



BUZZ VS. REALITY

Measuring the AI gap
in the financial services and payments industry

BUZZ VS. REALITY

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22 PAYMENTS EXECS, THINKING — WITH REAL INTELLIGENCE — ABOUT ARTIFICIAL INTELLIGENCE



For artificial intelligence, beyond the buzzwords and the breathless anticipation lies the reality.

Data exists everywhere, of course – and in the payments space, the data is effectively a deluge. Increasingly, companies across all links of the commerce value chain are harnessing machine learning and artificial intelligence in a bid to mine that data, and to make actionable decisions in real time measured in milliseconds.

But utter the two-lettered acronym “AI” and the discussion rampages, free-range, across a wide landscape. AI, some argue, means all sorts of jobs will be replaced. Others argue that it poses a danger that computers will think for themselves, with all sorts of unintended consequences.

To echo an old TV show, the truth is out there – and it seems vastly different than some might assume.

PYMNTS queried 22 payments executives to get a sense of what's real, what's in the here and now, and what lies ahead. We also asked for concrete examples of how their own firms – spanning payments processing, digital IDs and other functions – are leveraging AI right now, such as in core processing and risk scoring.

In some cases, there are cautions against overreaching or assuming AI can be a solution to all challenges within payments. Some describe cautious or piecemeal approaches to AI technologies, noting that the models need constant refinement and human attention to work properly.

Such context is especially important given the significant technology and human capital (not to mention money) that must be deployed.

Right off the bat, for those who fear job destruction on a grand scale: Some of the executives said there will always be a place for the human touch (and interaction) when banks and other FIs interact with business and consumer clients, even as AI helps analyze those clients' behavioral data to help steer the right service representatives and financial products their way.

AI also has a place in retail settings, said executives, in store or online – powering self-service kiosks, for example, or helping to bring chatbots

to the forefront when consumers need help completing a transaction.

The end result across those financial services and commerce settings, as a result of judicious use of AI, are vastly improved customer experiences.

AI can also help transform the way B2B is done, helping buyers onboard suppliers, streamline payments and, of course, keep up with the ever-onerous demands of compliance and regulations – and even helping them to access credit to manage working capital more effectively. In many ways, AI can help firms do more with less, according to observers.

All in all, we've just begun to scratch the surface of what AI can do.

But to get there – to visualize and plan an intelligent (pun intended) strategic course that brings AI into risk scoring, fraud fighting, eCommerce and any number of other realms – it's important to think clearly about what's at stake and what's possible now, and near-term. It's early days yet, but evolution moves swiftly in the digital world.

Read on, then, for 22 wide-ranging opinions, demonstrating some real intelligence about artificial intelligence.

BUZZ VS. REALITY



DEBBIE GUERRA

Executive Vice President,
ACI On Demand Merchant
and Payments Intelligence
Solutions

FRAUD PREVENTION: AN IDEAL USE CASE FOR MACHINE LEARNING

Artificial intelligence (AI) is among the most frequently used buzzwords in payments today. As banks accelerate their digital transformation strategies, there are more ways than ever to reach, engage and interact with existing and potential customers. The result is a wealth of data within

banks' systems that can be mined for improved customer insight.

One key AI capability, machine learning (ML), has been widely acknowledged as capable of processing and evaluating these volumes of data at a speed and scale far beyond the capability of any human. However, a bank-wide

ML project can be a significant undertaking that requires major investment in both technology and human resources. Some organizations fail to achieve a rapid return on this investment.

An alternative to such large-scale projects is smaller, more tactical ML initiatives that can be rapidly deployed in a way that delivers value to the business from day one. Fraud prevention as a use case for ML is one such opportunity.

Without ML, it's unlikely that any organization could keep pace with the changes in fraud. As the industry experiences rapid innovation — through open banking, real-time payments and digital transformation — fraud threats, too, continue to accelerate. The easiest way for banks to prevent fraud at scale may be to decline more transactions, but increased false positive rates have

a negative impact on customer experience and the bank's brand reputation. With a ML approach, banks and processors can correlate big data without relying on human beings at high precision while still driving down false positives.

ML is optimal for managing fraud across complex, real-time environments. When using statistical techniques to create algorithms that “learn” from the available volumes of data, insights become more precise and insightful. In the case of fraud prevention, ML's predictive algorithms look for signals and patterns across millions of data points to build a history of users and transactions that can be used to evaluate the risk of fraud.

ACI has leveraged ML in our ACI Model Generator, which lets organizations quickly build and deploy their own adaptive models.

One barrier to incorporating ML is that many solutions require a team of data scientists to develop the initial models, an approach that can be both time-consuming and ineffective as data is transferred out of a PCI-compliant production environment. Other solutions emphasize collaboration between data scientists and business analysts, which can produce strong results but with significant loss of efficiency.

The ACI Model Generator, part of our UP Payments Risk Management solution, bypasses the need for data scientists by allowing business users to build their own adaptive ML models in a fast and intuitive manner — within hours, not weeks. This “democratization of ML” empowers business users to “download” their knowledge and experience to create precise models without reliance on another team.

ACI believes ML has an important role in payments, and the fraud use case is an ideal application of this technology. Organizations that modernize their fraud prevention strategies using ML have an opportunity to create greater operational efficiency, reduce false positives and ultimately create a more positive customer experience.



SEAN ANDERSON
Chief Operating Officer

AI IS NOT ROBUST ENOUGH TO PREVENT FINANCIAL FRAUD

Artificial intelligence (AI) offers a promise of better decision-making and reduced human effort in delivering great financial services to customers, but the term is over-used — and often used inappropriately. Most of what markets itself as AI overstates the sophistication of the “intelligence.” Just saying you’ve got a good

algorithm doesn’t sound very cool, so companies tend to oversell what may just be a solid rule set or decision tree as AI.

It’s become a buzzword that, like most buzzwords, is oversold.

The closest AI comes to living up to its promise in financial services is fraud. Cybercriminals are ever-

adapting and innovating new ways to steal customers' money. Here, the huge data sets provide great opportunities to test and refine machine learning models and to use deep learning to fight fraud.

We, our partners and our competitors spend an enormous amount of time working to prevent compromised accounts, unauthorized activity and enrollment with synthetic identities. If controls are too loose, fraud gets through; if they are too tight, customers can't get things done. However, most FinTech companies still have people who can fill in the gaps where AI fails to deliver, or as a measure of last resort.

At Bento for Business, we use intelligent risk scoring of devices, identity, etc. as part of risk-screening customers. We find them helpful as a piece of a solution, not a full replacement of manual processes. Until we're convinced that AI systems can evolve faster than financial

criminals, we will keep a human component in our workflows. We simply can't risk our customers' funds or their trust.

For payments and core banking services, the innovation from challenger banks has been mostly about rethinking the customer experience. This area is largely untouched by true AI applications. At Bento for Business, the types of companies we serve — including a vast range of businesses and non-profit organizations — and the varied ways they utilize our platform don't easily lend themselves to AI. Spending patterns at a synagogue won't match spending patterns for a construction company, and neither will look the same as an event planner.

Generic solutions that try to learn from all customer interactions would be too dumb to provide valuable improvements to the customer experience. Niche uses by customers are too specific for AI training to

be of immediate value. In these cases, we use multiple solutions as inputs into developing the customer experience. Some of these are informed by specific AI applications that are aggregating and learning from data across the financial services ecosystem, but it's not true AI that's guiding the customer. Bento must still use these as inputs into designing a good experience.

Also, while it may sound old-fashioned, we at Bento find that many business owners prefer to talk to a human being. While we are looking at ways to incorporate AI into support, it won't replace human interaction. Instead, it will act as a multiplier to focus our direct customer interactions where they are needed the most, while delivering quicker resolutions for common issues. Our willingness to have conversations has enabled us to help our customers prevent fraud, make better use of our services and save relationships.

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**THIS AREA
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UNTOUCHED
BY TRUE AI
APPLICATIONS.**



 **Bottomline**

PETER COUSINS
Chief Technology Officer

PUTTING AI TO WORK IN PAYMENTS JUST MIGHT BE **THE SMARTEST MOVE YET**

If only the label AI were used consistently. Some sophisticated players shun the term “artificial intelligence” altogether as marketing hype. Others put the AI label on simple, conditional logic, when in reality it is hardly different from regular applications. Most use simple, supervised models that report scores

to users who often don’t know how to think about what the score really means. More often than not, AI is the watchword for magical thinking in software requirements.

Even sophisticated practitioners often suffer from tunnel vision in various ways. Maybe it’s the “enterprise data modeler” who

never gets started because he wants to catalog all the data before they begin, and the catalog is stale before it is complete. Or it could be the “AI dilettante” who uses too little data and declares victory with trivial results. AI can be used in very different ways.

At Bottomline Technologies, we embed AI in all of our products, driven by a collaboration between AI experts, individual product managers and customers. We build and manage application-specific AI, reducing the need for customers to have such expertise on staff.

It all starts with the data itself — automatically eliminating data that won't be valuable because it has no signal or is redundant, and boosting the signal by massaging the data. Model creation is automated by experimentation that includes algorithm selection, tuning and outcome analysis. Since this is

automated, customers can bring their own data and build large numbers of targeted models, which increases effectiveness without increasing costs. Equally important, the system is self-monitoring and self-improving — it actually uses AI to manage the AI, from modeling to production and back again.

We use AI within our cyber fraud and risk management product to analyze payments, but what's important is that we build and automate highly specialized models. The data can include any information the fraud prevention system gathers and analyzes, but it can also be supplemented using unique customer data, which might be the key to increasing accuracy. When suspicious events occur, our system acts as a virtual investigator, gathering additional context to support the incident or closing the case without ever involving an investigator.

