



Customs digitalization and its role in activating international trade logistics - South of Korea experience single window -

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Abstract:

This research focuses on the role of new technology in customs administration to enhance international trade logistics. It combines a descriptive analytical approach with a case study of Korea's advanced Single Window system, UNI-PASS, which has significantly improved efficiency, reduced costs, and streamlined customs operations.

In Algeria, logistics services face challenges, with costs 37% higher than in other countries. The study concludes that modernizing Algeria's customs systems, inspired by the Korean model, is crucial to improving customs clearance, reducing costs, and enabling the implementation of projects like the Customs Single Window to boost the country's trade logistics performance.

Key words: Foreign Trade, Customs, International Logistics, digitalization, Single Window.

Jel Classification Codes : F1 ; F19 ; F02 ; F2

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Introduction:

The customs administration plays an important role in increasing the volume of trade, by facilitating trade operations from export and import and diversification, as customs work to organize this trade at the borders, but with the development of technology, the customs administration has changed its direction, as technology contributes to reducing the duration of customs clearance as well as the speed of release of goods resulting from the speed of studying documents and information related to the process (import, export) away from paper bureaucracy and thus linking the various dealers of the logistics chain automatically, Reducing foreign trade costs and attracting foreign investment to raise the level of economic growth.

The information technology revolution has changed the course of international trade, by establishing modern websites and electronic platforms to manage international supply chains, and facilitates customs clearance for economic customers without going through the stages of administrative bureaucracy and avoiding paper documents in clearance. Algeria, like other countries, seeks to develop the customs apparatus to facilitate international transactions through the development of the information network of customs by issuing the decision in the Official Gazette in 2017 to establish a national center for reference and information system to activate import and export operations for economic operators, Additionally, Algeria sought to draw on the Korean experience in digitizing customs administration, but obstacles prevented the completion and implementation of the project. On the basis we have posed the following problem:

What is the role of the digitization of customs operations, inspired by the South Korean experience, on the activation of international logistics?

In order to take note of the subject of the study, the following questions can be asked:

- 1- What is the relationship between customs and the international logistics chain?
- 2- How can digitalization reduce the time of customs operations?

To answer the problem of the study and the sub-questions, the following basic hypothesis can be developed:

- **The digitization of customs operations has a positive role on the activation of international logistics by application new technology as single window as south of Korea experience.**

Objectives of the study: The study aims to clarify the nature of the relationship between customs operations and international supply chain, as well as to know the role of digitization in improving the movement of foreign trade and activating supply chains (foreign trade logistics).

1. Research methodology

We used the descriptive analytical approach by presenting various study concepts, data analysis and findings, and the case study approach by researching in the field and presenting the Korean experience in modernizing customs systems.

Research sections: The research section is as follows:

- Customs administration and logistics operations: Various concepts related to customs administration and modern logistics operations that would promote international economies and their foreign trade have been identified.
- The development of Algerian customs through field research and previous studies, then presenting the Korean experience in the digitization of customs to increase foreign trade revenues.

Previous studies:

1- **Dr. Halis Abdelkader, associat professor A at Ashour Zayan University of Djelfa, Digital Customs (A Case Study of Algerian Customs), Journal of Business Administration and Economic Studies, Volume No. 07, Issue 02, 2021, pp. 601-614** This study aimed to study the information and automated management system of customs SIGAD which has been developed since 1995 and is the only source of foreign trade statistics in

Algeria, and found the existence of a new information system much better than SIGAD which has not been launched so far without knowing the reasons.

2- Guendouz Aicha, Allaoui Safia, Ammar Tliji University of Laghouat, the role of the customs agent in facilitating Foreign Trade, Journal of Studies in Economics and Business Administration, Volume 03 Issue 06 December 2020:

This study aimed to study the customs agent, who is one of the most important parties to the customs clearance process, who is responsible for all stages of this process, and reached its impact on facilitating international trade exchanges.

