H2020 PROFILE project: Enhancing Customs Risk Management with Big Data and Data Analytics

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Presented by Dr. Juha Hintsa
Cross-border Research Association (CBRA)
GOAL
Develop modern data analytics and leverage Big Data and open data sources for customs risk management.

PARTNERS
14 partners (5 Customs)

Customs Administrations
- Belgium
- Estonia
- Netherlands
- Norway
- Sweden

Other Partners
- Cross-border Research Association (Coordinator)
- Netherlands Organisation for Applied Scientific Research
- The Swedish Defence Research Agency
- The Norwegian Defence Research Establishment
- IBM
- INLECOM
- Joint Research Centre
- TU DELFT
- University of Lausanne

DURATION
36 months

START
1 August 2018

BUDGET
5 million EUR
Develop modern data analytics and leverage Big Data and open data sources for customs risk management.

Data analytics:
- Machine learning
- Natural language processing
- Deep reinforcement learning

Data sources:
- Declaration data
- Industry Big Data
- EU databases
- Customs risk information
- Open internet data
- Tactical intelligence
- Customs databases
- Internet of Things
- Feedback from field officers
PROFILE Living Labs - overview

Netherlands: e-commerce value cross-validation
- Retrieval of price information on e-commerce platforms
- Cross-validation with customs declaration data to find undervaluation

Belgium: Economic Operator profiling
- Using historical data to analyze the behaviour of economic operators
- Using additional external data to reinforce accuracy

Sweden-Norway: Import/Export data and risk information exchange
- My import is your export approach (with legal barriers to overcome)

JRC: Risk data sharing architecture
- Common secure platform and sandbox for sharing of datasets and risk information.
Dutch Living Lab

Web data retrieval for valuation-relevant information

• Design of web data retrievers that collect valuation-relevant data from e-commerce sites
• Comparison of online pricing data against customs declarations
• Targeting interface for reviewing average prices for certain products

• Current scope:
  o E-commerce from China to the Netherlands (English Websites only)
  o Top 5 product types where price valuation errors occur in import declarations: (vintage) watch, leather jacket, camera lens, hard-disk drive, car CD player
Belgian Living Lab

Advanced profiling of economic operators

Behaviour analysis already a feature of targeting engine

Identify patterns and trends in behaviour from economic operators based on historical data

Declaration, Feedback, External Data

Evaluate 5 dimensions:
1. Core characteristics
2. Specialization
3. Technicity
4. Network
5. Trade lane characteristics

Extract risk relevant information
Sweden – Norway Living Lab

Upgrade customs import-export risk assessment at the Swedish-Norwegian border

• Study on opportunities for and barriers to exchanging import and export declaration data and risk-relevant information between an EU and a non-EU country.

• Legal barriers cause trouble, and only limited data elements can be exchanged (for now: weight, number of packages, total value).

• Based on control outcomes, customs can teach their targeting system to identify incidents of illegal cross-border movements.

• The Living Lab also seeks to connect unstructured text in “description of goods” with commodity codes.
Risk Data Sharing Architecture (RDSA)

Secure customs-to-customs sharing of risk-relevant information

- Developing an architecture for the agile sharing of risk-relevant data among EU customs (not covered by EU CRMS and ICS) and the reception of data from external sources
  - Explore sharing of targeting decisions, control results, risk criteria, and priority control areas
  - No need for full agreement among all Member States + EC
  - Constraints to pay attention to: Legal & regulatory; and, Data protection issues (personal data)

- Possible use cases (details under work):
  - ENS: (safety & security) - expand the national data for pre-arrival risk analysis
  - EORI: (antifraud+S&S) - sharing of <types of goods + origin> for each EORI as importer
  - BigDataMari: enrich ENS data (parties, goods description, weight, etc)
Status with Big Data access

**BigDataMari**
- Global container booking platform
  - Bookings
  - Shipping instructions
  - Track & trace events

**POST*CODE®**
- Global database for address validations
  - Shippers, FFs, consignees, notify parties
  - Red flags for nonexistent, wrong or suspicious addresses

**UPU EDI messages**
- Data on cross-border postal flows
  - Quest for complementary data elements
  - ITMATT CARDIT/RESDIT EMSEVT

- Historic datasets first, real-time feeds later
Thank you

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Annex 1. Author bios

- **Dr. Toni Männistö** is a logistics security and trade facilitation researcher with a PhD in supply chain security and MSc in industrial engineering and management. Toni has been working on transportation security and related topics since 2009 when he joined Cross-border Research Association for the first time. In 2015, after three years of doctoral studies in Switzerland, Toni rejoined CBRA as Head of Research.

- **Dr. Juha Hintsa**, founder and CEO of Cross-border Research Association (CBRA, www.cross-border.org), is a well-known researcher, lecturer and consultant in supply chain security and global trade facilitation, with some 30 projects and 70 publications on these topics. He currently coordinates two EU-projects, with 15 customs administrations as partners: Customs security innovation network (www.pen-cp.net) and Big data for customs risk management (www.profile-project.eu).

- **Mr. Jonathan Migeotte**, Coordinator for the Risk Management department of the Belgium Customs administration - is a former operational customs risk management expert, now specializing in Innovation and E-Commerce. As such, he is the organization’s coordinator for Horizon 2020 projects PROFILE and PENCP.

- **Mr. Marcel Molenhuis**, is a senior advisor at Dutch Customs Administration. He works in the Data & Analytics cluster. Marcel has studied at TU Delft and the Erasmus University and is a Master in Customs and Supply Chain Compliance.

- **Mr. Anders Aplstedt**, Swedish Customs, is the Manager of the core processes “Analysis & targeting” and “Perform physical checks. Before that he was head of the strategy unit at the Executive office of Swedish customs. Anders has been working with Swedish customs since 1992. He has had different positions, including Head of control at Stockholm-Arlanda Airport and Head of Analysis and Planning at the Customs Board. Anders has also been working with Eurocustoms, the mission was to implement risk analysis in Russia. Anders has a Master’s degree in “Decision, Risk and Policy Analysis” from Stockholm University.

- **Ms. Susana Wong Chan**, is a doctoral candidate at the Warsaw School of Economics and works as a Scientific Assistant at the University of Lausanne, Switzerland. She is also the head of educational materials at the Cross-border Research Association, where she works on topics related to trade facilitation and supply chain security. Past jobs include Trade negotiator at the Ministry of Foreign Trade of Costa Rica in the area of rules of origin and trade facilitation and Director of the Custom Administration and Trade Program at the University of Costa Rica.

- **Dr. Ari-Pekka Hameri** is professor of operations management at University of Lausanne, Switzerland. He has been involved with numerous international research and spin-off projects dealing with industrial IT and supply chain management. He has published over 70 articles in international management and science journals concerning technology management and transfer, and management of production, projects and supply chains.

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