S&P Global
Market Intelligence

Identifying Dual-Use, Military Goods & Other Export Control Regulations in Trade Finance

THE CLIENT

Major U.S. Global Trade Finance Institution

THE USERS

All global branches of the trade finance operations team utilize the S&P Global Market Intelligence solution covering 500,000+ dual-use and military keywords alongside a highly sophisticated machine learning program that screens a goods description, regardless of text length or complexity, to determine if the trade transaction in question contains strategic or embargoed goods. The S&P Global Market Intelligence solution will be rolled out and screened against the organizations 2million+ transactions per year.
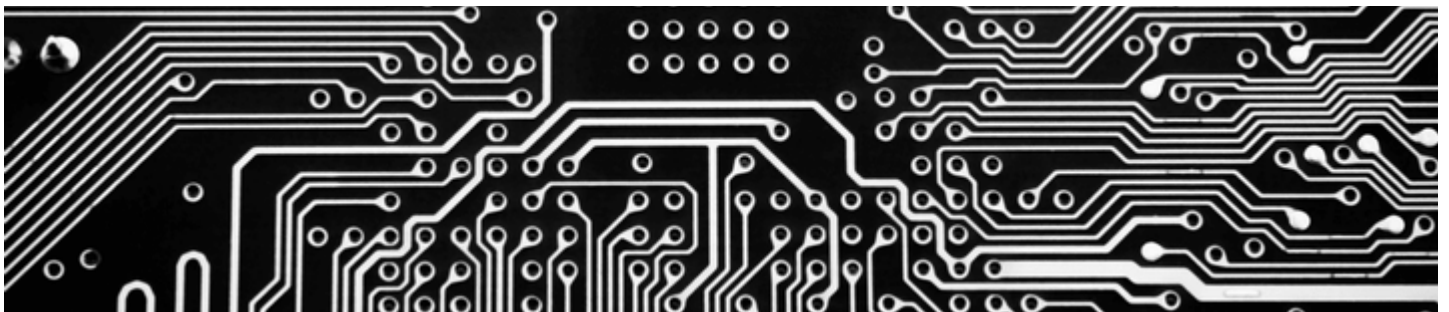
The identification of strategic goods in international trade has become an increasingly challenging process due to the lack of public data on the nature and scope of dual-use goods (goods that have a civilian and military application) and the constant change to regulatory export control lists. Most recently, the addition of semiconductor technologies such as multi-gate transistors, various marine toxins and a range of new chemicals classified within Russia-Ukraine trade sanctions by the U.S, EU and UK has exacerbated the frequency of updates to existing export control regimes.

Remaining compliant with these changes provides a challenge to firms that manage their export control screening through manually curated lists or with solutions that have a low number of dual-use and military keywords from which to draw intelligence from.

In this context, S&P Global Market Intelligence was approached by a top-tier U.S. financial institution which processes millions of trade transactions via the presentation of documents such as bills of lading, airway bills and invoices. The partner organization experienced a number of pain-points in their existing export control compliance program which they believed held operational weaknesses requiring correction.

Pain Points

- The number of goods descriptions requiring operator review slowed down the overall business unit. False positives were a time-consuming issue, requiring 20% of the time needed to perform a compliance review

- The process was subject to the operators experience of strategic trade goods which lacked overall consistency and was not easily adaptable to changing regulatory trends

- Previous attempts to automate the identification of strategic goods through text analytics, internet combing and other solutions did not yield the quality of trade data or provide a false positive rate deemed acceptable to the organization

- The organization was presented with a 'real-life' goods description bearing the phrase 'Wrobel 1', a Polish version of the ex-Soviet ZU-23, an anti-aircraft cannon. This was an unknown phrase to the operations team and an internet search did not yield sensible results, hence a major processing risk

An overall solution was required to answer these pain-points and allow for its integration into the organization's bespoke compliance screening platform.

Solution

S&P Global Market Intelligence provides a strategic goods risk management solution using historical bill of lading goods descriptions and industry specific data dictionaries. Both of these content sets are combined into a machine learning algorithm designed to extract key information from a goods description and classify it as either a positive or negative dual-use/military item.

On the data dictionary side, S&P Global Market Intelligence covers specific keywords and phrases of defense, electronic, engineering, nuclear, aerospace, trade and brand names. In addition, a machine learning application utilizes bill of lading goods descriptions from multiple countries and classifies each description as a dual-use, military item or not. To date, over 2 million goods descriptions have been classified in this way and are used within the model as training set data to offer an enhanced 'real-life' decision-making process that works out-of-the-box.

