



# AiteNovarica

DECEMBER 2021

## AITE MATRIX: LEADING FRAUD & AML MACHINE LEARNING PLATFORMS

FINANCIAL CRIME DETECTION'S  
NEXT FRONTIER

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TRACE FOOSHÉE  
CHARLES SUBRT

This excerpt is provided compliments of this  
Best-in-Class vendor:

**NICE** ■ ACTIMIZE

## IMPACT REPORT

# TABLE OF CONTENTS

INTRODUCTION..... 3

    METHODOLOGY ..... 3

THE PLAYERS ..... 5

THE MARKET..... 8

KEY STATISTICS.....11

    ANNUAL REVENUE ESTIMATES ANALYSIS .....11

    PROFITABILITY ANALYSIS.....12

    GROWTH RATE ANALYSIS.....13

    R&D INVESTMENT ANALYSIS.....14

    MACHINE LEARNING PRODUCTION INSTALLATION  
    ANALYSIS.....15

    DEPLOYMENT OPTIONS ANALYSIS.....17

AITE MATRIX EVALUATION.....18

    THE AITE MATRIX COMPONENTS ANALYSIS.....18

    THE AITE MATRIX RECOGNITION .....20

BEST IN CLASS: NICE ACTIMIZE .....23

CONCLUSION.....30

ABOUT AITE-NOVARICA GROUP .....31

    CONTACT .....31

    AUTHOR INFORMATION .....31

## LIST OF FIGURES

FIGURE 1: ANNUAL REVENUE ESTIMATES ANALYSIS.....12

FIGURE 2: PROFITABILITY ANALYSIS.....13

FIGURE 3: GROWTH RATE ANALYSIS.....14

FIGURE 4: R&D INVESTMENT ANALYSIS .....15

FIGURE 5: MACHINE LEARNING PRODUCTION INSTALLATION  
ANALYSIS.....16

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FIGURE 6: AVERAGE NET NEW CLIENT WINS FOR MACHINE LEARNING ANALYTICS PRODUCTION INSTALLATIONS 16

FIGURE 7: DEPLOYMENT OPTIONS ANALYSIS ..... 17

FIGURE 8: AITE MATRIX COMPONENTS ANALYSIS BY HEAT MAP ..... 18

FIGURE 9: FRAUD AND AML MACHINE LEARNING PLATFORM AITE MATRIX..... 21

## LIST OF TABLES

---

TABLE A: EVALUATED VENDORS ..... 5

TABLE B: MARKET TRENDS AND HOW THEY SHAPE THE FRAUD AND AML MACHINE LEARNING MARKET ..... 8

TABLE C: KEY STRENGTHS AND IMPROVEMENT OPPORTUNITIES—NICE ACTIMIZE..... 28

## INTRODUCTION

The impact that financial crime has on the financial services industry continues to expand and with it, the pressure to find innovative strategies and solutions for striking a more optimal balance between loss reduction, client experience, operating efficiency, and regulatory compliance. Fortunately, as the criminal elements have become better organized and more sophisticated, so too have the risk management strategies and, importantly, the detection systems and practices for disrupting the criminals' activities. As the adoption of advancements in applied analytics has propagated through the industry, fraud and AML have proven to be among the most appealing use cases in terms of return on investment. This has transformed the market for fraud and AML solutions and, in doing so, is reshaping how fraud and AML practitioners approach the design, development, and transformation of their control frameworks.

Among the most significant developments of this evolving market are the emergence of fraud and AML detection solutions that provide FIs with the ability to optimize the performance of their controls by way of applying advanced analytical techniques to discover, develop, test, deploy, and tune highly customized detection logic and policy administration. These machine learning platforms and ecosystems have created a new segment of the market for fraud and AML detection solutions.

This Impact Report explores the evolving market for these fraud and AML detection solutions as well as the factors that FIs should consider in their pursuit of transforming their control frameworks. This Impact Report also compares and contrasts the leading vendors' offerings and strategies, and it highlights their primary strengths and challenges. Finally, to help FIs make more informed decisions as they select new technology partners, this report recognizes specific vendors for their strengths in critical areas.

## METHODOLOGY

Leveraging the Aite Matrix, a proprietary Aite-Novarica Group vendor assessment framework, this Impact Report evaluates the overall competitive position of each vendor, focusing on vendor stability, client strength, product features, and client services. The following criteria were applied to develop a list of vendors for participation:

- Each participating vendor must have in production fraud and AML detection deployments in financial services, and its platforms must be able to support the deployment of (and have in production) customized machine learning analytics across multiple fraud and AML use cases.
- Each participating vendor must be able to support supervised and unsupervised model development, native custom model development authoring environments, the capacity to import and export custom model coding, on-premises and cloud-based deployments, and a robust set of APIs that enable external systems to trigger runtime execution of risk scoring tests that output results in real time.
- Each participating vendor must have had more than US\$25 million in annual revenue in one of the last two prior years.

Participating vendors were required to complete a detailed product request for information (RFI) composed of both qualitative and quantitative questions, conduct a product briefing and demo, and provide active client references.

To further develop an overview of the trends and capabilities shaping the fraud and AML machine learning solution market, additional information to produce this Impact Report was collected through surveys and interviews with financial crime executives at FIs across the globe, along with desk research.

## THE PLAYERS

This section presents comparative data and profiles for the individual vendors that were formally assessed in this Aite Matrix evaluation. This is by no means an exhaustive list of vendors, and firms looking to undergo a vendor selection process should conduct initial due diligence prior to assembling a list of vendors appropriate for their own unique needs. Table A presents basic vendor information for the evaluated solutions.

TABLE A: EVALUATED VENDORS

FIRM	HEADQUARTERS	YEARS IN BUSINESS	TARGET MARKET	NUMBER OF EMPLOYEES	NUMBER OF MACHINE LEARNING CLIENTS
ACI Worldwide	Miami, Florida	46	Issuers, processors, intermediaries, acquirers, merchants, central infrastructures, and payment service providers—covering the entire payment ecosystem	4,000	220
DataVisor	Mountain View, California	7	Financial services, insurance, airline, telecom, internet, e-commerce, and marketplaces	Over 140	75
Featurespace	Cambridge, U.K.	13	FIs, issuing and acquiring processors, and insurance and gaming firms	334	44
Feedzai	San Mateo, California	12	FIs, large merchants, issuing processors, and acquiring processors	500	67

