

Obstacles to the implementation of the South Korean electronic customs system UNI-PASS in Algeria: comparative study with Ghana

التحديات التي تواجه تفعيل النظام الجمركي الكوري UNI-PASS في الجزائر
دراسة مقارنة مع دولة غانا

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Abstract

This study aims to shed lights on the key challenges encountering the implementation of the South Korean electronic Customs system UNI-PASS in Algeria, following a comparative study with Ghana, based on secondary data. Finding suggested that inadequate ICT infrastructure, the absence of robust legal framework and organizational challenges including delays are the key challenges that hinder the implementation of the electronic customs system ALCES (based on UNI-PASS system) in Algeria, thus addressing these challenges is pivotal to ensuring the successful implementation of the UNI-PASS system.

Keywords: UNI-PASS, customs administration, digitalization, comparative study, Algeria, trade facilitation.

المخلص

تهدف الدراسة الى تسليط الضوء على اهم التحديات التي تواجه تفعيل نظام الجمركة الكوري UNI-PASS في الجزائر من خلال دراسة مقارنة مع دولة غانا. وكشفت النتائج المتوصل اليها ان غياب كل من البنى التحتية الالكترونية، النصوص القانونية والتحديات التنظيمية بما في ذلك التأخر في ادراج النظام الجمركي على مستوى كافة النقاط الجمركية؛ تعد من العوائق التي تواجه تفعيل النظام الجمركي الالكتروني في الجزائر وعليه فان التطرق الى هذه التحديات ومعالجتها يعد امرا محوريا من اجل إنجاح تفعيل هذا النظام.

الكلمات المفتاحية: الرقمنة، إدارة الجمارك، دراسة مقارنة، الجزائر، تسهيل التجارة

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1. INTRODUCTION:

In the realm of global trade, customs administration plays catalytic roles such as fiscal role like revenue collection, security role through the control of goods, and passengers across frontiers borders, and economic role including the implementation of policies.

In the era characterized by the facilitation of global trade, many economies have grown in several nations, especially those that have experienced an increase in trade volume and the number of travelers. For example, in South Korea instance, trade volume rose from 2.8 billion dollars USD by the end of 1990, to 885.8 billion dollars USD in 2015, and the number of travelers has similarly increased from 460,000 thousands to 53 million in 2015 (KCS, 2016). As trade volume, and travelers have significantly increased, the use of traditional, and manual customs procedures, have failed to meet the requirement to handle these volume of workflows. Facing this reality, South Korea has taken the initiative to modernize its customs administration through the automation of customs procedures.

The trend of the digitalization of customs procedures keeps expanding globally; many International organizations have given special attention to customs automation, especially the World Customs Organization (WCO), and the World Trade Organization (WTO), arguing that the digitalization of customs administration contributes to the facilitation of global trade through the elimination of paperwork, the reductions of costs, and time. Thus, expediting customs procedures, and reducing delays (WTO, 2016). While many developed countries have successfully implemented customs digitalization, several developing countries keep struggling to achieve this initiative.

1.1. Statement of the Problem:

Customs digitalization plays a pivotal role in facilitating trade and customs procedures, as several developed countries have successfully implemented electronic customs systems, many developing countries continue to struggle with modernization initiatives due to persistent challenges including ICT infrastructure, outdated legal frameworks, and organizational challenges such as delays. (Gekara&Nguyen, 2020). For example, Algeria has initiated the implementation of the electronic customs system ALCES in 2019 (CUPIA, 2023); however the system is not fully implemented yet. Despite the initiative to modernize the Algerian customs, there is a lack of clear strategies aiming to overcome these challenges.

1.2. Research Questions:

This study will address the following research question: What are the obstacles to UNI-PASS implementation in Algeria, and what are the key lessons drawn from Ghana's experience?

1.3. Hypothesis

We suggest the following hypothesis for this study as follows:

H1: The successful implementation of UNI-PASS in Algeria depends on how the country overcome ICT barriers, regulatory Framework obstacles, and delays in the implementation of the system.

H2: Although Ghana is not fully aligned with global benchmarks, in some ICT matrices; the country has successfully implemented UNI-PASS system since 2020. Demonstrating that even challenges still existing, they do not necessarily hinder the implementation of the electronic customs system UNI-PASS.

1.4. Significance of the Study:

This study aligns with Algerian initiatives that aim to not only modernize customs administration, but also facilitate customs procedures to improve trade facilitation, and ultimately aligns with international standards including World Trade Facilitation Agreement (TFA)

1.5. Objectives of the Study:

Proceeding with the previous introduction, this study aims to:

- identify the challenges that hinder the implementation of UNI-PASS in Algeria

- comparing the implementation of UNI-PASS in both Algeria, and Ghana to draw lessons for improving the implementation of the electronic customs system UNI-PASS in Algeria.

1.6. Methodology of the Study:

To conduct this study, we use a qualitative comparative approach. Given that both Algeria and Ghana have faced similar challenges in adopting South Korean Electronic Customs System UNI-PASS, we choose a comparative study to identify these obstacles.

