Achieving excellence in Customs and international trade with Data Analytics

SOLUTIONS FOR OPTIMIZING CUSTOMS AND BORDER PROCESSING

Applying Advanced Analytics in the real world

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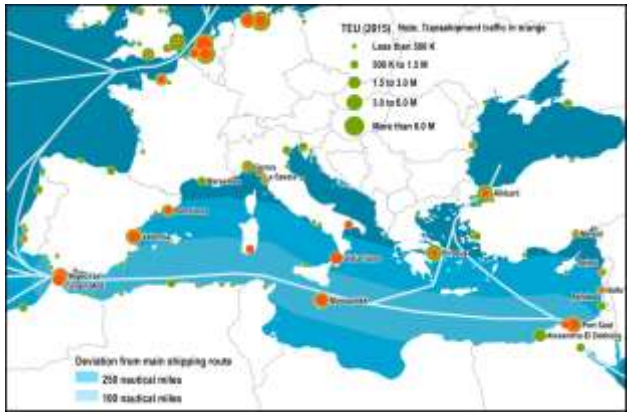
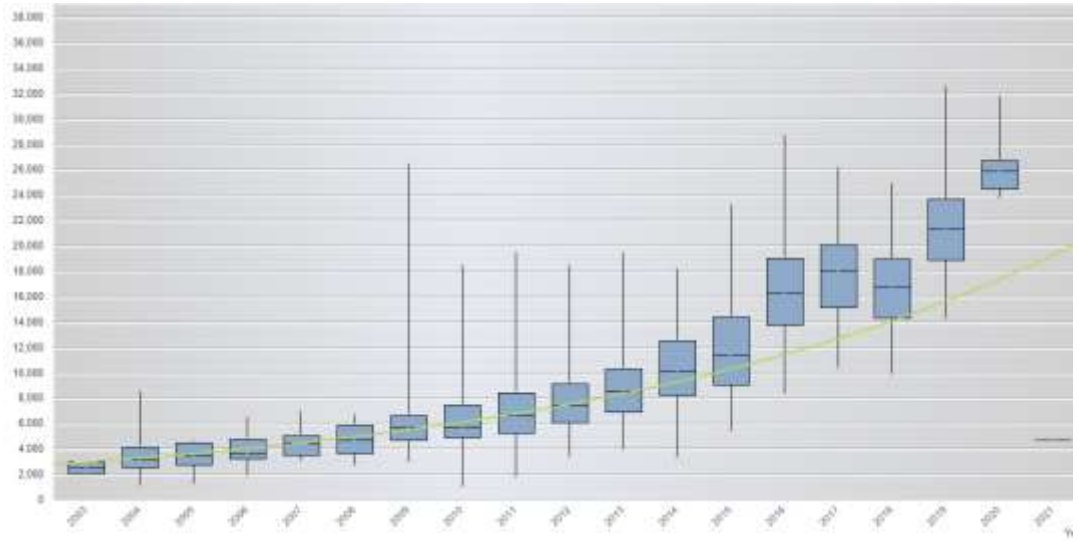
Applying Advanced Analytics for Customs Risk Management

- Data cleaning and resolution – The hardest part - 60% of your effort is here

- Using Advanced Analytics to Identify Irregular Container movements using container status messaging

- Identifying Undervaluation, Misclassification and Mis-declared country of origin





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1 **Entity names / Goods Descriptions -** Cleansing and canonicalization is fundamental to run more precise analyses without impacting the trade community

Challenges/ gaps

- Advanced analytics works best when run against 'clean' data. Company names or goods descriptions need to be standardized where possible.
- Subsidiaries, trading names and misspellings can obscure the true nature of an entity or the commodity, and avoid the entity being identified by the business rules deployed within advanced analytics

Recommended Approach

- Select an entity "canonical name" – *see example on the right*
- Run advanced analytics against 'derived' data; not raw data.
- When presenting insights, show both the declared information and the derivation. Cluster similar transactions based on the derived name to improve understanding and insights within the data.

Output

- Derived clean data that can be used as an input to topic modelling/ clustering models etc.

Results: Effectively provides more precise insights **without impacting** the trading community, Participating Agencies; or changing policies, business processes or regulations.

Illustrative example

Select the most frequently occurring name in the set as the canonical name.

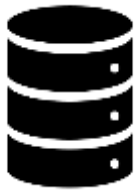
# of occurrences

exporter.name	# of occurrences
	749
RYUSOBANKIN CO LTD	156
RYUSOBANKIN	105
RYUSOBANKIN CO., LTD. JAPAN	95
RYUSOBANKIN CO JAPAN	46
RYUSOBANKIN CO., LTD.	32
RYUSOBANKIN CO	28
RYUSOBANKIN CO LTD JAPAN	26
RYUSOBANKIN CO. LTD.	22
RYUSOBANKIN CO LTD.	20
RYUSOBANKIN CO., LTD./ 35...	20
RYUSOBANKIN CO, LTD. JAPAN	19
RYUSOBANKIN CO.	16
RYUSOBANKIN CO., LTD. (31...	16
RYUSOBANKIN CO., LTD	11
RYUSOBANKIN CO. LTD. JAPAN	8
RYUSOBANKIN CO., LTD JAPAN	8
RYUSOBANKIN CO. LTD	7
RYUSOBANKIN CO.,LTD,JAPAN	7
RYUSOBANKIN CO LTD NAGO...	6
RYU	5
RYUSOBANKIN CO LTD/ 5 CH...	5
RYUSOBANKIN CO,. LTD. JAPAN	5
RYUSOBANKIN CO.LTD	5
RYUSOBANKIN CO LTD AICHI...	4
RYUSOBANKIN CO LTD, JAPAN	4
RYUSOBANK CO., LTD. JAPAN	3
RYUSOBANKIB CO JAPAN	3
RYUSOBANKIN CO.,LTD.	3
RYUSOBAKIN CO	2
RYUSOBANKIN CO LT	2
RYUSOBANKIN CO. LTD JAPAN	2
RYUSOBANKIN CO., LTD. NA...	2
RYUSOBANKIN CO.,LTD	2

