

RACONTEUR

Accelerating AI in Banking



FICO[®]

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CREDIT DECISIONING

Lending bankers an expert hand

Actionable analytics, utilizing artificial intelligence and machine-learning, can greatly improve lending decisions in banking

Rich McEachran

When it comes to lending, the financial services industry has become well versed in evaluating credit risk, but there's always room for improvement.

According to Peter Maynard, SVP for Data and Analytics at Equifax, banks and financial institutions are continuously looking to see where they can make changes that will give them a competitive advantage that in turn will help them to attract and retain the most profitable customers. Artificial intelligence (AI) and machine learning (ML) is often the solution to adding the value they're looking for.

"In order to make sure no opportunities to lend to good customers are missed, it's critical that credit decisioning with AI and ML leverage multiple, disparate data sources to gain a 360-degree view of the customer," he says. "carefully constructed AI/ML models can keep risk levels stable but raise acceptance rates by 20% or more in certain cases."

The standard credit decisioning tools, such as behavioral scorecards, are well embedded in financial services culture and well understood by employees, who tend to prefer to stick with what isn't broken. For this reason, some organizations may be wary of investing in technology where the true benefits are not yet tangible.



49%

of consumers prefer using digital channels to buy new lending products such as credit cards and personal loans

Deloitte, 2019

"The necessity for financial institutions to get credit decisions right is of fundamental importance as this is at the core of their and banks' business model. It's also one of the greatest sources of income when done right, or loss when done badly," explains Vijay Krishnaswamy, partner at consultancy True North Partners, specialists in risk and finance in the financial services sector.

Mr. Krishnaswamy adds that the potential financial implications may deter organizations from making the move to AI and ML, and putting their trust in an algorithm. The reality, though, is that using AI and ML techniques to augment the traditional credit model design can be hugely advantageous, particularly in areas such as customer segmentation, acquisition and onboarding.

"While the scorecard produced would look and feel much like a traditional one, the process of getting there using cutting-edge techniques can help to ease decision-makers into understanding this new technology," argues Mr. Krishnaswamy.

How to adopt the tech

According to Leslie Parrish, Senior Analyst at Aite Group, AI and ML should be used alongside analysts and data specialists - much like how the technology has been adopted to support practitioners in other sectors, such as healthcare.

There are some large datasets that can't be assessed manually. It's here where AI can provide valuable insights that a human practitioner might not be able to extract. The AI can also learn from previous decisions and make comparisons using historical data, she says.

"As with healthcare, the adoption of machine learning to support credit decision practitioners typically speeds up the process of [credit risk] assessment, as ML can undertake some aspects of the process relatively soon after adoption, while still being under the full oversight and control of a practitioner," adds Ms. Parrish.

With the low value lending market being relatively mature, efficient and largely automated, he expects the main beneficiary to be high value lending, where much of the decision-making is often done manually due to the risk involved.

Although AI and ML can enable the financial services industry to evaluate large datasets faster and more efficiently than a human



analyst can make credit decisions on their own, the technology can only predict what it's been trained to predict.

The downside to this is that, if not trained properly, it can lead to bias in credit decisioning. For example, a company with a healthy cash flow may be rejected for a credit extension based on loan applications from a decade ago. On the other hand, removing any erroneous or potentially problematic data from the ML model, reduces the likelihood of bias occurring.

"No credit model is perfect. There will be loans approved that shouldn't have been and loans not approved that could have been," says H.P. Bunaes, general manager for financial services at DataRobot, which has developed an ML platform for data scientists of all skill levels to build and deploy predictive models.

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With AI and ML, more precise and more granular risk-and-return models are achievable

Vijay Krishnaswamy
Partner, True North Partners

“But with AI and ML, more precise and more granular risk-and-return models are achievable. And the more precise your models are, the more aggressive and competitive you can be. This means you're going to be able to do business at better margins and unlock tangible value that's impossible to ignore.” ●



COLLECTIONS & RECOVERY

Ace up the sleeve in collections and recovery

Predictive modelling, enabled by artificial intelligence and machine-learning, can ensure efficient and timely collections and recovery for financial services firms

Rich McEachran

As global economic uncertainty grows and another downturn looms ever closer, firms in the financial services industry will need to find ways to ensure the collections and recovery (C&R) process is efficient. If they don't, they may struggle to address delinquencies.

Not only this, but C&R teams increasingly have fewer resources at their disposal and will often have to rely on legacy technology to perform collections tasks.

