

White paper



# Machine learning decisions in milliseconds

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## Executive summary

The future is here. Experian's new Business Information Services (BIS) Model Implementation Platform allows for deployment of innovative ground-breaking methodologies able to deploy and audit in weeks instead of months and maintain a sub-second decision. **Machine learning-based models consistently outperform traditional modeling approaches by 10-15 percent, and Experian® can deliver a decision to you in milliseconds.** This benchmark breaks most clients' one second SLAs for traditional decisioning and drives the demand for these solutions in the marketplace.

## Why now?

The concept of a computer helping your business to make smarter and more accurate decisions is very appealing for business process automation, more consistent results, and improved performance. Use cases for machine learning already exist in the industry for phases of the customer life cycle that don't generate a credit decision. For example, Experian has been developing these concepts for more than 20 years in the areas of marketing, identity, fraud, account management, and collections. Machine learning is also used to make more nimble decisions in operational parts of businesses, such as data ingestion, data quality, reporting, and invoicing.

However, one significant area where the application of machine learning proved difficult was for risk decisioning. The regulations surrounding credit decisioning in North America are stringent to protect consumers and businesses from predatory or discriminatory lending practices. Therefore, the decision process needed to be explainable to the customer and repeatable, auditable, and deployable. Significant demand exists for the most accurate models and scores that meet all regulatory requirements.

Creating a stable and explainable adverse action process and the ability to deploy a machine learning model with its vast set of code and data ingestion needs, that could run with sub-second transactional decisioning, was a significant challenge. Our clients have been reluctant to deploy machine learning-based models on their own platforms for origination usage due to the immense computation time required to score and the difficulty in interpreting results.

Creating adverse actions is quite simple for traditional modeling approaches, but it grows exponentially more complex when including hundreds of predictive attributes coupled with hundreds of predictive layers within machine learning methods. This exponential increase creates an immense amount of computation time to score a single record, let alone an entire portfolio. Deployed in a traditional mainframe-based process, the time required to score a batch request of one million records could take up to one full working month to complete, given the 1.5 to 2 second processing time per record in systems that don't provide parallel or distributed processing.

Many of our clients face similar technological limitations due to their own aging infrastructure and technology platforms. Our clients struggle to find a way to deploy fully compliant machine learning-based models within their own environments. A very limited number of large financial institutions have developed and deployed machine learning-based models but have had suboptimal results and ROI, with total project costs in the low-to-mid seven figure range.

## Challenging traditional modeling techniques

Experian solves this unmet need with an innovative and explainable risk decision-focused machine learning model. Our deployed machine learning scores utilize gradient boosted trees and random forests. We apply specific statistical methods to ensure that adverse actions are calculated accurately and appropriately.

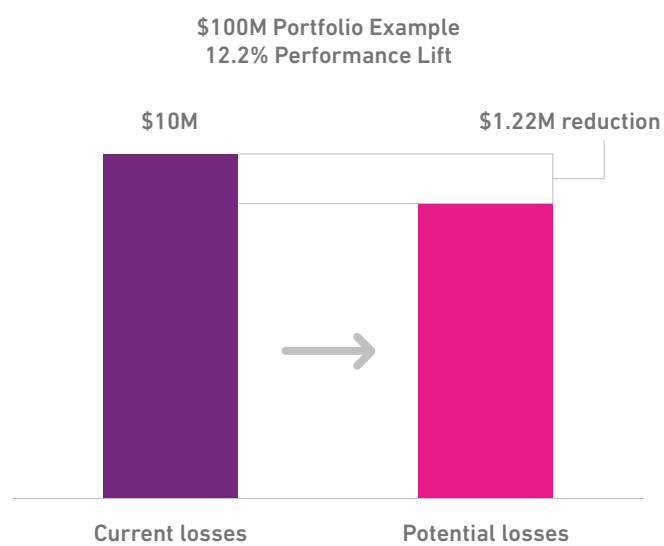
Adverse actions are output with each score including the top four adverse actions negatively affecting the score as well as the 5th factor if an inquiry-related adverse action isn't included in the top 4 actions. This blended machine learned score needs to be deployed into an environment where the integrity and stability of the scores remains intact, which requires a significant allocation of scalable compute capacity to power the score. This capacity can be expensive and complicated to establish and maintain. Developing your own deployment process and platform that can handle the amount of compute power required for a machine learning model will cost several million dollars. The excessive cost has been a deterrent for our clients based on the negative ROI until now.

## Superior results

A generic machine learning model developed by Experian's Commercial Data Sciences team recently provided a performance lift of approximately 12.2% compared to a very predictive logistic challenger model across both the validation and out-of-time samples. This lift equated to a significant portfolio performance improvement opportunity. Assuming a 12.2% performance lift on a \$100 million portfolio with an average loss rate of 10% over a 24-month period, we could expect to reduce losses by approximately \$1.22 million.