FIRM	HEADQUARTERS	YEARS IN BUSINESS	TARGET MARKET	NUMBER OF EMPLOYEES	NUMBER OF MACHINE LEARNING CLIENTS
<b>GBG</b>	United Kingdom	31	Banks, fintech firms, building societies, credit unions, digital banks, remittance, person-to-person lending, auto finance and auto leasing, and insurance	1,000	3
<b>INFORM</b>	Aachen, Germany	51	Banking, payment service providers, insurance, and telecommunications	850	75
<b>ISoft</b>	Saint Aubin, Paris, France	31	Fls, payments processors, insurance, and e-commerce merchants as well as governments	60	Not disclosed
<b>LexisNexis Risk Solutions</b>	Alpharetta, Georgia	21	Fls, healthcare, insurance, payment processors, government, hospitality/gaming, communications, mobile, media, utilities, social media, software services, money transfer, and logistics	9,000	Not disclosed
<b>NetGuardians</b>	Yverdon-les-Bains, Switzerland	11	Top-tiered banks (through partners and the standard solution)	Over 90	53

FIRM	HEADQUARTERS	YEARS IN BUSINESS	TARGET MARKET	NUMBER OF EMPLOYEES	NUMBER OF MACHINE LEARNING CLIENTS
NICE Actimize	Hoboken, New Jersey	22	FIs, credit unions, insurers, midsize to small businesses, payments providers, gaming, and casinos	Over 1,600	430
SAS	Cary, North Carolina	45	FIs, issuing processors, acquiring processors, and merchants	13,939	120

Source: Vendors



## THE MARKET

The tide of financial crime continues to rise and with it, a continued increase in market activity for detection solutions in general. As more FIs seek to transform their legacy control frameworks into those that more closely resemble the emerging control framework model, machine learning platforms will likely enjoy an increasing share of the overall market, though much of this adoption will likely be additive rather than cannibalistic.

The following market trends are shaping the present and future of the market for fraud and AML machine learning platform solutions (Table B).

TABLE B: MARKET TRENDS AND HOW THEY SHAPE THE FRAUD AND AML MACHINE LEARNING MARKET

MARKET TREND	IMPACT
<p>Demand is strong and growing for platform and ecosystem-based risk engines that are abstracted from signal detection systems.</p>	<p>FIs that have the resources and capabilities to support transforming their legacy control frameworks with machine learning platforms and ecosystems will enjoy benefits from improvements to detection rates, accuracy, and operating efficiency that outpace the benefits from making incremental improvements to legacy control framework models.</p>
<p>The number of vendor solutions has been increasing as the scope and sophistication of financial crime expand.</p>	<p>As control frameworks have expanded to mitigate risks, solution providers have sought to meet expanding demand through innovations in their core technology, how they position themselves in the control framework, and which segments of the market they emphasize. Practitioners have responded by rethinking relevant use cases and the overall control framework models. Moreover, the overall scope of the market has expanded to include nonfinancial organizations such as merchants.</p>

MARKET TREND	IMPACT
<p>The barriers that have inhibited FIs from adopting and maturing their capacity to leverage advanced analytical techniques will remain a headwind to adoption but will diminish as vendors improve model development automation and guidance.</p>	<p>The market for machine learning platforms and, perhaps especially, ecosystems will expand as an increasing number of FIs mature their nascent data science capabilities and as more vendors continue to advance model development automation, guidance, and documentation features.</p>
<p>Differences between fraud and AML (e.g., financial crime operational structures, ownership, needs, regulatory context) have driven divergent approaches to how solution providers approach the market.</p>	<p>As the convergence movement and control framework models, along with experience with emerging segments of those models (like those that leverage machine learning), continue to mature, an increased adoption of solutions that support a cohesive approach and a more robust range of use cases is likely.</p>
<p>Differences in the needs, resources, and risk appetites of big and small financial organizations have played (and will continue to play) a huge role in how the market is structured.</p>	<p>As the needs among smaller, midsize, and larger institutions mature, the approaches that solution providers take will get more nuanced as niches emerge and market opportunities are exposed. As differences solidify and the niches stabilize, so too will the smaller segments of the market and the players in it.</p>
<p>One of the biggest drivers in innovation has been the adoption and proliferation of applied analytics and advancements among both the practitioners and the solution providers in terms of the degree to which they use and benefit from these practices.</p>	<p>Many firms want the benefits of applying advanced analytics without spending the time and money necessary to mature their capacity to develop and manage the data science. Taken as a discrete group, these firms represent a segment of the market that is interested in prepackaged offerings that feature lower costs and increased time to value, often at the expense of less agility and flexibility in terms of use cases or functionality. This has been a significant driver behind Software-as-a-Service (SaaS) offerings and the increasing push for offerings targeting the non-data scientist.</p>

MARKET TREND	IMPACT
<p>Regulators are becoming less averse to the adoption of advanced detection systems, such as those that machine learning platforms and ecosystems leverage. Yet, along with increased adoption of solutions with advanced analytics has come the need to provide more transparency for regulators.</p>	<p>Receding concerns over the use of machine learning modeling to manage detection logic and the continually maturing nature of model risk management processes will add fuel to the additive growth in the market for machine learning platforms and ecosystems.</p>

Source: Aite-Novarica Group

## KEY STATISTICS

This section provides information and analysis on key market statistics related to the fraud and AML machine learning platform vendor market.<sup>1</sup>

### ANNUAL REVENUE ESTIMATES ANALYSIS

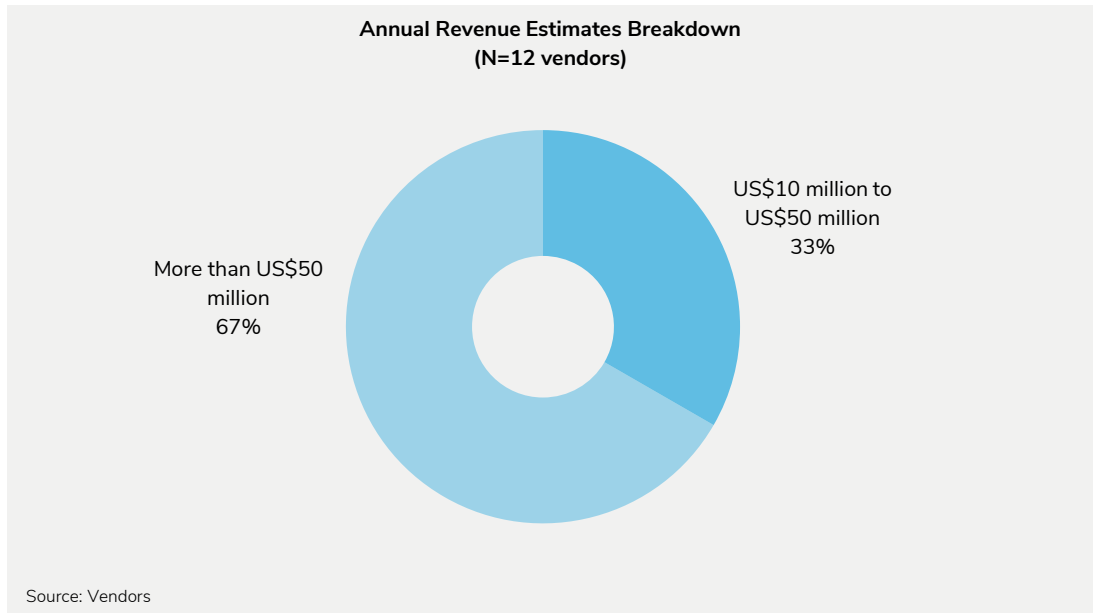
The vendors that provide machine-learning-enabling platforms consist of both long-time established market incumbents and relatively new entrants. Well-established providers have strong client bases, robust revenue streams, and financial strength. Many of these companies are publicly owned enterprises generating annual revenue substantially over US\$50 million. Compared to their more established peers, new enterprises generate lower annual revenue but they are penetrating the market, including neobanks, fintech companies, merchants and enterprises outside the financial industry.

