

The Impact of the Reengineering Process of AIDA Customs System on Italian Logistics

Marco Remondino*, Jean Claude Russo†

Summary: 1. Introduction - 2. Research methodology - 3. The evolution of EU customs - 4. The customs declaration - 5. New developments in import, export, and transit - 6. Potential optimizations in the customs process - 7. Conclusions – References,

Abstract

This paper examines the impact of AIDA 2.0 reengineering on Italy's customs operations and transport logistics, assessing enhancements including ICS2 integration, the elimination of low-value VAT thresholds via IOSS, the adoption of e-declarations, and optimized import-export-transit workflows.

A mixed-methods approach - combining systematic review of regulatory texts and technical manuals, semi-structured interviews with freight forwarders and logistics managers, and analysis of ADM-published reports and webinars - reveals that between March 2021 and March 2024 AIDA 2.0 delivered an average 50-60 % reduction in customs clearance time, a 70 % decrease in documentation errors, and an estimated 20-30 % cut in CO₂ emissions thanks to streamlined digital processes and shorter port dwell times.

By quantifying the operational and environmental benefits of AIDA 2.0, this study offers a replicable framework for other EU customs authorities, highlights strategic implications for risk-based controls, data transparency, and smart supply chains, and points to future research on cross-border interoperability and emerging technologies such as blockchain and AI-driven risk analysis.

Key words: customs digitalization, reengineering, AIDA 2.0, operations strategy, optimization.

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1. Introduction

In recent years, the digital transformation of customs and port logistics has been framed within the broader discourse on smart ports and smart borders, with studies highlighting how IoT, blockchain, and AI-driven risk analysis can enhance transparency, security, and efficiency in port operations and border management (Ding et al., 2020; Alsudani et al., 2023; Ivanova et al., 2024). Yet while this literature has expanded rapidly, much of it remains conceptual or policy-oriented, offering limited empirical evidence on how such initiatives reshape customs processes in practice (World Customs Organization, 2023).

This research addresses a critical gap: the lack of systematic evaluation of national-level reengineering projects, particularly Italy's AIDA 2.0 platform. While AIDA 2.0 represents one of the most ambitious European attempts to integrate ICS2 pre-notification, IOSS for low-value e-commerce, e-declarations, and optimized import-export-transit workflows, its concrete operational and environmental impacts have not yet been rigorously assessed. Filling this gap is essential, since the success of customs digitalization depends not merely on regulatory design but on the measurable outcomes experienced by logistics operators, customs authorities, and the wider economy.

The novelty of this paper lies in three main contributions. First, it provides the first comprehensive empirical assessment of AIDA 2.0's effects on Italian logistics, using a mixed-methods approach that integrates systematic regulatory review, semi-structured interviews with freight forwarders and logistics managers, and quantitative analysis of official ADM data.

Second, it broadens the scope of customs research by explicitly linking operational efficiency to sustainability, demonstrating how reductions in clearance times and port dwell periods correlate with decreases in CO₂ emissions.

Third, it develops a methodological framework that can be replicated in other EU member states, thus informing both scholarly debates on smart supply chains and policy discussions on customs modernization.

While the study draws extensively on institutional and regulatory documents, it is crucial to position AIDA 2.0 within the broader academic discourse on customs modernization and digital transformation in logistics. Existing scholarship has highlighted how customs procedures and trade facilitation mechanisms shape competitiveness and transaction costs in international trade (Grainger, 2011; Moïsé & Sorescu, 2013). More recent research has examined the role of port digitalization and community systems in enhancing interoperability and governance within supply chains (Parola et al., 2017; Rodrigue & Notteboom, 2020). At the technological frontier, studies on blockchain, artificial intelligence and risk-based management, and IoT-enabled traceability underscore the transformative potential of emerging tools for customs processes. Furthermore, the literature on institutional and regulatory frameworks (World Customs Organization, 2023) emphasizes that successful digital customs reforms depend not only on technical infrastructures but also on governance capacity, harmonization, and user adaptation.

By engaging with these contributions, the present paper positions the Italian case of AIDA 2.0 as an empirically grounded instance within a wider body of research on digital customs and smart supply chains, thereby bridging the gap between policy-oriented documentation and scholarly debates on the future of trade facilitation.

Against this backdrop, this study pursues three guiding research questions: To what extent has AIDA 2.0 reduced average clearance times and documentation errors? What cost savings have logistics operators experienced post-implementation? And how has the platform's adoption influenced environmental performance through reduced port dwell times and transport emissions? By answering these questions, the paper not only provides evidence-based insights for Italy but also contributes to the broader European and international discourse on the future of digital customs.

The paper is structured as follows. Section 2 outlines the research methodology employed in the study. Section 3 traces the evolution of EU customs digitalization and situates AIDA 2.0 within this trajectory. Section 4 explains the concept of the customs declaration and details how AIDA 2.0 reshaped clearance processes. Section 5 analyzes developments in import, export, and transit operations, with quantitative comparisons of pre- and post-reengineering performance. Section 6 discusses potential optimizations arising from AIDA 2.0, drawing on firm-level examples. Finally, Section 7 offers conclusions, strategic implications, and avenues for further research on cross-border interoperability and emerging technologies such as blockchain and AI-driven risk management.

2. Research methodology

This study adopts a mixed-methods research design in order to capture both the quantitative performance outcomes and the qualitative experiences associated with the reengineering of the AIDA customs system.

1. Documentary and regulatory analysis: we conducted a systematic review of EU and Italian regulatory texts, official communications from the European Commission, and technical manuals issued by the Italian Customs and Monopolies Agency (ADM). This step provided the legal and institutional framework for understanding the objectives and scope of AIDA 2.0.

2. Secondary data analysis: quantitative performance indicators were collected from publicly available reports of the ADM, the Italian Revenue Agency, and data released during official webinars and workshops (2021–2024). These data included clearance times, error rates, declaration volumes, and CO₂ emission estimates. We elaborated comparative tables contrasting pre- and post-reengineering phases in order to identify measurable changes.

3. Semi-structured interviews: to complement documentary evidence, we carried out semi-structured interviews with logistics managers and freight forwarders operating in major Italian ports and inland terminals. These interviews focused on operational costs, organizational changes, and perceived benefits or challenges

introduced by AIDA 2.0. Responses were coded thematically to identify recurring patterns and divergences.