3- Par Jean-Michel THILLIER head of service, adjoint at the general direction of customs and indirects lows, Adaptation of customs clearance operations to the globalization of trade exchanges , Annales des Mines - Réalités industrielles, n04 – novembre2015, pp78-81 :

This study aimed to study the importance of customs and its relationship to international trade transactions, especially international supply chains, where it concluded the need to develop and modernize customs administration to monitor and protect the international logistics chain of the European Union.

Research Gap: Our study examines the role of modernizing the customs sector in the logistics chain through the development of information technology to reduce the time of customs operations that reduce the costs of international logistics operations (import and export), which is the biggest obstacle in disrupting foreign trade in Algeria.

2. Customs Administration and Logistics Operations:

2.1 World Customs Organization:

It was established in 1952 as the Customs Cooperation Council in the Belgian capital, Brussels, and in 1994 the name was changed to the World Customs Organization with the inclusion of 164 customs administrations at the time, which became 184 customs administrations today, and is the only specialist in customs matters and the representative of the international customs community (wcoomd) .

2.2 Functions of the World Customs Organization (wco): WCO has many tasks (ferrah, 2017/2018) :

- Standardization and facilitation of international trade;
- Providing highly efficient customs systems by searching for the necessary modern technologies;
- Arbitration of the movement of persons, goods and shipments between Member States by specifying the necessary procedures for this;
- Assist Member States in addressing current economic and international fluctuations;

2.3 Role of the World Customs Organization in facilitating international trade:

Since 2005, delegations from the World Customs Organization (WCO) have participated in most of the activities related to international trade and facilitation of the World Trade Organization, in addition to the evaluation and development processes for trade facilitation, so the relationship between these two organizations is very strong within the framework of facilitating international trade operations, as embodied in many events and agreements such as the Kyoto Agreement 2006, and the Bali Agreement 2013, and among the objectives agreed between the two organizations (DR Halis, 2017) :

- Automatically determine the laws and regulations in force internationally regarding the exchange of customs information represented in the data on import and handling permit, and data on economic operators;
- Setting appropriate customs standards for trade exchange, especially for Member States;

- administrative cooperation between Member States;
- Based on the principle of reciprocity;
- Support capacity building in international trade facilitation.

2.4 Customs and international trade logistics:

2.4.1 International Trade Logistics:

It is the use of all methods used in traditional logistics (the management of all processes of the product from the supply of raw materials until the delivery of the product to the consumer or the final customer), in order to manage the tight and optimal agreements of goods and persons at the international level, including export and import operations, as well as the organization of cross-border commercial transport (logistique conseil) .

2.4.2 Logistic Performance Index:

It is a standard tool developed by the Central Bank, where it first appeared in 2007, its goal is to help countries identify weaknesses and strengths in their trade logistics, and develop the necessary measures to improve them. The measurement or survey process is carried out every two years and covers about 160 countries for six components of the performance of logistics services on a scale from 01 crossing for the worst, to 05 crossing for the better. (escwa, 2017)

2.4.3 Components of the Logistics Performance Index :Consists of six indicators (transport, 2016):

1. **Customs:** represents the efficiency of cross-border customs clearance operations;
2. **Infrastructure:** transport from ports, roads, railways, storage warehouses, and information and communication technology;
3. **Quality of logistics services:** the efficiency of transport workers, customs brokers and freight forwarders;
4. **Ease of arranging shipments** at competitive prices;
5. **Timing:** Efficient delivery of shipments on time or expected;
6. **Tracking and tracking:** the ability to track shipments until they arrive;

2.4.4 Objectives: The Logistics Performance Index has several objectives (amirta & al, 2017):

- Reduce logistical costs to achieve international competitiveness in international trade;
- Increase reliability in terms of continuity, service performance, and increased trust;
- Increased safety of goods and shipments until they arrive without any losses;
- Increasing financial returns, which in turn accrue to economic growth;
- Increasing foreign investment flows in the country due to low logistical costs;
- Reducing the time required for customs clearance helps reduce the logistical costs of international trade in addition to increasing opportunities to enter new markets, and some Datasets have proven that reducing 10% of customs clearance time leads to an increase in trade by 5% to 8%.

