chain connectivity and trade facilitation in the Asia-Pacific region. APMEN aims to comply with international and domestic laws related to data security, and APMEN endeavours to establish an information sharing network and cooperation platform with public and private stakeholders to achieve the following objectives:

• Making contributions to Suggested Framework of the Supply Chain Connectivity Framework Action Plan 2017-2020 (SCFAP II), where relevant

• Making contributions to the APEC Connectivity Blueprint under the pillar of institutional connectivity

• Making contributions to WTO Agreement of Trade Facilitation implementation where relevant

Pilot projects are the core of APMEN. The AOC encourages members of APMEN to join pilot projects. Three pilot projects have been proposed as the first batch, on the issues of:

1. Visualisation of Sea Freight Logistics

2. Exchange of Electronic Certificate of Origin

3. Digitisation of Air Freight Logistics

AOC is endeavouring to coordinate E-Ports, regulatory bodies and private sector in APEC member economies to promote pilot projects.

Since NSW Ports is one of the leading members of APMEN, and has a large bilateral trade volume with Shanghai (which makes up close to 45% of Port Botany's import trade), a proposal for a similar project to exchange shipping related data between NSW Ports, Shanghai E-port and Xiamen E-port was put forward and agreed to.

Visibility is a critical asset to supply chain competitiveness. Information must flow among the various parties; however, the quality, timeliness and integrity of the information is a challenge. The information is disseminated and fragmented in several points of the chain. Finding the most suitable and accurate source of information is not an easy task in a global supply chain. Shippers and logistics operators need to be able to share information and documents with operators and administrators of other ports and be aware of the events and incidents/delays taking place elsewhere to obtain visibility of traffic flows "end-to-end".

Ports play an important role in the supply chain acting in the first place as a transportation hub, as well as an information hub. Multi-e-port interconnectivity can be an instrument to address these challenges in an effective way by offering Track & Trace services to achieve end-to-end visibility, cutting information delays, supported by state-of-art technology to handle high volume of data exchange and a guarantee for data quality and security, while not making it necessary to build complex point-to-point connections.

It was agreed that a two phased approach will be taken.

Phase 1:

- Manual data capture and sharing

- One single platform

- Port to Port

- Basic data

- Two containers per week between NSW Ports, the Port of Shanghai and the port of Xiamen

Phase 2:

Phase 2 scope is to be dependent on the outcomes of Phase 1 and would need to be workshopped and agreed to by all Phase 2 project participants. Initial thoughts on potential Phase 2 activities include:

- Integrated data capture and sharing (APIs)

- Multiple Platforms (decentralised)

- Cargo Owners, Transport Companies, Recipients

- Extended Data (Contents)

- An increased number of containers per week between NSW Ports, the Port of Shanghai and the port of Xiamen

APMEN Pilot Projects Objectives

Applying the before-mentioned approach, the APMEN Visualisation of Sea Freight Logistics Phase I project aims at building a data sharing connection, using GS1 Global Data Standards (GDS), for the logistics and trade community to join and provide a standardised guideline for enabling global supply chain visibility.

Specifically, the objectives of carrying out APMEN multi-e-port inter-connections are:

1. To have optimum effectiveness, data should adhere to open GS1 Global Data Standards based on a commonly agreed event list that covers stakeholders' most critical tracking requirements

2. To build a data sharing framework, which can be expanded without major changes to incorporate other data sharing frameworks

3. To validate performance of the data sharing framework and value of the proposed Track and Trace service to maritime transport stakeholders under pilot test conditions

4. To analyse maritime transport processes to streamline trade flows in Asia Pacific

5. Based on the outcomes, to extend the project in ways such as engaging more member e-ports, adding more documents/data sets, connecting with IT providers (such as ERP), or developing other value-added services etc.

According to the level of capability at each participating port, these could be achieved progressively on a phased basis.