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Methodology for Consolidating E-commerce Cargo on International Logistics Corridors: From Shipment Acceptance to Delivery to the Final Recipient

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Abstract

The article examines a methodology for consolidating e-commerce cargo on international logistics corridors, from shipment registration to delivery to the final recipient. The study's relevance lies in the growth of cross-border e-commerce in Central Asia, the high importance of air delivery for double-landlocked countries, and the need to reduce the transportation costs of small shipments. The aim of the article is to develop an applied consolidation model that integrates digital customer identification, warehouse acceptance, repackaging, customs pre-verification, multi-route transportation, and last-mile management. The scientific novelty lies in the description of an integrated operational framework in which Suite ID, CRM, WMS, manifests, API integrations, dimensional-weight control, and risk protocols operate as a single logistics system. The main findings show that consolidation efficiency is determined by data quality, warehouse location selection, preliminary customs verification, direct contracts with air carriers, and the availability of reserve corridors. The model increases delivery-time predictability, reduces the share of identification errors, decreases customs delays, and supports delivery within a ten-day cycle. The article will be useful for logistics researchers, e-commerce delivery operators, warehouse managers, customs brokers, and companies developing cross-border supply chains.

Keywords: *E-Commerce Logistics, Cargo Consolidation, International Logistics Corridors, Central Asia.*

INTRODUCTION

The global revolution in retail and the e-commerce boom have required the development of international logistics (Kam et al., 2026). In particular, the Central Asian region (Uzbekistan, Kazakhstan and Kyrgyzstan) boasts some of the fastest growing e-commerce growth rates in the world. The regional e-commerce market is projected to grow from USD 19.2 billion in 2025 to USD 191.6 billion in 2034 at a CAGR of 28.23% (IMARC, n.d.). Kazakhstan is the largest and most developed market in the region in terms of e-commerce, with penetration rates above 10%. Uzbekistan has been identified as the fastest growth market, with a projected CAGR of 40% until 2026 (KPMG, 2022).

Yet, even if there were high demand for expansion, infrastructure constraints still exist. Uzbekistan is the only other country (alongside Liechtenstein) that is double landlocked meaning that at least two borders need to be crossed to reach a country with a direct seaport (Hennessy & Ai, 2023). Air transport manages to satisfy the geographic determinacy of its users, as it is the only type of transport able to meet the high delivery speed required in modern online marketplaces. On the other hand, direct postal delivery by customary carriers does not reach private buyers, as the freight rates are too high for small-volume shipments and customs procedures are complicated (Tovstolis, 2024).

Cargo consolidation is the consolidation of multiple shipments from different shippers to be carried as one cargo. The advantages are lower per unit logistics cost, better utilization of air cargo capacity, and, for consignees, fewer air manifests to clear customs for the consolidated cargo. This methodology is based on the practical case of Havvo Express, which demonstrated the potential to increase air transportation volumes from 2 tons per month in 2021 to 200–230 tons by 2025, while maintaining an average delivery time from the United States to Central Asia of 10 calendar days.

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CHAPTER 1. ARCHITECTURE OF THE CONSOLIDATION OPERATION: FROM REGISTRATION TO ISSUANCE

Registration and Identification

The efficiency of the consolidation model directly depends on the accuracy of the cargo identification system at the early stages. The process begins with user registration in the logistics operator's digital ecosystem. Each customer is assigned a unique identification number, Suite ID, which serves as a universal marker in a distributed database. The use of automatic ID assignment algorithms that hash user data eliminates duplication and ensures high request processing speed.

The account system provides a personal dashboard where information on planned and received shipments is accumulated. An important element is customer training on correctly indicating the warehouse address, including the customer's ID, when making purchases in online stores in the United States or Europe. This makes it possible to automate the process of awaiting a parcel at the warehouse: as soon as a courier service, for example UPS or FedEx, registers delivery to the consolidator's warehouse, the system performs a preliminary reconciliation of the tracking number with the data in the personal dashboard. Typical identification errors, such as the absence of an ID in the address, are minimized through the implementation of fuzzy-search algorithms by the recipient's first and last name in the CRM database.

