The AI Innovation Playbook, a PYMNTS and Brighterion collaboration, analyzes the survey response data of more than 200 financial executives from commercial banks, community banks and credit unions across the United States. We gathered more than 12,000 data points on financial institutions with assets ranging from \$1 billion to more than \$100 billion, then generated a comprehensive overview of how they leverage artificial intelligence and machine learning technology to optimize their businesses. This study details the results of our extensive research.


MOVING TOWARD A FUTURE OF SMART AGENT ADOPTION









The AI Innovation Playbook was done in collaboration with Brighterion, and PYMNTS is grateful for the company's support and insight. <u>PYMNTS.com</u> retains full editorial control over the findings presented, as well as the methodology and data analysis.





INTRODUCTION

here is an old fable about a man whose son was locked behind a door. The man panics, and his gut instinct is to run to the phone and call the fire department. Once he reaches the phone, though, he has a revelation: If he calls the firefighters, they are going to use whichever tools they have at their disposal to fix his problem. In other words, they will either chop up his door with an ax or spray it with a hose. The man decides to call a locksmith instead.

It's a simple enough lesson: People can only use the tools they have at their disposal to solve their problems, so it's best to be careful when selecting where one turns for help. The man in the story knows a firefighter would have solved his problem with an ax. He could have called a surgeon, if he wanted to, but the surgeon would have approached the problem with a scalpel.

Yet, this logic seems to evade decision-makers at most financial institutions (FIs) in the United States, particularly when it comes to deploying artificial intelligence (AI) and machine learning (ML) tools. Although almost all of them now employ some form of ML or Al, most tend to use such technologies in areas for which they are ill-equipped or even highly inefficient.

Most (54.5 percent) surveyed FIs more commonly use data mining to enhance customer lifecycle management than any other type of algorithmic tool, for example, though it is just the third-most effective option for the job. Al systems and neural networks would be more efficient, but just 2.5 percent and 1.5 percent of FIs employ them for this use case, respectively.

This is the banker's equivalent of trying to open a locked door with a scalpel when a locksmith is right down the street. It is both highly inefficient to use data mining in this way and carries an enormous opportunity cost, taking up far more time and resources than necessary. It would be easier and more affordable to simply use true AI systems or neural networks in the first place. So, why do FIs continue to utilize ML and AI systems in areas for which they are ill-suited? More importantly, what do they need to do to correct these mistakes?

In November 2018, PYMNTS conducted a survey of 200-plus FI decision-makers throughout the U.S. regarding how they leverage ML and AI systems to optimize their businesses. Respondents hailed from FIs of various sizes and types, from credit unions to commercial banks and holding anywhere from \$1 billion to more than \$100 billion in assets. This provided a clear picture of such technologies' current usage in the financial industry, and led us to discover what we refer to as the "AI gap" — the difference between what banks consider to be AI and how they use it, versus what it actually is and the limits of what it can accomplish.

¹ Kahn, J. Just how shallow is the artificial intelligence talent pool? Bloomberg. 2018. <u>https://www.bloomberg.com/rent-pool</u>. Accessed April 2019.

Most American FIs' decision-makers have only the vaguest understanding of what differentiates ML and AI systems. There are remarkably few true AI experts in the world, with some sources estimating the global talent pool to be just 10,000 strong.¹ It is thus only natural that some FIs would have trouble choosing between available systems to solve their various pain points.

It would also not be accurate to blame FIs for implementing AI and ML in areas in which it might be more appropriate to apply other solutions. These decision-makers are doing their best to address operational issues with the tools they have, and not all of them have AI. Most appear to understand that their AI and ML usage can be improved, however, but are frankly unsure if the return on investment (ROI) is worth it.

w.bloomberg.com/news/articles/2018-02-07/just-how-shallow-is-the-artificial-intelligence-tal-

The Smart Agent Adoption edition of our playbook homes in on these key insights, providing an overview of what decision-makers must keep in mind when weighing their ML and AI options. This includes the following five key takeaways:



Most FIs appear to understand that their current ML and AI systems have limitations. They plan to address those restrictions, however – primarily through further AI and ML investments.

Most decision-makers still feel these systems' benefits outweigh their limitations, so much so that 61.0 percent intend to make additional ML and AI investments over the next three years. Another 49.5 percent are planning to hire more experienced employees to help manage their current systems, and 38.5 percent intend to upgrade those systems.

