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ARTICLES

Digital Aspects of Customs Control in the New European Customs Reform Initiative

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An increase in the volume of world trade and the resulting pressure placed on European Customs requires the implementation of new technologies. The European Commission has prioritised the development of digitisation and the acceleration of information exchange processes between customs officials and economic operators. This article theoretically and practically examines how this reform might impact customs control in the European Union and how it might contribute to its digital transformation. The attitudes of customs officials in the Republic of Bulgaria and their readiness to implement the imminent changes were investigated. The results suggests that improvements in digitisation and information exchange are interdependent and should be addressed simultaneously.

1. Introduction

The digitisation of Customs has seen exceptionally rapid development in recent years, particularly following the entry into force of the main customs regulatory document in the European Union (EU) – the Union Customs Code (UCC). This can be attributed to external factors such as advancements

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in information technology, the growth of global trade, the development of the circular economy and green projects, globalisation and geopolitics. Internally, it is driven by Customs' efforts to create efficient control processes, manage and analyse increasing volumes of information, address expanding responsibilities and functions, simplify formalities for businesses and enhance cooperation at national, EU and international levels with other customs authorities, regulatory bodies and institutions.

The UCC is set for full implementation by 2025, however, during this period, a comprehensive revision and adoption of a modernised regulatory framework governing customs formalities in the EU is also necessary. The proposal for a New European Customs Reform (NECR), endorsed in May 2023, aims to modernise the Customs Union (Proposal for a Regulation of the European Parliament and of the Council Establishing the Union Customs Code and the European Union Customs Authority, and Repealing Regulation (EU) No 952/2013, 2023). This initiative is a response to the rapidly changing external environment (such as global health crises, geopolitical conflicts, the growth of e-commerce and the advancement of high technology), which significantly impacts the customs control system and highlights the need for its adaptation to new realities and increased overall effectiveness. The reform is ambitious, introducing numerous changes to customs control approaches through digital means. This article outlines the potential challenges and argues the potential benefits of the reform for customs control in EU member states.

2. The need for digitalisation of customs control in the EU

In the context of customs control, the term 'digitisation' describes the process of converting paper or analogue documents and data into a digital format. This includes electronically entering, storing and accessing customs declarations, commercial and transport documents, facilitating subsequent processing and the exchange of information. Digitisation enables customs administrations to work more efficiently by eliminating dependence on paper and creating conditions for transparency, traceability and reliable data.

'Digitalisation' extends this process by introducing digital technologies to completely restructure and automate customs procedures. This includes the electronic submission and validation of declarations, integrated risk management systems and the real-time exchange of data between national and international institutions. Digitalisation is a tool for creating a fully electronic customs environment, replacing paper-based, disconnected systems with a unified, interconnected and intelligent infrastructure.

Building on these processes, the 'digital transformation' of customs control represents a strategic and organisational change that goes beyond the introduction of individual technological solutions, aimed at completely rethinking the role of Customs in the global trade and logistics ecosystem. This involves integrating innovations such as artificial intelligence (AI), big data, blockchain and the Internet of Things (IoT) into management and control processes to achieve greater predictability, transparency and

cooperation between institutions and businesses. Within the framework of the EU's digital transformation strategies, customs administrations are not only called upon to modernise their procedures, but also to facilitate legitimate trade, strengthen supply chain security and build a competitive and sustainable European economy.

Considering the above definitions, digitalisation in customs control represents not only a natural process, following the inevitable development of high technology but also the result of deliberate efforts to modernise customs administrations. Nonetheless, customs administrations in the EU are not fully digitalised, as there is a significant gap between the implemented digital tools in practice and the available opportunities for further digital development. Reports such as *Putting More Union in the European Customs* (Wise Persons Group on the Reform of the EU Customs Union, 2022) and *A Comparative Analysis of Member States' Customs Administration Procedures for the Entry of Products into the European Union* (Hausemer et al., 2022) highlight the need for further digitalisation of customs control, which led to the NECR proposal in 2023. Several factors contribute to the current situation, including the need for legal framework changes, the complexity of national and EU customs information systems (CIS), the increasing functions and responsibilities of Customs, the lack of financial resources and administrative capacity for implementing modern IT solutions and the lack of motivation to utilise these solutions.

2.1. Outdated legal framework and the need for a 'revolutionary' change

Before the European Commission's (EC) proposal for the NECR, digitalisation in customs control was governed by several EU regulations. The UCC and related legislative acts allowed partial digitalisation, such as the electronic submission of customs declarations, but did not mandate a fully digital environment. This regulatory framework lacks a comprehensive, unified concept guiding customs authority towards higher digitalisation levels. Key legislative documents in this regard include the following.

Decision No. 70/2008/EC (Decision No 70/2008/EC of the European Parliament and of the Council of 15 January 2008 on a paperless environment for customs and trade, 2008): this regulates the establishment and interconnection of both European and national CIS in EU member states, fundamentally altering the method of information exchange among them. Article 2, paragraph 2 of the Decision introduces the requirement that communication at the 'Customs–Economic operators (EO)' and 'Customs–Customs' levels is to be conducted primarily electronically. The content of this regulatory act is entirely oriented towards the digitalisation of Customs, laying the groundwork for their digitisation. However, its focus is solely on how digitalisation can be implemented, ignoring the digital transformation of processes and approaches applicable to customs control. Its comprehensive implementation has a long-term perspective, as a portion of

customs documentation is still prepared and utilised in paper format. This indicates that, at present, this optimisation is not fully implemented within European customs administrations.