2.4.5 Customs clearance:

Customs clearance is defined as "**the process carried out by the person who is loyal to clear the material, whatever its form or type, to remove that material from warehouses or from the hands of customs legally, and after collecting the prescribed fees, and this material is one of the materials allowed to enter the country**" and therefore it is a customs process for the entry of goods and materials from inside and outside the country (alane alimane & ahmed, 2009) .

- Customs comes first at the front of international trade exchange, trade liberalization can complicate supplies, logistics and transported materials if customs laws are not imposed on them by spreading idleness and smuggling, so customs and customs clearance operations maintain international security and safety, so the development of customs services at borders maintains a balance between border security, International Trade Facilities (Thillier, 2015) .
- The World Customs Organization has recognized the need to integrate information and communication technology within legal limits without using it other than what is

prescribed by law according to the amended Kyoto Convention, to speed up and audit customs clearance, which would speed up trade operations, especially logistics.

Among the problems that plague customs clearance (guendouz & allaoui, 2020):

- Lack of transparency in the submission of customs declarations for shipments;
- Fraud in providing the correct certificates;
- Forgery of documents and documents;
- Holidays and occasions where administrative work is disrupted like an automation is done directly in the designated floor;
- Natural and political fluctuations, including the epidemic, such as the latest Corona pandemic.

2.5 Automation of customs and facilitation of customs operations:

2.5.1 The concept of customs automation:

It is the application of the latest information and communication technologies in the management of customs administration, and this includes all customs operations, especially international ones, such as the customs clearance process from the beginning of the request to address the passage of shipments for import and export, and the clearance of duties and taxes necessary to release goods faster and this is due to the speed of risk management (unece) .

2.5.2 Advantages and Benefits of Automation in Customs Administration (kyoto, 2014) :

- Achieve very precise customs control by means of electronic information matching;
- Improving customs services by speeding up various customs operations including customs clearance;
- Reduce the costs of economic operators;
- Reduction of shipping, transportation and storage costs (logistics);
- Imposing and increasing care to fight fraud;
- Achieve accurate analysis of information.

3. The development of Algerian customs in accordance with information and communication technology and the renaissance of foreign trade:

3.1 Information and communication system in the Algerian customs administration:

3.1.1 Système d'information et gestion automatisé de la douane (SIGAD) :

It was launched in 1995 to facilitate customs operations in import and export to avoid complications, but unfortunately it did not cover all customs functions due to the lack of Internet and software processing of the system at that stage. (helis, 2021)

3.1.2 Rebuilding a new network for information, communication and transition to electronic customs: In 2017, an executive decree was issued on February 20, 2017 No. 17-92 of the Customs Code providing for the establishment of a national center for the indication and information system of customs CNTSID and the definition of tasks, the most important of which are the following (official, 2017):

- Participate in the definition of customs technological policy of means as well as the preparation of various necessary programs;
- Preparation of technical and functional books for customs;
- Upgrading the communication system of customs from the Internet and others;
- Linking the customs information and communication system with the various elements of the international trade logistics chain;
- Ensure the protection of information and prevent its leakage;
- Achieving transparency in economic transactions;
- Electronic collection of various foreign trade beaches.

According to several media sources, this system was supposed to be launched by the beginning of 2019, but due to the disruption of equipment, the release was delayed.

Algeria has signed a partnership agreement with its Korean counterpart within the framework of customs digitization, in order to establish a single window project for customs that will erase the physical nature of customs procedures (alfadjr, 2021) , and the Korean partner confirmed in the

same meeting with the director of Algerian customs and representatives of the National Union of Customs Commissioners that this project will take place over a period of 36 months and includes 15 information units, and aims to address customs clearance operations in parallel with the single window project (untca).

