



ASEAN Single Window Baseline Study



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ASEAN SINGLE WINDOW BASELINE STUDY

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Distribution List

Name	Organization

Documents available - US ACTI	Version	Author	Version date
ASEAN SINGLE WINDOW Design of Project Management and Planning Team (Project Management Office)	Draft Report V 2.0	ACTI ASW Lead	September 2015
ASW Pilot – Live e-ATIGA Form D Final Report	Version No. 0.01	Axway	March 2017
ASEAN Single Window e-ATIGA Form D Process Specification and Message Implementation Guideline	Version No. 0.04	Axway	February 2016
ASW Pilot – e-ATIGA Form D Operations Handbook	Version No. 0.07	Axway	April 2016
List of Contact Points for the Live Operation	n/a	n/a	April 2016
ASW Cross-Border Information Process Modelling Final Draft Report	Version No. 0.03	Karen Henderson; Kenneth Tiong; Francis Lopez	December 2015
ASW Component 3 Technical and Financial Evaluation Final Report	Version No. 1.00	Ian Hogg	February 2016
Terms of Reference of ASW Pilot Project Component 2 (Full-Fledged) Based on Staging Approach	Version No. 9.0	n/a	November 2014
ASEAN Single Window Sustainability Study Final Report (Deliverable 9)	n/a	Lynn Salinger	October 2012
Memorandum of Understanding on the Implementation of the ASEAN Single Window Pilot Project	n/a	n/a	March 2010
Term of Reference of the ASW Pilot Project Component 2 (Scaled-down)	n/a	n/a	August 2012
Development and Live Implementation of the ASEAN Single Window (ASW) Software for the exchange of the e-ATIGA CO Form D for Cambodia	Version No. 0.01	Axway	July 2016

List of acronyms

ASEAN	Association of Southeast Asian Nations
ACDD	ASEAN Customs Declaration Document
AMS	ASEAN Member States
ASW	ASEAN Single Window
ATIGA	ASEAN Trade in Goods Agreement
BPMN	Business Process Model and Notation
CA	Certificate Authority
CDPS	Customs Declaration Processing System
COO	Certificate of Origin
G2B	Government to Business
G2G	Government to Government
HA	High Availability
HTTPS	Hyper Text Transfer Protocol Secure
IBM RUP SOA	IBM Rational Unified Process Service-Oriented Architecture (SOA)
IPSec	Internet Protocol Security
IPSec tunneling	Internet Protocol Security tunneling
ISO	International Organization for Standardization
ISP	Internet Service Provider
ITIL	IT Infrastructure Library
KPA	Key Performance Area
KPI	Key Performance Indicators
NSW	National Single Window
OGA	Other Government Agencies
PI	Performance Indicators
PKI	Public Key Infrastructure
PLF	Protocol on the Legal Framework to Implement the ASW
PMO	Project Management Office
PMU	Project Management Unit
QA	Quality Assurance
QOS	Quality of Services
SAD	Single Administrative Documents
SLA	Service-Level Agreement
SOP	Standard Operating Procedures
SPOF	Single Point of Failure
SSL	Secure Sockets Layer
SW	Single Window
TWG	Technical Working Group
US ACTI	The United States - Association of Southeast Asian Nations (ASEAN) - Connectivity through Trade and Investment project
VPN	Virtual Private Network
VPT-IT	IT Virtual Project Team
XML	eXtensible Markup Language

1 Introduction

Today's ASEAN Governments face a very interesting and challenging mix of demands coming from Trade, such as legal requirements, national & regional plans, social security and risk management, as well as demands of a purely technical nature. These emerging needs and demands drive ASEAN Member States' Governments towards the next generation of Trade Facilitation (TF) Information systems. The transition to a modernized TF concept, based on generally accepted minimal requirements, is a multidimensional problem that contains financial, time management, political, legal and technical elements. Without a well-organized and developed ASEAN Single Window strategy followed by an AMS National Single Window Strategy, the proper tools and large-scale project experience, technical aspects of the transition, like cross border data exchange, adaptations, scaling, enhancements, etc. can turn into an unsolvable problem within the available timeframe and budget.

Pressure to strengthen cross-border initiatives is growing from two sides: the globalization of production; and security initiatives. The business sector is already operating global supply chains, and the freight forwarding and transport industry operates worldwide logistics networks and chains. They exchange data and information across borders amongst the supply chain and logistics chain partners and seek further facilitation at the border crossing and clearing points. A security initiative launched by governments worldwide pushes cross-border data exchange for risk and compliance management at an unprecedented level.

TF is a rapidly evolving environment that is gradually shifting from manual / mixed processes¹ and independent tasks to trade facilitation and integrated solutions. Following the business needs, the ASW and NSW should no longer offer standalone applications restricted to the client's requirements; quite the contrary, it needs to be modernized and open to future extensions according to the current short and long-term trends.

The ASEAN Single Window (ASW) identifies some services, standards, concepts, functional components, and functional assets that can be used to achieve large scale TF goals.

The ASW rely on a common conceptual framework, which is used as a reference model for linkage of the ASW Architecture and AMS National Single Windows. ASW addresses the TF needs of today, as well as the expected business and technological challenges of the foreseeable future. The favorable approach is that of a modular and flexible transformation, through a pilot and phased implementation plan that is implemented/introduced incrementally. This means that it can be used for developing functional components based on a modern, flexible ASW/NSW IT Architecture and at the same time offer the means for the retention of some existing implementations (systems) through the provision of ASW integration services.

1.1 ASEAN Single Window Conceptual Framework

Most of the AMS are geographically located on strategic transport corridors and actively participate in the integration of the movement of goods in respective regions.

The ASEAN Single Window is a trade facilitation tool or platform for exchanging standardized information, regulatory procedures and facilitating customs formalities based on international best practices. A core component of the regional SW is the implementation of a system which will put into place the most efficient environment possible for the movement of goods across national borders and international transport corridors. This is of the utmost importance if the region is to ensure economic development and take part in the global competition. Foreign investment, as well as imports to and exports from the ASEAN region, can only be increased if competitive advantages are offered, one of

¹ Paper, mixed / paper less and no paper environment

which is the speedy, cost-effective and safe movement of goods between AMS as well as other countries worldwide.

As a trade facilitation measure, the ASEAN Single Window is designed to facilitate movements of goods, facilitate legitimate trade and to integrate the ASEAN region's economies further. More specifically the intention is to simplify and harmonize transport, trade and customs regulations and regulatory requirements and to establish an effective, efficient, integrated and harmonized regional/common SWs.

The ASEAN Single Window's goal is to promote/improve cross border communication and cooperation - regionalisation will contribute to closer cross-border cooperation, harmonization, simplification, and modernisation of procedures, practices and processes.

1.2 Development and Implementation of the ASEAN Single Window

For the past four years, ASEAN Member States and US-ACTI have invested significant resources to create and maintain national single windows and connect them through the ASEAN Single Window. ASEAN has established and funded the ASW management team needed to operate the day-to-day operation of the ASW system, provided funding for its ongoing maintenance, support, and continuous improvement. Over the years, USAID has supported the following activities:

- The design, launch and implement national single window programs, recently more on the NSW needs assessment, project management support, and required technical specifications of the national single window programs of Cambodia, Lao PDR, Myanmar, and the Philippines;
- Legal gap analyses at the national level to support the establishment of single windows and their connection to the regional platform;
- Developing the necessary regional legal framework that was ratified by all Member States to operate the ASEAN Single Window;
- The design, development, and implementation of the ASEAN Single Window enabling platform;
- Harmonization and standardization of (cargo clearance data) the e-ATIGA Form D, ACDD, and e-SPS certificates to support trade facilitation in the region using the ASW platform;
- Development and promotion of the business case for the implementation of the ASEAN Single Window and lay the groundwork for needed regional funding;
- Expanding the public-private dialogue on the ASEAN Single Window and national single windows;
- NSW software support in the installation of the ASW gateway on Brunei's NSW system and started to install the ASW Gateway software in Cambodia to connect to the ASW enabling platform;
- NSW project management support to Cambodia in setting up the NSW system, and developing the required agency applications prior to the installation of ASW gateway software to connect to the ASW platform; and
- NSW needs assessment support in the Lao PDR, Myanmar, and the Philippines to ensure their readiness to connect to the ASW platform

1.3 ASEAN Single Window Live Implementation

As of March 2016, Indonesia, Malaysia, Singapore, Thailand, and Vietnam are now exchanging the live data of electronic certificates of origin, which covers the end-to-end service delivery of the message, including the Customs confirmation receipt response. However, Member States agreed to continue

granting the preferential rate using paper until Member States are technical ready to generate the utilization response in electronic form.

Brunei Darussalam is expected to join the ASW live implementation by November 2017, while Cambodia and the Philippines, which are both in the installation of the gateway software and testing phases, are expected to come on board by February 2018. Similarly, Lao PDR and Myanmar are being supported by USAID in the conduct of their NSW requirements analysis in setting up a basic NSW environment, including the required front-end applications for sending and receiving e-ATIGA messages, and automated granting of preferential rate. Both are expected to join the ASW live operation by the second half of 2018.

1.4 ASEAN Single Window Live Operation

In line with the decision of the 31st AEM-AFTA Council Meeting urging Member States to intensify efforts for ASW to transition to live operation by 1 January 2018, Indonesia, Malaysia, Singapore and Viet Nam confirmed their readiness to transition to live operation on 1 January 2018 by accepting the e-ATIGA Form D to grant preferential treatment when received by such mode. The remaining Member States would continue the necessary preparatory work on their readiness to cutover to ASW Live Operation.

1.5 ASEAN Single Window Post Implementation Review

Member States agreed for the conduct of the Post Implementation Review (PIR) of the ASW, which would include both technical and financial analysis six (6) months after the cut-over to live operation in the production environment.

Certain conditions were agreed, which would need to be met by Member States for the PIR to be effective and meaningful. At least five (5) Member States would participate in the “live operation of the ASW” and that at least two (2) documents would be exchanged.

The specific goals of this review include:

- Assess whether the objectives were met, the contractor and Member States delivered planned levels of benefits, addressed the specific requirements as originally defined;
- Consider the analysis and recommendations of the ASW Baseline Study;
- Examine if further improvements can be made to optimize the benefits delivered;
- Assess the cost-benefit analysis of the project, outcome-based performance measurement information should also be identified and collected; and
- Cite the lessons learned from this project, which can be used by Member States to improve future ICT work in the region

1.6 Background -Purpose of the ASEAN Single Window Baseline Study

The purpose of this activity is to develop a set of key performance indicators for the ASEAN Single Window (ASW). The focus will be to provide baseline data on border clearance activities before live operation of the ASW that can be used to effectively measure the change in those activities six (6) months after the live operation when at least five countries begin exchanging at least two documents agreed on by the Member States.

