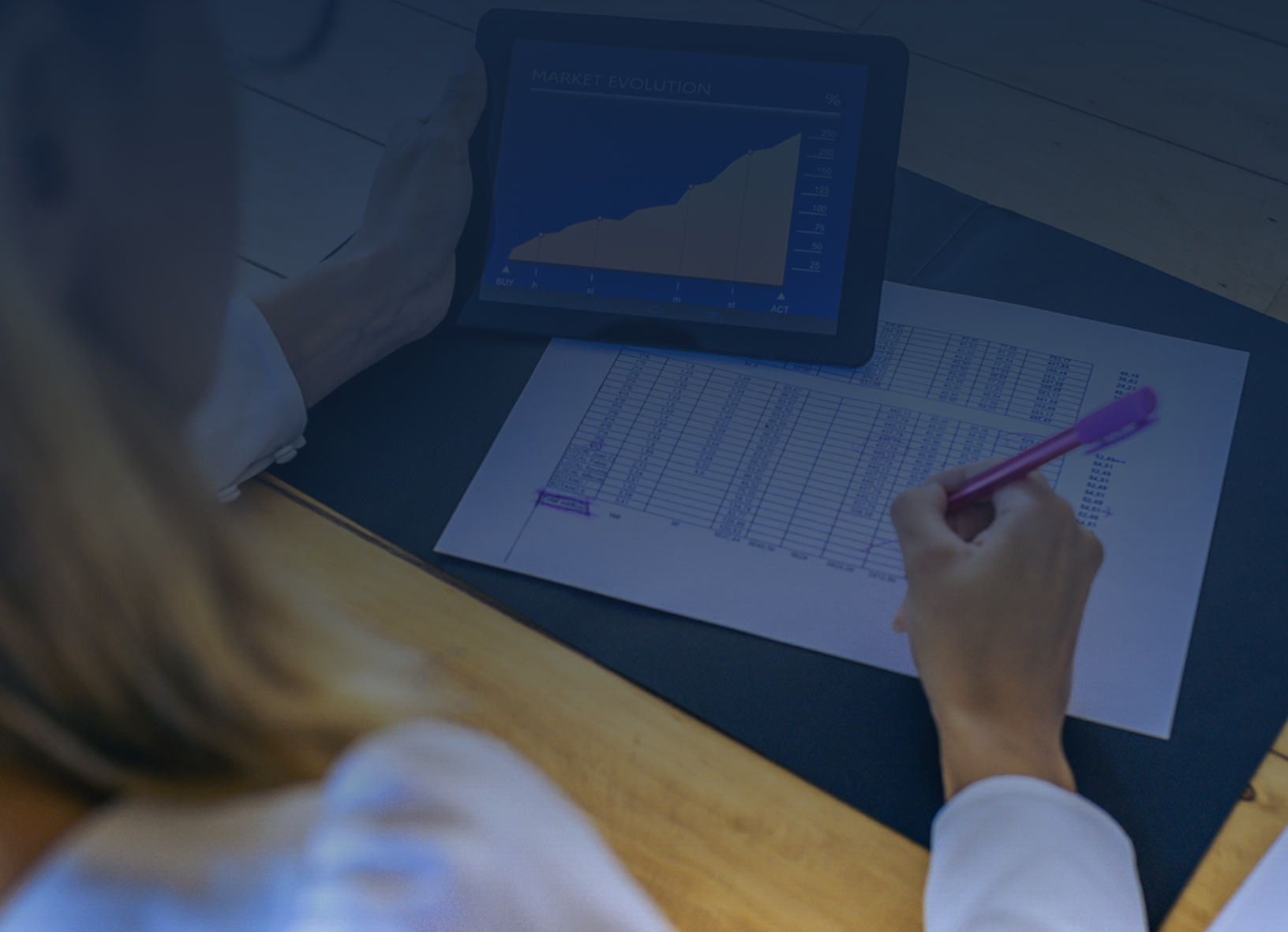
CAPTON

Guide to the Best Loan Prediction Models for NPLs



The need for NPL prediction is clear. Non-performing loans (NPLs) are on a delayed rise as a result of the economic stress of the pandemic: right now, we're in what ING is calling "the calm before the storm." In fact, the only banks seeing a decrease in NPLs are those aggressively writing them off or selling — with an accompanying dip in net profits, particularly for smaller banks. ***Many experts expect to see as much as a 25% increase in global NPLs in the next year.***

Forward-looking banks have realized that with the impending surge of non-performing loans, a reactive approach will no longer suffice.

> "Banks need sophisticated, accurate loan prediction models to cut back on losses, minimize risk and get ahead of non-performing loans"

Banks need NPL prediction right now

Banks either have a growing portfolio of NPLs, or they will soon. And the only way to know — aside from waiting until the loans have defaulted — is by predicting whether the loan will perform with a loan prediction model.

The majority of banks have no real system in place for prediction. Outside the enterprise sphere, few banks can afford to maintain a staff of data scientists; until recently, few specialized AI solutions existed to address the issue.

Banks need sophisticated, accurate loan prediction models to cut back on losses, minimize risk and get ahead of non-performing loans. The right models can even enhance decision-making and market analysis. However, they're not one-size-fits-all. Banks have to navigate a myriad of loan prediction models and associated implementation methods, from data science teams to single-model software programs to robust multi-model AI platforms.

