

LEVERAGING NEW TECHNOLOGIES TO ACHIEVE ENHANCED AML COMPLIANCE

Part 2 of a 3-part series on anti-money laundering technology.

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BACKGROUND

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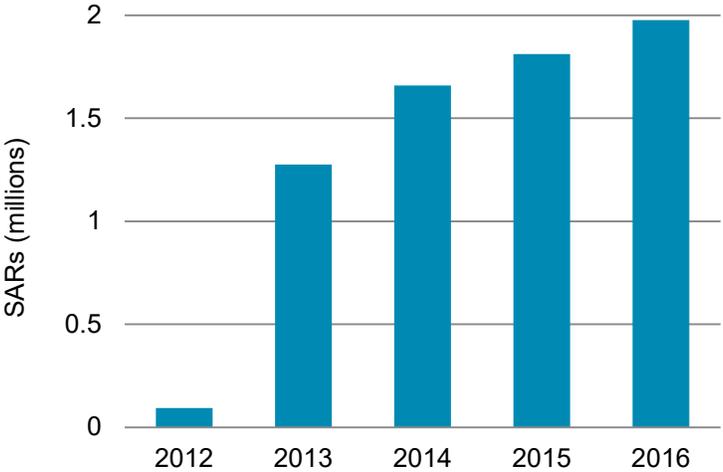
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INTRODUCTION

The role of compliance in the financial industry has expanded significantly in recent years, and this is nowhere more true than with anti-money laundering (AML) compliance. To take one indicator, e-filings of Suspicious Activity Reports (SARs) with the Financial Crimes Enforcement Network (FinCEN) increased from 1.3 million in 2013, already a very large number, to nearly 2.0 million in 2016.

Figure 1: Growth in SARs e-filings with FinCEN



Source: Celent, based on FinCEN data

SAR filings are just the tip of the iceberg; behind every completed SAR lie multiple AML alerts and false positives. AML compliance departments have ballooned in size and compliance budgets have risen dramatically, with some large global banks claiming annual AML compliance costs in the billions of dollars.

Faced with an ever-increasing compliance burden, financial institutions are seeking to make their AML operations more efficient and effective. As part of this effort, firms are exploring ways to supplement legacy AML technologies with advanced analytics and emerging technologies.

ISSUES IN AML TECHNOLOGY AND OPERATIONS

AML operations have developed into a mature and significant line of business at financial institutions. The number of AML compliance personnel at regional institutions exceeds 100 and reaches upwards of 1,000 or more at large global banks. Moreover, firms spend millions of dollars annually on AML technology investments.

Nevertheless, challenges remain in AML compliance operations, creating significant bottlenecks and inefficiencies in compliance workflows.

Watchlist screening and entity review are particularly thorny areas. Financial institutions must screen customers and/ or counterparties at every stage of the AML compliance value chain. This includes during know your customer (KYC), customer due diligence (CDD) and enhanced due diligence (EDD) checks, and periodic customer reviews; as well as when initiating wires and other payments. Watchlist screening is also an important component of ongoing transaction monitoring.

Some of the challenges in watchlist screening and entity review that are begging for effective solutions include:

- Positive identification of sanctioned entities and politically exposed persons (PEPs).
- Resolution of name variations, including aliases, transliterated names, and names in non-Latin scripts; as well as variations due to data quality issues such as partial names and corrupted names.
- Risk profiling, assessment, and scoring during the onboarding process as well as periodic customer reviews.
- Reduction of false positive rates, which can reach 70 percent of alerts or even higher.

