



BANK OF ENGLAND

FinTech Accelerator Proof of Concept

MindBridge Analytics Inc. - big data anomaly detection tool

Background

The Bank of England's FinTech Accelerator works with innovative firms and new technologies. Data analytics and data cleansing techniques are key areas that the Bank of England is examining through its FinTech Accelerator. The Bank gathers and analyses a large quantity of data from a variety of sources including banks, building societies, credit unions, insurers and mortgage companies. In addition to these traditional sources we also draw on less structured data including textual and contextual sources. Analysis of these data informs every aspect of the Bank's activities, including macroeconomic and macro prudential policy making, and front line supervision.

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 Proof of Concept

In the third cohort of the FinTech Accelerator, the Bank worked with MindBridge Ai on a Proof of Concept (PoC) to prove the analytical value of artificial intelligence tools in anomaly detection in anonymised credit union datasets. MindBridge Ai were given approximately 100,000 data points of desensitised, historic regulatory credit union data looking back seven years.

MindBridge Ai combines artificial intelligence and machine learning with more conventional data science techniques to produce a 'risk score' of each data point allowing anomalies to be easily identified. Over the course of 8 weeks, MindBridge built a bespoke tool for the Bank's Data and Statistics Division who collaborated with them to learn how the software analysed the data and detected anomalies, and suggested improvements and refinements to the tool. The tool used in this PoC was adapted from MindBridge's Ai Auditor software, originally created to detect fraudulent activity for audit purposes.



We found that the Ai Auditor produced a dashboard of results which identified potentially anomalous data, and allowed the user to drill down into each variable and view its development over time both in isolation and in comparison across peer firms to understand whether the driver was firm specific or industry-wide.

The tool combined statistical techniques, specific rules set by the user and machine learning, consolidating information both for individual businesses but also for the wider peer group. It included a useful workflow feature, which allowed the user to flag items as suspicious or safe, hence permitting the program to 'learn' from the user which items could be of potentially more interest. MindBridge demonstrated this functionality with a scenario that exhibited how the program adjusted its risk scores weighted by the user's priorities.

Reflections and next steps

MindBridge's tool demonstrated it can usefully detect anomalies in datasets. Its user interface is intuitive and presented the data visually, allowing the user to explore a time series of each variable, whilst comparing the result to the industry average.

To test the tool's machine learning capability fully, it would need to be run repeatedly as part of an operational process. The initial eight-week PoC did not encompass such a test. The Bank is therefore looking to explore this feature more specifically in an extended second phase of the PoC with the firm.