

Digital Customs and Vietnam's Logistics Competitiveness: From Procedural Electronification to Data Infrastructure

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Abstract:

In an international trading environment increasingly dependent on the speed, reliability, and predictability of supply chains, customs is no longer confined to the function of border control but is becoming a critical component of logistics data infrastructure. This paper examines the mechanisms through which digital customs affects logistics competitiveness, with a particular focus on Vietnam. A qualitative research approach is adopted, combining a synthesis and cross-examination of academic literature, policy analysis, descriptive statistics, and international comparisons.

The findings indicate that the impact of digital customs does not derive simply from the electronification of procedures, but primarily from its capacity to reduce information frictions and uncertainty at the border. When data are standardized, interoperable, processed prior to the arrival of goods, and integrated with risk management, digital customs can shorten cargo release times, reduce compliance costs, and enhance the predictability and coordination of goods flows. In Vietnam, customs digitalization has made substantial progress; however, the measurement of its effectiveness should shift from the rate of procedural electronification toward tangible supply-chain outcomes. Accordingly, this study proposes treating digital customs as an integral component of national data infrastructure and evaluating its effectiveness through indicators encompassing time, stability, data reusability, risk management, and compliance costs.

Keywords: *Digital customs; logistics; logistics competitiveness; trade facilitation; data interoperability; risk management; Vietnam.*

1. INTRODUCTION

A profound shift is taking place in the way the world understands logistics. For many decades, logistics capability was largely equated with seaports, roads, warehouses, and transport equipment. Today, however, these tangible assets represent only half of the story. The other half lies in less visible elements: data, connectivity, the degree of coordination among public agencies, the speed of information processing, and the ability to accurately predict when goods will be released.

A container may be transported by a modern vessel, call at a high-capacity port, and continue along a newly constructed expressway; yet if its documentation must pass through multiple incompatible systems, if the same information has to be submitted repeatedly, if regulatory authorities do not work from a shared data set, or if businesses cannot determine with confidence when their goods will be released, the logistics chain remains subject to a form of “congestion” that roads and ports alone cannot resolve.

From this perspective, digital customs should be understood not merely as an administrative reform programme but as a component of national logistics infrastructure. This proposition has a clear economic basis. Hummels and Schaur (2013), in a seminal study published in the *American Economic Review*, estimate that each additional day in transit is equivalent to an ad valorem tariff of approximately 0.6–2.1%, with time-sensitive goods—particularly machinery, equipment, components, and parts—being more strongly affected. Time, therefore, is not simply an operational indicator; it constitutes a component of trade costs.

For cross-border production networks, this significance is even greater. Saslavsky and Shepherd (2014) show that trade in parts and components within international production networks is more sensitive to logistics quality than trade in final goods. When an electronics, mechanical engineering, textile, or industrial equipment manufacturer depends on hundreds of suppliers across multiple countries, even a minor delay at the border can propagate through the

production system, altering production schedules, increasing safety-stock requirements, generating additional warehousing costs, and reducing delivery reliability.

Vietnam stands precisely at the intersection of these transformations. In 2025, the country's total merchandise import and export turnover reached USD 930.1 billion, representing an 18.2% increase from 2024. At this scale of trade, even marginal improvements in border time and costs have the potential to generate substantial economic effects when multiplied across millions of transactions.

On the logistics front, the Government has issued the *Strategy for the Development of Vietnam's Logistics Services for the 2025–2035 Period, with a Vision to 2050*, setting specific targets, including annual industry growth of 12–15%, a logistics-sector contribution of 5–7% of GDP, a reduction in logistics costs to 12–15% of GDP, and Vietnam's placement among the world's top 40 countries in terms of the Logistics Performance Index (LPI).

Vietnam's logistics challenge is thus entering a new phase. It is no longer simply a matter of “building more roads, expanding ports, and increasing warehouse capacity.” The more fundamental question is how to make the entire logistics system operate as a continuous flow, both physically and informationally.

The customs sector lies at the heart of this question. Yet it is precisely here that a paradox emerges. Customs operations have already achieved a very high degree of electronification. In 2025, more than 99% of customs declarations were processed through electronic systems; the sector also reported that it had reviewed and standardized more than 200 business procedures, while average customs clearance times had declined by 10–15% for exports and 8–12% for imports.