"The costs associated with servicing non-performing loans is estimated to be around 15 times the cost of servicing a performing loan. So driving efficiencies in C&R processes should be a top priority for many institutions in the financial services industry," says Helena Schwenk, market intelligence manager at Exasol, an analytics database management software company.

The ace up their sleeve can be artificial intelligence (AI), combined with machine-learning (ML) and predictive models. These technologies can create value from knowledge of a client or customer's past behaviors for example, says Paul Greenberg, author of the new book *The Commonwealth*

of Self-Interest: Business Success through Customer Engagement.

“Knowing the best time to contact them and which channels they prefer to use to communicate can be extremely useful knowledge to have when it comes to attracting and retaining customers,” he says. “There are other questions that AI and ML can provide answers to, such as what delinquency treatments will drive the best outcomes and what chain of best-next-actions will foster better customer engagement”.

Financial institutions that leverage such data in collections are more likely to get better outcomes for both themselves and borrowers, more efficiently and quickly. However, algorithms require huge amounts of data from transactional systems, service providers, external sources and even digital channels for building and training the predictive models.

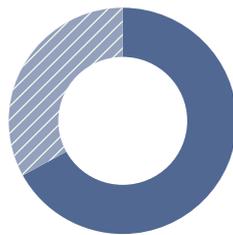
With so much data being generated, it’s unsurprising that in order to derive value from it, organizations need to have an effective method in place for collating it and making it easily accessible to anyone who needs it.

Data storage and management

The solution needed is data storage and management. While the potential of AI in C&R is immense, without a cohesive data strategy to store, organize and manage all this data, efforts to embrace AI will fall flat.

David Hicks, vice president, ISV Ecosystem Business Development at Oracle agrees that investing in a robust data infrastructure is key in enabling C&R teams to access all forms of data and see the bigger picture.

“Financial service organizations often strive to be data driven, but in order to



67%

of IFC members are not using big data sources to improve decision-making

Irving Fisher Committee, 2019

maximize accessibility and ensure data doesn’t get stuck in silos, a common platform and comprehensive tools are needed. The use of AI and machine learning technology as part of the company’s core capabilities enables them to analyze, measure and compare to pave the way for future success.”

This means that any journey towards data-driven C&R optimization will require a crawl, walk, run approach that starts with investments in data collection and organization before accelerating to high performance with advanced algorithms and predictive AI.

Tiffani Montez, Senior Analyst at Aite Group, says that such an approach can help to sieve through datasets and cut through the noise, separating the good data from the bad.

“Robust data management can also ensure that valuable data doesn’t end up being siloed. Traditionally, silos mean that useful insights are impossible to unlock because it proves too difficult to merge data sources from across departments and analyze, measure and compare them and extract the value,” she says.

By investing in the likes of data lakes, C&R teams can place more confidence in and be more trusting of the data at their disposal. This is going to assist them in recovering debts, increasing productivity and business value, while reducing risk at the same time.

There is a caveat though. Although financial services institutions have gotten past the issue of data lakes being expensive, the bigger problem is that C&R doesn’t always get prioritized and C&R groups can end up being left out enterprise data management and analytics initiatives.

That said, at a time of economic uncertainty when C&R teams are under pressure to deliver better results with tighter resources, those firms that successfully unlock the value of data using AI and ML will be able to increase their operational efficiency without increasing the size of their workforce, enabling them to collect debts with fewer resources, less uncertainty and at reduced long-term costs.

But to do so requires an understanding that AI and ML technologies are dependent on effective data management and this requires organizations to make the necessary investments to ensure they can walk before they can run. ●



Investing in a robust data infrastructure, especially data warehouses and lakes, will enable C&R teams to access all forms of data and leverage data science languages

Helena Schwenk
Market intelligence manager, Exasol

CUSTOMER ENGAGEMENT

Investing in a currency of trust

Artificial intelligence and machine-learning are opening the door for financial institutions to understand customer needs, improve personalization and deliver practical insights that will transform trust across the sector

Dave Howell

The relationship banks and other financial services providers have with their customers has always been based on trust. Yet consumer trust has been eroded as services have moved away from face-to-face interactions to digital platforms. However, AI and ML are now helping financial institutions regain this trust, as mobile digital services are increasingly delivering new and compelling beneficial customer experiences across multiple touchpoints.

According to the Collinson Group, more than 80 per cent of UK retail banking customers believe their banks don't know or understand their needs.