4. Triangulation and synthesis: findings from the three strands were triangulated to ensure robustness. Regulatory and technical data established the intended scope of reforms, performance indicators revealed measurable outcomes, and interviews provided practical insights into how operators experienced the new system in daily operations.

This combination allows us to move beyond descriptive accounts of digitalization, offering an integrated evaluation of AIDA 2.0's operational and environmental impact.

The methodological design aligns with traditions of evaluation research and policy implementation studies rather than action research. While the reforms were implemented independently by ADM, our role was not to intervene but to observe, document, and assess outcomes using multiple complementary sources.

3. The evolution of EU customs

Since 2022, the World Customs Organization has been committed to accelerating the digital transformation of customs, adopting a new culture made possible through the creation of a data ecosystem (World Customs Organization, 2023).

Therefore, various customs authorities are invited to consider the use of such data in interactions with the multiple stakeholders in the supply chain, making it available to the public and the academic world as a means to increase transparency, stimulate knowledge, and enable dialogue with civil society (European Commission, 2022).

The sharing of data analysis with other government agencies has indeed allowed customs to increase its role and visibility in the decision-making process.

The electronic, or telematics, customs, initiated by the European Commission, aims to replace paper-based customs procedures with electronic ones, thereby creating a more efficient and modern customs environment. The project has two main objectives: improving security at the European Union's external borders and promoting trade (European Commission, 2020).

Over the past two decades, paper-based customs procedures have been gradually replaced by electronic ones, aiming to make European businesses more competitive while simultaneously improving security.

The NCTS¹, launched in 1997, marked the first step toward the electronic exchange of customs declarations across the European Union: transitioning from paper-based support to electronic processing (European Commission, 2021).

A few years later, the electronic customs decision, protected by Decision No. 70/2008/CE of the European Parliament and the Council of the European Union, dated January 15, 2008, established the framework for creating a paperless customs

¹ New Computerised Transit System: a system based on the exchange of electronic messages between economic operators and both national and international customs offices.

and trade environment, identifying key objectives, structure, means, and deadlines (European Union, 2008).

The European Commission thus developed a plan that defines the vision, objectives, strategic framework, and key stages for implementing customs telematics, the MASP-C², which also provides stakeholders with an overview and basic information on projects and key issues related to the evolution of electronic customs (European Commission, 2022).

The adoption and application of the Union Customs Code since May 1, 2016, concluded the transition to a paperless, fully electronic and interoperable customs environment, with the core values of simplicity, service, and speed (European Union, 2016). It represents the new legal framework for customs rules and procedures throughout the European Union and covers most of the projects previously introduced under the electronic customs decision, including the European initiative for a single customs window, which provides businesses with a single interface to request, check, and download necessary documentation (certificates, approvals, authorizations) exclusively through electronic means (Armella S., 2017).

In this regard, in Italy, ADM initiated a digital transformation process aimed at improving information technology to foster innovation, progress, and economic growth in the customs field (Italian Customs and Monopolies Agency, 2022).

This includes computerizing processes and administrative customs control, adjusting regulations to develop initiatives beneficial to economic operators, and introducing advanced technologies to enhance current customs information systems, such as IoT³ (Italian Ministry of Economy and Finance, 2021).

ADM's mission is to develop smart supply chains, assessing the economic, social, and environmental impacts associated with implementing various initiatives, with several important objectives: digitalizing the supply chain, increasing port traffic to create new jobs, strengthening port competitiveness in terms of sustainability and the development of intermodal infrastructure, reducing polluting emissions linked to goods transportation, enhancing connections with local authorities and territorial cohesion, improving security through integrated risk analysis, and increasing transport network efficiency while minimizing territorial impacts.

To make the interaction between customs and stakeholders more effective, ADM decided to invest in strengthening the customs system to make it more modern, digital, and sustainable through specific interventions for the integration and digitalization of the logistics chain.

These innovation processes are based on three fundamental pillars: the first, digital first, related to the digital approach, which represents the first step in initiating digital transformation; the second, digital full, concerning processes that must be entirely digital; and finally, the third, once only, referring to the concept of

² Multi-Annual Strategic Plan for electronic Customs.

³ Internet of Things: a neologism used in the fields of telecommunications and information technology, referring to the extension of the internet to physical objects and real-world environments. These objects acquire a unique digital identity, enabling them to communicate with other devices within the network and provide services to users.

e-government, which aims to ensure that citizens, institutions, and businesses only provide certain information to authorities and administrations once.

The expected medium- and long-term objectives include optimizing the logistics/port cycle, simplifying the import-export cycle, automating transport and cargo tracking, restoring logistics chain efficiency, reducing costs and delays faced by economic operators in handling goods and fulfilling administrative and customs requirements, and increasing environmental benefits by reducing CO₂ emissions (due to shorter ship docking times) and the kilometers traveled by polluting vehicles in customs areas.

All of this is made possible by AIDA, ADM's information system, operational since November 10, 2003, with the ongoing support of the company Sogei S.p.A.⁴, which facilitates the exchange of information related to customs declarations and its recent reengineering, developed through a series of projects (Castellani L, 2023).

The first project, called ICS2⁵, involves the complete reengineering of the ENS⁶ process and the creation of two union modules, STI⁷ and CR⁸, and a national module, NES⁹, aimed at increasing data exchange between various authorities.

The first release, in force since March 15, 2021, involves postal operators and express couriers for air transport, with the subsequent obligation to transmit a minimum data set of an ENS to the ICS2 system before cargo boarding, for security checks. The second release, in force since March 1, 2023, extends the mandatory adherence to ICS2 to all goods entering the customs territory of the European Union by air. The third and final release, in force since March 1, 2024, fully extends the new obligations to operational and risk management processes for all goods entering the customs territory of the Union by sea.

The second project concerns e-commerce, for which, since July 1, 2021, at the Union level, the VAT exemption threshold for shipments of low-value goods has been eliminated. Other significant changes include the new type of customs declaration, with a reduced data set, and the possibility of using the IOSS¹⁰ code for VAT payments (European Commission, 2021).

The third project involves a new goods declaration system that reengineers the management of incoming and outgoing cargo manifests, temporary storage, and interaction with port/airport stakeholders. It also foresees the complete

⁴ Società Generale d'Informatica S.p.A.: an Italian company operating in the information and communications technology field, wholly owned by the Ministry of Economy and Finance, for which it acts as an in-house service provider.

⁵ Import Control System 2: a system that enables the collection of data on all goods arriving from third countries before they are imported into the common security area.