The UCC (Regulation (EU) No 952/2013 of the European Parliament and of the Council of 9 October 2013 laying down the Union Customs Code, 2013): the UCC is the primary regulatory act governing the objectives, tasks, mission and execution of customs control within the EU. Articles 6, 16, 278 and 280 of the UCC refer to digitisation in customs control, but this is insufficient given the complexity and comprehensiveness of the changes that digitisation itself brings. Based on these Articles, the UCC Work Programme has been developed, which sets out the framework for the creation, implementation and modernisation of various information systems in the activities of customs authorities, such as the Economic Operators Registration and Identification number (EORI) information system for the registration of economic operators. Under this program, which is updated on a regular basis, the CIS for imports and exports – Import Customs System 2 (ICS2) and Automated Export System (AES) – have been implemented, and the New Computerised Transit System (NCTS) has been updated, with Phase 6 coming into force in 2025. In practice, most of the planned systems are already operational, but there are delays and postponements in the implementation of some of them (European Association for Forwarding, Transport, Logistics and Customs Services [CLECAT], 2024; EC, 2025). Article 6 of the UCC significantly emphasises data exchange, as this process is crucial for establishing and developing cooperation among the 27 customs administrations within the EU. Data exchange and customs cooperation are activities that can facilitate a smooth transition towards a unified digital European customs framework and enhance the effectiveness of customs control in the EU. Essentially, the UCC regulates operations within an electronic environment without altering the processes involved in customs control during the import, export and transit of goods, nor does it transform them into digital processes. This, however, proves inadequate, as even prior to the deadline for implementing its provisions, the necessity arises for its repeal and the drafting of an entirely new code, as referenced in the proposal for the NECR.

Commission Delegated Regulation 2015/2446 (DR) (Commission Delegated Regulation (EU) 2015/2446 of 28 July 2015 supplementing Regulation (EU) No 952/2013 of the European Parliament and of the Council as regards detailed rules concerning certain provisions of the Union Customs Code, 2015) and **Commission Implementing Regulation 2015/2447** (IR) (Commission Implementing Regulation (EU) 2015/2447 of 24 November 2015 laying down detailed rules for implementing certain provisions of Regulation (EU) No 952/2013 of the European Parliament and of the Council laying down the Union Customs Code, 2015): these govern the use of CIS for the electronic processing and transmission of data as a key tool through which digitalisation in customs control is developed;

however, they do not encapsulate or define its essence. In the texts containing definitions of specific customs concepts, namely Article 5 of the UCC, Articles 1 and 37 of the DR and Article 1 of the IR, there is, in fact, no definition of what constitutes 'digitalisation in customs control.' The regulatory acts mentioned above only refer to 'the use of means for electronic data processing' and 'electronic systems for the exchange of information.' The necessity for more comprehensive legal regulation of the concept of 'digitalisation in customs control' arises from two primary factors:

- to fulfil the mission of Customs, according to Article 3 of the UCC, they must possess the necessary modern tools, including a regulatory framework, rules, technology and resources
- Customs and businesses should have equal procedures, tools and technical means to conduct effective control over the movement of goods across EU borders.

Regulation (EU) 2022/2399 (Regulation (EU) 2022/2399 of the European Parliament and of the Council of 23 November 2022 establishing the European Union Single Window Environment for Customs and amending Regulation (EU) No 952/2013, 2022): this regulates the establishment of the concept of a single electronic portal in the EU, with the aim of ensuring that information on shipments is submitted only once. All data on a given import or export operation will be accessible not only to customs authorities but also to all other interested parties who monitor the implementation of non-tariff measures applicable to imports and exports of goods to and from the Union. The Single Window (SW) electronic portal is scheduled to be fully implemented by 2031. To implement it, the EC plans to set up national information systems and roll out the EU Customs SW Certificates Exchange System (EU CSW-CERTEX), which will allow digital information to be shared between different control authorities directly involved in customs clearance for imports and exports. The European system will be linked to national 'one stop shop' systems and to the European non-customs systems of the institutions concerned. On the one hand, this concept will support the digitisation of customs control and facilitate customs formalities by eliminating the practice of multiple submissions of the same documents. On the other, it will increase the number of CIS at both national and European levels, which will further complicate the customs control system, as new links will have to be established between the newly created CIS for the purposes of the SW and the existing ones serving the import and export of goods.

The brief overview of the European legal framework above indicates that digitalisation in customs control is currently inadequately regulated. It is governed at the stage of digitalisation, meaning that a direct change with a digital focus in existing processes and procedures is not envisaged. Moreover,

the legislation does not in any way introduce a fully electronic mode of operation for Customs; rather, it establishes a parallel functioning of both paper and electronic environments. With the entry into force of the Modernised UCC (MUCC) (Pickett & Wolffgang, 2023), changes in this direction are anticipated to ensure that Customs is equipped for the digital age (Antov, 2023). The objective of the UCC is to simplify and modernise customs procedures within the EU, transitioning their operational execution entirely into an electronic environment and ensuring greater unification for businesses (Wise Persons Group on the Reform of the EU Customs Union, 2022). Simultaneously, the goal of the NECR is to undergo digital transformation and operate 'as one' (Proposal for a Regulation of the European Parliament and of the Council Establishing the Union Customs Code and the European Union Customs Authority, and Repealing Regulation (EU) No 952/2013, 2023).