With massive quantities of choice across the financial services marketplace, consumers now differentiate based on experience and on who can best enable them to meet their goals, rather than on the service or features available to them.

Using machine-learning (ML) coupled with artificial intelligence (AI), banks and financial

service providers can gather data and leverage insights to build long-term value, cultivate customer relationships and become a trusted partner to individual customers.

Fundamentally, AI and ML are enablers that can reveal actionable insights that have, until now, been inaccessible to financial services providers, hidden in opaque information about each customer.

As quality of advice becomes a key business differentiator, interpreting this customer data and understanding individual customer needs to take proactive, value-adding action are becoming a core component of the new age of customer experience and trust.

It's a simple equation: a better customer experience leads to improved customer satisfaction, brand loyalty and high levels of business advocacy, all of which are the core components of building and maintaining trust.

AI and ML-driven automation across the financial services sector continues to accelerate on multiple levels.

Front-line staff are augmented with AI profiling tools on mobile devices to recommend specific products to individual customers.

Chatbots using natural language processing (NLP) engines engage directly with customers online and over the phone, utilizing ML engines to improve the credibility of responses.

AI assistants

Using technologies like AI, customer engagement is transformed into a product or metric to be improved. AI assistants can eschew the need for human interaction and advise customers in real time, suggesting products and financial assistance based on individual needs and situations.

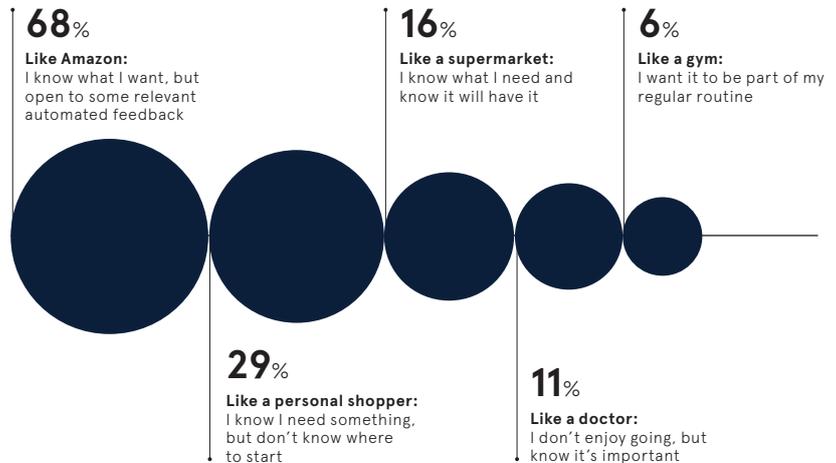
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AI and ML will enable the financial sector to make the personal connections which form the basis of a trusting relationship with their customers

Jonathan Shawcross

Managing director of banking, Gobeyond Partners

HOW CUSTOMERS WOULD LIKE TO INTERACT WITH THEIR BANK



Boston Consulting Group, 2019

According to Gartner, by 2020, 85 per cent of customer interactions will be managed without any human intervention. Indeed, it's predicted that the average person will have more conversations with a chatbot than their spouse.

ML when coupled with AI and advanced deep learning, is revolutionizing how businesses engage with their customers. For example, Lloyds Banking Group has announced a partnership with Thought Machine, an innovative Fintech, that will enable greater product tailoring and mass customization for individuals, while Bank of America's 'Erica' AI acts as a personal, 24/7 financial advisor for customers.

Advanced ML and AI can enable banks and financial services providers to better organize customer data, identify insights and also consider an individual's behavior. These insights then enable predictive connections to be made. These patterns of service use the behavior to deliver actionable, personalized outcomes to consumers.

Research from IBM shows the importance of personalization, with 57 per cent of executives stating that their number-one reason for adopting AI is to personalize experiences in response to customer demands. Personalization clearly plays a vital part of building customer trust, but it must be based on detailed customer profiling that goes beyond simple demographic data. These are the deeper insights that AI and ML can help financial institutions uncover for more effective personalization and build more trust.

Another trust-building use-case for AI and ML is security. "With consumer awareness of fraud



and identity theft having grown in recent years, we know that customers want to feel as secure as possible online, especially when it comes to banking,” says Rene Hendrikse, Europe, Middle East and Africa managing director at Mitek, a mobile capture and identity verification software solutions provider.

“But the challenge for banks and financial services firms is balancing this with providing a simple and convenient customer experience. Convenience and speed are important to customer experience, but to build long-term trust with customers it’s important to provide some security hurdles to ensure customers can ‘feel’ the security.”

