BAI Banking Strategies

EXECUTIVE REPORT

The insights of data and analytics

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BAI POWERING SMART DECISIONS.

In this issue

Artificial intelligence boosts banking's use of data and analytics to supercharge a variety of benefits

BY EDMUND LAWLER
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Banking's digital transformation continues to produce vast troves of data. It's almost an embarrassment of riches.

Properly harnessed and analyzed, the ever-growing wealth of information can generate a feast of benefits—from more personalized messaging to more focused risk analysis to enhanced fraud protection.

But the data is often trapped in silos, it's hard to decipher and staff charged with making sense of the data often lack the training to effectively command the rapidly evolving technologies to read the tea leaves.

But help is on the way. In the lead story of this Executive Report on data and analytics, contributing writer Dawn Wotapka describes how artificial intelligence is bringing transformative advancements to data analysis in financial services institutions.

Dawn spoke to several experts on the topic, including Christine Parker of Crossroads Advisory Partners, who said, "Data analytics have been used for several decades now, and by leveraging the power of AI, financial institutions can gain an even keener competitive edge, gain operational efficiencies and make more informed management decisions in a rapidly evolving industry and customer and talent management landscape."

Contributing writer Katie Kuehner-Hebert interviewed several more experts for her story on the new tools of data analysis. Alex Kwiatkowski, SAS's director of global financial services, says any bank can now tap the sort of technological capability that was once reserved for the deeper pockets of bigger banks because it wasn't affordable. The size barrier is now a thing of the past, he says.

Regardless of an institution's size, a shiny new suite of data analysis tools must be accessible and comprehensible to the staff charged with deploying them. The training of in-house data scientists should be continuous, Kwiatkowski says. "They need to keep finding ways to do things differently to get better results, and then they need to refresh their analytics models. When models aren't continuously reinvigorated, their effectiveness degrades over time."

This month's Q&A features Sam Savage, executive director of the nonprofit Probability Management, who believes financial services organizations must develop a more sophisticated approach to probabilities. They need to change the way they deal with uncertainties and stop using averages because they are not robust enough, given banking complexities. Banks should also bring top decision-makers, data scientists, statisticians and the IT department together to shape a more accurate and valuable predictive method.

"In many places, they're still using averages," Savage says. "And of course, that masks risks and opportunities."

Also in this month's Executive Report:

» **For bank marketers, transaction data can lead to increased revenue.** Alkami's Joan Clark says behaviors within digital banking—including spending patterns and login behavior—all produce critical signals that can inform message delivery to bolster the bottom line. She adds: "AI and machine learning (ML) can efficiently mine invaluable insights from a variety of account holder data sources, without necessitating additional headcount."

» **How data-driven insights transform digital banking.** Apiture's Ajay John says banks and credit unions have a wealth of available data about their account holders that can be used to better understand their current activities and potential needs. "Financial institutions that can tailor the digital banking experience despite minimal in-person interaction will set themselves apart," John says. "Building a consultative relationship with consumers, one that supports their financial literacy, savings goals and debt avoidance, for example, can shift the relationship from purely reactive and transactional to one that proactively addresses consumers' needs."

» **Taking a new approach to portfolio management in a complex landscape.** Chris Stanley of Moody's Analytics says AI-enabled processes are reshaping how bank executives are identifying actionable insights for enhanced operating leverage across the risk-analysis lifecycle. He adds, "Portfolio monitoring is an important starting place for this transformation, as existing customer data is already available and represents embedded risks that shape the trajectory of future growth."

» **Fighting financial fraud with open-source AI.** According to Srikrishna "Kris" Sharma of Canonical, the analysis of vast amounts of data allows banks and credit unions to better identify fraud patterns and anticipate and detect emerging ones. AI techniques, including anomaly detection, machine learning models, natural language processing (NLP), neural networks and deep learning models, allow financial institutions to combat sophisticated fraud schemes that evade traditional methods. Anomaly detection involves identifying unusual patterns or behaviors in data that deviate from the norm.

We hope you will find actionable insights on data and analytics in this BAI Executive Report. As the experts here agree, smart use of data and analytics will increasingly drive the success of financial services organizations. Artificial intelligence adds a dynamic new layer to the process and will allow smaller institutions to compete with banks with more substantial IT budgets and teams. Feel free to contact us with your thoughts on banking's evolving use of data and analytics.

Edmund Lawler is a contributing editor for BAI.

The future of banking is AI

Experts weigh in on how AI is impacting data analytics for financial institutions.

BY DAWN WOTAPKA

Imagine being able to perform an analysis that once would take a week in the middle of a board meeting. That's the picture painted by Octavio "O.J." Laos, AI lab practice leader at Armanino LLP, one of the nation's largest independent accounting and consulting firms. "It isn't just the instant breakdown, but also new ideas or ways to analyze data you never would have thought of," he says.

In the future of banking, artificial intelligence plays a starring role. As AgileThought puts it: "We've just scratched the surface of what data and AI can do for the banking sector."

Even so, "we are now in the AI-powered digital age," says Christine Parker, founder and managing partner of Crossroads Advisory Partners, a boutique advisory focused on designing and delivering revenue and operational scale through innovation and purpose-led strategy. "Artificial intelligence technologies are increasingly integral to the world we live in, and banks of all sizes need to deploy these technologies at scale to remain relevant."

This will, she continues, "require purpose-led, holistic transformation across the organization. It must be a coordinated effort versus applying AI for the sake of AI. The up-front investment and transformation path will be an investment; however, the results should set up banks to thrive in the ever-evolving digital economy, serve customer

OCTAVIO "O.J." LAOS
ARMANINO LLP

CHRISTINE PARKER
CROSSROADS ADVISORY PARTNERS

MICHELLE DELKER
WILLIAM STANLEY CFO GROUP

expectations with on-point products and services and operate more efficiently."

The global market size of AI in banking was valued at $3.88 billion in 2020 and is projected to skyrocket to roughly $64 billion by 2030, growing at a CAGR of 32.6% from 2021 to 2030, according to Allied Market Research.

"Artificial Intelligence has brought transformative advancements to data analysis in financial services institutions. Key among these is the ability to process and analyze large volumes of data at unprecedented speeds," says Michelle Delker, founder of the William Stanley CFO Group, a boutique fractional CFO and financial services firm.

"Artificial Intelligence has brought transformative advancements to data analysis in financial services institutions. Key among these is the ability to process and analyze large volumes of data at unprecedented speeds."

MICHELLE DELKER
WILLIAM STANLEY CFO GROUP

The potential uses and benefits are widespread. "AI has the potential to revolutionize how businesses use data to drive decision-making, uncover new trends or opportunities and gain a competitive edge," says Zachary Jarvinen, vice president of Exact Payments, an embedded payment solutions company, and author of "Enterprise AI For Dummies." "AI algorithms are capable of processing vast amounts of data quickly and accurately to identify patterns that would otherwise go unnoticed."