The study will provide a comprehensive view of how the ASEAN Member States currently use and implement ASEAN Single Window. The study will also reflect on the ways in which the ASEAN Member States can strengthen their efforts to ensure successful operations and sustainability and leverage a trade facilitation benefit.

The proposed approach for delivering this study combines a cross-country assessment framework with a pragmatic approach to policy options development. The work was implemented in 45 working days and entails off-site work for research, analysis, and drafting, as well as on-site work in selected ASEAN Member States for interviews with relevant stakeholders.

1.7 Tasks

The following tasks are identified for drafting the ASEAN Single Window Baseline Study Concept Note;

- Analyze and revise the developed set of KPIs for the ASW, its definition, and parameters to be set;
- Provide the mechanism for collecting the data and sensitivities for each of the proposed KPIs;
- Provide the implementation strategy on how the KPIs would be used to measure the baseline data with the goals of the ASW;
- Provide the Revised Implementation Strategy Measurement Report;
- Based on an approved set of indicators, provide recommendations on the next steps that need to be undertaken by AMS to ensure that all stakeholders/key players can actively participate in measuring the proposed KPIs against the goals of the ASW;
- A presentation on the final documents to the 41st TWG meeting.

Outcomes and deliverables

The following Outcomes and deliverables are identified as an output from the ASEAN Single Window Baseline Study Concept Note;

- Finalized KPIs and their definitions for the ASW Baseline Study;
- A report with a methodology for data collection and challenges/sensitivities for the proposed KPIs, including the implementation strategy for the Member States approved criteria in the conduct of the Post Implementation Review;
- Submit the revised implementation strategy measurement report, incorporating comments received, for Member States' approval;
- Provide appropriate recommendations on the next steps that need to be undertaken by AMS;
- ACTI Consultant to provide the draft final report based on the comments provided by AMS.

ASW Business Goals

- Establish a business model that supports AMS long-term vision, goals, and sustainability in trade facilitation;
- Create a cross border exchange of data and information (import and export) infrastructure based on international standards and data harmonization to facilitate interoperability and interconnectivity across the ASEAN business environment;
- ASEAN regional/public-private collaboration highlights the criticality of aligning integration efforts across each NSW and the ASW to overcome individual NSW disparities;
- The scope of AMS integration thresholds must be established to maintain business continuity;
- Active participation of the business community to support sustainability of ASW and mitigate decision risks;
- Continuous business process analysis (data harmonization and digital documentation of all cargo support documents);
 - Certificate of Origin;
 - ASEAN Customs Declaration Document (ACDD)
 - Sanitary and Phytosanitary certificate;
 - Animal Health certificate;
 - Food Safety certificate;
 - Others

- Adopt integrated risk management for cross border supply distribution to minimize cargo delays;
- Implement change management to convert from current Standard Operating Procedures (SOP) to new standard operating procedures and techniques; and
- Implement a regional PMO to ensure day-to-day management of the regional ASW services;

ASW System Ownership

Ownership of project activities by all AMS stakeholders is essential for successful implementation and integration of the ASW. The ASW main objective is to ensure that all AMS stakeholders are actively involved in the project, where the ASEAN Secretariat – the PMO- plays a leading role in supporting and facilitating the day-to-day management of the ASW regional services. A strong commitment by all AMS stakeholders is the most important element in ensuring that the approximation to the services reaches a higher level paying off in actual trade facilitation improvements. Therefore, the overall philosophy of the ASW approach will be to start working on the issues by pro-actively involving the stakeholders through a process of “learning-by-doing”.

Survey method

Four types of survey questionnaires were produced and circulated to selected contact points in the ASEAN Member States. Two different channels were used for the dissemination of the survey: Through the ASEAN Secretariat and official contact points for Customs in AMS. Return rates on the survey were acceptable and valuable information was collected for the NSW. The survey was produced to be simple and short, encouraging contact points to reply and allowing the consultant to follow up on the replies to more in-depth questions (where needed). Survey information will also be complemented and verified through desk research / open source data by the consultant. Where no replies from the survey are received, the consultant will rely on desk research as a source of information.

Desk research

In the past years, numerous studies have been published on the importance of SW and cross border exchange of information. Some of these publications describe the SW conceptual framework and best practices of trade facilitation; others summarize and evaluate individual country SW experiences. The consultant was reviewing these publications and uses the information to complement ASW / NSW survey information for the cross-country assessment.

In-country data collection

For five ASW participating AMS (Indonesia, Singapore, Vietnam, Thailand, and Malaysia – skype conference) information was collected using personal interviews and observations. The consultant visited five AMS to interview representatives of the Customs and Single Window entities. To the extent that the Customs / NSW entities allow and facilitate, services and functionalities of the NSW were observed and data on performance collected.

The results of the in-country and survey data collection feed into the country assessment and in the future, into an AMS profile case study. These AMS case studies provide in–depth details regarding the particular NSW situation using the assessment framework used for the comparative assessment. Compared to the comparative assessment covering ten countries, the case studies, however, should provide more details with regards to the readiness of NSW to host and manage the new / planned ASW services with the details on business coverage, and business processes and technical criteria of the ASW / NSW assessment framework.

1.8 ASEAN Single Window Interoperability

ASW Interconnectivity refers to the NSW to NSW connectivity or connectivity of the different services of systems which interact with one another. The key challenge of NSW system is interconnectivity

services for Other Government Agencies (OGAs) and Customs to better respond to complex regulatory challenges and to improve the delivery of services to traders. The NSW should provide the agencies with collaborative, networked and interconnected approaches to deliver and support services. There are three basic interconnectivity concepts that should enable smooth interaction between the NSW services and user systems.

Procedure Interoperability: only Single Window harmonized procedures can be interoperable. Interoperability starts on process level by describing and harmonizing the SW procedures to build a foundation for a common process and data model. If the AMS NSW use different business processes and data models, interoperability will be hard to achieve.

Message Interoperability: according to the best practices of the data modeling the data exchanged in a process must be based on the same semantic structures and definitions. In an ideal world, everybody would use the same syntax and the same message implementation guidelines. However, in the real world, this works differently. ASW message interoperability can and must be achieved by matching the various implementation formats against the recognized information model to make sure there are no gaps. This ASW interoperability concept will always involve a certain amount of data translation or conversion, but the aim is to minimize these requirements to increase efficiency and reduce operational costs.

Technical interoperability: the ASW / NSW Architectural pattern must ensure that the technical exchange of information can be unified. This Architecture includes interconnectivity patterns like network systems and communication standards, security devices, and encryption, etc.

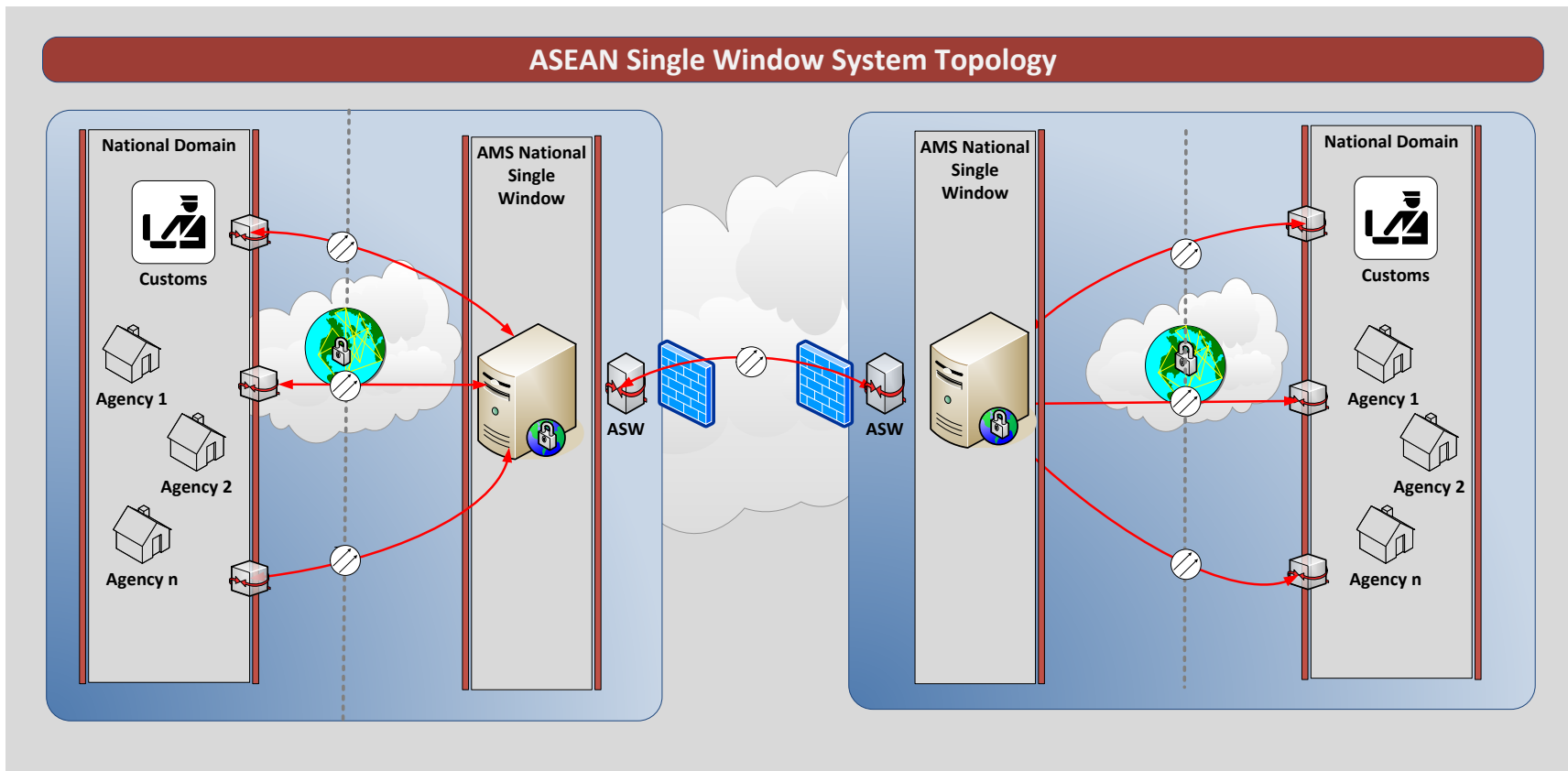


Figure 1: ASEAN Single Window System Topology

2 ASW Baseline Study Questionnaires

In June 2017, the Consultant circulated the survey questionnaire to Member States with the objective of knowing the baseline data on border clearance activities prior to the live operation of the ASW enabling platform. This would assist the consultant to develop a set of key performance indicators (KPIs) that can be used effectively by Member States to measure the change in those activities six (6) months after the live operation and beyond. To date, six (6) Member States (Indonesia, Malaysia, Philippines, Singapore, Thailand, and Vietnam) submitted the completed questionnaires, which were consolidated by the consultant in a separate file “ASW Baseline Study - AMS Completed Questionnaires Matrix 171011” (attached).