Trusting a machine

The trust a consumer of financial services will have in an automated system has yet to be defined. What is clear, however, is that AI and ML are being used to define that trust.

Jonathan Shawcross, managing director of banking at Gobeyond Partners, a management consultancy focused on customer services, believes we should expect to see: “large financial institutions really beginning to deploy highly intelligent, fast-learning systems to reduce friction in both sales and service experiences.”

The challenge for the whole financial services sector, as it moves to adopt AI and ML as core components of their customer services, is always to understand the goals of individual customers.

Mr Shawcross concludes: “Targeted marketing directed at a customer’s key life events, such as buying a house, having a baby or retiring, for example, is not new in financial services. However, by using AI and ML, this process can become far easier for the financial institution and, importantly, much more precise.”

As technology enables an increasingly always-on culture, consumers are becoming more fickle. With trust no longer based on the expertise of a local banker, financial institutions need to leverage technology to improve their service offering.

In a digital world, customers turn to the brand that can give them the answers they need, when they need them. To deliver the customer experience consumers now expect, the financial sector needs to embrace innovations, such as deep learning, NLP, and predictive and prescriptive analytics, to support AI and ML initiatives that will enable them to make the personal connections which form the basis of a trusting relationship with their customers. ●

THE PERSONALIZED CUSTOMER JOURNEY

In an increasingly digital world, meeting the demands of customers a key competitive differentiator. To drive results, financial organizations are turning to Artificial Intelligence, Machine Learning and Advanced Analytics tools to add value throughout the customer lifecycle - but are they doing enough to stay competitive?

1 Financial institutions know how important the customer experience is

81%

of financial services businesses regard customer journey optimization as 'very important', compared to 69% of people in other sectors

eConsultancy, 2018

2 And they recognize that getting it right is a key business differentiator

87%

of banking executives agree that the integration of real-time personalization is the next big competitive advantage

Accenture, 2019



Salesforce, 2018

90%

of customers find personalization very or somewhat appealing

Episolon, 2018

3 Leveraging advanced analytics enables banks to take into account individual financial situations, personalize their services and improve the customer experience

Banks see the importance of providing customized financial guidance to customers

Digital Banking Research Report, 2018



4 Yet financial institutions are struggling to implement advanced analytics technology fast enough to meet customer expectations...

Banks are still in the early days of offering personalized digital financial advice services



Digital Banking Research Report, 2018

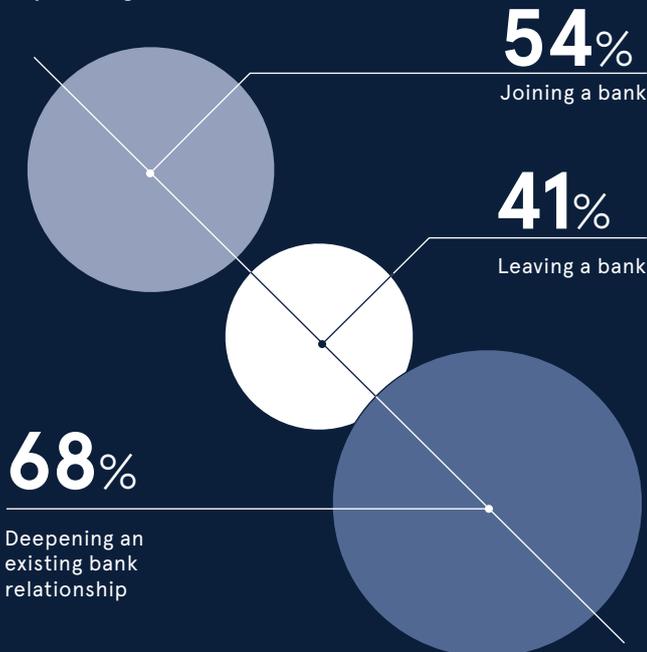
Only **12%** of customers have received digital advice from their bank

J.D. Power, 2018

5 With customers more informed and connected than ever before, loyalty comes at a premium. This makes data-driven personalization a vital tool in driving trust, reducing churn and improving the all-round experience of customers...