It's well-known that banks and credit unions have vast amounts of untapped customer data within their organizations. For a time, the analytics discovered from all that data was ahead of the curve. No longer. "Data analytics have been used for several decades now, and by leveraging the power of AI, financial institutions can gain an even keener competitive edge, gain operational efficiencies

ZACHARY JARVINEN
EXACT PAYMENTS

and make more informed management decisions in a rapidly evolving industry and customer and talent management landscape," Parker says.

AI-infused data analysis offers several key benefits in the financial services industry and will "supercharge" those capabilities, she adds. "These include accelerated solutions for improved operations, reduced costs, enhanced fraud detection, automated regulatory compliance, reduced risk and faster decision-making."

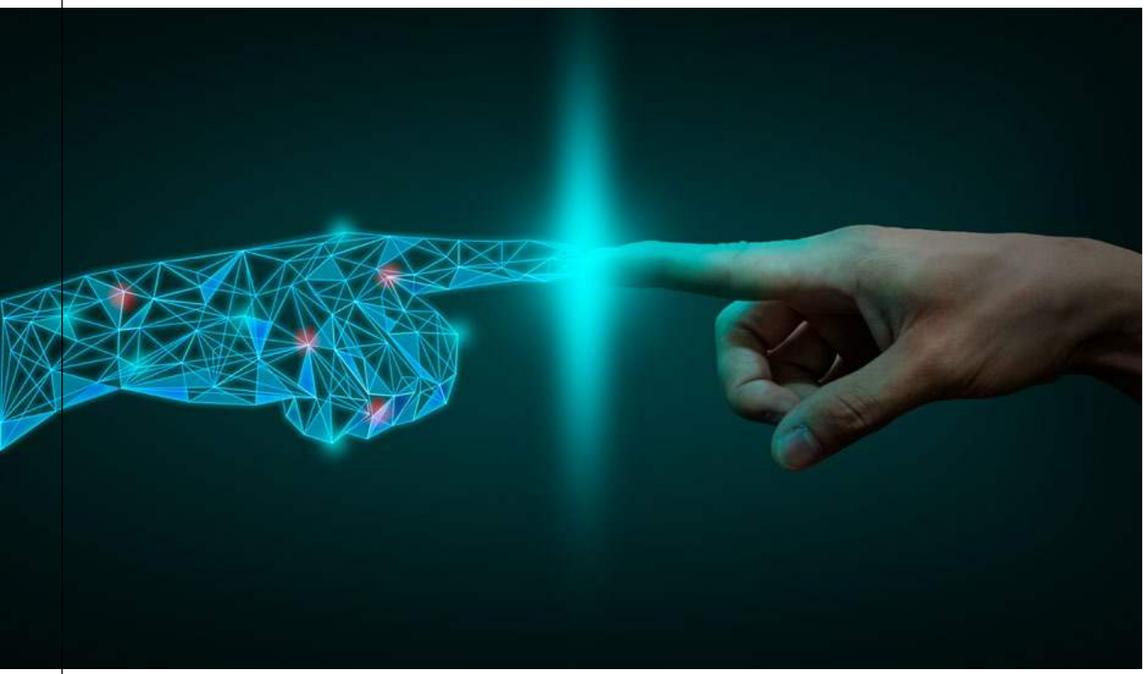
What's more, according to Jarvinen, "AI can drastically improve the accuracy, speed and scalability of data analysis. AI algorithms are able to identify patterns in data much faster than humans,

JOE WELU
TOTAL EXPERT

and they can also process vast amounts of data at once. In addition, AI tools are capable of automatically learning from past experiences and adapting to new situations, which can lead to better decision-making."

AI algorithms can identify correlations between different types of data and discover insights that would otherwise go unnoticed. "This makes it possible to uncover valuable trends and new opportunities more quickly than ever before," he adds.

Think about it like this: "Using AI and machine learning, these organizations can monitor for specific activities, like marriage, a credit inquiry or a new baby, that would trigger customer



communications. When they can unlock those insights, AI can help them double their output and productivity, and they'll grow because they are reaching out with the right offering at the right moment of opportunity," says Joe Welu, CEO and founder of Total Expert, a fintech software company that launched the first customer experience platform purpose-built for modern financial institutions. "By surfacing insights that trigger personalized outreach, AI and machine learning technologies allow agents to focus on doing what they do best—building relationships and connecting with customers."

"AI will work as a 'copilot' for every professional; enhance what humans are able to do on their own, in terms of quality of service, financial advice and timing; make sales and marketing people more efficient; create guidelines to ensure people aren't crossing compliance lines; and support retention as it helps create context for customer-facing teams," Welu says.

Not everyone is on board yet. Allied Market Research reports that "about 32% of banks are already using AI technologies such as predictive analytics, voice recognition and various others to have a competitive advantage in the market." A spokesman for one credit union stated that "we are not using AI in this way at the moment," while another's response was that "we certainly have not used AI for any of our marketing or data analysis."

"Collaborative efforts, partnerships with technology providers and embracing innovative solutions can help credit unions stay competitive and provide better localized services to their members."

JASON DEREUTER
VERKEND

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VERKEND

Indeed, several of the larger banks with their bigger tech budgets are ahead of the curve. But there is room for all. "As far as credit unions, they have a unique position in all of this. While they may not have the same resources as the larger banks, credit unions can still leverage AI for data analysis," says Jason DeReuter, chief product officer of Verkend. "Collaborative efforts, partnerships with technology providers and embracing innovative solutions can help credit unions stay competitive and provide better localized services to their members."

Whether large or small, "banks not capitalizing on AI tools are lagging," Delker points out.

In time, they'll undoubtedly dip their toes in the water. Of course, no one is promising this will be a seamless and simple process. "It's important to remember that these technologies are still in their infancy," AgileThought notes in a blog post. "There will be bumps along the way as we figure out how best to use them and integrate them into our daily lives. But this doesn't mean we should stop exploring new ways of using these technologies!"

As DeReuter puts it: "The AI revolution in data analysis is well underway, and it's going to be an exciting journey for the industry as a whole."

Dawn Wotapka is a BAI contributing writer.

Achieving the new analytical tools' full potential

Banks and credit unions must continue to invest in staff training so employees can effectively glean insights from data.

BY KATIE KUEHNER-HEBERT

Do banks and credit unions need to do a better job of training employees to realize the full potential of new data analysis tools?

Can they even compete with other industries for data scientists and all the other professions emerging within this field? And how do these specialists best communicate with nontechnical leaders at institutions to make these tools most effective?

We spoke with several industry consultants—as well as an expert with decades of data analytics experience—to get their takes on how banks and credit unions can get the most out of data analytics.

ALEX KWIATKOWSKI, SAS'S DIRECTOR OF GLOBAL FINANCIAL SERVICES, BASED IN LONDON

This sort of technological capability was once reserved for the deeper pockets of bigger banks

because it wasn't affordable. But the size barrier is now a thing of the past.

These days, financial institutions (FIs) don't have to spend millions of dollars installing data analytics tools within their own data center—they can access more powerful advanced analytics tools through the cloud, with pay-as-you-go options.