2.2. The digital transformation of EU customs: from the Union Customs Code to the new customs reform

There are over 111 functioning CIS at both European and national levels (EC, 2023), characterising customs control in the EU as a complex and heterogeneous system. Since the entry into force of the UCC, each member state has been enhancing and developing its own CIS to enable the acceptance, processing and exchange of data electronically, compatible with European systems such as the NCTS, the Automated Export System (AES) and the Import Control System (ICS). However, these developments have proven insufficient, given the increasing volume of customs declarations (single administrative document, SAD) resulting from changes in international supply chains and, most notably, the rise of e-commerce. For these reasons, recent years have seen the introduction of more automated checks and various oversight mechanisms into the business architectures of CIS, aimed at ensuring the protection of businesses, citizens and the environment within the EU (Heijmann, 2018). Considering that customs control includes a range of non-customs checks, all relevant control bodies (e.g. tax, police, phytosanitary and veterinary) involved in import-export operations must operate interoperable systems. Simultaneously, these electronic systems must exchange information with third countries, but this is only possible if a standardised dataset is used (Wolffgang, 2018).

Due to the continuous dynamism and diverse political and economic characteristics of the member states, each country has reached a different stage in the enhancement of its CIS (EC, n.d.). This applies to the digital development of Customs in the EU as well, hindering the synchronised development and functioning of the European Customs Union. Consequently, varying practices are applied, resulting in different control actions across the member states. In summary, common European customs legislation, policies and development strategies are insufficient for the establishment and functioning of a unified European CIS. This assertion

is supported by findings from the *Putting More Union in the European Customs* report (Wise Persons Group on the Reform of the EU Customs Union, 2022) and from *A Comparative Analysis of Member States' Customs Administration Procedures for the Entry of Products into the European Union* (Hausemer et al., 2022). The former highlights persistent significant differences in the application of rules and procedures among national Customs, as they face growing challenges in controlling borders. The comparative analysis of customs administrations in the surveyed member states also reveals significant disparities, not only in the degree of digitalisation (e.g. different national systems) but also in the operational implementation of, for example, customs controls and sanctions (Hausemer et al., 2022). This suggests that, in practice, other factors contribute to these differences. However, both reports provide guidelines and recommendations for the digital transformation of European customs, which would significantly enhance their functioning 'as one' and increase the effectiveness of customs control within the Union.

Opportunities for implementing digital tools (Zhelev & Kostova, 2024) and digital customs transformation can also be explored in the individual manifestation of their core functions. These functions demonstrate the complexity and dynamic nature of customs control development in response to external environmental changes, which directly affect the efficiency of customs activities. Although the functions are presented at a purely conceptual level and, due to their theoretical nature, are not subject to digital transformation, the processes involved in their implementation and the activities performed by Customs are subject to digitalisation. In specialised literature, customs control functions are viewed and classified in various ways. Azcárraga and others (Azcárraga et al., 2022) identify three primary functions of Customs: fiscal, economic and protective. Functions in customs control are considered in much more detail by Antov (2012), who conditionally divides them into:

- functions relative to the content of the control – ascertaining, informational, evaluative and regulatory
- functions about the set control goals and tasks – fiscal, protective, economic and political.

Particular attention should be paid to the growing significance of a potentially new function of customs control, namely the coordination function, arising from the adoption of Regulation (EU) 2022/2399 on the establishment of an EU Single Window Environment for Customs. According to the regulation, 'Trade facilitation, and safety and security, concern all authorities involved in the goods clearance process across Union borders. The rapid rise in international trade and e-commerce has increased the need for better cooperation and coordination among those authorities' (Regulation (EU) 2022/2399 of the European Parliament and of the Council

of 23 November 2022 establishing the European Union Single Window Environment for Customs and amending Regulation (EU) No 952/2013, 2022). The expansion of customs functions demonstrates the need for revising the concept, updating procedures and introducing innovative high-tech tools into the customs control system to adapt to contemporary realities. Therefore, the introduction of the NECR, with its focus on the digital transformation of Customs, is one of the necessary means for their modernisation and elevating them to a new, higher level, enabling them to function 'as one'.

3. Transformation of customs control from a process-based to a systemic approach

The core customs formalities, according to the current UCC and its predecessor, the Community Customs Code, are centred on a process-based approach. This is demonstrated by the fact that control actions aimed at ensuring compliance at each stage of the customs process are conducted separately for each consignment moving to or from the customs territory of the EU. With the proposed changes under the NECR, the focus shifts towards a systemic approach. External influences such as the substantial growth of e-commerce, geopolitical factors and the development of digital tools exert pressure on the customs control system, necessitating its modernisation and overall transformation. This shift signifies a reorientation in the applicable approaches, though the combined use of both approaches should continue. In practice, the two approaches complement each other, as process-based customs checks serve to confirm and correct the results achieved through prior assessments and analyses based on the systemic approach.

3.1. The process-based approach in customs control

In customs control, there are numerous diverse processes at both the organisational level (Customs) and at the level of control activities. Of primary importance is the definition of the main processes related to the control of imports, exports and transit of goods. Without claiming to be exhaustive, the following definition of a process in customs control activities can be given: a process is a set of legally regulated, sequential and interconnected actions with a clear structure and scope. These actions transform incoming data into output information, ensuring that the movement of non-EU goods to, from and through the customs territory of the Union is in full compliance with applicable norms, rules and procedures.

