



*September 2022*

# Using Churned as an Input for Predictive Analytics

**From mixture of experts to predictive benchmarking, model  
validation and testing**

# A brief intro to customer churn

5x more costly to sell to  
new customers

Churned is a company specialized in bringing advanced AI solutions to the world of churn prediction and customer retention. Most clients seek out Churned for their clear and user-friendly all-in-one churn prediction and prevention software. This allows customer success managers and business leaders to gain insight into their customer base and improve retention. Over time however, some of our clients have approached us for something entirely different. These are companies with their own data science and analytics teams. They do not seek Churned for its end-user analytics. Instead, they seek Churned to enhance and strengthen their own data science capabilities. Here's three examples of how they do it.

## Leveraging Churned indicators.

### *The mixture of experts revolution.*

If you're not yet familiar with the Machine Learning modelling approach known as "mixture of experts", then don't worry... you will be soon! The mixture of experts approach is a trending methodological shift with important new applications in many areas of machine learning and data science. In a mixture of experts model architecture, each prediction is a combination (or mixture) of predictions from multiple "smaller" models called experts. These experts may be just simple data transformations or complex models themselves. Most importantly, by combining predictions from multiple models one can ultimately improve on model accuracy, stability, robustness and computational efficiency.

Of course, the idea of combining multiple small experts underlies already many famous nonparametric techniques, such as artificial neural networks (ANNs), which combine individual neurons spread over multiple hidden layers to obtain a forecast. Similarly, the combination of small models is also found in ensemble techniques, like random forests, where the prediction combines the output of many individual decision trees. However, in the mixture of experts architecture, the experts can be used sparsely (only in certain situations), and they can be much more general and complex than individual neurons in ANNs or decision trees in random forests.

For example, in churn analytics, a mixture of experts architecture may combine different churn predictions from different models, to obtain a final stronger prediction. The idea is to explore the relative strengths of different models. Think for example of combining churn risk scores from your own internal models, with the accurate risk scores produced by Churned. Or incorporating the subjective risk scores from your own customer success managers, to obtain stronger and more robust results. You can also use our engagement scores, health scores and customer classifications as inputs for your own mixture of experts. This will strengthen and give confidence to all the results produced by your own data science team.

# Using Churned for added clustering dimensions

## 1.

### Using Churned for added clustering dimensions

*Enhance your customer segmentation and profiling.*

Achieving high levels of personalization is key for customer success management, marketing automation and pricing strategies. When it comes to customer segmentation, *all help is valuable*. The key to successful data-driven customer segmentation is to feed clustering algorithms with rich and well structured sources of information. After all, your clustering techniques are only as good as the data they have available. Yes, popular clustering techniques such as *k-means* or *hierarchical clustering* can be applied to raw data, but results are often disappointing. This is why dimensionality reduction tools, such as *principal component analysis*, are so often used as complementary tools or even close substitutes

## 3.

### Explore the relative strengths of different models

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## 2.

### Churned as a driving force for development.

*The most awesome and complete benchmark-validation indicator you can ask for.*

*How good is your machine learning model? Is it well calibrated? Have you adopted the right approach? Should you further enrich your data? These are questions that every data science team is routinely confronted with. Even if you believe your models perform reasonably well, the question remains: is it possible to do significantly better? In data science, good performance benchmarks are invaluable. They offer guidance, motivation, and ultimately a way of testing and validating the performance of the machine learning models and predictive algorithms that your team develops. This is especially true in churn analytics as prediction accuracy translates directly into value for companies. For this reason, smart data science teams wanting to drive and enhance their own analytics performance and capabilities turn to Churned and use our rich AI results for their own benefit.*

## 4.

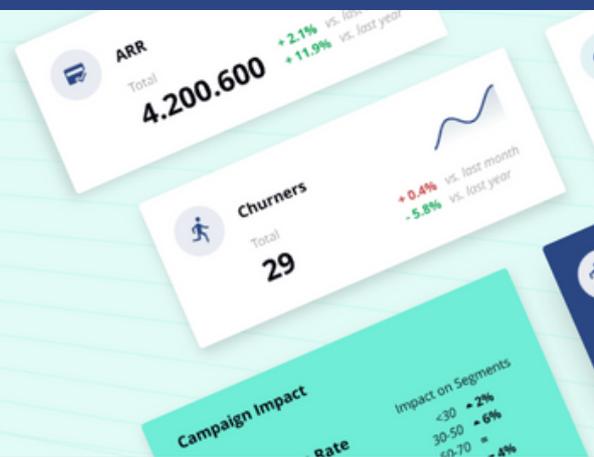
### Obtain high-quality indicators

With every time frame new data comes in about loyal and churned customers. This can be used for improving and adjusting the results. In addition to this, new strategies can be applied to customers who are highly likely to churn. The results of the new strategy can be compared with the previous strategies, i.e. A/B testing. If a new strategy outperforms all the old strategies, this new strategy can be used to retain the customers who are highly likely to churn. The best thing to do is to incorporate this improvement strategy as a standard periodic process in your business operations and update the churn predictions and retention strategy frequently.

# Churned

Who are we

## The AI-driven customer retention platform



Take control over your customer base by leveraging the power of AI with Churned retention management software

Data-driven customer success for SaaS, B2C & E-commerce

\* Churn predict & prevent

\* Upsell and cross-sell accelerations

\* Next best action

\* CLV prediction

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