In practice, the Suite ID is often lost because the customer forgets to enter it into the address when placing an order in a foreign store, and the parcel arrives at the warehouse anonymously. To avoid this, the following scheme should be applied. In the personal dashboard, the customer should see the complete address as a single block, with the identifier already embedded, and a Copy in full button. If the identifier is nevertheless absent, an automatic search by the recipient's surname should be launched, with a tolerance of up to 15 percent for spelling errors, and, if unsuccessful, the weight and dimensions should be reconciled with the expected shipments.

A specific example is as follows: customer Michael Johnson with identifier SU-48217 orders sneakers on Amazon and indicates the warehouse address in Florida without the identifier, while the recipient's name is written as Micheal Jonson with two typographical errors. The system finds a match for Michael Johnson with a similarity level of 0.87, compares the parcel weight of 1.2 kilograms to the expected order in the dashboard, and automatically links the cargo to the Suite ID in 4 seconds.

Warehouse Acceptance

The acceptance procedure at a consolidation hub, especially in highly loaded nodes such as Delaware, requires regulation. Each incoming shipment passes through a primary scanning stage, during which the system records weight, dimensions, and packaging condition. The use of computer vision technologies enables automatic detection of packaging damage at entry, a necessary condition for implementing the insurance-compensation mechanism and preventing claims at the issuance stage.

Under peak-load conditions typical of the fourth quarter, warehouse infrastructure must switch to adaptive processing algorithms. This includes zoning the warehouse into rapid acceptance segments for standard parcels and clarification zones for shipments with incomplete data. Multi-level quality control involves external inspection and verification of contents to ensure compliance with aviation security rules and the list of goods prohibited for import into Central Asian countries.

In practice, warehouse acceptance often weakens during the peak weeks of November and December, when the Black Friday and Cyber Monday flows overload the unloading area and standard procedures begin to slow down the entire consolidation cycle. To avoid this, the warehouse should be physically divided into two zones with different processing logic. Parcels whose barcode was read on the first attempt, whose identifier was found, whose packaging is intact, and whose weight deviation from the customer's expectation does not exceed 10 percent should be sent to the rapid-acceptance zone; such shipments should pass from gate to cell in 90 seconds. Everything else should be sent to the clarification zone: damaged packaging, weight discrepancies above 10 percent, or suspicions of import-prohibited items such as lithium batteries or liquids.

For example, a 2.4-kilogram box from Best Buy for customer James Wilson arrives at the Delaware warehouse; the camera on the conveyor detects a dent on the packaging corner with an area of approximately 5 square centimeters, and the system automatically takes 4 photographs from different angles, links them to the Suite ID, and sends the customer a notification offering to activate insurance for USD 3 before the shipment is sent by flight.

Consolidation and Packaging

The essence of the methodological technique of consolidation lies in the mathematical optimization of the dimensional weight of a shipment batch. Most goods from online stores are packed in boxes whose volume significantly exceeds the contents' volume. Repackaging reduces customers' freight costs by eliminating excess volume and consolidating multiple orders into a single durable transport package. IATA standards require packaging to be rigid enough to prevent deformation during stacking in aircraft cargo compartments. Packaging and handling standards for consolidated shipments are shown in Table 1.

Table 1. Packaging and Handling Standards for Consolidated Shipments

Packaging and Handling Standard	IATA Requirement	Implementation in the Consolidation Model
Sealing Method	H-taping method with 2-inch tape	Use of reinforced tape
Internal Protection	5–8 cm cushioning	Bubble wrap / Kraft paper
Documentation	Invoice and manifest required	Auto-generation via CRM
Labeling	Barcode / QR / UN marking for dangerous goods	RFID tags for pallet consolidation

At the consolidation stage, a package of documents for customs clearance is formed. The CRM system must automatically aggregate data from store invoices to produce a consolidated air manifest. This eliminates manual data entry and reduces the risk of errors when declaring commodity items in the destination country.

In practice, consolidation fails at two points: the repackaging operator carelessly cuts the original box, damaging the product, or the CRM generates a manifest with discrepancies in HS codes, causing the shipment batch to be held at customs in Almaty or Tashkent. To avoid this, the process should be structured into three steps. First, the operator scans the barcode of the incoming box and photographs the contents before repackaging; the images are automatically attached to the customer's Suite ID as proof of completeness. Then the algorithm selects transport packaging by calculating the dimensional weight as length × width × height ÷ 5000, and suggests a box whose empty space does not exceed 15 percent.