According to ISO 9001:2015, the process-based approach 'includes establishing the organization's processes to operate as an integrated and complete system' (International Organization for Standardization, 2015, p. 1). Davenport (1993, p. 6) adds that 'the application of the process-based approach implies placing a strong emphasis on improving the way work is performed and on using efficient and effective processes in providing services or producing products'. This means that the use of the process-based

approach necessitates the continuous optimisation of processes. Otherwise, they may become ineffective in the future, given that the external environment is dynamic and some of its aspects influence the system.

Under the UCC, customs control is structured around the process-based approach, with the primary processes being the control of imports, exports and transit of goods. Each of these has a specific set of actions (sub-processes) which, according to the UCC, remain unchanged in essence during optimisation, with only the manner of execution subject to improvement (such as moving to an electronic format). For instance, the goal of the 'declaration' sub-process has remained unchanged over time, regardless of whether the customs declaration and accompanying commercial documents are submitted on paper at the customs office or electronically. The aim of the improvement is thus to update the method of performing the 'declaration' activity by modernising the tools for achieving it. This example illustrates that the use of the process-based approach is applicable both for creating new, efficient processes and for transforming existing ones to modernise them.

The application of the process-based approach enables a deeper understanding of the individual activities within an organisation, such as Customs, but simultaneously 'can separate what is fundamental to the process from what is superficial' (Hammer, 1990, p. 108). The conditional division of a process into separate sub-processes aids in more clearly justifying the necessity of their existence and functioning, and sub-processes that do not add value can be replaced with more efficient ones. Moreover, when an error arises, it is much easier to identify and optimise the malfunctioning sub-process without requiring an extensive and large-scale reconstruction of the activity.

As global and online trade volumes increase and supply chains are redefined, the current operational model as seen through the lens of the process-based approach, involving numerous repetitive actions in customs procedures, proves to be insufficiently effective and may negatively impact the quality of control. EU member states should provide not only for adequate penalties, but also effective and dissuasive customs control measures to combat infringements of Union customs legislation in an appropriate manner where such infringements are liable to impede. One example of this is the effective and complete collection of traditional own resources such as customs duties and, consequently, to affect the financial interests of the Union (*European Commission v United Kingdom of Great Britain and Northern Ireland*, 2022). It is also common practice, for example, that during the importation of goods, a risk analysis is conducted both by the member state where the goods first enter the customs territory of the Union and by the customs authorities of the receiving country. These repetitive actions not only lead to the use of different practices in the member states but also to inefficient resource allocation in Customs. Due to the increase in declaration volumes, it becomes impossible to cover the entire flow of goods passing through the EU's borders daily. The consequences of this might

include a decrease in the effectiveness of control, allowing for more errors or significant delays in customs clearance, disrupting supply chains. This necessitates process optimisation and the simplification of certain procedures, such as the introduction of the H7 declaration type with a reduced dataset and more automated customs control for low-value consignments. However, this specific measure does not always manage to encompass and prevent all potential threats posed by the importation of such goods. According to the EC, in 2022, approximately 86 million counterfeit goods worth over two billion euros were seized upon import and within the internal market, a 3 per cent increase compared to 2021 (EU Intellectual Property Office, 2023). In this case, the process-based approach's facilitation of customs formalities was not a sufficiently effective optimisation for fulfilling customs functions and goals. Greater optimisation is required, where the systemic approach will take precedence, as envisaged in the NECR.

3.2. The systemic approach in customs control

Customs control can be represented as a system which, at its core, is a complex, dynamic, legally regulated entity with clearly defined boundaries. This system consists of interconnected and continuously interacting elements, all of which have the unified objective of ensuring compliance between the specific actions of controlled entities and the applicable customs legal framework at any given time of enforcement.

Through the lens of a systemic approach, customs operations can be viewed as an integrated and indivisible whole. This perspective enables targeted interventions to mitigate negative impacts, correct systemic errors and maximise the achievement of customs objectives. A system operates correctly and efficiently when it can flexibly respond to both internal and external influences, which may otherwise have a detrimental effect on its performance. To this end, certain key factors that affect the system's operation, as well as their negative manifestations, need to be minimised, as they may present risks or threats to the system's usual state. In 2017, the Organisation for Economic Co-operation and Development (OECD) published a report identifying four major external factors (Volatility, Uncertainty, Complexity and Ambiguity – VUCA) that significantly influence public sector systems (OECD, 2017). These factors are so dynamic and pervasive in system operations that they have become both typical external influences and norms within the system itself (OECD, 2017). The presence of VUCA necessitates those systems be flexible and adaptable to contemporary realities; otherwise, they risk losing their efficiency and failing to meet their objectives.