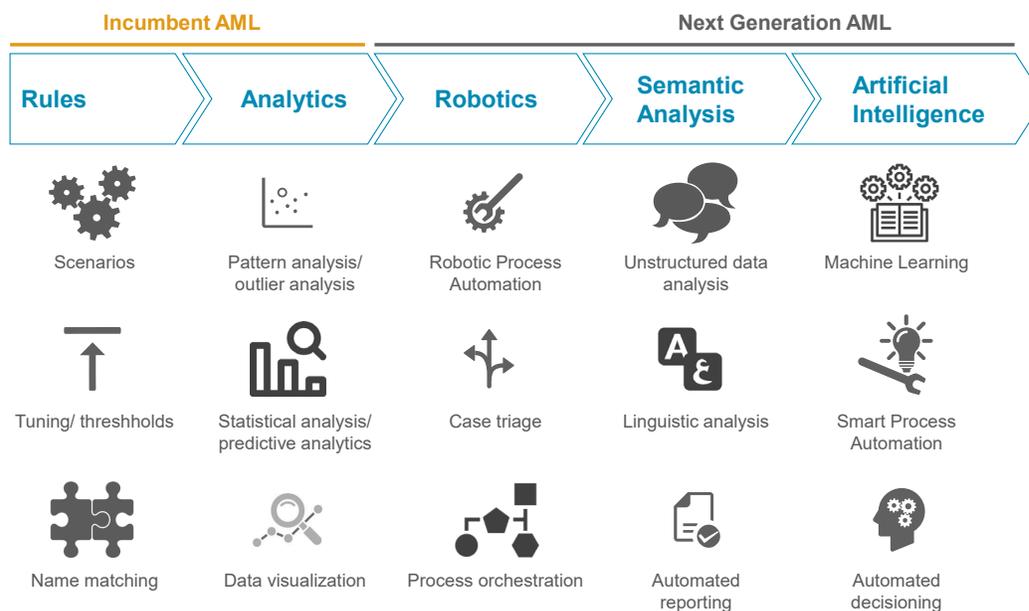
The persistence of these pain points despite heavy investments in AML software is leading financial institutions to seek additional solutions to supplement their existing AML technology. Already, forward-looking institutions are implementing advanced technologies such as statistical analysis, data visualization, software robotics, natural language processing, and artificial intelligence to address these issues.

ADVANCES IN AML TECHNOLOGY

Over the past two decades, AML technology has seen continuous development and innovation. These advances have been propelled by the need to keep up with the ever-evolving schemes employed by financial criminals on the one hand; and by an imperative for enhanced operational efficiency to offset increasingly onerous compliance requirements on the other.

Accordingly, AML solutions have undergone a twin evolution in terms of the analytics employed in detection as well as the degree of automation achieved in the investigative process. Some of these progressively sophisticated technologies are described below.

Figure 2: Evolution of AML technology



Source: Celent

- **Rules.** The first generation of AML technology was rules-based and rules-based engines continue to be the mainstay of many AML software solutions. Generally using structured query language (SQL), rules interrogate source databases for financial and/ or non-financial transactions meeting specific criteria. These can range from simple rules (for example, find all transactions over \$10,000) to compound rules that define scenarios involving multiple criteria (for example, find all transactions over \$10,000 involving overseas counterparties).

Rules-based scenarios can achieve a degree of complexity, but must be predefined by a programmer or business user and are generally applied to structured data or for name search in unstructured data.

- **Analytics.** Advanced analytics used in AML employ a variety of techniques such as data mining, statistical analysis, and predictive analysis to search for complex patterns, outlier events, and probabilities in data sets. Advanced analytics often employ specialized open source or proprietary modeling languages.

Effective use of analytics in AML requires the orchestration of multiple specialized functions aimed at specific areas, including entity matching, risk assessment, prioritization of entities and alerts, and network analysis.

Data visualization tools present the analytic results in graphic form to provide additional insights to AML compliance users. Network graphing to show the transactional and relational links between entities is a particularly valuable visualization tool in AML compliance.

It should be noted that these advanced analytics techniques are often integral to artificial intelligence. Machine learning, for example, essentially involves layering iterative functions on algorithmic routines to achieve a self-learning capability.

- **Semantic analysis.** Semantic analysis techniques enable the interpretation of unstructured data such as open text fields and documents, but also photographs, videos and audio recordings. Semantic analysis greatly expands the data universe susceptible to meaningful analysis, including external data like online and social media.

In the AML context, natural language processing (NLP) can be used to unearth information about entities in unstructured data sources such as news reports, including contextual information such as roles and relationships. Information on an individual's professional, personal, and familial relationships might be contained in one source, such as a profile in a PEPs database or an investigative newspaper article. Crucial data points might also be spread across many disparate sources. NLP makes it possible to automatically extract and contextualized the relevant information from large entity databases as well as from multiple sources.

Conversely, natural language generation (NLG) can automate the creation of narrative documents based on data inputs; for example, suspicious activity reports (SARs).