Finally, before sealing, invoice auto-generation is triggered, with HS codes retrieved from the directory based on the product description. A specific example is as follows: customer Robert Davis ordered Levi's jeans, Nike sneakers, and Bose headphones in three separate boxes with a total dimensional weight of 5.2 kilograms and an actual weight of 2.8 kilograms. After repackaging into one box measuring 40 by 30 by 20 centimeters with 5-centimeter bubble cushioning and H-method sealing, the dimensional weight decreases to 4.8 kilograms, which, at a tariff of USD 4 per kilogram, saves the customer approximately USD 11 and reduces the share of customs delays from 12 to 2 percent.

Customs Clearance

Customs regulation in Uzbekistan and Kazakhstan is characterized by a gradual transition to digital interaction formats. However, when submitting electronic declarations in Uzbekistan, a major challenge for the operator is to maintain restrictions on duty-free imports for individuals and correctly classify goods according to the established HS code (UNCTAD, 2022). Resolution of the Cabinet of Ministers No. 418 dated January 29, 2024, imposes value limits on imports of certain product groups, requiring that the declared import price of those goods is at least 80% of the average price of those goods in the domestic market for the last 90 days (International Trade Administration, 2025).

To minimize delays, the logistics operator must apply a pre-verification method. Cargo data is transmitted to the customs authorities of the destination country when the aircraft departs from the United States. This allows customs officers to conduct risk analysis before the goods physically arrive. Havvo's CRM system is integrated with government single-window information systems, ensuring customs clearance for the majority of cargo within 4–6 hours of flight arrival.

In practice, customs clearance most often fails because of the understated value of goods in the invoice: a customer buys sneakers on sale for USD 60, but in Uzbekistan, the average market price of this model over 90 days is USD 120, and customs automatically blocks the declaration under Resolution No. 418. To avoid this, at warehouse entry in the United States, the declared value should be compared with an internal database of average prices by HS code, and if it is below 80 percent of the median, the customer should be asked to provide a screenshot of the order page and proof of payment from a bank card.

Fourteen hours before aircraft departure, the manifest is sent to the ASYCUDA World system via the single-window API, giving customs officers in Tashkent time for preliminary risk analysis. Table 2 shows the Pre-Shipment Customs Verification Checklist.

Table 2. Pre-Shipment Customs Verification Checklist

No	Verification Item	Pass Criteria
1	Declared value on invoice	At least 80% of the median market price by HS code over the last 90 days
2	Duty-free threshold per recipient per month	Up to 200 USD for Uzbekistan, up to 200 EUR for Kazakhstan
3	HS code	Matches the product description, visually verified by the operator
4	Sanctioned and licensed goods list	Medicines, supplements, radios, drones, and lithium batteries above 100 Wh are flagged separately
5	Recipient's passport data	Matches the personal account by TIN and passport series format
6	Manifest submission to ASYCUDA World	No later than 14 hours before flight departure via the single-window API

For example, customer Daniel Brown imports an iPhone 15 Pro for USD 999 and AirPods headphones for USD 180; the total amount of USD 1,179 exceeds the duty-free threshold of USD 200 for an individual, so the system calculates in advance a duty of 30 percent on the excess amount and offers to pay USD 293.7 through the personal dashboard before flight arrival. As a result, the cargo clears customs in 4 hours and 20 minutes, while the share of declarations subject to value adjustment decreases from 18 to 3 percent.

International Transportation and Issuance

The choice of air carrier is based on an analysis of flight stability and the availability of direct agreements. For the United States–Central Asia corridor, the key exit points are JFK and ORD airports.

After customs clearance, the cargo is distributed to the local warehouse for issuance via the operator's own pickup points or partner courier networks. The last-mile process is completed by recording Proof of Delivery in the courier's mobile application, which automatically updates the order status on the customer's personal dashboard. The time standards for the full registration-issuance cycle are 10 days, of which air freight accounts for 1.5–2 days, warehouse processing in the United States accounts for 3 days, and customs procedures and local logistics account for the remaining time. The Full Cycle Timeline is shown in Figure 1.