If the rate of electronification has already exceeded 99%, where, then, does further reform potential lie? From the author's perspective, the answer rests on the distinction between digitizing procedures and transforming the operating model around data.

Converting a paper document into an electronic document is digitization. Processing a procedure through an electronic system is electronification. But when a business submits its

data once, authorized agencies can reuse that data, risk-analysis systems can process it, the information can be assessed before the goods arrive, and the data can be connected with ports, warehouses, shipping lines, and logistics enterprises, digitalization begins to generate genuine economic value. This is the central issue addressed by this study.

Research Gap and Research Questions

International research has established a relatively robust foundation concerning three relationships. First, logistics quality is associated with trade and the capacity to participate in international value chains. Second, trade facilitation reduces the costs and time associated with transactions. Third, logistics can serve as an intermediary mechanism through which trade facilitation affects international trade. Using data for 62 countries over the 2010–2018 period and a structural model, Yeo and Deng (2020) identify a positive and statistically significant relationship among trade facilitation, logistics performance, and international trade.

A notable gap, however, lies in the fact that digital customs is often examined as a component of procedural reform, whereas logistics is typically studied as a transport and service capability. The two domains have yet to be sufficiently integrated through a coherent data-driven mechanism.

This study addresses four questions:

First, through what mechanisms does digital customs affect logistics competitiveness?

Second, what conditions determine whether customs digitalization translates into reductions in the time, cost, and uncertainty associated with goods flows?

Third, how far has Vietnam progressed in the transition from electronic customs to data-driven customs?

Fourth, what indicators and policy frameworks need to be revised to measure and enhance the economic value generated by digital customs?

Accordingly, the study advances the central proposition that digital customs does not directly create logistics competitiveness; rather, it creates the capacity to process and connect information in ways that reduce transaction frictions, time, and uncertainty at the border. Sustainable

improvements in logistics performance can be achieved only when the digital capabilities of Customs are integrated with physical infrastructure, border-management agencies, and private-sector actors throughout the supply chain.

2. LITERATURE REVIEW, RESEARCH GAP, AND THEORETICAL FRAMEWORK

2.1. From Transaction Costs to Logistics Costs

A useful way to understand the role of digital customs is through the lens of transaction cost economics. In cross-border trade, firms do not pay solely for transportation. They also incur costs associated with searching for and verifying information, preparing documentation, coordinating with multiple actors, waiting, amending declarations, storing goods in warehouses and yards, and dealing with unforeseen situations.

Most of these costs share a common characteristic: they arise when information is incomplete or does not circulate sufficiently quickly. Digital customs can therefore affect logistics through a pathway that is less immediately visible but highly consequential: better data → less information asymmetry → fewer repetitive processes → faster decision-making → lower time and costs.

This explains why digital customs cannot be assessed solely on the basis of the number of online public services available.

If businesses still have to provide the same information separately to Customs, specialized inspection authorities, ports, and other agencies, transaction costs have merely been transferred from “paper” to “screen.”

Genuine value emerges only when the principle of “provide data once, use it multiple times” becomes an operating principle of the system.

2.2. Trade Facilitation: Not Less Control, but Smarter Control

The WTO Trade Facilitation Agreement (TFA) establishes a particularly noteworthy approach. Article 7.4 requires or encourages Members to adopt risk-management systems that concentrate controls on high-risk consignments while expediting the release of low-risk goods; it also encourages the use of data such as HS codes,

origin, customs value, compliance records, and the mode of transport as criteria for selecting consignments for control.

Article 7 further encourages pre-arrival processing and the publication of average release times. The WTO also requires or recommends the establishment of a single-window mechanism through which traders can submit data or documentation through a single entry point.

What is particularly significant is that these measures are increasingly dependent on digital technologies. The WTO notes that technologies such as data analytics, artificial intelligence, the Internet of Things, and blockchain can enhance the capacity to collect, share, and use data for trade facilitation; however, their effectiveness depends on institutional capacity, technology planning, and private-sector participation.