- **Robotics.** Software robotics is used to automate workflow processes, such as system data entry or document routing. Robotic process automation (RPA) is used to handle routine processes that can be orchestrated using basic rules; for example, populating an alert file with account and transaction data sourced from multiple systems. Smart process automation (SPA) joins robotics with artificial intelligence to enable the automation of workflow tasks that require decisions. Continuing with the AML example above, SPA could automate the decision to open a case based on the semantic interpretation of the collected information.

While RPA is already being trialed by some banks to add efficiencies to rote processes, automated decisioning by smart robotics still faces barriers in terms of the maturity of the technology as well as acceptance by regulators.

- **Artificial intelligence (AI).** Artificial intelligence aims to imbue computer systems with the cognitive and decision-making faculties of humans. A rapidly evolving field, AI utilizes a range of techniques including advanced analytics, semantic analysis, machine learning, and robotics. Sector-specific applications of AI (such as AML) often involve providing the system with an ontology of the relevant categories, terms, and operations to be used with the data sets. Machine learning technologies such as neural networks enable AI systems to continually refine the results of their analysis. For complex sector-specific tasks (such as AML), AI may use human experts to train the system by manually processing tasks so that the system learns to associate data characteristics with specific outcomes.

While current AML compliance operations are mostly invested in using rules-based solutions and analytic platforms, financial institutions are exploring the use of next-generation technologies including advanced analytics, robotics, and artificial intelligence. The next section will examine some of the use cases.

APPLYING NEW TECHNOLOGIES TO AML COMPLIANCE

The intractable problems of AML compliance often lead financial institutions to use multiple technologies to try to plug the gaps. For example, firms faced with high false positive rates from their watchlist screening software often turn to specialized analytic solutions to help increase the efficacy and efficiency of their compliance operations. Emerging technologies, including advanced analytics, can be applied to the challenges in entity resolution discussed earlier in this paper, facilitating and automating specific aspects of AML compliance.

IDENTIFYING SANCTIONED ENTITIES AND PEPs

Due to a range of issues — including shared names and incomplete, inaccurate, or stale data in watchlists as well as in banks' back-end systems — precisely matching an entity in a bank record to a watchlist remains a time consuming task.

Traditional approaches to the issue typically rely on identity verification services provided by credit bureaus and other suppliers, which largely base their matches on personal data such as date of birth, addresses, phone numbers and social security numbers. Another important source of data is the commercially available entity databases that provide collated data on sanctioned entities, PEPs, and various special interest categories. Automated screening of entity databases is a powerful tool in financial institutions' AML solution sets. If automated analysis proves insufficient, however, compliance analysts may need to manually comb through entity databases, public records, online media, and other sources to piece together enough clues to achieve a reliable identification.

New techniques are becoming available to reduce the workload. Robotic software can be employed to assemble the required documentary information by searching the relevant sources and entering the results into a case management system. This may automate the data collection phase, but still requires a compliance analyst to interpret the results and make the final call on the match. Accordingly, the use of RPA alone may result in only about 20 percent greater efficiency in entity resolution.

In this regard, statistical analysis, predictive analysis, and other specialized techniques such as fuzzy matching and edit distance algorithms have demonstrated success in increasing efficiency in the entity review process by improving results for name matching, risk assessment, and network analysis. Adding AI to the mix to enable automation of the decisioning itself has great potential for time and cost savings, but AI-driven KYC solutions are generally still in early days.

RESOLUTION OF NAME VARIATIONS

A related and equally recalcitrant pain point in entity resolution is the existence of nicknames, aliases, corrupted names, and other name variants. These issues, ipso facto, make a direct name match impossible in many cases. The complexity of name variants increases exponentially when dealing with overseas names and transliterations of names in non-Latin scripts.

Traditional approaches to this challenge have coupled Soundex and other name-matching algorithms, rules, and fuzzy logic with extensive, manually-compiled libraries of name tokens. Whether collected by third-party providers or in-house by financial institutions themselves, assembling such libraries of rules and tokens is an incremental, time-consuming, and arguably never-ending process. Again, names in non-Latin scripts and names transliterated from non-Latin scripts require additional, specialized effort for each language. This is a particular headache for financial institutions with overseas

operations as well as for any firm that encounters international customers and transactions.

