FLYING PHASE

Superior Forecasting through Machine Learning

CAPABILITIES COVERED

Machine Learning
Business Strategy
Data Analytics
Operational Efficiency
Risk Management

FEATURED CONSULTANTS

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THE SITUATION

A TOP 10 BANK was looking to improve its forecasting process. Traditional statistical methods the organization was using were slow to catch on to inflection points and recent trends, and uncertainty surrounding accuracy of more than a dozen unique forecasting models drove the bank to overlay hundreds of millions in additional loss allowance. Time for improvement was limited, as the team was maintaining more than a dozen arbitrarily unique forecasting models for individual targets and lines of business. Each model required its own governance, upkeep and rebuild efforts. To improve accuracy and drive efficiency, the bank was ready to reimagine its process within the clear regulatory guidelines.

CHALLENGE

Create an accurate, simplified forecasting platform that can be leveraged across multiple use cases.

OUR APPROACH

We began by assessing the scope of the organization's modeling activities to understand the collective assumptions, limitations and weaknesses. Through that exercise, we identified several areas of underperformance, arbitrary uniqueness and regulatory risk. We laid out a plan to replace the existing diffuse modeling suite with a single framework that would more accurately forecast all relevant targets and portfolio segments.
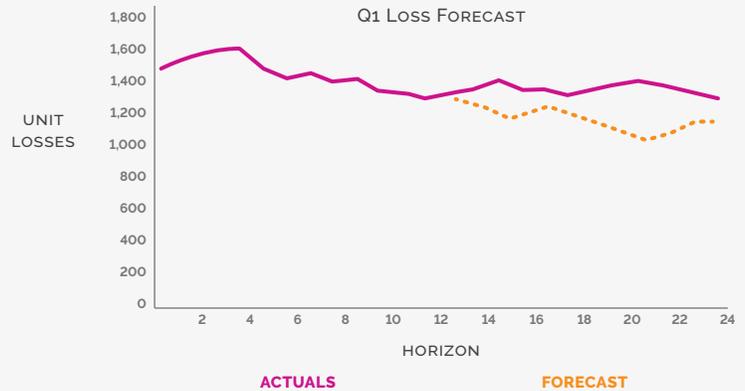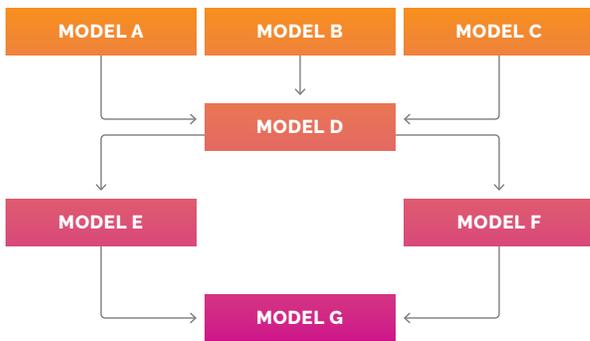

FIGURE 1: *Representation of the complexity and accuracy of the original modeling system*
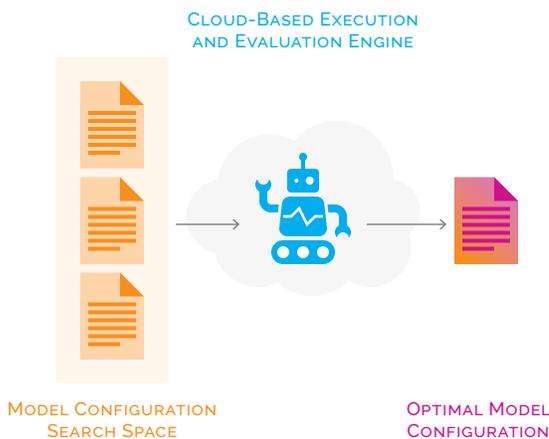

FIGURE 2: *High-level representation of our cloud-based execution and evaluation system*

After creating the initial framework, it was time to choose an algorithm, a list of features and a host of other configurable parameters. In an effort to truncate the development process from months to days, our team developed a cloud-based platform to execute and evaluate hundreds of competing models in parallel. Results from these executions were then fed through a custom evaluation tool based on accuracy and volatility, eliminating the chance of manual error and subjective judgement. This allowed us to arrive at an optimal model configuration that could be generalized to all sub-segments of the bank's portfolio.