In 2019, when Aite-Novarica Group last completed this vendor evaluation, half of the vendors evaluated earned more than US\$50 million in revenue per year. In 2021, with the accelerated growth of the market, two-thirds of the vendors evaluated earn more than US\$50 million in revenue per year (Figure 1).

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<sup>1</sup> The key statistics within this section relate to the 12 vendors that participated in the Aite Matrix; however, one vendor opted out before the completion of the evaluation.

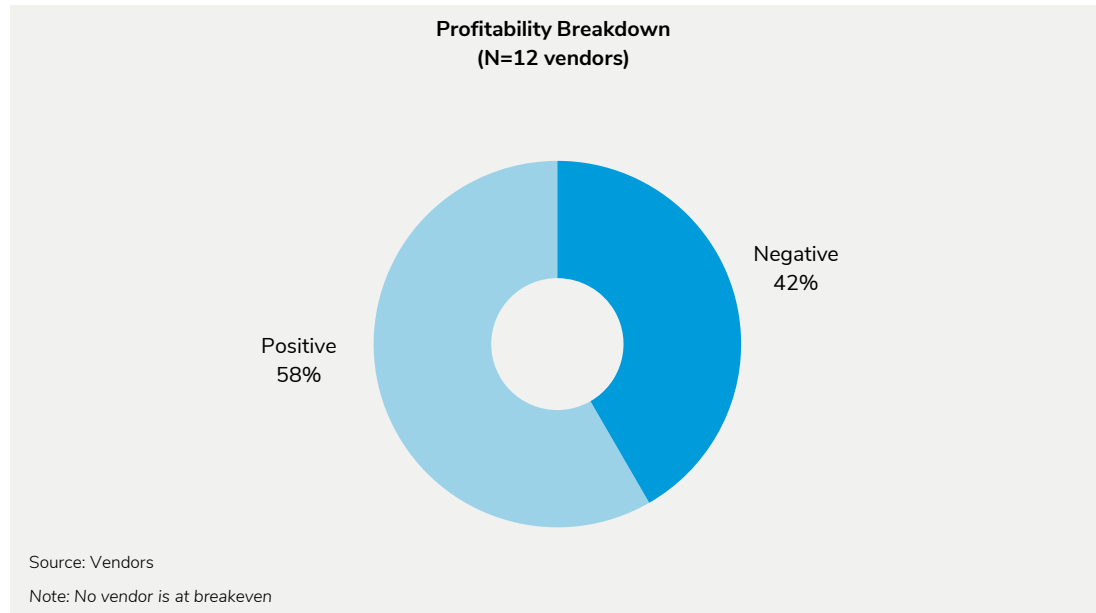
FIGURE 1: ANNUAL REVENUE ESTIMATES ANALYSIS



## PROFITABILITY ANALYSIS

More than half of the participating vendors (58%) generate a profit. Many with negative profitability are relatively new enterprises that continue to invest significantly in R&D (Figure 2). It is interesting to note that nine of the 12 participating vendors generate more than 50% of their annual revenue from machine learning solutions.

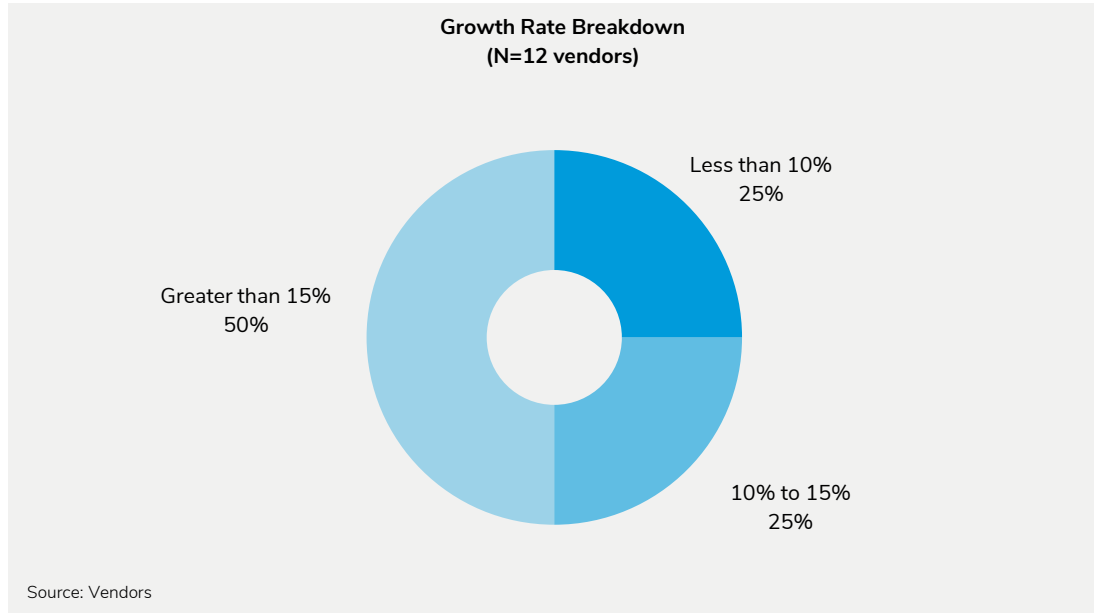
FIGURE 2: PROFITABILITY ANALYSIS



## GROWTH RATE ANALYSIS

All participating providers reported as growing. Half increased annual revenue by more than 15%, and the remaining segment's growth rate was evenly split between less than 10% and between 10% and 15% (Figure 3). These figures illustrate the expanding appetite among financial crime executives to leverage machine learning capabilities—inside and outside of North America and Europe and beyond the traditional financial services industry—and the growing opportunities within the overall fraud and AML machine learning solution market.

