

## Port Community System in Central America and its Global Trade Impact

Luis Alfredo Alfaro\*, Huyng Rim Choi, Thi My Hanh Le

<sup>1</sup>*Department of Port and Logistics Systems, Dong-A University,  
Busan, South Korea*

<sup>2</sup>*Department of Management Information Systems, Dong-A University,  
Busan, South Korea*

<sup>3</sup>*Department of Port and Logistics Systems, Dong-A University, Busan,  
South Korea*

*myamerica81@gmail.com, hr.choi@dau.ac.kr, hanhle74@gmail.com*

### Abstract

*The ongoing infrastructure, networking road connectivity supported by foreign governments in most of the Central American countries in order to strengthen roads, net-like supply chain, port development & business models, etc. basically has prevail in Latin America and the Caribbean countries (LACC) with a tremendous progress due to major economic reforms and countries laws creation to enhance public-private partnership/Asocio projects carried out since in the early 1990's and the 2000's. However, Central America still needs more investment to develop a foreshadowing framework of compromise exhaustion in different quantitative and qualitative countenance, a case in point is the working plan to acquire high level of snarl-up in infrastructure network of transport services (including no only road access, efficiently transmission of electronic documents, national and regional government agencies communication, cargo inspection areas, single point checking, borders protection, etc.); but also there is a deficit or evolvment to attain and keep soaring level standards of operation through a systematic Informatics Coordination Systems implementation in the logistic port chain, where projects such as Port Community Systems (PCS) and Port Single Windows (PSW) adjusts an value added. This research introduce the case of Central America in recent years and overlook the minimum results achieved, even remark some situations of investment to improve idle failure system which still remaining a challenge, detail conflict situations and its forcing proposals to invigorate public-private partnership/Asocio projects as a way to create a bona fide Port Community Systems across the said region.*

**Keywords:** *Port Community System (PCS), Single Window (SW), Central American Governments, Cost & Benefits of PCS, Port and Logistics Investments, Public-Private-Partnership/(Asocio), Information Exchange, Safety, Customs Technology Necessity*

### 1. Introduction

This research explores different promulgation in finding best practices applied worldwide and later adoption from Central America to obtain port governance, international shrewd standards, operational ameliorations, based on modern management of logistic port chains & execution of technical guidelines for gradual utilization of information technology like Port Community Systems/ Single Window, hereafter PCS/

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\* Corresponding Author

SW. The study includes a series of recommendations and professional arguments observed in each country as a regional consensus to create public policies and make the effort by proposing the expected results to the political debates level of each Government through their Port Authorities in Central America to adopt the Information System Development Community. In that sense, this research proposes the following questions:

PRQ1: Is there real benefits vs. costs in the adoption of PCS/ SW implementation across Central America?

PRQ2: What can certainly guarantee benefits and minimize disadvantages of the costs and profit from a stakeholder perspective according with the current business environment of Central America in case of using a PCS/ SW scheme?

## 2. Port Activity in Central America

Port selection can be based on several criteria, from physical characteristics and geographical location to port efficiency, strategic carrier considerations, and hinterland access. [2] (Wilmsmeier and Notteboom, 2011). Magala and Sammons (2008) argued that port choice is a by-product of the choice of a logistics pathway. Thus, the port choice becomes more a function of the overall network cost and performance. From the carrier's perspective, the economies of scale, scope, and density in shipping, port operations, and inland operations would favor a very limited number of load centers in a region (Cullinane and Khanna, 2000; and Frémont and Soppé, 2007). It appears that networks in the Latin America and the Caribbean countries, henceforward LACC region are being served by a *hub-and-spoke network*; as secondary network of smaller regional services are starting to develop, and shipping lines can now offer direct services from these ports to overseas regions.