3 Analysis of the KPAs and KPIs Initially Identified

To get a more detailed understanding of the value in the particular ASW goal areas, we try to identify Key Performance Areas (KPA) in the surveys. By studying the available literature as well as ASW and NSW surveys (see Annex IV), an initial set of KPAs and KPIs which is applicable for value assessment in AMS NSW was developed and can be used as a starting point for defining case-specific values for a particular AMS. Namely, for these generic KPAs, AMS specific Key Performance Indicators are elaborated. The analysis of the ASW and NSW will serve us also to validate and extend this set of KPAs.

3.1 Three Levels of Analysis

The identification of values to assess is made top-down by going through three levels of granularity.

First, Key Performance Areas (KPA) were identified, i.e. the key goals of the ASW and NSW. Next, Key Performance Indicators (KPIs) are defined per value type for each KPA. Finally, every KPI can be measured (on a quantitative basis) or assessed (on a qualitative basis) by one or more concrete Performance Indicators (PIs). The three level of analysis can be represented as a pyramid; at the top there are the KPA and in the bottom the very specific Key Performance Indicators that are used to assess the performances value. Each level is additionally elaborated on further in this section.

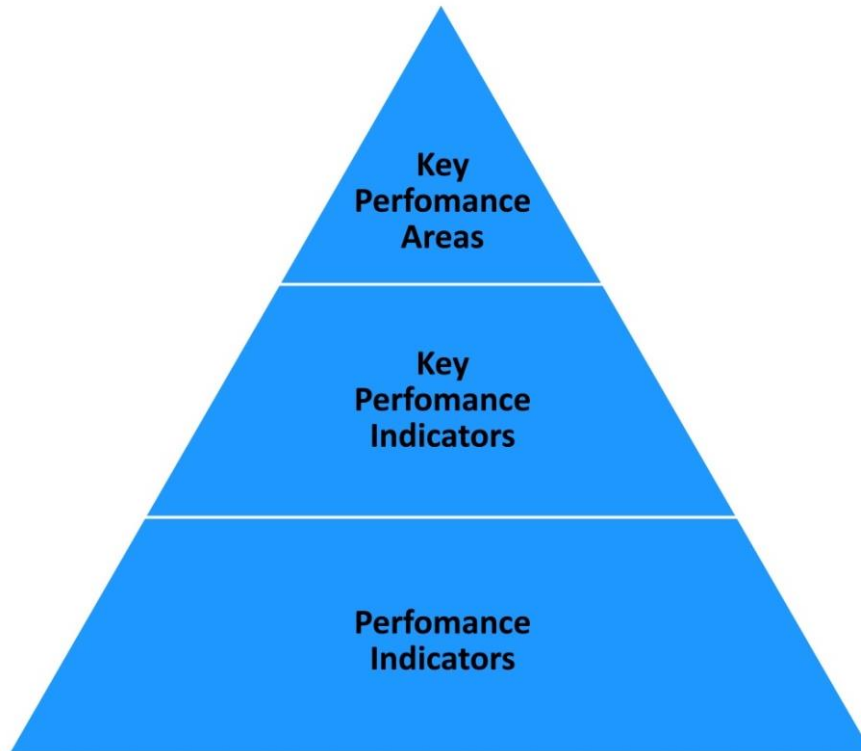


Figure 2: Three level of analysis represented as a pyramid

3.2 Key Performance Areas

Key performance areas, referred to as KPAs, are areas for business success factors and improved performance of an organization, in this case, ASW and NSW. A KPA can be assessed by assessing one or more concrete KPIs which are all related to this specific area. This hierarchy enables a transparent and aggregated view of a large number of KPIs especially for ASW and NSW with complex structures and heterogeneous business processes. For ASW strategic organization’s planning, the first step is to define goal areas and success factors on KPA level. Afterward goals and factors can be defined and refined by different KPIs.

3.3 Key Performance Indicators

Key performance indicators, also known as KPIs, are quantitative or qualitative measurements, which reflect the business success factors and strategic performance of the ASW. For this Baseline Study, the KPIs are qualitative, which one may not necessarily measure with a quantitative measurement (e.g., acceptance of ASW common standards). Therefore, in this document, we use the terms “measure” to relate to quantitative KPIs, and the term “assets” to refer to qualitative KPIs or a set of qualitative and quantitative KPIs.

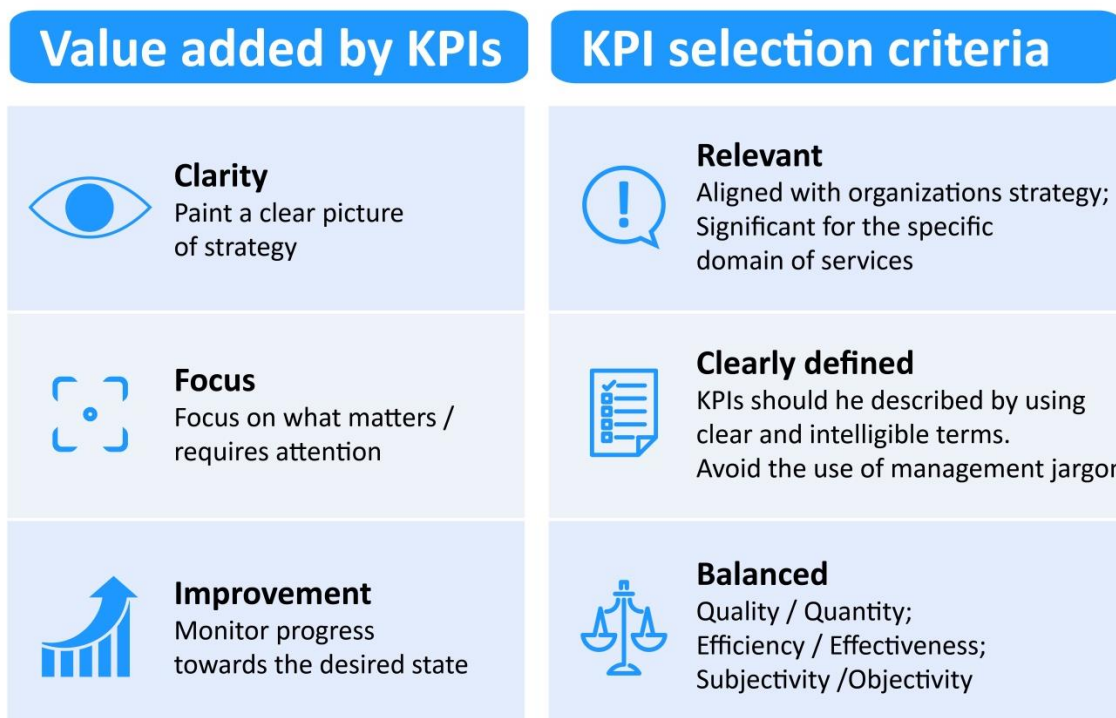


Figure 3: KPI Value added and selection criteria²

3.4 Performance Indicators

Often more than one KPI is related to the same success factor - Performance Indicators (PI). In that way different areas of interest can be evaluated to achieve a specific ASW KPI goal. The PIs are usually long-term considerations or refer to a specific period, during which their values will be collected, measured or assessed. The definition of what they are and how they are measured or assessed does not change often. It is important for ASW performance measurements to stay with the same definition of the KPI from year to year or a particular period.

Each PI must be correctly defined by a specific target, the period of validation (e.g. month or year), considerations, the unit of measurement (e.g. lower cost for traders) and a description how to assess/measure it respectively how and where the data can be collected.

3.5 Performance Indicators Baseline, Target, and Actual Data

Member States are currently under live implementation stage, which allows Member States to start exchanging live data based on the agreements and MOUs signed such as the ATIGA rules, ACDD message implementation guide (MIG) and other MIGs. The baseline data will be set on 31 December 2017 based on the actual number of Member States participating in the live exchange and messages successfully exchanged. All the baseline data metrics provided are indicative based on the available current information. This will be updated by December 2017 by the consultant, as the suggested baseline process point. It is up to the ASW Management Team (PMO) to determine on how the baseline data would be set. This can be qualitative, in which case the assessment criteria need to be identified, or it can be numerical or using a scale, in which case the formula or scales with categories need to be identified. Example, using a 0-10 scale (not at all likely to extremely likely) respondents will

² Source: PKI Institute

answer: How likely is a particular cargo document agreed by Member States would be exchanged using the ASW platform?

The target and actual data columns are suggested to provide metrics to monitor the performance of Member States and ASW stakeholders per key performance area / performance indicators.

4 ASW Implementation Strategy

Transparency, coordination, public credibility, flexibility, longevity, and effectiveness are the key principles upon which the ASW implementation shall stand. By implementing the strategy the ASW shall strive to these principles in the organization's culture. The adoption of these principles must be a long-term objective which shall be achieved by the certain time frame, and it will be accomplished if AMS accept the new working practices and attitudes.

4.1 Key Performance Area - ASW Implementation Strategy Performance

Implementation Strategy Performance Area takes a broad view of performance management to keep organizations on the right track. Creating a service value to drive the ASW and NSW performance, the development of planned and governance processes will ensure that the short-term goals are aligned with the ASW long term strategy and agenda.



Figure 4: ASW Implementation Strategy Performances³

By using a wide variety of KPI proven tools and techniques, including project management methodologies, balanced scorecards, and trader/government feedback surveys, the goal is to focus and guide their activities. No matter which performance management tools used, the fact that they used at all—and that they are used effectively—is most important.

The ASW service value generating mechanisms follow:

- Provide services in a secure, accurate, and timely manner;
- Increases in efficiency – obtaining increased outputs or goal attainment with the same resources, or obtaining the same outputs or goals with lower resource consumption. (e.g. reduce time and costs for import procedure);
- Increases in effectiveness – increasing the quality and quantity of the services. (e.g. increase revenue, better risk management);

³ Source: PKI Institute

- Enablement – providing means or allowing otherwise infeasible or prohibited desirable activity, or preventing or reducing undesirable events or outcomes. (e.g. increase control, preventing fraud); and
- Intrinsic enhancements – changing the environment or circumstances of a stakeholder in ways that are valued for their sake. (e.g. G2B and G2G partnership enhancement).

