Point Of View

SIGMOID

Financial Crimes - Detection and Prevention

Table of Content

1. Introduction: what is the financial crimes problem?

Corporations of today exist in a hyper connected world backed by extremely complex IT infrastructures and processes demanding faster and consistent availability all the time. This leads to some gray areas that could be exploited for Financial Crimes. The Financial Crimes rate has increased significantly in recent years. The US based Association of Certified Fraud Examiners (ACFE) in 2014 projected that organizations can lose up to $3.7 trillion in lieu of Financial Crimes, an enormous figure that can raise concerns.

It is essential for organizations to be able to preemptively and proactively detect such crimes with sophisticated control and prevention measures that could catch frauds even before they happen. However, due to the sheer complexity of the entire IT ecosystem, mitigating financial crimes requires an approach powered by assisted intelligence processes. This makes it all the more crucial to augment decision-making processes with Machine Intelligence to mitigate the risk of financial crimes for a better future.

Organizations quite often fail to convert their data into actionable insights to devise a well-planned operational framework. Also, many data sources remain fragmented and siloed which cause loss of information.

2. Types of financial crimes

There are two broad categorizations of Financial Crimes – One that involves dishonest activities to secure material benefits, and other involves facilitating these dishonest activities.

The most commonly known Financial crimes are as below:

Money Laundering

Terrorist Financing

Tax Evasions

Financial Fraud

Electronic Crime

Bribery

Embezzlement

Insider Trading

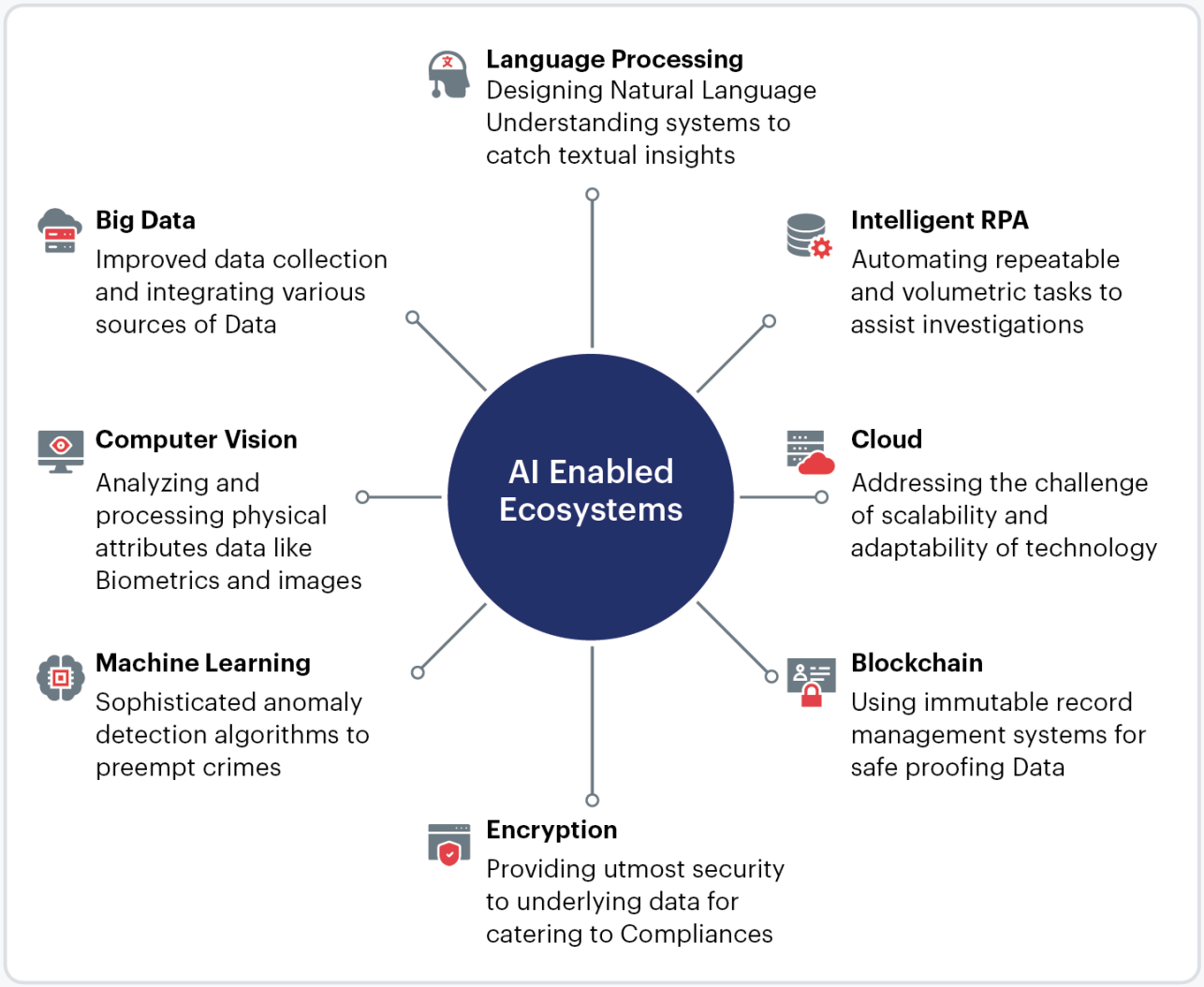
Information Security

Income from these crimes constitute a substantial portion of GDP, hence the Regulatory Authorities need to constantly develop new tactics to keep them under control. While technology is in the hands of both parties, it drops down to who can make better use of it faster. Financial Compliance has been evolving and adapting to the newer challenges, pushing the boundaries of