White Paper

AML Quagmire

AN AI & ML APPROACH WITH HUGE PROMISE

Key Takeaways

AML is major initiative for governments, banks, exchanges and other providers of financial services

Research from McKinsey, Accenture and others highlight the short comings of conventional transaction monitoring using rules based engines

Leading analysts agree that AI and machine learning holds promise to reduce number of false positive alerts leading to lower administrative costs in processing suspicious activity reports

Trendalyze has applied its unique deep learning, sequence matching, motif search and correlation techniques to financial transaction monitoring

Trendalyze extends transaction monitoring to advanced scenarios such as structuring (layering, smurfing) and blockchain networks

TRENDALYZE

The AML Quagmire

A number of well-respected firms have written papers on AML and the promise of AI & ML while also outlining the issues with adoption. We have found that these respected organizations tend to agree on the promise and problems. At a high level, the problems fall into two categories, one of cost, and low adoption. We attempt to bring this out and offer a solution to the problems that have been identified. According to many sources, the cost of AML compliance in Europe is $83 Billion.

The cost for US firms by the size of the firm is illustrated below:

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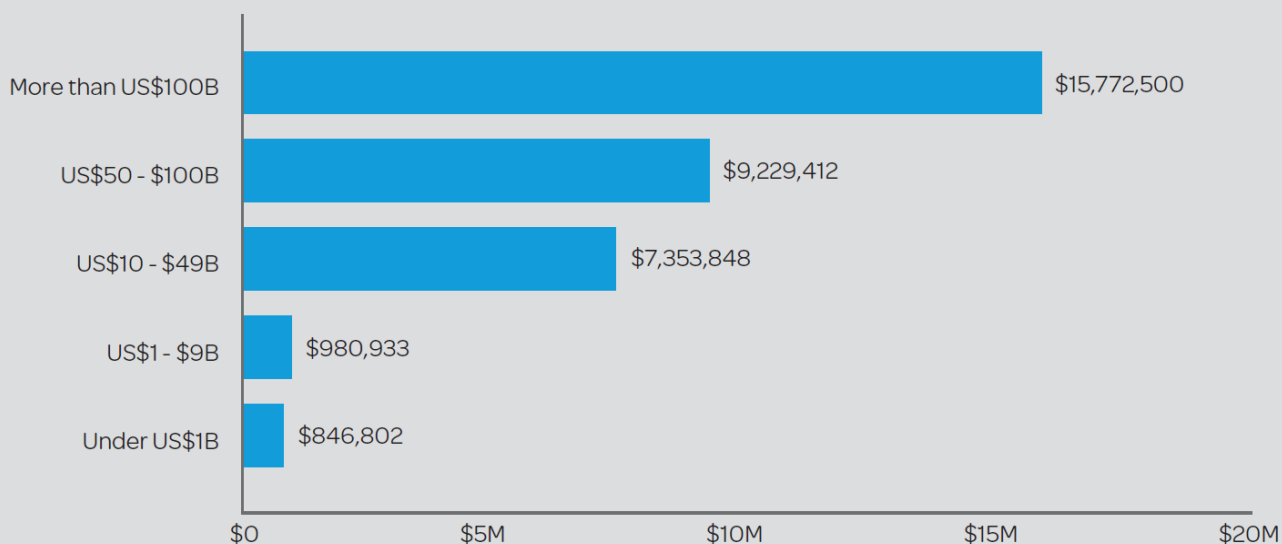
Source: LexisNexis® Risk Solutions The True Cost of Anti-Money Laundering Compliance survey
Note: Firm size = total assets; annual written premium for insurers

It is estimated that 75% of these cost are associated with labor and the remaining 25% on technology. The issue is that labor is continuing to take up a disproportionate share of the expense with no end in sight. This cost continues to be ongoing expenses as well while technology typically has an ROI. We explore some of the issues surrounding this AML problem and put forth an alternative to the expensive approach taken so far by placing tools in the hands or the regulators and business professionals to mitigate some of this cost.