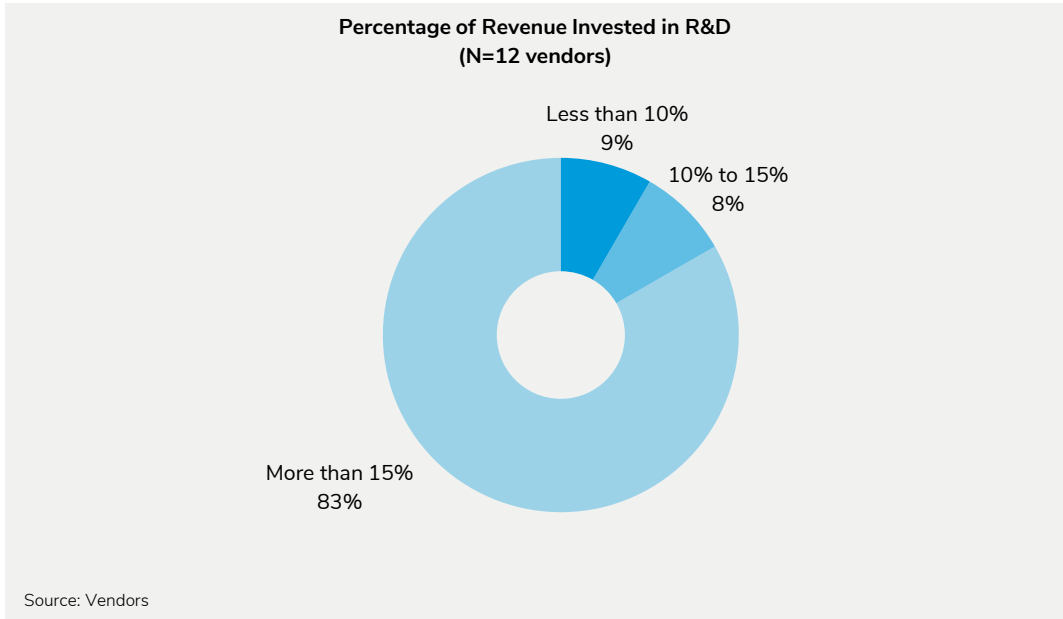
FIGURE 3: GROWTH RATE ANALYSIS



## R&D INVESTMENT ANALYSIS

As firms inside the financial services industry demand better tools and data to meet increasing financial crime threats and intensifying regulatory expectations as well as more effectively tackle the ongoing business and operational challenges, vendors are continuing to invest substantially in their product suites and to expand their capabilities, functionality, and features. Otherwise, they would fall behind their competition. The vast majority of vendors (83%) in the space invest more than 15% of their revenue in ongoing R&D (Figure 4). Those vendors that fall below 15% tend to be larger vendors that have higher levels of annual revenue, thus making it harder to hit the higher percentages of revenue invested in R&D.

FIGURE 4: R&amp;D INVESTMENT ANALYSIS



## MACHINE LEARNING PRODUCTION INSTALLATION ANALYSIS

The machine learning production installation breakdown among the participating vendors illustrates that full machine learning model adoption for financial crime monitoring and detection is still in its early phase. Forty-one percent of the vendors report having a total of more than 100 machine learning model platform installations, with another 42% reporting 50 or fewer total installations (Figure 5). Yet installations are growing, as 42% report more than 10 average net new client wins for machine learning analytics production installations over the last three years, and 25% report between six and 10 net new wins over that same time period (Figure 6).



FIGURE 5: MACHINE LEARNING PRODUCTION INSTALLATION ANALYSIS

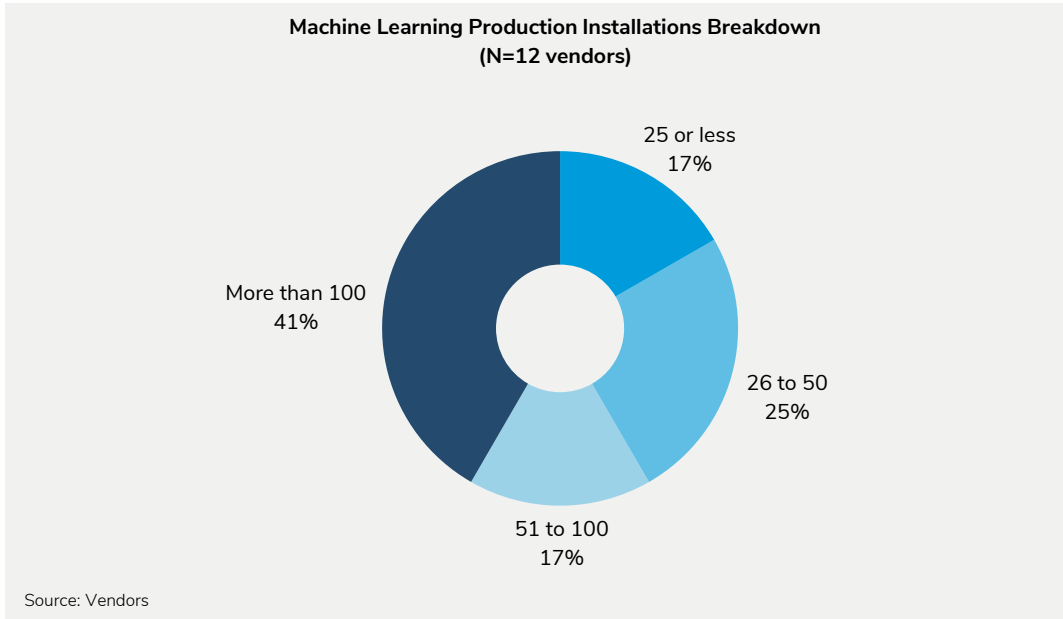
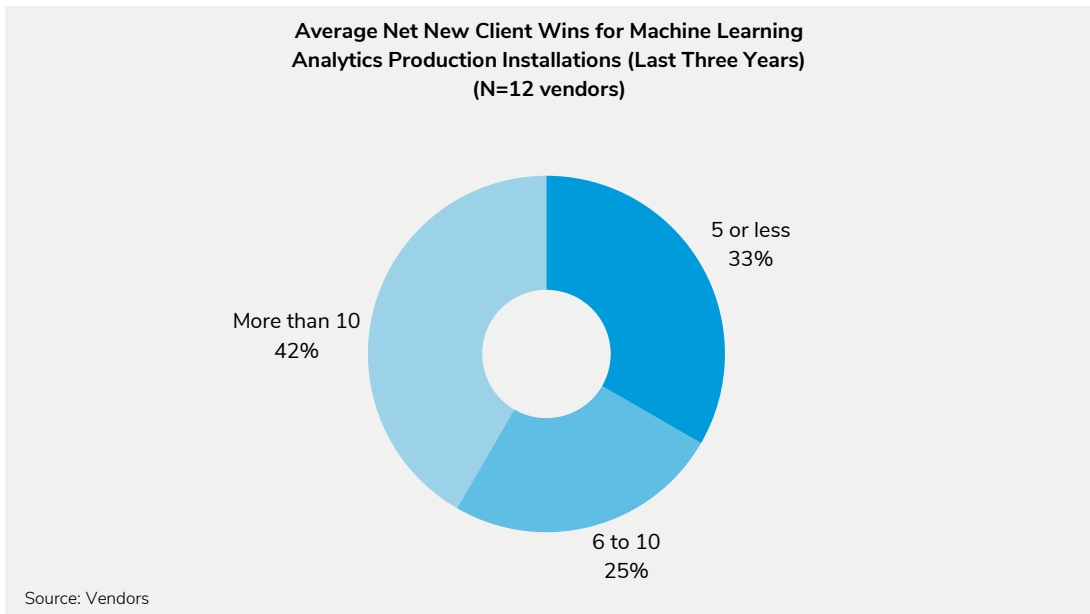