This leads to an important theoretical conclusion: digitalization is not the objective of trade facilitation; rather, it is a means of reorganizing border controls to make them more precise and less friction-intensive.

2.3. Logistics as an Intermediary Mechanism

The study by Yeo and Deng (2020) is particularly relevant to the argument developed in this paper because the authors do not treat logistics merely as an end outcome. Instead, they examine logistics as an intermediary variable linking trade facilitation to international trade. Their findings indicate that the effects of trade facilitation can be transmitted through improvements in logistics performance.

Building on this insight, the present study takes the argument one step further: if logistics constitutes an intermediary mechanism through which trade facilitation affects international trade, then the digital capability of customs can be regarded as a foundational capability that enhances the effectiveness of that mechanism.

Table 1. Mechanisms through Which Digital Customs Affects Logistics Competitiveness

Mechanism	Digital Customs Tool	Direct Impact	Value for Logistics
Reducing time	Electronification, pre-arrival processing, automation	Shorter processing times	Faster movement of goods
Reducing manual	Single window, one-time	Less data entry and	Lower compliance

processes	submission, data reuse	fewer declaration amendments	costs
Reducing uncertainty	Transparent status information, document tracking, real-time data	Greater predictability of release times	Lower inventory and buffer-time requirements
Smart control	Data analytics, risk management	Controls concentrated on high-risk consignments	Control and facilitation achieved simultaneously
Increasing interoperability	Single-window mechanisms, data sharing	Less information fragmentation across agencies	More seamless logistics-chain operations
Enhancing coordination	Customs-port-shipping line-logistics connectivity	Synchronized information and decision-making	Greater supply-chain reliability

Source: Compiled from Hummels and Schaur (2013), Saslavsky and Shepherd (2014), Yeo and Deng (2020), the WTO Trade Facilitation Agreement, and the World Bank's LPI 2.0.

Accordingly, the analytical framework is formulated as follows:

Digital customs → quality of information and border coordination → reduced time, costs, and uncertainty → improved logistics efficiency → enhanced trade competitiveness.

Within this framework, physical infrastructure, the quality of logistics services, firm capabilities, and the institutional environment constitute complementary conditions. This distinction helps avoid the overly simplistic assumption that investing in customs technology alone will automatically improve logistics performance. It is not enough!

3. RESEARCH METHODOLOGY AND DESIGN

This study adopts a qualitative approach based on four principal analytical activities: literature synthesis, descriptive statistics, international comparison, and mechanism analysis.

The first group of sources comprises official Vietnamese documents and reports issued by the Government, the Ministry of Finance, the Customs Authority, and the Ministry of Industry and Trade. The second consists of international sources, including the World Bank, the WTO, and the WCO. The third comprises academic studies with DOI identifiers, focusing on trade time,

logistics, trade facilitation, and customs performance.

A methodological principle applied throughout the study is the distinction between correlation and causation. For example, the simultaneous decline in customs clearance times and increase in trade turnover is insufficient to conclude that digital customs has caused trade growth. Both phenomena may be influenced by other factors, including free trade agreements (FTAs), foreign direct investment, infrastructure investment, production growth, changes in the composition of traded goods, or transport capacity.

The study therefore focuses on a more fundamental question: what mechanisms enable digital customs to generate logistics value? This is also why statistical data are used primarily to describe the context and assess the consistency of the argument, rather than to claim a causal relationship that the research design is not sufficiently equipped to establish.

4. DIGITAL CUSTOMS AND THE STRUCTURAL TRANSFORMATION OF VIETNAM'S LOGISTICS CAPABILITY

The year 2025 may be regarded as a notable milestone for both Vietnam's trade and customs sectors. Total merchandise import and export turnover reached USD 930.1 billion, an 18.2% increase from 2024. This scale of trade not only reflects Vietnam's productive capacity and degree of international integration; it also changes the economic significance of every hour of delay at the border.

Suppose a business experiences a delay of only a few hours for a single shipment. The direct cost may be modest. Yet when such delays are repeated across a very large number of transactions, they become a form of invisible "time tax" on the economy.