A November 2017 McKinsey & Company white paper on The New Frontier in Anti-Money Laundering observed:

> "
>   In recent years, three factors have heightened the risk banks face when combating financial crimes. First, the growth in the volume of cross-border transactions and greater integration of the world's economies have made banks inherently more

vulnerable. Second, regulators are continually revising rules as their focus expands from organized crime to terrorism. Finally, governments have expanded their use of economic sanctions, targeting individual countries and even specific entities as part of their foreign policies. Banks have responded to these trends by investing heavily in people, manual controls ("checkers checking the checkers"), and systems addressing point-in-time needs. For example, in the United States, anti-money laundering (AML) compliance staff have increased up to tenfold at major banks over the past five years or so.

As McKinsey&Company states, regulatory compliance, additional methods of money laundering and new players are putting extreme pressure on governments and financial institutions to combat these ever-changing methods of hiding illegal activity. In this industry, things are moving so quickly that you sometimes can't catch your breath. We end up throwing more people at the problem which ends up being costly and ineffective.

Most Financial Institutions are too busy solving FRB Cease & Desist Letters, MRIA (Matters Requiring Immediate Attention), Internal Audit Points and additional regulations to take a breath. The reactive vs. proactive approach is impeding their ability to embrace newer technologies.

AI and machine learning hold a lot of promise in helping break this cycle but at the same time may be held back due to the lack of knowledge and the amount of time it takes to incorporate these solutions into our thinking.

In a recent article from Accenture regarding the Evolving AML Journey in Financial Services, they wrote:

> "
>   Despite numerous potential applications within the financial services sector, specifically within Anti-Money Laundering (AML), adoption of AI and ML has been relatively slow. This has been, in part, due to the following (1) limited comprehension of the application of AI and ML within AML compliance programs; (2) the notion of ML being a "black box" where the inner workings are not clearly understood by regulators and compliance officers; and (3) the cautious approach taken by regulators requiring compliance officers to understand and validate how outcomes from AML models are arrived at.

So due to lack of comprehension and a cautious approach regarding AI and ML we haven't been able to advance our solutions and in fact continue to fall further behind due to complexity, the volumes of data and the increasing sophistication of the criminals. We end up throwing more resources at the problem that could be minimized by AI and ML approaches.

How can Trendalyze help with these issues?

The first thing you realize is that the design and use of Trendalyze hits all three of the issues holding back faster implementations of AI and ML in AML projects. The way that Trendalyze functions has ML in it but you don't need to be a data scientist to use it.

We demystify the "BlackBox" aspect of ML. We find and correlate sequences and patterns in large amounts of time-series data that predict a future outcome. In the case of AML, these outcomes could be fraud or other nefarious activities that we want to prevent. Regulators easily understand patterns and can validate the meanings of these patterns to anyone. We can correlate patterns from multiple data sources with scoring so people can understand how close the patterns are to the ones that we want to find and take action, thus greatly simpli-fying the overall process. Watch Scaling the Human Eye video to see why the human eye alone can't do this.

Accenture uses Transaction Monitoring(TM) as an example of why a triage-based system doesn't solve the problem completely. They wrote:

> "
> A common TM challenge is the generation of a vast number of alerts requiring costly operations teams to triage the alerts. With increasing customer numbers and increasing numbers of transactions, TM alert volumes have increased significantly at financial institutions (FIs). This increase in alerts has resulted in an upsurge in the number of personnel required to triage and process them. However, in leveraging ML at the alert triage stage, alerts can potentially be suppressed, hibernated (set aside for later examination) or even, at some time in the future, closed automatically.

McKinsey&Company further expands on the triage issue with more detail about false positives:

> "
> 90 percent of the alerts generated by rules can be false positives, and should be quickly discarded by investigators (but often are not). Though rarer, false negatives (or criminal activi-ty that goes unnoticed) also pose a significant risk to banks. It is relatively easy for criminals to understand the linear rules currently applied by many banks and then design approaches to circumvent them (like smurfing, including the use of dormant intermediary accounts before the funds converge into the target account).