6 Intelligent tools will come to shape the future of financial communications, moving from smart notifiers to fully-fledged proactive customer advisors. The World Economic Forum has identified how AI could one day enable self-driving finance in three key ways:

Customers say that personalization is a key factor in several key banking decisions



Boston Consulting Group, 2018

01 **EMPOWERED PLATFORMS:** The ability to compare and switch between products and providers is critical to managing financial decisions

02 **MASS ADVICE AND CUSTOMISATION:** Advice will be increasingly personalized and products will increasingly be bespoke thanks to the use of data

03 **CONTINUOUS OPTIMISATION:** Algorithms operating below the level of perception will automate most routine customer decisions

World Economic Forum, 2018

7 The customer currency of the future is trust, with consumers much more likely to use and pay for the services of a brand they trust rather than one who provides a comparable - but cheaper- service. Advanced analytics offer financial institutions the advantage they need to turn data into action, build trust and create a seamlessly integrated, intelligent customer life-cycle.

ETHICS & EXPLAINABILITY

Explaining a digital train of thought

As the financial services sector continues to embrace artificial intelligence and machine-learning, it's critical these systems can be explained and are built with ethics in mind, says **Dr Scott Zoldi**, chief analytics officer at FICO

Dr Scott Zoldi

Why did an artificial intelligence (AI) and machine-learning (ML) system make a particular decision? It's a question not often asked in the rush to develop and deploy these systems.

AI and ML may enable greater decision-making insights, but for many these models remain opaque and unexplainable. Without explainability, there is a clear risk accidental, unintentional and even undesirable features will be built into the AI and ML model. This could result in costly regulatory and reputational impacts for banks that cannot explain the models they are using.

It makes ethics a crucial component of any conversation that considers bias within AI and ML models, for example when trying to identify

whether certain models are biased towards or against particular classes of data or specific groups of people, geographic areas, income levels, race or gender. The danger is that often explainability doesn't go far enough to allow visibility of potential bias in models.

Explaining explainability

When we talk about AI explainability, we are trying to understand the relationships that are driving the outcomes of an ML model. In reality, explainable AI has been around for decades and we have examples of this such as Falcon Reason Reporter, but what we are seeing now is a big change in the marketplace.

As regulations become tighter and scrutiny from society in general intensifies, a business's ability to comply with them impacts not only how they use and understand ML models, but how they account for their decisions.

What we need to see is an explanation of how individual outcomes were generated by the AI. In the past, we might have seen a question asking what is driving a model at a portfolio level? Today we need to understand what drove the decision for an individual. This is where explainability becomes of paramount importance. To achieve this we need new models and data architectures.

