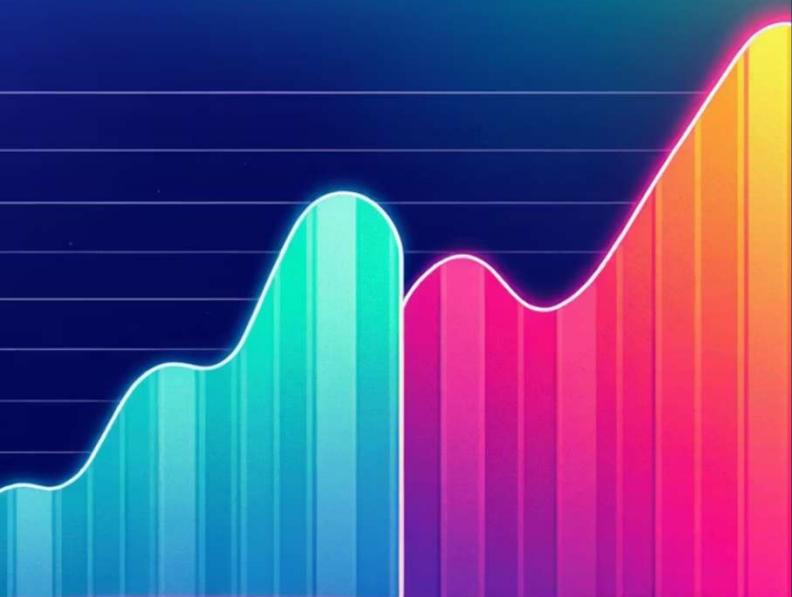


Revenue Impact of Customer Churn



Customer Churn Prediction Using Machine Learning

Anshika Vishwakarma | Data Science Intern

△ CHALLENGE

The Customer Churn Problem



Telecom companies have a big problem. Their customers often switch to other providers. This is called **customer churn**.

It means they lose money and have to spend more to get new customers. Usually, companies only find out customers have left after it's too late to stop them. We need a smart way to predict which customers are thinking of leaving, **before** they do. This would let us reach out and keep them.

Project Objective

Primary Goal

Predict whether a customer will churn using machine learning algorithms with high accuracy

Behavioral Analysis

Understand customer patterns and identify key factors driving churn decisions

Business Impact

Enable early intervention strategies to reduce customer loss and protect revenue streams

By combining predictive analytics with actionable insights, this project empowers businesses to shift from reactive to proactive customer retention.

Dataset & Key Features

We're using a lot of detailed information about our telecom customers. Every bit of this data helps us understand their relationship with us and how they use our services.

What's in the data: We have records of past customers, including things like their age, how they use our services, and all their billing info. It goes back several years.

Important Details We Look At

- **Contract Type:** Do they have a monthly plan or a longer-term agreement?
- **Tenure:** How long have they been a customer?
- **Payment Method:** How do they pay (online, by mail, or automatically)?
- **Monthly Charges:** What's their current bill?
- **Total Charges:** How much have they paid us overall?
- **Paperless Billing:** Do they get digital bills?
- **Senior Citizen:** Are they a senior?

Our Approach

Here's how we turn customer information into useful predictions. We follow a clear, step-by-step process using smart computer programs to help us understand what might happen next.

01

1. Clean Up the Data

We start by tidying up the customer information. This means fixing any missing details, getting rid of duplicates, and making sure everything is in a consistent format.

02

2. Get Data Ready

Next, we prepare the data so our prediction models can understand it. We convert categories into numbers and adjust values so the computer programs can work with them effectively.

03

3. Focus on Key Info

We then simplify the data, keeping only the most important parts. This makes it easier for our models to work efficiently without losing any crucial details.

04

4. Train and Test Models

After that, we teach our computer programs to make predictions. We then carefully test them to ensure they are accurate and reliable using separate practice data.

05

5. Make Predictions Live

Finally, we launch the prediction model. It runs continuously through a simple web application, so it can provide real-time results whenever we need them.

Model & Prediction Flow



This step-by-step process helps us make accurate guesses every time. We take customer information and prepare it carefully before our smart program makes a prediction.

How It Works

When we get new customer information, we prepare it just like we did when we taught our smart program. We adjust all the numbers so they can be compared fairly. Then, we pick out only the most important pieces of information.

After that, our trained program looks at this prepared information. It then tells us if a customer is likely to **leave** or **stay**.

 PERFORMANCE

Model Results & Accuracy

81%

Model Accuracy

Achieved after the tuning on test dataset

Prediction Outcomes

The model classifies customers into two distinct categories based on churn probability:

Customer Will Churn

High-risk customers requiring immediate retention intervention

Customer Will Not Churn

Stable customers with low churn probability

Results are delivered through an intuitive web interface, enabling business teams to quickly identify at-risk customers and prioritize retention efforts.

Business Insights from Data Analysis



Tenure Risk Factor

Customers with tenure under 12 months show significantly higher churn rates, indicating vulnerability during the early relationship period.



Contract Type Impact

Month-to-month contracts exhibit 3x higher churn compared to annual contracts, revealing commitment level as a key predictor.



Loyalty Advantage

Long-term contracts correlate with reduced churn rates and increased customer lifetime value.



Payment Method Influence

Electronic payment methods show lower churn rates compared to manual payment options, suggesting convenience drives retention.

Business Impact & Value Proposition

Implementing this churn prediction system delivers measurable returns across multiple business dimensions, transforming customer retention from reactive firefighting to strategic advantage.



Early Warning System

Identify at-risk customers weeks or months before churn occurs, enabling proactive intervention



Enhanced Retention

Develop targeted retention strategies based on specific churn risk factors and customer segments



Cost Reduction

Decrease customer acquisition costs by retaining existing customers—5x cheaper than acquiring new ones



Customer Satisfaction

Improve loyalty and satisfaction through personalized engagement and proactive support initiatives

Conclusion & Strategic Recommendations

Key Takeaway

Machine learning provides a powerful, data-driven approach to predict customer churn with **87% accuracy**. Early prediction transforms business operations from reactive damage control to strategic customer relationship management.

Organizations that leverage predictive analytics can reduce churn rates by up to 30%, directly impacting bottom-line revenue and competitive positioning.

Action Plan

- 1. Targeted Incentives:** Offer retention discounts and loyalty rewards to high-risk customers identified by the model
- 2. Contract Optimization:** Encourage month-to-month customers to upgrade to annual or multi-year agreements
- 3. Onboarding Excellence:** Provide enhanced support during the critical first 12 months of customer tenure
- 4. Marketing Precision:** Deploy churn predictions for hyper-targeted retention campaigns and personalized outreach