Trendalyze helps solve this triage problem in several ways:

First, we limit the number of false positives through an advanced

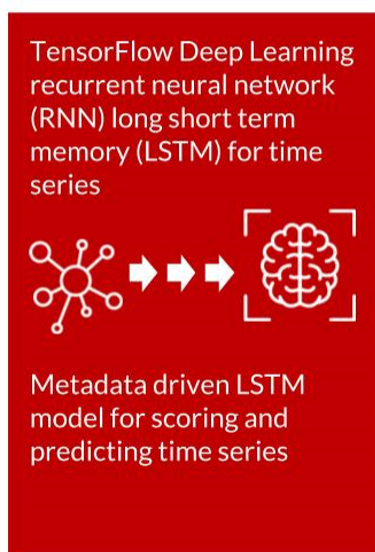method of deep learning and correlations of sequence and pattern recognition.

Second, we not only reduce the number of false positives but also improve the overall ability to find more valid cases in suspicious activity reports (SARs). The reduction in false positives can greatly reduce the cost of personnel expenses associated with the triage process.

Third, in scoring the outcomes, we can also automate the processes to take action based on the score. These scores may begin to deviate from what once was, indicating the criminals are adjusting their patterns which we can easily adjust to their new patterns.

The Trendalyze solution is described in the below schematic:

Trendalyze Metadata Driven Deep Learning Solution for AML Entity Screening, Real-Time Transaction Sanctions and Transactions Monitoring

- The algorithms predict Potential Suspects for Customer Entity Screening, Transactions Sanctions (OFAC) and Transactions Monitoring
- Does not need supervised learning or any custom model development
- Linear scalability for micro trend analysis and prediction (at the Customer or Account levels)
- Self service tools for busness analysts and professionals

Customer Ratings
Checking Accts
Commercial Loans
Equity Products
Derivative Product
Global Payments
Local Payments
Letters of Credit
Fixed Income

TensorFlow Deep Learning recurrent neural network (RNN) long short term memory (LSTM) for time series

Metadata driven LSTM model for scoring and predicting time series

False Positive Reduction

Customer Entity Screening

Real-Time Transactions Sanctions

AML Transactions Screening

Adopting Best of Breed Fraud Detection Engines

Most financial institutions are now moving toward "Risk-Based and Model-Driven" approaches to centralize and streamline the transaction lifecycle to provide a 360-degree view of the customer and transaction. These AML Risk-Based approaches must carry the customer risk as the transactions and payments travel through transaction filtering and transaction monitoring. A lot of the false positives emanate from the lack of controls and data governance. The problem continues to become more complex as regulations try to close the gap with the criminals.

Many organizations are moving towards the AML centralization and

consolidation by the creation of "Fraud Detection Engines" on top of centralized models, but they are lacking the AI and ML implementations. Trendalyze can narrow the gap in that area.

Trendalyze provides end-to-end transaction analytics identifying red flags and false-positives early in the life-cycle and thus eliminating the need for unnecessary escalations.

A complete solution for Know Your Transaction (KYT) that can be integrated with existing on-boarding KYC processes and integrated with workflows for the processing of SARs.

In a recent Harvard Business Review article about The Democratization of Data Science by Jonathan Cornelissen he wrote the following:

> "
>   These days every industry is drenched in data, and the organizations that succeed are those that most quickly make sense of their data in order to adapt to what's coming. The best way to enable fast discovery and deeper insights is to disperse data science expertise across an organization.

Trendalyze is helping organizations do exactly that. We put tools in the hands of business people, business analyst or the citizen data scientist that need to analyze data for trends. Trendalyze has application across the board but specifically in AML where the stakes are so high. The key is to detect patterns that predict future AML outcomes and then monitor them to catch the anomalies early to take corrective action, mitigate risk and avoid costly personnel expenditures.