Key Performance Indicator	Performance Indicator	Baseline Data (December 2017)	Year 1 Target	Year 1 Actual	Description and Unit of Measurement	Data Source / Reporting Authority	Reporting Frequency
ASW / NSW Implementation	Tracking the regional protocols, agreements, and MOUs that need to be adopted by ASEAN to implement the ASW	5/11	2		<p>This indicator keeps track on the progress of achieving the activities agreed/to be agreed by ASEAN in relation to the implementation of the ASW. Regional protocols, agreements, and Memorandum of Understanding (MOU) refer to the binding legal agreements that Member States signed/ratified. Member States that spearhead the execution of the ASW objectives in relation to the use of the ASW enabling infrastructure for the exchange of live data.</p> <p>List of agreements considered:</p> <ol style="list-style-type: none"> 1. Protocol on the Legal Framework to Implement the ASW (PLF) 2. ASW Project Management Office (PMO) or the ASW Regional Service Management Team 3. Study on the viability of the ASEAN Secretariat to host the ASW Regional Services servers/Sustainability Plan 	ASW / NSW	On update by the Member States

Key Performance Indicator	Performance Indicator	Baseline Data (December 2017)	Year 1 Target	Year 1 Actual	Description and Unit of Measurement	Data Source / Reporting Authority	Reporting Frequency
					<ul style="list-style-type: none"> 4. Amended Operational Certification Procedure (OCP) of the ATIGA Form D 5. Electronic ATIGA Form D Message Implementation Guide and Process Specifications 6. ACDD Message Implementation Guide and Process Specifications 7. Electronic Phyto-sanitary Certificate Message Implementation Guide and Process Specifications 8. Electronic Animal Health Certificate Message Implementation Guide and Process Specifications 9. Electronic Food Safety Message Implementation Guide and Process Specifications 10. PKI Paper to Implement a Robust, Flexible, and Neutral Certificate Validation Solution based on International Standards 11. ASW Information Security Policy 		

Key Performance Indicator	Performance Indicator	Baseline Data (December 2017)	Year 1 Target	Year 1 Actual	Description and Unit of Measurement	Data Source / Reporting Authority	Reporting Frequency
	Number of Member States adopting specific regional Protocols, Agreements, and MOU	14/50	5		<p>Member States refer to any ASEAN country that is complying with the agreed agreements. This PI counts the Member States that will comply with only the following agreements:</p> <ol style="list-style-type: none"> 1. Protocol on the Legal Framework to Implement the ASW (PLF) 2. ACDD Message Implementation Guide and Process Specifications 3. Electronic Phyto-sanitary Certificate Message Implementation Guide and Process Specifications 4. Electronic Animal Health Certificate Message Implementation Guide and Process Specifications 5. Electronic Food Safety Message Implementation Guide and Process Specifications <p>The baseline data fourteen (14) is based on the completed domestic ratification of the PLF by all Member States, and the four Member States that are</p>	ASW / NSW	On update by the Member States

Key Performance Indicator	Performance Indicator	Baseline Data (December 2017)	Year 1 Target	Year 1 Actual	Description and Unit of Measurement	Data Source / Reporting Authority	Reporting Frequency
					already exchanging live data of the ATIGA Form D,		
	Number of messages successfully exchanged of e-ATIGA Form D based on the Importing Country Gateway confirmation response (RES)	0	400,000		This PI counts the number of XML messages exchanged using the ASW platform. Capture the number of e-ATIGA Form D messages from the ASW RS Services Management Report (at least a RES returned by receiving AMS)	ASW / NSW	ASW Weekly and Monthly RS Service Management Report
	Total number of ATIGA Form D issued/processed by all Member States	2,000,000 (indicative number)	2,000,000 (indicative number)		This PI counts the number of ATIGA Form D issued by all Member States for both paper and electronic form	ASW / NSW	Monthly to be provided by the Member States
	Percentage of e-ATIGA Form D processed	13.5%	20%		Percentage of electronic ATIGA Form D processed/transmitted through the ASW platform out of the total number of ATIGA Form D issued by all Member States. The intent is to know the progress of Member States in shifting to electronic environment.	ASW / NSW	Monthly / Yearly / Computed
	Number of messages successfully exchanged of ACDD based on the Importing Country	0	1,000		This PI counts the number of XML messages exchanged using the ASW platform. Capture the number of ACDD messages from the ASW RS Services	ASW / NSW	ASW Weekly and Monthly RS Service Management Report

Key Performance Indicator	Performance Indicator	Baseline Data (December 2017)	Year 1 Target	Year 1 Actual	Description and Unit of Measurement	Data Source / Reporting Authority	Reporting Frequency
	Gateway confirmation response (AS4)				Management Report (at least an AS4 returned by receiving AMS)		
	Total number of ACDD processed by all Member States	1,000,000	1,200,000		This PI counts the number of ACDD processed and transmitted by all Member States for both paper and electronic form	ASW / NSW	Monthly to be provided by the Member States
	Percentage of ACDD processed	0%	0%		Percentage of electronic ACDD Form D processed/transmitted through the ASW platform out of the total number of ACDD issued by all Member States. The intent is to know the progress of Member States in shifting to electronic environment.	ASW / NSW	Monthly / Yearly / Computed
	Number of messages successfully exchanged of e-Phyto certificate based on the Importing Country Gateway confirmation response (AS4)	0	100		This PI counts the number of XML messages exchanged using the ASW platform. Capture the number of e-Phyto-sanitary certificate messages from the ASW RS Services Management Report (at least an AS4 returned by receiving AMS)	ASW / NSW	ASW Weekly and Monthly RS Service Management Report
	Number of messages successfully exchanged of e-Animal Health certificate based on	0	0		This PI counts the number of XML messages exchanged using the ASW platform. Capture the number of e-Animal Health messages from the ASW	ASW / NSW	ASW Weekly and Monthly RS Service

Key Performance Indicator	Performance Indicator	Baseline Data (December 2017)	Year 1 Target	Year 1 Actual	Description and Unit of Measurement	Data Source / Reporting Authority	Reporting Frequency
	the Importing Country Gateway confirmation response (AS4)				RS Services Management Report (at least an AS4 returned by receiving AMS)		Management Report
	Number of messages successfully exchanged of Food Safety certificate based on the Importing Country Gateway confirmation response (AS4)	0	0		This PI counts the number of XML messages exchanged using the ASW platform. Capture the number of e-Food Safety messages from the ASW RS Services Management Report (at least an AS4 returned by receiving AMS)	ASW / NSW	ASW RS Weekly and Monthly Service Management Report
	Time to Export: Border Compliance, Average	144	130		Hours, Work Bank Doing Business Report – Trading Across Borders	World Bank Report	Annually
	Time to Export: Documentary Compliance, Average	144	130		Hours, Work Bank Doing Business Report – Trading Across Borders	World Bank Report	Annually
	Time to Import: Border Compliance, Average	152	136		Hours, Work Bank Doing Business Report – Trading Across Borders	World Bank Report	Annually
	Time to Import: Documentary Compliance, Average	152	136		Hours, Work Bank Doing Business Report – Trading Across Borders	World Bank Report	Annually

Key Performance Indicator	Performance Indicator	Baseline Data (December 2017)	Year 1 Target	Year 1 Actual	Description and Unit of Measurement	Data Source / Reporting Authority	Reporting Frequency
	Number of Documents to Export, Average	4	3		Number of Documents Needed to Export, Work Bank Doing Business Report – Trading Across Borders or World Development Indicators	World Bank Report	Annually
	Number of Documents to Import, Average	6	5		Number of Documents Needed to Import, Work Bank Doing Business Report – Trading Across Borders or World Development Indicators	World Bank Report	Annually
	Logistics Performance Index, Average	6	7		Rating, 1- 10, Logistics Performance Index	World Development Indicators	Annually
	Average time saving for consignments supported by documents exchanged through the ASW	0	0.5 days		This will require that AMS NSWs/Customs systems are able to collect data on clearance times by consignment and then compare between those using ASW data and those not using ASW data	NSW or Customs / AMS	Quarterly

Table 1: ASW / NSW Implementation Strategy KPIs

4.2 Key Performance Area - ASW Current and Planned Services

The KPIs related to the current and future/planned ASW services are the most important to measure the impact of the ASW. The ASW services KPIs must be updated accordingly, with focus on the AMS national domain readiness to manage the services provided by ASW.

Member States are working closely with development partners in addressing the sustainability of the ASW, as well as training the ASEAN Secretariat staff to competently operate the ASW prior to handing over the ASW platform to Member States, which agreed to use the ASEAN Secretariat’s Annual Operations Budget (AOB) to sustain the day-to-day operations of the ASW platform starting 01 April 2017. Moreover, US-ACTI is assisting the Member States for the

exchange of the Export Information Data (ACDD) to support Member States' Risk Management Systems as well as the exchange of electronic Phyto-sanitary Certificate starting next year

As a result of utilizing the the certificate of origins (e-ATIGA Form D), participating Member States were able to enhance their National Single Window in supporting their risk management system for online informed decision. Further, dashboards are being used to allow traders to see time-stamped e-ATIGA Form D live data in real-time

Key Performance Indicator - ASW	Performance Indicator	Baseline Data (December 2017)	Year 1 Target	Year 1 Actual	Data Source / Reporting Authority
Implementation of the Intra-ASEAN certificate of origin (ATIGA Form D)	Number of Countries, successful conduct of the end-to-end testing phase	5	7		ASW / NSW / SC-AROO Customs
	Number of Countries, Member States that are exchanging live data of the e-ATIGA Form D	4	7		ASW / NSW / SC-AROO / Customs
	Number of Countries, utilizing the e-ATIGA Form D and sending electronic notification in granting preferential rate	0	7		ASW / NSW / SC-AROO / Customs
Implementation of the ASW Common Message Exchange Header	Endorsement of the Technical Design of the ASW Common Message Exchange Header	No	Yes		ASW / NSW / Customs
	Number of Countries, successful conduct of the end-to-end testing phase	0	7		ASW / NSW / Customs
Implementation of the ASEAN Customs Declaration Document (ACDD)	Number of Countries, successful conduct of the end-to-end testing phase	0	7		ASW / NSW / Customs
	Number of Countries, Member States that are exchanging live data of the ACDD	0	7		ASW / NSW / Customs
	Number of Countries, utilizing the ACDD as advance information to support their Risk Management System	0	7		ASW / NSW
E-Phyto-sanitary Certificate	Number of Countries, successful conduct of the end-to-end testing phase	0	3		ASW / NSW / ASCP

Key Performance Indicator - ASW	Performance Indicator	Baseline Data (December 2017)	Year 1 Target	Year 1 Actual	Data Source / Reporting Authority
	Number of Countries, Member States that are exchanging live data of the e-Phyto-sanitary Certificate	0	3		ASW / NSW / ASCP
	Number of Countries, utilizing the e-Phyto-sanitary certificate in compliance with SPS Measures and sending electronic notification to the Exporting Country	0	3		ASW / NSW / ASCP
Animal Health Certificate	Number of Countries, successful conduct of the end-to-end testing phase	0	0		ASW / NSW / ASCP
	Number of Countries, Member States that are exchanging live data of the e-Animal Health	0	0		ASW / NSW / ASCP
	Number of Countries, utilizing the e-Animal Health in compliance with SPS Measures and sending electronic notification to the Exporting Country	0	0		ASW / NSW / ASCP
Food Safety Certificate	Number of Countries, successful conduct of the end-to-end testing phase	0	0		ASW / NSW / ASCP
	Number of Countries, Member States that are exchanging live data of the e-Food Safety	0	0		ASW / NSW / ASCP
	Number of Countries, utilizing the e-Food Safety in compliance with SPS Measures and sending electronic notification to the Exporting Country	0	0		ASW / NSW / ASCP
Other Documents [Template only for future documents]	Member States' endorsement of the Message Implementation Guide and Process Specifications for the additional document				ASW / NSW
	Number of Countries, successful conduct of the end-to-end testing phase				ASW / NSW
	Number of Countries, Member States that are exchanging live data of the additional document				ASW / NSW

Key Performance Indicator - ASW	Performance Indicator	Baseline Data (December 2017)	Year 1 Target	Year 1 Actual	Data Source / Reporting Authority
	Number of Countries, utilizing the additional document and sending electronic notification to the Exporting Country				ASW / NSW

Table 2: ASW Current and Planned Services KPIs

4.3 Key Performance Area – Funds and Resources

The funds and resources KPIs involve creating and managing the PMO which includes defining the roles and responsibilities with a clear chain of reporting. Solid project management, planning of resources and funding should be the vital component of the ASW’s management structure in determining the actual budget needed for the yearly operation of the ASW enabling infrastructure.