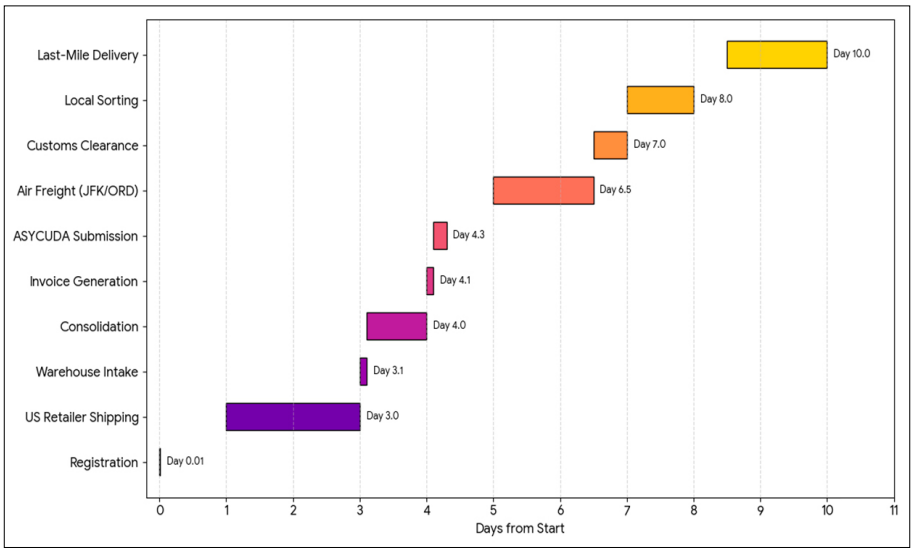

Fig. 1. Full Cycle Timeline

The full cycle of consolidated delivery, from customer registration to Proof of Delivery recording, fits within 10 working days and is divided into ten sequential operations with clear time standards. The first three days are spent on Suite ID registration, delivery of parcels from American stores to the warehouse in Delaware, and primary acceptance with automatic scanning; on the fourth day, consolidation, repackaging, and manifest formation are performed, with data transmitted to ASYCUDA World 14 hours before departure. Air freight from JFK or ORD to Tashkent or Almaty takes 1.5–2 days, customs clearance through the single window takes 4–6 hours, local sorting and routing to a pickup point or courier network takes up to 12 hours, and final door delivery to the recipient with electronic-signature recording in the courier's mobile application completes the cycle on the ninth or tenth day.

CHAPTER 2. CONSTRUCTION OF WAREHOUSE AND PARTNER INFRASTRUCTURE

Warehouse Location Selection

Strategic planning for the warehouse network must take into account the tax landscape of the country of origin. In the United States, the state of Delaware is a priority for e-commerce consolidators because there is no sales tax at the state or local jurisdiction level (Stripe, 2026). For the final consumer, this means savings on the value of goods compared with purchases through warehouses in New York or California. In addition, Delaware has developed a courier hub infrastructure that accelerates the first mile within the United States. A comparative analysis of U.S. states for logistics operations is presented in Table 3.

Table 3. Comparative Analysis of U.S. States for Logistics Operations (Stripe, 2026)

Comparative Analysis of U.S. States	Delaware	New Jersey	California
Sales Tax	0%	6.625%	7.25%–10.25%
Gross Receipts Tax	0.09%–1.99%	None	None
Operational Efficiency	High	Medium	Medium
Proximity to JFK Hub	2.5 hours	1 hour	Air connectivity

Despite the 0% tax rate, operators must consider Delaware's Gross Receipts Tax, which is levied on the seller rather than the buyer. For large companies, this tax can become a significant factor when certain turnover thresholds are reached. Additional warehouses in California or Chicago are advisable only when there is a specific flow of goods, for example, electronics from Asia, in order to reduce domestic transportation costs.

For example, customer Daniel Brown orders a MacBook Pro worth USD 2,499 with delivery to a warehouse in California; at a sales-tax rate of 7.25 percent, he pays an additional USD 181.2, for a total of USD 2,680.2. The same laptop shipped from a warehouse in Delaware costs USD 2,499 without surcharges, resulting in savings of USD 181, or 7.25 percent of the product value. For 100 such shipments per month, the aggregate benefit to the operator's customers reaches USD 18,100, providing a direct competitive advantage over services with hubs in New Jersey or California. At the same time, it is important for the operator to monitor its own turnover under the Gross Receipts Tax: if the quarterly threshold of USD 1.5 million is exceeded, the rate increases from 0.09 to 0.75 percent. Therefore, for large players, it is reasonable to divide legal entities by business segment to keep the effective tax rate as low as possible.