In addition, this study relies on secondary data extracted from :Governmental website such as the National Communication Authority of Ghana <https://nca.org.gh/> ,Algerian Regulatory Authority for Posts and Electronic Communications arpce.dz , international organizations including [World Bank Open Data | Data](https://data.worldbank.org/) .Official documents including The Algerian official journal <https://www.joradp.dz/> , and Ghana Customs ACT <https://gra.gov.gh/> . The Official websites of South -Korean customs services <https://hrd.customs.go.kr/> and CUPA organization <https://www.unipass.or.kr/> were consulted to understand the development of UNI-PASS implementation in Algeria, and Ghana. Thus, comparative tables will be addressed to compare the similarities and differences between these countries in ICT infrastructure, regular frameworks related to customs administration, and the development of UNI-PASS

We also determine the data collection will vary from 2017 to 2023, due to its availability in the countries in question.

1.7 Literature review

In Algeria, several academic research studies have highlighted that the implementation of the "new electronic customs system, for instance:

The study published by (Ghozlani & Brahmia, 2023) examined "The contribution of the South Korean experience with the electronic customs clearance system UNI-PASS to the development of the information system of the Algerian customs SIGAD". Findings underscored the importance of developing robust ICT infrastructure to support the implementation of the South Korean electronic customs in Algeria. In addition, the lack of a legal framework could impede UNI-PASS implementation in Algeria.

The research paper (Ferrah, 2021), analyzed the "Digitization of the Algerian Customs Administration and the imperative shift from SIGAD to Electronic Customs". The findings emphasized the importance of implementing a "new electronic customs system" at the Algerian customs. By doing so, the new system ensures the automation of customs procedures reduces costs and time, and aligns with global standards. However, delays were observed in the implementation of this system.

The study published by (Ghozlani, Amroun, et al, 2024) entitled "The role of artificial intelligence in managing customs risks for Algerian Customs", analyzes the feasibility of the integration of emergent risk management tools into Algerian customs to strengthen customs effectiveness. Findings suggest that the absence of data interchanges, and inadequate ICT infrastructure can hinder such initiatives.

In the legal context, the integration of electronic customs relies on robust legal frameworks that support the implementation of such a system, including ICT, data protection, and cyber security:

The study (Rabhi & Elhadjali, 2023), reviewed "The new information system as a mechanism for digitizing customs procedures in Algeria". It underscored the importance of the integration of the "new electronic system". The study suggested that the persistent gaps in the existing legal framework might hinder the implementation of the electronic custom system.

The existing literature review emphasized the challenges of UNI-PASS implementation in developing countries, while (Ferrah, Ghozlani, and Rabhi) acknowledged that the lack of robust ICT infrastructure, laws, and delays might hinder the successful implementation of electronic systems like UNI-PASS in Algeria. There is a lack of comparative studies of how countries like Algeria have implemented the UNI-PASS system and the challenges encountered during its implementation. Therefore, this study examines the challenges that might hinder the implementation of UNI-PASS in developing countries including Ghana, in comparison to Algeria. This study also helps to identify challenges in these countries, and draw lessons for Algeria to improve the implementation of an effective electronic customs system.

1.8. Organization of the Study

This study will be organized into two main sections as follows:

In the theoretical section, we will address the main definitions related to this study, in addition to the challenges that face the implementation of UNI-PASS especially in developing countries.

In the practical section, we will conduct a comparative study between Algeria, and Ghana to identify the barriers that face the implementation of UNI-PASS in both countries, and draw key lessons learned from Ghana.

2. Theoretical framework:

The theoretical section aims to identify key definitions related to the study, and address key challenges related to the implementation of the electronic customs system UNI-PASS in developing countries including Algeria, and Ghana as follows:

2.1 key definitions:

In this section, we identify key definitions related to the study as follows:

2.1.1 Trade facilitation

Trade facilitation is defined as a range of strategies that aim to improve trade efficiency (Grainger, 2012). These measures not only improve the flow of goods but also reduce delays and simplify global trade. In addition, these strategies play a catalytic role in improving their business environment. Governments in developing countries including Algeria, and Ghana are prioritizing efforts to streamline global trade with a particular focus on customs digitalization through the implementation of electronic customs systems.

2.1.2 Customs digitalization

In the field of Customs, digitalization has diverse definitions. For example, the general secretary of the World Customs Organization, (WCO, 2016) defined it as the use of a digital system to optimize customs activities through the automation of customs procedures.

Custom digitalization can also be defined as the shift from traditional procedures of paper information to electronic information (vorona et al, 2022). The digitalization of customs administration aims to simplify customs procedures, facilitate trade, and ensure a smooth flow of goods and people.

2.1.3 Single window system

The single window system (SW) is defined by the United Nations Economic Commission for Europe (UNECE) as : electronic platform that allows all trade participants, to fulfill import/export, and transit documents using a single entry point. Hence, facilitating trade and streamlining customs procedures. (UNECE, 2016)

It is important to point out the difference between the single window system and UNI-PASS. While the single window is an electronic platform to facilitate the submission of declarations, UNI-PASS is a solution designed to enhance customs activities such as clearance, cargo tracking, and risk management as demonstrated in the next section.

2.2-Integrated Customs Management System UNI-PASS

UNI-PASS was the strategic solution adopted by South Korean Customs Services (KCS) to overcome challenges in the limited financial, and human resources, to manage the impressive increase in trade volume, and international travel, since 1970. (Choo&Nam, 2016).