ASEAN Member States started funding the operation of the ASW platform beginning October 2016. Two technical staffs as indicated in the ASW Governance Structure Paper (PMO Study) were hired in the last quarter of 2016 and trained to take over the operations of the ASW beginning March 2017. Member States of ASEAN have agreed that the costs of operating the ASEAN Single Window will be shared across Member States equally.

Key Performance Indicator	Performance Indicator	Baseline Data (December 2017)	2018	2019	Description and Unit of Measurement	Data Source / Reporting Authority	Reporting Frequency
Funding and resources	ASW Regional Services servers' operational cost (in US dollars)	24,000	43,400		Annual ASEAN Secretariat’s Operating Budget for ASW	ASEAN Secretariat	annually
	The ASW Regional IT operational budget (in US dollars)	0	8,800		Annual ASEAN Secretariat’s Operating Budget for ASW	ASEAN Secretariat	annually

Key Performance Indicator	Performance Indicator	Baseline Data (December 2017)	2018	2019	Description and Unit of Measurement	Data Source / Reporting Authority	Reporting Frequency
	Percentage Actual ASW Expenditure	66.67%	TBD		From the ASEAN Secretariat financial records	ASEAN Secretariat	quarterly
	PMO Personnel	2	2	3	From the ASEAN Secretariat personnel records	ASEAN Secretariat	quarterly

Table 3: ASW Funds and Resources KPIs

4.4 Key Performance Area - ASW Management and Planning Team (Project Management Office)

This part is providing KPIs and PIs for the ASW Management and Planning Team (PMO) based on the reference material provided by the ACTI ASW lead on the ASW Governance Structure. The implementation approach in setting up the PMO team for managing the ASW and establishing the broader project management and planning team (PMO) was based on three (3) phases:

- Phase 1 was handled by the IT Virtual Project Team (VPT-IT), comprised of national technical experts from Member States, that managed and tracked the testing phase of the project, until the creation of the ASW PMO, which was agreed to be in place prior to ASW live implementation which started in March 2016.
- Phase 2 covered the initial two-year setup consisting of a technical officer and senior officer, given the minimal volume of messages to be exchanged in the first two years of live operation. Formal training and hands-on familiarization activities were provided by the ASW contractor to the PMO staff.
- In anticipation of the completion of the exchange of additional documents using the ASW platform, the basic PMO team setup would evolve to a full ASW PMO by 2019 (Phase 3). This will require the services of a dedicated ASW Project Manager, Assistant Director Level, that is familiar with information security policies based on international standards and best practices, including information security areas such as human resources security, physical and environmental security, access control, incident management, business continuity management, and compliance.

Key Performance Indicator – ASW	Performance Indicator	Performance Indicator Details	Baseline Data (December 2017)	Year 1 Target	Year 1 Actual	Description and Unit of Measurement	Data Source / Reporting Authority
Project Management and Planning Team's (PMO) Performance	Reviews and resolves technical issues within their capacity, or ensure that these issues should be addressed at the appropriate level promptly	Number of technical issues raised by AMS	25	20		Number of technical issues submitted to VPT_IT using the Issue Statement Form	Member States and PMO reports, Quarterly
		Number pending/resolved each quarter	5	5		Number of pending technical issues submitted to VPT_IT using the Issue Statement Form	
		Average time from submission to resolution	5 days	4 days		Time, average time from submission to resolution	
		Average percentage of total issues resolved within 5 days at the end of quarter.	20 %	25%		Time, average pending time to resolve outstanding issues	
		Average percentage of total issues resolved within 15 days at the end of quarter.	30%	40%			
		Average percentage of total issues resolved within 30 days at the end of quarter.	50%	80%			

Key Performance Indicator – ASW	Performance Indicator	Performance Indicator Details	Baseline Data (December 2017)	Year 1 Target	Year 1 Actual	Description and Unit of Measurement	Data Source / Reporting Authority
	Resolving network problems, perform further investigation of network problems, and change the network security configuration, if necessary	Response time in addressing network problems	5 days	4 days		Response time, average time in addressing network problems	Member States and PMO reports
		Response time in performing enhancement for the continuous improvement of the network security configuration	30 days	15 days		Response time, performing enhancement for the improvement of the network security	
	Notifies any deviations/gaps from defined requirements at the earliest instance, require the contractor to take corrective action.	Number of technical issues raised by AMS	19	15		Number of technical issues submitted to VPT_IT using the Issue Statement Form	Member States and PMO reports, quarterly
		Number pending/resolved each quarter	5	4		Number of pending technical issues submitted to VPT_IT using the Issue Statement Form	
		Average time from submission to resolution	5 days	4 days		Time, average time from submission to resolution	
		Average pending time for incomplete at end of quarter.	10 days	8 days		Time, average pending time to resolve outstanding issues	

Key Performance Indicator – ASW	Performance Indicator	Performance Indicator Details	Baseline Data (December 2017)	Year 1 Target	Year 1 Actual	Description and Unit of Measurement	Data Source / Reporting Authority
	Monitors progress on activities of the project and provides regular feedback to AMS/TWG	Timely submission of [weekly] transaction reports	7	8		Rating, 1 – 10, 10 is the highest	Member States and PMO reports
		Handling of the ASW Meetings	8	8		Rating, 1 – 10, 10 is the highest	
		Time to finalize meeting report after meeting	9	9		Rating, 1 – 10, 10 is the highest	
	Provides technical guidance and assistance to AMS in conducting activities related to operational /planned services		6	7		Rating, 1 – 10, 10 is the highest	Member States and PMO reports

Table 4: ASW Management and Planning Team KPIs

4.5 Key Performance Area - the Protocol on the Legal Framework to Implement the ASW (PLF)

The Protocol on the Legal Framework to Implement the ASW (PLF), signed in September 2015 by the Finance Ministers, and was ratified in June 2017 by all Member States. The following KPIs are covering the Protocol on the Legal Framework to Implement the ASW (PLF) KPIs for their implementation in the AMS.

This PLF will supplement and implement the ASW Agreement, and shall be read and interpreted in accordance with the ASW Agreement. In the event of any inconsistency between this Protocol and the ASW Agreement, the provisions of the ASW Agreement shall prevail to the extent of such inconsistency. The PLF will not affect the rights and obligations of Member States under any other international agreements to which two or more Member States are party. In the event of any inconsistency between this PLF and the ASW Protocol, Member States shall immediately consult each other with a view to finding a mutually satisfactory solution.

This PLF aims to provide a legal framework for the operations, interactions, and electronic processing of transactions between NSWs within the ASW environment, taking into account the relevant international standards and best practices recommended by international agreements and conventions concerning trade facilitation and modernisation of customs techniques and practices. Member States shall establish and maintain national laws and

regulations⁴ that enable the operation of their NSWs and permit cross-border transmission and exchange of trade and customs-related data and information between NSWs that Member States have specifically agreed to for the purposes of the ASW. Such transmission and exchange shall be subject to the consent of the trader submitting the data and information, where such consent is required by national law, and shall be made in accordance with this PLF.

ASEAN Member States shall establish policies and regulations for the transmission and exchange, use, and dissemination of NSW data and information for domestic government usage that are consistent with the provisions of this Protocol. Data and information transmitted, exchanged and disseminated by a Member State's NSW to another Member State's NSW through the ASW environment shall be used and maintained only in furtherance of this PLF.

Performance Indicator (Derived from Protocol on the Legal Framework to Implement the ASW)	Baseline Data (December 2017)	Description and Unit of Measurement	Data Source / Reporting Authority	Reporting Frequency
Policies and regulations for the transmission, use and exchange and dissemination	Yes	Protocol on the Legal Framework to Implement ASEAN Single Window Article 6.1 - Policies and regulations for the transmission, use and exchange and dissemination – Message Implementation Guide and Process Specifications were agreed by Member States for cross-border documents to be exchanged using the ASW platform	Data Modelling International Standards / ASW documents	When needed
Recognition of e-signature (digital signature)	No	Protocol on the Legal Framework to Implement ASEAN Single Window Article 6.1 and Article 15 - Recognition of electronic signature (system to system, national and cross border / ASEAN)	ASW / NSW documents	When needed
Establishment of policies and regulations for the transmission and exchange, use, and dissemination of data	Yes	Protocol Article 6.2. – Establishment of policies and regulations for the transmission and exchange, use, and dissemination of NSW data and information for domestic government usage that is consistent with the provisions of this Protocol	ASW / NSW documents	When needed
Agreed and adopted communication and transaction protocol	Yes	Article 7 – Service Level Requirements – Member States agreed and adopted the web services communication on protocol on bilateral level / ASEAN Level	Data Modelling International Standards / ASW documents	When needed

⁴ In adopting or maintaining laws and regulations referred under this provision, Member States may decide to ensure that the transmission and exchange of data and information within the ASW environment shall be subject to comparable safeguards to those it applies in its own jurisdiction.