⁶ ENtry Summary Declaration: any introduction of goods from a non-EU country must be preceded and then accompanied, upon entry, by an entry summary declaration containing advance information about the consignment entering the EU.

⁷ Shared Trader Interface: a platform developed and managed by the European Commission that interacts with the national system AIDA.

⁸ Common Repository: a European portal where ENS are submitted.

⁹ National Entry System: the national portal for submitting ENS.

¹⁰ Import One Stop Shop: a special scheme for distance sales of goods imported from third countries.

dematerialization of still-paper documents, with the ability to transmit the electronic file of the bills of lading.

Finally, the fourth and last project, related to the import, export, and transit declaration process and its customs reengineering, began with import traffic through Circular No. 22/2022 of June 6, 2022. It was initially planned to extend to export and transit flows during 2023 but had been postponed until the end of 2024 (Italian Customs and Monopolies Agency, 2022).

In general, the process involves a radical restructuring of flows to seize the opportunities offered by true digitalization within the broader digital transformation efforts. It aims at the digitalization of customs compliance, telematics for document and information exchange, risk analysis optimization, service usability, and the functioning of the single customs window.

The literature on customs digitalization highlights three broad trends. First, scholars emphasize the transformative potential of emerging technologies - IoT, blockchain, AI-driven risk analysis - in increasing transparency, improving security, and reducing administrative burdens in cross-border logistics (Ding et al., 2020; Alsudani et al., 2023). Second, several studies underscore the regulatory push toward harmonization and interoperability within the EU, noting the importance of frameworks such as the Union Customs Code and the MASP-C roadmap in steering member states toward paperless, standardized processes (European Commission, 2020, 2022; Ivanova et al., 2024). Third, research points to the potential benefits of digital customs in terms of sustainability and competitiveness, though most evidence remains theoretical or anecdotal (World Customs Organization, 2023; OECD, 2021).

However, despite this growing body of work, there is a notable absence of empirical studies evaluating the actual performance outcomes of national-level reengineering initiatives. Much of the literature treats customs modernization as a policy aspiration rather than as a measurable set of operational changes. Specifically, there is little systematic analysis of how digitalization affects clearance times, error rates, cost structures, or environmental performance in practice.

This gap directly motivates the present study. By examining Italy's AIDA 2.0 reengineering, the paper moves beyond descriptive accounts of regulatory change to provide quantitative and qualitative evidence of impact. In this way, Section 2's review establishes both the theoretical promise and the empirical vacuum in the state of the art, thereby situating AIDA 2.0 not merely as a national reform but as a case study with wider relevance for EU customs authorities and global debates on smart supply chains.

4. The custom declaration

The customs declaration is a public document with privileged authenticity, as it attests to the truth of facts perceived by the public official. Through it, a person expresses, in the prescribed forms and methods, the intention to place goods under a specific customs regime, indicating, if applicable, the procedure to be followed.

It can be submitted by anyone able to provide all necessary information and documents to apply the provisions governing the customs regime for which the goods are declared. Therefore, this person must also be able to present or arrange for the goods to be presented to customs.

Submitting the declaration obliges the person involved regarding the accuracy and completeness of the information provided, the authenticity, accuracy, and validity of the supporting documents, and, if applicable, the observance of all obligations related to binding the goods to the concerned customs regime or carrying out the authorized operations.

The declarant, in possession of all the necessary accompanying documents, makes them available to the customs authorities when presenting the declaration, as required by union law. For this reason, in Italy, signed electronic declarations are submitted to STD11.

With Circular No. 16/2012, ADM clarified that the process for digitalizing customs declarations has been completed, eliminating residual cases where a paper copy was still required.

In essence, the customs declaration consists of an electronic file containing information in the form required by the DAU12. Consequently, all data, attestations, or other annotations required by community and national regulations at the time of declaration submission must be entered in the appropriate fields of the electronic message template using current DAU coding or, where no specific coding exists, in textual form.

The electronic declaration may be submitted by the importer, exporter, sender, or their representative, either directly or indirectly, provided that the subject is authorized by STD, and it is considered accepted once registered in the ADM telematic system.

Following registration, the message is verified through the customs control circuit, and once released, the goods are freed from customs supervision. An intelligible image of the DAU, containing the declaration's data, is produced.

With the introduction of the electronic file, documents are no longer presented to customs offices, but, in the case of a control, they are uploaded to the telematic system, allowing the entire life cycle of the customs declaration and the control process to be traced.

Through the declaration, all necessary elements are transmitted to the authorities to ensure the application of the provisions regulating the chosen regime and to calculate the due customs duties, such as the classification of the goods, useful for determining the duty rate, the quantity and value of the goods, since there are both ad valorem duties based on transaction value and ad quantum duties based on weight, and the origin, which can be either preferential or non-preferential,

¹¹ Sistema Telematico Doganale: a portal that allows the submission of various types of declarations to ADM, digitally and electronically.

¹² Documento Amministrativo Unico: a form with specific characteristics defined by community regulations. It serves as the customs declaration itself for all customs regimes and destinations used by operators.

determining possible reductions or increases in import duties (Moriconi L. e Manca F., 2017).

Every customs declaration submitted to the system through the customs verification circuit and local systems is directed to one of five control channels, based on the various risk profiles associated with one or more elements of the declaration, such as origin, goods, packaging, etc.: the red channel (goods verification, abbreviated VM) involves document verification and physical inspection of the goods; the orange channel (scanner control, abbreviated CS) involves document verification and scanner inspection, including X-ray scanning of transport vehicles and containers; the yellow channel (documentary control, abbreviated CD) involves document verification of the declaration and related documentation; the green channel (automated control, abbreviated CA) involves automated control, and the declaration is immediately cleared without further checks; and the blue channel, which involves post-operation review.

If the declaration is selected for control (CD, CS, or VM), the signatory uploads the documents using the consultation function and the electronic file upload system, allowing for the tracking of modifications to the file's status and reviewing any notes or reasons entered by the customs office.

As a result, the electronic management of customs dossiers enables faster processing and control, eliminating the need for paper documentation and physical interactions with customs offices, except in cases selected for inspection. This has led to a significant reduction, estimated at 50-60%, in the time required to release customs declarations.

This improvement is primarily due to the automation of document checks, automatic cross-referencing with databases, the broader adoption of simplified and domiciled procedures, and real-time management of authorizations and clearances. Furthermore, the system facilitates the submission and acceptance of declarations on a continuous, 24/7 basis, independent of the traditional working hours of customs offices.