Raw exporter name

Entity resolution model

Canonical Name = "**RYUSOBANKIN CO LTD**"
Exporter_canon_ID = **1736**

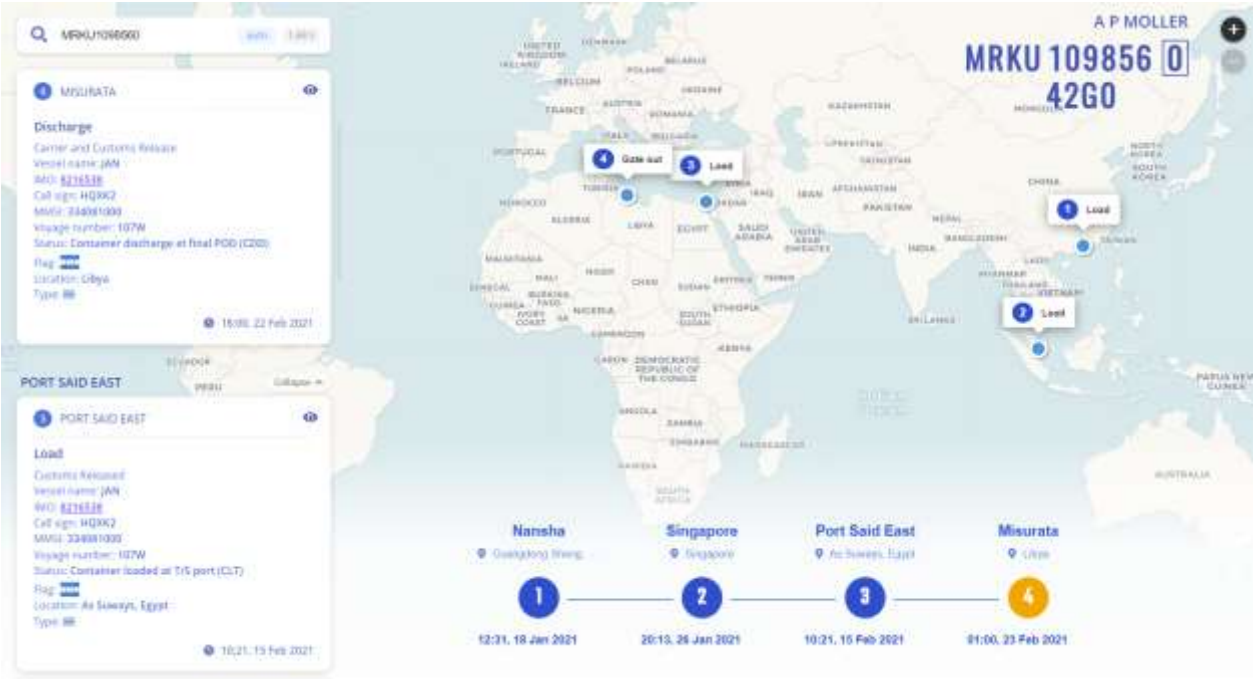


Predictive model run against Exporter_canon_ID = 1736

② Using Container Status Messages to identify irregular movements in the supply chain

Challenge
Cargo Bills of lading don't always provide a complete picture of the routing that a container has taken.
Irregular cargo routings are a known effective risk indicator but traditionally hard to identify and analyse at scale.

Recommended Approach
Use advanced analytics to risk assess all containers entering your country pre-arrival by comparing data from the manifest with the actual container routing.
Look for:
Uneconomic shipping routes – Container routing that is more time consuming or costly than is typical for that route combination
Irregular shipping routes – Where a container deviates from a standard route; or is directed to another destination during it's journey
Long dwell times in ports of weak security – An indicator for smuggling or seal tampering
Differences in documents - Port or country of export different to that listed on the bill of lading
Sanctioned Operators - Container has travelled on a sanctioned vessel or suspicious vessel operator



Results: Delivers immediately actionable insights based on risk indicators defined. Great for identifying security related risks. Analytics performed pre-arrival

③ Revenue Leakage Analytics

Challenge
It's hard for Customs to identify cases of undervaluation, misclassification, misdescription and mis-declared country of origin at the scale required to ensure low risk trade is rapidly released.

Recommended Approach
Advanced analytics can identify specific items where revenue leakage is occurring beyond a defined lower limit of acceptable revenue loss.

Use exporter data where possible as it generally exhibits less biases with respect to valuation.

Rare or serious cases can be managed before the goods are released from the Customs controlled area
The majority of cases can be automatically referred to post-clearance audit for further review.

Results: Rapid improvements in revenue collection with technology paying for itself within days/weeks. Strengthened PCA team.

Undervaluation

Misclassification

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