We use AI in our own business to identify which businesses or vendors are most likely to join our B2B payment network, Paymode-X, and then focus our customer service team on those vendors. Once those businesses begin onboarding, we focus on validating the legitimacy of the information supplied, which includes automated research and analysis of the results (e.g., validating the phone number, email or bank account information). Payments made in the application are reviewed using a comprehensive set of data that allows for outlier detection across the network or specifically to a segment, customer or user.

In the area of banking, we look for accounts that are in the process of being opened and then get held up unreasonably for risk review — in those cases, we are able to determine with a degree of certainty that the account opening will, in fact, be approved. When the full process

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is automated, it improves customer acquisition while limiting the risk.

In our cash management suite of products, we support our customers by providing a cash flow forecast that uses past trends and time series analysis. These forecasts can be improved by analyzing past transactions for recurrence and growth, assessing the probability of assumptions about when accrued receivables will actually be paid.

What makes this a true case of AI rather than just a simple forecast is that the product acts as a member of the team. If shortfalls are predicted, the system can automatically transfer funds from other accounts or institutions, or request a line of credit in the time it takes to make a difference. Alternatively, if especially large future payments or receivables warrant a foreign exchange purchase, that can also be assessed and completed automatically.

At Bottomline, we also use natural language processing to analyze payments and customer interactions. Concept detection is a powerful way to amplify the signal, like when payment instructions mention diplomatic expenses so that flag is available for models to consume. Named entity recognition can find organizations, people and locations reliably in text and fuzzy-match them against lists of interest, from regulatory lists for sanctions screening to customer names from a CRM database.

Authorship analysis can indicate whether the same person created new text by comparing it to previous texts. Intent analysis can determine what set of possible intents are mentioned in text to categorize it reliably. All of these things make the system much smarter than when it looks at data without this kind of semantic lens.

The key point is to implement AI activities that run as automated processes, taking the routine work out of the queue instead of just reporting a score to a user while they continue to do all of the work.

We are living in exciting times — we have only just begun to leverage the potential of AI in financial services and payments. It isn't even necessary to advance upon state-of-the-art systems: Simply implementing them would be a huge improvement.

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MANISH KOHLI
Global Head of
Payments and Receivables,
Treasury and Trade Solutions

AI-DRIVEN PAYMENTS: THE FUTURE IS TODAY

Today, artificial intelligence (AI) is starting to deliver on its promise of redefining the payments landscape. It is not a lone force, however. Machine learning (ML), big data analytics and computer processing speeds have picked up momentum in recent years, along with AI, to help fuel a sustainable

shift toward faster, more secure and highly efficient payments.

With this in mind, Citi has made significant investments in infrastructure, tools, talent and practices to leverage the power of AI in an effort to enhance both our own performance and that of our clients. Through our in-house Innovation

Labs and strategic partnerships with specialized FinTechs, we are in the process of deploying AI to improve receivables reconciliations, respond to customer inquiries faster and help identify unintended or unauthorized payments, to cite just a few examples in a broad array of undertakings.

Opportunities And Challenges

We have reached a point where ML and other deep learning algorithms can harness massive volumes of data to realize measurable business benefits.

What’s more, processing technologies have finally become powerful enough to advance the promises of AI. Computing power has increased several-fold in the last decade.

Data also has grown exponentially over the years, actually becoming a double-edged sword when it comes to converting AI opportunities into reality. We are armed with the

computing power and AI technology to take data to the next level, yet fragmented data, regulatory restrictions around data privacy and data quality create limitations. Intense efforts must be devoted to enhancing and preparing data before sound AI-centric concepts can be turned into real-world solutions. That said, the potential of AI is beginning to be realized.

Creating Efficiency

One example of where we have successfully commercialized AI is in matching incoming payments to outstanding invoices. Solutions like Citi’s Smart Match, which we developed in concert with a FinTech partner, both reduces manual interventions and helps to increase straight-through receivables reconciliations rates.

Smart Match brings together disparate pieces of remittance information from multiple sources and applies AI- and ML-enabled business logic to automatically

match payments received with expected receipts.

Unmatched payments are segregated and transmitted in reports to clients, who can in turn manually reconcile them via our electronic banking platform. The system uses programmed algorithms to “learn” from the manual actions and payment patterns to continually improve matching rates over time. Companies that have used the solution have seen staff time spent keying errors reduced by as much as 80 percent and straight-through reconciliation rates in the 90 percent range.

Improving Speed

In another effort, we are applying natural language processing (NLP), a sub-field of AI, to respond to customers’ payment queries faster. We are using NLP to interrogate both internal and external databases to generate automated responses to queries. The Citi team has successfully automated some

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enquiry workflows using NLP, and the system is able to generate an immediate response by reading client SWIFT messages and emails. For many cases, the average time to resolution has been significantly reduced because of this automation using NLP.

Similarly, ML applied to SWIFT GPI data can help to predict the cheapest and fastest route for payment processing, which can help drive down clients' transaction costs in addition to settling their transactions faster.

Another compelling AI use case involves speeding up the repair of incomplete or incorrect payment instructions that clients send to the bank. In pilot tests, we are applying ML from clients' historical transaction flows to in-flight transactions. Payments that could otherwise be delayed or cause losses due to incorrect or incomplete instruction data are being intercepted and auto-repaired before being released.

Detecting Anomalous Payments

AI's potential also is coming into focus as the payments industry steadily moves toward a state in which "instant" will be the new global payment standard.

Citi Payment Outlier Detection, for example, is changing the paradigm for detecting unusual payments. Using AI and predictive analytics, this new service uses multiple fields in payment transactions to train itself, recognizing payment norms and fine-tuning underlying algorithms over time. When the system detects payments that are outside an organization's typical payment patterns, an alert is sent to a company's designated anomalous payments reviewer, before the payments are released, so that the payments can immediately be approved or rejected by the reviewer.

It would take a human an inordinate amount of time to process and analyze the data flows involved.

In the time that it takes a human to process 20 or 30 data points, for instance, AI can process approximately 20,000 to 30,000 data points — and has the potential to make better decisions in the process.

The Path Forward

The payments industry is embarking on a new era in which AI is enabling providers to reinvent their services and how they deliver them. Until now, only simple tasks were automated while complex tasks requiring intelligence were performed by humans. In the future, we expect AI, with its ability to conduct complex processing tasks better than humans, to play a major role in improving the cost, speed, convenience, transparency and security of payments.

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JULIEN NADAUD
Senior Vice President
of Innovation

AI HELPS MITIGATE SOME OF **PAYABLES' MOST DIFFICULT ISSUES**

There has been a great deal of hype around artificial intelligence (AI) as companies like Amazon continue to expand the use of the technology in ways that have forever transformed the buying experience.

But within the B2B world, the expectations for AI must be both

realistic and forward-thinking. We need to be pragmatic and look at how this technology can best address the issues that impact our industry. It's less about hype and all about reality.

For now, most applications have used AI to help users of enterprise applications make better business decisions. AI can do a lot of things,

but to be effective, it must have access to a multi-year history of high-quality data. But it can take years to organize enterprise solutions to generate the proper data to be used by AI — which may be one reason some companies feel it has not lived up to the hype.

For those of us in the payments industry, AI has made a major impact on some issues, one of which is fraud. The Association of Certified Fraud Examiners recently estimated that 5 percent of all revenue is lost to occupational fraud, often caused by human intervention during invoice and payment processing.

Certainly, P2P automation mitigates the likelihood of fraud, but it is AI that makes that possible. AI analyzes the unstructured documents that have been received and scanned and, with a nod toward new deep continuous learning solutions, extracts all

information automatically. At that point, information can be analyzed against whatever data is available. This is where AI helps to reconcile information, from discerning suppliers from fuzzy names and addresses or categorizing goods and services based on descriptions.

At Corcentric, we have been using AI to grow our business through predictive analytics to provide forecasts of company budgets. That enables executives to make better spend decisions during the year and manage cash flow more efficiently. We have also used AI to push recommendations that are specific to users based on their history and position in the organization, and also to automatically classify spend.

In managing millions of payment and procurement transactions every year, and in starting the effort to organize, analyze, process and develop AI

models, we have found hundreds of business cases and potential applications that will enable us to save money, move faster and provide more value to our customers.

AI requires specific infrastructure, new skills and the capability to think outside the box and drive change across the entire organization. This is why Corcentric has made the strategic decision to invest in a dedicated Business Innovation Lab to focus on these technologies.

In a study we conducted recently with PYMNTS, the Payables Friction Index, we found that AP professionals are losing their patience with paper checks as a payment method, but — for many reasons — are not making the leap to digitization. We can help make that leap less daunting with intuitive AI that provides a seamless process, all the way from procurement to payment.

The impact of AI on the financial and payables industries has yet to be fully felt. B2B has often lagged behind B2C when it comes to the implementation of new technologies — but, as the promise of AI becomes fulfilled, we can expect more and more companies to utilize this amazing tool.



CHRIS DEAN
Vice President,
Fraud Solutions

IN AN AI-DRIVEN WORLD, **ROAD TO SUCCESS** IS PAVED WITH DATA

The impact artificial intelligence (AI) will have on consumers going forward is unprecedented, and AI is quickly gaining ground among financial institutions.

While AI is clearly ushering in a new era in FinTech, as a practical matter, is it living up to its promise

for financial institutions and the consumers they serve?

The short answer is yes. Our industry is already realizing widespread benefits from investments in AI and related technologies. Yet AI is a broad term — and an often-misunderstood one. For example, when consumers think of AI, they envision everything from driverless

cars and facial recognition software to a host of futuristic applications depicted by Hollywood. (Remember “The Terminator”?)