2.2.1-definition

UNI-PASS is a comprehensive customs solution developed by South Korean customs services in 2005 through a collaboration with notable companies including CUPIA, and KTNET (CUPIA) to handle customs operations including declaration, cargo clearance, and inspections. Unlike the previous systems that relied on manual procedures, and fragmented platforms, the UNI-PASS system aims to eliminate the paperwork used in administration, and facilitate customs procedures under a unified platform.

2.2.2-Features of UNI-PASS

The South Korean Customs Services (KCS) developed the integrated customs management system to enhance work and system efficiency, foster customer satisfaction, and ensure customs efficiency: (KCS, 2016)

-work efficiency: reduce the use of paper documents, automate customs procedures, and use real-time data.

-Customer satisfaction: Multi-device (meaning that the system is available on phones or personal computers), access services at any time. The system also enables users to pay customs duties through e-payment platforms.

-enforce customs system efficiency: ensure interoperability, and integration with various operating systems like Windows and Linux, the system can be also integrated with multiple databases, and facilitate the harmonization of data across all the datasets.

2.2.3-Challenges of UNI-PASS implementation in developing countries

Despite the advantages realized by UNI-PASS, especially in reducing costs and time, elimination of paperwork, the system faces several challenges that hinder its implementation, particularly in developing countries like Algeria, and Ghana; these challenges are summarized as follows:

- **inadequate ICT infrastructure:**
 - Weak internet connectivity, especially in rural zones, and remote areas.
 - The reliance on outdated hardware, and software may affect customs activities including :
 - Delays in clearance procedures and the continued use of manual procedures to enter information within customs administration due to the outdated systems.

.In this context, several developing countries including Algeria, Kenya, and Nigeria are struggling to implement the electronic customs system UNI-PASS, due to the poor ICT infrastructure.

- **Legal and regulatory Frameworks**

In addition to ICT infrastructure, the existence of a robust legal and regulatory framework is pivotal to ensure the effective implementation of electronic systems including UNI-PASS. However, many developing countries including Algeria and Ghana are still lagging behind developed nations in the field of legal regulations that

support electronic systems implementation including cybersecurity laws, electronic data information exchanges, and electronic signatures. (International Trade Administration, 2024)

For example, in Algeria, customs procedures are mainly relying on outdated laws since 1979, meaning that continuous updates are recommended to align with technological advancements, and global standards such as the World Organization's Trade Facilitation Agreement (TFA).

While some progress has been made in modernizing regulatory frameworks in Algeria such as the protection of individual data, and the electronic signatures laws of (18-07, passed in 2018), gaps remain persistent. These gaps are evident in the misalignment of these existing laws with customs procedures.

The existence of these challenges might hinder not only the implementation of electronic systems like UNI-PASS, but also delays the resolution of legal concerns related to electronic transactions, give rise to misunderstanding of laws regarding cyber security and data protection, and create uncertainty in the applications of the law. Therefore, addressing these challenges is critical for the UNI-PASS system.

- **Delays in the implementation**

Despite efforts made by developing countries to modernize customs administration, they continue to face several challenges. For instance, weak internet coverage especially in remote areas and rural zones will hinder the use of electronic customs systems like UNI-PASS, thereby; forcing customs officers to rely on manual procedures to data entry. Additionally, the lack of electronic platforms like E-payment also obstruct the use of electronic systems effectively.

Moreover, rigid regulations and inadequate coordination between organizations in developing countries (Kim & Duval, 2020) such as Algeria also cause delays in laws application, particularly those related to electronic transactions. Thus addressing these challenges through the modernization of the legal framework and enforcing ICT infrastructure's investment is pivotal to reduce delays encountered in the implementation of electronic customs systems.

3. Comparative study:

3.1 overview:

Algeria launched the automated information system SIGAD (système d'information et de gestion automatisé des douanes), which was developed in-house by Algerian customs in 1995 to manage goods clearance, tax collection, and cargo management throughout the country. (Algerian Customs, 2004).

However, relying on SIGAD for almost 24 years has hindered technological progress aimed to replace manual procedures. Although this system enabled the customs administration to meet some international standards, it required high costs, which ultimately continues to increase as long as the system is in use (Iran et al, 2023). Additionally, the use of legacy systems including SIGAD exposes customs administration systems to cyber security threats and further complicated processes. (Walsh, 2023)

On the other hand, Ghana Customs Management system (**GCMS**) was launched in 2002 to replace manual procedures within customs administration. However, additional systems like the Pre-Arrival Assessment Reporting System (PAARS) were also implemented in collaboration with GCMS system, at Tema Port to manage cargo clearance. (HeraldGhana, 2020).