Know Your Transaction (KYT) for Crypto Currency AML

Criminals are on track to launder more than $1.5 billion via cryptocurrency trading in 2018, more than five times as much than as in 2017, according to CipherTrace. Authorities in USA and EU are focusing on programs to regulate and monitor the industry: FinCEN in the USA and AMLD5 in the 28 countries of the European Union.

Blockchain anonymity makes identity management a significant challenge, and the majority of wallet and exchange providers have minimal KYC procedures. Cross chain transactions are very hard to monitor when combined with techniques such as atomic swaps, zero proof protocols, and ring signature protocols.

Trendalyze has integrated a number of public blockchains for transaction monitoring, correlation, and search. The searches can span across chains to help with detection of fraud originated with structuring techniques such as layering and smurfing.
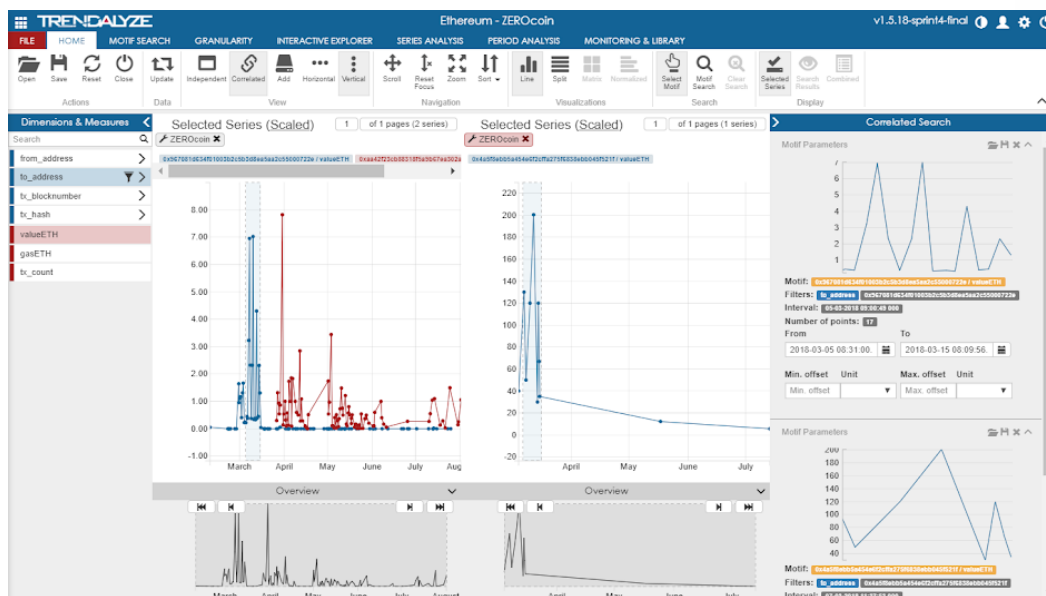
Trendalyze monitoring suspicious transactions across multiple wallets and exchanges on the Ethereum network

Summary

It takes a lot of different technologies to help solve these issues. The quality of data has to be such that we don't exacerbate the problem down the line. Along with the quality, the data elements have to be consistent with the AML initiatives and flexible enough to meet future challenges such as blockchain networks and cryptocurrency. Most financial organizations have had a KYC ongoing project that can be, or already has been, brought into the AML strategy. AI an ML hold a lot of promise but with the problems described by McKinsey and Accenture above.

At Trendalyze we believe we have a small but significant part of the overall solution to place tools in the hands of the business users and regulators, therefore, streamlining the process and avoiding the need for a ten fold increase in personnel identified by Accenture above. Please see our AML Video for introduction into our AML approach.

We invite you to connect with Trendalyze to set up a collaborative session to mutually determine whether there is a good fit between our technology and your AML strategy. These sessions usually takes no more than an hour with 15 minutes of prep time to answer a few questions regarding where you are in your AML journey and to identify the gap that you want to close.