When discussing AI in the context of payments, I prefer to focus on a very powerful subset of the technology that is successfully driving use cases for financial institutions today: machine learning (ML).

Uncovering Fraud In A Sea Of Data

ML technology is currently being widely adopted for fraud detection, and for good reason. Fraud is a rampant, advancing threat to our industry.

ML technology applies massive computing power to fraud detection processes. Working with extraordinarily large data sets, such as a credit union’s card transactions for the year, ML platforms can quickly pinpoint even the most obscure anomalies within the data that could

indicate the presence of fraud — and flag those transactions accordingly.

And as the term aptly describes, ML platforms *learn*. As more data is analyzed, these systems *automatically* adapt to changes in fraud patterns, thereby uncovering and responding to the evolving tactics of fraudsters. They accomplish all of this with unrivaled speed and accuracy — and without manual programming or any other form of human intervention.

The idea of having a model that is analyzing volumes of historical data is nothing short of revolutionary in the war on fraud. This model can precisely predict future fraud and automatically improve its performance based on new data sources both internal and external, including data from the dark web.

Using ML, financial institutions can also dramatically reduce the false positives that are so damaging to

member cardholder experiences and trust. At CO-OP Financial Services, we have introduced rules-based approaches for real-time and non-real-time decisioning at the point of transaction for our account-based fraud service, COOPER Fraud Analyzer. We are also testing new options for the technology that will enable more predictive models.

Putting Data To Work

The opportunities for ML to transform the credit union experience for members are far-reaching. Fraud detection is just the beginning. From streamlining member onboarding to expediting service through back-office automation and hyper-personalizing cardholder rewards offers, there are countless applications for the technology that are already reshaping our industry.

But the success of any ML initiative hinges entirely on one key factor: data integrity. For credit unions and

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other financial institutions, the time is now to get data warehouses, lakes and strategies in order. This likely means updating legacy systems and breaking down technological silos. It also means cleansing internal data, validating it and bringing it together in logical, accessible and actionable ways.

Ultimately, we're in largely uncharted territory right now with respect to AI. New FinTechs are popping up everywhere, new real-time payments technologies continue to emerge, and the Internet of Things is fast evolving. Industry deregulation and

new consumer data privacy laws are also impacting the payments industry.

The confluence of these factors presents a huge opportunity for financial institutions large and small — AI is allowing us to innovate and differentiate our services like never before. But it is also opening up a much larger surface area for fraudsters to target.

So be nimble, but also be aware. And build a sound data strategy. That, more than any other factor, will determine your future success.

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 **DATAVISOR**

YINGLIAN XIE
CEO and Co-founder

BETTER CUSTOMER EXPERIENCES THROUGH **THE USE OF AI FRAUD SOLUTIONS**

It wasn't so long ago that artificial intelligence (AI) existed only in our imaginations, or in secretive labs largely unknown to the general public. Today, however, AI is everywhere. It powers our entertainment choices (Netflix) and helps around the house (Alexa). It monitors and maintains our environments (Nest) and

manages our commutes (Waze). It choreographs our social lives (Facebook) and directs our shopping choices (Amazon). You'll find AI in hospitals, on planes, at universities and in banks. In short, AI is changing the way our world works.

This omnipresence is truly remarkable, given the rapidity

of our transformation to an AI-powered world. Virtually overnight, it seems, we went from skepticism to evangelism, with AI suddenly being touted as the solution for just about every problem any industry wants to throw at it. Unsurprisingly perhaps, given the intensity of the hype around AI, the pendulum is already swinging back toward skepticism, as it becomes clear there is an emerging gulf between AI's promise and its reality.

Many myths surround AI and its applications in arenas such as commerce and finance. One of the most pervasive of these is the idea that AI replaces humans. This is not the case. AI augments our abilities, extends our powers and expands the scope of what we can do and achieve, but it still depends on humans for direction, guidance and expertise.

Another pervasive myth has to do with what we might call “The Cult of the Algorithm.” This is the idea that all-powerful algorithms are the answer to every business challenge. Organizations across industries have been led to believe that by merely training, testing and deploying new algorithms, they'll instantly see greater efficiency, lower costs and higher profits.

At DataVisor, we work with financial services providers, marketplaces, social platforms and more. In all these industries, it's true that AI is having a massive impact. Transactions and payments now happen online, at lightning speed. Real-time loan approvals are increasing the norm. Credit card applications are processed as fast as they come in. Commerce and banking are increasingly dominated by mobile, and customer demand

for speed, efficiency and access continues to intensify.

Businesses are responding with new offerings and services, but this activity comes at a troubling price. While AI is indeed powering growth, it's simultaneously introducing risk. So many of our enterprise customers are wrestling with the same challenge — how to balance pro-growth innovations that optimize for customer experience, against increased risk and vulnerability to fraud.

This is where that “Cult of the Algorithm” thinking breaks down. Algorithms alone can't deliver bulletproof customer experiences any more than they can address the vulnerabilities they introduce. What's required are comprehensive solutions that incorporate not just advanced algorithms, but also

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domain expertise, global intelligence and integrated technologies that work together to simultaneously deliver convenience and safety. These solutions need to perform at scale and facilitate seamless collaboration across a wide range of teams and contributors.

This is what DataVisor works to provide for every customer we protect. We want to understand their businesses, and the users of their platforms and services. We want to help power growth and promote efficiency. At the same time, we want to establish proactive defenses that prevent fraud and abuse before damage can occur. We want to help our customers build trust, maintain reputational integrity and deliver outstanding experiences for great customers. This is what

comprehensive AI-powered fraud prevention is all about — marshaling the best of what AI has to offer, and combining it with human expertise to promote a safer and more prosperous digital economy for all.

DataVisor’s AI-powered fraud solutions draw on the integrated power of unsupervised machine learning, global intelligence and deep domain expertise to eliminate the false positives that cause friction for customers; to increase the operational efficiencies that ensure organizations can put their energies toward their customers and not their processes; and to enable the early detection that prevents damage before it happens. This approach is tactical, strategic and comprehensive. The result is safe companies — and safe customers.

BUZZ
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REALITY



 Diebold Nixdorf

CORTEZ ADAMS
Director of Software
Product Management

AI'S MOVE FROM HYPE TO HOPE

When it comes to artificial intelligence (AI) for financial institutions, the battle is one of hope versus hype — and the question is whether AI can really transform how financial services are delivered.

Financial services executives have hope that AI will help improve

their firms' effectiveness in handling payments.

Thus far, there has been a risk-scoring component in enabling AI. And these same executives are interested in leveraging AI to help automate the decision-making process, which is still marked by manual tasks.

Automating the risk-scoring has value, especially against the backdrop of high-value, high-risk transactions, and where payment activity spans several offerings across a financial institution (FI), from check payments to wire transfers and beyond, regardless of whether they involve individual consumers or B2B activity.

It's a pain point, and the institutions that have spoken with Diebold Nixdorf want to address this with AI.

Moving Beyond Decision-Making

Beyond decision-making, executives want to use AI as they provide services to clients and consumers.

AI can help with onboarding of documentation related to Know Your Customer (KYC) mandates — but it can also match consumers with relevant financial product and service offerings. That's especially true as banking moves to a self-service channel, streamlined in nature.

It's a channel where consumers choose what is right for them, complete applications and then, after all is said and done, there is still someone at the back end of the process (at the FI) to approve or deny the application. AI can bring the “best fit” to a financial institution's customers based on data surrounding activities such as loan decision-making, whether in a branch or digital setting.

If we leverage AI at the beginning to identify the user based on external social behavior data feeds — or maybe existing interactions with that particular institution — you can leverage that in the decision right at the beginning.

Diebold Nixdorf can offer a hotbed of data that is likely to be highly valuable in the right scenario. What you do with that data is obviously a huge discussion topic, especially across the retail, fuel and convenience store verticals. Sharing information through multiple arenas

across an institution can offer end users services and products on an optimally tailored basis.

While there may not be a hard and fast roadmap for AI deployments just yet, you will find components of AI and analytics through multiple product areas across Diebold Nixdorf.