Performance Indicator (Derived from Protocol on the Legal Framework to Implement the ASW)	Baseline Data (December 2017)	Description and Unit of Measurement	Data Source / Reporting Authority	Reporting Frequency
SLA at ASEAN level and adoption and use of these SLA at national level	No	Article 7 – Service Level Requirements - Are there SLA at ASEAN level and adoption and use of these SLA at national level	ASW / NSW / Customs	When needed
Alignment with international data modelling standards and other relevant international standards including data model	Yes	Article 8 – Standardized Data and Information - Cross-border documents agreed were aligned with relevant international data modelling standards.	ASW documents	When needed
Use of data and information received through the ASW environment shall be for lawful and authorized purposes	Yes	Protocol on the Legal Framework to Implement the ASEAN Single Window Article 9.2 - Ensure that the use of data and information received through the ASW environment shall be for lawful and authorized purposes	ASW / NSW / Customs	When needed
Establishment of national laws and regulations, protection	Yes	Protocol on the Legal Framework to Implement the ASEAN Single Window Article 9.3 - Establishment of national laws and regulations, protection from unlawful disclosure of confidential information that may be transmitted, exchanged or disseminated by the NSWs of other AMS	ASW / NSW / Customs	When needed
Registry of an AMS for access ASW data	No	Protocol on the Legal Framework to Implement the ASEAN Single Window Article 12 - Registry of an AMS - NSW shall not be permitted access to data or information other than that are authorized by law, rules, regulations, and policies	ASW / NSW / Customs	When needed
Technical standards	Partial	Protocol on the Legal Framework to Implement the ASEAN Single Window Article 13.2 - Technical standards: - Minimum schedules for data retention, archiving, and data disposal for each type of data that is processed in their respective NSW; - Establishment of technical standards and procedures for maintaining authenticated electronic data and information;	ASW / NSW / Customs	When needed

Table 5: Protocol on the Legal Framework to Implement the ASW (PLF) KPIs

4.6 Key Performance Area – ASW Security Policy

The ASW KPIs Security Policy assessment includes defining and valuing the assets, defining the threats to those assets, determining the system's vulnerabilities, and recommending reasonable safeguards to bring the risks down to acceptable levels. This is to ensure that the ASW platform conforms to the international standards on security policies. An security officer should closely work with the Member States information security officers, if any. These security officers are responsible for communicating any security threats and issues that may affect the daily operation of the ASW enabling infrastructure for them to take the applicable measures and actions.

Member States agreed in principle to co-locate the ASW Regional Services servers to a private data center provider in Jakarta, Indonesia, where the ASEAN Secretariat is located, for the following reasons:

- (i) The ASEAN Secretariat's Computer Room is not Tier-III compliant, which means that it is not secure based on international data hosting standards;
- (ii) The data center co-location service must provide reliable, flexible, and cost effective to meet current demands, and comply with international hosting standards;
- (iii) The data center would provide power and cooling to the space, but the IT equipment would still be owned by the ASEAN Secretariat;
- (iv) ASEAN Secretariat could still retain full control of the design and management of the servers and storage, but turn over the daily task of managing data center and facility infrastructure to the data center provider;
- (v) Near enough for the ASEAN Secretariat's PMO staff to be able to make occasional visits. However, the data center should not be so close to the ASEAN Secretariat such that its operations would be affected in case a disaster or other disruptive events should occur; and
- (vi) Co-locating service could include redundancy and mirroring to address disaster recovery management

Key Performance Indicator - ASW Strategy performance (Derived from Protocol on the Legal Framework to Implement the ASW)	Performance Indicator	Baseline Data (December 2017)	Year 1 Target	Year 1 Actual	Description and Unit of Measurement	Data Source / Reporting Authority	Reporting Frequency
Information Security Policy	Member States defined, developed, and endorsed an Information Security Policy	No	Yes		Member States accepted and endorsed an ASW Information Security Policy	ASW / NSW	For Member States review and acceptance. Once accepted, subject to annual review
		0	5		Number of Countries, developed an Information Security Policy at the national level		
	Regular updates, monitoring, and management of the ASW Security Policy	No	TBD		No Information Security Policy	ASW / NSW	For Member States review and acceptance. Once accepted, subject to annual review
ASW Software Security Objectives	Active management of authorization/access within the ASW systems	6	7		Rating, 1 – 10, the PMO should provide active management of authorization and access policies within the ASW	ASW / NSW	Member States and PMO reports, annually

Key Performance Indicator - ASW Strategy performance (Derived from Protocol on the Legal Framework to Implement the ASW)	Performance Indicator	Baseline Data (December 2017)	Year 1 Target	Year 1 Actual	Description and Unit of Measurement	Data Source / Reporting Authority	Reporting Frequency
					systems, ensuring that data and information is processed according to the need to know and modify access		
	Develop the SOP for Testing of Software Updates	No			No Standard Operating Procedure for Testing of Software Updates	ASW / NSW	Member States and PMO reports, annually
	Number of Times New Software is Installed and Tested	5	7		Number, count for new software installed and tested	Vendor / ASW / NSW	Member States and PMO reports, annually

Table 6: ASW Security Policy KPIs

4.7 Key Performance Area – ASW / NSW Public Key Infrastructure - Digital Signature

For the application of ASW / NSW security mechanisms, it is necessary to use services of Public Key Infrastructure (PKI) for the management of the certificates needed both for platforms (for example to support SSL, IPsec, HTTPS, IPsec tunneling, etc.) and for the functions of signature electronic data and documents. The PKI must also support the system-to-system digital signature, for cross-border exchange of cargo clearance documents, and signature of data packages.

As the reliance on paper shifts to electronic transactions and documents, so must the reliance on traditional trust factors shift to electronic security measures to authenticate electronic transactions of actors involved in cargo clearance before engaging in the exchange of information, goods, and services. Similarly, the need for confidentiality and confidence in the integrity of exchanged information is critical. As the world of commerce becomes increasingly dependent on the electronic storage, accessibility, and delivery of valuable information, the question of maintaining a level of trust in all those business processes, which

is commensurate with the levels well established in the brick and mortar world, becomes critical. In electronic commerce, the establishment of trust is key. Not only must we trust the identity of the business partner but we must also have utmost confidence in the transaction itself. Digitally signing a transaction can achieve both of these trust objectives. A **digital signature** or **public key certificate**, binds a public key to identifying information about its owner, the infrastructure is designed to create the binding, and manage it for the benefit of all within the community of use.

In order to ensure essential ICT security for a supply chain security strategy in the exchange of electronic messages, the use of PKI arrangements (digital certificates) to authenticate/verify the identity of the trader ensures integrity, confidentiality, non-repudiation, and can play an important role in securing the electronic exchange of cross-border information. This would allow the authorized trader to sign all electronic messages to those ASEAN Member States having accepted to recognize this certificate. As such, there's a need for ASEAN to continue discussing the business, legal compatibility, and technical interoperability of authentication schemes. This will cross-jurisdictional electronic transactions, and will ensure that authentication can be deployed at both the national and regional levels.

Member States challenges in implementing Mutual Recognition Agreement for PKI

- Physical security requirements are high. AMS registration officers, whether a person or an agency, must be subject to strict security policies and practices. In order to create a digital identity that can be relied upon, users need to correctly and securely take ownership of their key pair(s). In PKI terms, this means that:
 - the CA, usually through a trusted relationship with registration authority, must be sure of the applicant's identity
 - a certificate request must be created, which has correct and unique user identification
 - once the user has taken charge of their private authentication key(s), measures must be taken to ensure that this key cannot be used by anyone else. In particular, ensure that there is no possibility of any application or person at the issuing site (e.g. the AMS Registration Officer) having taken a copy of the keys or the PIN protecting those keys.
- Difficult to fit the technical standards to the requirements of ASEAN. AMS struggle to comprehend the implications of the use of digital signatures, formulating for laws for a technology which is still debatable. There are so many conflicting papers on the benefit/non-benefit of PKI infrastructure. There is not yet a viable alternative to the strong authentication afforded by public key cryptography. Looking around, there are some product vendors and organization that are advancing their capability in implementing PKI. However, ASEAN is still in the experimentation stage, trying to understand where the technology best fits, and how it can be adapted without compromising security. In the case of Malaysia, under its digital signature Act 1997, any document digitally signed using digital signature is deemed to be written document in terms of validity and use for enforcement. Further, Malaysian court recognizes the use of PKI and digital signature in case of a legal dispute arises. Moreover, Malaysia recognizes that there's a need for

AMS to adopt a standard in developing PKI for ASW to ensure interoperability of digital certificates among AMS and to enable the cross-certification between AMS. Vietnam has confirmed that there's already an operational root CA handling all the digital signatures of the government, while Indonesia has no available root CA yet to handle digital signatures.

- Readiness for recognition of cross-border digital signatures. The readiness of national legislation and PKI implementation is crucial to regulate the cross-border PKI implementation and to ensure the digital signature is valid and enforceable. There is a need to conduct domestic consultation on the requirements of Mutual Recognition Framework in ASEAN, which includes proposal on the governance structure to enable mutual recognition of cross-border digital certificate, and ensure effective monitoring of ASW Digital Signature Mutual Recognition Framework. Further, domestic consultation with relevant government agencies such as the Attorney General Chambers, the agency which controls ICT implementation, ICT standards, information security policies, etc. to confirm:
 - Level and type of document that require digital signature, etc.;
 - Appointment of Root CA for the ASW.
 - Each AMS must decide which CA they want to appoint

- Identify resources required for the implementation of ASW digital signatures at the national level. Estimating the costs and resources required to implement the enhancement should include how much to set it up, impact to network traffic, human resources required to carry out the activities, the fastest way to do it, the cost of issuing a digital certificate, potential revenue stream, setting up a Root CA, sustainability issues, and the estimated cost for their NSW system enhancement to accommodate PKI digital signatures.

Key Performance Indicator - ASW Strategy performance	Performance Indicator	Baseline Data (December 2017)	Description and Unit of Measurement	Data Source / Reporting Authority	Reporting Frequency
Development and Implementation of Public Key Infrastructure and Digital Signature	Legislation				
	Is the existing legislation able to support electronic transactions exchanged via a NSW?	8	Number of Countries, existing legislation able to support electronic transactions. Cambodia and Lao PDR did not provide their responses	ASW / NSW	When needed
	Does the country's legal framework recognize electronic transactions with digital signatures?	8	Number of Countries, existing legislation recognizing electronic transactions with digital signatures. Cambodia and Lao PDR did not provide their responses	ASW / NSW	When needed
	Does the country have a plan for enhancement of the legislation framework to support the ASW implementation?	4	Number of Countries, supporting a plan to support ASW implementation of digital signatures. Indonesia and Philippines said "no" and for Brunei and Singapore, not applicable. Cambodia and Lao PDR did not provide their responses	ASW / NSW	When needed
	Certificate Authority				
	Is there a government appointed Certificate Authority for government electronic transactions?	4	Number of Countries, is there a government appointed CA for government transactions? Malaysia, Myanmar, Philippines, and Vietnam said "Yes." Cambodia and Lao PDR did not provide their responses.	ASW / NSW	When needed

PKI Implementation				
Are digital signatures used in NSW transactions?	3	Number of Countries, is there a government appointed CA for government transactions? Malaysia, Thailand, and Vietnam said "Yes." Cambodia and Lao PDR did not provide their responses.	ASW / NSW	When needed
Are there any other government projects using digital signatures?	6	Number of Countries, is there a government appointed CA for government transactions? Brunei and Myanmar said "No." Cambodia and Lao PDR did not provide their responses.	ASW / NSW	When needed

Table 7: ASW / NSW Public Key Infrastructure KPIs

4.8 Key Performance Area - ASW Public Outreach (Awareness and Visibility)

As live operation of the ASW requires significant participation by all stakeholders, Member States are implementing a series of public outreach activities with the support of development partners to expand the awareness of ASEAN's efforts to implement the ASW platform while managing expectations and promote demand for governments and other stakeholders to expand the ASW.