Moreover, banks of varying sizes have different strategies when addressing ML and AI systems' limitations. Larger banks with \$5 billion to \$100 billion in assets appear more prone to planning further investments, cited by 76.7 percent of those with between \$5 billion and \$25 billion and 78.9 percent with \$25 billion to \$100 billion. The 81.8 percent of FIs holding more than \$100 billion in assets — many of which have already implemented ML and AI systems — are the most likely to address their current setups' limitations through upgrades.



A large portion of American FIs express interest in adopting smart agent technology, with commercial banks being the most enthusiastic.

In fact, according to our research, 41.1 perecent of them are "very" or "extremely" interested in adopting smart agents, as are 27.3 percent of credit unions, 72.7 percent of those holding more than \$100 billion in assets and 48.8 percent of those with between \$5 billion and \$25 billion in assets.



Fls believe smart agents can make the greatest impact in their anti-fraud and credit underwriting business units.

More than 45 percent of fraud prevention decision-makers would like to adopt smart agents, but FIs' interest in doing so varies by type and size. Commercial banks are the most enthusiastic about adopting them and using them for several business units, like banking services, credit underwriting, fraud prevention and payment services, among others.



Many of the factors hindering wider financial sector smart-agent adoption have more to do with FIs' limitations, not those of the technology.

In total, 36.0 percent of decision-makers in our study are "slightly" or "not at all" interested in adopting smart agents, with approximately 58.1 percent of this group citing that its benefits are intangible. Its other hinderances include lacking employees with the skillsets to handle the technologies (50.0 percent) and the belief that the technologies are too complicated (35.1 percent). Neither issue pertains to the abilities and limitations of AI and ML, but rather those of the FIs using such solutions.



Some FIs have adopted AI systems and are highly satisfied with their performance. In fact, those that use them tend to be more satisfied than those using any other algorithmic tool.

The FIs that have already implemented AI systems are few and far between, but they cite a greater number of benefits to using them than those employing other systems. Our findings show 63.6 percent say AI solutions reduce the need for manual exception management or review, minimize fraud risk and increase customer satisfaction, for example.

The following pages will outline what drives financial sector AI and ML usage, and parse out a roadmap for future system and smart agent adoptions.

Brighterion PYMNTS.com

PLANNING FOR THE FUTURE



I and ML may make headlines, but both are still extremely niche areas of expertise. Very few professionals are trained and practiced enough to best apply these technologies in everyday operations, and FIs have a limited understanding of such systems' capabilities. Nevertheless, their ML and AI system experiences have taught them that both have limitations, and

FIGURE 1:

How FIs plan to address current learning systems' limitations Share expressing select plans to improve overall AI and ML system usage, by solution and size PLAN TO ADDRESS LIMITATIONS FURTHER INVESTMENTS 61.0% 63.6% 78.9% 76.7% 52.8% HIRE ADDITIONAL EXPERTS 49.5% 36.4% 47.4% 44.2% 52.8% UPGRADE TO NEW VERSION 81.8% 47.4% 38.5% 55.8% **INCREASE BUDGET** 35.5% 26.3% 32.6% 40.9% CHANGE SERVICE PROVIDERS 20.5% 27.3% 26.3% DO NOT HAVE A PLAN 2.5%

many FIs intend to address those restrictions through further investments.

The most popular approach is to double down, cited by 61.0 percent of respondents, followed by hiring more experienced employees (49.5 percent) and upgrading to new versions (38.5 percent). Fls also plan to invest in addressing their current systems'

ASSET SIZE 27.6% 0.0% 11.6% 22.0% 0.0% 2.3% 2.4% ■ \$1B-\$5B ■ \$5B-\$25B \$100B+ \$25B-\$100B

FIGURE 2:

limitations, with 81.8 percent of large banks working to upgrade, and 27.3 percent open to changing providers to solve their problems.

The solutions FIs consider tend to vary by size. It appears that 81.8 percent of those with assets above \$100 billion prefer upgrading to new technology versions, for example, while just 27.6 percent of small FIs see this as a solution. The latter favored hiring more

Interest in implementing smart agent systems

Share of FIs interested in adopting smart agent technology, by institution type

experienced employees, though, cited by 52.8 percent compared to 36.4 percent of large Fls.