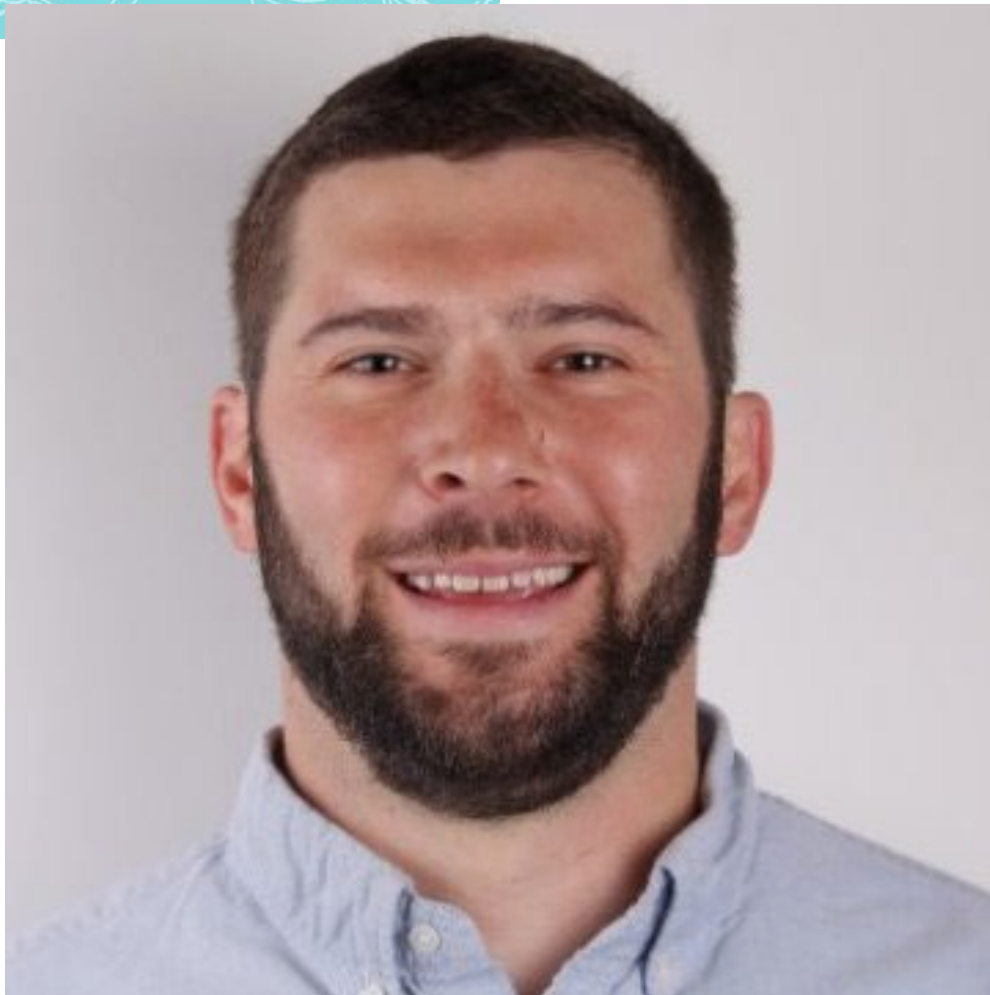
But in fashioning the journey, logical first steps involve looking at the collective data of the firm's clients to get a baseline of behavior and determine how AI might be of use. Beyond that, we're looking to provide actionable data around payment decision-making for our clients.

After that, there comes a point when AI becomes more prescriptive. Some of those prescriptive actions may come in the need for specific approvals from Diebold's clients, and where AI streamlines payments, money movement or “next-best offers” for customers based on models in place at specific FIs.

To bring AI to scale requires a collaborative and collective effort. Executives are placing their bets slowly when it comes to investing in it.

We're noticing a few chips coming to the table, and everyone has a small allocation toward this particular bet, but no one is going all-in. There is not a collective movement of investment allocation just yet. Consider it a case of AI grabbing an increasing share of mind, if not wallet.

Against this backdrop, Diebold Nixdorf seeks to partner with other like-minded institutions focused on the intersection between payments, digital technology, AI and legacy systems meeting at the AI bridge, and discovering how we can cross it together.



EKATA

KURT WEISS
 Director of
 Strategic Accounts

USING AI TO ASSESS IDENTITY RISK AND TREAT GOOD CUSTOMERS BETTER

The democratization of artificial intelligence (AI) has had a dramatic impact on how businesses approach identity risk. Prior to its introduction, there was already an influx of data points streaming into digital businesses, from site behavior to device IDs to digital signatures like IP addresses.

Traditional rules-based approaches to onboarding customers were overwhelmed by new access to data.

Artificial intelligence, then, through the adoption of machine learning (ML), became a needed tool. Compared to rules-based systems, ML offers a way to take advantage of all known data points within a

customer transaction to hone the signal, reduce the noise and provide a better customer experience.

ML has also afforded a shift to focus on good customers. Fraud can be isolated through binary signals with the low recall and high precision that is effective in rules, but it leaves the majority of customers in an unactionable “not fraud” bucket. This has two consequences. First, it leaves no ability to treat your best customers better; and second, it forces many good customers through unnecessary friction due to false positives, triggered by blunt force rules.

A rules-based approach to customer decisioning is reduced to a series of if/then statements. Often implementation is from a binary data point where if true, X action is taken, and if false, Y action is taken. Teams

can buy or build platforms that combine rules using multiple data points, or move from binary data to field arrays. The most complex rules systems leverage scorecards where any number of criteria might trigger a specific action.

At the end of the day, however, these systems are only leveraging a small portion of the data available — data with linear combinations based on historical analysis to come to a decision point. The best decisions made with these systems are only related to whether or not something is fraud, however.

The knowledge that something is not fraud does not infer any risk at all. While fraud risk can be flagged with blunt signals like a risky IP address or new email, to confirm the inverse requires a more holistic understanding of all data available.

Not only do individual factors need to be true or false, validity must be measured by its relationship to the validity of multiple other data points. ML understands the linkages between all data points, and all the permutations of those links in real time. This provides a holistic understanding of an identity, creating profiles of both fraud and customers. Decisions can then be made across the spectrum of risk, both positive and negative, creating opportunities for businesses to treat good customers like their best customers while still mitigating fraud.

COMPARED TO
RULES-BASED
SYSTEMS,
ML OFFERS
A WAY
TO TAKE
ADVANTAGE
OF ALL KNOWN
DATA POINTS
WITHIN
A CUSTOMER
TRANSACTION
TO HONE
THE SIGNAL,
REDUCE
THE NOISE
AND PROVIDE
A BETTER
CUSTOMER
EXPERIENCE.



fiserv.

GASAN AWAD
 Vice President,
 Product Management,
 Financial Crime and
 Risk Management

AI AND THE FIGHT AGAINST **FINANCIAL CRIME**

It's almost 2020, a date long used to evoke a far-out future, and while we're not yet taking to the sky in flying cars, other staples from the realm of science fiction have become reality. Take artificial intelligence (AI), for example. No matter how you define it, the ability of a car to drive itself or a chatbot to interact with a human

were only concepts a relatively short time ago.

The promise of AI to transform our lives in general and financial services in particular is greater than ever before. And the reality is that we as an industry have been making more progress than we may have realized.

AI is built on a long progression of innovations, from analytics to machine learning (ML), and is already part of the fabric of financial services. Consider fraud detection, which is an area of focus for Fiserv.

Analytics And Automation

Using data analytics to detect fraudulent activity is not a new concept. For years, behavioral and predictive analytics have been used in payments and financial services to reduce risk and fraud. However, emerging AI technologies take analytics to a new level by enabling financial institutions to quickly and easily examine data that is collected from a wide range of touchpoints.

Combining the robust analysis capabilities of AI with its other particularly promising element — robotic process automation (RPA) — strengthens fraud prevention even further through greater

automation, unsupervised learning and more sophisticated algorithms. This enables solutions to build on previous knowledge and evolve to face new fraud threats without being expressly programmed to do so.

As these capabilities continue to advance, AI systems could be fine-tuned to deliver the best response for any situation, providing a higher level of security with fewer disruptions to the customer experience.

Reducing Risk Without Sacrificing Customer Experience

As transaction speeds have increased in recent years, there's less time for approvals, making the automation and precision of AI more necessary than ever. Deploying real-time ML algorithms can improve the accuracy and speed of decisions that help curb fraud.

As these algorithms are calibrated to become more accurate over time, look for false-positive fraud alerts to be greatly reduced. We've even seen examples where false positives are reduced more than 40 percent while improving detection rates and even helping catch the bad guys. That's good news for security analysts who spend significant time reviewing alerts — and for customers whose payments can be delayed by extra research and approvals. And better accuracy in detecting fraudulent transactions means customers won't be interrupted (and potentially annoyed) by a text, call or email to validate legitimate transactions.

Freed from time-consuming reviews of false positives, banking employees can instead turn their attention to other, more efficient tasks, including finding solutions to complex threats. Human insight is an essential method for fine-tuning

ML models to more accurately detect changing patterns of fraud. A financial institution's team can use information about today's fraud to enhance the next generation of automated fraud prevention.

Beyond simply offering a step forward in fraud prevention, AI has the potential to propel fraud strategies in a new direction. Maybe those flying cars won't be too far behind.



flywire

DAVID KING
Chief Technology Officer

AI IS MORE THAN HYPE – IT DELIVERS **REAL VALUE**

There is no question the hype outshines the reality, but artificial intelligence (AI) absolutely plays a very valuable role in financial services, payments and commerce. It's not a panacea though. The applications are unique to the use cases that each market is trying to solve.

For example, in financial services, we see AI being used to help companies better understand their customers and improve the user experience. Banks are anticipating their customers' needs based on past experience with other customers, deploying chatbots to support service inquiries, and using intelligent automation to provide faster and more targeted financial scoring.

In commerce, AI plays multiple roles — both in-store and online. We're all familiar with automated and self-checkout options available at many grocery, hardware and other types of stores. We walk up with a cart of items to an automated checkout, scan our items, and if we don't put our items in the bag it tells us to do so, or it realizes we put an item in the bag we may not have scanned properly. On the eCommerce side, AI-powered recommendation engines learn what we like based on past behavior, and chatbots engage us when needed to answer questions and complete online sales.

On the payments front, AI continues to play an increasingly important role in reducing fraud by correlating mass amounts of data. For example, AI can be used to monitor the IP address from which a transaction is initiating and quickly identify if bad actors have originated transactions from the same IP address in the past. The ability to identify patterns and behaviors on a payment card in real

time and notify card holders about potential fraudulent transactions are good examples of high-value applications of AI in payments. And there are many more.

Flywire moves a high volume of cross-border transactions that bring their own unique set of challenges. AI and machine learning capabilities help us manage these transactions as they move through our banking network. For example:

- Related to the fraud use case above, we use AI to monitor IP addresses, credit card number behavior and velocity rates to determine potential fraudulent transactions. This helps our clients ensure the highest levels of security and meet compliance requirements like Know Your Customer.
- AI has also enabled Flywire to streamline the identification and reconciliation of complex, cross-border payments in real time

(i.e., matching inbound payments with outstanding invoices — especially when that payment might not have all the proper identifying information included with it). Today, with the help of AI, our platform automates the matching of 90 percent or more of cross-border transactions, and we continue to gain additional improvements as the AI models learn. This saves our clients a lot of administrative time, cost and trouble on reconciliation.