Formation of the Route Network

A modern route strategy requires reducing dependence on a single carrier and one aviation corridor. Under external constraints, such dependence renders the route systemically risky. The experience of 2022–2023 showed that airspace closures, sanctions regimes, insurance restrictions, prohibitions on aircraft servicing, and revisions of overflight rights can change the economics of transportation within a short period. A flight that under normal conditions was considered optimal in terms of price and time may, when the political and legal regime changes, lose availability, increase in price, or require a complex bypass leg.

Corridor diversification allows risk to be distributed across multiple directions and carriers. One aviation corridor creates dependence on the decisions of a limited group of states, airports, air-traffic-control services, and carriers. In the event of a disruption in such a corridor, the company faces a cascading effect: batches are delayed at the consolidation warehouse, storage costs increase, delivery deadlines are disrupted, and predictability for the final recipient declines. This effect is especially pronounced in e-commerce because commodity batches have high dispatch frequencies, small order sizes, and strict linkage to fulfillment deadlines.

The main route is the direct New York–Tashkent flight. At the same time, reserve capacities must be contracted in advance through transit hubs in Istanbul, Dubai, and Frankfurt. Such directions serve as a safety net. Their availability enables rapid redistribution of flows in the event of flight cancellations, tariff increases, airport congestion, or changes in overflight rules. A reserve route should be regarded as an element of operational resilience, because connecting it after a crisis has occurred is often accompanied by capacity shortages and higher rates.

The route-evaluation algorithm includes four variables: transit time, cost per kilogram, flight frequency, and reliability expressed through the share of cancellations and delays. For e-commerce, frequency plays a key role. Daily flights reduce the risk of goods accumulating at the consolidation warehouse and maintain an even order flow. Their cost may be 5–7% higher than charter programs, but this surcharge is offset by lower warehouse costs, fewer disruptions, and more predictable delivery times.

Routes should be reviewed once per quarter based on data on delays, cancellations, tariff changes, transit-hub load, and legal restrictions in overflight countries. At least two reserve corridors with verified operational availability should be maintained in the route network. This approach reduces reliance on a single channel and makes the system resilient to political, infrastructural, and market disruptions.

Work with Air Carriers and Partners

Relations with airlines should be built on direct contracts and service-level agreements. Direct partnership gives the consolidator access to carrying capacity, more stable tariff conditions, priority in capacity allocation, and direct data exchange on bookings. Work through a broker reduces process controllability, since part of the decision-making is transferred to the intermediary. When the schedule changes, a flight is overloaded, or cargo is removed from the aircraft, the consolidator has fewer instruments of influence over the carrier. A direct contract must specify the procedure for booking confirmation, permissible reasons for refusal of carriage, notification deadlines for changes, and penalties for removing cargo without justification.

Domestic providers in the destination countries should be selected through stability and digital connection. Door delivery providers must hold licenses, have customs clearance knowledge, and have good coverage in the cities involved. They should also have measurable first-attempt delivery and returns handling levels. This includes warehouse capacity, shipment identification, cargo safety controls, and readiness to transmit movement status. In e-commerce, data synchronization is especially important: shipment status discrepancies can result in incorrect delivery time calculations, affect support-service responsiveness, and diminish e-consumers' confidence that products will be delivered as promised.

The service-level agreement with partners must define deadlines, areas of responsibility, and the consequences of non-performance. The document should specify the maximum cargo-processing time upon arrival, the

warehouse release time, the time for the first delivery attempt, the procedure for notifying of a problematic parcel, and the permissible deviation percentage. Responsibility is distributed by stage: the air carrier is responsible for transportation and cargo safety in the air; the ground partner is responsible for acceptance, sorting, last-mile, and return; while the consolidator is responsible for data accuracy and document transfer. Such detailing reduces the risk of disputes and enables the evaluation of partners using measurable indicators, including delays, damage, losses, and quality.