This is particularly significant for industries that rely on imported components and participate in international production networks, where border time can affect entire production schedules. Hummels and Schaur (2013) demonstrate that time-sensitive goods, especially parts and components, are more strongly affected by transit time. Saslavsky and Shepherd (2014) likewise show that logistics quality is particularly important for trade within production networks.

This means that the same customs reform can generate different amounts of value across industries. For a low-value commodity, waiting time may primarily increase inventory and storage costs. For a high-value component or a production line dependent on just-in-time delivery, the impact can be considerably greater.

Against this backdrop, the progress made by Vietnam Customs is highly significant. According to official information from the sector, in 2025 more than 99% of customs declarations were processed through electronic systems; more than 200 operational procedures were reviewed and standardized; and average customs clearance times declined by 10–15% for exports and 8–12% for imports compared with the preceding period. The customs sector has also reported that its information technology systems are being developed toward greater process automation, big-data analytics, and the application of AI to risk management.

These figures indicate that Vietnam has moved beyond the initial stage of electronic customs. The question is no longer whether customs procedures have been electrified, but rather the extent to which electrification has transformed the underlying structure of the process.

This distinction is important. A rate of more than 99% for electronic declarations is a significant indicator of the extent of digital adoption. However, it does not in itself reveal whether businesses have to resubmit the same data, whether goods are processed before arrival, whether inspection decisions are made at an early stage, or whether cargo-release times are stable and predictable.

In other words: the rate of electrification measures the extent to which technology is used; logistics capability measures the economic value that technology generates.

This is precisely the gap that the next phase of reform must address.

Table 2. From “Electronic Customs” to “Data-Driven Customs”

Dimension	Electronic Customs	Data-Driven Customs	Logistics Implications
Focus	Electronification of procedures	Optimization of data flows and decision-making	Reduced friction across the entire

			supply chain
Data	Businesses declare and submit data	Data are submitted once and reused multiple times	Lower compliance costs
Processing point	Primarily when the declaration is received	Processing before goods arrive	Reduced waiting time
Inspection	Based on procedures and established criteria	Data-driven risk analysis	More targeted inspections
Interoperability	Connections between individual systems	A border-wide data ecosystem	Fewer inter-agency bottlenecks
Measurement	Proportion of electronic records	Time, reliability, and data reusability	Measurement of actual outcomes
Ultimate objective	More convenient procedural processing	Fast, stable, and predictable goods flows	Enhanced logistics competitiveness

Source: Developed based on the WTO (Trade Facilitation Agreement; Trade Facilitation and Digital Technologies), the World Bank (LPI 2.0), and the studies reviewed in this paper.

5. FROM “ELECTRONIC CUSTOMS” TO “DATA-DRIVEN CUSTOMS”

One of the most important transformations in modern logistics is the shift from managing goods to managing the flow of data associated with those goods.

Under the traditional model, regulatory authorities can generally make decisions only after the relevant documentation has been submitted.

Under a data-driven model, information can precede the goods themselves. Businesses submit information before a vessel reaches the port. Risk-analysis systems assess the shipment in advance. Customs authorities determine which consignments require inspection before arrival. Ports and logistics operators can prepare the necessary handling arrangements. When the goods actually arrive, the decision can therefore be implemented more rapidly.

The value here is not simply speed. The greater value lies in predictability.

A business does not need to know only the average customs clearance time. It needs to know

whether its particular shipment is likely to be held, why it might be held, what preparations may be required, and within what range the goods are likely to be released.

For modern supply-chain management, variability in processing time can be just as important as average processing time.

Consider two systems with the same average customs clearance time of 12 hours. In the first system, most shipments are released within 10–14 hours. In the second, some shipments are released in as little as 2 hours while others take 48 hours. On average, the two systems may appear identical. For businesses, however, they are fundamentally different.

The second system requires businesses to maintain larger contingencies, hold greater inventory, schedule transportation with wider safety margins, and absorb greater operational risk. The reliability of processing time should therefore be regarded as a component of logistics capability.