Digitalisation can serve as a powerful tool to reduce the negative effects of complexity within the customs control system. The implementation of digital solutions contributes to both its modernisation and the harmonisation of internal and external complexities (Ashby's Law of Requisite Variety, as applied by Boisot and McKelvey) (Umpleby, 2009). Moreover, digitalisation functions as an instrument for adapting the system to current external

influences, optimising it and enhancing its flexibility. However, as it stands, digitalisation is not applied as an approach to altering the system. In practice, the underlying customs system architecture remains the same as in the pre-digital era, being primarily oriented towards goods (i.e. a process-based approach). This is evident in the fact that the rules and procedures for importing, exporting and transiting goods, as per the UCC, focus on goods rather than on information. The introduction of the NECR will shift the primary focus of customs control towards a systemic approach, involving the collection, processing, analysis, automatic exchange and storage of large volumes of data. These data will be submitted once to a unified European CIS (EU Data Hub) and will be used by a broad range of public administration representatives at both European and national levels to perform customs and non-customs checks. As Antov (2023) notes, 'this will also require an expansion of the scope of processed data, including those generated and submitted by consignors and consignees of goods, the transport and logistics sector, financial institutions and other participants in the supply chain'.

With the implementation of the NECR, customs formalities are expected to be streamlined to a significantly higher level, with some scholars describing these changes as revolutionary (Antov, 2023; Lux, 2024). A prominent example is the evolution of the Authorised Economic Operator (AEO) status, which will transform into Trust and Check (T & C) Traders, predominantly through the lens of the systematic approach. The NECR envisions not only enhancements (Zheleva, 2023) but also a complete restructuring of the operational framework of the AEO program, which will manifest in a shift to the Trusted Trader model. The forthcoming changes will focus primarily on digitalisation, leading to a comprehensive review of the existing rules and procedures governing customs control. This means that the innovations within the T & C framework provide clear evidence of the impact of digital transformation on customs formalities for imports, exports and transit of goods. It is anticipated that the connection between the electronic systems of Customs and traders will be continuous, with real-time information exchange. Given its large volume and diversity, all this information can be classified as 'big data', as it encompasses unstructured, semi-structured and structured data, with the primary emphasis on unstructured information. This data will be utilised to uncover relationships and dependencies and to make predictions about outcomes and behaviour (Ribov, 2021). Conducting such a complex analysis for numerous organisations simultaneously would be unimaginable without the digital transformation of customs operations.

The information submitted to Customs can be processed and analysed not only through predefined algorithms but also through the integration of AI, the IoT, Machine Learning (ML) and other advanced technological tools. These tools would help reduce the time needed for data analysis, cover the entire volume of available information, and minimise systemic errors often caused by human intervention. The application of a systemic approach

to customs control primarily involves conducting preliminary controls. Additionally, cross-checking would significantly contribute to achieving a sufficient level of confidence in the data entering the customs control system. Timely submission of information is also crucial, and it would be relevant for customs authorities to have continuous access to the databases of EOs, from which information can be used and analysed in real time to perform effective customs control when necessary.

4. SWOT analysis[1] of the digital aspects of the NECR

To properly understand the concept presented in the EC's proposal for comprehensive reform of customs control in the EU, it is crucial to maintain a high level of awareness of all processes, including current and future changes in the internal and external environments of Customs. Due to the early stage of the reform, it is challenging to provide specific practical assessments regarding the feasibility of the proposals and their anticipated impact, as adaptation processes are still ongoing within the EC, tailored to the actual needs and development of the reform. Nevertheless, from a theoretical perspective, it is possible to analyse the effects of various components of the reform. A SWOT analysis of the digital aspects of the NECR is particularly useful in this context. Without claiming to be exhaustive and based solely on research conducted by the authors, as well as on a review of regulations and publications on the topic, the four elements of the SWOT analysis are presented according to the environment in which they manifest.

An examination of the internal environment of the customs control system reveals the strengths and weaknesses of the digital aspects of the NECR. These have been defined based on information from focus groups (customs officers and EO) and considering the resources available to customs administrations and the organisation of internal processes.

4.1. Strengths

Enhanced digitalisation of customs administrations: The focus of the NECR is on standardising the electronic exchange of data for every movement of goods across the external borders of the Union and ensuring a high level of automation in data processing. At the core of this exchange is the creation of a dedicated Central EU Data Hub, which will handle all customs processes, eliminating national CIS, streamlining customs declarations across the EU, and reducing IT costs at the member state level and for individual EOs. At the same time, the EU Data Hub will interface with other regulatory national or European databases, ensuring the processing of non-customs data relevant to the security and safety of supply chains. Under the principle of SW, EOs will submit data once, in real time.

1 A SWOT analysis identifies an organisation's Strengths, Weaknesses, Opportunities and Threats.

Harmonisation of customs procedures: One of the main goals of the reform is to eliminate the so-called 'national' practices in member states, which undermine the uniform application of customs legislation across the Union. A positive step towards achieving this goal is the proposal to establish a single EU Customs Authority with the capacity for centralised decision-making and the harmonisation of customs sanctions across the EU.

Improved risk analysis: In line with global trends in the development of customs control, the EU also places significant emphasis on risk analysis concerning cross-border movements of goods. Under the NECR, this process is expected to be performed automatically, primarily at the pan-European level rather than nationally, with the aim of reducing discrepancies, omissions and errors. The development of current CIS (ICS2 phases 1, 2, and 3 + PLACI – Preloading Advance Cargo Information, AES, NCTS phases 5 and 6, etc.) provides a solid foundation for this.

Better resource allocation for the maintenance and development of EU Customs: The establishment of the EU Customs Authority will enable the timely and more precise allocation of limited financial, technical and human resources within customs administrations. The results of risk analysis concerning traffic at specific customs points along the EU's external borders, the movement of high-risk goods and the behaviour of risky EOs will form the basis for this.