With regard to regulatory flows, interoperability between institutions and IT systems has been significantly enhanced. The AIDA platform is now integrated with data sources from the Italian Revenue Agency, the Ministry of Health, the Ministry of Infrastructure and Transport, among others, as well as with European systems and digital interfaces for businesses and customs brokers.

Consequently, every phase of the customs process is now digitally traceable, featuring real-time notifications, updated access to shipment and documentation status, and a reduction in fraud and manual entry errors of up to 60-70%. Lastly, the full dematerialization of documentation, enabled by the widespread use of digital signatures, certified email (PEC), and related tools, has resulted in the elimination of paper forms and a notable increase in efficiency, traceability, processing speed, and security in information exchange.

These benefits are clearly illustrated in the table below:

Table n. 1 - Key Indicators Before and After AIDA 2.0

Indicator	Pre-AIDA 2.0	Post-AIDA 2.0	Change (%)
Volume of declarations (millions)	15 millions	20 millions	+ 34 %
Average customs clearance time (min)	90 min	25 min	- 72 %
Average cost per procedure (€)	50 €	35 €	- 30 %
Error rate (%)	5 %	2 %	- 60 %
CO ₂ emissions (tons)	10.000 tons	7.000 tons	- 30 %

Source: Italian Revenue Agency (2024), Author's elaboration.

In summary, the AIDA system managed approximately 15 million customs declarations annually prior to its reengineering, with volumes rising to around 20 million following the implementation of the new digital procedures. The digitalization significantly reduced the average customs clearance time, from approximately 90 minutes to 25 minutes, primarily due to process automation and the ability to submit declarations in advance. Procedural simplification and automation also led to an estimated 30% reduction in the average cost per procedure, factoring in savings in time, labor, and material resources.

The introduction of automated controls and the standardization of data formats contributed to a decrease in customs declaration errors from 5% to 2%. Moreover, the dematerialization of documentation and the reduction in cargo dwell time at terminals resulted in an estimated 30% reduction in CO₂ emissions associated with customs operations. These findings underscore the significance of the innovations introduced through the reengineering of the AIDA system, which have enhanced operational efficiency, reduced costs, and mitigated the environmental footprint of customs procedures in Italy (Italian Revenue Agency, 2024).

5. New developments in import, export, and transit

The customs reengineering process introduces several significant innovations: incremental data submission of declarations through parcelled mode (multiple progressive and partial submissions) and complete mode (submitting all data in a single submission); an increase in the maximum number of items per declaration, with the limit rising from 40 to 999 individual items; the possibility for importers to request the release of goods by item; new communication modes with declarants based on the latest international standards (XML message exchange via web services); new forms for import, export, and transit customs declarations, with the decommissioning of the IM, EX, and T messages and their replacement with new H,

B, and D formats; telematic request for modifications and invalidation of customs declarations; the recognition of other certification authorities for digital identification and signatures; the use of SPID or CNS (Italy's public digital identity systems) for user authentication; and the ability for operators using representatives for submitting customs declarations to access declarations in their name (Vismara F., 2023, Italian Customs and Monopolies Agency, 2025).

Some of these innovations differ depending on the type of customs operation, as previously mentioned, which can involve import, export, and transit traffic.

In regards to the import operations, before the reengineering process, a digitally signed DAU copy, registered in AIDA, together with the release document, served as proof of import and release of goods for Italian importers. The DAU also had fiscal validity and was entered in the VAT purchase register of the importing company, as per Article 25 of DPR 633/1972 (Italian Ministry of Economy and Finance, 1972).

Figure n. 1 - The Import Declaration Prior to Reengineering

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Source: Author's elaboration.

Figure n. 2 - The Import Declaration Post-reengineering

DICHIARAZIONE DOGANALE H1 - Copia di Cortesia
Dichiarazione di immissione in libera pratica e regime speciale

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		Totale Nolo EUR 9.774,53	Tot. Assicuraz. EUR 444,96	Val. Conc. Iva			

Dettagli Dichiarazione				Svincolo VMH2RJ	Data Svincolo 05/07/2022
Esportatore RAGIONE SOCIALE INDIRIZZO CAP CITTÀ JP			Importatore RAGIONE SOCIALE INDIRIZZO CAP CITTÀ IT		
Dichiarante/Rappresentante 2 Rappr. Diretta DICHIARANTE DOGANALE C/DEBITO 13309 G VIA GIULIO DELLA TORRE 9 19126 LA SPEZIA, IT ITALIA			PARTITA IVA Condizioni di Consegna FOB YOKOHAMA Dilaz Pag. ITDPOIT068000-2018-WMY11499 Modo di Trasp. Frontiera 1 Via Mare Modo di Trasp. Interno		
Paese di Spedizione GIAPPONE (JP)		Paese di Destinazione ITALIA (IT)	Prov. Destinaz. PARMA	Luogo 068100	Identificativo Mezzo MSC GABRIELLA

Altri Soggetti					
Tipo	Codice	Eori	Ragione Sociale	Indirizzo	Città
TITAUTO	DPO	IT00793560111			

Documenti							
CD/DOC	Tipo	Riferimento	Autentità emissione		Data validità	U. Mis.	Quantità Valuta Importo
DOC	N705	2022 JP PC N.760643					
DOC	N935	2022 JP FATTURA N.MBA000235200					
DOC	U110	2022 JP RIF FATTURA MBA000235200					

Informazioni Supplementari		Note libere	
Codice	Descrizione	Natura	Riferimento

Dettaglio Articolo n°1 di 1				Cod.Add. 1 e 2	Contingenti	Svincolo	Data Svincolo
Colli	Peso Lordo	Peso Netto	Unità Suppl.	Valore Fattura	Preferenz.	Origine	Reg./Reg. Agg.
92	3.300,00000	2.572,87000		103.048,18	300	GIAPPONE (JP)	40 00 1NN
Descrizione Merce OGGETTI ED ATTREZZATURA PER COSTRUZIONI I,DI MATERIE PLASTICHE TRATTASI DI ACCESSORI PER ZANZARIERE				Marche -			
Contenitori TEMU4393869							
Valore delle merci				Liquidazione			
Prz. Art.	Valuta	Cambio	Importo in valuta	Importo	Tipo	Base Imponibile	Aliquota
	JPY	143,110	14.747.225,00	103.048,18	A00	113.267,67	% 0,00000
Nolo	EUR	1,00000	9.774,53	9.774,53	927	4,00	Q 0,75130
Assic.	EUR	1,00000	444,96	444,96	935	4,00	Q 0,30000
					B00	113.271,88	% 22,00000
Scarichi				Totale diritti da garantire: 0,00			
Tipo	Riferimento	Art.	Imb. Num	Quantità	Unità		
337	A3-00126161-2022-068100		92	3.300,000000	KG		
Totali: 92				3.300,000000			
						Valore Conc. IVA	
Informazioni Supplementari				Note libere			
Codice Descrizione				Natura Riferimento			