Digitization has been at the heart of this progress, and almost every organization has embraced digital because customers expect it. Whether an institution is large or small, all customers want to know—what can you do for me? Answering this all-important question requires insights gleaned from analytics.

ALEX KWIATKOWSKI
SAS

The training of in-house data scientists should be continuous. They need to keep finding ways to do things differently to get better results, and then they need to refresh their analytics models. When models aren't continuously reinvigorated, their effectiveness degrades over time.

Do all FIs need to do better? Yes, but not because they're currently doing a terrible job. The more the digital world progresses, the more data we create, and we all need to do a better job of using existing data to make better decisions. Regardless of size, banks could always be improving this.

Do they need to hire an entirely new or different set of employees to master these technologies, such as data analysts, data visualization specialists or data engineers? Institutions don't need an entirely new type of data science professional—they just need someone with a broad skill set and familiarity working with data science tools; someone who not only understands data tables, but also has the ability to visualize data so they can develop algorithms to determine correct answers.

It's a lifelong learning journey, adding new skills as new technologies evolve. For those who have stuck around since mainframe computers and punch cards, and decided they didn't need to change much through each generational evolution—that's where institutions will have problems.

JOSEPH H. CADY, MANAGING PARTNER AT CS CONSULTING GROUP IN LAKE ARROWHEAD, CALIFORNIA

Do banks and credit unions need to do a better job of training employees to realize the full potential of these new data analysis tools? The short answer is yes. Whether it is data analytics tools or leveraging AI with ChatGPT or AutoGPT, all will require a new skill set.

JOSEPH H. CADY
CS CONSULTING GROUP

Using ChatGPT as an example, it is important to learn how to ask the right questions or phrase the task appropriately to improve the output quality. This becomes even more important as the output learns from itself and the user adds new tasks.

Do institutions need to hire an entirely new or different set of employees to master these technologies, such as data analysts, data visualization specialists or data engineers? Not necessarily. But skills will need to be developed to sort out the useful data and results from the misses.

Banking executives and users also need to be mindful of the risks these tools create, both for biases and compliance issues. They should not be mindlessly applied. There is much trial and error when using these tools. Moreover, because of their broad application, the tools will be used throughout the institution, requiring these skills to be developed within all business units or departments.

"Banking executives and users also need to be mindful of the risks these tools create, both for biases and compliance issues. They should not be mindlessly applied. There is much trial and error when using these tools."

JOSEPH H. CADY
CS CONSULTING GROUP

Do FIs need someone in IT to translate the potential of the new technologies to the business units and vice versa? McKinsey has observed that organizations need to shift from digital users to "becoming digital." This includes creating a bridge between IT and the rest of the organization.

The beauty of a tool such as ChatGPT is that it doesn't require an IT background. Tasks can be written in plain English. Thus, IT has a role in ensuring that digital skills are developed throughout the institution, at a level that everyone understands.

IT, in this case, shifts from being a department to becoming an organization-wide process.

STEVE PIERCE, VICE PRESIDENT OF INNOVATION FOR THE $2.1 BILLION-ASSET BLACK HILLS FEDERAL CREDIT UNION BASED IN RAPID CITY, SOUTH DAKOTA

Do banks and credit unions need to do a better job of training employees to realize the full potential of these new data analysis tools?

For nontechnical bank leaders, there is often an initial misunderstanding when purchasing commercial software for data analytics and business intelligence reporting that it "contains all the magic," including a preload of existing finished product templates. And that after IT connects it to the core banking database, it will just start spitting out charts of branch performance metrics and the next best product for the customer.

The reality is that the magic comes not from in the box but from the minds of skilled employees. That's why companies that offer these solutions also provide the training to get the most out of them. The more mature programs range from foundational data literacy to advanced certifications.

Contemporary data analysis environments are surely more intuitive, efficient and powerful than legacy offerings. But that doesn't necessarily mean these advancements replace the business acumen, wisdom and curiosity of a savvy data analyst. These new systems are better connected to massive data sets—though they lack the statistical skills of a data scientist who can predict what's to come for the financial institution.

As such, these institutions must begin if they haven't already, and perpetually invest in staff development in the disciplines of each relevant specialty to coincide with the software stack and the goals for each.

STEVE PIERCE
BLACK HILLS FEDERAL CREDIT UNION

Starting is easy. All key roles would benefit from taking a well-designed data literacy course. This course sets the operational expectations, common language and foundational understanding of data as an organizational asset. Then, data analysts and power business users can begin with simple reporting as they take the coursework offered by providers.

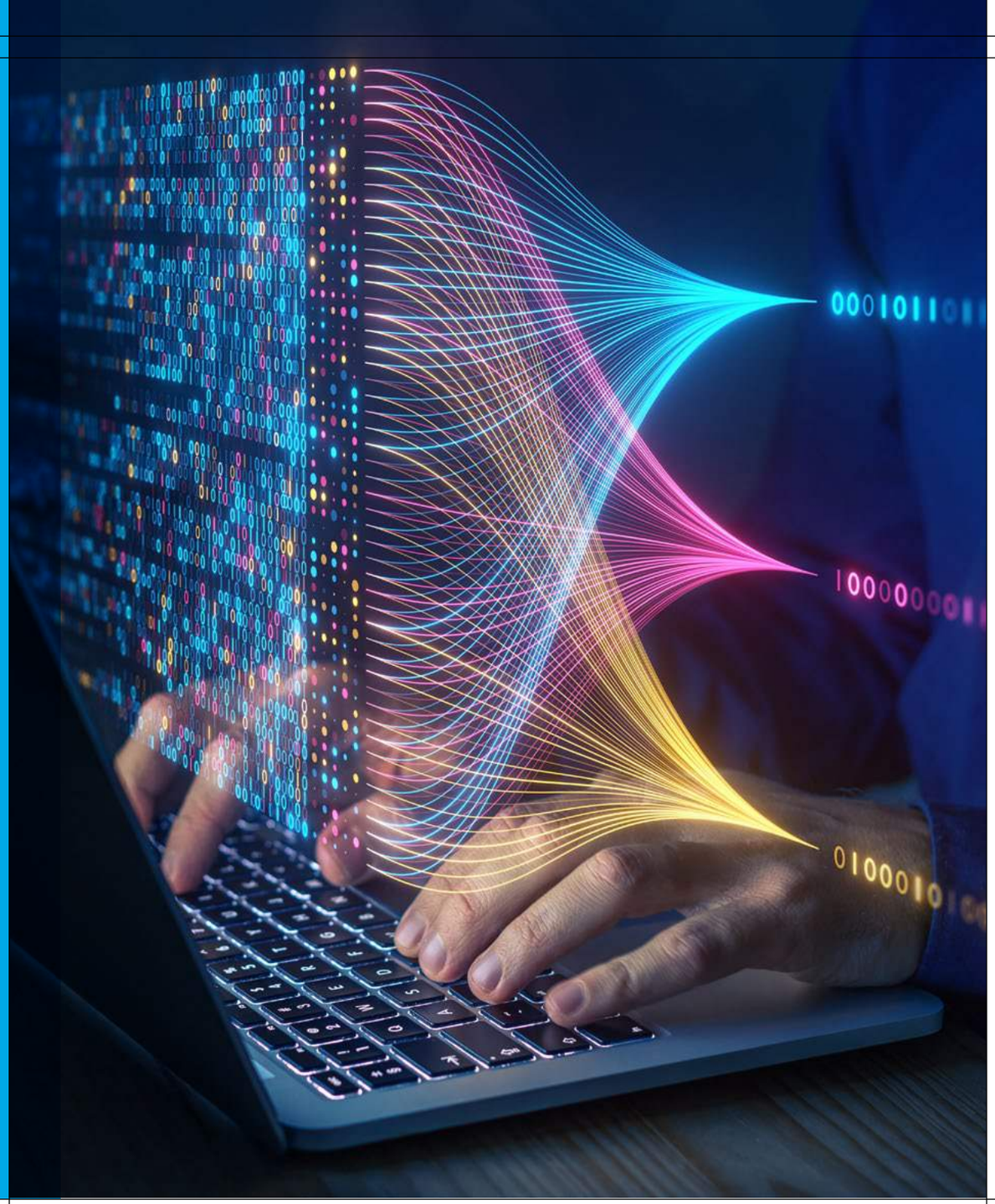
Do institutions need to hire an entirely new or different set of employees to master these technologies, such as data analysts, data visualization specialists or data engineers?