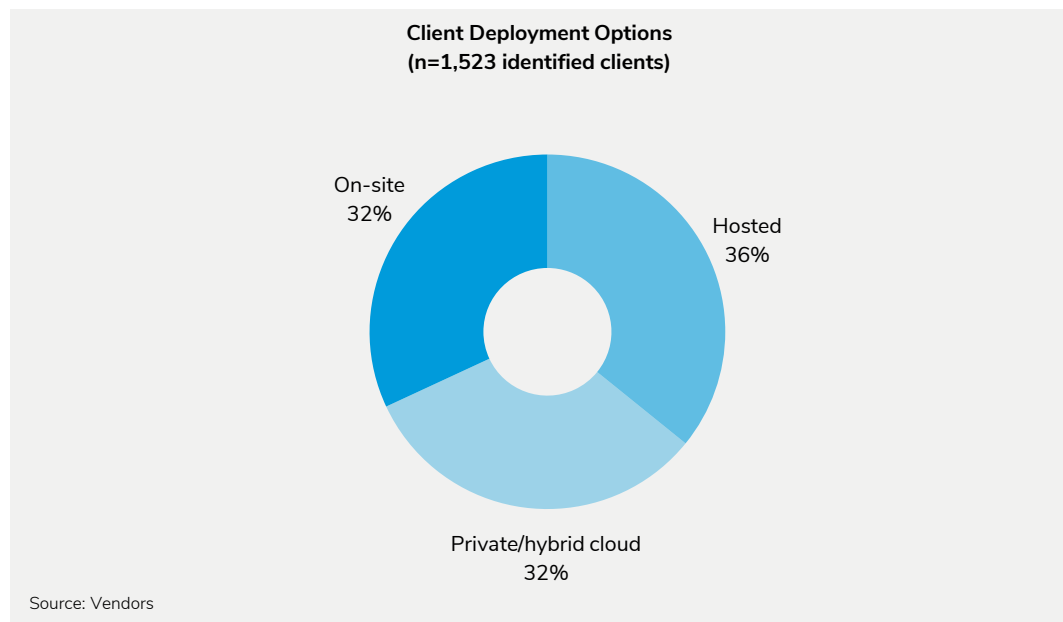
FIGURE 6: AVERAGE NET NEW CLIENT WINS FOR MACHINE LEARNING ANALYTICS PRODUCTION INSTALLATIONS



## DEPLOYMENT OPTIONS ANALYSIS

Historically, financial crime units have been reticent to embrace cloud-based deployments, particularly due to concerns over data security, latency, and customization capabilities. In 2019, more than 70% of deployments were on-premises. However, that trend is changing quickly. Executives are becoming more comfortable with cloud and vendor-hosted options with the promise of facilitated integration, increased scalability and flexibility, multitenancy, and lower operational expense. As reflected in Figure 7, only 32% of deployments reported in this vendor evaluation were on-premises, with the remaining either hosted (36%) or on a private/hybrid cloud (32%).

FIGURE 7: DEPLOYMENT OPTIONS ANALYSIS



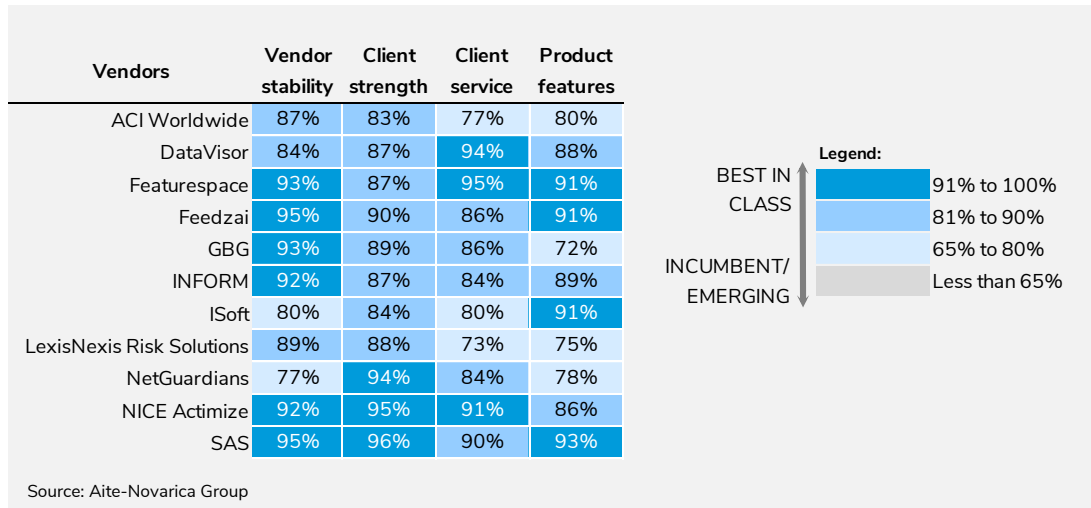
## AITE MATRIX EVALUATION

This section breaks down the individual Aite Matrix components, drawing out the vendors that are strong in each area and how they are differentiated in the market.

### THE AITE MATRIX COMPONENTS ANALYSIS

Figure 8 provides an overview of how each vendor scored in the various areas of importance. Each vendor is rated, in part, based on its own data provided when responding to the RFI distributed by Aite-Novarica Group as well as on product demos and follow-up discussions as part of the Aite Matrix process. Ratings are also driven by the reference customers of the examined vendors, along with analyst knowledge of the space, to support a multidimensional rating.

FIGURE 8: AITE MATRIX COMPONENTS ANALYSIS BY HEAT MAP



### Vendor Stability

Rapidly growing and ultra-competitive, the fraud and AML machine learning platform market consist of both long-established market incumbents and relatively new entrants. Well-established providers have strong client bases, robust revenue streams, and financial strength. Many of these companies are publicly owned enterprises generating annual revenue substantially over US\$50 million. Not surprisingly, many of these providers profiled in this report scored well for vendor stability.

Compared to their more established peers, new enterprises generate lower annual revenue, but they are penetrating the market, including neobanks, fintech companies, merchants, and enterprises outside the financial industry. Note that several new ventures have emerged that are making significant penetrations within the market by offering robust capabilities and data science expertise, along with strong and committed management teams and superior customer service.