Riepilogo Dichiarazione				Dati Contabili	
Riepilogo Liquidazione				A93 N° 257	
Tipo	Descrizione	Importo	MP	EURO 24.924,02 SCADENZA 08/08/2022 Tipo pagamento G	
927	TASSA PORTUALE		3,01 G		
935	TASSA PORTUALE SICUR		1,20 G		
A00	DAZIO		0,00 E		
B00	IVA		24.919,81 G		
Totale diritti da garantire:		0,00			
		24.924,02			

Source: Author's elaboration.

Figure 1 illustrates the import declaration before reengineering, highlighting its complexity, while Figure 2 shows the streamlined post-reengineering format. The

simplification reduces the number of required codes and facilitates electronic submission, thereby cutting processing time.

With the reengineering, the use of a form such as the DAU is no longer required for submission or printing of the declaration. Therefore, there is no longer a document verifying the accuracy of the data in the customs declaration or one to be archived for the mentioned article, so, to address this gap, three types of summaries have been introduced.

Figure n. 3 - The Summary Statement for Accounting Purposes



Riepilogo ai fini contabili della dichiarazione doganale di importazione H1

MRN: 22ITQSS04FN45378R6 Ver. 0

Generato il: 19/02/2024 12:19:32

Ufficio 068100 - UD LA SPEZIA SEZIONE OPERATIVA CENTRALE	Data Rett./Ann. 05/07/2022	Data Svincolo 05/07/2022
	Data Dichiarazione 05/07/2022	Data Accettazione 05/07/2022
Importo totale fatturato 14747225 JPY	Tasso di cambio 143,11	Totale Articoli 1
Riepilogo relativo a tutti gli articoli: SI	Elenco Articoli	
Articoli non svincolati:		
Rappresentante Diretto CODICE FISCALE DICHIARANTE DICHIARANTE DOGANALE	Rappresentante Fiscale	Importatore PARTITA IVA RAGIONE SOCIALE
Elenco Fatture		
Codice N935	Paese JP	Anno 2022
Identificativo FATTURA N.MBA000235200		
Condizioni di Consegna FOB JPYOK		
Liquidazione dazi		
		Totale Dazi: 0,00
Liquidazione tributi nazionali		
Tributo	Imponibile	Aliquota
927	0,75	3,01
935	0,30	1,20
		Quantità
		4,00
		4,00
		Totale Tributi: 4,21
Liquidazione IVA		
Tributo	Imponibile	Aliquota
B00	113271,88	22,00
		Importo
		24919,81
		Quantità
		Lettera di intenti
		Totale IVA: 24919,81

Source: Author's elaboration

The first, the accounting summary, generated after the release phase, considering the various release methods (full declaration or by item), possible corrections, or invalidations.

This allows operators to fulfill their accounting and tax obligations related to the registration of import bills, enabling the exercise of the right to deduct VAT paid. The importer uses data from the accounting summary, provided by the ADM system, based on declarations using H-format data.

Figure n. 4 - The Summary Overview of the Declaration



Prospetto di sintesi della dichiarazione doganale di importazione H1

MRN: 22ITQSS04FN45378R6 Ver. 0

Generato il: 19/02/2024 12:19:36

Ufficio 068100 - UD LA SPEZIA SEZIONE OPERATIVA CENTRALE		Data dichiarazione 05/07/2022	Data accettazione 05/07/2022
Totale colli 92	Totale massa lorda 3300	Valore fattura 14747225 JPY	Tasso di cambio 143,11



22ITQSS04FN45378R6

Dettagli Dichiarazione:		Svincolo VMH2RJ	Data svincolo 05/07/2022	Num. A93 257	Anno A93 2022
		Totale Articoli 1	Data rilascio 12/08/2022	Num. Quiet. 4791	Data Quiet. 03/08/2022
Esportatore		Importatore			
RAGIONE SOCIALE JP CAP		PARTITA IVA RAGIONE SOCIALE IT CAP			
INDIRIZZO CITTÀ		INDIRIZZO CITTÀ			
Dichiarante		Rappresentante Diretto			
PARTITA IVA		C.F. DICHIARANTE DOGANALE DICHIARANTE DOGANALE IT 19126 VIA GIULIO DELLA TORRE 9 LA SPEZIA			
Condizioni di consegna		Dilazione di pagamento			
FOB JPYOK		*****			
Paese di sped. JP	Paese di dest. IT	Provincia dest. PR	Id. Mezzo all'arrivo MSC GABRIELLA		Natura transazione 11
Aggiunte / Detrazioni					
Codice	Descrizione	Importo			
Documenti					
Codice	Identificativo	Autorità Emitt.	Data Validità	Unità di misura	Quantità
33YY	-				
Scarichi					
Tipo	Riferimento	Art.	Num. imb.	Quantità	Unità

Dettaglio Articolo n° 1		Svincolo 40 00	Data svincolo 12/08/2022	Num. A93 4791	Anno A93 03/08/2022
Codice merce 3925908000	Massa lorda 3300	Massa netta 2572,87	Unità Suppl. Container TEMU4393869	Regimi aggiuntivi 1NN	
Descrizione merce OGGETTI ED ATTREZZATURA PER COSTRUZIONI DI MATERIE PLASTICHE TRATTASI DI ACCESSORI PER ZANZARIERE				Preferenze 300	Contingente
Paese di sped. JP	Paese di dest. IT	Prov. dest. PR	Paese di orig. JP	Paese orig pref JP	Natura transaz 11
				Prezzo art. 103048,18	Valore stat. 113267,67
Aggiunte / Detrazioni					
Codice	Descrizione	Importo			
AK		10219,49			
Documenti					
Codice	Identificativo	Autorità Emitt.	Data Validità	Unità di misura	Quantità
N705	2022-JP-PC N.760643				
N935	2022-JP- FATTURA N.MBA000235 200				
U110	2022-JP- RIF FATTURA MBA00023520 0				
Liquidazione					
Tributo	Imponibile	Quantità	Unità di misura	Aliquota	Importo
A00	113267,67			0	0
927		4	T	0,751	3,01
935		4	T	0,30	1,20
B00	113271,88			22	24919,81
Scarichi					
Tipo	Riferimento	Art.	Num. imb.	Quantità	Unità
337	A3-00126161-2022-068100		92	3300	KG
Colli					
Tipo imb.	Numero imb.	Marchi spedizione			
CT	92	92 CT -			

Source: Author's elaboration.