New customs facilities: The NECR prioritises streamlining of customs processes and access to simplified customs procedures (such as self-assessment, centralised clearance, deferred duty payments, automatic release of low-risk goods, etc.) for EOs that meet the required criteria. This benefits businesses by reducing time and costs associated with customs clearance, while customs authorities benefit by freeing up control resources and redirecting them more effectively.

Redefining e-commerce control: The reform envisages removing the threshold for low-value shipments (up to EUR150), allowing control over all goods regardless of their value and limiting fraud in this area. It also simplifies how duties are determined, reducing the thousands of possible rate options to just four groups. Customs collection will be simplified by expanding the existing Import One Stop Shop scheme with the addition of these four groups to the H7 electronic customs declarations.

4.2. Weaknesses

Concentration of many activities and responsibilities in the EU Customs Authority: Centralised decision-making has both positive and negative aspects, primarily related to limitations in the consideration of specific local conditions and potential technological delays. The lack of direct communication between the supervising customs office and the EO could have a negative effect, as the accumulated experience in terms of trade traffic would be disregarded. At the same time, the EU Customs Authority's

overloaded responsibilities and its authority over the 27 member states will inevitably lead to the slow and questionable efficiency of the administrative management of customs processes.

Additional costs for training and retraining of customs officials: Given the increased implementation of digital solutions in control processes, financial resources and time will inevitably be required to train and retrain customs officials to operate these systems. The possibility of resistance to change from customs officials, especially due to low overall IT literacy, conservatism or even reluctance to abandon certain practices, should not be underestimated.

Engagement of many participants in the supply chain: The reform envisions that all available business information on shipments will also be available to Customs, including not only exporters, importers, customs brokers and carriers but also financial and insurance institutions, terminal operators and other supply chain participants. The EU Data Hub will also exchange information with other national and European regulatory bodies. All this represents a significant volume of data that Customs cannot physically process. The risk of delays in processing and errors due to low data quality should not be overlooked, potentially compromising the efficiency of the European customs control system.

Diverse national penalty legislation in member states: One of the reform's proposals is to harmonise sanctions for customs violations and crimes across the EU. However, this may prove challenging from a legislative standpoint due to the different practices in member states, such as the application of only administrative penalties, only criminal penalties or a combination of both.

Unrealistic reform timetable: The final implementation deadline, 2038, is too distant given the current pace of digitalisation in business and society. IT solutions decided upon today may be obsolete by then.

The opportunities and threats related to the digital aspects of the NECR are part of the external environment of Customs. They should be considered, although they cannot be directly controlled. For the purposes of this study, they are identified based on information about trends in international trade, anticipated changes in the legislative framework, and the digital development of EO, among others.

4.3. Opportunities

Comprehensive view of the entire supply chain: The inclusion of information from all supply chain participants will provide Customs with a significantly broader perspective on the production, trade and transport processes associated with them. This will allow Customs to better target their efforts and more successfully prevent the importation of undesirable goods into the EU. Improved communication and coordination of actions with other regulatory bodies and institutions, as well as with EOs, is essential for the effectiveness of the customs control system.

Reduction in resources needed for customs clearance: The digital solutions proposed in the NECR create opportunities to save time, costs and resources in the processing of shipments, both for Customs and other regulatory bodies, as well as for EOs. The enhanced risk analysis effect, amplified by the digitalisation measures, is among the primary positive outcomes expected from the reform.

Increased trust from businesses and society towards Customs: One of the primary goals of the reform is to reduce the administrative burden on businesses, which, if achieved, will significantly mitigate negative perceptions regarding Customs' operations. Digitalising customs processes will enhance transparency and limit opportunities for improper practices of any kind.

Integration of modern IT and digital solutions in customs processes: The reform proposals highlight the central role of IT in customs control, setting the stage for their further development. The objective is to expand the use of technologies such as AI, IoT, ML and blockchain in customs operations.

4.4. Threats

Unauthorised access to EOs' trade data: The threat of cyber-attacks is always present, and the EU Data Hub would be of particular interest to malicious actors due to the type and volume of data stored. This threat also raises the question of how far EOs are willing to go in sharing their data with Customs. Providing Customs with direct access to well-protected Enterprise Resource Planning (ERP) systems, with strict access control, is not without risk and might lead to potential security breaches.

Failure of the EU Data Hub: In such a scenario, trade with third countries across the EU would come to a standstill, not just within a single member state. This risk is especially relevant for trade in, for example, live animals, medicines, food products, perishable or hazardous goods.

Inability of EOs to meet customs requirements: Small and medium-sized enterprises (SMEs) are particularly vulnerable to any changes in legislation or administrative processes, as their limited capacity makes adaptation challenging. Considering the raised criteria for being certified as Trust and Check Traders outlined in the reform, it is possible that EOs may resist certification. This would compromise the reform as it would hinder the envisioned electronic data exchange and the expected access to customs simplifications.

Increase in the prices of imported goods in e-commerce. Due to changes in how customs duties are applied to e-commerce imports, these goods may become more expensive for end consumers. As a result, some importers may withdraw from this mode of purchasing goods from third countries, leading to a reduction in customs revenue for member states.