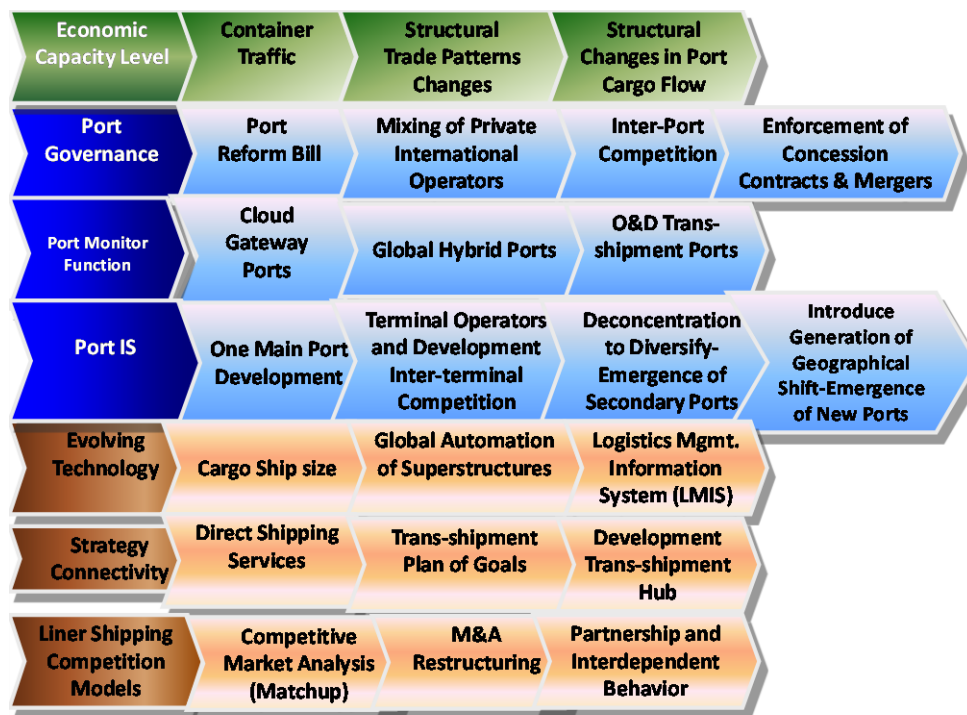
The change in services lacks an analysis process in Central America [1] which without discussion could undermines operations, inefficiency of the existing hubs as seek liner service connections and other ports in the region do not have high connectivity to overseas markets (Wilmsmeier and Notteboom, 2011). Central American Ports can take on "the challenge of the periphery" (Barke, 1986; Hayuth, 1981; and Slack and Wang, 2002); in particular by using a *secondary ports concept* the region may take advantage of wider trends such as the limits of concentration and reposition themselves in a network that currently needs changes as there is some outdated system used in the hubs to innovate for new structures. In order to understand how secondary ports act under such conditions, a more complex and nuanced view of the port's ability action is required.

Maritime transportation is among the most important mode to export commodities from Central America; some in specific serves to vast countries of the world and has straight inference in core regional competitiveness. The Central American region encompasses about 14 large container ports located on both (the Atlantic and Pacific coasts). [3] For instance, four are located in Panama, three in Guatemala, two in Costa Rica and two in El Salvador (officially only one is fully operating while La Union Port yet defines its local strategy of competition either by concession or any other business model of operations), the rest of the region have just one or two. The quantity of terminals positioned in Central America offers a valuable asset in the region as a nucleus strategic location with easy access to the main international maritime routes. The significant growth of containerization in recent years, categorize a tremendous opportunity to operate business by improving first its operational efficiency and infrastructure before becoming a "priority in face" of an increasingly higher demand in the maritime shipping sector and *future potential port services transshipments*.