The second, the declaration summary, generated upon acceptance of the customs declaration on AIDA, summarizing key data such as the subject's details, unloading data, quantities, qualities, release information, A93 number, receipt number, etc.

Figure n. 5 - The Release Statement of the Declaration

Stampato il: 19/02/2024 12:19:28

Ufficio: 068100 - UD LA SPEZIA SEZIONE OPERATIVA CENTRALE

PROSPETTO DI SVINCOLO


22ITQSS04FN45378R6

Articolo : 1
Prospetto di svincolo per 1 di 1 articoli

Informazione mezzo di trasporto

Id Container	Targa Mezzo
TEMU4393869	MSC GABRIELLA

Articoli

Num. Articolo	Massa Lorda(Kg)	Codice svincolo - Data
1	3300.000	VMH2RJ - 05/07/2022 15:26:39

Source: Author's elaboration.

The third and final, the release summary, generated as part of the process when goods exit customs areas, allowing verification activities by the Italian Financial Police, which are finalized with the exit stamp (Italian Customs and Monopolies Agency, 2025).

It contains various data, including the MRN¹³ of the declaration, the number of items, the container identification code, the license plate of the transport vehicle, and, for each item, the gross mass and the release code along with the corresponding date.

To ensure the smooth flow of commercial traffic even after goods have left the customs premises, ADM recommends that operators provide the release note to transporters, as it may serve as proof that customs formalities have been completed in the event of en-route inspections by the competent authorities.

For export and transit operations, the reengineering introduces new communication modes with declarants based on XML message exchange via web services, digital signatures with a qualified certificate issued by accredited

¹³ Movement Reference Number: a unique barcode assigned to each customs declaration.

certification authorities under eIDAS¹⁴, and user authentication via SPID, CNS, or CIE (European Union, 2014).

The main innovations for export declarations include fully computerized management of export declarations; new features that allow not only the submission but also the rectification or cancellation of export declarations via a digitalized protocol between the export office and the declarant; the possibility of submitting a declaration electronically before goods are presented to the export office; the removal of the 40-item maximum limit; the possibility of submitting different types of customs declarations, standard, simplified, complementary, and pre-declarations, and centralized clearance (Italian Customs and Monopolies Agency, 2025).

Furthermore, operators are no longer allowed to submit groupage export operations or those combined with transit. Consequently, in the first case, it is necessary to submit one or more declarations for each exporter, whereas in the second case, the export declaration must be followed by the submission of the corresponding transit declaration (European Union, 2014). All items included in an export declaration must be encompassed within the same transit declaration; conversely, a transit declaration may refer to multiple export declarations. In order to be referenced within a transit declaration, an export declaration must first be released by the export office. An export declaration followed by external transit is automatically closed upon the release of the transit movement by the office of departure. In such cases, the customs office of exit coincides with the customs office of departure for the transit operation (Italian Customs and Monopolies Agency, 2025).

With regard to Union/Common/TIR¹⁵ transit operations, the main innovations introduced by the reengineering and digital management of the system depend on the type of operator involved, namely, the authorized shipper and the authorized consignee.

The first is an entity authorized to dispatch, in the course of its economic activity, excise goods released for consumption in one Member State and subsequently transported for commercial purposes to the territory of another Member State. The latter is an entity authorized to receive, at a premise under its control, excise goods released for consumption in another Member State and delivered for commercial purposes within the national territory (European Union, 1992).

Regarding the authorized shipper, the reengineered system provides not only for the submission of the transit declaration but also enables the submission of related amendments and/or cancellations through the same digital interface. It also allows the electronic submission of the declaration prior to the presentation of the goods at

¹⁴ Electronic Identification, Authentication and Trust Services: a European regulation that establishes the legal framework for secure electronic identification, the recognition of electronic signatures, and related trust services within the EU.

¹⁵ Transport International Routier: an international customs document for goods transported by road, which allows customs formalities to be carried out only at the point of departure and at the destination, thereby eliminating intermediate checks and duties along the transit route.

the office of departure, and lifts the previous maximum limit of 40 items per declaration.

On the other hand, the communication process between the authorized consignee and the office of destination remains unchanged. However, the structure of the relevant messages and the data they contain is modified due to the new format of the customs declaration. Furthermore, the "Desktop Dogane" application will no longer be operational. As a result, economic operators holding an authorized consignee status must either acquire dedicated software or adapt their existing systems to support the new communication process.

The reengineering of the AIDA 2.0 customs system has introduced significant improvements in Italy's customs clearance processes, with measurable impacts on control probabilities, clearance times, and error rates.

Table n. 2 - Control Probabilities, Clearance Times, and Error Rates Before and After AIDA 2.0

Control channel	Chance pre-AIDA 2.0 (%)	Chance post-AIDA 2.0 (%)	Change (%)	Clearance time pre-AIDA 2.0 (min, h)	Clearance time post-AIDA 2.0 (min, h, days)	Change (%)	Error rate pre-AIDA 2.0 (%)	Error rate post-AIDA 2.0 (%)	Change (%)
Green	45 %	68 %	+ 51 %	10 min	3 min	- 70 %	2 %	0,8 %	- 60 %
Yellow	30 %	20 %	- 33 %	90 min	45 min	- 50 %	4 %	2 %	- 50 %
Orange	15 %	8 %	- 47 %	24 h	12 h	- 50 %	6 %	3 %	- 50 %
Red	8 %	3 %	- 63 %	48 h	24 h	- 50 %	7,5 %	4,2 %	- 44 %
Blue	2 %	1 %	- 50 %	-	5-10 days	-	-	1,2 %	-

Source: Italian Customs and Monopolies Agency (2025), Author's elaboration.

In summary, the table illustrates how the implementation of AIDA 2.0 has reshaped the distribution of customs declarations across the various control channels, promoting a significant shift toward automated operations and a reduction in physical inspections. As a result of the increased share of declarations processed through the green channel, and the corresponding decrease in the use of other, more intrusive channels, the benefits for economic operators have been considerable, especially in terms of time efficiency. Automation enables immediate release of goods, often in real time, thereby accelerating the entire logistics chain and reducing storage delays and waiting times.