Despite the efforts to modernize customs administration, both Algeria, and Ghana face several challenges including ICT infrastructure, legal frameworks, and delays in adopting electronic system

Building on these foundations, this study explores these challenges as follows:

3.2 ICT infrastructure in Algeria, and Ghana:

The following sections will examine ICT matrices in Algeria, and Ghana as follows:

3.2.1 ICT Indicators in Algeria

Table n°= 01: ICT indicators in Algeria

variables years	Fixed telephone subscribers (million)	Fixed broadband subscription (per 100 inhabitants)	Mobile cellular subscribers (million)	Mobile Broadband connection (3G +4G) % of internet users	Internet users (million)
2017	4.1	7.7	45,85	53	18
2018	4.3	7.22	47.20	59	21
2019	4.6	8.28	45.40	66	24
2020	4.7	8.61	45.60	70	22.7
2021	5.1	9.33	47.00	80	26
2022	5.5	10.35	49.00	82	27
2023	6.3	12.01	51.50	85	32

Source: By authors, data retrieved from <https://datareportal.com/>, arpce.dz , [World Bank Open Data | Data](https://data.worldbank.org/) , retrieved: December 28, 2024, at: 23hAM

The table (1) presents key insights on some ICT matrices in Algeria as follows:

- Fixed telephone and fixed broadband subscription:

As demonstrated in the table, Algeria showed a steady growth in fixed-line, and fixed broadband subscriptions. For instance, fixed-lines users increased from 4.10 million in 2017 to 6.3 million in 2023. Similarly, fixed broadband subscriptions rose from 7.7 subscriptions per 100 inhabitants, meaning that 12.01 % of the population used technologies like ADSL, and Optical fiber in 2023.

This expansion reflects Algeria's ongoing investment in telecommunications, with approximately 62 million DZD invested in ICT infrastructure including optical fiber

deployment by the end of 2022. Despite these efforts, the expansion of optical fiber remains limited. This low expansion can be attributed to several factors including the lack of infrastructure, and users' preference for mobile broadband connections.

- Trends in mobile cellular subscriptions

Regarding mobile cellular subscriptions, Algeria showed significant adoption, increasing from 45.85 million subscribers in 2017, to 51.50 subscribers in 2023. This growth is attributed to the introduction of 4G LTE services in 2017 to improve connectivity. By the same year, 56 % of the population was using broadband connection. These services are provided by three state-owned, operators approved by the Ministry of Telecommunications including Djazzy, Ooredoo, and Mobilis. As of 2023, Mobilis led the 4G LTE coverage in Algeria, while Djazzy and Ooredoo showed; improvements in both speed (download and upload). These improvements were supported by the allocation of more spectrum* to improve 3G, and 4G LTE coverage in 2022, reflecting the high broadband adoption among users.

Despite this progress, there is room for improvement, especially in the 5G network expansion, which remains underdeveloped, in addition, concentrating efforts on improving mobile coverage in rural and remote areas.

- mobile broadband connection and internet users

Algeria has experienced rapid growth in broadband connection over the years. In 2017, 53% of the population used broadband connection through 3G, and 4G LTE services, out of 18 million internet users, meaning that internet users in Algeria rely heavily on broadband connection. By 2023, 85% of the population was connected through 3G, and 4G LTE services, out of 32 million internet users. This trend can also be explained by users' preferences for broadband connection, and the access to affordable data plans provided by Ooredoo, Mobilis, and Djazzy. However, challenges persist. As of 2023, the median speed of mobile broadband download reached 30 Mbps, which is lower than the global standard average of 70 Mbps (Kemp, 2023).

Despite the fast growth in mobile broadband connection, Algeria has experienced a steady growth in overall internet users over the years. As of 2023, Algeria had 32.9 million users, over a population of 45 million, meaning that 29 % of the population remained offline reflecting persistent challenges in ICT infrastructure such as the digital divide between rural and urban zones, especially in Sahara (ITA, 2024)

3.2.2 ICT infrastructure in Ghana

Table n°= 02: ICT indicators in Ghana

variables years	Fixed telephone subscribers (million)	Fixed broadband subscription (per 100 inhabitants)	Mobile cellular subscribers (million)	Mobile Broadband connection (3G +4G) % of internet users	Internet users (million)
2017	0.30	0.19	36.8	41	7.9
2018	0.27	0.2	40.9	56	10.1

* Spectrum allocation is defined as the use of range of frequencies to transmit data **Source spécifiée non valide.**

2019	0.28	0.19	40.9	62	10.3
2020	0.30	0.19	40.5	70	14.7
2021	0.31	0.35	40.5	78	15.7
2022	0.31	0.62	40.0	83	16.9
2023	0.31	0.66	33.4	92	23.05

Source: by authors, data retrieved from <https://nca.org.gh/> , [World Bank Open Data | Data, https://datareportal.com](https://datareportal.com) , retrieved : December 28 , 2024, at : 23hAM

Table (2) exposes, the key trend observed in Ghana's ICT matrices as follows:

- **Trend in fixed telephone and fixed broadband subscriptions**

Ghana experienced stable adoption of both fixed telephone and fixed broadband subscriptions. Fixed telephone subscriptions fluctuated between 0.30 and 0.31 from 2017 to 2023. Similarly, the trend in fixed broadband subscriptions remained stable over the years, varying between 0.19 and 0.35 in 2021, and between 0.62 and 0.66 by 2023. This modest growth can be attributed to government investments to enhance connectivity. However, this sector remains underdeveloped despite the ongoing efforts made to improve ICT infrastructure.

- **Trend in mobile cellular subscriptions**

Ghana showed considerable growth in mobile cellular subscriptions over the years, increasing from 36.8 million in 2017 to 40.0 million in 2022. This growth is primarily attributed to the extensive efforts by private sectors to enhance 3G, and 4G services connectivity in Ghana, especially in rural areas. These services are provided by private operators, approved by the National Communication Authority (NCA), including MTN, Vodafone, AirtelTigo, GloMobile, and Telesol (NCA, 2023). However, market saturation in 2022, led to a decrease in cellular mobile subscriptions to 33.4 in 2023.