New techniques can assist with entity resolution in cases involving name variants. Natural language processing can add efficiency by automating cognitive tasks such as name parsing and multi-lingual analysis. Statistical analysis and semantic analysis applied to large data sets containing multiple instances of the same entities can leapfrog the issue of name variants altogether by directly assessing the latent risk of an entity in the context of relevant data sets such as negative news. Advanced analytics and semantic analysis can be particularly powerful tools for financial institutions dealing with the complexities of transliterations, name variants for international names, and non-Latin scripts.

RISK ASSESSMENT

Risk profiling, assessment, and scoring of both new and existing customers lies at the very core of KYC and AML compliance. Accurate risk assessment can deliver double benefits by both alerting a firm to its high risk and high profile clients as well as enabling it to ring-fence the much larger pool of low risk clients from the need for resource-heavy scrutiny.

Traditional approaches to risk profiling combine onboarding questionnaires with a due diligence process involving the automated or manual querying of watchlists, entity databases, public records, online media, and other sources. Risk assessment is typically predicated upon generic risk assessment categories such as business type, geography, and expected transactional activity, which are susceptible to gaming by experienced bad actors. Other challenges include data quality, reliability of media sources (including traditional, online, and social media), and the veracity of customer-provided information.

New techniques for risk assessment start with the realization that to correctly understand a customer's risk profile, it may be necessary to scan mountains of structured and unstructured data to unearth risk indicators, links to PEPs, and other pertinent information about an entity. Traditional name search is clearly not sufficient to make these connections. Data science techniques such as statistical analysis, predictive analytics and semantic analysis can be applied to these large data sets to establish the pertinent, contextual characteristics of entities, establish associations among them, and identify risks with greater certainty.

REDUCTION OF FALSE POSITIVES

Despite several decades of development in AML technology and operations, financial institutions can still face shockingly high false positive rates from their AML and KYC software, which can reach 70 percent of alerts or even higher. False positives are the single greatest contributor to the onerous AML compliance burden at financial institutions today.

Traditional approaches to reducing false positives are largely based on rules, thresholds and parameter tuning, and supplemental functionality such as good actor lists. Financial institutions have spent years developing their rule sets and refining parameters, but for many firms false positive rates remain high.

New techniques such as robotic process automation can be applied to the problem to automate much of the workflow involved in processing alerts and thereby achieve time and cost efficiencies. Preventing false positives to begin with, however, is the surer approach. To achieve this, advanced analytics such as statistical and semantic analysis are needed to identify the high risk entities that point to a true positive. Prioritization algorithms play an important role by suppressing the least likely potential matches.

THE CENTRAL ROLE OF ANALYTICS IN AML COMPLIANCE

Anti-money laundering compliance has been a field of constant evolution as it strives to meet the continuing challenges of financial crime and the regulatory framework set up to combat financial crime. A major area of focus for financial institutions today is understanding how to leverage emerging technologies in order to achieve efficiencies and overcome pain points in their AML compliance operations.

A variety of new tools are being applied to the problem, including robotics, natural language processing, machine learning, and artificial intelligence. Multiple RegTech startups are developing new services aimed at solving various aspects of the AML and KYC value chain.

A common thread to all these developments, however, is the central role of advanced analytics. Statistical analysis, predictive analysis, semantic analysis, data visualization, and related fields are the essential building blocks for the next generation of financial crime technology.

At the same time, black box approaches will not suffice. Regulators are making it clear to financial institutions that their AML processes must be demonstrable and auditable, including analyses, actions, and decisions generated by AML technology. Model governance, model validation, and transparency of machine-generated results will help get regulators on board with firms' use of advanced analytics and AI. Transparency, validation, testability, and recoverability of results will be increasingly important to regulators as advanced technologies come into widespread use.

An important task facing financial institutions is creating a roadmap to incorporate advanced technologies into their AML compliance operations. Leveraging the power of advanced analytics is key to this effort.

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Typical projects we support related to anti-money laundering compliance include:

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Business practice evaluations. We spend time evaluating your business processes. Based on our knowledge of the market, we identify potential process or technology constraints and provide clear insights that will help you implement industry best practices.

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