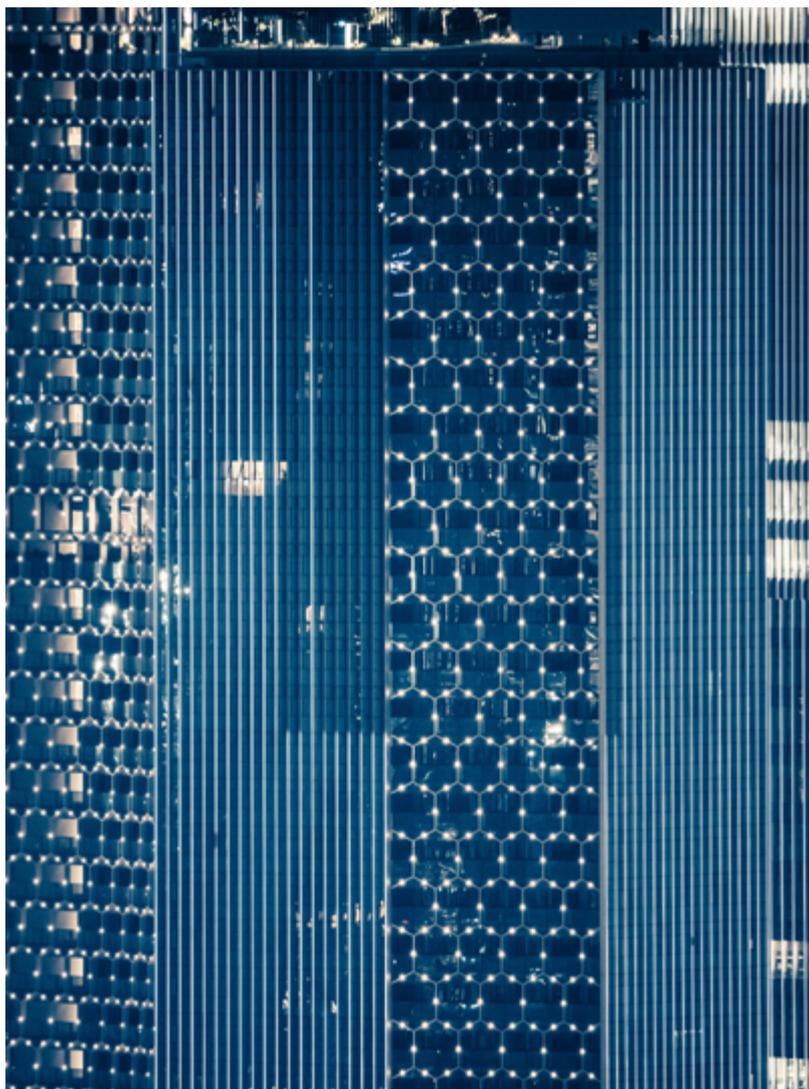
Ethics and explainability challenge

There are several factors that are challenging how explainability is being perceived and adopted. Here at FICO, we have scorecard technology that takes datasets and interprets them, applying constraints and controlling bias to deliver a system that is explainable to regulators and customers alike.

Users are comfortable with this technology. They understand it and can apply it to their businesses. So, it's not as though they have no systems in place. They have an existing foundation.

“
What we need is an industry-wide change in mindset that encourages a greater degree of corporate responsibility

Dr Scott Zoldi
Chief analytics officer, FICO



The challenge is what they build on top of it.

The question then asked is what's the journey organizations need to undertake to meet their goals while balancing the capability of technology with their understanding of it?

This often results in one of two such journeys. The first is that of a challenger bank, where more maverick institutions look to leverage AI and ML technology to drive results without fully understanding it. Essentially unexplainable, the predictions and results these models generate cannot be accounted for, they cannot be cleared of bias and they cannot be justified or clarified; they are opaque.

This creates both business and moral dilemmas that could prove costly for organizations which fall foul of regulators, who are uncomfortable with AI and ML technology that cannot be explained. This is something the C-suite won't stand for. In this instance, while regulators become a blocker by having to play catch up with the advance of

technology, the ethical responsibility falls on financial institutions to put explainability first.

Secondly, some businesses simply won't develop their use of ML in a way that could potentially conflict with the regulator. They opt for simpler, more limited models that deliver less value. They use ML and AI to understand relationships in existing data and reuse the results as new variables for use with their existing models, the ones that the regulators do understand and can be defended if needed. Rather than fully embrace the benefits offered by advanced analytics, these conservative players limit their own progress by fearing AI.

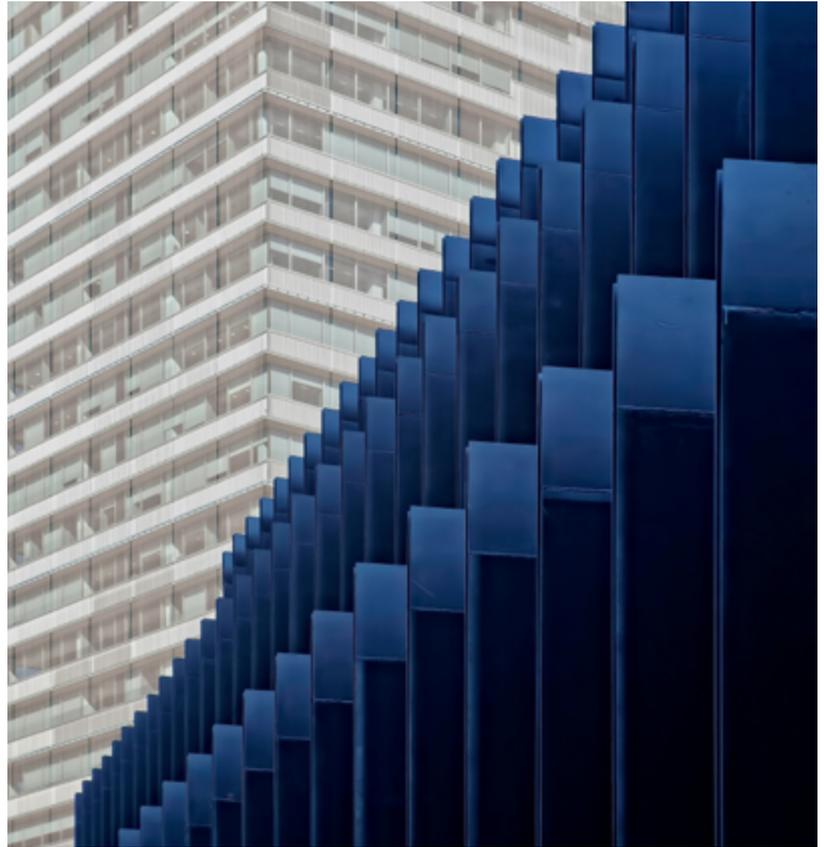
Explaining the future

What we need is an industry-wide change in mindset that encourages a greater degree of corporate responsibility. We need to put explainability ahead of predictability and work to build architectures that can be explained by one person to another, whether it's to the C-suite, to regulators or even to customers.