- **Trend in mobile broadband connection and internet users**

Regarding broadband connection, Ghana demonstrated rapid growth. For instance, in 2017 41% out of 7.9 million internet users accessed broadband connection through 3G, and 4G LTE services. This trend significantly increased over the years. By 2023, 92 % of 23 million internet users used broadband connection, reflecting the heavy reliance on broadband services including 3G, and 4G LTE services. The expansion of broadband connection is primarily attributed to the large coverage of 3G, and 4G, however, internet quality remained low. As of 2023, the mobile median speed reached 7.90 Mbps, which is lower than the global average of 34Mbps. (Shanahan & Calvin, 2023)

Regarding internet users, Ghana experienced a considerable growth, jumping from 7.9 million users in 2017, to 23 million users in 2023. This expansion is primarily supported by the large broadband connection; however, internet usage has remained low over the years. As of 2023, Ghana has counted 23.5 million users, out of a population of, meaning that approximately 31% of the population has no internet access in Ghana, reflecting the persistent challenge in ICT infrastructure.

-The following table summarizes a comparison between Algeria, and Ghana in ICT infrastructure as follows:

Table n°=03: comparative table between Algeria, and Ghana

Variable/country	Algeria	Ghana
Fixed telephone subscriptions	moderate	low
Mobile cellular subscription	high	high
Broadband connection	high	high
Internet users	moderate	low
Common challenges	-Rural and urban zones gap -Internet speed	

Source: By authors

From the table (3) the key observations are as follows:

-Dominance of mobile cellular subscriptions in both countries, meaning that the fixed-line and internet is underdeveloped.

-Dominance of broadband connections in both countries reflects the heavy reliance of users in both countries on broadband connections including 3G, 4G LTE, optical fiber...etc.

-Algeria surpassed Ghana in ICT infrastructure development, reflecting the ongoing efforts of government to improve the telecommunications sector.

-Despite the efforts, both Algeria, and Ghana experienced a low internet speed compared to the global average, this performance reflects the persistence of challenges in ICT infrastructure like digital divide between rural and urban areas.

3.3-legal Framework

A robust legal framework is pivotal to supporting the implementation of the electronic customs system in Algeria, especially UNI-PASS. The following section compares the existing legal framework in Algeria, and Ghana, related to the electronic systems including UNI-PASS implementation as follows:

3.3.1 Legal framework in Algeria

Algeria has made significant efforts to modernize its regulatory framework and aims to provide an adequate legal environment to support technological advancements, thus supporting the implementation of electronic customs systems such as UNI-PASS. For instance:

-The law (17-04) introduced on 16/02/2017, amended law 79-07, signed in July 1979, related to the customs code. This law explicitly mentions electronic declarations as follows: "The retention period for registers, declarations, and documents related to customs operations, including those established through electronic supports, and held by customs administration is fifteen (15) years". The law explicitly acknowledged electronic declarations but did not provide further explications.

-Act 44 of the law (17-04), passed in 2017, enabled the use of electronic process, or authentication code to replace the physical signature of the electronic declarations. The Act has explicitly acknowledged the electronic signature.

-Act 91 of law (17-04), related to the customs code, passed in 2017, and provided the concept of the "single window" (Guichet unique) as follows:" The accomplishment of customs formalities can be done through an electronic platform". The article introduced the single window as an electronic platform to submit declarations related to import, export, and transit. However, the law remained unclear about the implementation of the single window and its functionalities.

-The Executive Decree (21-146), signed on April 17, 2021, established a legal framework to complete Act 91 related to law 17-04, thus providing further information related to the single window, for instance:

-The single window is an electronic platform to exchange data information (EDI) among trade participants.

-the single window aims to reduce clearance delays, unify and facilitate customs formalities.

-interconnection with stakeholders.

-Act 06 of the executive decree acknowledged the collaboration of the Algerian customs administration with other administrations and organizations to ensure the implementation of the single window.

-Act 07of the executive decree, highlighted the importance of integrating stakeholders and trade participants to ensure interoperability with the single window as follows "The general direction of customs administration, organizations, and concerned stakeholders are compelled to respect the rules, and regulations related to interoperability of their information system with the single window". The provided act does not directly define the administrations and the concerned stakeholders such as the ministry of Trade, Ministry of agricultures, and national organization such as The Algerian Consumer Protection and Orientation (ACPO)...etc.

-law (18-07), related to the protection of individual personal data was enacted on June,10,2018.This law reflects an important shift from Algeria towards cyber security concerns, aiming to establish a legal framework for collecting, storing, and sharing individual personal data especially those related to customs operations .However, it was officially operational in 2023.

-Executive decree (17-90), passed on February 20, 2017, defined the role of the Algerian customs, recognized the existence of risk management department, and its engagement to establish and develop risk management system. However, no further information was provided.

-membership in international organizations, and agreements including World Customs Organization (WCO), Revised Kyoto Convention, and Harmonized System (HS) agreement. This membership aims to align with international standards to support trade facilitation and Global trade.