This mostly depends on what their goals are and the structure and complexity of the data sources. Minimum viable delivery of an operational reporting environment, ad-hoc lists and the like—an FI could begin with a couple of data analysts. They don't necessarily need to hire them.

Often, I've seen the best data analysts cross-train from a business analyst or other role with a business and analytical mindset. Organizations with mature goals and data sources, which include sophisticated data models, AI and predictive analytics that drive hyper-personalization and business growth—those FIs typically have a team of specialists, as I've described.

The rule of data analysis outflow is that you get out what you put in. And it's almost always multiplied. There's always more to go after. As cited in a 2020 Accenture report, a Forrester study found that between 60% and 73% of an organization's data is never analyzed!

Katie Kuehner-Hebert is a BAI contributing writer.



Should banks stop using averages?

Probability Management's Sam Savage discusses the 'flaw of averages' and recent bank failures.

BY THE BAI EDITORIAL TEAM

Banking continues to grow more complex, creating more uncertainties and risks. Yet banks and credit unions tend to oversimplify when gauging probabilities because they lack enough standardized data about key risk metrics to build more effective predictive models.

Sam Savage, executive director of the nonprofit Probability Management, says financial services organizations must develop a more sophisticated approach to probabilities and should change the way they think about and deal with uncertainties.

They should stop using averages because they are not robust enough, given banking complexities.

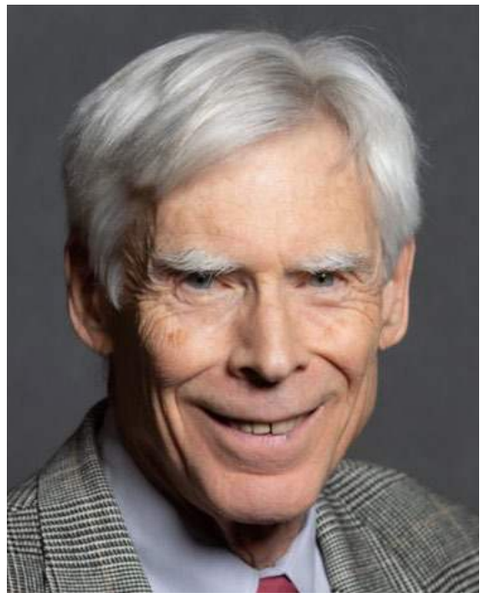
Banks should also bring top decision-makers, data scientists, statisticians and the IT department together to shape a more accurate and valuable predictive method.

Savage is the author of the book, "The Flaw of Averages: Why We Underestimate Risk in the Face of Uncertainty." He has a Ph.D. in computational complexity from Yale University and is an adjunct professor of civil and environmental engineering at Stanford University.

"The Flaw of Averages" is the title of one of your books. What's a compact definition of the flaw you're talking about?

Imagine an organization building out a new website, and the site has 10 separate pages. And you've got 10 teams working in parallel to get this website live. Imagine that each team takes an average of six weeks to complete their page. Of course, you're not finished until the last page is done, and every team is a little uncertain. So, the boss says, "When do we go live?" and you say, "Well, I don't know. I don't know how long team one will take, or team two." The boss says, "Give me a number." You'd be amazed how many people will say, "Well, on average, each team takes six weeks, so I would expect us to be done in six weeks."

Guess what? There's one chance in a thousand of being done in six weeks. Imagine that each team flips a coin to see if they come in over or under six weeks. You're not done till the last team is done, so to finish in six weeks is a little bit like flipping 10 heads in a row.



SAM SAVAGE
PROBABILITY MANAGEMENT

"The discipline of probability management represents uncertainties as data. And we don't mean, here's the mean of a distribution. We mean it represents the entire range of uncertainties. And it does it in a way that you can do calculations with the uncertainties."

SAM SAVAGE
PROBABILITY MANAGEMENT

The name of your organization is Probability Management, and it so happens that probability management is also a discipline. Tell us more about this discipline in the context of the "flaw of averages."

The discipline of probability management represents uncertainties as data. And we don't mean, here's the mean of a distribution. We mean it represents the entire range of uncertainties. And it does it in a way that you can do calculations with the uncertainties. I don't want to bore you with mathematical details, but it has taken a while to do.

It's an open standard. It has involved a number of pretty smart people. So, there's a whole technology stack built around this, and it allows us to cure the flaw of averages because we don't use averages, we use uncertainties as represented by the discipline.

Banking is in the midst of turmoil as the string of sizable banks failing continues to grow, most recently with First Republic joining Silicon Valley Bank, Signature Bank and several others. What connections do you see between what we're talking about here and what happened to those banks?

All these things involved uncertainties. The banks undoubtedly were running some internal stress tests. These were not standardized in the same way that the discount rate is standardized coming from the CFO. So, in many places, they're still using averages. And of course, that masks risks and opportunities.

Did it surprise you that in Silicon Valley Bank's case, the downfall couldn't be traced to anything exotic? Instead, it seemed to be simply mismanaging assets and liabilities on the balance sheet, which strikes me as a banking 101 thing.

Ultimately, the solution to these things involves running a simulation. To clarify, this is analogous to shaking a ladder before you climb on it to paint the side of your house. The discipline of probability management in effect stores ladder shakes as data.

> "The analysts often go to the bosses and try to tell them something statistical, and they trigger what I call post-traumatic statistical disorder, or PTSD, and the boss says, "Give me a number." You've got the bosses, who've got to be trained to stop asking for a number. And you don't need anyone else."
>
> **SAM SAVAGE**
> PROBABILITY MANAGEMENT

Now, let's go to Silicon Valley Bank. They actually had two ladders. One was their assets that got badly dinged with inflation. The other was their deposits, which were coming from people who were venture-funded. As inflation went up and venture funding went down, suddenly these people had to take their money out.