This is consistent with the World Bank's methodological shift. The 2025 Logistics Performance Index 2.0 moved away from a perception-based survey measure toward a system based on operational, shipment-level data, drawing on tracking data from maritime, air, and postal transport. The World Bank emphasizes three dimensions—supply-chain connectivity, speed, and reliability—and notes that significant uncertainty is concentrated at ports, transshipment points, and inland control locations.

The evolution of the Logistics Performance Index has major methodological implications for Vietnam.

In the 2023 Logistics Performance Index, Vietnam scored 3.3 out of 5 and ranked 43rd among 139 economies, with a customs score of 3.1. However, the 2023 Logistics Performance Index relied primarily on expert surveys, whereas the Logistics Performance Index 2.0 uses actual operational data. The two sets of scores should therefore not be linked into a simple time series or used to draw a direct conclusion that Vietnam's customs performance has improved or deteriorated between the two editions.

More important is the change in how logistics performance is measured. The world is increasingly concerned with two questions: How long do goods actually take to move through the

supply chain? and Where does uncertainty arise? These should likewise become the central questions guiding Vietnam's future assessment of digital customs.

6. DIGITAL CUSTOMS CANNOT STAND ALONE: THE CHALLENGE OF INTEROPERABILITY AND THE “FINAL BOTTLENECK”

If digital customs is viewed as a standalone system, it becomes difficult to explain why a very high degree of electronification can coexist with substantial logistics costs.

According to the Ministry of Industry and Trade, Vietnam's logistics costs are currently estimated at approximately 16–17% of GDP. The Ministry has nevertheless noted that this is a macro-level indicator, that measurement methodologies vary, and that there is an urgent need to establish a more formal, consistent, and stable data system and baseline.

This is an important methodological caveat. It also makes clear that logistics costs cannot be attributed to Customs alone.

Businesses also incur:

- transportation costs;
- port charges;
- warehousing costs;
- container detention and storage charges;
- inventory carrying costs;
- labor costs;
- compliance costs;
- specialized inspection costs;
- costs arising from delays;
- costs resulting from incomplete information...

Thus, even if Customs processes documentation more quickly, the overall cost of the supply chain may not decline proportionately if goods must still wait for inspection at another stage or if the port lacks sufficient capacity to release cargo.

This is why the WTO regards single-window systems, coordination among border agencies, and risk management as challenging yet decisive components of trade facilitation. In implementing the Trade Facilitation Agreement, the WTO has noted that measures concerning single windows, border-agency coordination, and

risk management continue to be among those requiring substantial implementation capacity.

The WTO Trade Facilitation Agreement also calls on Members to establish or maintain a single-window mechanism through which traders can submit data or documentation to the relevant authorities through a single entry point.

Accordingly, Vietnam's challenge in the next phase is no longer simply to develop additional applications.

The real challenge is to dismantle the "data silos" separating agencies. If Customs possesses data that specialized inspection authorities cannot reuse; if ports hold data that are not connected to cargo-release decisions; or if logistics enterprises have information on container locations that regulatory authorities cannot utilize, the system continues to contain points of discontinuity. A mature digital customs system must therefore be embedded within an integrated border data ecosystem.

7. DISCUSSION

Drawing on the synthesis of theoretical perspectives, empirical evidence, and the practical experience of customs reform, this study identifies a point of particular significance: the economic value of digital customs lies not merely in processing procedures more quickly, but increasingly in making the timing and status of goods flows more predictable. If the initial phase of digital transformation focused on the electronification of procedures, the next phase should focus on reducing uncertainty throughout the logistics journey.

Time can be measured in hours or days; uncertainty is more difficult to quantify, yet it can generate substantial costs. A business may accept a 12-hour customs clearance process if it can be reasonably confident that its goods will be released within that period. By contrast, a process that "normally takes 12 hours" but occasionally extends to 36–48 hours forces businesses to compensate by holding more inventory, allowing longer delivery lead times, choosing more expensive modes of transport, or maintaining additional resources to monitor and handle customs procedures. For industries operating on a just-in-time basis, such uncertainty may also increase the risk of production-line disruptions.