Experian can provide superior support for improved performance while also providing adverse actions to ensure regulatory compliance with an innovative model methodology and governance support. In the example above, we've helped provide the opportunity to reclaim more than a million dollars in potential lost revenue.

Experian BIS can provide the value and support needed to ensure these clients innovate their decisioning processes and reduce their losses, without the exorbitant cost to deploy and maintain these complex machine learning-based models in their own aging legacy systems. We can provide this level of analytic sophistication with the underlying technology stack to support such complex and compute-heavy calculations.



## Scalable deployment using innovation

Due to the intensive computational resources required to score both single record and batch requests, the creation of a new scoring process outside of a mainframe environment was required. Experian BIS Technology has modernized over the past year to support big data scoring processes required to provide innovative machine learning-based scores. These technology improvements include both the creation of Predictive Services and the Data Fabric to support BIS deployments.

Predictive Services was created to ease the efforts to deploy models. In simple terms, this platform is like a 24-7 food delivery service that makes models available for scoring at anytime and anywhere. It's a model deployment platform that containerizes models to be available for a variety of scoring calls. Predictive Services provides the deployment mechanism to make machine learning scores possible for a variety of scoring needs.

The BIS Data Fabric is an internally hosted Hadoop cluster to support data storage and processing needs and has the capacity for expansion based on future processing needs. This cluster technology is similar to Amazon's supply chain in the sense that many distribution vehicles are available to ensure one-day delivery of goods after ordering. The Data Fabric has a variety of big data tools available to support efficient data processing utilizing both distributed and parallel methods.

The combination of these technologies is the foundation for our BIS Model Implementation Platform and makes the deployment of the more advanced machine learning-based scores possible. This technology platform created the vehicle to deliver an innovative and advanced score for the underserved market.

## Embracing the future

The ability to efficiently deploy advanced analytical predictive models, which ensure regulatory compliance, creates an endless frontier for innovation in risk decisioning. Advanced analytics deployment and automation are the biggest limitations for large organizations to overcome, per a recent Forrester study.<sup>1</sup> This study emphasizes that organizations are significantly more confident in their origination evaluation process when they have integrated advanced analytics, automated decisioning, machine learning, and/or artificial intelligence into their risk management strategy compared to those who have no plans in place. According to this study, 59% of organizations with integrated advanced analytics are very confident in their current approach, compared to 36% of those who have no plans to integrate new technologies into their current processes. Experian BIS can partner with our clients to provide solutions to meet several of these needs to improve future success. Clients who are less sophisticated from a technology perspective can leverage our innovative and advanced analytical methods.

The emergence of the BIS Model Implementation Platform has established the foundation to deploy a variety of models from a variety of data sources to supply advanced analytics for all Experian BIS clients. The ability to easily deploy advanced analytical techniques opens the door for Experian BIS to deploy even more advanced cutting-edge machine learning-based models, such as gradient boosted trees, random forests, support vector machines, neural networks and clustering.

1 - "Build Credit Risk Confidence Through Advanced Assessments" — A commissioned study conducted by Forrester Consulting on behalf of Experian.

## Conclusion

The commercial marketplace has a tremendous need for new innovative decisioning methodologies as well as efficient model deployment capabilities. Future possibilities are endless for expanding the use cases and applications to utilize advanced analytical methods. Experian BIS provides an opportunity for clients to achieve the next level of advanced analytical techniques without incurring the significant cost to completely modernize their own legacy infrastructures. Using Experian's machine learning models, it's not uncommon to see double-digit lift over traditional models in a way that easily meets compliance requirements. The BIS Model Implementation Platform enables clients to benefit from the value of advanced analytical applications and embrace future innovation now.

## Let Experian help you on your data journey

Schedule an analytics consultation to learn more about Experian's business targeting services or advanced analytics, consulting, or deployment support of your traditional or machine learning models. Contact an Experian representative at 1 877 565 8153 or visit [www.experian.com/b2b](http://www.experian.com/b2b).

## About Experian's Business Information Services

Experian's Business Information Services is a leader in providing data and predictive insights to organizations, helping them mitigate risk and improve profitability. The company's business database provides comprehensive, third-party-verified information on 99.9% of all U.S. companies, as well as on millions of companies worldwide. We provide market leading tools that assist clients of all sizes in making real-time decisions, processing new applications, managing customer relationships, and collecting on delinquent accounts.

For more than 125 years, Experian has used the power of data to help unlock opportunities for businesses and consumers. With more than 16,500 employees in 39 different countries, Experian proudly offers blended data assets, giving you access to hard-to-find small and micro businesses. Funneling numerous data sources — including BizSource<sup>SM</sup>, member trade, alternative and consumer — our breadth and depth of information helps you fine-tune marketing efforts, identify new profitable customers, assess risk, improve data modeling and conduct market research to break into new market segments.