So, let's talk now about shaking two ladders. If you just shake them independently, there may be 1 chance in 10 of the first ladder falling down, and 1 chance in 10 of the second ladder falling down. The chance that both fall down is 1 in 100. But these two ladders were connected by a board. Both ladders were operating in the same interest rate environment. Silicon Valley Bank may well have been dutifully shaking each one of their ladders and saying, "No problem here," without coordinating their results. If both ladders are tied together and either one falls over, they're both going to fall over.

We've been talking about the issues that can arise when bankers seek to boil complex uncertainties down to a single number, and, in the case of the recently failed banks, some real-life ramifications of this kind of oversimplification. I want to ask you now about how to fix this. Aside from the board between the ladders, what other types of high-level advice would you give to banking institutions about how to avoid these kinds of modeling problems?

The real beauty here is that, if they avail themselves of the latest open technology, they've got all the people they need. They've got analysts, they've got bosses. The analysts often go to the bosses and try to tell them something statistical, and they trigger what I call post-traumatic statistical disorder, or PTSD, and the boss says, "Give me a number." You've got the bosses, who've got to be trained to stop asking for a number. And you don't need anyone else. In other words, you don't have to go out and hire new people to start taking advantage of this new data-centric approach.

The BAI Editorial Team

For bank marketers, transaction data can lead to increased revenue

Behaviors within digital banking—including spending patterns and login behavior—all produce critical signals that can inform message delivery.

BY JOAN CLARK

For banks, sometimes the most insightful marketing data can come from the spending habits of their customers.

Consider Sophie, a small business owner who uses her personal checking account to run a photography business. That may work well enough for her now, but she may benefit more from small business services as her company grows. But, Sophie is busy and may not inquire about these services directly.

How can your marketing team identify Sophie as someone who could use your small business services? The answer is to look at what she's not telling you. Her spending likely includes online advertising expenses and recurring transactions for other business services, which tell you plain and simple that she needs more than a consumer checking account.

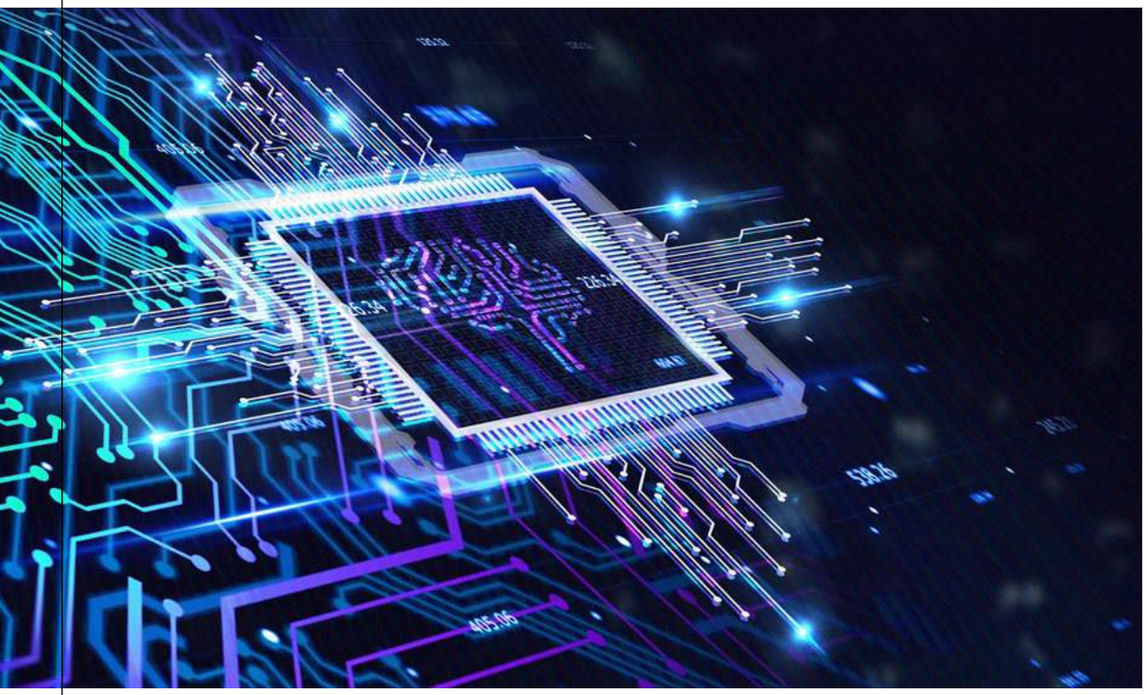
There are millions of account holders like Sophie who would benefit from personalized, relevant product offers before they have to ask for them.

Financial institutions of any size can solve these challenges by leveraging transaction data, using a single platform to yield insights and launch personalized communications.

Diligent banks have proactively reached out to their account holders and encouraged them to add products and services. But for decades, these efforts have been imprecise and have felt more like turning on the proverbial fire hose: spraying a product or service to many customers—regardless of their personal needs—and waiting for results.

Financial institutions of any size can solve these challenges by leveraging transaction data, using a single platform to yield insights and launch personalized communications.

By delivering targeted and relevant engagements and offers, profits and account holder longevity



can increase exponentially. The key is to identify what account holders want before they initiate outreach to you—or to a competitor.

WHERE ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING FIT IN

Artificial intelligence (AI) and machine learning (ML) can efficiently mine invaluable insights from a variety of account holder data sources, without necessitating additional headcount. Partnering with the right fintech vendor that understands how to cleanse and categorize data and how to make it actionable within your ecosystem can not only keep your data safe, but enable channels such as digital banking to transition to a profit center.

Behaviors within digital banking—including spending patterns, login behavior and adopted products—all yield critical signals. AI tools can monitor these signals and trigger message delivery, tailored to the right audience based on your financial institution's campaign strategy.

DATA AND MARKETING SOLUTIONS USE CASES

Financial institutions that prioritize the value of data look for vital signs within that data to drive decisions for targeting around product promotion, messaging relevance, competitive engagement and financial wellness.

Onboarding and cross-selling: For the account holder, the first interactions—opening accounts, taking out loans, applying for and using credit cards—must be fast, easy, welcoming and seamless. This is an opportunity to understand who the account holder is now and what they may need in the future. Prescheduling a digital onboarding journey that includes other relevant products, messages containing advice, to-dos and financial tips creates efficiencies as well as keeps the institution top of mind for each account holder.

Increasing lending products: Consider those who have significant expenses with recency and frequency at home improvement stores, such as Lowe's, Home Depot, a local lumber yard, a paint store or a carpet store. This spending indicates that they are likely making investments in their home. They may benefit from messaging that suggests a home equity line of credit or other loan product to finance these home improvement expenses.

The more account holders associate their debit or credit card to recurring expenses, like car rides via Uber, subscriptions such as Hulu or utility and mobile phone payments, the more they will be committed to that card and to your institution, leading to an increase in interchange revenue.