- AI also plays a role in enabling Flywire to predict and manage foreign exchange rates — reducing costs for our clients and their customers.
- Additionally, in our healthcare vertical, AI helps determine which patients might have difficulty paying their treatment bills. This allows us to proactively engage patients earlier in the process, and (also using AI) offer that patient a payment plan, based

on his or her ability to pay. As a result, fewer receivables go to collection, providers get paid in a timelier fashion and the stress is reduced for patients.

As AI matures, and more use cases are proven out, it has the potential to improve many aspects of our business as well as that of our clients. We will continue to use it to automate more of the receivables process, streamline payment reconciliation requirements and reduce the potential for fraud. We're also looking for opportunities to extend our worldwide multilingual customer support operations with AI. That's still in the planning stage, and it will be additive — designed to give our customer support team more insights into the needs of both our clients and their customers.



PRASHANT FULORIA
Chief Operating Officer

USING AI TO **REVOLUTIONIZE** THE B2B ECONOMY

If we look beyond some of the hype related to artificial intelligence (AI) and instead focus on this moment in time, then I can say with great confidence that AI is most certainly living up to its potential.

We know this based on the rapid growth of AI-enabled businesses that are delivering new kinds of service

value for their customers where traditional services have been limiting.

While we're still in the early days of using different AI techniques, in general it's clear that AI has enormous potential to unlock massive amounts of value in the financial services, payments and commerce industries.

With regard to financial services, there are new use cases where AI is creating broad value by democratizing access to credit for those consumers or businesses that have been underserved and safeguarding payments by reducing systematic fraud. And let's not forget that AI is helping businesses retain and grow their customer base by creating better commerce experiences through personalization.

In all, AI is about making services more customer-friendly, faster, perhaps cheaper, perhaps just better via more personalized experiences, and so on. I think on all these fronts, AI is adding a lot of value.

In the world of financial services, when we think about how AI is implemented, it's almost always in the context of decision-making.

Some of the key dimensions of decision-making are things like: How much data you need to make a decision? How much manual

intervention or how much manual effort you need to make a decision? And of course, how good is the decision? Is it economically sound? Is it fair?

If you look at AI in all of those contexts, it's about service optimization to the benefit of the customer. From gleaning more insights from a limited amount of data to automating a more accurate decision-making process to removing the need for human beings from repetitive tasks so they can focus on high-value business initiatives, AI is driving many optimizations.

One way to think about AI in the context of financial services is that AI enables companies to make faster and more accurate decisions with greater efficiency at scale.

That's why we view AI to be fundamental to who we are and what we do at Fundbox. We've been focused on data right from the very beginning.

Fundbox was founded on the thesis that there was a tectonic change in the way businesses were consuming and creating data. That combined with advances in technology, big data, as well as data science and machine learning (ML), would open the door for a better credit decision.

From the very beginning, we've invested in our data capabilities, including the data that we're collecting, our team and the technology we're building on how to use the data. For example, we connect to various popular accounting systems so that a customer can, with the click of a button, share their accounting data or bank account information with Fundbox.

We've invested in a team of data scientists that have been building our ML models and improving them over the years to the point where they are very robust, which helps us drive industry-leading credit performance.

Our investments in AI have enabled us to create an onboarding process which is extremely fast, where a customer can come in and typically get access to credit in less than three minutes.

Those investments we've made in data, with our team of data scientists and ML engineers, have paid off in the form of better outcomes, for the customer and for the business as a whole.



DREW EDWARDS
CEO

HOW AI CAN MAXIMIZE CUSTOMER EXPERIENCE

For decades, experts have placed predictions around artificial intelligence (AI) and machine learning (ML) — both in terms of the ability to enhance human productivity, and the potential threat to human independence.

Recently, University of Oxford and Yale University conducted a survey

among 350 AI researchers, and the results show they predict machines will be superior to humans at writing high school essays by 2026, driving trucks by 2027 and conducting surgeries by 2053. Clearly, a number of industries are seeing the impact of AI — from healthcare and medicine to education, eCommerce and financial services. Business leaders around the world are constantly

seeking new ways to leverage this tool in search of a competitive advantage. But let's be clear — despite the buzz surrounding AI, it is simply a tool.

Over the last several years, we've seen financial services and payments companies deploy AI and ML to various parts of the ecosystem, including risk management, fraud detection, trading and personalized customer experiences in banking. But the companies that are most efficiently and effectively capitalizing on the tool are the ones that are laser-focused on the interaction between these technologies and their human capital. It is at this intersection of AI and human intervention where the customer experience and employee experience are maximized.

At Ingo Money, we provide instant money as a service to companies and consumers, enabling the movement of guaranteed, instant and safe-to-spend funds from any source to any destination.

Processing roughly \$4 billion in gross dollar volume annually requires that risk management be core to our operation. Like any payments company, Ingo is in the risk management business because this is core to money movement.

And when your business is about getting people their money fast, great risk management is also critical to delivering great customer experiences. What we've discovered is that AI is especially useful for culling out the easy stuff and freeing our human capital to focus on the hard stuff. The more lower-risk transactions our people can

ignore, the more time they have to combat the truly bad actors, such as organized fraud, and create those great customer experiences for our clients.

By investing in AI we've been able to grow our business four times without the need to grow our call centers. It's technologies like this that are critical to offering speed and accuracy at scale and at competitive price points. Going forward, we see other areas of our business beyond risk where this technology can be leveraged. An example is with customer service, where without AI, we'd sift through 10 bad actors trying to scam us for every legitimate customer who needs attention. Applying AI in this area would allow us to "cull out the bad actors" and focus on those customers who truly need our attention.

While interpretable ML is still an emerging field, we will continue looking for new and innovative applications for AI to help scale our business. However, our belief is that AI can never fully replace the human aspect of what we do. Instead of viewing it as the silver bullet, we'll continue to expand our approach regarding how our people can interact and optimize this tool within our organization. Said another way, we don't see AI replacing our human capital, we see it making them more effective.

**JUMIO**[®]

LABHESH PATEL

Chief Technology Officer
and Chief Scientist

FIGHTING FRAUD AND REGAINING DIGITAL TRUST WITH AI

The internet is where we go for nearly everything. Whether you're looking for the best eBike or top productivity hacks, you can find pretty much anything online — except trust. How can you trust that someone is who they say they are online?

Unfortunately, a significant share of businesses, including banks and financial institutions, still rely on outdated methods of identity verification and user authentication including SMS-based two-factor authentication and the traditional username and password. These traditional methods of establishing trust are vulnerable to everything

from phishing to sophisticated account takeover exploits.

Artificial intelligence (AI) can help fight fraud in a big way. Nearly two-thirds (63.6 percent) of financial institutions believe that AI is an effective tool for stopping fraud before it happens, and 80 percent of fraud specialists using AI-based platforms believe the technology helps reduce payments fraud, according to the [AI Innovation Playbook](#).

AI is core to Jumio’s business, and Jumio AI Labs is dedicated to the creation, experimentation and at-scale deployment of AI, machine learning (ML) and deep learning technologies.

Historically, we’ve used classical computer vision to create ID templates for specific ID types. We created hand-coded classifiers, like edge detection filters, so the program could identify where an image of an ID started and stopped, along

with advanced OCR technologies to recognize characters and letters in different languages. From all those hand-coded classifiers, we developed algorithms to make sense of the ID document and “learn” to determine the type and country of origin of the ID.

Classical computer vision and traditional ML techniques simply don’t scale or deliver the verification accuracy and speed that AI promises. Plus, computer vision is challenged when the ID document is captured in less-than-ideal circumstances.

This is why AI delivers considerable promise in the identity verification space.

The Power Of AI

Jumio uses AI in three important ways:

1. Data Extraction: Jumio uses AI to extract key data from ID documents. Jumio’s scale means we can feed our algorithms with

lots of data to not only improve their ability to recognize specific ID documents, but also to know how to extract the data and make sense of it.

2. Fraud Detection: AI helps us spot characteristics of fraudulent IDs, such as understanding the unique fonts, pictures and security features of a specific country-issued ID. If an ID document does not conform to the pattern, our AI algorithms flag it for closer review.

3. Risk Scoring: We also leverage AI to identify patterns and probability of fraud based on a combination of high-risk variables. These insights have allowed us to identify that 1 percent of the ID documents (with a unique risk profile) account for about 15 percent of known fraud. We use this scoring to alert our verification experts to pay special attention to high-risk IDs.

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There are still instances in which our AI models fail to identify what is wrong with an ID. This is where verification experts can determine what error occurred and teach our algorithms how to spot the issue in the future. This feedback loop creates a different method of learning where new information is constantly being input to the learning model so that the model can improve.

The Wisdom Of The Crowd

Unlike automated solutions, Jumio has always been delivered as a hybrid model — leveraging technologies and verification experts. This has proven extremely important when it comes to face matching.

Jumio’s identity verification solutions go one step beyond ID verification by verifying that a selfie and the picture of the person on the ID actually match. But matching these images is a very difficult technical problem. The ID could be older, and this could mean the person taking

the selfie naturally looks different from the person on the ID. Even the way the picture was taken makes a comparison exceedingly challenging even for the most seasoned verification experts.

Thanks to AI, Jumio can now automate over 90 percent of its face match solution based on the data from authentication and 3D liveness products. This breakthrough makes it easier to reliably make faster identity verification decisions to support more than 3,500 constantly changing ID types and subtypes.

This is another area where AI is having a dramatic impact.

