FinTech Proof of Concept

MindBridge™ Analytics Inc. – big data anomaly detection tool

Background

The Bank's Data and Statistics Division is responsible for ensuring the quality of a range of core regulatory datasets. Plausibility checks and anomaly detection form part of a broad-based toolkit they deploy. In order to ensure analysts' time is used most effectively, the Bank regularly tests new and innovative tools. The Bank has worked with MindBridge® Ai on a second Proof of Concept (PoC) following a previous PoC that aimed to identify anomalies in synthesized credit union datasets.

The use of algorithms to learn iteratively from data and drawing out potential patterns could be used to complement and strengthen central bank analysis and supervisory activity.

In this second phase, the Bank built on previous learnings to look at the versatility of the MindBridge Ai Auditor™ tool to provide data visualisation and data preparation techniques for larger numeric and transaction-level datasets, including credit union datasets and a daily dataset of trades submitted for the calculation of the SONIA benchmark.

The Proof of Concept

The purpose of the PoC was for the Bank to enhance its understanding of the benefits of using machine learning for anomaly detection, including which methods showed the most promise for anomaly detection and how those methods interact together to give a clear indication of error within one interface.

The Bank was also interested in the potential of machine learning to assist the way the Bank conducts plausibility and validation checks. One of the reflections stemming from the initial work with MindBridge was for the Bank to gain a better understanding of running the tool repeatedly as part of an operational process. Therefore operational credit union regulatory data and data underpinning the reformed SONIA benchmark were used by our in-house experts for this second phase. The Bank was able to load the Ai Auditor™ applications securely in to a ring-fenced environment within Bank infrastructure to maintain the confidentiality of stakeholders data.

Two versions of the tool were created by MindBridge over a number of weeks working collaboratively with the Bank's Data and Statistics Division and Markets Directorate. This enabled the machine

learning and artificial intelligence based techniques contained within the MindBridge tool to be targeted towards the specific use case presented by each set of data. Additionally, tailored dashboards were created to present results most effectively for each use case.

Using the tool across two operational datasets, and particularly applying it to the larger and more complex SONIA dataset, enabled the versatility of the tool to be explored.

Reflections and next steps

The Bank found the dashboard and interface were very effective with a strong focus on usability. The data was well presented and visualised, using heat maps to present risk and trend charts for reporters and counterparties.

A wide range of control points fed into the algorithms to effectively flag anomalies, some techniques proved more effective than others on the dataset, with the most useful being ones which found anomalies within counterparties.   It was felt that further optimisation would be achievable as part of a longer process of engagement with MindBridge and tailoring the tool to the specific use cases, however this would be beyond the scope of this PoC. As the system analyses data over a period of time it proved beneficial to see trends and find anomalies within the datasets, however the Bank found these flags were most useful for retrospective checks, with particular regards to the Bank's responsibilities for the administration of the benchmark, SONIA.

The learning element of the application was easy to use with a simple process for marking transactions as normal or for follow-up with a workflow. This showed promising signs of being useful over longer periods of time.

The work with MindBridge has aided the Bank's understanding of the machine learning and artificial intelligence approaches used within the tool to detect anomalies in datasets, and has demonstrated the flexibility for these to be tailored and combined with bespoke visualisations to ensure relevance to the use case.