This is a quick reference guide that can help banks in the exploration and evaluation of options for prediction of NPLs.

What are loan prediction models

Simply put, ***loan prediction models are algorithms that predict whether or not a given loan will be paid in the future*** — or whether it'll become a non-performing loan (NPL). There is an enormous variety of loan prediction models out there, from the standard to the complex or the innovative to the tried-and-tested. Any model deployed or classification of customers based on their behavior, demographics etc. in the highly regulated banking industry must be explained to authorities to ensure unbiased operations.

Some approaches have ML models which are explainable and seek to be able to balance between risk and profits.

Reducing the institutional risk by ***predicting customers who are likely to default***

Increasing the profits by improving loan accessibility to the customers

There are approaches that compare loan default prediction using decision trees and random forest. The accuracy of the models is greatly influenced by the choice of attributes such as the length of the payment history.

These and similar models can be executed by a team of data scientists or by software, often AI and machine learning programs.

Unlike the existing system in which banks classify a loan as non-performing after months of missed payments, ***prediction models assess the likelihood that a loan will stop performing up to 12 months before any payments are missed***.

With predictive systems, banks can:`

- ***Analyze their portfolios*** *to forecast non- performing loans*
- ***Significantly reduce risk*** *by taking early action on said data*
- ***Inform strategic decisions,*** *such as which markets or verticals to loan to*

> Prediction models assess the likelihood that a loan will stop performing up to 12 months before any payments are missed

What are the benefits of different loan prediction models

Frequently, there is no one "best" NPL loan prediction model. Loan prediction models are algorithms to process data. One data set might work best with a graph-based model. Others might require decision trees, regression models or many, many more.

The bottom line is, anyone can predict NPLs. Anyone can apply a loan prediction model to a data set.

What matters is the accuracy with which they predict NPLs based on that data — is it 10%, 70% or 95%?

The method in which you implement those models is therefore key. For instance, if the software program you use relies on one or two models rather than a range, it will deliver inconsistent results depending on the data it's fed: it's just taking data, running it and showing results. It's not learning or providing optimal results.

You have a few choices:

(i) **Work with a team of data scientists**

(ii) **Build a system yourself**

(iii) **Leverage an existing AI solution**

1. The data scientists option

Data scientists are expensive. They need to be recruited, their teams and toolsets integrated with the bank's current workflows. Those costs are prohibitive for most small or regional banks.

Even then, data scientists work manually compared to AI programs — they wouldn't be able to learn as quickly or at the same scale from their models' findings. Thus, hiring data scientists to handle the job alone is a limiting option for most operations.

2. The DIY option

Banks that can't afford a full-fledged team might be tempted to build something on their own. There are two major stumbling blocks with this idea:

(1) It'll take six months or more

(2) It'll commonly cap out at ~70% accuracy

Making and honing a prediction model — or a set of models, as the first one may not deliver great results — is not a month-long undertaking. It's likely to take multiple months or years, particularly if the bank wants to fold in AI. Unfortunately, banks don't have that time to spare if the current trends around NPLs and the predicted surges continue.

Additionally, without guidance from experts, the oversight of a data science team or the benefit of machine learning tools, ***DIY models tend to only reach 60-70% accuracy (if not much lower)***. Compared to zero prediction efforts, that accuracy is fantastic; however, compared to the results possible with pre-built AI solutions, the quality of the results remain sub-par.

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3. The AI option

Artificial intelligence solutions that address banking challenges are relatively new. However, for the majority of small and mid-size banks, they're by far the best option.

Individual AI solutions operate quite differently. One might double down on a specific prediction model; another might pull from several. Some assess only the past internal data, while others incorporate industry and market data. Clearly, the ones that pull from more data and include more models are the better option.

When assessing an AI solution, look for:

1. Details about data usage
2. Transparency around prediction quality
3. Multiple loan prediction models
4. Clarity around AI type, such as machine learning capabilities
5. Clean, usable interfaces to enable your team

> "The best-fit models deliver 90 - 99% accuracy"

> 11 models to see which model delivers the highest accuracy...from over 165 data attributes

What is the Capton(TM) AI approach?

The Capton AI team's approach was to create the NPL Early Warning System (EWS), to enable banks to predict NPLs with a high probability of accuracy and across multiple time horizons. Starting with 65 loan prediction models, they were tested on multiple data sets over multiple time periods -- and narrowed them down to the best 11 models.

The machine learning program was built around these models. When partnering with a prospective bank, its data is fed into the NPL EWS product, which plugs it into all ***11 models to see which model delivers the highest accuracy.*** It also pulls ***from over 165 data attributes*** including external data to assess whether particular loans are at higher risk because of preexisting factors, such as the rocky post-pandemic travel industry.

The best-fit models deliver 90-99% accuracy – and compared to 70%, that can mean billions of dollars in loan write-offs. Each model's result is displayed on the AI dashboard.

These rich insights enable banks to decide whether to send loans to collections, to sell them or to write them off ahead of time, long before they're officially designated as NPLs. It's also a direct strategic lens into their loan mportfolio, delivered on a digital silver platter.

Want to learn more about Capton's loan prediction solution?

Get In Touch

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