We already leverage ML to perform “similarity checks” of the selfie and ID image. Jumio has a large team of verification experts who apply their judgment to accept or reject these image pairs and better inform our DL models. We are also looking at image pairs of identity checks that were rejected and using deep learning to

spot additional unique features that will train our algorithms to better spot discrepancies which may signal fraud. Once again, our ability to identify these trends and nuances is based on the quality of our AI algorithms, which is being fed by millions of verification transactions.

AI has already been productionalized to reduce the time it takes to verify an ID document or an online identity, which, in turn, is helping Jumio’s customers reduce their abandonment rates and increase new account conversions. And we’ve only just begun.

BUZZ
VS.
REALITY



BRAD WISKIRCHEN
CEO

JUST SCRATCHING THE SURFACE OF AI IN DIGITAL FRAUD PREVENTION

Artificial intelligence (AI) is key to keeping up with today's emerging fraud trends. Fraud has evolved to become more sophisticated and complex than before, but fraud prevention is not the only reason companies turn to AI. Advanced AI-driven fraud protection also enables businesses to make

decisions based on specific and desired outcomes.

AI Usage In Payments And Fraud

The payments, fraud prevention, financial services and eCommerce industries have only begun to scratch the surface of what AI can do. All of these industries leverage AI in different ways, whether that's

processing large amounts of data for risk decisioning, creating virtual assistants or making purchase recommendations to shoppers. eCommerce is still a relatively young industry, and as we move into the next decade, we will see AI being used in far more use cases than it is today.

In digital fraud prevention, AI is crucial for making real-time decisions at the scale and speed demanded in today's environment and into the future. In the evolution of digital fraud prevention, we've seen rules engines, supervised machine learning (ML), unsupervised ML and, now, AI.

AI and ML are not inherently interchangeable. While ML is a component of AI, true AI emulates a human's judgement. It should be difficult, if not impossible, to determine whether a machine or a human came up with the result. However, that is not to say AI should replace humans. To the contrary,

AI-driven fraud prevention is so scalable that it allows humans to reduce manual reviews so they can focus on strategic initiatives, such as using fraud prevention to maximize business outcomes far beyond preventing chargebacks.

Kount's AI

Earlier this year, Kount launched its next-generation AI, which detects emerging and existing fraud in a faster, more accurate and more scalable way than previous solutions. Kount's AI emulates the decision-making process of an experienced fraud analyst by weighing the risk of fraud against the value of the customer. It takes into account historic data and looks for linkages and anomalies that indicate new fraud attacks.

Kount's AI uses both unsupervised and supervised ML, along with additional algorithms, to create a decisionable risk score. The

company's supervised ML draws from its universal data network, which includes more than 12 years of comprehensive data comprised of billions of transactions. Meanwhile, unsupervised ML simulates the instincts of an experienced fraud analyst by using advanced models to detect transaction anomalies before they become chargebacks.

Benefits To Customers

Next-generation AI-driven fraud prevention solutions like Kount's can enable customers to focus on business-driven outcomes. With the AI handling payments fraud in a quick and scalable manner and minimizing manual reviews, fraud analysts can focus on strategic initiatives that support the company's larger goals. In this way, AI can allow customers to set dynamic and customizable risk thresholds to maximize their desired result.

IN DIGITAL FRAUD
PREVENTION,
AI IS CRUCIAL
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IN TODAY'S
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AND INTO
THE FUTURE.

Prevention of payments fraud and chargebacks isn't the only business-driven outcome companies might require. Lower manual review rates, fewer false positives and false negatives, lower operational costs, increased revenue and improved customer experiences are all desirable outcomes that black-box decisioning can't deliver.

In addition, certain business-driven outcomes may vary by promotion or product. For example, a video game company that offers a high-margin product like in-game currency would want to deliver the least amount of friction possible to keep the player engaged in the game. A diamond company, on the other hand, may welcome a bit longer of a risk review process to avoid a costly chargeback and loss of product. And a third company that offers a holiday weekend promotion in hopes of gaining new customers may be willing to tolerate a little more fraud

for a few days in favor of a seamless customer experience.

Having a flexible control center allows firms to make these types of business-driven decisions. Companies can balance the amount of risk they are comfortable taking while supporting revenue growth.

AI In Fraud Prevention

In the next decade, consumer tolerance for friction will diminish even further, yet fraud will become even more complex. As a result, every touchpoint on the digital customer journey is an opportunity for businesses to know their customers, and to either strategically block fraud or create a premiere experience. It's one way AI-driven fraud prevention continues to evolve, proving that we've only just scratched the surface of what's digitally possible.

BUZZ
VS.

REALITY



SRI NARASIMHAN
Head of Strategy,
Partnerships and
Business Development

FINANCIAL SERVICES AND PAYMENTS HAVE **BARELY SCRATCHED THE SURFACE OF DATA**

Artificial intelligence (AI) is perhaps the most used and abused terminology in our industry today. It is used both as a catch phrase as well as a silver bullet by many for problems that ail us as a race. So much so, that AI is often cited even before any thoughtful attempt to understand the problem itself. And due to the hype out there,

it is tempting for financial execs to simply spray the AI WD-40 on a problem not well understood to begin with.

Are We Asking The Right Questions?

Perhaps a better question to ask our industry is: Are we collecting the right data to make informed decisions surrounding a given proposition?

The veritable explosion of FinTech ideas in the financial and payment industry is testament that we have not. The convergence of “financial” and “technology” is understood to happen in the backdrop of copious amounts of data. Each FinTech is presenting its take on predicting (aka scoring) a subjective problem. A precise assessment of the riskiness or propensity of the next best action of a specific account or a transaction based on any combination of individual, cohort, social, cultural, aesthetic or regional angles.

I list riskiness before propensity since no financial institution likes to lose its shirt in the process of making money by moving or holding money. The secret sauce is how they meld their secret sauce into their proprietary algorithm and models.

So, let us break this down. Riskiness is the assessment of liability to the liability owner and the ecosystem as a whole. There are all sorts of risks out there in the industry —

financial or fraud risk, credit or underwriting risk, compliance or regulatory risk. There is enterprise risk, which includes a whole host of risks embedded in the running of a financial firm — specifically, liquidity risk, market risk, operational risk, currency risk, settlement and inter-party settlement risks, etc. Whereas propensity models focus on decisions that provide services attuned to current and future financial needs of a customer. Just take a look around. Do you think we have done a good job tapping the data that we have collected on consumers and businesses?

A Personal Wakeup Call

When I was with PayPal Risk a while ago, I knew we had been doing some smart things with data for a while. A chance hallway encounter with Jeff, everyone’s favorite architect, turned out to be an eye-opener for me. The big reveal — “Sri, over 90 percent of our internal service calls [which I term compute proportions] are used to assess various types of risk.”

Around 8 percent to measure and assess the propensity of an account (i.e. for marketing purposes). This, for a firm that has been lauded as the favorite eCommerce brand across the world.

Now I am not giving any secret sauce away. This has been eloquently summarized before by PayPal Founder Max Levchin in a congressional testimony: “PayPal is a security firm masquerading as a financial services company.” Only I now had a quantified confirmation of this. And the smart things we were doing with data? It is now popularly labeled as AI.

It is especially striking when you hear the ratio of this compute proportion in companies like Google and Facebook. It is said that Google spends 2 percent of its compute cycles in protecting and cleaning out malfeasance from its platform, while Facebook spends even less than that, at least before 2016. Just let that sink in for a moment.

**RISKINESS
IS THE
ASSESSMENT
OF LIABILITY
TO THE LIABILITY
OWNER AND
THE ECOSYSTEM
AS A WHOLE.**

What if PayPal exhibited a similar allocation of compute resources as Google? Imagine 98 percent of PayPal's horsepower being directed toward scoring and making propensity decisions while 2 percent of its compute cycles are focused on assessing riskiness — while keeping existing risks at the same levels. What if their investments started shifting toward user or account behavior? Now you can imagine the size of the opportunity that exists for harnessing data in the financial services industry.

Miles To Go Before We Sleep

Data models are as intelligent as the humans who program them. Deep learning models purport to learn all and tell all. But I am not sure that learning systems are anywhere close to the ingenuity of fraudsters and gypsters who are always a step ahead of the game.

One of the best kept secrets of the online financial and payments industry is handicapping how

many humans it can afford to laboriously assess every “suspect” case manually. The more humans you can afford to locate root cause, the faster the insights you learn and roll those insights into the next iteration of your model. The velocity of this learning cycle, assess-learn-program-rollout cycle, now becomes the engine that makes the difference. It is a beginning of a journey toward the elusive goal of perfect human-machine harmony.

Mapping The Data Islands

We have heard of data silos and data lakes. I've got news for you: We now have data islands. Data silos are internal to an enterprise. But data islands are external to the enterprise. How can you leverage external data to create new value?

This developing game is creating new and interesting partnerships. You have by now heard of Mastercard selling its transaction data to Google, and Facebook's entreaties to banks. Amazon's move into Whole Foods

was a power play across data islands. New players, such as LISNR, are innovating at the edge to help deliver great user experiences while collecting new context at retail proximity.

There Is A Data Gap Before True AI Kicks In

It is common knowledge that midway through the last century, Alan Turing suggested a landmark test. The “Turing Test” assesses the ability of a computer to mimic a human, as judged by another human who could not see the machine but could ask it written questions. Are we there yet, you ask? Turing goes on to declare an emphatic no. While we are barely at the edge of AI as a race, we can develop momentum by harnessing basic data in our industry.

Let us begin there first.

BUZZ
VS.