This is crucial to combat bias and improve the clarity of decision-making, especially during periods of economic volatility when operations become more uncertain and organizations need to account for the results their models generate.

Almost all financial service providers are striving to use AI and ML to become more of a partner with their customers. They can see the value that making close personal connections with customers can bring to their businesses.

Yet if the models they are using cannot be explained, then it's impossible to ensure that certain classes of data and people, whether customers from a certain region or a specific background, are not being favored or penalized through inadvertent bias.



Ignorance is unacceptable

Fundamentally, explainability and ethics are symbiotic. They cannot exist in isolation. They have to be connected together. While ignorance is bliss for organizations that leverage unexplainable, black-box models, from an ethics perspective it's simply unacceptable.

The models that are now being built must be built ethically and offer a fully transparent service to consumers of these services. AI and ML can help banks to make better decisions for their customers, but these decisions must be both understood and accounted for.

Does this mean we may need to change our approach to the machine learning model architectures that are being built today? Almost certainly. But it is a conversation that FICO believes is necessary. Financial services need a culture change that puts explainability and ethics at the heart of their service model.

Ultimately, we want to see a future where all algorithms in use are completely explainable and ethical, with open architectures which are transparent and can demonstrate to regulators, decision-makers and, crucially, customers that bias has been removed. But to achieve this future, we need to take action today. ●



37%

of organizations have implemented AI in some form or plan to before the end of the year

Gartner, 2019



62%

of senior bankers say the proportion of roles requiring people to collaborate with AI will rise in the next three years

Accenture, 2018

FINANCIAL CRIME

Two negatives don't make a false positive

Artificial intelligence and machine-learning are powerful weapons in the global cyber-war with fraudsters

Jenny Turton

Fraudulent transactions around the globe total £3.89 trillion, driven by complex technological advances and increasing digitization, which banks and financial institutions are struggling to keep pace with.

According to The Financial Cost of Fraud 2019 report, produced by Crowe, a public accounting, consulting and technology firm, in conjunction with the Centre for Counter Fraud Studies at the University of Portsmouth, while technologies offer businesses the opportunity to capitalize on changing consumer behaviors, they also open the door to those with online crime in mind.

Further analysis by Juniper Research, in Online Payment Fraud: Key Vertical Strategies and Management 2016-2020, estimates fraudulent online transactions will reach \$25.6 billion by 2020. This means that by the end of the decade, \$4 in every \$1,000 of online payments will be fraudulent.

According to the Juniper study, however, while banks can counter online fraud by deploying new technologies, such as 3D-secure frameworks, biometrics and device fingerprinting, among others, these measures often only provide temporary respite as fraudsters quickly find new ways to overcome them.





Artificial intelligence (AI) and machine-learning (ML) are central in the fight against fraud. In fact, numerous organizations have employed AI based on algorithms for almost 20 years.

For financial institutions, access to enough relevant data remains the biggest challenge. ML models can be trained on such data and enable institutions to position themselves better to detect financial crime. Yet getting to this point relies on having access to the data to analyze and learn from.

Initiatives such as the FICO Falcon Intelligence Network can help financial institutions overcome this challenge by generating a shared reference dataset that is beyond any resource a single player could hope to create. Unifying 9,000 banks worldwide, Falcon facilitates the sharing of intelligence, which



Initiatives such as the FICO Falcon Intelligence Network can help financial institutions overcome this challenge by generating a shared reference dataset

can be tagged, analyzed and used to train ML models, increasing the scope and speed of response to potential financial crime.

In addition to ML, which uses datasets to improve over time, “self-learning” can play a significant role in identifying new types of crime. Such self-learning models don’t need to be trained using data, but instead learn to spot suspicious outlier behavior, providing an avenue for institutions to stay ahead of the fraudsters.