NICE Actimize scored well in this category. Profitability and corporate financial stability (a varied range of products contributing revenue) all contribute to strong performance in this category.

### Client Strength

NICE Actimize scored in the best-in-class range for client strength. Key scoring drivers in this category include the total number of machine learning instances in production, client retention rate, and client reference checks on the vendor's reputation in the market.

### Client Service

Strong client service has become a must to achieve customer satisfaction and demonstrate how committed a vendor is to the concept of ensuring that its customers receive the highest standard of products and services. Financial crime compliance executives often expect vendors to become strategic partners—collaborating and guiding them on near-term and long-term technology adoption. Customers continue to seek greater visibility into and enhanced documentation on current product changes as well as future product development. Customers expect quick resolution of defects and issues as well as continual advancements on design, usability, functionality, and performance.

NICE Actimize achieved high marks in the client service category. Client ratings of vendors' service and support, responsiveness, ability to deliver on promises, and cost-to-value ratios were the primary drivers of the ratings in this category, along with vendors' position on key support items, such as providing 24/7 support, having a dedicated point of contact, facilitating customer advisory boards, and offering global/localized support.

For many vendors, the overall scores indicate that client service remains a huge opportunity to achieve a competitive advantage, especially as the competition among solutions continues to escalate.

## Product Features

Today's financial crime machine learning platforms are expected to enable sophisticated rule and model development, testing, validation, and deployment. Bringing a more integrated AI approach, leading solutions enable an agile orchestration of machine learning techniques and facilitate integration across disparate systems and data sources:

- Solutions should enable and support a diverse repository of both supervised and unsupervised modeling approaches, as well as multiple languages, techniques, and libraries. By investing significantly in R&D, leading vendors continually augment their portfolio of machine learning algorithms and modeling capabilities.
- To ensure quality model performance and minimize and prevent model deterioration, continuous learning capabilities are embedded to automatically retrain, tune, and deploy models when degradation is detected.
- Capabilities for ingesting, wrangling, aggregating, and enriching data are a must; doing them exceptionally well is a major differentiator.
- Solutions must also be able to clearly articulate how financial crime detection schemas operate and mitigate evolving financial crime risk. Extensive documentation, record-keeping, and audit trails are table stakes.
- A key differentiator among platforms is the nature, breadth, and depth of intelligent automation embedded across the product suite.
- Some vendors complete their offerings with rich data sets and risk and identity intelligence.
- Many solutions enable citizen data scientists and other business users to design, write, build, test, and deploy machine learning models, without significant data science expertise. Robust UIs, guided workflows, drag-and-drop tools, and reporting capabilities empower users with full control of the end-to-end model development process.

## THE AITE MATRIX RECOGNITION

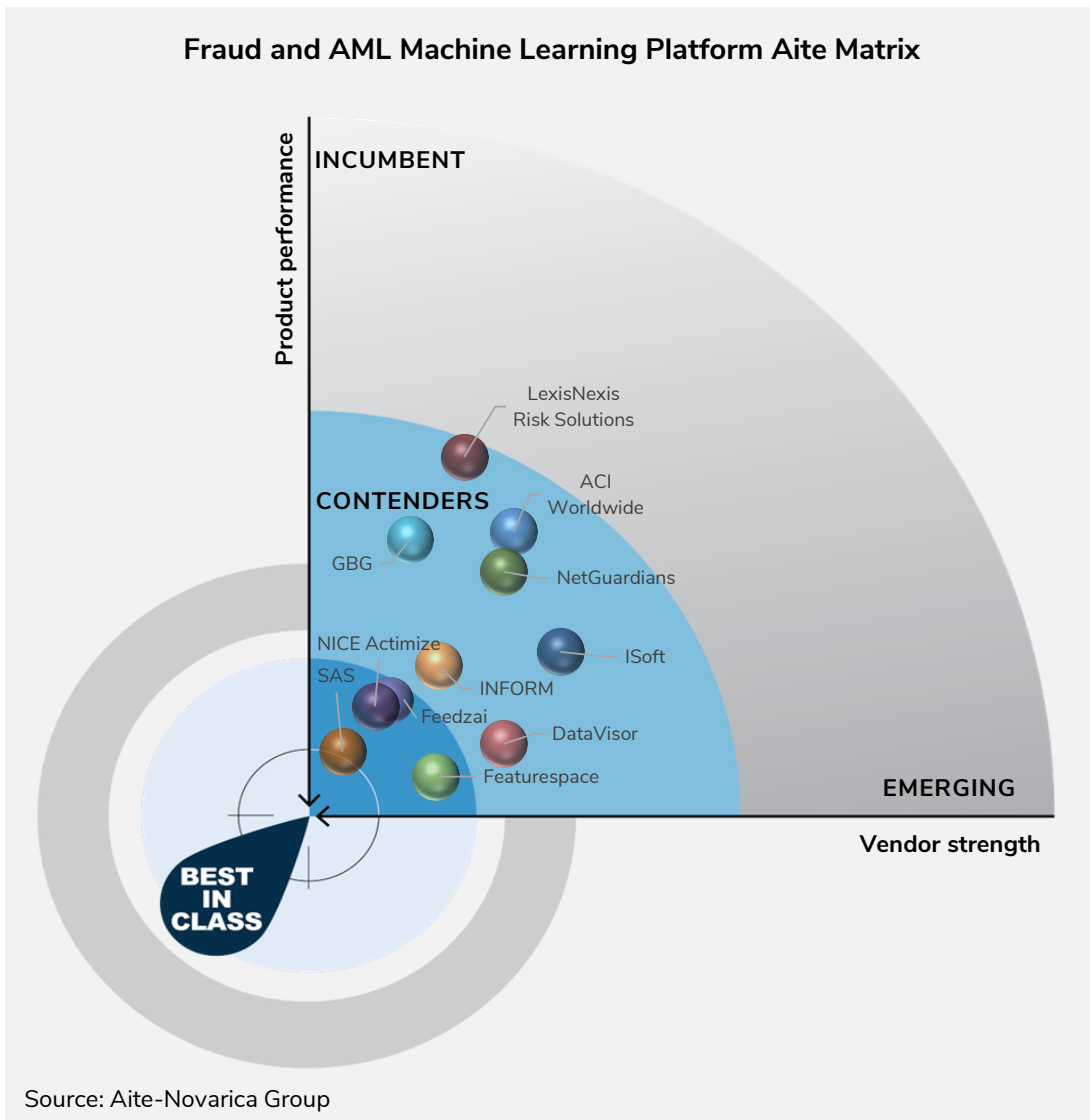
To recap, the final results of the Aite Matrix recognition are driven by three major factors:

- Vendor-provided information based on Aite-Novarica Group's detailed Aite Matrix RFI document

- Participating vendors' client reference feedback or feedback sourced independently by Aite-Novarica Group
- Analysis based on market knowledge and product demos provided by participating vendors

Figure 9 represents the final Aite Matrix evaluation, highlighting the leading vendors in the market.