This argument is consistent with empirical evidence concerning the value of time in international trade. Hummels and Schaur (2013) show that each additional day in transit can be equivalent to an ad valorem tariff of approximately 0.6–2.1%, with time-sensitive flows being particularly important within production networks. Saslavsky and Shepherd (2014) likewise demonstrate that trade in parts and components is more sensitive to the logistics quality of the importing country than trade in final goods. Thus, in cross-border supply chains, uncertainty surrounding transit and processing times can be understood as a form of hidden logistics cost.

From this perspective, digital customs generates value through four principal mechanisms. First, it reduces processing time through electronic documentation, pre-arrival information processing, and automation of appropriate stages. Second, it reduces repetitive operations and duplicate data, thereby lowering compliance costs and the risk of information discrepancies. Third, it enhances predictability and transparency regarding processing status, enabling businesses to adjust transportation, warehousing, and production plans proactively. Fourth, it improves the quality of risk management, allowing controls to be concentrated on high-risk consignments while facilitating the release of low-risk consignments.

The fourth mechanism is particularly important because it addresses the tension between control and trade facilitation. If inspections are conducted indiscriminately, processing times increase; if inspections are reduced without adequate risk-analysis capabilities, the quality of control may deteriorate. Data-driven risk management makes it possible to move from the logic of "more inspections for greater safety" toward "more targeted inspections for both greater security and faster clearance." This is also consistent with the spirit of Article 7.4 of the WTO Trade Facilitation Agreement, which recommends concentrating controls on high-risk consignments and expediting the release of low-risk consignments on the basis of appropriate risk criteria.

Based on these four mechanisms, the study proposes a broader perspective: digital customs does not directly create logistics competitiveness;

rather, it creates the informational and institutional conditions under which logistics capabilities can operate more effectively. The causal chain can be summarized as follows:

Data digitalization and standardization → reduced information frictions → reduced time and uncertainty → enhanced predictability, coordination, and risk management → improved logistics efficiency → greater trade competitiveness.

This point also demonstrates why the degree of digitalization should not be equated with the degree of effectiveness. A system with a high proportion of electronic declarations may still impose substantial costs if data are not interoperable, businesses are required to submit the same information repeatedly, or cargo-release times fluctuate considerably. Conversely, a genuinely effective digital customs system must transform data into greater predictability and coordination.

This is consistent with the World Bank's new approach in the 2025 Logistics Performance Index 2.0. Rather than relying primarily on perception-based surveys, as earlier editions did, the Logistics Performance Index 2.0 draws on shipment-level operational data and places greater emphasis on supply-chain speed, connectivity, and reliability. This approach is particularly relevant to the assessment of customs performance because effectiveness is reflected not only in average processing times but also in the stability and predictability of goods flows. [World Bank – Logistics Performance Index](#)

7.1. Academic and Policy Implications

First, the concept of logistics infrastructure needs to be broadened. Under the traditional approach, logistics infrastructure is primarily composed of roads, seaports, railways, warehouses, and transport equipment. In the digital economy, this structure should be expanded to encompass: roads – ports – warehouses – transport equipment – data – standards – connectivity – institutions.

Data, therefore, is no longer merely a tool supporting management; it has become a component of logistics infrastructure, enabling physical and institutional actors to coordinate with one another. This opens a new avenue for research

into digital border infrastructure, in which customs performance is examined in conjunction with data quality, interoperability, single-window mechanisms, and risk management.

Second, the measurement of digital customs performance needs to be reconsidered. The proportion of electronic declarations reflects the extent of technology adoption but does not fully capture its economic value. A more mature performance measurement framework should include: cargo release time; dispersion in processing times; the number of times businesses are required to resubmit the same data; the rate of data reuse; the proportion of consignments processed before arrival; the degree of automation; the proportion of inspections based on risk assessment; the ability to track the status of declarations; and compliance costs per consignment.

The central point is to shift the question from “What systems has the government built?” to “What outcomes have businesses and the economy gained?”