Balancing act

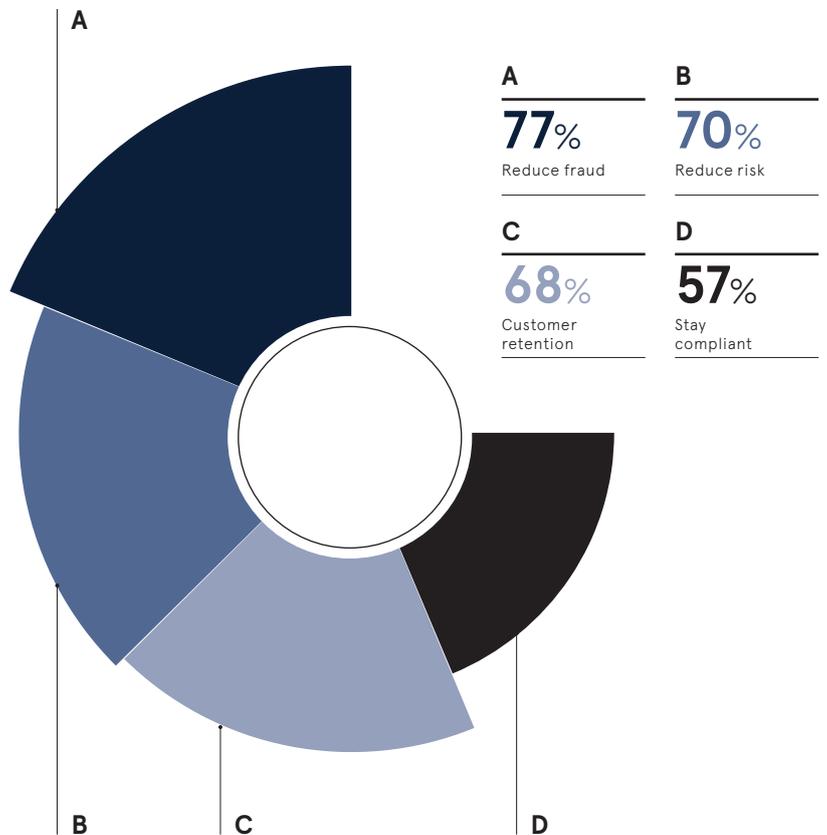
The data that these models depend on must be captured and analyzed instantly behind the scenes to maintain the balancing act between offering a seamless buying experience to customers while simultaneously providing a defense against fraudulent transactions. As the number of digital transactions continues to grow, this cannot be done without the support of ML and vast amounts of computing power.

As AI and ML come to dominate conversations at board level, strategic decisions need to account for ever-evolving operating and regulatory environments, both of which increase in complexity as technology develops. Such complexity is pushing banks and financial institutions towards the realization that to combat fraud and money laundering they need to also face up to the additional pressures of compliance with anti-money laundering (AML) legislation.

Fundamental to overcoming these pressures is the decision to adopt a smarter, more active approach to dealing with financial crime. Take fraud and money laundering as an example: both are linked, not least through the need to launder any funds acquired through fraud, and it is for this reason that banks are bringing their fraud and AML compliance functions together. Many are now deploying the same kinds of AI and ML technologies within financial crime compliance that have been used in fraud detection for many years.

However, as neither financial services organizations nor law enforcement have had much success in stopping money laundering – the United Nations Office on Drugs and Crime estimates that money laundering currently accounts for up to 5 per cent of global GDP (£1.5 trillion) – global regulators are encouraging the use of AI and ML to help identify cases of money laundering more accurately.

OUTCOMES FOR BANKS WHO UTILIZE AI



Finextra, 2018

“[We] welcome these types of innovative approaches to further efforts to protect the financial system against illicit financial activity,” according to a joint statement from five US federal agencies in December 2018.

For banks and financial institutions, the cost of fraud is more than just financial, with the loss of customer trust and wider reputational impact potentially just as damaging. It is likely that the arms race between financial institutions and those with malicious intent will continue for the foreseeable future. However, with effective application, a large and reliable pool of data, and models that are explainable to customers and regulators alike, AI and ML can be decisive tools in keeping banks one step ahead of fraudsters. ●



With world-class banking expertise and a proven track record of innovation in decision science and applied AI, FICO enables even the best organizations to make smarter, faster and more effective data-driven decisions, in real-time and at scale across their operations.

Harness the power of predictive and prescriptive analytics, optimization, and machine learning combined with a leading digital decisioning platform to take your business to the next level and deliver amazing customer experiences.

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