Central America [3] has to open the challenge in creating new policies to analyze implications, evaluate the devolution of port management, analogous operations and more commonly, the deregulation of transport services in this economic zone; additionally, it needs the release of new opportunities as well as the Maritime development in the region,

facilitated through the regional governments to open the doors to adopt the port logistics like the structural of “going in the course of a transformed institutional structure” in which all actors and their relationships are proactively embedded to the point where a new role of containerization in Central America will spontaneously appears; such transformation impels the design of innovative strategies & master plan structural requirements to find investment infrastructure on behalf of obtaining successful port operational businesses, capability to make specialized process and institutional adaptation (movers). Fig 1. shows the critical moments of Port Community Development as the most important progress in Central America and the current demands in terms of cooperation to improve the region’s port development container ports environment to progress diverse operational areas more “effectively” to attract larger cargo volumes (a necessity adjusted to the new Panama Canal expansion and the competition of traders).

The Panama raise success, for instance awareness the example to see how other Central America countries are trying to expand their infrastructure services to reach their “own business criteria” of their physical capacity to enter into the rest of countries running this type of business and container terminals with infrastructure quality and expansion services. Firstly, to assets such improvement, Central America would need to develop operational efficiency to increase throughput, some of this affirmation directly measure clue concepts of “*innovation of its main container ports, systems*”, and other issues in each country such as, Puerto Limón & Moín in Costa Rica that urgently requires an expansion of its physical capacity, even though it is actually addressed by a new container terminal under construction. On the other hand, many principal ports, including Puerto Corinto-NIC, Puerto Acajutla-SLV, and Puerto Cortés-HON are underutilizing their present infrastructure endowment and there is room to scale up operations.



**Figure 1. Critical Moments in Central America to Adopt the PCS/ SW Development. Main Author Data Collection and Analysis**

The improvement of port performance and border efficiency contributes in directing cargo to underutilized ports. When analyzing the PCS/ SW and its Global Impact in the trading market it is important to consider a pre-system and leap to totally evolution of

Port System and Sub-Systems regionally and locally in each country; to execute this strategy, it is important to approach not only the path dependence wield by traditional-dominant ports (like Guatemala and Panama cases) but also consider the existence or impact of a possible port development on port decentralization, competition and public planning support. [4] *Ports in Central America cannot achieve a large competition and innovation as far as single Port Authorities decide control, policy, and operations of their terminals (an exception of this statement is the Panama Canal due the leading management structure).*

### **3. The General Single Window Approach**

The SW concept was introduced early in the last decade, initiated, recognized and promoted by diverse world organizations concerned on trade facilitation. Some leading promoters are, the United Nations Economic Commission for Europe (UNECE) through its Centre for Trade Facilitation and Electronic Business known as (UN/CEFACT), the principal World Customs Organization (WCO), the program launched by the United Nations Network of Experts for Paperless Trade and Transport in Asia and the Pacific (UNNEExT), a singular project named SITPRO with a limited used in the United Kingdom only and the biggest recognized worldwide Association of Southeast Asian Nations (ASEAN).

There is a phenomena in the rapid trade boundaries started early 1980s and 1990s, which grounded in a majority of countries to start to see SW as a facility of considerably support and the mechanism to enhance different measures, method, systematic procedures in implementing reforms for international standards, routine and leverage of tools by making the process simple and expedited to provide information with high flow between traders, government and other related parties. PCS in specific applying a SW boundaries absolutely contribute in simplifying processes, arrange & harmonize data, increase transparency among the participants or any other singular user, improve the concept of sharing relevant information across governmental agencies, serve as a channel of the systems used by those country's counterpart and other third party (controlling authorities). Some more benefits include, a connection of systems in harmony with a single point or SW to improved efficiency of every process, effectiveness of controls in each stage of its use and the most valuable point of reduction in costs both for governments & the private sector (traders and any user looking to access information), this kind of technology allows a better use of resources and modifies the concept of routine working, as it can bring meaningful gains to the whole parties included in cross-border trade segments.

### **4. National Single Window in Central America**

The SW concept is stated in the Recommendation No. 33, UNECE, it is defined as a “facility that allows parties involved in trade and transport to lodge standardized trade-related information and/or documents to be submitted once at a single entry point to fulfill all import, export, and transit-related regulatory requirements. The case of Central America in general is even yet in a middle basic stage of its adoption and applicability; such problems are due the differences of skepticism. Some other top reasons causing poor execution in processing information through a PCS/ SW is the factor limitation of political willingness to adopt its benefits and “control” custom procedures. However, it is also truth that financial and training of human resources to operate its technology is deprived which leaves the infrastructure and subsequent projects without changes in the traditional way of doing things, affecting the general interest from the Customs Service Agencies to adopt and change procedures, among other serious reasons.

