Big data against money laundering: machine learning, financial applications and regulations

Future of IT: *Could it be possible to avoid financial fraud like the "Russian Laundromat" by using machine learning to analyze data? If so, why is this not done?*

By George Anadiotis, ZDNet.com | Modified Wednesday 10 April 2019 at 18:30

One of the main areas of application of advanced big data techniques such as machine learning is to predict and act against financial fraud. Last March, a money laundering case involving a number of global banks operating in the UK known as the "Russian Laundromat" was exposed by the organized crime consortium OCCRP (Organized Crime and Corruption Reporting Project).

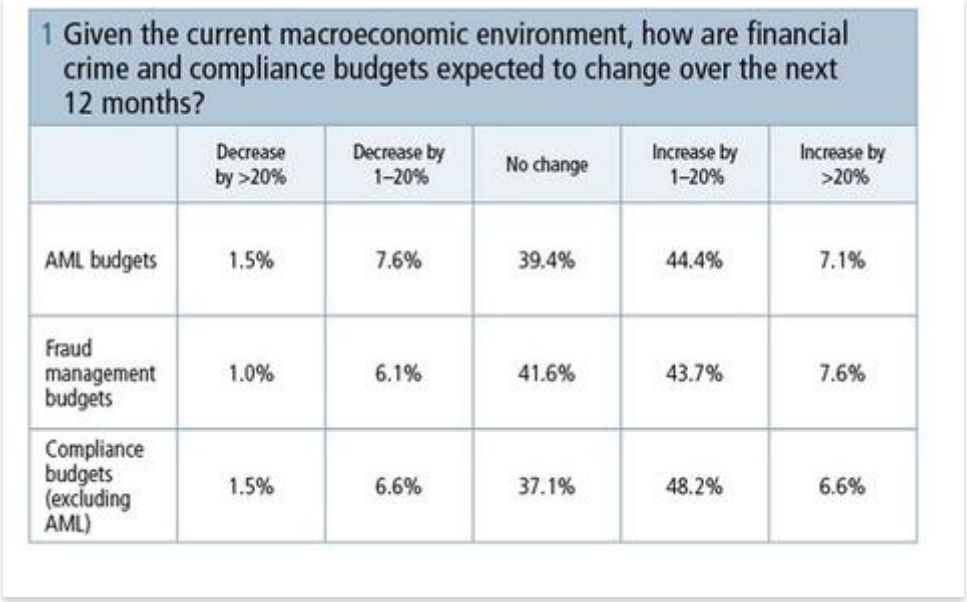
Could machine learning have helped prevent such incidents? What progress is being made on this front, how does it fit into the bigger picture, what are the obstacles and what may be the repercussions of adoption?

"It's not just about individual transactions. It's repeating the pattern."

There are many different types of financial industry fraud. The "Russian laundromat" is a type of money laundering that is estimated to generate around $ 300 billion in illicit profits each year in the United States alone. Although each type of financial fraud has its own characteristics and implications, money laundering is considered important enough that the US Department of Economics and Finance has devoted a report to it called the National Money Laundering Risk Assessment (NMLRA). in 2015 .

It is clear why money laundering carries such weight, even without reading the 100-page document in its entirety. Money laundering does not only have a financial impact, as it is associated with activities ranging from human and drug trafficking to terrorism and corruption. It's no wonder then that governments around the world are trying to put a stop to it through regulations on financial institutions.

They must indeed comply with a set of rules imposed by regulatory bodies and are subject to audits to verify their compliance. If they are found guilty of negligence in their obligations, they expose themselves to legal consequences. For example, the US branch of HSBC entered into a deferred prosecution agreement in the US in 2012, for failing to properly monitor more than $ 670 billion in wire transfers and $ 9.4 billion in purchases of US banknotes. from HSBC Mexico.



1 Given the current macroeconomic environment, how are financial crime and compliance budgets expected to change over the next 12 months?

	Decrease by >20%	Decrease by 1–20%	No change	Increase by 1–20%	Increase by >20%
AML budgets	1.5%	7.6%	39.4%	44.4%	7.1%
Fraud management budgets	1.0%	6.1%	41.6%	43.7%	7.6%
Compliance budgets (excluding AML)	1.5%	6.6%	37.1%	48.2%	6.6%

The fight against money laundering is serious business and it is also reflected in the way companies plan the resources they are going to devote to it. Image: BAE Systems and Operational Risk

It is therefore not surprising that financial institutions in turn seem to take anti-money laundering compliance very seriously. 51.5% of people questioned in a recent study of banks and insurance companies working in the areas of risk, fraud, compliance and finance believe that budgets dedicated to the fight against money laundering money will increase. But is this money well spent? Judging by the example of HSBC, maybe not that much.

According to OCCRP, HSBC is the main culprit in the "Russian laundromat" affair, having processed more than $ 500 million in cash through its UK and foreign branches. Banks like HSBC claim that despite having sophisticated units dedicated to eradicating financial crimes, the sheer volume of payments (several billion a year) makes this task difficult.