MEASURABLE RESULTS

- **Decreased average model error from 10% to 3%,** increasing confidence with the new system in business leaders

- Reduced conservativism in the allowance for loan losses, **freeing up hundreds of millions for lending and investment**

- **50% cycle time reduction** for new model builds and implementations

- **Increased efficiency through a single modeling framework,** eliminating several days of manual adjustments each quarter and more than 1,000 pages of documentation

- Execution of a full **end-to-end loss forecast** reduced from weeks to minutes

OUR APPROACH

In order to meet strict monitoring requirements and ensure confidence in the model's impact to the bottom line, we developed a suite of tools designed to create trust in each step of the model's build and execution process. This enabled us to monitor the impact of the latest data, monthly rebuild, model residuals, volatility and shifts in feature impacts over time. To dispel myths related to the "black box" nature of machine learning models, we developed an explainability platform that allowed analysts to conduct an interactive deep-dive into the primary motivators of model results, including seasonality, detailed feature contributions and changes to the competitive environment.

Finally, working alongside compliance, we developed robust model documentation, a whitepaper, a monitoring plan and a change control plan, which allowed the dynamic systems to continuously operate without the need for lengthy approvals.
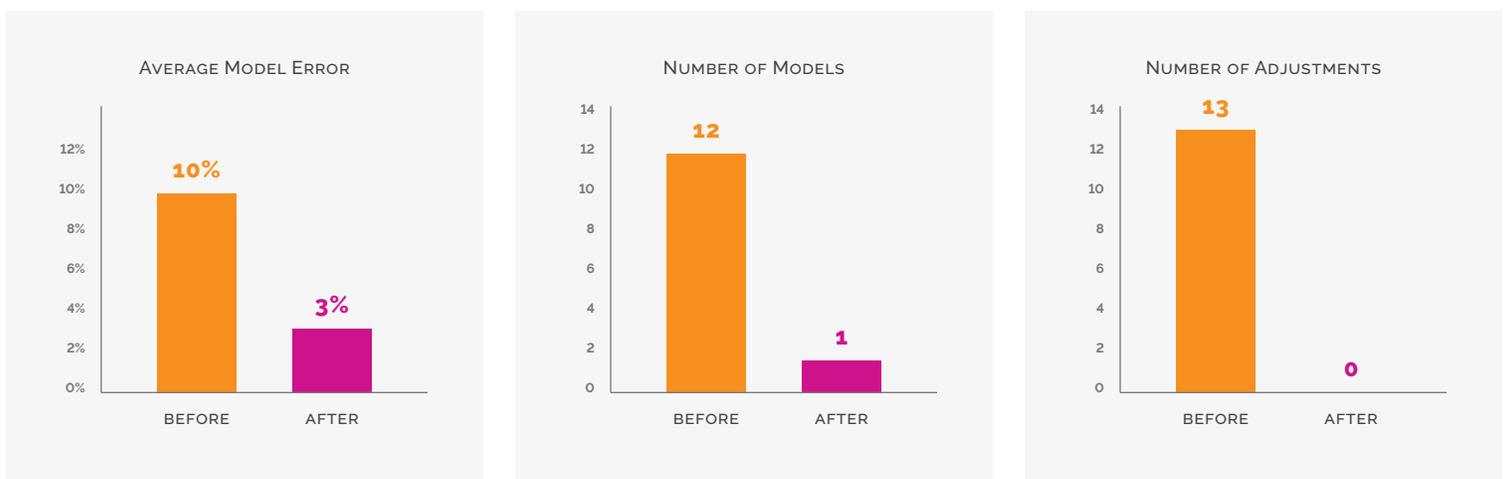

FIGURE 3: *Measurable results*