Countless ML and AI systems are available to help banks optimize their operations, but one stands to benefit them the most: smart agents. These solutions represent a very particular form of AI, using large collections of Al-based digital entities called "smart agents"

to gather, analyze and utilize data collected from various market actors. These can include anything and anyone - from point-ofsale (POS) systems to individual customers to entire banks - and their capacity allows them to cut costs, crunch time and deliver highly customized results in banking services, fraud protection and beyond.

FIGURE 3:

Interest in implementing smart agent systems Share of FIs interested in adopting smart agent technology, by asset size



Despite these potential benefits, no FIs in our sample reported using smart agent technology. Many decision-makers expressed interest in adopting it, but their enthusiasm varies by the type of institution for which they work. Commercial banks are the most likely to be "very" or "extremely" interested in acquiring smart agents at 41.1 percent. Credit unions are slightly less excited about the proposition

(27.3 percent), followed by community banks (12.1 percent). This makes sense, given that commercial banks tend to have more resources to implement smart systems - and hire or train personnel to handle them - than their credit union and community bank counterparts.

Larger FIs tend to express greater interest in adopting smart agents than smaller ones, too. Our data shows 72.7 percent of the former say they would be "very" or "extremely"

interested in acquiring available systems, as did just 13.4 percent of the smallest. Thus, it appears large FIs with more than \$5 billion in assets are most interested in adopting smart agents.

It is unfortunate that smaller banks seem wary of investing in smart agent technology. Larger FIs are not the only ones that could benefit from it, but smaller firms already seem to know this.



"VERY" OR "EXTREMELY"

Brighterion PYMNTS.com



WHY BANKS ARE INTERESTED IN ADOPTING SMART AGENT TECHNOLOGY



he decision-makers who would be interested in implementing smart agents seem to have a very clear idea of how and where the technology could improve their operations. More interestingly, those from certain units appear more likely than others to be interested at all. The most enthusiastic worked in fraud detection, with 45.0 percent either "very" or "extremely" interested in adopting smart agents.

FIGURE 4:

Business units' interest in smart agents Share reporting interest in adoption, by business unit



45.0% of decision-makers working in **fraud detection** are interested in adopting smart agents.

Decision-makers who work in accounts payable and receivable are the second- and third-most likely, respectively, to express interest in implementing smart agent systems. Just 36.7 percent of those in the former and 29.6 percent in the latter say they would consider adopting the technology.

It makes sense that decision-makers in fraud protection would be most interested in smart agents, as the systems are particularly well-suited for such operations. Their ability to collect, analyze and learn from vast amounts of data allows them to decipher differences in genuine and fraudulent customer behaviors with tremendous accuracy, which can also be very useful in accounts payable and receivable. That said, smart agent applications go far beyond these use cases. Many decision-makers are not only interested in adoption for their own usage, but also to benefit other business units. The most frequently cited include banking services, internal fraud and credit underwriting, respectively,



followed by payments services, customer lifecycle management and, to a lesser degree, compliance and regulation.

Once again, decision-makers' interest in smart agents for each use case varies considerably by the type of FI for which they work. Those employed by commercial banks are the most likely to express interest in implementing smart agents for banking services (72.1 percent) and fraud protection

\$100B+



(63.2 percent). By contrast, just 53.0 percent of credit unions and 42.4 percent of community banks would be interested in doing so for banking services, while 47.0 percent and 40.9 percent, respectively, would do so to fight internal fraud.

Again, we see larger banks expressing more interest in adopting smart agents than smaller ones. In fact, 100 percent of those with more than \$100 billion in assets say they FIGURE 6:

would like to deploy the technology for banking services, compared to just 38.6 percent of those with between \$1 billion and \$5 billion in assets. It is possible that smaller banks are wary of adopting smart agents due to their complexity and cost, topics we will explore in greater depth later.

The largest FIs are not the most interested in adopting smart agents for fraud protection, however. Those with \$25 billion to \$100 billion in assets are more open to implementing the technology to boost such measures than any other group, including those holding more than \$100 billion. Most (81.8 percent) of the surveyed FIs with assets exceeding \$100 billion and 74.4 percent of those holding \$5 billion to \$25 billion say the same.