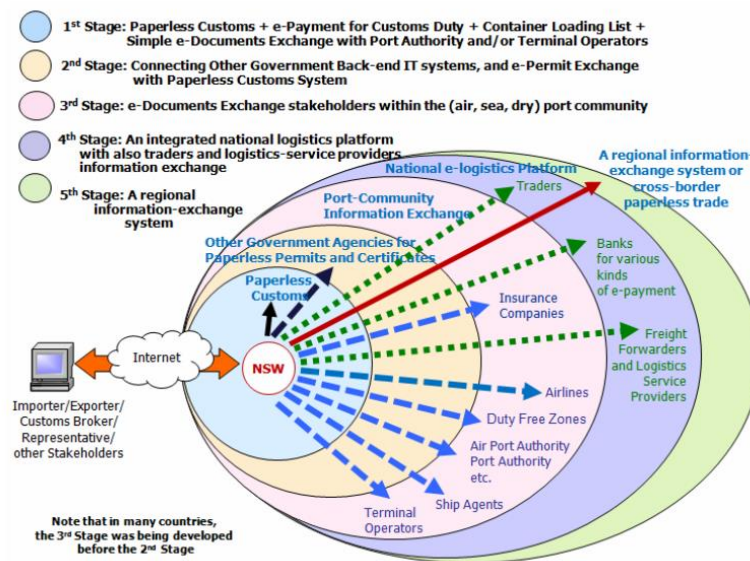
Even though Central America is not an extensive region in terms of geography (7 countries, 521,499 KM<sup>2</sup> and a population as of 40,001,000 millions), the SW project is not

fully considered to improve operational basis, for instance the project may be not a top priority in most of these countries; some countries in Central America justify the SW as a project of complexity and cost-undertaking in its specific adoption, a situation that includes specially the founding resources to adopt this pattern of information under highly offering to reach a top priority. According with the rhetorical history of LACC, in specific Central America, the implementation of PCS/ SW is something more belong to the “adoption of the project but political willing first” so that commitment to cooperate into the standardization of Customs borders, the Supply Chain and cross-border trade processes, etc. could be a reality.

#### **4.1 Progress of the National Single Window in Central America**

The United Nations Network of Experts for paperless Trade (UNNEXT) has a very basic and traditional approach to develop a SW implementation and each component classified as “forward to the next stages”. The roadmap presented in the Fig. 2. As it is indicated, depicts five different stages which must be adopted by following an ascend trajectory; the culmination of stage (1) means move on to continue progressing up to achieve fully adoption (5<sup>th</sup> stage in the Fig. 2). In theory, the case of Central America (and not entirely including Panama) may be at the present working a mixture phase between stages 1 & 2, which even include some limitations as there is not full integrative-adoption stages due some external reasons and applicability understanding of the roadmap (explained in the previous numeral 4). This statement then calls for a better improvement and design a group strategy to enhance as a region the “single real physical roof”, since the virtual link in all of stages or its regional situation mostly is currently a kind of “Poor Trade Point - PCS/ SW project” rather than an exclusive & integrative plan looking to provide all benefits cited paragraphs before, to create an assurance to fulfill requirements of trading transactions and framework integration through the communication and efficiency of these PCS/ SW systems.

Central America and the PCS/ SW project at all could serve as a gateway to the world to increase the movement of goods, technology transfer, etc. However, Central America is compromised to innovate its technology infrastructure factors to offer a better global electronic networks, this shift would include (internet access and its coverage, educational programs, training of human resources, port and logistics road and rail network, information systems with all national and private sectors, integration of other government agencies (OGAs), Customs-Single-Windows for a variation of the limited SW which in some cases creates a misunderstanding between the concepts of Custom Single Window vs. Single Window itself). Otherwise, if these technology factors are not adopted, the existence of worldwide interconnectivity through electronic network (EDI) expansion, VAN providers or the fully share of information and communication emerge with stagnant.