REALITY



msts

DAN ZIMMERMAN
Chief Product
and Information Officer

HOW AI ADDS REAL VALUE TO PAYMENTS

It can feel as if the major industry players are releasing products and features powered by artificial intelligence (AI) on a near-weekly basis. AI is a buzzword, trendy and coveted by businesses hoping to be viewed as innovative. And any product with even a single rule in its application is often touted as using AI, extending the term into solutions that aren't really powered

by the technology (at least to the degree we expect). Overall, the industry falls short in many places where AI is overused when it's not appropriate.

And that buzz has consequences. The industry may be spending time and money on technology that doesn't offer any real, meaningful value. And with some businesses

still in the process of setting up eCommerce, investing heavily in generic “AI solutions” won’t take their business into the future as they would expect. In fact, it could end up being a waste of money.

The bottom line is that there’s no value proposition in a generic AI solution. When it comes to AI, we must ask ourselves: “What specific business problem do I need to solve and how does AI solve that problem?” The answer to that question is where you’ll get the most ROI for your AI-powered efforts.

Of the many products and tools available, the biggest impact is made when AI modernizes traditional, rules-based fraud detection systems. But that’s not just your typical tech buzz — that’s a promising reality for the financial services and payments industry.

For example, within fraud prevention, false positives commonly occur with traditional payment providers when legitimate transactions are mistaken for fraudulent ones, and therefore can cost businesses as much or more than actual fraud. Heavy AI investments are being made in the industry to not only identify fraudulent transactions that would not have been caught before, but also to improve fraud detection rules to identify false positives and help businesses avoid losing revenue. Despite how overhyped the technology is in some cases, AI is working beautifully in fraud prevention, and the models are continuously learning.

At MSTS, we work with B2B businesses across the globe to streamline payments and AR processes. The most impactful use for AI is within our underwriting process. Not only does AI significantly

speed up onboarding, but it’s a valuable tool that allows us to accept far more applicants than before. By adding additional sources of data to our machine learning (ML), we have the potential to onboard 10-15 percent more customers that we otherwise may have overlooked. We’ve also pulled thousands of hours out of our manual processes using robotic process automation.

When we look to solve challenges using AI, we prefer to partner with organizations that already have the algorithms developed. This allows us to leverage best practices to find solutions using AI in customer support. Internally, we are exploring ways in which ML can aid in customer loyalty and increased share of wallet. We support our partners’ growth by identifying engaged buyers and providing insight to help increase sales.

There’s a real promise for AI in the payments space. Just like in any industry, technology continues to accelerate otherwise tedious, manual processes. AI has the potential to revolutionize and automate solutions to address historical industry problems like customer loyalty and fraud protection, promising a favorable ROI.



pingpong

ROBERT CHEN
CEO and Founder

HOW AI IS **BENEFITTING** INDIVIDUALS AND CORPORATES

Artificial intelligence (AI) has been a buzzword in both the academic world and the larger world for decades, with generations of new technologies defining new boundaries of what's possible, profoundly influencing our lives day in and day out. The financial industry, probably one of the most old-school and conservative industries out

there, was inevitably impacted, and even became the centerpiece of the change that is empowered by many AI-based technologies.

The financial services industry, historically focused on servicing individuals and corporates, is very much a “people” business that emphasizes on and thrives from interpersonal interaction

and relationship-building. But today, a wave of new products and technologies is wiping out the necessity of such interaction wherever possible. And AI is certainly an important component driving this trend.

One can almost always find the trace of AI behind the evolving scene of modern financial services, from internet banking to virtual banking, eKYC to facial recognition, and from payment outlier detection to instant lending. AI has been everywhere in traditional financial services and is transforming every bit of it, be it customer onboarding, payment, lending or investment.

AI is making onboarding easier. Remote Know Your Customer (KYC) with facial recognition and smart ID validation are becoming widely adopted and becoming industry standard. The smart ID validation allows the system to automatically recognize the area of the image which contains critical ID information

and converts such into characters that can be searched and validated in an official database.

Payment is safer with AI. Outlier detection techniques allow a payment service provider to identify the outlier from a cluster of payments based on the machine learning capability of the system, and then take proactive action to either generate alerts or block such outlier payment to avoid potential losses from duplicates or neglected wrongdoings.

Lending is also faster. Digital lending backed by targeted marketing pushes lending advertisement targets to a specific mobile user while that user is searching for specific key words in a mobile app. The lending recommendation with the relevant amount of information and appealing tenor are generated by a machine or system based on the user profile developed by capturing the user's behavior patterns.

Finally, investment is smarter. Smart-matching investment in a specialty app can calculate the user's risk-aversity level and return aspiration based on historical data, as well as current positions in various securities and the liquidity available, and then recommend the next moves about portfolio and return target with the right metrics (e.g. sharp ratio) the user looks to. A traditional investment advisor now would be behind the app in the form of bytes.

We are seeing all these changes happening in the financial services industry having positive impacts on both individuals and corporates. While the people-to-people interaction is fading out, the convenience and efficiency that AI offers are filling the gap and becoming the new norm.

As a company focused on servicing online merchants and promoting cross-border eCommerce flows, PingPong is dedicated to implementing smart technologies

(including AI) to provide better cross-border solutions to our clients.

Some of the areas we are exploring include:

- An AI-enhanced user portal to provide a customized interface for different clients
- An interactive knowledge reservoir populated with local market expertise and regulatory updates based on a client's selling activities and interests
- Smart ERP to improve online store management and selling process

We are also adapting an industry-leading, AI-empowered risk control model to further fortify our already robust anti-money laundering capability to better serve our merchant clients, their consumers and eventually the cross-border eCommerce community that we are part of.



TOM GANDRE

Executive Vice President
and Chief Operating Officer

LEVERAGING AI TO IMPROVE **CREDIT UNION MEMBER EXPERIENCE**

While some still view the idea of artificial intelligence (AI) with skepticism, companies around the world are finding that it can accelerate their products' time to market and help them do more with less. This is particularly true in the financial services space, where AI is,

in fact, living up to the label that the payments and commerce industries have given it. Faster payments, stronger fraud detection and an improved member experience are just a few of the many ways AI is bolstering the capabilities of financial institutions as they relate to member needs.

To truly leverage AI, it is helpful to view it in terms of augmentation — the idea that this next-generation, intelligent technology is here to help us interact and deal with the increasingly digital world in which we live, rather than eliminate the value of our inherently human qualities.

For credit unions, this might mean getting excited about the ways in which AI can analyze high volumes of complex data and automate key steps within a process that might take a team member several hours or days to complete. AI does not necessarily translate to the elimination of human intervention, but rather, opportunities for staff to focus on areas where they can have more impact on credit union members.

While it may be a few more years before AI reaches a level of maturity with many credit unions’ member-facing applications, PSCU is seeing

multiple areas within the industry where it is making an impact.

It’s important to remember that AI is in the early stages of revolutionizing the way payments and processing are accomplished. Still, our organization recognizes the value of this innovative technology and regards it as an increasingly vital component of today’s payments landscape. We want to not only push the limits of AI’s current capabilities, but also understand its future possibilities.

As we continue to harness the applicability of AI, while consistently learning how to mitigate its risks, we have leveraged AI to improve our operations at PSCU through several industry-leading vendor partners. We have identified use cases, using them to bolster our confidence of AI in our enterprise. We began our implementation of AI technology with a “low-hanging fruit” approach,

in which we looked for opportunities to quickly improve processes and affect positive change. So far, we have enhanced our fraud detection capabilities, implemented AI into our data insights, and recently deployed robotic processing automation (RPA) in our back-office implementation center and our contact center.

PSCU’s Linked Analysis, developed by our in-house fraud experts, uses cross-network analytics to create a 360-degree view of a member, enabling PSCU to link events across different platforms, individuals across different institutions, merchants across any card, and all of these points to each other — enabling our data scientists to proactively take action to prevent fraud.

Linked Analysis uses machine learning (ML), enabling credit unions to look for data patterns holistically across channels, such as digital, cards and the contact center, to

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detect potential criminal activities. By also leveraging consortium data across multiple financial institutions and channels where fraud is being committed, a credit union can more quickly detect potential patterns occurring within their institution. The ML of Linked Analysis is saving PSCU owner credit unions nearly \$2 million a month, in addition to the millions of dollars being thwarted by our holistic solutions in addressing traditional card fraud.

We are also leveraging AI in our Project Delivery and Platform Operations (PDPO) area that automates the index rate change process. Automating this process allows PSCU to quickly react to rate changes and provide a seamless experience for our credit unions. In our contact centers, we have launched an attended bot that ties into a password vault, enabling our agents to automatically obtain logins

to our credit unions' digital banking platforms and decrease call time for members.

Next, we will look to use AI to help enhance the dispute management experience for our credit union owners and their members. With early AI accomplishments under our belt and our vision set squarely on the future, we continue to explore opportunities to leverage this evolving technology to operate more efficiently and serve our credit unions more effectively. Ultimately, as we look at changing our business model in this new digital age, we will want to take advantage of the broader transformations AI brings to the table. So many possibilities exist for personalized member interactions, and as insights and reporting continue to advance within our organization, so will opportunities for AI.

Accordingly, PSCU has teamed up with the Mastercard Startpath program, where we now have access to the later-stage FinTech startups that excel at innovation, thought leadership and information on strategic AI investments. This creates a competitive advantage for PSCU owner credit unions, and helps us have a hand in reshaping the future of banking.

Notably, all companies will need to know how to prioritize AI in their member interactions and solutions to ensure that it is well-aligned to their consumers and meets their own long-term strategies. We must quickly adapt, as it is no longer competitively or financially prudent to nurture the status quo. AI provides capacity and scalability, which is critical to keeping your business future-proof and relevant.

BUZZ
VS.

