



IBM

A COMPREHENSIVE TECHNOLOGY PLATFORM AND DATA MODEL FOR CUSTOMS & BORDER MODERNIZATION

IBM is one of the world's leading technology corporations in developing enterprise data models, system architectures, and specialized solutions for Customs authorities. Leveraging decades of real-world implementation experience with governments worldwide, IBM has developed the **Customs Enterprise Data Model (Conceptual)**—a standardized and comprehensive data model that enables Customs agencies to undertake nationwide digital transformation.

This model serves not only as a data foundation but also as a complete operational framework for the entire Customs sector, covering key domains such as declaration management, risk assessment, intelligence, investigation, revenue administration, cargo supervision, workforce management, and border operations.

With a vision to become a pioneer in delivering national-scale technology solutions, **GENERAL STORM INDUSTRY PTE. LTD.** (GSI) is proud to be IBM's strategic partner in the fields of Data & AI, Customs system modernization, and Government Digital Transformation. Through this partnership, GSI has the capability to bring IBM's proven data models, advanced analytics platforms, and globally validated solutions to the APAC market.

This foundation enables GSI to support ministries and governmental bodies in their digital transformation journey, particularly in projects related to border management, cargo monitoring, risk assessment, and automation of Customs operations.

Combining GSI's local implementation expertise with IBM's global experience, we are committed to delivering world-class solutions that are secure, scalable, fully interoperable, and aligned with the modernization strategies of government agencies.

1. Customs Enterprise Data Model – A Comprehensive Framework Based on International Standards

IBM's Customs data model is built upon three major international standards:

- **WCO Data Model,**
- **EU Customs Data Model (EUCDM), and**
- **UN/CEFACT Buy–Ship–Pay Reference Data Model.**

Based on this foundation, all data and processes across the Customs domain are standardized, enabling seamless integration, analytics, and nationwide scalability. The model covers more than 20 critical subject areas, such as declarations, risk, intelligence, investigation, cross-border movement, finance, and workforce management.

In the area of declaration management, the model supports the full lifecycle of goods declarations, consignments, HS codes, electronic submission, approval, and clearance.

For risk management, it enables entity profiling, risk indicator management, scoring models, violation events, and rule-based selectivity.

In intelligence, IBM supports OSINT and HUMINT data sources, event reporting, watchlists, and behavioral analytics.

Investigation and enforcement capabilities include case management, evidence handling, inter-agency coordination, and legal record management.

Additionally, the model supports cross-border operations with passenger data, cargo manifests, vehicle tracking, and route analytics; financial operations such as tax, debt, exemptions, and liquidity; and workforce management, including shift planning, checkpoint scheduling, resource allocation, and officer competency profiles.

This model is designed to create seamless integration between data – processes – analytics – decision-making, forming a unified operational backbone for the entire Customs ecosystem.



2. IBM's Technology Ecosystem for Customs Authorities

Built on top of the Customs Enterprise Data Model, IBM delivers a comprehensive suite of technology solutions supporting all Customs operations—from declaration processing and supervision to risk control, investigation, and strategic decision-making.

The **Declaration & Cargo Management System** enables real-time declaration processing, international data standardization, automated validation, integration with carriers, airlines, seaports, and logistics partners, and automation of cargo verification.

The **Risk Management & Selectivity System**, one of IBM's core strengths, applies AI and Machine Learning to risk scoring, anomaly detection, automated lane selection, and multidimensional risk analytics (by enterprise, transport route, and cargo history).

The **Customs Intelligence Platform** integrates data from OSINT, logistics, aviation, and port systems; builds entity profiles; performs network and behavioral analytics; and provides automated early-warning alerts.

The **Investigation & Compliance Solution** supports case management, chain-of-custody tracking, fraud analytics, and coordinated operations between Customs, police, border guards, and coast guard units. The IBM Data & AI Platform serves as the core infrastructure for the entire ecosystem, built on an open Lakehouse architecture that supports structured and unstructured data, streaming data from border checkpoints, full data governance, and nationwide scalability.

Finally, the **Decision Intelligence System** provides real-time visibility and analytics through operational dashboards, risk indicators, trade trend analysis, cargo flow forecasting, and sector-level KPIs—supporting strategic decision-making at the Government level.



3. Global Deployment of IBM's Customs Solutions

IBM's solutions and data models are not only theoretical frameworks but have been successfully implemented at major Customs agencies worldwide.

For example, IBM partnered with a leading Customs authority in the Americas to develop a unified data platform, real-time risk analytics system, and intelligence tools for border control. The solution enabled the agency to process massive data volumes across cargo, passengers, and vehicles while enhancing risk detection, preventing violations, and optimizing border operations.

Similarly, IBM implemented an enterprise Customs data model for a national Customs authority in Asia, focusing on modernizing its data architecture, building a national-scale Lakehouse analytics platform, and upgrading key operational processes such as declaration management, risk assessment, cargo supervision, and investigative support.

This adoption significantly improved clearance times, increased transparency in trade, and strengthened coordination across logistics–Customs–border management ecosystems.

These real-world deployments demonstrate that IBM's solution suite is fully capable of supporting complex, multi-stream operational models with stringent security requirements while proving adaptable to the needs of countries in diverse regions.