CHAPTER 3. DIGITAL TOOLS FOR OPERATIONAL MANAGEMENT

Proprietary CRM as the Basis of the Operation

In Logistics 4.0, the information system becomes the core of the operational model. Havvo's proprietary customer-management system unites acceptance, warehouse processing, cost calculation, status transmission, customer notifications, and document flow within a single data contour. When a shipment arrives, the system assigns it a unique number, links the product to the customer, and creates a record of weight, volume, tariff, and route. It then transmits statuses by movement stage and sends notifications about arrival, delay, warehouse release, and transfer for delivery. Electronic document flow reduces manual operations during the preparation of waybills, registers, invoices, and customs data. As a result, the risk of errors associated with repeated data entry decreases.

The experience of developing and implementing Havvo shows that the greatest effect arises in processes with high repeatability. Shipment acceptance accelerated due to scanning and automatic creation of a cargo card. Invoice generation began taking minutes instead of the manual reconciliation across several tables. Status transmission to the customer began immediately after a system stage change, reducing the load on the support service. Batch processing at the warehouse accelerated due to a unified task queue that displays priority, route, delivery method, and document readiness. As a result less time is spent locating information and coordinating interdepartmental activities. The management benefit of the system is therefore drawn from peaks seasonally, the time intervals in nodes, the frequency of returns and the productivity of the shifts.

Whether a proprietary or off-the-shelf solution is needed depends on the scale and on the complexity of the process and to what extent it departs from the standard logistics business model. Proprietary development is justified in cases of non-standard routing, large volumes of cross-border shipments, a complex tariff grid, and integration with air carriers, customs services, and local partners. It provides control over processing logic, the speed of change, and the composition of data. A ready-made solution is suitable for a company with standard warehouse operations, a small number of routes, and a limited development budget. Its advantage consists of rapid launch and lower initial costs. For Havvo, the choice in favor of a proprietary system stems from the need to manage the entire supply chain from a single data source, where customer requests, warehouse operations, transportation, documents, and financial calculations are integrated.

Tracking and Personal Dashboard

The modern consumer demands transparency. The personal dashboard must provide access to detailed tracking, which includes not only logistics statuses but also information on customs clearance. Implementing GPS monitoring for trunk transportation enables the customer to see cargo movement in real time. Agentic commerce is effective, as AI assistants in the personal dashboard help customers optimize orders and calculate taxes. Client account functionality and operational benefits are shown in Table 4.

Table 4. Client Account Functionality and Operational Benefits

Personal Account Functionality	Value for the Client	Effect for the Operator
Cost Calculator	Price transparency	25% increase in conversion
Cargo Photo Documentation	Trust in the service	40% reduction in claims
Auto-fill Declarations	Time savings	Data accuracy for customs
WhatsApp/Telegram Integration	Convenient notifications	Reduced call center workload

For example, customer Daniel Brown registers a parcel containing three items from different stores, and the personal dashboard shows, in real time, the status Arrived at the warehouse in Delaware, awaiting consolidation, along with photographs of each box. The AI assistant analyzes the contents and sends a Telegram notification: If you add another 0.8 kilograms to this batch, the rate per kilogram will decrease from USD 4.5 to USD 3.8, with savings of USD 12. The customer orders an additional T-shirt on Amazon for USD 25, and the system automatically links it to the open batch. After aircraft departure, a GPS marker appears on the personal dashboard with an estimated arrival in Tashkent in 38 hours, and the calculator shows a final duty amount of USD 0 because the total value of USD 187 falls below the duty-free threshold of USD 200. Such transparency reduces the call center's workload and increases repeat-order conversion to 65% within 3 months.

WMS and Warehouse Automation

The warehouse management system for Havvo's consolidation node must support dynamic allocation of storage locations, since the flow of e-commerce goods is highly variable in

terms of volume, category, arrival frequency, and dispatch deadlines. Acceptance begins with customer identification through a unique number, which is used when placing orders in online stores and links the incoming cargo to the customer's account. After scanning, the system records the shipment, transfers it into warehouse accounting, and creates the basis for further tracking. Automation of acceptance, packaging, statuses, notifications, and document flow reduces dependence on manual data entry and decreases the risk of errors in processing waybills, registers, customs data, and customer requests.