"…an obscure military item in a goods description was not found via our manual compliance process, implying a structural weakness"

Requirements

Using the S&P Global Market Intelligence model, the partner organisation wanted to understand how successful it would be in clearing false positivies and identifying true positives. To capture the overall validity of the model, both S&P Global Market Intelligence and the partner organisation conducted a series of benchmarking and validity testing scenarios. These comprised the following:
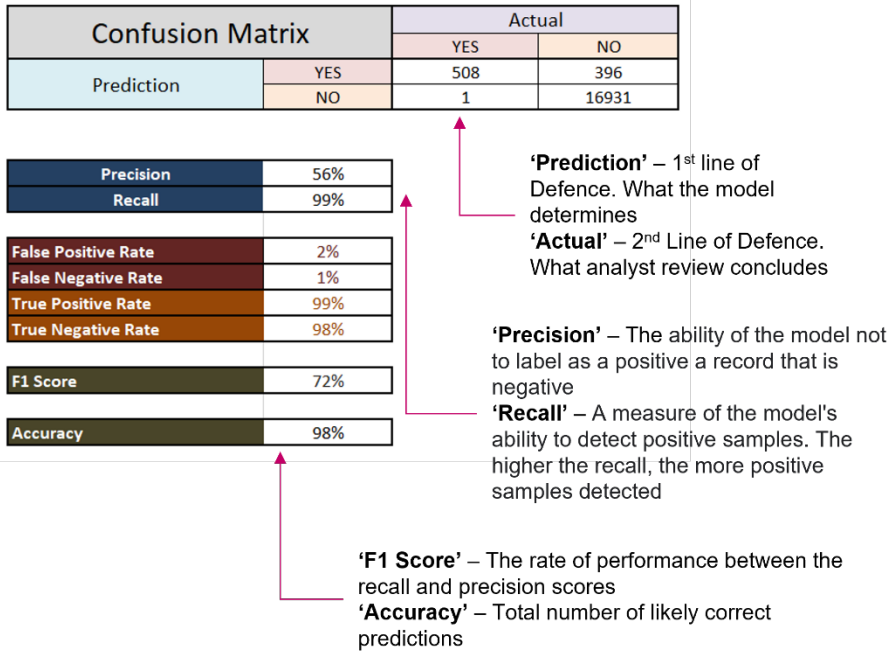
- The partner organization provided 80,000+ sample goods descriptions from their internal database for testing against the S&P Global Market Intelligence model. The output from the model was shared with the partner organization and the results were analyzed for accuracy, precision, false positive rate, true positive rate and false negative rate

- A number of blind tests were conducted on the model to check for its accuracy in capturing obscure military and defense brand names

A number of metrics and performance indicators were established with which to measure the testing scenarios. The requirements the partner organization wanted to meet were:

- A false positive rate below 10% and a 'recall' (measuring the success of the number of positive matches) rate greater than 90%

- To maintain through various testing phases a Population Stability Index (measurement of how much a variable has shifted over time providing an insight into the applicability of a statistical model to its current data population) of less than 0.1, which would indicate no movement in the model's overall stability

S&P Global Market Intelligence was able to demonstrate to the partner organization the following success criteria highlighted within the Confusion Matrix below and an associated Population Stability Index score of 0.002699.

Confusion Matrix		Actual	
		YES	NO
Prediction	YES	508	396
	NO	1	16931

Precision	56%
Recall	99%

False Positive Rate	2%
False Negative Rate	1%
True Positive Rate	99%
True Negative Rate	98%

F1 Score	72%

Accuracy	98%

'Prediction' – 1st line of Defence. What the model determines
'Actual' – 2nd Line of Defence. What analyst review concludes

'Precision' – The ability of the model not to label as a positive a record that is negative
'Recall' – A measure of the model's ability to detect positive samples. The higher the recall, the more positive samples detected

'F1 Score' – The rate of performance between the recall and precision scores
'Accuracy' – Total number of likely correct predictions

Additional metrics were also provided, including an Area Under the Curve (AUC) score to determine how successful the model is when distinguishing between a 'Yes, this goods description contains dual-use or military goods' and 'No, this goods description does not contain dual-use or military goods'. All class metric scores submitted by S&P Global Market Intelligence met the approval of the partner organization.

Benefits

Using the S&P Global Market Intelligence solution and deploying its unique datasets, the partner organization made the following decisions prior to integrating the content into their automated trade platform:

– S&P Global Market Intelligence will maintain a current and up to date database that encompasses new changes to defense, security, military and dual-use goods

– S&P Global Market Intelligence's database will learn from previous dispositions to keep false positive and false negative rates within an accepted risk appetite score

– S&P Global Market Intelligence's database will stay current with new regulations covering this space and seek to update in a timely manner all regulatory changes to export controls

– The trade operations internal data feeds will allow real time transaction processing through the deployment of the S&P Global Market Intelligence API endpoint

– The quality of data being processed and sent from an internal goods description to S&P Global Market Intelligence contains enough information for an effective decision allowing trade operations staff to act quickly and decisively

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Contact Us

Asia-Pacific
+852-2533-3565

Europe, Middle East & Africa
+44-207-176-1234

The Americas
+1 877 863 1306