4- Korean experience of the Single Window Customs project:

The Korean digital customs system has gone through several stages, which are summarized in the following table:

Table 1: Stages of development of Korean customs

Years	Stages	
1973-1993	First generation stage	-Computerized statistics - File conversion system and customs clearance using automated information
1994-2003	Second generation stage	-EDI-BASED digital data exchange system -Entering data on the private platform -Risk Management Approaches
2004-2013	Third generation stage	-Internet databases with EDI platform -Human Resources Management and Customs Relations -Use of the single window in customs clearance
2014 to present	Fourth generation stage	- smart system - Internet dependence - Consistency of various information (customs clearance + trade logistics + control + verification and tracking) electronic customs office - Global partnership unity - Window and ISCM Integrated tax limits Administrative system

Source: (customsKorea, 2010)

The latest Korean customs smart system is based on uni-pass technology, which allows digitization and automation of customs operations b using five important systems (hoon-goo-cho & sung-hoon nam, 2016):

- Customs clearance management system;
- Freight management system;
- Information Management System;
- Risk management system;
- And the single window system that controls the previous systems.

Basic characteristics of uni-pass: One of the most important characteristics of this system is the acceleration and effectiveness of customs operations, the reduction of shipping time, the consistency of the logistics chain with the rapid flow of information, the increase in foreign trade revenues due to the risk management that led to the reduction of errors and forgery of various information related to trade operations (Cho, 2016).

4.1 The concept of a single window:

It is a widely used concept in foreign trade, especially after the International Trade Facilitation Agreement, and it was defined by the United Nations Trade Facilitation Center according to recommendation No. 33 "... It is a means / facility that allow parties involved in trade and transport to submit information and standard documents through a single entry point to meet all regulatory requirements related to import, export, and transit.

If the information is provided electronically, then individual data elements must be submitted only once." (wvoomd)

4.1.1 Single window services: can be summarized as follows:

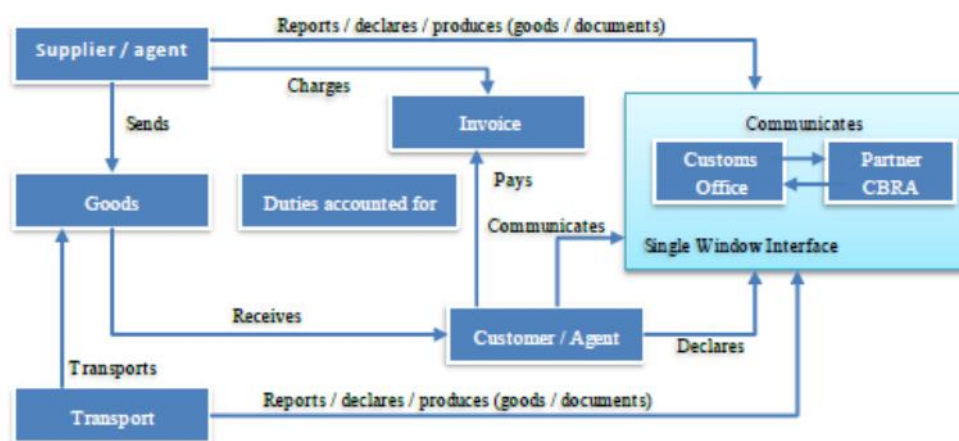
Figure 1: Single Window Services



Source: (wcoomd, 2014)

The modus operandi of the single window according to the World Customs Organization:
The World Customs Organization presented a graphic model of the work of the single window project as shown in the figure:

Figure 2: How the Single Window program logistic chain

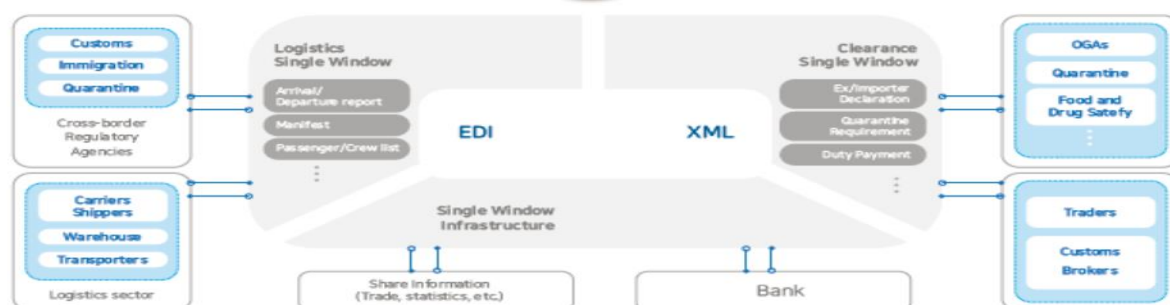


Source: (wcoomd, 2014)

On the other side, several countries benefit from signing partnership agreements in the development of customs using the single window system due to its extensive experience in the field, where Tanzania, Ecuador, France and Algeria participated, which prevented progress in the project for unknown reasons. (koreancutoms, 2023)

4.2. Constitution of korean custom single window single window: its constituted as follows: a- electronic custom single window:

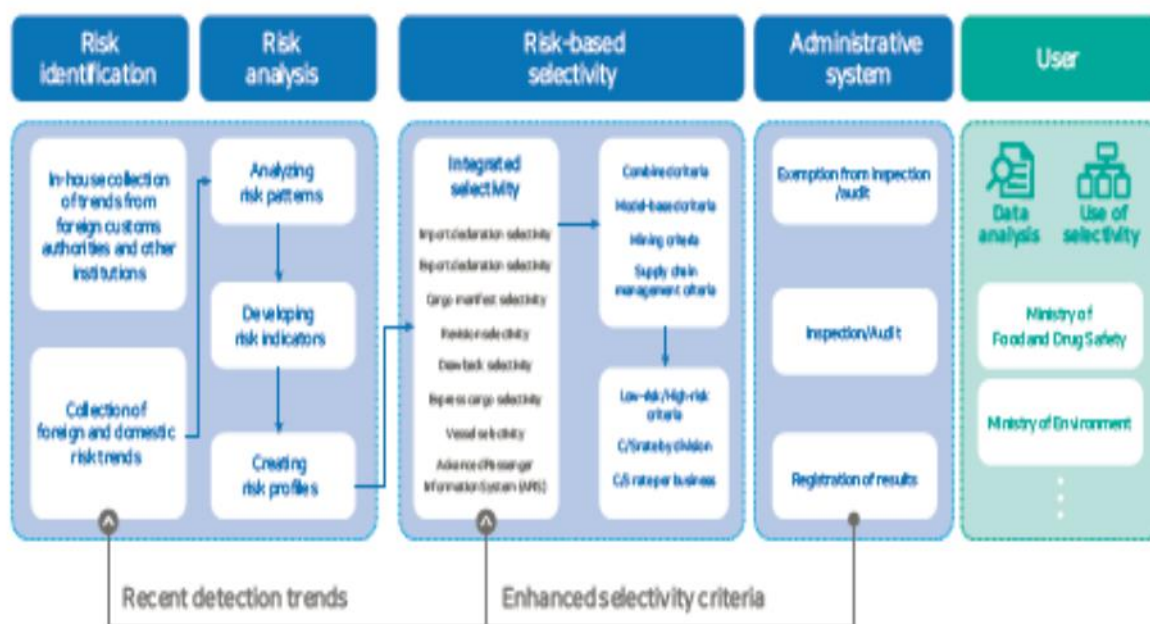
Figure (3): korean custom single window



Source: (koreacutomservice)

b- Risk management system:

Figure (4): schema of risk management system

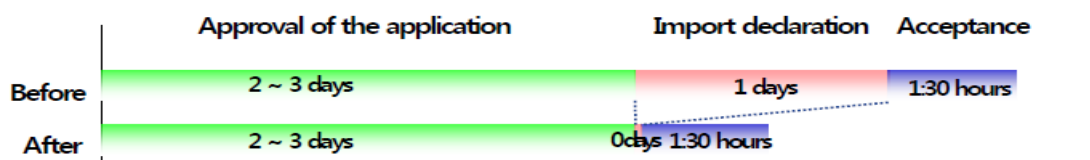


Source: (koreacustomservice)

4.3 The effect of single window on korea clearance custom and international logistics trade:

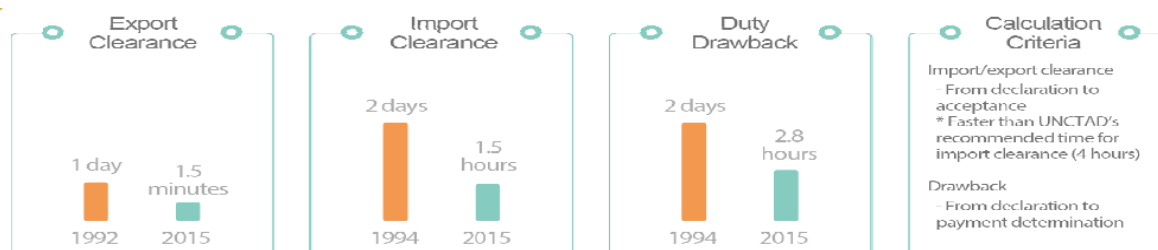
a. reducing time declaration:

Figure (5): reducing time processing of import declaration



Source: (kye-yeong-kim, 2017)

Figure (5): reducing clearance time

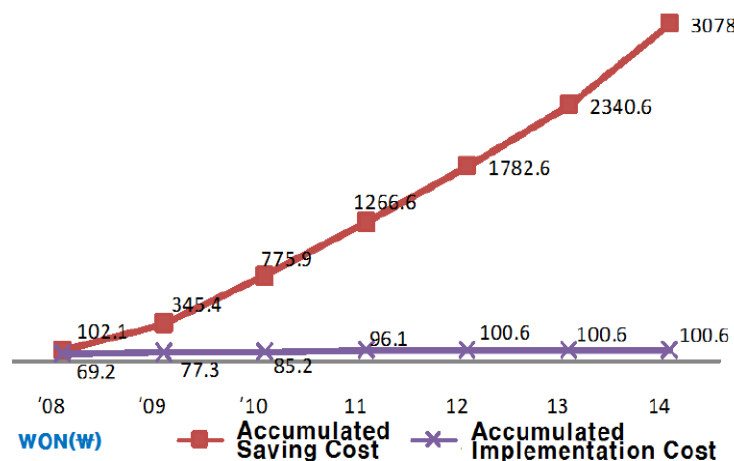


Source: (korea custom service, 2018)

From the figure (5) and (6) we observe that the time of import declaration and export declaration was one day per declaration before using single window that it changed to zero days after using single window. Which confirmed the efficiency of using SW on clearance time, by satisfaction of clearance declarants and trade clients.

- b. **Increase of tax revenues:** from 8 billion dollars in 1990 to 57 billion dollars in 2015 (korea custom service, 2018)
- c. **Reduction in logistic costs:**