FIGURE 9: FRAUD AND AML MACHINE LEARNING PLATFORM AITE MATRIX



### Best-in-Class Vendor: NICE Actimize

With its “AI First” approach, NICE Actimize is dedicated to infusing advanced analytics across the entire client risk life cycle. Tailored to different market segments, NICE Actimize’s agile and scalable platforms aim to deliver elevated data sets and intelligence, drive better financial crimes risk management, and lower the total cost of ownership. Through its acquisition of Guardian Analytics and subsequent launch of the Xceed solution, NICE Actimize offers unsupervised machine learning-based prevention and detection that address the unique needs of the midmarket.

## BEST IN CLASS: NICE ACTIMIZE

NICE Actimize is a leading provider of enterprise software solutions for financial crime and is well-known for developing innovative technology to protect institutions by identifying financial crime, preventing fraud, and providing regulatory compliance. NICE Actimize combines deep industry expertise and a patented technology platform to quickly enable global businesses to increase their insight into real-time customer behavior and improve risk and compliance performance. NICE Actimize provides enterprise risk management solutions to banks, insurance companies, payment companies, and government entities in 70 countries.

### Aite-Novarica Group's Take

As the expectations for more responsive and dynamic financial crimes risk management accelerate, NICE Actimize is dedicated to infusing advanced analytics across the entire client risk life cycle. With its "AI first" approach, NICE Actimize is embedding more machine learning, advanced analytics, and automation within its product portfolio and expanding its number of use cases. By delivering more agile and scalable platforms tailored to different market segments, NICE Actimize aims to deliver elevated data sets and intelligence, drive better financial crimes risk management, and lower the total cost of ownership:

- As an open, scalable, and flexible platform, the X-Sight solution serves the needs of larger FIs, for which self-service development environments are mandated. To support bespoke use cases, the X-Sight solution is infused with financial crime domain expertise and sophisticated advanced analytics and machine learning features. X-Sight's main use cases include real-time payments fraud detection and prevention as well as AML customer segmentation and model optimization.
- Through its acquisition of Guardian Analytics, NICE Actimize launched its Xceed platform as a fully packaged end-to-end AML and fraud offering. Xceed delivers unsupervised machine learning-based prevention and detection that addresses the unique needs of the midmarket. Xceed's main use cases include real-time online and mobile banking ATO detection, real-time wire fraud detection, and same-day ACH fraud detection.



- In concert with NICE Actimize's case manager ActOne, X-Sight DataIQ can aggregate, cleanse, and orchestrate data from hundreds of sources to deliver enriched intelligence. To fuel analytics, NICE Actimize has integrated X-Sight Data IQ intelligence into its solutions.
- Through X-Sight Studio, NICE Actimize has productized its data science development environment for use by citizen data scientists. The X-Sight Studio cloud environment offers model development workflows from data preparation to model delivery.

### Basic Firm and Product Information

- **Headquarters:** Hoboken, New Jersey
- **Founded in:** 1999
- **Number of employees:** Over 1,600
- **Ownership:** NICE (Nasdaq: NICE)
- **Global business footprint:** The company has offices globally in the U.S., Canada, Europe, the Asia-Pacific, Latin America, the Middle East, and Africa.
- **Key product names:**
  - NICE Actimize X-Sight Financial Crime Management Platform-as-a-Service
  - NICE Actimize Xceed Integrated AML & Fraud Platform
- **Target customer base:** FIs, credit unions, insurers, midsize to small businesses, payments providers, and gaming and casinos
- **Number of machine learning clients:** 430
- **Global footprint:** The company has clients in the U.S., Europe, Latin America, and Africa.
- **Modeling:**
  - Canned and custom models
  - Vendor-developed and maintained models
  - Support for import of external models

- No limitation on the number of transactions per second supported (the platform leverages AWS cloud services that are highly scalable)
- Automated feature generation functionality
- **Implementation options:** On-site, hosted, and private/hybrid cloud
- **Product version frequency schedule:** Since NICE Actimize's solutions are operating in the cloud, new and updated services are continually pushed to production.
- **Pricing structure:** Typically, NICE Actimize offers three licensing models:
  - **Term license:** Clients pay an annual fee that includes the right to use the license.
  - **Perpetual license:** Clients buy the right to use the solution in perpetuity.
  - **Subscription license:** Clients pay an annual fee for a subscription service.
- **Percentage of revenue invested in R&D:** More than 15%

### Key Features and Functionality Based on Product Demo

- To support financial crimes detection and prevention, NICE Actimize's solution suite leverages advanced analytics, such as machine learning, automation, and NLP, from the data layer to insights, and decisioning, investigation, and reporting.
- NICE Actimize uses several machine learning algorithms in its models depending on the business need—both supervised (e.g., XGBoost, Random Forest, and regression) and unsupervised (e.g., clustering and Isolation Forest). For example, unsupervised machine learning models in Xceed automatically create and maintain unique behavioral profiles. Each customer's activities are scored against its own individual profiles so the model risk scores are purely driven by the customer's actions. In X-Sight, unsupervised machine learning models leverage customers' activities to create account clusters to segment the customer population.
- Both X-Sight and Xceed solutions have predefined data dictionaries. Specifically with Xceed, hundreds of connectors to cores and payments processes minimize the need for data wrangling, as the integration is already done. For X-Sight, data preparation, cleansing, and exploration is automated within the X-Sight Studio.
- The X-Sight Studio environment is equipped with built-in templates that automate and streamline the main stages to build, train, and test a machine learning model—data sampling, preparation and cleansing; exploratory data analysis; feature

discovery, engineering, and selection; hyperparameter optimization; model training, evaluation, and testing; model packaging and deployment; and model governance, documentation, and interactive reports. Automated data exploration provides initial insights for model development.

- Model validation and risk management are supported in multiple ways:
  - NICE Actimize provides a model development evidence white paper that describes the data model, modeling approach, feature list, and main considerations taken when building the underlying model and model accuracy and precision.
  - Its machine learning models are equipped with a model explanation functionality that allows investigators to understand the underlying risk factors behind alert risk scores.
  - With each custom model delivery, NICE Actimize provides a set of documents describing the specific features, algorithms, hyperparameters, and assumptions behind the custom-made model.
- The X-Sight Marketplace offers a substantial financial crimes application ecosystem.