Havvo's experience shows that the digital system acts as a connecting element among the customer, warehouse, international transportation, customs clearance, and delivery in the destination country. The customer's personal dashboard, preliminary delivery cost calculations, and shipment tracking provide the user with access to information at all stages of transportation. The warehouse management system speeds up processing and minimizes warehousing costs by organizing the acceptance, inspection, warehousing, packing and delivery of the freight to the destination carriers. Reinspection of the freight on its arrival in the country of destination is important, to ensure the packaging conditions and contents are correct. As evidence for the volume of operations, the customer base has steadily grown: in 2026, Havvo gained more than 6000 active users every month, and the average time for delivery from the moment the order enters the Havvo warehouse is about 10 calendar days.

The choice between proprietary development and a ready-made solution depends on the complexity of the logistics model. A proprietary system is justified for international consolidation, cargo pickup from the United States and Europe, working with business-segment customers, preliminary document verification, customs support, route diversification, and partner network management. Under such conditions, the software must account for the customer identification number, shipment status, route, documents, warehouse operation, cost calculation, compensation procedures, and customer notifications within a single chain. A ready-made solution is suitable for a company with a simple warehouse scheme, a limited number of directions, and a standard set of operations. For Havvo, the proprietary digital system has applied value because the company manages a wide range of processes: from customer registration and shipment acceptance to international transportation, customs clearance, delivery, and compensation in the event of product damage.

CHAPTER 4. DELAY MANAGEMENT AND ADAPTATION OF LOGISTICS CHAINS

Map of Typical Delays

Risk management in international logistics is based on classifying delays by their source, as shown in Table 5.

Table 5. Delay Risk Analysis and Mitigation Methods

Type of Delay	Probability, %	Duration, Days	Mitigation Method
Peak Season, USPS/UPS	90, Q4	3–5	Use of regional hubs
Flight Cancellation	5	1–2	Backup allotments
Customs Inspection	3	2–7	Pre-verification
Identification Errors	2	1–3	Fuzzy search algorithms

Geopolitical factors, such as airspace closures or changes in sanctions regimes, require the operator to have rapid-response scenarios. The restructuring of routes in 2022–2023 through alternative hubs in Central Asia, such as Navoi Airport, enabled delivery times to be maintained amid an overall increase in tariffs.

Response Protocols

The protocol for actions in the event of a customs delay must begin before the cargo actually arrives in the destination country. Preliminary document verification enables identification of errors in the product description, value, commodity group code, recipient data, and restrictions on certain categories of goods. If, after arrival, the shipment status remains unchanged for 48 hours, the system generates an alert for the operations manager. Escalation is then launched: the cause of the delay is checked, the customs authority's requirement is clarified, missing information is requested from the customer or partner, and the deadline for the next control action is recorded. In the event of a mass delay, some new shipments are transferred to a reserve route via another aviation node or transit country, if that option reduces the risk of cargo accumulation.

Peak-load management should be based on predefined scenarios. During sales periods, seasonal order growth, and courier-service overload, the company introduces additional shifts and strengthens the acceptance, sorting, packaging, and customer-support zones. Flow over the routes is defined by transport cost, travel time, frequency and stability of air capacity, and requirements of transit countries. At congestion within a warehouse, part of the flow can be transferred to other warehouses or connected nodes. It reduces the chance of overproduction, optimizes the utilization of throughputs, and keeps the average delivery time within a reasonable range.

Within this framework, customers must be informed of deviations after they occurred and after changing the cause for

the delay and the new processing deadline. The information provided must include the shipment number, the current status of the shipment, the reason for the delay, the corrective measures taken by the company to resolve the delay and a contact point. In the event of a damaged product, the Havvo model's full-value compensation mechanism is applied. In the event of a delay without damage, compensatory measures, such as bonuses or a discount on the next shipment, may be available if this is established in the internal service rules. Such a system reduces customer uncertainty, reduces support load, and transforms a disputable situation into a controlled process.

Checklists

The use of checklists forms operational discipline and reduces the risk of errors during mass shipment processing. Pre-dispatch document verification must include reconciling invoice data with the actual contents, verifying the product description, value, quantity, weight, and sender and recipient data. The translation of the product description into Russian or Uzbek, the correctness of the commodity code, the presence of restrictions by product category, and compliance with duty-free import limits for the specific recipient for the current month are subject to separate verification. At the end of a check, the employee to be held responsible, the control date and the result are recorded. Transport of the shipment is permitted only after eliminating the discrepancies of the documents and warehouse records.