3.3.2 Legal framework in Ghana

In this section, we summarize the key regulatory framework that handles the implementation of electronic customs systems including UNI-PASS in Ghana as follows:

-The customs Act; enacted on May 18, 2015, related to customs procedures, was established to update and replace existing laws in the previous customs code: "customs, excise, and preventive services management law P.N.D.C.L ,passed in 1993.For instance :

- The electronic declarations are defined as the submissions of declarations through electronic systems. It can be submitted to the customs authority (commissioner-general) by the importer, exporter, or any agent related to trade activities (e.g. customs brokers).Thus; the law recognized directly the existence of electronic declarations.

-The National single window (NSW) has been fully implemented and operational since, 2015. (Ghana Web, 2016)

-The law acknowledges the electronic signature as an electronic method to verify the submission of electronic declarations.

- The law engages the customs authority to establish regular dialogues, with those covered by the customs act, and ensuring the availability of the laws on the official website

-the customs authority is compelled to respect "the data protection agreement, and laws" when sharing information with national or international authorities.

-The use of electronic systems for risk management to identify suspicious goods, and enforce control.

-the use of advanced tracking technologies, and tools to enhance customs efficiency.

-membership in international agreements, and organizations including the World Customs Organization, and the Revised Kyoto Convention.

The following table provides a comparison between the legal framework in Algeria, and Ghana as follows:

Table n°= (4): Legal Framework in Algeria, and Ghana

Variables / country	Algeria	Ghana
Electronic declaration	Explicitly defined	Directly defined
Electronic signature	Explicitly mentioned	Directly mentioned
Risk management system	Not mentioned	mentioned
Data protection	Not mentioned	Not mentioned
Single window system	mentioned	Explicitly mentioned

Source: By authors

Legal framework	fragmented (Decree, law , ministerial notes)	Unified under the custom act
Stakeholder engagement	Not clearly defined in The Executive Decree 21-146	Defined under the customs act of 2015
Common challenges	- Lack of laws related directly to UNI-PASS. - Outdated legal framework. - Lack of integration	

From the previous table:

- The legal framework in Ghana is clear, in contrast, the legal framework in Algeria still faces ambiguities, especially in customs laws.
- The customs act, established by the Ghanaian government addressed key laws, and obligations related to modern customs procedures including electronic signatures, risk management systems, and the use of emergent tracking technologies. However, the customs code of Algeria has not yet addressed those topics.
- Algeria has directly defined the single window (SW) system ..."under Act 91 of Law 17-04; however, the complementary executive decree was only passed in 2021, reflecting legal delays
- As of 2022, Algeria has not yet established a national single window, reflecting delays in implementation. (APS, 2022).In contrast, Ghana has successfully implemented the national single window (GNSW) since 2015.
- Ghana has prioritized stakeholders in the customs act 2015, conversely; stakeholders are not clearly defined in the Algerian customs code.
- Unlike Algeria, Ghana ratified its membership in the trade facilitation agreement (TFA) in January 2017, meaning that the government was engaged to establish procedures to facilitate trade, and enforce customs efficiency.
- While both countries acknowledge data protection under law 18-07 related to the protection of personal information in Algeria, and the data protection act of 2012 in Ghana, these laws are not integrated with customs procedures, meaning that there is no clear mention of data protection in the customs acts of Algeria, and Ghana.
- There is no legal Framework related directly to UNI-PASS system in both countries
- Relying on outdated legal frameworks can be challenging for both countries, reflecting that ongoing efforts are pivotal to update these laws, and align with recent advancements.

3.4-UNI-PASS development in Algeria, and Ghana

This section aims to provide a comparative analysis between Algeria, and Ghana in the context of UNI-PASS journey development as follows:

3.4.1-UNI-PASS development in Algeria

To address the challenges of the outdated system used in Algerian customs SIGAD (Système d'information et de gestion douanières), the new Customs Electronic services (ALCES) project was officially initiated in collaboration with the international organization CUIA in 2018. Under this contract, the organization will deliver the South Korean Customs system UNI-PASS. The system was planned to be implemented in 2019, and completed by 2020, aiming to modernize customs procedures. Thus, the implementation of ALCES was planned to be launched over three strategic phases, as follows:

-development phase (2018):

Algeria signed a strategic collaboration with CUIA to launch the UNI-PASS system. The system was designed to align with the country's economic and legal environment.

-deployment phase (2019):

-ALCES was deployed in major customs offices including Algiers Port, and Algiers International Airport.

-final rollout (2019-ongoing):

-There are ongoing efforts to extend the system nationwide, and ensure full integration.

- Building on the previous foundations, the key stakeholders engaged in the deployment of ALCES in Algeria are:

-CUIA international organization:

- International collaboration with Algeria.
- Implementation of UNI-PASS modules such as cargo tracking, clearance.
- Technologies Transfer with Algeria.

-Algerian customs services (direction générale des douanes) DGD :

- Ensure the alignment of the regulatory framework
- integration of UNIPASS with current systems
- Providing training programs for customs officers, and stakeholders

-Algerian Port Community System (APCS):

As of 2024, Algerian customs and notable ministries including the Ministry of Finance and Transport passed a collaboration with the (APCS) to support the integration of ALCES with existing systems. (ministry of finance, 2024)

-Final users:

ALCES was primarily established to automate customs procedures, and reduce paperwork for both customs officers and trade participants.