The reasons why are not entirely clear, though sample credit unions may be less interested because they feel they lack the resources

Commercial banks Community banks

Credit unions

of FIs with assets exceeding \$100 billion are interested in using smart agents

needed to effectively manage smart agent systems. Our data supports this hypothesis. FIs have several reasons for being "slightly" or "not at all" interested in adoption, a group which includes approximately 36.0 percent of the total sample. Not all decision-makers are entirely sure how to quantify the technology's benefits, as 58.1 percent of the reluctant consider smart agents' benefits intangible. This aspect is not so much about the technology's capabilities as decision-makers not knowing how to communicate its value or bottom-line impacts.

Our research found that decision-makers' smart agent implementation concerns often have less to do with capabilities than their organizations' limitations. Fifty percent of FIs that are slightly or not at all interested in smart agents say they lack the skillsets

Concerns about implementing smart agents, by FI type Share of respondents expressing select concerns smart agent technology adoption CONCERNS **INSTITUTION TYPE** INTANGIBLE BENEFITS 581% 50.0% 58.1% 6219 LACK NECESSARY SKILLSETS 50.0% 42.9% 48.4% 55.2% UNTRUSTWORTHY RESULTS 28.4% 214% 387% 20.7IMPLEMENTATION IS TOO EXPENSIVE 36.5% 42.9% 35.5% 34.5% TECHNOLOGY IS TOO COMPLICATED 351% 28.6% 41.9% 31.0% SYSTEMS ARE TOO COMPLICATED 21.6% 21.4% 22.6%

Brighterion PYMNTS.com

to enhance their fights against fraud.

to properly handle such advanced systems, and another 35.1 percent say the technology is simply too complicated. In both cases, concerns are not that smart agents would yield few benefits, but rather that the FIs do not have the necessary personnel for proper adoption. In the end, it is decision-makers' inability to quantify these benefits and their lack of familiarity with the systems that most hinders wider implementation.

Smart agents offer myriad possible benefits, yet respondents still seem to see their benefits as just possibilities. Some decision-makers perceive their benefits as intangible, revealing there is still a lot of work to be done in educating them - particularly those at smaller FIs - on how smart agents can be used to gain a competitive edge.

AI BENEFITS, ACCORDING TO THE BANKS THAT USE IT

here is an opportunity cost to implementing AI or ML systems in the wrong place. Case-based reasoning applied in an area requiring systems to analyze and adapt to new information will produce operational frictions that could be avoided by using AI or deep learning, for example. The question is, which applications are best for which learning systems? The decision-makers in our sample have first-hand experience here, meaning they know what works and what doesn't — and they say AI systems work.

Although none of our sample FIs reported using smart agents, 5.5 percent had implemented other AI systems and were highly satisfied with overall performance. Banks that use AI systems are more satisfied with the technology than those using business rule management systems (BRMS), data mining, fuzzy logic or other algorithmic tools. In this sense, the rarest tools have the highest satisfaction rate among the FIs that use them, as they notice more AI benefits than with other learning systems. Conversely, those that use more common learning systems tend to be far less satisfied, but this varies by application.

For most FIs, AI and ML systems' primary benefits include reducing manual processes and lessening payments fraud. More banks reported benefits from AI than any other learning



TABLE 1:

Fls' reported benefits of using learning systems

Share of decision-makers citing select smart agent technology benefits

	MEDIAN	Business rule management	Data mining	Case-based rea- soning	Fuzzy logic	Deep learning and neural networks	AI systems
Reduced manual review	55.4%	49.6%	71.6%	57.8%	44.8%	52.9%	63.6%
Reduced manual exception management	51.5%	47.1%	54.6%	50.0%	41.4%	52.9%	63.6%
Reduced payments fraud	43.1%	17.6%	28.4%	39.1%	65.5%	47.1%	63.6%
Improved customer satisfaction	43.0%	44.5%	39.0%	32.8%	41.4%	58.8%	63.6%
Reduced false positives	37.9%	42.0%	27.7%	34.4%	41.4%	29.4%	54.5%
Reduced fraud personnel management	36.8%	21.0%	1 5.6 %	21.9%	51.7%	58.8%	63.6%
Improved money laundering identification	31.3%	16.8%	18.4%	28.1%	34.5%	52.9%	36.4%
Improved fraud prevention	30.5%	16.8%	22.0%	39.1%	58.6%	17.6%	63.6%
Decreased credit and portfolio risk	25.0%	20.2%	58.2 %	26.6%	17.2%	23.5%	27.3%
Reduced charge offs	24.3%	31.1%	9.2%	25.0%	17.2%	23.5%	63.6%
Improved delinquent debt collection	19.2%	17.6%	10.6%	25.0%	20.7%	23.5%	9.1%
Improved borrower identification	18.5%	19.3%	70.9%	7.8%	3.4%	17.6%	27.3%
Improved targeted banking services	17.4%	14.3%	63.8%	20.3%	17.2%	17.6%	9.1%