Outreach activities in support of the ASW focuses on promotion efforts and raising awareness/knowledge about the ASW—both implementation and adoption—as a key element to support the establishment of the AEC, and that ASW benefits governments and businesses in the region, in line with the goal and objectives of the AEC

Challenges

To better determine how Member States could best support outreach efforts for the ASW work stream, it is important to understand the challenges faced by the program to raise awareness about the ASEAN Single Window and its operation.

The main challenges in implementing the ASW as a trade facilitation measure are:

- An ASW Potential Impact Survey conducted in September 2012 revealed that only 30 percent of the companies surveyed understand the concept of ASW and how it benefits all the stakeholders including government and private sector. Survey respondents represented mostly manufacturers, especially textiles and apparel and food industry manufacturers, but traders (importers and exporters) and logistics companies were also well represented. Findings at that time included:
 1. Paper forms were the primary means for government and companies to exchange cross-border documentation. E-mail was the means used most often in data exchange with commercial partners;
 2. The largest savings from the single window project were expected to come from the reduction of dispatch costs, particularly in the exchange of regulatory documentation;
 3. When processes are fully automated in the ASW/NSW framework – that is, when data are standardized and harmonized and when business processes are aligned – companies can expect to reduce the time they spend on documentation significantly; and
 4. The future of the ASW depends on the cooperation between the private sector and governments in outlining and implementing a vision of paperless clearance in ASEAN over time.
- The business sector has yet to be convinced that using the ASW will be much faster than the current process since some processes at the agency level will still be manual. What is in it for them to shift to a new system? What are the benefits for early bird users, and possible incentives to encourage the traders to use the ASW/NSW system?

The impact of the ASW will be felt gradually as National Single Windows integrate electronic cross-border data into pre-arrival clearance processes and risk management. There should be a business case that would translate to significant savings for the traders that using the ASW enabling infrastructure would be more beneficial.

The Communications and Outreach Plan for the ASW program aims to:

- Raise stakeholder awareness, especially (regional) governments and businesses, regarding the ASW as a key trade facilitation measure to achieve the ASEAN Economic Community goal – a single market and production base, and highly competitive economic region.
- Create a demand among private sector stakeholders for the adoption and continuous improvement of the ASW while managing stakeholder expectations about its early impact and implementation.

- After the commencement of live operation of the ASW, the outreach activities will shift to highlighting updates and milestones to show the impact of ASW implementation and expansion.
- Highlight ASW benefits and impact for a range of stakeholders (especially governments and businesses) to encourage other ASEAN member states to join and expand the ASW.

Public awareness supports the compliance impact of the ASEAN Single Window: traders are made aware of the enhanced ability of governments to detect offences and fraud through the data exchange and adjust their behaviour accordingly. Because behaviour of the traders is crucial for strengthening regulatory compliance, the role of effect awareness of the ASW is very important.

Key issue: Differing concepts, poor awareness and understanding of the importance and criticality of the ASW role among NSW and OGAs and the business community sector, with some interpreting the ASW as a “virtual” building or a one stop shop for trade approvals, and others as standard software which would facilitate information exchange among AMS OGAs and traders;

The Internet, as the most widespread medium, offers extremely scarce information on the role and importance of ASW. The ASW website provides basic information that is quite technical and very vague. To obtain a clearer overview of the ASW website, the consultant utilized Alexa⁵ and Quantcast⁶ (Checking website traffic and rank is the basis for uncovering actionable ideas). The limits of this analysis are set by the fact that both Alexa and Quantcast are subscription based services; therefore, the data presented below has been obtained through a free trial account.

The website itself – asw.asean.org offers little to no information on ASW. The ASW website particularly lacks information in the planned/future ASW services section. The last update was in 2016, in the Beyond 2015 section.

Referring domains, also known as "ref domain," are websites which have a backlink pointing to a page, or link, to the site asw.asean.org. In total, there is a 17 Referring Domains backlink pointing to the site asw.asean.org.

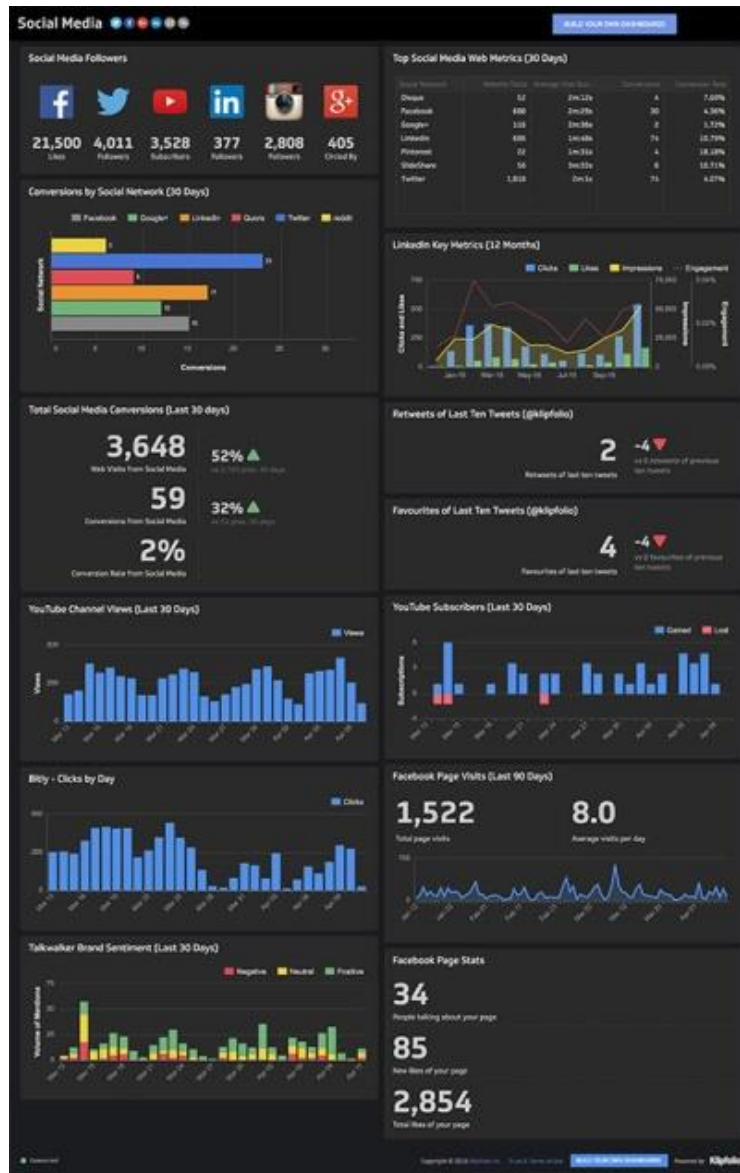
The impact of social media is vast for the business community; ASW should take advantage of this digital version of word-of-mouth marketing. However, “asw.asean.org” has not been widely shared on social media

⁵ <http://www.alexa.com/siteinfo>

⁶ <https://www.quantcast.com/measure/properties/>

Figure 5: Example – Social Media Business Intelligence Dashboard

4.9 Keyword consistency



Keyword consistency is the use of keywords throughout the different elements of the web page. Consistent keyword use helps crawlers index⁷ of your site and determines relevancy to search queries. The list above highlights the most frequently used keywords on “asw.asean.org” page and how consistently is used.

Keyword consistency results for <http://asw.asean.org>

- There are 727 words on page;
- Of those 727 words 260 words are linked ones with the key words;
- Of 727 words 467 are not linked;
 - Of 467 nonlinked words, 166 words are either stop words or have less than three phrases/characters – critical for most search engines – example: “ASEAN Single Window.”

⁷ https://en.wikipedia.org/wiki/Web_crawler

Web Traffic Share by AMS

The analysis conducted using Alexa has shown that only a few AMS access asw.asean.org and mostly refers to a handful of keywords. The rate of access through mobile devices is negligible compared to access through a desktop device.

Out of a total of 510 website visits during June 28th – July 28th, the largest portion of visits comes from Lao PDR – 70%.



Figure 6: Traffic Share by AMS

In most cases, the access to the website is through search engines. The image below shows traffic sources, were 75% is through search engines.

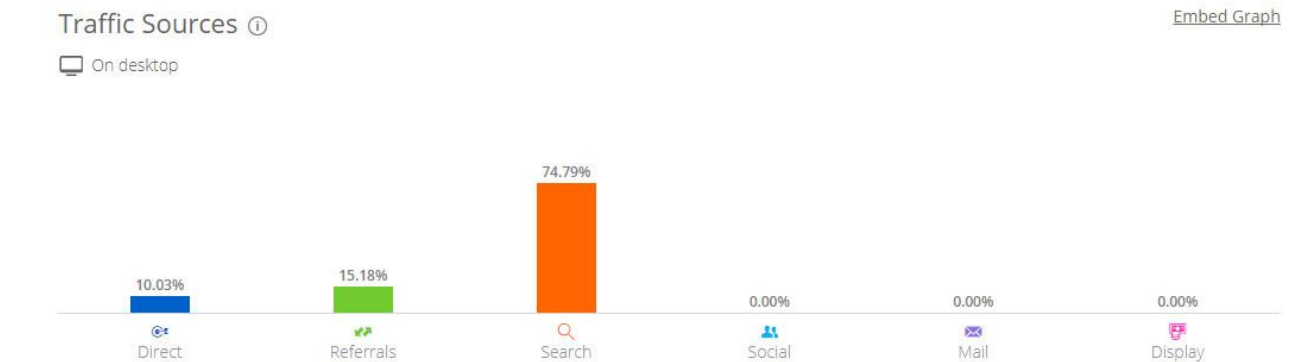


Figure 7: Web traffic sources

The table below represents the results of a search of the term “ASEAN Single Window” in google.com.