innovation to come up with better systems. This has made Data Science and Big Data Technologies a strong ally for organizations to enhance their Financial Crime operations.

3. Assisted intelligence ecosystems

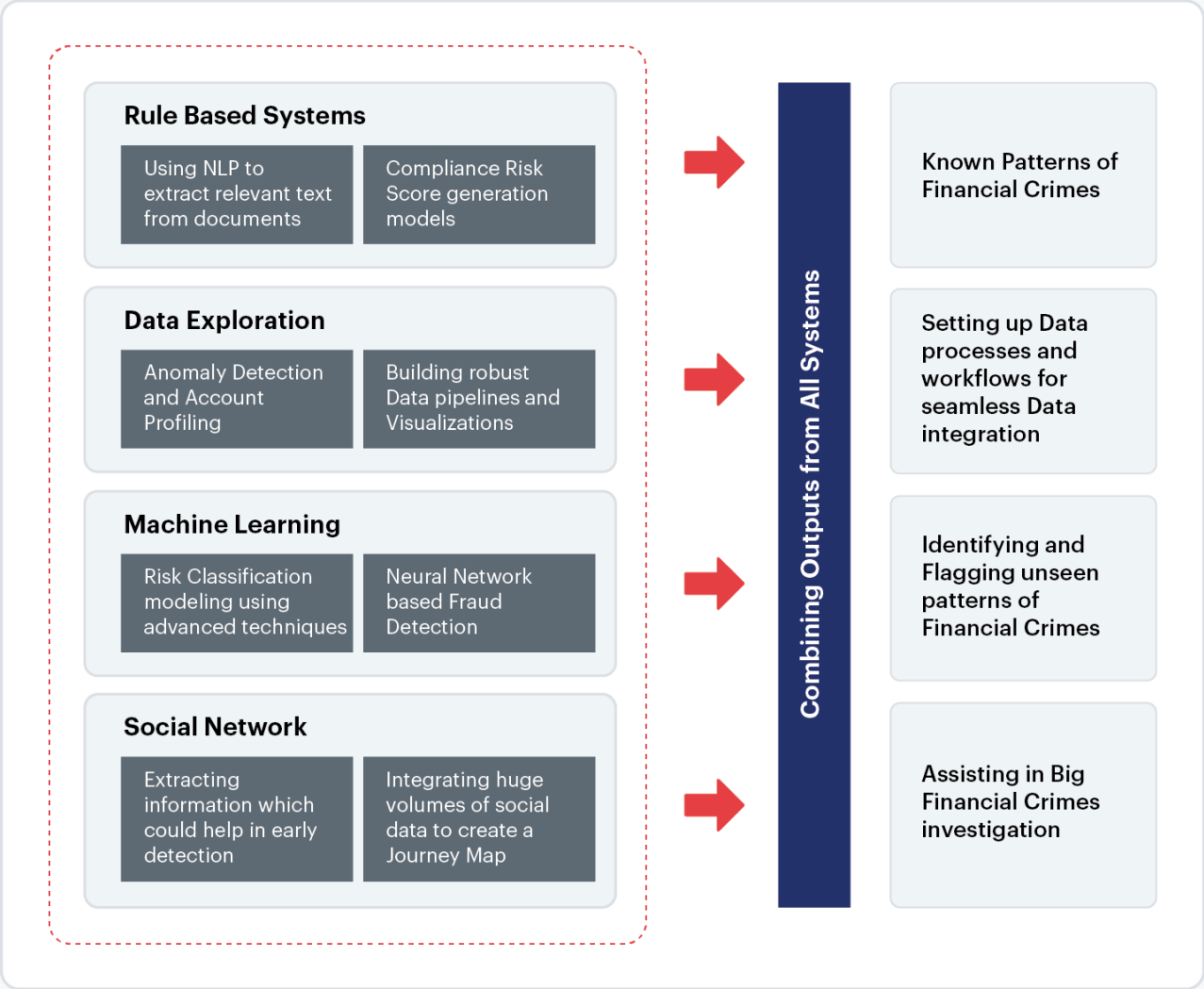
There is a constant war between criminals and organizations on who comes up with new and better technologies in order to serve their interests, and organizations MUST lead the fight to save billions of dollars from falling into the wrong hands. This requires constant innovation and upgradation of existing systems.