system in six of the 13 use cases studied, and decision-makers whose companies already use it say AI reduced manual exception management (63.6 percent), manual review (63.6 percent) and payment fraud (63.6 percent) and increased customer satisfaction (63.6).

By contrast, decision-makers are less likely to report that BRMS, case-based reasoning, data mining, fuzzy logic and neural networks benefit them in any of these ways. This may be because most banks use ML and AI to perform operations to which they are not well-suited, particularly with regard to fighting fraud and manage credit risk.

Fighting fraud and managing credit risk represent two of the three areas in which FIs express the most interest in smart agent technology implementation. Most in our sample use learning systems that are far less sophisticated and versatile than true AI - including data mining (70.5 percent), BRMS (59.5 percent) and case-based reasoning (32.0 percent) - to enhance these operations, but tend to employ them in relatively ineffective ways.

Take FIs' case-based reasoning usage, for example, which sees 53.1 percent of those

TABLE 2:

Algorithmic tools used to combat fraud and support credit Al tools respondents report using for credit risk and fraud tasks

	MEDIAN	Business rule management	Data mining	Case-based rea- soning	Fuzzy logic	Deep learning and neural networks	AI systems
Banking services	79.7%	86.6%	87.2%	59.4%	41.4%	76.5%	81.8%
Payment services	53.7%	43.7%	63.8%	39.1%	13.8%	82.4%	63.6%
Credit underwriting	22.3%	16.0%	82.3%	17.2%	17.2%	47.1%	27.3%
Customer lifecycle management	23.7%	20.2%	77.3%	53.1%	10.3%	17.6%	27.3%
Internal fraud	29.6%	20.2%	8.5%	39.1%	69.0%	17.6%	72.7%
Compliance/regulation	17.9%	49.6%	7.8%	31.3%	10.3%	17.6%	18.2%
Collections	16.4%	12.6%	7.1%	15.6%	17.2%	64.7%	27.3%
Merchant services	12.6%	12.6%	22.0%	12.5%	10.3%	47.1%	9.1%
Supplier onboarding	8.5%	9.2%	7.1%	7.8%	0.0%	23.5%	18.2%

that use it doing so to enhance customer lifecycle management. The problem is that case-based reasoning is the least-effective learning system for this use case: It cannot learn from new data it collects, and customers' financial behaviors are often simply too complex for the system to effectively track, making it a bad overall fit here.

Another example can be found in how FIs use data mining. The learning system has become almost ubiguitous in the financial sector, and is the most commonly used in our study including for fighting fraud and supporting

it	und	erw	/ritin	ıg
		-		-

credit underwriting systems - but is not always the most effective option for the task at hand. As explored in our last Playbook, Al systems are the best option for customer lifecycle management and a host of other functions.² BRMS and data mining are good starts for the FIs looking to automate operations, but aren't as effective as smart agents at complex processes like banking services.

Meanwhile, most firms that use AI systems are doing so to enhance their banking services (81.8 percent) and combat internal fraud (72.7 percent). In fact, AI systems (72.7 percent) and fuzzy logic (69.0 percent) are being implemented to combat internal fraud more than any other method, while BRMS (86.6 percent) and data mining (87.2 percent) are used for banking services.

of FIs that use AI systems cite lack of transparency as one of the technology's limitations.