Boosting interchange revenue: Subscription account holders with recurring expenses on debit cards or credit cards are also worth examining. The more account holders associate their debit or credit card to recurring expenses, like car rides via Uber, subscriptions such as Hulu or utility and mobile phone payments, the more they will be committed to that card and to your institution, leading to an increase in interchange revenue. Another opportunity lies with identifying those account holders without these types of recurring expenses and encouraging usage for subscription charges.

Customers are telling banks exactly what they need—banks just need to know where to look. Savvy banks understand that account holders yield a wealth of monetizable insights. Banks need to leverage that data to help grow share-of-wallet, turn digital banking into a profit center and drive loyalty simultaneously.

Understanding competitive intelligence: Financial institutions can spot account holders who are making loan payments to a competitor or transferring funds from their institution to an investment firm. No matter the engagement, these customers have money that can easily stay within your institution, and using competitive intelligence to market to them can win back or capture a higher percentage of your account holder's share-of-wallet.

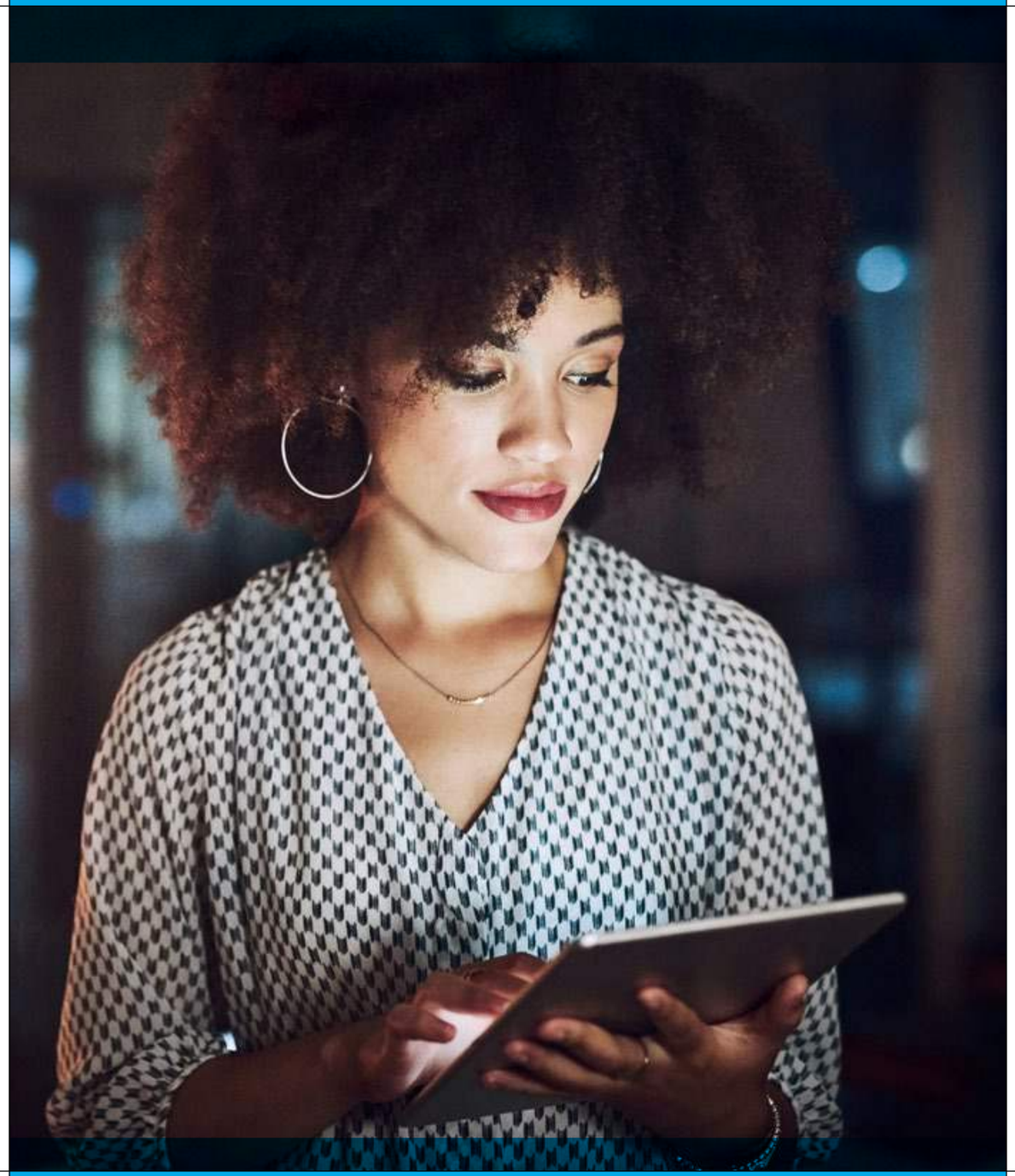
Supporting customers' financial health: You can also spot signs of financial distress. If a customer begins collecting unemployment, for example, reaching out to them—with empathy—and offering assistance and other financial wellness tools could benefit both the individual and the financial institution.

Acting on this intelligence can be very efficient with self-serve audience list builders using insights and integration with campaign delivery tools. The insights provide the right knowledge to build your tailored content and messaging so it resonates with the account holder.

When content is delivered, banks can automatically track return on investment, allowing the financial institution to quickly adapt to campaign engagement. When it comes to proving marketing's worth, today's technology can make it seamless to drive those high-performing campaigns faster, with a holistic view of results. Companies like Alkami can automatically produce metrics that identify the accounts opened, the channels used and the value of those accounts.

Customers are telling banks exactly what they need—banks just need to know where to look. Savvy banks understand that account holders yield a wealth of monetizable insights. Banks need to leverage that data to help grow share-of-wallet, turn digital banking into a profit center and drive loyalty simultaneously.

Joan Clark is director of product management for Alkami Technology.



How data-driven insights transform digital banking

Banks and credit unions have a wealth of available data about their account holders that can be used to better understand their current activities and potential needs.

BY AJAY JOHN

Financial institutions are prioritizing personalization and innovation to attract and retain account holders in an increasingly competitive environment. However, according to a J.D. Power study, only 38% of U.S. consumers recall receiving personalized financial advice from their bank—and among these, only about half say it completely met their needs.

Why the disconnect? Today's consumers increasingly rely on digital banking rather than traditional branches. In fact, online and mobile banking is no longer a channel of convenience used to supplement branch visits. For many, it has become the only touchpoint with their financial institution.

As a result, banks and credit unions are finding it harder to understand and truly partner with their customers and members. The lack of personal interaction means institutions have lost a valuable feedback loop based on consistent face-to-face interaction, during which a consultative relationship can be established and nurtured.

The best digital banking solutions employ an architecture designed to interact with users proactively rather than reactively, using insights gleaned from this data. By leveraging information about users' banking habits, institutions gain important insights that help them connect more easily with their users.