This checklist helps to determine if the alternative route could be used to bypass the primary channel in case of force majeure. It takes into account the following: availability of flights and cargo space, frequency of departures, transit time, cost per kilogram, requirements of the transit countries, risk of nodes getting overloaded, weather-related issues, availability of a ground partner, warehousing. Other checks include requirements for transfer to other carriers, routing through airports and transit documents; aviation security; and if the tariff contains the profitability target. After a check for legal, tariff, warehouse and timing risks, the route is accepted for operation.

In cases involving customer communication that deviates from the norm, it should be ensured that all customers are informed of the shipment number, shipment status, reason for deviation from the normal process, next steps, expected time of next update, and support contact method. In the event of a customs delay, the customer receives a request for missing information or documents. In the event of product damage, the established value-compensation procedure is applied. In the event of a route change, the customer is informed of the new route and the reason for the reroute. Each notification is recorded in the system so that the history of the request, employee decisions, and partner actions is available for subsequent analysis.

For example, before dispatching a batch of 120 parcels from Havvo's warehouse in Delaware, an employee checks each shipment according to the first checklist: whether the invoice data correspond to the actual product, whether the recipient is indicated, whether the commodity code has been entered, whether there is a translation of the description into Russian or Uzbek, and whether the duty-free import limit has been exceeded. If one parcel has clothing indicated in the documents instead of children's footwear, the cargo is temporarily removed from dispatch, the description is corrected, and the parcel is then returned to the general batch.

If the main flight is overloaded or canceled, the manager opens the second checklist and compares the reserve route by flight frequency, delivery time, cost per kilogram, transit-country requirements, and warehouse-capacity availability at the destination point. If the route through Istanbul causes a two-day delay but preserves acceptable cost and available capacity, the batch is rerouted through this node. After the route change, the customer receives a notification according to the third checklist: shipment number, reason for transfer, new route, expected time of the next update, and support contact channel.

CONCLUSION

The operational consolidation cycle is a closed system. Its efficiency is determined by the speed of information transmission between individual nodes. The faster data passes among the warehouse, digital systems, carriers, customs structures, and customer services, the more resiliently the operator functions and the greater its ability to maintain process quality under changing external conditions.

A resilient operator is built on several key principles. An important factor is a tax-free location, where the warehouse is located in a zone with a zero Sales Tax rate, for example, in Delaware. Such placement increases price competitiveness. Digital sovereignty, based on the development of a proprietary CRM or WMS, is of substantial importance. This gives the operator flexibility and control over data. Another significant principle is aggressive consolidation, associated with minimizing dimensional weight through professional repackaging. To accelerate customs clearance, a preliminary declaration is submitted through Pre-clearance systems.

The operator's resilience also depends on multi-routing, that is, the availability of at least three alternative aviation corridors. Additional stability is provided by direct contracts with airlines for fixed quotas, or Allotments. Customer centricity is expressed through 100% cargo insurance and a transparent compensation system. Technological integration presupposes the use of APIs to connect all supply-chain participants. Scalable resource management (or resource adaptability) allows a company to increase labor and warehouse space rapidly. Predictive analytics, collecting

and analyzing data to anticipate problems, allows to manage demand.

Five maturity levels of Logistics 4.0 can be distinguished for an operator. At the entry level, data is entered manually, monitoring is limited, and there is a sole carrier. At the managed level, there may be a basic CRM, barcoded labels, and regulated delivery times. Automation level 3 includes fully automated warehouses and customs connected via API, quantifiably managed level 4 includes decision making based on Big Data and real time observance of Key Performance Indicators (KPIs), and optimizing level 5 includes the use of AI agents, predictive risk management, or total transparency via blockchain.

The future of consolidation models in Central Asia is tied to the development of multimodality, combining air and road transport for deliveries to regions. The construction of regional fulfillment centers is also becoming an important direction. Such a model will enable the delivery of goods from abroad and support local producers by providing them with access to international markets. Expansion into new corridors, including China, South Korea, and Germany, will create a resilient ecosystem of cross-border trade.

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