TABLE 3:

FIs' reported limitations associated with various learning systems

Share of decision-makers reporting select limitations of employed learning systems

	MEDIAN	Business rule management	Data mining	Case-based rea- soning	Fuzzy logic	Deep learning and neural networks	AI systems
Not transparent enough	42.3%	35.3%	37.6%	39.1%	55.2%	52.9%	45.5%
Unable to quantify ROI	35.6%	39.5%	34.8%	34.4%	48.3%	23.5%	36.4%
Limited to the data sets	27.2%	30.3%	40.4%	40.6%	24.1%	5.9%	9.1%
Complicated and time consuming	23.0%	22.7%	23.4%	15.6%	20.7%	35.3%	36.4%
Requires manual intervention	22.6%	37.0%	27.0%	35.9%	17.2%	17.6%	18.2%
Does not work in real time	22.4%	26.1%	34.0%	18.8%	37.9 %	17.6%	9.1%
Multiple solution providers	18.9%	20.2%	17.0%	21.9%	13.8 %	17.6%	27.3%
Unable to adapt	7.5%	2.5%	5.7%	10.9%	10.3%	5.9%	9.1%
Existing systems work fine	7.4%	4.2%	3.5%	7.8%	6.9%	11.8%	9.1%
Unable to identify behaviors	1.8%	4.2%	3.5%	0.0%	0.0%	11.8%	0.0%

⁴⁰ Author unknown. The AI Gap. PYMNTS. 2019. https://www.pymnts.com/study/ai-gap-study/. Accessed April 2019

These are precisely the types of operations in which AI systems - smart agents, in particular – are most effective, so it is unsurprising that banks tend to be more satisfied with it here.

This does not mean AI systems are perfect, of course. Banks that use them have misgivings about the technology, though most of their frustrations stem from organizational limitations. Among those that said their Al systems had restrictions, most cited lack of transparency (45.5 percent) or an inability to calculate ROI (36.4 percent). This is painful, as it means even FIs that implement AI aren't creating support networks - such as metrics to measure progress - to reap their full benefits.

When we broke these limitations down by

45.5%

technology, lack of transparency emerged as users' main issue associated with fuzzy logic (55.2 percent) and neural networks (52.9 percent).

Meanwhile, 36.4 percent of AI users called the technology complicated and time consuming, and 27.3 percent said that the multiple solution providers required were problematic. Many such issues speak not only to AI systems' complexity, but also to FIs' ongoing AI and ML implementation struggles. No one is there to instruct them, so most are forced to learn through trial and error.

Luckily, we now have enough data on what works, meaning FIs looking to finance AI and ML projects in the future will be able to look back, reflect and make more informed investment decisions.



nough FIs have now implemented AI and ML systems that others can look to their experiences to understand capabilities and limitations. Those that haven't are advised not to learn the hard way: AI and ML systems are not created equal, and the data shows that settling for what's currently available simply will not cut it.

Banks of all types and sizes stand to benefit from building up their AI and ML repertoires. Not all of them seem to know this yet, but the longer FIs avoid investing in the right technologies for the job, the longer they forgo incalculable profits due to opportunity costs.



METHODOLOGY

FIGURE 7:

How banks budget for AI and ML systems Portion of respondents whose businesses allocate select budgets for AI and ML operations, by size



he Al Innovation Playbook: Smart Agent Adoption edition, a PYMNTS and Brighterion collaboration, draws its data from an extensive survey that investigated how FIs leverage a wide variety of supervised and unsupervised learning systems to optimize payments, cash flow management, regulatory and credit risk, financial fraud and other business operations. Though most may not qualify as true Al, and despite both their perceived costs and a lack of understanding hindering implementation, these learning systems still help businesses alleviate operational pain points.



To learn more about how FIs are leveraging these technologies, we interviewed 200-plus senior executives at commercial banks, community banks and credit unions with assets between \$1 billion and more than \$100 billion. The industry distribution of participating firms was almost evenly split, with each representing approximately one-third of the overall sample.

As shown in Figure 9, most participating firms held assets between \$1 billion and \$25 billion, and approximately 15 percent held more than \$25 billion.

Participating FIs were also diverse in terms of the number of branches they managed. The sample included banks and credit unions with anywhere from a single branch to more than 5,000 locations across the United States, and half of all the FIs we surveyed managed between one and 25 branches.



PYMNTS.com

ABOUT

<u>PYMNTS.com</u> 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.