Others, like L. Burke Files, an international financial investigator, characterize the compliance audits of many Western banks as "rambling and often doing little more than ticking boxes." “Most of the transactions I see here would have required much more diligence,” notes L. Burke Files. "It's not just about individual transactions. It's repeating the pattern."

Rules are a blunt instrument, machine learning is a black box

Repeated patterns and transaction volumes that run into the billions? This is a job that seems ideal for Financial

Crimes and Compliance Unit of OFS. Its mission is to work with nine of the ten largest banks in the world to help them comply with anti-money laundering regulations, including exploring the possibility of applying machine learning in this area.

OFS works with its clients to review the banking products they own, the markets in which they operate and the regulations that apply to those markets to understand the risks they are trying to manage. Then, OFS aligns these risks with the controls that must be in place and provides detection scenarios that implement these controls.

Sunil Mathew indicates that over the past fifteen years, a set of scenarios have emerged for regulators around the world. One such scenario is monitoring rapid movement of funds that may indicate money laundering and generate alerts. However, even if the general scenario may be the same, its parameters will vary: for example, the volume of funds to be monitored, the rate and time window of movements, or the risk profiles of the stakeholders of the transactions to be monitored.

95% accuracy

This rules-based approach works, but as Sunil Mathew puts it, "Rules are blunt instruments. They can trigger to intercept criminals, but they will also trigger for a lot of people who have nothing to blame themselves for. ". This is a problem, because it means that the people whose job it is to check these alerts will have a heavier workload. This is the reason why Oracle incorporates machine learning into its products.

Machine learning algorithms are well suited for this scenario, as they can use training data to be developed, and then customer specific data to be tuned, resulting in greater accuracy and better performance.

Even though Sunil Mathew was unable to share the results, machine learning approaches used today in areas such as speech recognition are known to achieve 95% accuracy . There is one problem, however: to use Sunil Mathew's words, machine learning is a black box.

Showing results is not enough

When it comes to determining how banks will market their products or what offers they will make to their customers, that is not really a problem; regulators care little about how these processes work. In contrast, when it comes to compliance, showing results is not enough: banks need to be able to explain how they achieved those results.

This is one of the main difficulties with machine learning: "More sophisticated algorithms are a lot like a black box and you can't open it to see what's inside. . This is a major obstacle to adoption, ”laments Sunil Mathew. The stakes are too high to abandon machine learning, however, so he's trying to apply different approaches to tackle the problem.