Below are some technologies that organizations can leverage to win this battle everyday:



4. Sigmoid's solution approach

We at Sigmoid have worked with our clients in helping them design and implement Big Data and AI/ML enabled fault tolerant ecosystems to mitigate the Financial Crimes problem. Our approach includes using cutting edge technology complemented with human intelligence to design a framework that can be applied across systems.



5. Case study

Improved trade surveillance infrastructure to handle regulatory compliance for a top-3 global investment bank

Business challenge

The client is a global investment banking company looking to bridge gaps in their existing data infrastructure to adhere to MAR, MiFID and other compliances. They were looking to achieve the desired regulatory standards by means of effective alerting and reporting capabilities. Meeting the compliance standards meant that there had to be robust data pipelines in place for analysis and availability of data mapped to global statistics and other internal data aggregators in real-time. They wanted to develop a customized tool in-house to have the right data at the right time. This also required integrating newer sources of data to refine non compliance detection and eliminate false positives and false negatives.

Sigmoid developed, implemented and optimized the trade surveillance infrastructure for a leading global investment bank to detect compliance issues in a more accurate, faster and efficient manner. Apart from efficiently processing over 100 MN rows of daily data and resolving various data and latency challenges in data pipelines, data integrity, and alerting, the system was compliant to MAR, MiFID II and other regulatory rules.

Sigmoid's solution

Sigmoid developed, implemented and optimized the trade surveillance infrastructure for the leading global investment bank to detect compliance issues in a more accurate, faster and efficient manner. Apart from efficiently processing over 100 MN rows of daily data and resolving various data and latency challenges in data pipelines, data integrity, and alerting, the system was compliant to MAR, MiFID II and other regulatory rules.

Sigmoid reviewed the client's existing surveillance model and increased its efficiency and effectiveness by identifying new scenarios and parameters to generate meaningful alerts. We developed a workflow and interface for alerting that provided detailed information and feedback about the various alerts. We also enabled tuning and iteration of the model as per the requirements of the compliance team. New data flow models, infrastructure maps, data retention policies, privacy constraints and regulatory frameworks were created as part of our solution. The custom-built architecture which combined data from multiple sources to arrive at key metrics enabled client teams to classify fraudulent transactions. Our solutions were implemented across multiple data pipelines, enabling surveillance across aspects such as market manipulation, ramp and dump, insider trading, and spoofing, among others. We monitored and improved performance of these solutions across cost, processing times and infrastructure utilization.