Brighterion

Brighterion, a Mastercard company, offers a portfolio of artificial intelligence and machine learning technologies, providing real-time intelligence from all data sources regardless of type, complexity and volume. Brighterion's technology is and serves as a general-purpose AI platform across varying industries to manage anti-money laundering, acquiring fraud, omni-channel fraud, early delinquency/ collections and credit risk for businesses, governments and healthcare organizations through personalization, adaptability and self-learning that enables discovery, identification and mitigation of anomalous activities.

We are interested in your feedback on this report. Please send thoughts, comments, suggestions or questions to <u>theaigap@pymnts.com</u>. The AI Innovation Playbook: Smart Agent Adoption edition may be updated periodically. While reasonable efforts are made to keep the content accurate and up-to-date, PYMNTS.COM: MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND, EXPRESS OR IMPLIED, REGARDING THE CORRECTNESS, ACCURACY, COMPLETENESS, ADEQUACY, OR RELIABILITY OF OR THE USE OF OR RESULTS THAT MAY BE GENERATED FROM THE USE OF THE INFORMATION OR THAT THE CONTENT WILL SATISFY YOUR REQUIREMENTS OR EXPECTATIONS. THE CONTENT IS PROVIDED "AS IS" AND ON AN "AS AVAILABLE" BASIS. YOU EXPRESSLY AGREE THAT YOUR USE OF THE CONTENT IS AT YOUR SOLE RISK. PYMNTS.COM SHALL HAVE NO LIABILITY FOR ANY INTERRUPTIONS IN THE CONTENT THAT IS PROVIDED AND DISCLAIMS ALL WARRANTIES WITH REGARD TO THE CONTENT, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, AND NON-INFRINGEMENT AND TITLE. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OF CERTAIN WARRANTIES, AND, IN SUCH CASES, THE STATED EXCLUSIONS DO NOT APPLY. PYMNTS.COM RESERVES THE RIGHT AND SHOULD NOT BE LIABLE SHOULD IT EXERCISE ITS RIGHT TO MODIFY, INTERRUPT, OR DISCONTINUE THE AVAILABILITY OF THE CONTENT OR ANY COMPONENT OF IT WITH OR WITHOUT NOTICE.

PYMNTS.COM SHALL NOT BE LIABLE FOR ANY DAMAGES WHATSOEVER, AND, IN PARTICULAR, SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, CONSEQUENTIAL, OR INCIDENTAL DAMAGES, OR DAMAGES FOR LOST PROFITS, LOSS OF REVENUE, OR LOSS OF USE, ARISING OUT OF OR RELATED TO THE CONTENT, WHETHER SUCH DAMAGES ARISE IN CONTRACT, NEGLIGENCE, TORT, UNDER STATUTE, IN EQUITY, AT LAW, OR OTHERWISE, EVEN IF PYMNTS.COM HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

SOME JURISDICTIONS DO NOT ALLOW FOR THE LIMITATION OR EXCLUSION OF LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, AND IN SUCH CASES SOME OF THE ABOVE LIMITATIONS DO NOT APPLY. THE ABOVE DISCLAIMERS AND LIMITATIONS ARE PROVIDED BY PYMNTS.COM AND ITS PARENTS, AFFILIATED AND RELATED COMPANIES, CONTRACTORS, AND SPONSORS, AND EACH OF ITS RESPECTIVE DIRECTORS, OFFICERS, MEMBERS, EMPLOYEES, AGENTS, CONTENT COMPONENT PROVIDERS, LICENSORS, AND ADVISERS.

Components of the content original to and the compilation produced by PYMNTS.COM is the property of PYMNTS.COM and cannot be reproduced without its prior written permission.

You agree to indemnify and hold harmless, PYMNTS.COM, its parents, affiliated and related companies, contractors and sponsors, and each of its respective directors, officers, members, employees, agents, content component providers, licensors, and advisers, from and against any and all claims, actions, demands, liabilities, costs, and expenses, including, without limitation, reasonable attorneys' fees, resulting from your breach of any provision of this Agreement, your access to or use of the content provided to you, the PYMNTS.COM services, or any third party's rights, including, but not limited to, copyright, patent, other proprietary rights, and defamation law. You agree to cooperate fully with PYMNTS.COM in developing and asserting any available defenses in connection with a claim subject to indemnification by you under this Agreement.