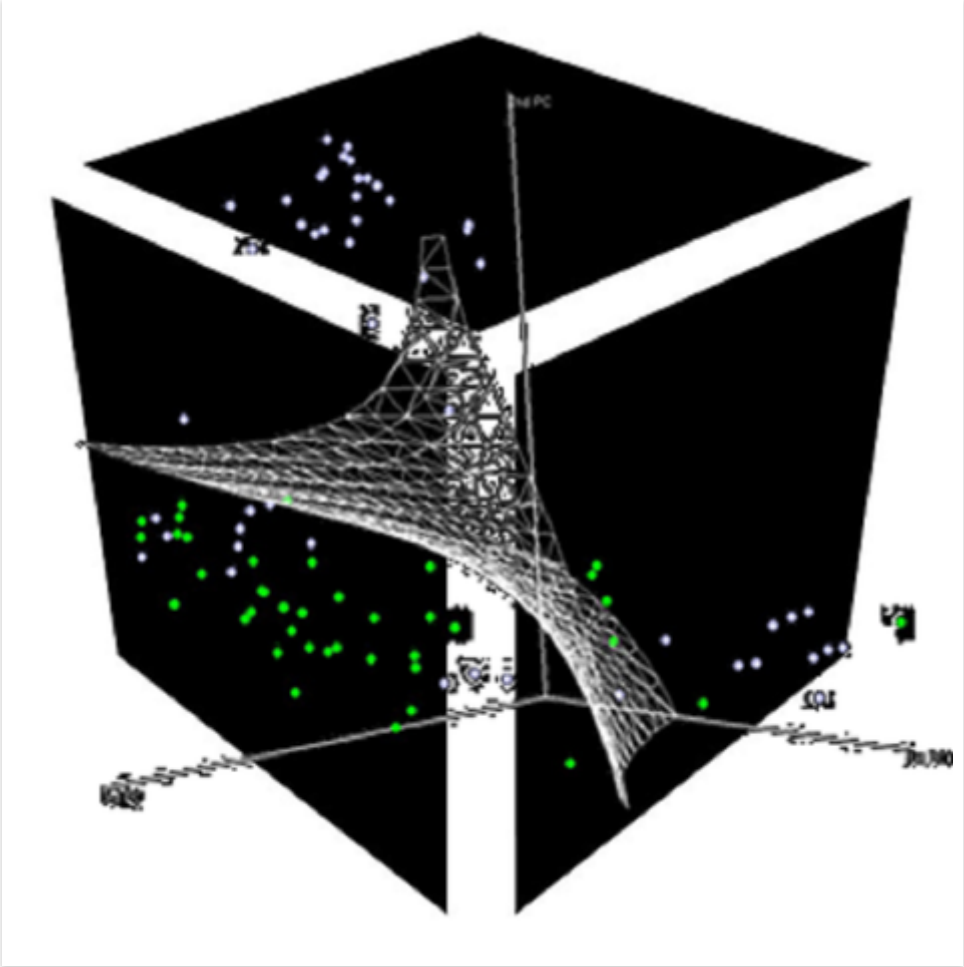
Building trust in the black box

- The first approach is pragmatic and directly applicable: if regulators are reluctant to accept machine learning at the heart of the anti-money laundering engine, keep the rules as a core and apply machine learning to assess alerts. generated.

  By training machine learning about actions taken in the event of alerts, it is possible to identify patterns that help classify them as more or less indicative of money laundering, thereby establishing the priorities. This approach is part of the trend of gradually injecting advanced functionality into businesses to support their day-to-day operations.

- The second approach is also pragmatic, albeit more forward-looking: it is about trying to sidestep the concerns of regulators. OFS is working with some of its clients to convince regulators that machine learning can be used as a tool in the fight against money laundering.

  The reasoning is that even though you may not be able to see inside the machine learning models, by building enough controls all around and independently testing and auditing them, it must be possible to verify that they are working as they do. are assumed. Having the data that these algorithms are working on is an integral part of that as well.



What can be done to open the black box of machine learning? Image: aitrends

- The third approach is to work on the outright elimination of the obstacle. “We are fortunate to work with our research labs and one of the areas we focus on is improving the interpretive ability of machine learning,” Sunil Mathew says.

  As the fight against money laundering is in many ways similar to making the link between different information, it naturally lends itself to a graph processing paradigm. Graph processing is used in such cases as exploring links in Panama Papers data . A mixed approach combining machine learning and graphs can produce results of greater interest.

Machine learning is effective, but opaque

Machine learning is effective, but opaque: "It works, and it works well, but we don't understand exactly why or how . " While this phrase has been spoken about deep learning, it applies more broadly to machine learning as well and, coming from experts in the field, it is not. not a detail to sweep away with the back of the hand.

It can raise philosophical questions, which mostly relate to the growing sense of being sidelined and

notes, no matter what approach you take to fight money laundering, getting results is not enough. It must also comply with a number of directives, ensuring, for example, that there is no discrimination against certain groups of the population.

The issue of algorithmic transparency is becoming more and more understood and widely discussed; there are many examples where opaque algorithms represent all kinds of biases . If regulators decide to embrace machine learning in the financial industry, it will be interesting to see under what conditions this will be done and what the repercussions will be.

The human factor: efficiency versus transparency and distribution

The question of whether opacity is a price we are willing to pay for efficiency is not the only question here: do regulations work? And who will benefit most from the adoption of advanced techniques in the financial industry?

According to Sunil Mathew, these are the banks that work with them, although OFS does advise regulators. Aside from the obvious question about the relationship between them , do regulators have the resources and knowledge to keep pace in this arms race?

For example, the UK has been praised by UBS for "its progressive regulations and support for new innovations" , but what does that mean exactly? Sunil Mathew notes that in areas such as capital management, some regulators have advanced knowledge of statistical techniques and predictive models, but compliance is different.

Seems like even though the future is already here, it's not evenly distributed : the expectation is that innovation will eventually balance things out and create new jobs, but it's impossible to know if or when that will. will happen, nor what will happen in the interim.

Innovations and technological implications

In a world of growing inequalities , doesn't technological innovation make society even more unequal? This is an ongoing debate and the financial industry is a prime example of the application of innovation to amass unevenly distributed wealth.

"Banks want to embrace modern technology because it will save them money. Some banks may have as many as 6,000 people working on compliance," recalls Sunil Mathew. While it is evident that automating a tedious, error-prone, and time-consuming task such as combating money laundering will [illegible] the subject.

All of these issues go far beyond the fight against money laundering. The financial industry is not only a good example of how big data innovation can be applied, but also of the implications that are integral to it. As Sunil Mathew says, "This is an exciting area and things are just starting to move."

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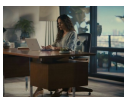

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We're dealing with finance and its rules here, aren't we?
However, since the Reagan Tacher period of the early 1980s, we have resolutely entered an era of financial deregulation. The recurrent financial crises and the hyper-concentration of wealth are just two consequences among many others.

And we would like to believe that we could succeed in imposing rules on the world of finance? Unlikely.

Only countries around the world, if they unite, can hope to bring finance to a halt.

The financial industry brews in a year more than 120 times what the manufacturing industry produces.

... And without any regard for the cannon fodder that we are.

Yveslegault
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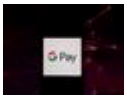

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