Moreover, the digitization of procedures and the use of secure digital identities (e.g., SPID/CNS) have contributed to halving the rate of declaration errors. This

reduction in processing time leads to lower warehousing and vehicle standby costs, decreased personnel hours devoted to administrative tasks, and fewer penalties for delayed deliveries. Additionally, the decrease in physical controls and data-entry errors translates into reduced direct and indirect costs for both economic operators and the public administration. It is estimated that such optimizations result in a cost reduction of up to 30% per shipment compared to other control channels.

Ultimately, the higher probability of clearance through the green channel has enabled a comprehensive optimization of logistics processes, benefiting companies and reducing unnecessary inspections, while enhancing the overall efficiency of the customs system (Italian Customs and Monopolies Agency, 2025).

6. Potential optimizations in the customs process

AIDA reengineering process, among other innovations, allows for the optimization of key concepts such as approved places, authorized consignee, in-house customs clearance, and the introduction of centralized customs clearance (Italian Customs and Monopolies Agency, 2025).

Under Article 139 of the Union Customs Code, ADM facilitates the simplification of customs procedures by authorizing import-export operations at company warehouses, eliminating the need to go to customs to perform customs procedures (European Union, 2013).

Therefore, possessing such authorization enables a company to clear goods at its own premises (or logistics facilities), effectively assimilating a portion of its business, specifically the approved place, as an extension of customs areas, where goods can be presented for clearance.

The benefits of this procedure are numerous: faster execution of customs procedures and goods release, reduced or eliminated costs for port or airport stops, and enhanced security in goods inspections (European Union, 2013). Only the holder of the authorization can utilize the approved place, although they can appoint a representative to perform customs formalities. Additionally, the location must meet suitability requirements, including fire prevention certification. Other requirements for obtaining authorization vary based on the type of operation: for export, continuous operations are required, while for import, a guarantee for customs duties on imported goods and recognition as an authorized consignee for Union transit are necessary.

Article 230 of the Union Customs Code governs the concept of the authorized consignee, allowing them to receive goods in circulation in accordance with the TIR Convention at an authorized location (European Union, 2013).

By transmitting data electronically to the destination customs office, the consignee can perform a simplified transit procedure to the destination.

However, certain mandatory requirements must be met by the operator. They must possess the status of an authorized consignee and appropriate certifications and authorizations issued by STD, and be equipped with software that enables

electronic communication in the absence of the "Desktop Dogane" application (Italian Customs and Monopolies Agency, 2025).

The status of an authorized consignee reduces the risk of delays in customs clearance and allows for the centralization of customs operations at a single office (Italian Customs and Monopolies Agency, 2025).

The combination of customs authorisations for the authorised consignee and the approved location enables the customs clearance process to be shifted from ports/airports to the operator's premises, for both export and import operations. This allows for so-called in-house customs clearance, whereby the operator can rely on a single customs broker to submit customs declarations on behalf of the company to the competent customs office responsible for the approved location of import and export.

Registration in the STD system offers companies the possibility to manage the entire customs clearance process fully in-house, without the need to rely on an external customs broker.

For exports, customs clearance takes place at approved locations within the company's facilities. As a result, the customs declaration is immediately available, and the goods arrive at the port or airport of departure already cleared. This ensures the absence of customs broker fees, eliminates administrative burdens or costs related to the retrieval of customs documents, and removes the risk of goods being subject to inspection in customs-controlled areas, thereby avoiding storage charges at the port or airport.

For imports, the authorized consignee company receives the goods at the approved location under a transit regime with suspension of duties and VAT. Once placed in the approved location, the transit is closed. The goods can then be placed under free circulation by paying duties and VAT, or placed under another customs regime.

This avoids customs broker costs and duties/VAT at the border, with very low risk of physical inspection at the port/airport. Any applicable duties or VAT are paid at the time of release for free circulation.

Among the key features of the reengineered export services, centralized customs clearance stands out. This allows operators (authorized for this purpose) to submit a customs declaration at a competent customs office located where the operator is established, for goods presented at another customs office, either within the same Member State or in another Member State, under the conditions set out by the regulations.

Authorization from the competent customs office, at least at the European level, is required, and specific general requirements must be met, including the possession of an AEOC16 certification. Regarding the VAT payment country, in the case of centralized clearance, negotiations should occur before granting authorization, according to an agreement between the authorizing and controlling Member States,

¹⁶ Authorized Economic Operator - Customs: a status granted by the customs authority to economic operators who demonstrate a high level of compliance with customs regulations, effective internal control systems, and proven financial solvency.

with the goal of paying VAT at the place of actual release for consumption. Alternatively, two methods could be used: payment of the tax or its liquidation.

This approach allows for greater flexibility, efficiency, and cost savings in handling customs operations across borders, facilitating the movement of goods and ensuring smoother compliance with customs requirements (European Union, 2013).

The adoption of the aforementioned customs simplifications has led to significant time and cost savings for Italian companies engaged in import/export operations.

Below is a summary of the main benefits reported by firms that have implemented these measures, based on publicly available data and sectoral analyses.

Table n. 3 - Benefits of the New Concepts Introduced by AIDA 2.0

Concept	Reduction in clearance time (%)	Reduction in operational costs (%)
Approved place	- 40 %	- 30 %
Authorized consignee	- 35 %	- 25 %
In-house clearance	- 50 %	- 40 %
Centralized clearance	- 45 %	- 35 %

Source: Italian Customs and Monopolies Agency (2025), Author's elaboration.

The adoption of the aforementioned customs simplifications has led to significant time and cost savings for Italian companies engaged in import/export operations. Below is a summary of the main benefits reported by firms that have implemented these measures, based on publicly available ADM reports, sectoral analyses (Italian Customs and Monopolies Agency, 2025; Confindustria, 2023), and trade press case studies.

For instance, IKEA has leveraged centralized clearance to synchronize customs procedures with its inbound container flows, reducing idle times at ports and enabling smoother inventory management. By integrating AIDA 2.0 functionalities into its supply chain management systems, the company has reduced the release time of goods by approximately 45%, thus achieving significant logistical savings on container imports. This outcome reflects IKEA's managerial focus on minimizing bottlenecks at intermodal terminals and enhancing just-in-time distribution practices.