Improvements in the data pipeline

Performance optimization

- T+3 to T+1 timelines
- Spark-based ETL
- Resource optimization
- Garbage Collection GC tuning

Data integrity

- Added MapReduce counters
- Integrated alerting and monitoring
- Blueprinting escalation metrics
- Improved overall orchestration

Resilience & new surveillance

- Quashed production bugs
- Improved testing process
- Platform for ad-hoc surveillance
- Pipeline for locate wash trades

Business outcomes

T+3 to T+1
Performance optimization

4x
Faster system response time

65%
Reduction in false alerts

Sigmoid's solution increased the overall speed and agility of the data pipelines, resulting in 4x faster system response times. The system was now able to capture new and comprehensive alerts across market segments. We were able to identify various instances where price movements were captured in a fraction of seconds generating 15% additional and valid alerts due to millisecond-level granularity. Our solution successfully suppressed various false alerts, with the metrics (liquidity of stock, trader participation score) providing a more improved and holistic analysis of the exceptions.

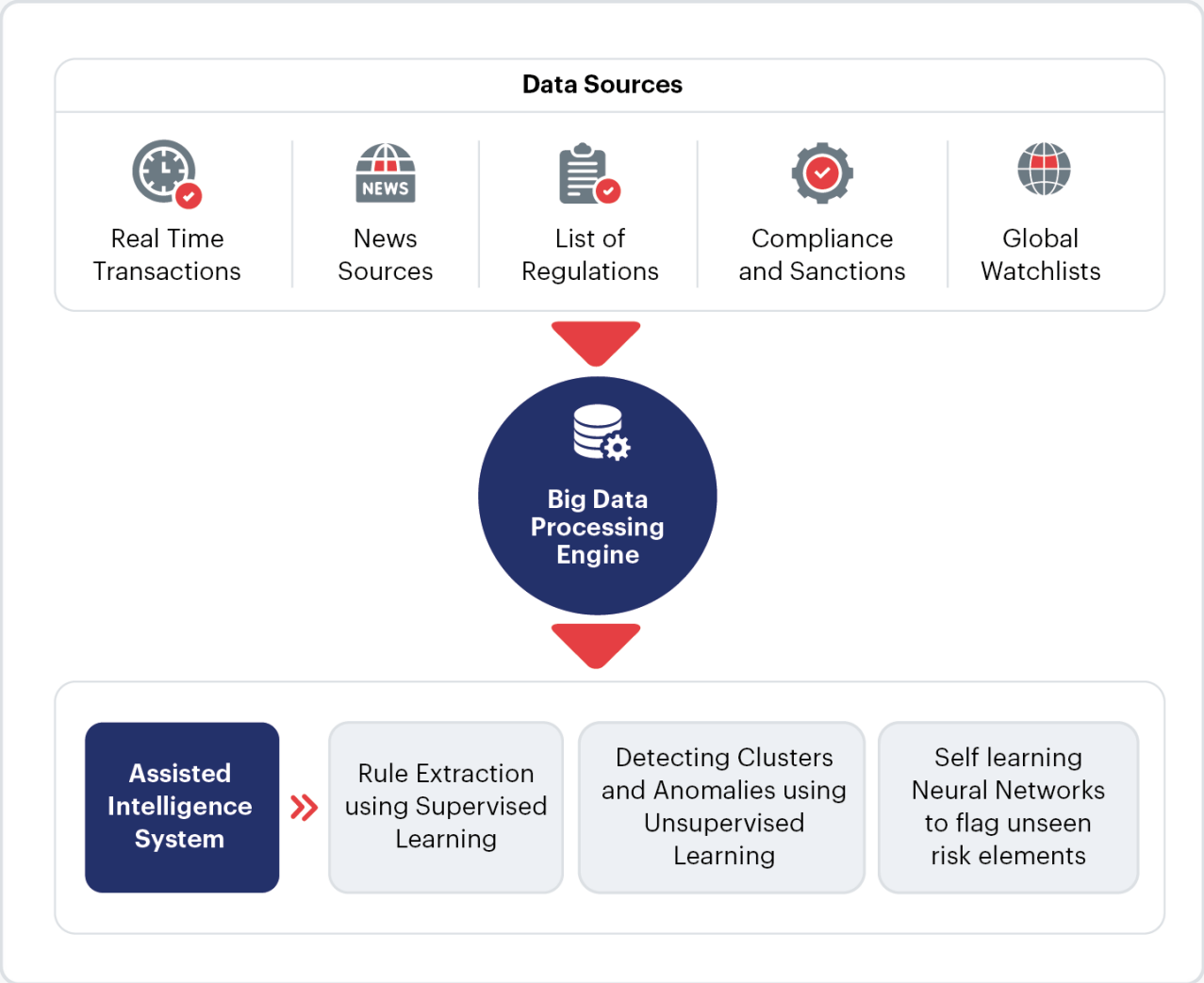
6. FCC for anti money laundering

AML activities are performed by Financial Institutions for complying with legal requirements and to prevent, detect and report suspicious activities. Augmented Machine Intelligence based systems can not only preempt suspicious transactions but also help in reducing the number of false alerts (also called false positives) compared to traditional surveillance systems.

Financial Institutions need to have sanctions screening performed for all transactions in order to detect Financial Crimes like Money Laundering. The Sanctions Screening is the first level detection of fraud and essentially involves screening payments against a list of sanctions that are predefined. However, in traditional systems the screening is done through fuzzy matching logic which is not scalable to adapt to ever increasing list of sanctions and its thresholds need to be manually updated.

The above architecture leverages AI/ML and Big Data to reduce the problem of false alerts by complementing the entire AML pipeline with Automated Detection system. It combines data from various sources and simplifies the screening by performing intelligent compliance checks on various parameters, can self-learn any new patterns that emerge in the activities and flag them for enhanced scrutiny levels. This architecture makes AML compliance more robust since it can incorporate new changes to sanctions and regulations very quickly and seamlessly, reducing the need for manual checks which could be both time consuming and expensive. Financial Organizations can complement their Compliance Management activities by leveraging the system for an effective AML solution which is powered by AI/ML and Big Data technologies at its core.

Below architecture details how Assisted Intelligence can augment existing systems for helping with AML compliance:



Financial Institutions need to have sanctions screening performed for all transactions in order to detect Financial Crimes like Money Laundering. The Sanctions Screening is the first level detection of fraud and essentially involves screening payments against a list of sanctions that are predefined. However, in traditional systems the screening is done through fuzzy matching logic which is not scalable to adapt to ever increasing list of sanctions and its thresholds need to be manually updated.

The above architecture leverages AI/ML and Big Data to reduce the problem of false alerts by complementing the entire AML pipeline with Automated Detection system. It combines data from various sources and simplifies the screening by performing intelligent compliance checks on various parameters, can self learn any new patterns that emerge in the activities and flag them for enhanced scrutiny levels. This architecture makes AML compliance more robust since it can incorporate new changes to sanctions and regulations very quickly and seamlessly, reducing the need for manual checks which could be both time consuming and come with high monetary expense.

Since the system described above can assist Human Intelligence in automated categorization of High-Risk transactions pertaining to Money Laundering, it reduces the burden of false positives thereby saving resources and reducing risk. Financial Organizations can complement their Compliance Management activities by leveraging the system for an effective AML solution which is powered by AI/ML and Big Data technologies at its core.

Contact

To know more on how to enforce robust compliance by modernizing your data infrastructure and AI solutions.

Click Here

To learn more visit our website.

About Sigmoid

Sigmoid enables business transformation using data and analytics, leveraging real-time decisions through insights, by building modern data architectures using cloud and open source. Some of the world's largest data producers are engaging with Sigmoid to solve complex business problems. Sigmoid brings deep expertise in data engineering, artificial intelligence, and DataOps.

Sigmoid helps CPG companies improve marketing measurement and optimization, enhance demand forecasting accuracy, and save costs through inventory planning with data engineering and AI solutions. We help CPG enterprises define analytics strategy, accelerate cloud data modernization and enable the integration of data from multiple sources while improving data quality.

Stay Connected