Table 3. From “Electronification” Indicators to “Economic Value” Indicators

Measure ment Dimensi on	Traditional Indicator	Indicator to Be Added	Significance
Degree of digitaliza tion	Proportion of electronic declarations	Proportion of processes that are automated	Measures the extent of technology adoption
Speed	Average processing time	Median cargo release time	Measures actual outcomes
Reliabilit y	Limited measuremen t	Dispersion in cargo release times	Measures the degree of uncertainty
Data	Number of electronic records	Number of times the same data must be resubmitted	Measures information friction
Pre- arrival processin g	Proportion of online submissions	Proportion of consignments processed before arrival	Measures predictive capability
Risk managem ent	Number of inspections	Proportion of inspection decisions based on risk assessment	Measures the quality of control
Cost	Administrati ve costs	Compliance cost per consignment	Measures economic

			value
Supply-chain outcomes	Agency-specific KPIs	Time from vessel arrival to cargo departure from the port	Measures the impact on logistics

Source: Proposed based on the WTO, World Bank LPI 2.0, and the Ministry of Industry and Trade's orientation toward measuring logistics costs.

Third, a border data ecosystem needs to be established. Customs, ports, shipping lines, logistics enterprises, warehouses, and specialized inspection authorities need to be able to exchange data using common standards, accompanied by appropriate access controls and security safeguards. The objective is not to “share all data with all actors,” but rather to ensure: the right data – to the right actor – at the right time – for the right purpose.

This is also the core logic underlying the WTO's single-window and coordinated border-management approach. A single window can generate its full value only when data are integrated across agencies, rather than merely replacing paper-based submissions with an electronic portal. [WTO – Trade Facilitation and Digital Technologies](#)

Fourth, AI should come after the establishment of a sound data foundation. Artificial intelligence and big-data analytics can provide substantial support for risk classification, anomaly detection, and forecasting. However, AI cannot substitute for data governance. A rational reform sequence should therefore be: data standardization → data connectivity → data quality control → analytics → AI → decision support.

If input data are not standardized, automation may simply make errors faster to process rather than make decisions more accurate.

Fifth, customs performance should be measured along the entire journey of the goods. Businesses are not primarily concerned with how quickly each individual agency completes its own tasks; they are concerned with whether their goods arrive on time, at the expected cost, and under the required conditions. Customs KPIs in the next phase should therefore be linked to the logistics chain as a whole, including, for example: the time from vessel arrival to cargo departure from the port; the proportion of consignments released

within the expected timeframe; time spent waiting due to administrative procedures; the number of information handovers between agencies; and the proportion of data submitted once but reused multiple times.

This approach is consistent with Vietnam's logistics development strategy. The *Strategy for the Development of Vietnam's Logistics Services for the 2025–2035 Period, with a Vision to 2050* sets targets of reducing logistics costs to 12–15% of GDP, sustaining annual growth of 12–15%, and placing Vietnam among the 40 countries with the highest Logistics Performance Index scores. These are not merely targets for the development of a service industry; they also require improvements in the efficiency of the entire physical, data, and institutional infrastructure that supports the movement of goods. [Ministry of Industry and Trade – Strategy for the Development of Vietnam's Logistics Services](#)

Thus, the core issue for digital customs in the next phase is no longer “What percentage of procedures has been electrified?” but rather “To what extent has the system made goods flows faster, more transparent, and more predictable?” As the evaluative question changes, so too does the position of customs within the logistics chain: from a “control gate” to a data node that creates value for the supply chain.

In economic terms, the deeper value of digital customs lies not merely in reducing manual processes or replacing paper documentation. It lies in its capacity to reduce uncertain periods of time, repetitive declarations, and invisible waiting points along the movement of goods. As uncertainty declines, businesses can reduce the “insurance cost” they otherwise bear through higher inventory levels, larger time buffers, and more expensive modes of transport; the economy, in turn, can operate supply chains with greater reliability. Reducing uncertainty may therefore become one of the most important measures of the economic value generated by digital customs in the next stage of development.

9. CONCLUSION

Digital customs is entering a new stage of development.

The initial phase of digital transformation involved moving paperwork into the electronic

environment. The next phase focused on process automation. The decisive phase for national competitiveness, however, will be the one in which data become the foundation for reorganizing how borders operate.