**Figure 2. Representative Approach of Single Window. Source: UNNEXT**

While developed countries and some other developing countries located mostly in Asia, all these countries have created together a working plan toward the implementation of the National and Regional PCS/ SW as their economies created the “demand”, a sentiment and understanding of the use and benefits obtained when the PCS/ SW is adopted; in part this importance and necessary tool is implemented to level up operations; unfortunately there is not the same adoption in some Central American countries and the full benefits of its adoption is far beyond the early stages; across LACC there is a few exceptional cases such as, Chile, Colombia, Belize and the recently adoption in Panama leading this PCS/ SW initiative.

A pre-SW was first used in 1960s – 1970s and adopted by a few Customs authorities when they started to automate functions systems through the ASYCUDA (Automated System of Customs Data) provided by the United Nations Conference on Trade and Development (UNCTAD). Central American nations have not retaken this idea initiated a few decades ago with the intention to studying the “Trade Points”, at that time, the data provided was simple but useful to create business and market opportunities. In the other hand, SW itself and the adoption pretends that Customs border protection, financial groups (banks), office of chambers for commerce, service freight forwarders, transportation companies, insurance corporations, etc. would certainly obtain security of information, real time access, regional transparency, sharing information with related and non related parties, efficiency, low risk of corrupted activities, and a fully integration scope as a regional/ global PCS/ SW project.

## 5. Integration of the Port Community Systems in Central America

It is not the case of customs/ borders security protection from Central America but some other worldwide port authorities where the provision for a substantial impact on the improvement trade and recently the customs at Port Authorities have also decided to operate a starting and limited option called port-centric, which in somehow is a “SW”, known with different name under the term a “Port Single Window” or “PCS”. In general, this port-centric/ Port Single Window acts as a networking system which by adopting a singular service is capable to provide a central, local, regional or even international levels to guarantee information regarding the flow of vessel where worldwide agencies or Port Authorities on notable port levels applies the model of B2G (Business to Government)

basis; while the exceptional PCS is in charge of providing a tool to exchange information such as messages within the port environment, transmit a commercial and sophisticated logistic nature and adding an important layer of B2B (Business to Business) role even worldwide basis.

In some countries (develop economies) the PCS is already in operation, offers successfully and distinguished Information Communication Technology (ICT) that procures a “centrally operated system for sharing, transferring data and implementing other variety of services where the support of this data collection, not only benefit government, companies, system integration, etc. The use of this PCS/ SW platforms operates in most of the cases "real-time information" regarding the sea-borne transport. As the term and applicability is not new in developed economies, its broader benefits is still gaining expansion and improvements, perhaps due the adoption benefits, PCS/ SW in Central America does not allow bilateral data transfer”. In case of Central America if this PCS/ SW is implemented, then the adoption of other linked new technologies are necessary, for instances; Cloud Computing (CC), Virtual Reality (VR), Artificial Intelligent (AI) which allows the applications to serve data collected on the Internet (forcing Central America automatically to invest heavily in the concept, technology and expertise to provide increased speed and data transfer communication) not only in cloud servers, but also apps beyond cloud services to reach and shared by participating parties a whole involve services & structural dynamics in the process of supply chain networking operations.

For instances, the use of CC services in Central America is still low and therefore bringing the concept to the cloud service for national, regional and international Single Windows is very new, basically not explored at all, creating in consequence principal concerned issues regards the access to structure and unstructured data, analysis, quality, other restricted data, privacy, layers of security, not alternative or misuse of accessing information, reliability in the processing stage of information, confident or liability of results in the data, inexistent entity for a lawful authority in the data access and other critical points. Even though CC has options to operate a Single Window implementation through the basis of a public “cloud” where all access to the data is basically given to the general public/ public host, this yet fully exist in Central America due low confidence, investment and other reasons like “unique private clouds”, application & uses. Due the previous constraints data services are restricted to single or centralize providers; at that point cloud services classification certainly may be a great option in Central America but depends of the availability invest and pay such services. Table 1. includes a general background of the group/ documents currently used in the custom borders per country to import and export in Central America.