Position	url	Keyword	Engine	Mobile version
1	http://asw.asean.org/	ASEAN Single Window	Google	null
2	http://asw.asean.org/component/content/category/13-static-pages	ASEAN Single Window	Google	null
3	http://asw.asean.org/about-asw	ASEAN Single Window	Google	null
4	http://asw.asean.org/events/category/asean-single-window	ASEAN Single Window	Google	null
5	http://www.asean.org/storage/images/2015/October/outreach-document/Edited%20ASEAN%20Single%20Window-2.pdf	ASEAN Single Window	Google	null
6	http://asw.asean.org/news/item/vietnam-officially-joins-asean-single-window-customs-system	ASEAN Single Window	Google	null
7	http://www.miti.gov.my/index.php/pages/view/1284	ASEAN Single Window	Google	null

Position	url	Keyword	Engine	Mobile version
8	http://www.portcalls.com/phs-asw-connectivity-target-date-remains-unclear/	ASEAN Single Window	Google	null
9	http://pdf.usaid.gov/pdf_docs/PA00JKPP.pdf	ASEAN Single Window	Google	null
10	https://www.usaid.gov/vietnam/press-releases/sep-8-2015-vietnam-officially-joins-asean-single-window-customs-system	ASEAN Single Window	Google	null
11	http://pdf.usaid.gov/pdf_docs/Pnadm816.pdf	ASEAN Single Window	Google	null
12	http://www.conferencesw.org/SWC2013/uk/presentation/201309_Antananarivo_SW_Conference-ASW-Viboon_Chaojirapant.pdf	ASEAN Single Window	Google	null
13	http://www.dagangnet.com/trade-facilitation/asean-single-window/	ASEAN Single Window	Google	null
14	https://csis-prod.s3.amazonaws.com/s3fs-public/legacy_files/files/attachments/130829_GeorgeTan.pdf	ASEAN Single Window	Google	null
15	http://www.nathaninc.com/projects-and-cases/asean-single-window-2008-2012	ASEAN Single Window	Google	null
16	https://www.usaseanconnect.gov/pdfs/ACTI-Asean-Single-Window_Dec-2015.pdf	ASEAN Single Window	Google	null
17	http://www.bworldonline.com/content.php?section=Economy&title=single-window-trade-system-seen-integrated-with-asean-by-dec.&id=146868	ASEAN Single Window	Google	null
18	http://scholarworks.waldenu.edu/dissertations/3174/	ASEAN Single Window	Google	null
19	https://vnembassy-daressalaam.mofa.gov.vn/en-us/About%20Vietnam/General%20Information/Economic/Pages/Official-connect-ASEAN-Single-Window.aspx	ASEAN Single Window	Google	null
20	https://www.jiffa.or.jp/en/news/entry-4435.html	ASEAN Single Window	Google	null
21	http://www.customs.gov.kh/trade-facilitation/national-single-window/	ASEAN Single Window	Google	null
22	http://www.jus.uio.no/english/services/library/treaties/09/9-04/asean_protocol_single_window.xml	ASEAN Single Window	Google	null
23	https://unnex.unescap.org/content/cross-border-e-trade-asean-single-window	ASEAN Single Window	Google	null
24	http://www.jastpro.org/topics/pdf/asw_2012e.pdf	ASEAN Single Window	Google	null
25	https://www.slideshare.net/Africanalliance/asean-single-window-for-regional-integrationskswc2016	ASEAN Single Window	Google	null
26	http://www.dnex.com.my/dnex-enables-customers-leverage-on-asean-single-window/	ASEAN Single Window	Google	null
27	https://www.customs.gov.vn/Lists/EnglishNews/ViewDetails.aspx?ID=433	ASEAN Single Window	Google	null

Position	url	Keyword	Engine	Mobile version
28	http://customsnews.vn/establishment-of-the-national-steering-committee-for-the-asean-single-window-and-national-single-window-1226.html	ASEAN Single Window	Google	null
29	http://customstrade.asia/2017/06/20/ph-plans-year-end-nsw-linkup-with-asean-single-window/	ASEAN Single Window	Google	null
30	https://www.sbs.ox.ac.uk/cybersecurity-capacity/content/asean-single-window-project	ASEAN Single Window	Google	null

Table 8: Results of a search of the term “ASEAN Single Window” in google.com

Key Performance Indicator - ASW	Performance Indicator	Baseline Data (December 2017)	Year 1 Target	Year 1 Actual	Description and Unit of Measurement	Data Source / Reporting Authority
ASW Awareness and Visibility	General public and business community support	Medium	Medium		Making the general public and business community in AMS aware of the importance of the ASW services. Support the work it does, the problems in encounters	ASW / AMS NSW
	Public Relation Strategy / Communication and Visibility plan	Medium	Medium		Rating, increasing awareness of the ASW stakeholders	ASW
	Raising public awareness	High	High		Explain ASW objectives in a specific, measurable, achievable, realistic and timely manner <ul style="list-style-type: none"> • Conferences • Statements • Profile articles 	ASW / AMS NSW
	Provisions for feedback (when applicable)	Low	Medium		Publication of assessment forms or other means used to get feedback on the activity for each target group	ASW / AMS NSW
	Public awareness responsibilities	Medium	Medium		Identify the resources within the ASW / NSW / Customs Public Relation/who have public awareness responsibilities Raise awareness of how the ASW and the partner work	ASW / AMS NSW
	Financial resources	Low	Medium		Allocation of the budget required to	ASW

Key Performance Indicator - ASW	Performance Indicator	Baseline Data (December 2017)	Year 1 Target	Year 1 Actual	Description and Unit of Measurement	Data Source / Reporting Authority
					implement the awareness and visibility activities - in absolute figures and as a percentage of the overall ASW budget	
	Newsletters / Newspaper ads	Low	Low		Regular update the news / newsletter page of ASW and AMS NSW / Customs web sites - http://asw.asean.org/news - last update Friday, 01 April 2016	ASW / AMS NSW
	Referring Website/Ads on other sites	Low	Low		Banners (links) point to ASW <ul style="list-style-type: none"> • NSW • Customs • Forwarding Agents • Business community • Chamber of Commerce 	ASW / AMS NSW
	Social media activity /Present ASW on social platforms	Low	Medium		Create social media profiles associated with ASW (asw.asean.org) on Facebook, Pinterest, LinkedIn, Google+ and other sites that can be used to increase awareness of ASW	ASW / AMS NSW

Table 9: ASW Awareness and Visibility KPIs

5 Annex I, II and III Findings

The following findings have been observed through a statistical analysis of ASEAN member states' trade volumes data, collected through a World Bank methodology. The first portion of the report focuses on determining the trends of trade volume that can be observed in the ASEAN member states

prior to and after the process of implementation and integration, where applicable, of the Single Window system. The second portion focuses on determining the extent to which there is a change in tendency, positive or negative trade volumes, towards Total World volume and towards Total ASEAN volume. The final portion focuses on observing the trends of the ASEAN member states and their respective LPI ranking across four years prior to and after the operation of the ASW enabling infrastructure.

Key Performance Indicator -AMS	Performance Indicator	Description and Unit of Measurement
World Bank World Development National Indicators	Cost to export	US\$ per container
	Cost to export	Border compliance US\$
	Cost to export	Documentary compliance US\$
	Cost to import	US\$ per container
	Cost to import	Border compliance US\$
	Cost to import	Documentary compliance US\$
	Documents to export	Number
	Documents to import	Number
	Time to export	Days
	Time to export	Border compliance hours
	Time to export	Documentary compliance hours
	Time to import	Days
	Time to import	Border compliance hours
	Time to import	Documentary compliance hours

Table 10: World Bank World Development National KPIs

5.1 ASEAN Member States - Logistics Performance Index rank and score analysis

The ASEAN countries display a mixed trend with some countries backsliding in their overall logistics performance and others performing above the regional average.

Singapore topped the list of ASEAN countries for time period examined in this study.

Top performing countries are countries from ASW&NSW group of countries. The report found that a “logistics gap” exists between three groups of countries. The leading position in LPI ranking belongs to ASW&NSW countries, followed by NSW only, not ASW countries. Cambodia and Myanmar, grouped together as neither ASW nor NSW countries, are ranked lowest compared to the two other groups of countries.

Singapore, Malaysia, Thailand and Indonesia are countries that all outperformed the regional average, with Indonesia, Vietnam and the Philippines ranking high as well.

However, apart from Singapore, Myanmar and Cambodia, all other ASEAN countries backslide in their 2016 rankings compared to two years ago.

Lao PDR has dropped significantly in ranking in the measured period, and has the lowest rank from all ASEAN countries.

Infrastructure plays a big role in assuring basic connectivity and access to gateways for most developing countries. In all ASEAN countries except Singapore and Malaysia, the scores for infrastructure are lower than the overall scores.

Regarding timeliness, the frequency at which shipments reach their destination within the scheduled or expected time, ASEAN countries scored highest. Compared to 2014, Singapore showed the largest improvement in the timeliness indicator in 2016.

Key Performance Indicator - AMS	Performance Indicator	Description and Unit of Measurement
International LPI Performances	Efficiency of the clearance process (i.e., speed, simplicity and predictability of formalities) by border control agencies, including customs	LPI Performance show on a scale (lowest score to highest score) from 1 to 5 (worst to best)
	Quality of trade and transport related infrastructure (e.g., ports, railroads, roads, information technology);	LPI Performance show on a scale (lowest score to highest score) from 1 to 5 (worst to best)
	Ease of arranging competitively priced shipments	LPI Performance show on a scale (lowest score to highest score) from 1 to 5 (worst to best)
	Competence and quality of logistics services (e.g., transport operators, customs brokers)	LPI Performance show on a scale (lowest score to highest score) from 1 to 5 (worst to best)
	Ability to track and trace consignments	LPI Performance show on a scale (lowest score to highest score) from 1 to 5 (worst to best)
	Timeliness of shipments in reaching destination within the scheduled or expected delivery time	LPI Performance show on a scale (lowest score to highest score) from 1 to 5 (worst to best)

Table 11: AMS International LPI Performances KPIs

Key Performance Indicator -AMS	Performance Indicator	Description and Unit of Measurement	Description and Unit of Measurement
Domestic LPI: Performances	Export time and cost/ Port or airport supply chain	Lead time (days)	Cost (US\$)
	Export time and cost/ Land supply chain	Lead time (days)	Cost (US\$)
	Import time and cost/ Port or airport supply chain	Lead time (days)	Cost (US\$)
	Import time and cost/ Land supply chain	Lead time (days)	Cost (US\$)
	Shipments meeting quality criteria (%)		
	Number of agencies – exports		
	Number of agencies – imports		
	Number of documents – exports		
	Number of documents – imports		
Clearance time without physical inspection (days)			

Key Performance Indicator -AMS	Performance Indicator	Description and Unit of Measurement	Description and Unit of Measurement
	Clearance time with physical inspection (days)		
	Physical inspection (%)		
	Multiple inspections (%)		
	Declarations submitted and processed electronically and on-line (%)		
	Importers using a licensed Customs Broker (%)		
	Able to choose the location of the final clearance (%)		
	Goods released pending customs clearance (%)		

Table 12: AMS Domestic LPI Performances KPIs