REALITY



Recurly

JONAS FLODH
Senior Vice President
of Product

LEVERAGING AI TO GIVE SUBSCRIPTIONS BUSINESSES **A COMPETITIVE ADVANTAGE**

Financial services in general — and the payments industry in particular — involves vast amounts of data, real-time transactions and the high monetary impact of decision-making. Given all of these elements, this is clearly the industry that will most benefit from the application of artificial intelligence (AI) and machine learning

(ML) models to address its challenges.

ML models are already being used frequently across the industry. The most prominent use case is likely fraud detection. The rapidly growing number of transactions with rich, associated data creates a perfect opportunity to apply ML models to find patterns and identify fraud at

a level of accuracy not previously possible. ML models are also applied to make better decisions around the creditworthiness of individuals and businesses, or to recommend better spending patterns based on analysis of personal transaction data.

AI and ML are used to optimize decision-making and forecasting across the industry, to automate and improve customer communication via chatbots, to estimate a prospect's propensity to buy, and to perform authentication through, for example, facial recognition.

The uses and benefits of AI and ML are already real in the industry and will only grow stronger — in fact, they will soon become an absolute necessity for offering relevant services and staying competitive.

However, there are challenges. Pure AI suggests comprehensive, human-like intelligence that can be applied to many problems and autonomous learning. Most of today's applications

and models are based on pragmatic AI or ML models that can exceed human intelligence in a narrow field, but require constant attention and retraining for new data patterns and behaviors. This means in order to succeed, companies must have a long-term investment horizon and strong buy-in from senior management.

Starting AI is not easy, but continuing to apply it is even more difficult. ML modeling is an ongoing process due to the nature of data evolution and pattern changes. The ML models built six months ago might not work well today as newer data patterns emerge. It is not uncommon to see at least 10 versions of key performing models, and many projects will never bring real business benefits.

At Recurly, we have long since applied ML to optimize payment success rates and minimize involuntary churn, which is one of the largest challenges for any high-volume, high-velocity subscription

business. If they fail to act, subscription businesses can lose 7.2 percent of subscribers each month from transaction declines. Recurly uses ML models to optimize retry schedules for failed transactions as one of the key strategies for recovering revenue.

In total, Recurly delivers a 12 percent revenue lift for our clients through effective decline management strategies. To maximize payments success, we also apply ML models to predict the gateway for routing payment transactions, which effectively increases the new customer sign-up rate and improves the customer experience. We are also looking at time series forecasting to help customers predict future MRR and subscription volumes.

Recurly is heavily invested and a strong believer in leveraging AI and ML to provide customers with a competitive advantage in the subscription business.

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ANANT AGRAWAL
Executive Vice President
of Corporate Development

MODERN-DAY AI TO DELIVER **AN OPTIMAL CONSUMER EXPERIENCE**

There has never been a greater need or opportunity for artificial intelligence (AI) in retail.

Retailers have long valued the importance of data in understanding what consumers want — and why — to more proactively market to them. Retailers that did this the best

reaped the most rewards. However, traditionally, data accumulated on consumer behaviors was limited in scope and based on a mix of mostly historical sales trends and cumbersome surveys. With this data, companies were making subjective guesses, limiting the effectiveness of the resulting marketing campaigns and strategies.

Now, as consumers increasingly turn to more digital mediums to communicate their preferences, we no longer face the problem of collecting data from consumers. Data systems are becoming more open and integrated, and retailers around the world are finding new ways to access and gather more data about consumers' wants and needs than has ever been possible before.

That said, with seemingly endless access to data, retailers are now faced with a new challenge. Traditional modeling techniques that had been built to analyze just a few variables for human analysts or marketers can no longer keep up with the vast amount of differentiated data being amassed, making it difficult to analyze exponentially larger data sets and turn them into actionable insights.

This is where modern-day tools like AI, or machine learning (ML), come into play. These next-generation

technologies were built to analyze much larger data sets than previously possible. It is critical for retailers to leverage these tools to analyze different facets of consumer preferences and understand these more robust data sets.

Since we are still in its early days, saying that AI has delivered positive real-world results by leveraging all this new data would be premature, and subjective at best.

There are really two ways to look at the technology. There is supervised AI, which is where we tell the machine to react based on consumer behaviors (if consumer does A, serve up B, etc.), and then there is unsupervised AI, which is really releasing it freely into the wild so it can come back and provide a recommendation based on the data it found and the way it chose to look at it. Supervised AI has been an existing concept, but unsupervised AI is where the tools are still improving

— and they hold the promise of exciting opportunities to unlock new consumer insights in the industry.

The Power Of AI And Unattended Retail Colliding

At USA Technologies (USAT), we are actively exploring how to better leverage AI for our customers, particularly in the field of merchandising and machine health. In fact, we were the first to use these new ML tools to better merchandise the machines for more optimal servicing, and to proactively address why a machine may be malfunctioning to reduce downtime.

However, one limiting factor we encountered was that these tools were used based on data sets collected on individual machine performance, rather than tapping into the massive data set across our more than 1 million unattended retail locations.

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USAT has arguably the biggest base in the world, targeting consumers within unattended retail environments. Looking ahead, we aim to further leverage AI to provide insights across our entire machine base, including layering social media input onto consumer preferences (such as Twitter content on consumers expressing their preferences for snack food or beverages, for example). We also plan to track sales impact from more rapid, targeted merchandising, which aligns with consumer preferences we've identified through better analysis of data.

An important use case for AI is not just about collecting all the data, but also about tracking the

impact from the changes AI is recommending. For example, if you switch out a Coke in a machine with an alternative drink, how does that impact all the other variables in the machine? We look to explore how methods like unsupervised AI can help identify these changes and their impact on the rest of the machine's environment.

If we can deliver a solution that analyzes all of these data points we are collecting in real time, we believe we will be able to offer the most appealing experience for each of our consumers at all of our locations, every time.

BUZZ
VS.

REALITY



VISA

RAJAT TANEJA
President, Technology

AI'S POWER TO PREDICT WILL FUEL THE FUTURE OF PAYMENTS

When a technology term like artificial intelligence (AI) makes its way to the mainstream, it can be co-opted or misused — especially today, when there is a greater urgency to talk about new technologies than to actually understand them. Part of the challenge is that AI has mostly been

defined by what it could be versus what it actually is, leaving consumers confused and perhaps apprehensive about what the technology means in practical terms.

In reality, the type of AI that we see and use today is best described as “narrow” intelligence, meaning it is exceptional at performing a

single, specific task defined by its programmer. We are far off from living in a world in which computers are able to make decisions on their own, for good or bad, which is more accurately defined as “general” AI.

That said, AI has become an excellent tool for detecting and learning more about the patterns that exist within massive data sets, and this is having a profound impact on the payments industry, among many others. The confluence of several trends — the exponential growth of data, advances in computer processing that make it possible to perform millions of mathematical operations in parallel, and breakthroughs in AI algorithms — has given rise to a new wave of AI innovations, and is making payments smarter, safer and more reliable.

Early Adopters

AI has been part of the fabric of Visa from the earliest days. We pioneered the use of AI and neural nets in real-time fraud analytics in the early '90s, and today, this technology is core to our ability to flag and prevent suspicious transactions. Risk-scoring tools like our Advanced Authorization (VAA) helped issuers prevent an estimated \$25 billion in annual fraud last year. Meanwhile, we're helping merchants harness AI for fraud prevention through tools like the CyberSource Decision Manager, which leverages 260 anomaly detectors and 15 risk models to automate and streamline fraud operations.

Beyond fraud detection, we're using sophisticated algorithms to improve the security and resilience

of our network. AI powers several cybersecurity platforms at Visa, allowing us to analyze billions of system events and proactively identify and prevent threats aimed at our company. We're also using AI to help us predict the potential of hardware and software disruptions on the Visa network, giving us insights to prevent problems before they affect Visa clients and account holders.

We are also using our unique data and analytic capabilities to help our clients better serve their customers. Using AI, we can unearth insights for the ecosystem that might be useful in shortening eCommerce transaction times, smoothing the checkout experience at brick-and-mortar storefronts or speeding credit underwriting decisions.

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Making AI Work At Hyper-Scale

Bringing the “AI hype” into the realm of reality is no easy task in the world of real-time payments, where hundreds of millions of transactions in nearly every corner of the globe must be authorized in milliseconds, every single day. Harnessing AI when operating at our scale requires massive computational resources, sophisticated data security and storage, and a critical mass of top talent in both the science and systems of AI.

That’s why we’ve made significant infrastructure investments to unlock the potential of AI for our clients, partners and accountholders. We modernized our data storage platform to improve our ability to create intelligent, entirely data-driven applications. We built powerful AI

and machine learning platforms to create, test and deploy sophisticated models. And we’ve expanded our bench of experts in data science, engineering and research.

These investments have strengthened our ability to harness AI across Visa’s product portfolio and operational systems. Today, we’re piloting several AI-based capabilities that add new layers of intelligence to our core processing and risk management services.

In human terms, I believe we are in the “toddler stage” of AI — we’ve moved beyond infancy, but there is still tremendous room to grow, and we’re reaching new developmental milestones at a stunning pace. It’s impossible to predict what AI could be 10, 20 or 50 years down the road. The innovations that emerge

will impact nearly every sector of the economy, and payments is no exception. Whether it’s AI-powered biometric authentication or sophisticated recommendation systems, AI has the potential to enhance every aspect of the shopping and payments experience.

BUZZ
VS.

REALITY

ABOUT

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PYMNTS.com is where the best minds and the best content meet on the web to learn about “What’s Next” in payments and commerce. Our interactive platform is reinventing the way in which companies in payments share relevant information about the initiatives that shape the future of this dynamic sector and make news. Our data and analytics team includes economists, data scientists and industry analysts who work with companies to measure and quantify the innovation that is at the cutting edge of this new world.

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