Similarly, Ferrero has utilized approved place and in-house clearance authorizations at its logistics hubs to align customs formalities with production schedules. By embedding customs clearance within its own facilities, the company has improved just-in-time planning, reduced border waiting times, and enhanced coordination between production and distribution. From a managerial standpoint,

Ferrero's adoption of in-house clearance illustrates how customs digitalization can become an enabler of lean manufacturing strategies, ensuring that customs processes do not disrupt production cycles.

DHL and UPS, benefiting from their AEO status, have integrated automated customs controls into their standard operating procedures, accelerating clearance while reducing compliance risks. Their experience highlights how logistics operators can internalize regulatory simplifications into digitalized workflows to improve reliability and cost efficiency.

Finally, CNH Industrial, by leveraging the authorized consignee status and centralized clearance, has streamlined movements across European plants, cutting administrative costs by more than 30%. This case illustrates how multinational firms can align customs digitalization with broader supply chain restructuring, using AIDA 2.0 to support network optimization and operational continuity.

Collectively, these cases underscore how managerial choices - such as whether to invest in in-house clearance infrastructure, integrate digital interfaces with AIDA, or exploit centralized clearance for intermodal flows - determine the extent to which firms capture value from customs reengineering. They illustrate that AIDA 2.0 does not deliver automatic gains; rather, its benefits depend on the strategic alignment of digital customs capabilities with firms' operational models and supply chain strategies (Italian Customs and Monopolies Agency, 2025).

7. Conclusions

This study offers one of the first systematic and empirically grounded assessments of the AIDA 2.0 reengineering process, moving beyond policy-oriented accounts to provide concrete evidence of its operational, economic, and environmental impacts. By integrating regulatory analysis, secondary data, and stakeholder interviews, the paper demonstrates that AIDA 2.0 has significantly reduced clearance times, error rates, and procedural costs, while also contributing to measurable reductions in CO₂ emissions (Italian Revenue Agency, 2024).

The novelty of this research lies in three interrelated contributions. First, it provides an empirically validated account of how digital reengineering translates into tangible performance gains for both customs authorities and private operators. Second, it explicitly connects efficiency outcomes with sustainability, showing how digitalization can simultaneously advance competitiveness and environmental responsibility. Third, it develops a methodological framework - combining documentary review, data analysis, and stakeholder perspectives - that can be replicated by other EU member states seeking to evaluate similar reforms.

Despite these positive results, the study also reveals several limitations that should be highlighted in order to properly contextualize the impact of the reengineering of the AIDA system. The available data are often partial or heterogeneous: many of the metrics used come from aggregated sources or from Customs Agency reports that are not always up-to-date, and there is currently no centralized information system offering disaggregated indicators by region, type of

operator, or nature of the goods. This makes it difficult to conduct a detailed and comparable analysis across different contexts (Italian Customs and Monopolies Agency, 2023). Moreover, the primary focus has been on import operations, with exportation and special customs regimes being given secondary attention, despite the fact that these could present different benefits and challenges. Methodologically, the available evaluations focus on a relatively short period: there are still no longitudinal studies analyzing the evolution of the system's performance over the years, nor systematic surveys on user satisfaction (European Commission, 2023). Another important limitation concerns the varying adaptability of businesses. More structured operators, who already possess advanced digital skills, have benefited from the potential offered by AIDA 2.0 right from the start. On the other hand, many SMEs or less digitalized entities struggle to access services like centralized customs clearance or approved places, risking exclusion from the benefits of digital customs processes (Confindustria, 2022).

A major strength of this paper is also its most evident limitation. By focusing on the highly technical and regulatory aspects of customs reengineering, the study provides a detailed and empirically grounded account of AIDA 2.0's impact. However, this specificity inevitably constrains the generalizability of the findings. The outcomes observed are context-dependent, shaped by Italy's institutional framework, regulatory culture, and logistics infrastructure. While the methodological framework developed here is replicable, the results cannot be automatically transferred to other jurisdictions without considering their distinct legal, organizational, and technological environments.

Looking ahead, these limitations open promising avenues for further inquiry. One initial objective should be the concrete extension of centralized customs clearance, making it more accessible to medium and small businesses, possibly through simplified platforms or standardized declaration models (Italian Customs and Monopolies Agency, 2023). Longitudinal studies are also needed to assess whether performance gains are durable over time. Disaggregated analyses by region, sector, or type of operator could shed light on distributional effects, while comparative research across EU member states could identify the contextual conditions that maximize the effectiveness of digital customs reforms. Finally, experimental and simulation-based approaches could evaluate how emerging technologies - such as blockchain, AI-driven risk management, or digital twins - might be integrated into AIDA or future customs platforms (European Court of Auditors, 2023).

From a strategic perspective, the innovations introduced by AIDA 2.0 align with broader national and European objectives, such as the National Logistics Plan 2022–2030 and the National Recovery and Resilience Plan, which prioritize digitalization, simplification, and sustainability in logistics (Ministry of Infrastructure and Transport, 2022; Presidency of the Council of Ministers, 2021). The complete dematerialization of customs declarations, computerized management of controls, and integration with services such as SPID and CNS significantly reduce the time goods spend in ports and intermodal terminals. This directly improves traffic flow, contributing to better flow planning and reduced infrastructure congestion,

resulting in lower emissions and energy consumption associated with prolonged vehicle and container stops (Italian Customs and Monopolies Agency, 2023).

From the standpoint of Italian ports competitiveness, AIDA represents a strategic asset. In a context where large Northern European ports have long relied on fully automated customs systems, the modernization of AIDA enables Italian ports to bridge part of the technological gap, offering faster and more predictable customs clearance times, an increasingly crucial element in the decision-making of international operators. Ports such as Genoa, Trieste, and Gioia Tauro, which already host operators with approved places and benefit from simplified procedures, are experiencing a positive impact in terms of attractiveness and traffic management capacity, particularly in high-turnover sectors and intermodal flows (National Port Conference, 2023).

In sum, AIDA 2.0 represents not only a national milestone in customs modernization but also a broader case study for the European Union and beyond. Its experience demonstrates that reengineering customs systems can generate a triple dividend of efficiency, transparency, and sustainability, provided that reforms are accompanied by robust data collection, interoperability efforts, and inclusive access for firms of varying digital capacities. The integration of AIDA with Port Community Systems and, in the longer term, the development of a genuine Single Window for customs and logistics, would consolidate these achievements, positioning Italy at the forefront of digital trade facilitation in line with the European Green Deal (European Commission, 2020).

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