Relationships built over many years have been replaced with digital interactions that—while providing a comprehensive collection of features a given user may need—are far from personalized in a way that supports users through their unique financial journey.

FINDING A BETTER WAY TO CONNECT WITH USERS

The opportunity is clear. Financial institutions that can tailor the digital banking experience despite minimal in-person interaction will set themselves apart. Building a consultative relationship with consumers, one that supports their financial literacy, savings goals and debt avoidance, for example, can shift the relationship from purely reactive and transactional to one that proactively addresses consumers' needs. In turn, such a relationship fosters brand loyalty in a highly competitive climate.

The challenge for many financial institutions is that today's digital banking solutions are often built primarily to support the performance of transactions, such as viewing an account balance, paying a bill or making a transfer. Meanwhile, other valuable products and services that could enhance a consumer's financial journey are simply overlooked. Connecting consumers to those additional opportunities and delivering the right service and support at the right time can shift the relationship from one that is purely transactional to one where the financial institution is viewed as a value-added service provider and, ultimately, a trusted partner.

Banks and credit unions have a wealth of available data about their account holders that can be used to better understand their current activities and potential needs, such as information about financial relationships, third-party transactions, loans, credit cards, mortgage payments, investments and savings.

The best digital banking solutions employ an architecture designed to interact with users proactively rather than reactively, using insights gleaned from this data. By leveraging information about users' banking habits, institutions gain important insights that help them connect more easily with their users. For example, institutions might notify account holders about products that can deliver higher returns on existing investments, flag fraudulent activity or alert users that they are at risk of incurring overdraft charges.

MOVING FROM PROACTIVE TO ACTIONABLE

It's an accomplishment to adapt a digital banking system to be proactive rather than reactive, and it should pay dividends in customer or member satisfaction. But to fully evolve digital banking, financial institutions must empower users to take action based on the data. And because data analysis is often separated from data actionability, this critical piece is sometimes overlooked.

Consider the following examples where a consumer banking solution can not only proactively engage with users but then go a step further to blend personalization with convenience—an approach that is likely to result in far greater customer or member stickiness.

- ***Facilitating account opening**: Institutions can be proactive by informing consumers about available products that provide higher returns on existing deposits. They can make it actionable by following up with a link to a customized digital account application that allows consumers to set up this new account immediately.*
- ***Providing overdraft protection**: Institutions can be proactive by alerting consumers that they are about to incur overdraft charges. They can make it actionable by enabling consumers to move the required funds from savings to checking by simply responding to the message.*
- ***Building savings**: Institutions can be proactive by coaching consumers to establish savings goals. They can make it actionable by presenting a savings transfer template to consumers that they can simply activate.*
- ***Streamlining fraud detection**: If potentially fraudulent activity is suspected, institutions can be proactive by contacting consumers via email or text to confirm whether the transactions are valid. They can make it actionable by enabling consumers to easily freeze their card by responding to the message.*

UNDERSTANDING THE END GAME

Many financial institutions fall short when it comes to comprehensively supporting consumers' financial goals and objectives. Despite limited in-person interaction in today's digital-first world, banks and credit unions have an opportunity to move beyond a reactive, transactional relationship to one that more holistically supports a consumer's financial journey.

With modern data intelligence tools, financial institutions can transform their digital banking platforms to interact more proactively with their users and deliver actionable insights.

The result? Consumers will shift from transactional digital banking users to loyal brand advocates, viewing their financial institution as a valued partner who helps them take steps to truly enhance their financial lives.

Ajay John is product manager, data intelligence at Apiture.

Taking a new approach to portfolio management in a complex landscape

AI-enabled processes are reshaping how bank executives are identifying actionable insights for enhanced operating leverage across the risk-analysis lifecycle.

BY CHRIS STANLEY

Faced with a rapidly evolving suite of tools and a more complex risk landscape, banks must take a new approach to portfolio management to be resilient. Historically, compliance or regulatory requirements were the drivers behind advancements in risk management, but they also reinforced siloed expertise and processes—an issue so inherent in banks' operating models it can be difficult for executives to see a new way forward.

AI-enabled processes are reshaping how bank executives and Moody's Analytics experts are surfacing actionable insights and directing expertise for enhanced operating leverage across the credit lifecycle. Portfolio monitoring is an important starting place for this transformation, as existing customer data is already available and represents embedded risks that shape the trajectory of future growth.

Portfolio management commonly falls to credit and enterprise risk executives, but there are key connections to front-office activities (new originations, cross sales, renewals, etc.) that risk officers should not overlook. A holistic approach to both risks and opportunities is more likely to justify the investment in these enhanced capabilities and will ultimately help banks grow profitably.

AN INTEGRATED RISK FRAMEWORK FOR GROWTH

With this multidisciplinary mindset, we've established an outcome-focused framework for banks preparing for the future of credit:

1. Structured sensitivity analysis: Understanding events that impact borrowers' businesses in an empirically structured way is key to an integrated risk assessment. Evolving regulatory and customer expectations are forcing bankers to address a range of business assumptions, macroeconomic and climate scenarios or "what-if" analytics.

To deliver the nuanced analysis these questions deserve, bankers must move beyond rudimentary shocks to borrower performance metrics. Tools that maintain relationships among financial statement line items (for example, shocks to revenue produce corresponding changes in cost of goods sold, inventory and accounts receivable) represent a significant step toward this goal. These tools help keep existing credit and enterprise risk management frameworks resilient to emerging risks and agile for new opportunities.

Understanding events that impact borrowers' businesses in an empirically structured way is key to an integrated risk assessment. Evolving regulatory and customer expectations are forcing bankers to address a range of business assumptions, macroeconomic and climate scenarios or "what-if" analytics.

2. Ensemble of signals: The need to address the variety and frequency of signals that support decisions and target experts where they add value is a key competitive evolution. Equity market, trade credit, adverse media, cyber risk scores, climate and macroeconomic scenarios and industry and peer benchmarks are all examples of alternative signals that enrich traditional risk measures and provide a more diverse mosaic of evidence to support confident decision-making.

To find opportunities and stay on top of risks, portfolio managers need to assess potential gaps in traditional approaches (e.g., financial statements are a historic view of a customer's business and only arrive annually), address portfolio data that is scattered across systems and mitigate risks of bias or information gaps that could skew analysis. Solutions that centralize these inputs and increase the diversity of signals available are critical enhancements to bank operating leverage—helping bankers prioritize opportunities, get earlier warnings for changes in risk and transform manual or periodic processes by targeting expertise in real time.

The best way to grow your business is always to help your customers grow theirs—understanding your customers with sensitivity analysis, monitoring changes with an ensemble of signals and amplifying the impact of your experts with smart technology are all key to this effort in an evolving risk environment.

3. AI-enhanced expertise: While there is no shortage of hyperbole around the ways AI will impact the future, there are present examples of its impact on credit processes and a steady pipeline of innovations that make it an invaluable tool for bankers. Current AI and machine learning tools for adverse media scanning and automated financial data ingestion have brought substantive operating leverage to loan origination and credit review processes by moving experts away from data entry and toward judgments and client interactions.