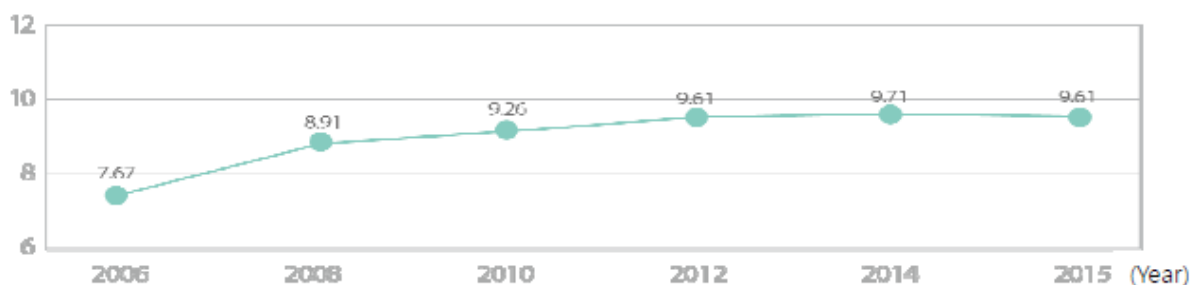
Figure (7): logistic costs



Source: (wcoomd)

- d. **Transparency of procedures and reducing risks (no corruption acts):**

Figure (8): results of hyundai survey



Source: (korea custom service, 2018)

This graph result the survey of Hyundai research institute about administrative transparency from 2006 to 2015.

5. Conclusion:

The Algerian customs administration aims to develop its information and communication apparatus, which would increase the performance of its tasks, especially those responsible for protection by combating fraud and corruption and maintaining the confidentiality of information, but despite the efforts made by the state to reform the technological system of customs administration with the South Korean partnership, it has not yet been completed for unknown reasons, and the previous system SIGAD remains in force effectively pending the realization of the single window system, which will contribute to reducing the duration of Customs operations and accelerating the release of goods and thus reducing logistical costs, which constitute a major obstacle in the development of Algeria's foreign trade, which is 37% more expensive than other countries, and also facilitates the transfer of people and property

of all kinds without any bureaucratic obstacles, so it is necessary to benefit from various international experiences to improve the services of the information and communication system in the field of custom .

5. Results and recommendations: Through our study and several attempts to get closer to some specialists in the field (economic dealers, customs agents, exporters and importers) as well as exploring some international experiences, we reached the following results:
a- Results from the Algerian situation:

- Disrupting customs clearance operations through procrastination and the spread of administrative bureaucracy, which leads to hindering foreign trade logistics.
- The length of the release of goods in the period of customs investigation and control due to the large number of paper transactions and the spread of fraud such as falsification of information.
- Lack of quality risk management due to the lack of technology and the inefficiency of the old information system SIGAD.
- Despite the state's initiation of the establishment of a new customs information system since 2019, it has not received progress for undisclosed reasons, which has disrupted most economic projects to keep pace with international technological development.

b- Results from the Korean experience:

- Speeding Up Customs Processes by digitizing documents such as invoices, certificates of origin, and shipping permits reduces processing times, which Impact on Logistics by Reduced transit time, with faster movement of goods across borders.
- Reducing Costs by eliminating Paper Transactions, lowering costs associated with printing, storage, and transportation, minimizing Human Errors wich Impact on Logistics trade by Improving economic efficiency and Reduced transportation and storage costs.
- Enhancing Transparency and Combating Corruption: Improved trust between trade partners and attractions of more investments in the trade sector.
- Integration with Logistics Systems: Enhanced integration in the supply chain and improved inventory and distribution management.
- Strengthening Compliance with International Laws: by aligning with Global Standards, and applying risk assessment tools to analyze suspicious shipments and reduce random inspections.
- Facilitating E-Commerce: Support for international e-commerce networks, and improved customer experience.

Recommendations: From international experiences, we conclude that:

- Developing Algeria's technological infrastructure to avoid obstacles to technological development.
- Tightening penalties for those involved in corruption and threatening economic security.
- Work on the completion of the customs information system project to activate customs operations, which in turn activate the international logistics chain (foreign trade).
- Work on the completion of a project belonging to the information system in the process of completion and complete it with the block chain system to avoid any

leakage of information or any error in one of the dealers in the international supply chain (automation of customs operations).

- Issuing and reforming the customs legal system to be in line with the new automated system.

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