▪ Potential outcome of ALCES

The integration of the electronic customs system ALCES within Algerian customs aims to:

- -Integrate emerging technologies in customs procedures including risk management tools
- Reduce the costs and time of customs clearance.
- Simplify customs processes.
- Modernize the Algerian customs regime.
- Enhance transparency.
- Support the private sector stakeholders such as exporting companies.
- Integration with the single window system.
- Aligning with international standards.

3.4.2-UNI-PASS development in Ghana

In 2015, CUPIA established a long-term contract, aiming to deliver UNI-PASS to the Ghanaian government. The contract was planned to take 25 months to integrate main modules of UNI-PASS including electronic customs clearance, risk management system, and cargo management. Under the signed contract, CUPIA was also, responsible for the development and the implementation of the sophisticated customs management system, aligning with the country's economic and legal conditions.

ICUMS was integrated following three phases as follows:

-Development phase (1 April 2020):

ICUMS was introduced through a collaboration between the Ghanaian government, Ghana Revenue Authority (GRA), Ghana Link Ltd. limited, and CUPIA. The system was primarily launched at Takoradi port aiming to replace legacy systems used previously to manage customs operations including Ghana Customs Management System GCMS and the pre-arrival assessment report system (PAARS)

-Second phase (20, April 2020)

The second phase of deployment was in 2020. Once the issues related to the system were addressed; ICUMS was implemented at Tema Port, and Kotoka International Airport aiming to ensure seamless customs procedures.

-Third phase (1, June 2020)

In June 2020, ICUMS was fully implemented in Ghana. In addition, the system was delivered to importers, exporters, and trade participants.

In 2022, recent modules were integrated into ICUMS system including:

- advanced passenger information system (API), to ensure effective passenger controls.
- Electronic payment system to enable users to pay customs taxes remotely.
- Integration of an electronic auction system at Ports to manage seized or abandoned goods at Ports.

▪ Key participants

Building on the previous foundations, we identified key participants in ICUMS implementation in Ghana as follows:

-Ghana Revenue Authority (GRA)-customs division:

- Ensure the integration of legacy systems including Ghana Customs Management system (GCMS) previously used.
- Robust collaboration with international partners CUPIA and Ghana Ltd. Limited.
- Provide the regular framework supporting the implementation of ICUMS system.

-Korean organization CUPIA:

Cupia was responsible for the development and implementation of UI-PASS in Ghana by

- delivering technologies
- providing assistance, and expertise
- -Ghana link limited.Ltd:
- collaboration with CUPIA to implement UNI-PASS in Ghana
- contributed to the system's effective deployment
- Management of ICUMS system.
- Providing advanced technologies that support ICUMS system including electronic auction.

-Ghana port, and harbors authority:

- Ensure the implementation of the system ICUMS at ports including Tema port.
- The integration of the system with the port arrival assessment report system (PAARS) that was previously used.
- The integration of new technologies including cargo-tracking systems, to support ICUMS.

- Final users

ICUMS was delivered to exporters, importers, and trade participants. Ghana link in collaboration with Ghana Revenue Authority, and customs division provided comprehensive training, seminars, workshops, and online portal that aims to (German Alliance, 2024):

- Familiarize users with ICUMS system.
- reduce the errors during the use of the system
- resolve the issues encountered by users
- Extensive training sessions, covering more than eight (8) locations across the country including Accra, Tema port, Takoradi, and Kumasi.

▪ **Outcome of ICUMS system**

The national press, Ghana Web (GhanaWeb, 2020) reported in 2021 that the integration of ICUMS led to

- The increase of customs revenues to 104 million dollars USD
- Simplifying customs procedures
- Providing more than 7000 devices for cargo tracking

- The use of the pre-manifest declaration means that users can complete declarations, and duties payment before the arrival of the merchandise.

▪ **Comparison between UNI-PASS development in Algeria, and Ghana**

We summarize the key differences between Algeria, and Ghana in the development of UNI-PASS in the following table:

Table (5): UNI-PASS development in Algeria, and Ghana

Variables /country	Algeria	Ghana
UNI-PASS system	ALCES	ICUMS
implementation program	Three phases of implementation with a pilot phase Implementation : 2019-ongoing	Full implementation without a pilot phase Implementation in 2020
Training program	Unclear training program	Comprehensive training programs for customs officers, and trade participants
Previous systems used	SIGAD (système d'information et de gestion douanière)	GCMS : Ghana Customs Management system PAARS : Pre-Arrival Report System (used to manage customs procedures at ports)
Private sector engagement	Not mentioned	CGNET : private information, and telecommunication provider company
Main outcomes	Expected to modernize, and facilitate customs procedures	-The increase of customs to 104 million dollars USD. -Providing more than 7000 devices for cargo tracking -The use of the pre-manifest declaration means that users can achieve declaration, and duties.

challenges	-Delays in implementation -Lack of training programs. -Lack of collaboration with the private sector.	Potential stakeholder resistance in the first stage of the implementation.
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Source: By authors

▪ **key conclusion :**

Based on the previous comparison we noticed **organizational challenges** as follows:

Delays in nationwide implementation of UNI-PASS (ALCES) system: Unlike Ghana, ICUMS was fully implemented in 2020. In 2021, Ghana Customs division added new modules like risk management system, and e-payment platforms.