The documents either to export or import include evidence such as: Bill of lading, Certificate of origin, Commercial invoice, Customs Export Declaration, Non-Intrusive Scanner Payment Receipt, Packing list, Road Transport Document, Terminal handling receipt, Transit document.

**Table 1. Documents by Country used in the Process of Export and Import from/to Central America**

Country	No. Documents to Export	No. Documents to Import
Guatemala	9	6
Belize	7	7
El Salvador	9	9
Honduras	9	7
Nicaragua	10	5
Costa Rica	6	5

Panama	4	3
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\*\*\*\* The information in this table was structure by the main author’s based on different technical, academic researches and other resources

## 6. Risk Allocation and Public Private Partnership

### 6.1 Port Community System/ Single Window Projects: The case of Central America

The concept of risk allocation is also a main constrain in the development of technology to control container terminals, port strategy, and customs borders where a strict policy in Central America, for instance the implementation of a PCS/ SW is not highly demanded due the lack in investment cooperation either from the National or International community interested to invest in the region, specially the North Triangle as it is an strategically boundary for future trading. In terms of PCS/ SW currently only a few improvements exist, in specific regarding the aircraft traffic control borders. In Central America, the main partner is the United States of America due the facilitation of trading, movement of people and plan developments. Among the content of risk allocation, Public Private Partnership projects (PPP) is usually the priority concept used in this kind of cooperation. The PPP risk allocation is relatively a common concept but actually it is only in a early implementation, sometimes amenable of modifications by the time of realization and collaborative framework in terms of project development. Even though the meaning is straightforward, the concept of risks should be allocated through the combination parties (public or private) as the best enables of management. Any PPP participating party is the best to understand a risk (investors and collaborators), control the likelihood of risk occurrence and/or minimize the risk impact capable to response on time for managing [11].

The idea of identifying the best method to allocate risk in Central American projects under the PPP umbrella is in somehow difficult as the measures (internal and external) has the limitation of access to strategically information, the country’s risk (insecurity and education) which is classified from low to high levels and this phenomena limits the vision of creating a integration of communities for a better communication between nations, therefore the necessity to leverage standards in security and society education before going through innovated platforms of services like PCS/ SW requires a in-depth necessity of changes and each Government should not ignore this issue. From an international perspective, the risk allocation in collaboration with the party managing the risk also tends to evaluate or bears its financial cost. Central America needs to work a regional master plan to cooperate, face incentives for technology infrastructure in order to mitigate the risk transcend from a traditional perspective to an amply concept of future investment and better connectivity into a net of nets integrating the Port Communities. If these principles are adopted, then risk allocation may be assumed or spread by the parties to generate the most efficient risk allocation, lowest costs of the projects and greatest investment return over the capital. Risk allocation also demands optimal evaluation as one of the main key strategies in terms of investment and its return in a PPP delivery model.

The diversity of PPP models, usually consider risk allocation as the core medium-long-term risks operated by the public investments in the agencies. Central America yet is in demand to consider a PPP model where people also become the main target and scenario of the allocation (Public Private Partnership and People [PPPP]). Risk allocation needs to allow the public sector agencies to transfer risks in the private party, as a relieving of bearing the cost of risks which cannot totally turn manageable—such as cost overruns. In some develop economies the PPP approach is pursued when the involvement from the private sector is related to lead the infrastructures or other projects to generate greater returns of the investments—or a larger positive net gain to the society—this private sector always procured to work a special “via conventional approach”.