Vietnam has already come a considerable distance along this path. In 2025, total import and export turnover reached USD 930.1 billion. More than 99% of customs declarations were processed through electronic systems, while the customs sector reported reductions in average clearance times of 10–15% for exports and 8–12% for imports. Meanwhile, the Logistics Development Strategy for 2025–2035 sets targets of reducing logistics costs to 12–15% of GDP and placing Vietnam among the world's top 40 economies in terms of the Logistics Performance Index.

These achievements, however, do not mean that the problem has been solved. On the contrary, the larger the volume of trade, the greater the demands placed on border performance. Once total trade turnover exceeds USD 930 billion, even small amounts of time lost repeatedly across millions of transactions become a significant cost to the economy.

At the same time, when the proportion of electronic declarations has already exceeded 99%, the indicator of “electronification” gradually loses its ability to distinguish between a well-integrated digital system and one that remains fragmented despite extensive digital adoption.

Accordingly, the central proposition of this study is that the ultimate measure of digital customs is not how many electronic records exist, but the extent to which goods are released faster, more consistently, more predictably, and at lower compliance cost. This requires customs to be viewed in relation to the logistics chain as a whole.

Customs cannot replace seaports.

Customs cannot replace expressways.

Customs cannot replace logistics enterprises.

What customs can do, however, is enable these components to coordinate more effectively through data. This is precisely the point at which digital customs becomes logistics infrastructure.

Through the 2025 Logistics Performance Index 2.0, the World Bank has taken a particularly noteworthy direction: moving from perception-based assessment toward actual operational data,

with an emphasis on supply-chain speed, connectivity, and reliability. The WTO, likewise, has increasingly emphasized single-window mechanisms, coordinated border management, risk management, and data digitalization as pillars of trade facilitation.

These developments indicate a relatively clear direction for Vietnam over the coming decade. The country should not stop at electronic customs. It needs to move toward data-driven customs and, beyond that, toward a predictive digital border.

In such an environment, shipment data can be submitted before goods arrive; systems can identify risks before inspection takes place; businesses can monitor processing status in real time; agencies can use shared data rather than repeatedly requiring businesses to resubmit the same information; and compliant consignments can be released with minimal friction.

At that point, digital customs will no longer be merely a matter for the customs administration. It will become a matter for the economy as a whole. In a world where supply chains compete not only on price but also on speed and reliability, every hour by which goods are released earlier, and every instance in which a business does not have to re-enter data that already exist, represents part of a country's competitiveness.

The findings of this study can be condensed into a single chain:

Better data → more accurate decisions → less friction at the border → more reliable logistics → more competitive trade.

This is also the transformation toward which Vietnam Customs should aspire: from an agency that processes electronic procedures to a strategic data infrastructure underpinning an open economy.

10. LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

This study has three principal limitations. First, its research design is predominantly qualitative and does not permit direct estimation of the causal effects of individual components of digital customs on logistics costs.

Second, publicly available data on customs clearance times are currently reported mainly as averages or aggregate improvements. More

granular research would require micro-level data disaggregated by border gate, type of goods, enterprise, risk level, and mode of transport.

Third, the 2023 Logistics Performance Index and the 2025 Logistics Performance Index 2.0 employ different measurement methodologies. They should therefore not be treated as consecutive observations within a single index time series. The Logistics Performance Index 2.0 represents a new measurement design based on operational data, with a focus on speed, connectivity, and reliability.

Future research should therefore move toward micro-level data. An ideal database would include:

- the time of customs declaration registration;
- the time of goods arrival;
- the time of the inspection decision;
- the time of inspection completion;
- the time of cargo release;
- the number of declaration amendments;
- the number of supplementary-document requests;
- the number of times businesses are required to re-enter the same data;
- enterprise type;
- type of goods;
- mode of transport;
- risk level;
- border gate;
- container dwell time;
- storage and yard charges;
- compliance costs.

Such data would make it possible to construct a Vietnam Digital Customs Maturity Index and empirically test the relationship between this index and logistics time, logistics costs, and import–export performance.

This would represent an important step from qualitative inquiry toward quantitative analysis, while also opening up opportunities to compare Vietnam with ASEAN economies and major Asian logistics hubs in the years ahead.

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