Unclear training programs: While Ghana established comprehensive training programs for stakeholder, and customs officers through workshops and seminars, Algeria lacks training programs targeting stakeholder and ALCES users.

Lack of collaboration with private sectors: Ghana established strong collaboration with private sector including CGNET Company, and Ghana Ltd, and involve them in ICUMS implementation, while Algeria showed restricted collaboration with private sector.

3.4.3-findings

The findings of this study summarize the key challenges to UNI-PASS implementation in Algeria as follows:

- Despite the improvements made by Algeria to enhance ICT infrastructure, the country still lags behind international benchmarks, aligning with (Ghozlani & Brahmia, 2023), reflecting a lack of digital readiness, and thus hindering the development of the electronic customs ALCES.

- There is a lack of robust legal frameworks that support the implementation of electronic customs system UNI-PASS. Aligning with (Rabhi & Elhadjali, 2023), a fragmentation in laws was also identified in the regular framework in Algeria; especially those related to customs procedures.

- The implementation of the electronic customs system in Algeria started in 2019; however, the system is not fully implemented nationwide. As (Ferrah, 2021) suggested Delays in implementation, it can be attributed to several barriers including the lack of collaboration with private sector, the lack of comprehensive training programs, and the use of restricted communication channels to promote the use of the new customs system ALCES.

3.4.4-Key lessons learned from Ghana:

The comparative study with Ghana suggests several key lessons for Algeria as follows:

▪ **Establishment of robust ICT strategy:**

To overcome the existing challenges in digital infrastructure, especially in ICT, it is necessary to set up strategies through collaboration between the ministry of telecommunication; and Information and telecommunication technologies (IT) providers (Algeria Telecom), support private sector collaborations, similar to the partnership between Ghana and CGNET Company to provide ICT solutions.

.These strategies aim to support the development, and use digital technologies and systems to ensure the modernization of the public sector such as customs. For example:

- The expansion of internet coverage in the rural and remote zones.
- Extensive nationwide coverage of broadband connection especially optical fibers connection.
- enhance internet speed for both mobile and fixed connections to align with global standards.

• **Creation of customs modernization national strategy :**

To ensure the successful implementation of UNI-PASS it is necessary to:

- Expedite the implementation of the system in all customs borders
- Identification of stakeholders engaged in global trade including importers, exporters, logistics companies, banks, customs officers...etc.
- To establish training programs nationwide, to target the stakeholders, previously identified, similar to Ghanaian experience.
- Expedite the implementation of the Algerian National Single Window System to improve international trade, and support UNI-PASS implementation.
- Ensure smooth integration of UNI-PASS with the previous systems used.

▪ **Efforts to straighten regulatory frameworks**

- As Ghana experienced, Algeria should take into consideration major revisions to customs administration laws, these measures encompass
 - The unification of customs laws under single law
 - Alignment of customs laws with recent technological advancements
- Establishment of clear laws directly related to electronic system implementation including UNI-PASS.

▪ **Establishment of robust collaboration :**

- Partnership with stakeholders to establish comprehensive training programs to reduce tension among the system's users.
- Enhancing the inter-collaboration between ministries, and governmental sector, similar to the collaboration with Ghana Revenue Authority with the customs division.
- Collaboration with regulatory authority to relate digital transactions laws including data protection customs procedures.

- By addressing these key challenges, Algeria will ensure the successful implementation of ALCES system in Algeria. In addition, engaging stakeholders, and the private sector similar to Ghana's experience, will help to overcome resistance from the users of ALCES system **meaning that H1 is verified**
- As demonstrated previously, Ghana is still lagging behind global standards in some ICT matrices, especially internet coverage. However, the country has made significant efforts to ensure the full implementation of ICUMS system through comprehensive strategy aiming to enhance ICT infrastructure, improve the regulatory framework, and collaborate with stakeholder including the extensive training program nationwide, to mitigate resistance from stakeholder early encountered in ICUMS implementation. Hence, **H2 is supported.**

4. CONCLUSION:

This study aimed to shed lights on the key challenges, hindering the implementation of electronic systems like UNI-PASS in Algeria, and drawn significant lessons from Ghana's experience. Findings showed that the main obstacles facing the adoption of the electronic customs system ALCES (based on the South Korean system UNI-PASS) are: the inadequate ICT infrastructure, limited regulatory Frameworks and delays in the implementing the system nationwide, while Ghana has successfully implemented its electronic customs system ICUMS, despite the persistent challenges in ICT infrastructure.

Aligning with the previous studies, the study highlighted the important role of ICT infrastructure and robust legal framework to ensure the adoption of the electronic system UNI-PASS, similar to Ghana's experience. However, addressing organizational challenges (delays, training program, and stakeholder engagement) is also critical.

Continuing from the previous conclusion, this study relied on secondary data, with special focus on Algeria and Ghana, limiting then the generality of the results.

We also recommended the following suggestions for further studies such as: focusing on stakeholder engagement in the implementation of electronic customs system in Algeria, to get more in depth into legal Framework related to customs act, and digital transactions, and the use of quantitative analysis to address the impact of these challenges on custom's efficiency.

This study addressed the key challenges to UNI-PASS implementation in Algeria, and highlighted the importance of customs digitalization to ensure trade facilitation.

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