Central America needs to cooperate in the structural framework PPP project not only to generate infrastructure but also a model capable of offering (i) standard cost efficiencies, applying a lower construction, management/ operational and/or maintenance costs; (ii) return in terms of time savings, efficiency through an earlier completion of the project; education vision & training and/or (iii) people together with technology to offer quality enhancement competitiveness and final enhancement service provision. In recent years the definitions of return in investment and risk allocation are being merged in to a variety depending on the countries or jurisdiction. However, it is not the same concept in regions, for example risk allocation in the European zone is totally different in comparison with the United States of America where in each case, risk allocation in terms of value return is classified as “the optimum combination & whole-of life costs respectively as quality (fitness for purposes) of the good or service needs to meet the user’s requirements” (HM Treasury, 2006). Similarly, some other agencies classify PPP projects to yield value for money if the result obtained is a net positive gain to society which is better than any alternative procurement route” (European Investment Bank, 2015).

The sufficient conditions to effectively control the risk allocation, more creativeness and innovative thinking could help to performance these unique characteristics in Central America. A model of PPP is not only to request financial cooperation to execute projects in their home countries, organizations, etc. rather than that additional guiding principles are required; including considering parties (private or public) provide the greatest incentives to undertake preventative risk management and to minimize the financial consequences of a risk. It not recommended to continue working a strategy or model where there is only partially transferring risks which are typically fully retained by the public sector as this may not create incentives into the private sector, more cost-efficient solutions is necessary. Central America recently is demanding innovated ideas to execute a policy of PCS/ SW under a sustainability basis before taking projects as the risk, up to date it is transforming and considering other factors throughout the life’s project, general guiding principles or “the ruling PPP framework” when this balance in project is applied, the output itself should provide enough planning to create management predictability of unexpected risks or emergence in new risks.

Finally, Central America is a region where throughout the risk allocation process, parties should avoid pursuing overly sophisticated risk management strategies which result in eminent monitoring, transaction and management costs, eroding as a consequence the investment returns in terms of people as beneficiaries of the projects and policies of constructive project-initiatives such as PCS/ SW.

## **7. Recommendation – National and Regional Public Policy Guidelines and Conclusion**

Port Community Systems/ Single Window (PCS/ SW), is a complex Information Communication Technology (ICT) systems which requires finding new technologies and Information Systems to apply its benefits, in case of Central America, the project should be carefully planned and evaluated in order to determine potential real monetary benefits derived from such implementation. This PCS/ SW suitability plan, demands quantitative or qualitative measures (in nature subjective). The quantitative benefits evaluates classic project management methodology and financial indicators and methods, while qualitative benefits are best suited to exploited boundaries through strategic analysis. Analysis and assiduous consideration is needed during its planning stage; this ICT initiative contains measure standards to avoid biased input parameters to limit obscuring the outputs. The main author in this study exemplifies the current situation of Central America regards the adoption of PCS/ SW by considering core administrative areas, contribute through the research in core areas of planning, investment, priorities & evaluation, internal analysis subprojects, the research also includes the risks allocation, PCS/ SW implementation

stages, cost-benefit, return in the strategy management and value-added analysis to approach a futuristic PCS/ SW framework development project across Central America.

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## Authors



Luis A. M. Alfaro, is the main author and an executive researcher at the National Research Foundation of Korea (BK 21 PLUS), the biggest research program organization supported by the South Korea Government. Luis A. M. Alfaro holds Engineering and Business degrees obtained in South Korea and El Salvador, as well as certifications in ICT, business, port & logistics and supply chain management to name a few.

He is the nephew of Maximiliano Hernández Martínez, former President of the Republic of El Salvador who was also a leader representing as a General the Salvadoran Army (FAES), among other high positions such as head department of the Ministry of Defense and Navy.

Luis A. M. Alfaro, applies his motto which aims to continuously make efforts in the present to discover new technologies, economic mechanisms, social interaction with a global channel vision focusing on public - private sectors to innovate business models, the strengthen of ports, logistics, management, explore global financial systems, aerospace, and supply chain managements of the future.