### Top Three Strategic Product Initiatives Over the Past 12 to 18 Months

- Through the acquisition and launch of the Xceed platform, NICE Actimize further served the needs of the midmarket with unsupervised machine learning-based prevention and detection. Immediately after the acquisition of Alacra, it enabled seamless access to data intelligence with ActOne and AML solutions.
- It productized the data science development environment that NICE Actimize data scientists use. NICE Actimize began the rollout of interactive insights that show trends across the industry and can be used as a benchmarking tool for subscribers of X-Sight's ActimizeWatch. These insights will be marketed first under the Actimize Fraud Index banner and then rolled out for AML and financial crime overall.
- NICE Actimize embedded enhanced entity resolution capabilities to resolve, aggregate, and enrich data, and deliver valuable intelligence to drive improved model development. These capabilities will automatically synchronize data with the core loading processes, map and standardize entity data features, compute new entity data features, and apply a real-time learning feedback loop.

### Top Three Strategic Product Initiatives in the Next 12 to 18 Months

- NICE Actimize will develop a Collaboration Portal, a centralized workspace for all model development stakeholders to review, collaborate, approve, and promote models to production. Functions will include a focus on model validation designed to reduce the dependencies on the model developer and provide a single workspace. This approach will address machine learning decisioning workflow—a systematic approach whereby the model developer will publish new artifacts (e.g., a new feature) and trigger an event that will then be reviewed by model risk management, who will either approve or ask clarifying questions. IT will eventually deploy the relevant logic or code within the production environment once approved.
- It will further develop machine learning algorithms to support multiple financial crime use cases, including the following:
  - An online model retraining capability will leverage advanced machine learning algorithms for automatic model refresh in real time by learning from new labels. This is expected to result in continually updated, always current, and better performing models, while meeting model governance and explainability requirements. The models used are advanced machine learning algorithms.
  - A cluster-based sampling approach will result in more efficient features and better overall model quality and ensure the sample model training sets are well represented.
  - GUI-based model development capabilities will be developed that can be used by data scientists as well as business users with limited coding or statistical background to train machine learning models within a few clicks. This workflow will allow users on the different ends of the analytics spectrum to explore data and identify new features as well as train single or ensemble-based supervised models and visualize their results without having to write a single line of code.
- NICE Actimize will implement a master risk profile across fraud and AML. It aims to deliver a single, precise, and dynamic customer profile and risk score throughout the customer's life cycle that can be leveraged across risk domains and throughout the FI. This deliverable is foundational to its larger customer life cycle risk management initiative designed to enhance and merge existing AML and fraud behavioral analytics to better understand customer patterns and discover deviations across all activities, channels, and entities associated with the customer in real time.

**Client Feedback**

NICE Actimize’s client references give the firm high marks for the analytical performance of its machine learning models as well as the responsiveness and partnership of its professional services and client support teams. One client expressed that “Client support and service is excellent. The team at NICE Actimize is very responsive, attentive, and often point out items for consideration. Its financial crime expertise and acumen in this area is extremely impressive.”

A large credit union Xceed client spoke highly of its long-standing relationship with NICE Actimize (through its preexisting relationship with Guardian Analytics) noting that “the Xceed platform is part of the credit union’s DNA, and it is embedded across numerous facets of the organization.” The credit union praised the solution’s anomaly detection for fraud and real-time risk scoring capabilities and detailed how the platform’s learning capabilities drive both efficiency and effectiveness. The credit union will be integrating Xceed into its AML program.

A large institution client that leverages NICE Actimize for AML transaction monitoring tuning and optimization strongly recommended the functionality, as it has made a significant impact on the firm’s AML transaction monitoring program, citing greater efficiencies, increased accuracy, and reduced false positives. Through the NICE Actimize platform, this firm can simulate complex scenarios, test various permutations, and optimize thresholds and parameters. This firm does not yet use any machine learning model authoring or alert risk scoring capabilities.

Table C provides a summary of feedback on NICE Actimize’s strengths and improvement opportunities.

**TABLE C: KEY STRENGTHS AND IMPROVEMENT OPPORTUNITIES—NICE ACTIMIZE**

STRENGTHS	IMPROVEMENT OPPORTUNITIES
Enhanced functionality and model performance	The ability for clients to write their own rules and models to see the impact using production data in Xceed

STRENGTHS	IMPROVEMENT OPPORTUNITIES
Service and support responsiveness	More automated adaptation to changing patterns, activity, and trends (without being triggered by manual intervention)
Ability to run simulations and increase scope of coverage	
Anomaly detection for fraud and real-time risk scoring capabilities and significant out-of-the-box modeling functionality for real-time anomaly detection in Xceed	

Source: Aite-Novarica Group

## CONCLUSION

Despite the variety of barriers to adoption that have kept many FIs' machine learning ambitions less than optimally realized, investment in these platforms has remained and is forecast to continue its robust growth. The benefits of applying machine learning risk models to fraud and AML use cases have created a thriving market that is only expected to grow as the dimensions and sophistication of criminal enterprises expand.

- Much benefit can be realized from the flexibility afforded by machine learning platforms, largely in terms of expansion into future use cases as well as their capacity to streamline and consolidate shared overlapping elements of the financial crime control framework.
- It's important that firms understand, as objectively and honestly as possible, their strategic approach to maturing their financial crime control framework. Firms must focus on the solution providers that are well-positioned to meet their particular needs and circumstances not only in the present but also in a manner that won't restrict the capacity and potential for developing and expanding into more robust analytical capabilities in the future.
- FIs must be cautious about overestimating the degree to which their data science capabilities will mature in such a way that will enable them to optimize the benefits of developing and deploying their own risk models as opposed to leveraging the capabilities and offerings provided by third-party solution providers.

## ABOUT AITE-NOVARICA GROUP

Aite-Novarica Group is an advisory firm providing mission-critical insights on technology, regulations, strategy, and operations to hundreds of banks, insurers, payments providers, and investment firms as well as the technology and service providers that support them. Comprising former senior technology, strategy, and operations executives as well as experienced researchers and consultants, our experts provide actionable advice to our client base. The quality of our research, insights, and advice is driven by our core values: independence, objectivity, curiosity, and integrity.

### CONTACT

**Research and consulting services:**

Aite-Novarica Group Sales  
+1.617.338.6050  
[sales@aite-novarica.com](mailto:sales@aite-novarica.com)

**Press and conference inquiries:**

Aite-Novarica Group PR  
+1.617.398.5048  
[pr@aite-novarica.com](mailto:pr@aite-novarica.com)

**For all other inquiries, contact:**

[info@aite-novarica.com](mailto:info@aite-novarica.com)

**Global headquarters:**

280 Summer Street, 6th Floor  
Boston, MA 02210  
[www.aite-novarica.com](http://www.aite-novarica.com)

### AUTHOR INFORMATION

Trace Fooshée  
+1.857.406.3515  
[tfooshee@aite-novarica.com](mailto:tfooshee@aite-novarica.com)

Charles Subrt  
+1.617.338.6037  
[csubrt@aite-novarica.com](mailto:csubrt@aite-novarica.com)

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