Based on the above SWOT analysis, it can be concluded that the proposed reform of the Customs Union offers both opportunities and challenges for European customs administrations and businesses. Many customs practitioners within the EU express their principled support for the need

to improve the customs control system, as the approach of centralised management at the EU level will eliminate national 'peculiarities' in its application. The differences in customs practices among member states remain a key issue that should be resolved as quickly as possible, and this can undoubtedly be achieved through digital tools. However, attention must also be given to the contentious points of the reform, as it should ultimately benefit all participants in international trade – EOs and regulatory authorities alike.

5. Analysis of the interrelationship between digitalisation and information exchange in customs control

5.1. Methodology

The statistical software IBM SPSS was used to analyse the survey data collected from 504 Bulgarian Customs Administration employees. The primary methodological instruments employed were the Chi-square test of independence and Cramér's V coefficient. The Chi-square test was used to determine whether there was a statistically significant relationship between the variables selected, for example, between the perceived level of digitisation of customs processes and the perceived quality of communication and information exchange. A statistically significant result ($p < 0.05$) indicates that the observed relationship is unlikely to have occurred by chance.

As the Chi-square test can only confirm the existence of a relationship, Cramér's V coefficient was also used to evaluate its strength. Cramér's V coefficient ranges from 0 (no relationship) to 1 (a very strong relationship), and this study focuses on relationships of at least moderate intensity. It is important to note that the methodology does not seek to establish direct causal links, but rather to demonstrate the extent to which two aspects of customs modernisation – digitisation and information exchange – tend to vary together. Consequently, the conclusions highlight the direction and strength of associations rather than one-sided causal effects.

Descriptive statistical analysis was also employed to support the interpretation of results and identify patterns in respondents' answers. Only relationships that were both statistically significant and practically meaningful are discussed in the results section. This ensures that the analysis captures systematic tendencies in how customs officers perceive the relationship between digitisation efforts and the effectiveness of communication and information exchange, rather than just random variation.

5.2. Results

Descriptive analyses reveal a statistically significant association between the extent to which customs processes are perceived as digitised and the extent to which communication and information exchange are perceived as effective. In practical terms, this means that employees who view customs processes as being more extensively digitised are also more likely to evaluate communication and information exchange as being effective. Conversely,

officers who perceive shortcomings in communication and information sharing also tend to report lower levels of digitisation. This reciprocal pattern suggests that improvements in digitisation and information exchange are interdependent and should be addressed simultaneously (Table 1).

To further justify the interrelationship between the degree of digitisation and data exchange, the different levels of communication within the Bulgarian Customs Administration were examined. The strongest and most statistically significant relationship is that between 'digitisation and information exchange' between the Bulgarian Customs Agency and the customs authorities in EU member states, the EO and other national control institutions (Table 1, comparison 1).

Firstly, the quality of information exchange is directly related to the level of digitisation of individual national customs authorities. It means that the more digitised the customs administrations, the faster and timelier the exchange of information between European customs authorities will be. Currently, there is a lack of synchronisation between systems, even where digital processes have been implemented. Respondents believe that the results in poor-quality information exchange, with each authority interpreting and applying customs regulations differently. Therefore, improvements in digitisation should focus not only on information exchange, but also on:

- effective risk management supporting customs control and the performance of its protective and economic functions towards business and society
- traceability and transparency of customs operations during import, export and transit of goods
- improving processes in the international supply chain and customs control by reducing the administrative burden and speeding up customs formalities
- progress towards the functioning of a unified European customs system operating 'as one'.

A Cramér coefficient of 0.108 shows a weak statistically significant correlation between the level of digitisation and the exchange of information between the Customs Agency and EU customs authorities. It indicates that greater digitisation enables more effective cross-border cooperation and coordination between European customs authorities.

The introduction of the proposal for the NECR aims to achieve the aspects above, which are the result of enhanced interaction in the information exchange between individual customs administrations in the EU and their level of digitalisation development. A unified European customs system would significantly facilitate and enhance the information flow between the respective national customs administrations, which is a fundamental prerequisite for closer collaboration.

Table 1. Examination of the statistical relationship between variables.

Comparison number	Variables	Number of valid cases	Chi-square value	p value	Cramér's V coefficient
1	'Digitisation and information exchange' between Bulgarian customs authorities and those in other member states	504	5.924	0.015	0.108
2	'Digitisation and information exchange' between the Customs Agency and EO in Bulgaria	504	9.475	0.002	0.137
3	'Digitisation and information exchange' between the Customs Agency and other control institutions in Bulgaria	504	6.585	0.010	0.114

Source: Authors.

Secondly, the study found a statistically significant correlation between the degree of digitisation and the efficiency of information exchange between Customs and businesses (Table 1, comparison 2). The study also found that the pace of digitisation differs between Customs and business representatives. Aligning the level of digitisation of the customs administration with that of businesses is essential for fostering equal communication and partnerships. This minimises errors and increases compliance, as automated and digital processes implemented in CIS detect and correct errors made by EOs in a timely manner. The survey found that respondents perceived customs rules and procedures as complex and extremely dynamic. This creates an environment conducive to errors and inaccuracies in the performance of customs formalities. The focus should be on facilitating communication between Customs and EOs, which will impact:

- flexibility in communication, enhancing the EOs' competence regarding current rules and policies in customs control
- reducing the administrative burden for businesses
- acceleration of processes during import, export and transit of goods or when receiving additional services
- improving the quality of incoming information, including to the customs control system, submitted by the EO and processed and analysed by Customs.