Smart workflow tools expand on this foundation by helping experts manage the ensemble of signals they've assembled and identify patterns that traditional approaches may miss—benefiting portfolio and opportunity management, as well as fraud detection and other multidisciplinary applications.

With this framework for the future of credit, portfolio managers and experts from across the bank can prioritize investment opportunities and reimagine their portfolio processes for profitable growth. The best way to grow your business is always to help your customers grow theirs—understanding your customers with sensitivity analysis, monitoring changes with an ensemble of signals and amplifying the impact of your experts with smart technology are all key to this effort in an evolving risk environment.

Chris Stanley is Moody's Analytics' senior director, banking industry practice lead.

Fighting financial fraud with open-source AI

By analyzing vast amounts of data, banks and credit unions can identify fraud patterns and anticipate and detect emerging ones.

BY SRIKRISHNA 'KRIS' SHARMA

Crime against financial institutions is escalating rapidly. Fraud risks are evolving in tandem with digital transformation. Criminals are constantly innovating and using cutting-edge technology to exploit the interconnectedness of digital channels.

Over the next decade, global card fraud losses for issuers, merchants and acquirers will total $397.40 billion, according to the December 2022 issue of the Nilson Report. Payments fraud is a perpetual threat for banks, businesses and payments providers, with 74% of organizations falling victim to some type of payment scam last year. Payment fraud losses are expected to total $206 billion over the next four years, with firms expected to spend $11.8 billion annually on fraud prevention by 2025.

These are big numbers, but it's not only a matter of financial loss. Fraud prevention is a business imperative to maintain customer trust, integrity and stability within the banking sector.

BEYOND RULE-BASED SYSTEMS: AI FOR FRAUD PREVENTION

Traditional rule-based systems, which rely on predefined rules to flag transactions, are effective for addressing known fraud patterns but fall short in tackling sophisticated fraud schemes due to their inherent limitations in adaptability, scalability and complexity handling.

In the face of growing fraud complexity and sophistication, the finance sector is using artificial intelligence (AI) and machine learning (ML) to identify and prevent complex fraud. By analyzing vast amounts of data, recognizing subtle anomalies and uncovering hidden relationships, financial institutions can now not only identify known fraud patterns but also anticipate and detect emerging ones.

KEY AI TECHNIQUES FOR FRAUD PREVENTION

AI techniques, including anomaly detection, ML models, natural language processing (NLP), neural networks and deep learning models, allow financial institutions to combat sophisticated fraud schemes that evade traditional methods. Anomaly detection involves identifying unusual patterns or behaviors in data that deviate from the norm.

AI algorithms, particularly unsupervised ML techniques, can uncover anomalies that might indicate fraud. By learning from historical data, AI models can recognize outliers and anomalies that could signify fraudulent activities, even if these patterns have never been explicitly defined. Financial institutions can employ NLP techniques to analyze text-based data, such as emails, messages or notes. AI-powered NLP models can identify language patterns and sentiments that suggest phishing attempts, fraudulent communication or identity theft.

One of the primary hurdles involves ensuring the availability and quality of data necessary for training AI models. The effectiveness of these models hinges on diverse and well-curated data that spans a wide range of potential fraudulent behaviors. It requires continuous data collection, cleansing and curation.

Financial firms can now analyze diverse data sources, like images of checks, text from various customer communication channels and signatures, to detect fraudulent activities. Deep learning techniques excel at processing large amounts of unstructured data, helping organizations do this at speed.

While AI technologies are reshaping the financial security landscape through enhanced fraud detection and prevention, their successful deployment at scale can present a set of challenges that demand careful consideration.

CHALLENGES OF DEPLOYING AI AT SCALE

Deploying AI at scale to combat fraud presents a series of complex challenges for the financial industry. One of the primary hurdles involves ensuring the availability and quality of data necessary for training AI models. The effectiveness of these models hinges on diverse and well-curated data that spans a wide range of potential fraudulent behaviors. It requires continuous data collection, cleansing and curation.

Bridging the expertise gap is another hurdle financial institutions have to overcome, given the scarcity of professionals with necessary AI/ML expertise for the effective deployment and management of AI solutions. Another challenge revolves around model bias and fairness, as AI systems can inadvertently inherit biases from training data, demanding continuous efforts to ensure equitable outcomes.

Ensuring transparency and interpretability of AI algorithms, particularly for complex models, poses a two-fold challenge for financial institutions—internally comprehending intricate AI models to ensure accuracy and ethical alignment while also addressing external concerns from regulatory bodies, auditors and customers who demand transparent automated decision-making processes.

Furthermore, the dynamic evolution of fraud tactics requires AI systems to continuously learn and rapidly adapt. Financial institutions also need to

ensure seamless integration with legacy systems and effective cost management of large-scale AI implementation programs.

Amidst these challenges, financial institutions must strategize effectively, foster cross-functional collaboration and embrace open-source AI. This will alleviate resource constraints, address expertise gaps and accelerate the development of sophisticated fraud prevention models.

OPEN-SOURCE AI FOR FINANCIAL FRAUD PREVENTION

Open source has the potential to address challenges associated with AI at scale. As a matter of fact, a large majority of applications in the AI ecosystem are already open source. For instance, Python is the language behind a majority of AI applications, and the same applies to AI systems powered by open-source software such as TensorFlow, MLflow and Kubeflow, among many others.

Open-source AI provides transparency and accessibility of the underlying code, algorithms and models and thereby better mitigates discrimination and bias in ML models as compared to traditional AI closed-source software. Financial institutions can scrutinize the code and models throughout the AI application lifecycle to ensure alignment with regulatory standards and ethical considerations.

Open-source AI drives innovation due to the decentralized nature of code contributions that can increase the number and accuracy of AI models. The use of open standards ensures that data and model output can be interpreted independently of the tool which generated it, facilitating interoperability and avoiding vendor lock-in.

Open-source AI is driven by the collaborative efforts of various experts, fostering a multidisciplinary approach to tackle the ever-evolving challenges posed by sophisticated fraudulent activities. The open-source setting is truly effective because it can attract tremendous technical talent and bring together experts with specialized knowledge who contribute to specific aspects of fraud prevention.

Collaborative development allows for faster iteration and refinement of fraud prevention algorithms. Open-source AI can quickly react to emerging threats, rapidly developing countermeasures to mitigate the risks posed by new fraud schemes.

SUMMARY

In the relentless battle against financial fraud, the convergence of open-source technologies and AI is shaping the future of the fraud prevention landscape. As financial institutions navigate the challenges of large-scale AI deployment, open-source AI bridges expertise gaps, facilitates interoperability and addresses some of the challenges of AI implementation at scale. The potential impact of open-source AI on the financial industry's security landscape is both promising and transformative. The symbiotic relationship between open-source technologies and artificial intelligence is well-positioned to help financial institutions combat fraud, secure transactions and foster trust in the digital economy.

Srikrishna 'Kris' Sharma is Canonical's financial services sector leader.

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