Implemented a new fraud detection process for a large insurer

Mu Sigma

What We Did: Enabled an auto insurer to more effectively identify potential cases of fraudulent claims

The Impact We Made: An improved methodology for fraud identification helped realize $30 M in potential savings

Summary - Insurance fraud detection

False claims, intentional falsification of data during the under-writing process, and fraud perforated by crime rings cost billions of dollars in losses to auto insurance companies each year. Existing fraud management practices used at this client had room for improvement given significant need for manual intervention to identify fraud and a high rate of false alarms in claims being flagged. Mu Sigma helped create a solution that caught 20% more fraudulent claims while flagging a significantly lower number of cases for investigation.

About The Client - A personal lines insurance company

The client is one of the largest publicly traded personal lines insurance companies.

The Challenge - Heuristic framework used for fraud detection

The existing approach for fraud management deployed at the client was largely business rules driven. The existing model was not very effective in identifying suspicious patterns and inflated claims through looking at historical data. Further, the approach relied on manual intervention to understand patterns among claims having very similar or abnormal descriptions. A large number of actual fraud cases hence were not being caught and a good amount of the investigators' time was spent chasing false alarms.

The Approach - Fraud propensity model

Mu Sigma had been supporting the claims team at the client for a couple of years to improve the efficiency and effectiveness of the claims process. Being familiar with the claims lifecycle and data, one of our hypotheses was that text entries captured during various stages of the process could reveal scripted patterns indicative of suspicious fraudulent activity. Since these would not be easily visible during manual review, a lot of these cases were not being flagged. Mu Sigma built a text mining algorithm and generated a fraud propensity score that combined the business rule classification with the authenticity of textual entries.

Testing with the fraud investigation unit in the field revealed that the number of fraud cases being caught improved by 5% over a control group. Some of the suspicious text patterns found through the model indicated collaboration between various entities involved in the claims process which the -field unit wanted to investigate further.

Borrowing from the concept of influence mapping used in the social media world for marketing purposes, Mu Sigma used social network analysis to identify suspicious relationships between parties involved in a claim (claimant to employees, claimant to medical providers etc.). This element was added to the propensity score. While this further significantly improved the number of cases being flagged, the number of false positives was still high and a cause of concern for the investigators.

Mu Sigma next listed all possible factors that could be indicative of suspicious activity and identified relevant data elements to be used through our problem solving framework. The factors identified were used to build a logistic regression model to predict probability of fraud given historical customer and behavioral characteristics from known cases of fraud. This model replaced the business rules being used and helped improve accuracy of the cases flagged. A composite fraud propensity score was generated using all three elements. A claims case tool was developed and deployed that allowed investigators to visualize and examine the fraud propensity score along with relevant factors/reasons for suspecting fraud for each case.

The Outcome - Increased savings

The improved approach was able to capture 90% of actual fraud cases by investigating 3.5% of the total claim payments in a sample set. Implementation of the model in test markets showcased potential savings of over $30MM through identification of 20% more fraudulent claims while flagging a smaller number of cases for investigation.