# WCO 2026 Hackathon

**(v1, 23 January 2026)**

Theme: Customs Agility in a Complex World: Securing and Facilitating Trade through Innovation

Mission: Operationalizing the *WCO Framework of Standards on Cross-Border E-Commerce* (E-Commerce FoS)

Location: Hacker Lounge, Abu Dhabi, ADNEC

## 🚀 The Mission

The E-Commerce FoS calls for the exchange of Advance Electronic Data to enable effective risk assessment and facilitation of growing volumes of cross-border e-commerce parcels.

Your mission is to build the "Brain" of a modern Customs E-Commerce Lane: a pipeline that captures and processes raw marketplace order data and produces automated outcomes for risk assessment and revenue collection.

## 🚨 The Challenge

Customs administrations facing rapid growth in small-parcel flows can no longer rely on manual or purely physical controls. Your system should help Customs to simultaneously:

1. Stop Revenue Leakage: Detect split shipments designed to evade the 1,000 AED (United Arab Emirates Dirham) de minimis threshold.
2. Data from the Source: Automatically assign 6-digit HS codes to commercial descriptions based on Advance Electronic Data.
3. Facilitate Trade: Apply automatic checks accurately so compliant goods pass with minimal friction.
4. Enforce Safety & Security: Flag prohibited or restricted items to protect society.

## 📂 The Data

You have been provided with synthetic "Advance Electronic Data" simulating a real-time feed from a marketplace.

### 1. The E-Commerce Orders (ecommerce_orders.csv)

- Structure: One-to-Many (One *order_id* = Multiple Items).

- Columns: *order_id*, *timestamp*, *importer_name*, *delivery_address*, *pid*, *product_category*, *product_title*, *description*, *image_url*, *item_price_inr*, *total_order_value_inr*, *number_of_items*

2. The Tariff Book (tariff.csv)

- Your digital tariff table for automated classification and duty calculation.
- Columns: *hs_code*, *tariff_rate*
- Note: For simplicity, tariffs are provided at the 4-digit HS heading level. For example, 6203 applies to all 6-digit subheadings under heading 6203 (e.g., 6203.42).

3. The Risk Intelligence

- A bunch of risk profiles for prohibited or restricted items.

## ⚔️ The Logic Gates

Your engine must process every transaction through four "logic gates" and generate actionable outputs per item and per importer-day.

### Level 1: The Identity Engine (Revenue Risk)

Goal: Identify the true daily total value for each unique person to detect split shipments.

- The trap: Smugglers use split shipments to stay under the threshold (same person, same day, 3 orders of 350 AED = 1,050 AED total).
- Action: Aggregate orders by Importer Name + Delivery Address + Date and compute the daily total value in AED.

### Level 2: The Classification Engine (E-Commerce FoS - Data Quality)

Goal: Assign a possible HS Code to every item using NLP (rules, ML, or hybrid approaches).

Example logic: description = "Men's Jeans" → HS code 6203.42 (illustrative) and flag where because of not sufficient description information

- Output: Predicted HS code (6 digits)

### Level 3: The Valuation Engine (E-Commerce FoS - Revenue Collection)

Goal: Apply the de minimis rule and calculate duty due for dutiable goods.

Business rules for the hackathon:

- Currency conversion: AED = INR * 0.044
- De minimis decision uses the Daily Total Value (AED) computed in Level 1.

- Duty rule:
    - If Daily Total Value <= 1,000 AED: Duty = 0
    - If Daily Total Value > 1,000 AED: Duty (per item) = item_value_aed * tariff_rate
- Output: Duty per item (AED), plus an order-level and importer-day summary.
- Level 4: The Protection Engine (E-Commerce FoS - Safety and Security)
  Goal: Flag high-risk goods regardless of value.
- Logic: Check item data (category/title/description and, if used, HS code prediction) against the risk profiles.
- Output: Risk flags and short "reason codes" explaining why the item was flagged.

## 🧩 Deliverables

Minimum deliverable (required):

- A runnable pipeline (notebook, script, or API) that:
    1. reads ecommerce_orders.csv,
    2. applies the four logic gates, and
    3. produces an output file (CSV or JSON) with results per item.

Recommended deliverable:

- A simple UI/dashboard that allows to explore:
    - split shipment detections (breaches),
    - duty calculations,
    - risk flags, and
    - the rationale behind decisions.