The Cramér's coefficient value of 0.137 shows a significant relationship between digitisation and the effective exchange of information between customs authorities and businesses. It confirms that automation and digital systems can greatly improve communication and reduce the administrative burden on economic operators. The objectives set out in the NECR can help achieve the above aspects quickly and contribute significantly to the implementation of the digital transformation concept.

Regarding the third aspect, the survey results suggest that the reform will improve the quality of information exchanged between the various control institutions in Bulgaria and the EU, as well as Customs (Table 1, comparison 3). The high level of digitisation within Customs and other control authorities is a vital tool for facilitating the exchange of information between national and European institutions. This conclusion is also supported by respondents who believe that comprehensive digitisation of information exchange can enhance cooperation between institutions through joint inspections and other control activities. A good example in Bulgaria is the electronic system for excise goods (BACIS – Bulgarian Excise Centralized Information System), which is used by the Customs Agency and the National Revenue Agency concerning fuel. In practice, these two state institutions operate with real-time data exchange to monitor activities involving this type of excisable good. Increased efficiency in Customs and other national/European control structures contributes to stricter compliance with applicable legislation. Other important aspects of a high level of digitalisation and enhanced information exchange between Customs and other national and European control institutions include:

- rapid and opportune information exchange, aiding in timely decision-making regarding control actions
- minimisation of public expenditure during coordinated joint inspections conducted by institutions
- enhancement of the quality of control activities overall, as each institution specialises in a specific area of expertise. Joint control actions significantly broaden the scope of oversight conducted on a given subject and multiply its effect
- optimisation of joint control actions through the requirement of documentation and other evidence only once during inspections, among other benefits.

A Cramér's coefficient of 0.114 indicates a moderate correlation between digitisation and the quality of information exchanged between customs authorities and national control authorities. The correlation is important for strengthening interinstitutional cooperation and enabling real-time joint control.

The establishment and operation of the EU Data Hub will foster cooperation between institutions at both national and European levels, based on enhanced development of digitalisation and information exchange. This is due to the provision for single data submission, which any interested public authority can utilise. This, in practice, would contribute to coordinated interaction among control institutions at a higher level.

Based on the above analysis, the following six aspects can be deduced in which digitalisation positively influences information exchange:

- creation of a unified European CIS
- electronic communication between Customs and EOs
- data exchange and customs cooperation
- strengthening the role of the coordination function in customs control
- implementation of information systems for registration and data processing
- transition to a unified digital European Customs.

The above aspects emphasise the importance of digitalisation in improving information exchange in customs control and the necessity to adapt to the new digital realities in the context of the NECR. Based on the research related to the potential influence of the reform on information exchange, the following conclusions can be drawn:

- The operation of over 111 CIS at the European and national levels creates a complex and heterogeneous information processing structure, necessitating effective management of data volumes within the EU.
- The development of e-commerce and changes in international supply chains have led to a significant increase in SADs. This necessitates the implementation of automated checks and data processing mechanisms for effective management of the growing volume of information.
- The systems of all control authorities (tax, phytosanitary, veterinary, etc.) must be operationally compatible with those of Customs. This facilitates the exchange of large amounts of information among various participants in the processes of import, export or transit of goods.
- The implementation of automated digital systems for preliminary data processing in CIS enhances the efficiency of information exchange and provides better oversight of goods, particularly concerning the protection of businesses, citizens and the environment.
- Each EU member state is at a different stage of digitalising its customs systems, leading to disparities in information exchange and processing. This complicates synchronisation and effective management of large volumes of information at the European level.

These aspects highlight the significance of digitalisation for managing the increasing volume of information in customs control and the necessity for standardised and integrated systems for more effective data exchange. The NECR encourages the implementation of more automated checks and mechanisms for oversight of goods through preliminary data processing. This will facilitate the automatic recognition of high-risk goods and their faster processing.

6. Conclusion

The implementation of the NECR will fundamentally alter not only how customs control is conducted within the EU but also its overall conceptual framework. A primary manifestation of this change is the shift in the employed approaches, highlighting the systemic approach at the expense of the process-oriented approach. This strategic realignment enables concurrent facilitation of customs formalities for businesses while enhancing digital customs control to ensure compliance with applicable customs and non-customs regulations as per existing legislation. The coordinated application of both approaches may yield optimal outcomes and mitigate the weaknesses inherent in each, as the limitations of the systemic approach may be addressed through the application of the process-oriented approach. Central to achieving these objectives is digitalisation, which serves as a vital instrument in fulfilling the goals set forth by the impending changes upon the enforcement of the NECR. The accelerated integration of advanced technologies such as AI, IoT, Blockchain and ML can significantly contribute not only to the establishment of a unified European customs system operating 'as one' but also to the comprehensive modernisation and transformation of customs control.

This research underscores the critical importance of digitalisation in shaping the future landscape of European Customs, which will facilitate more effective protection of fiscal, well-being, economic, environmental and other interests of all stakeholders within the Union. The digitalisation of Customs should align with global trends in this domain, seeking opportunities for increasingly closer cooperation and exchange of customs and non-customs information among all stakeholders. Expectations surrounding the NECR are substantial; however, the associated challenges for both customs authorities and businesses should not be underestimated. Consequently, from the early stages of developing and implementing its components, it is imperative to pursue consensus and mutual understanding between these entities.

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