

Customer Satisfaction Prediction using Machine Learning

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The Challenge: Understanding Customer Satisfaction

Businesses often struggle with customer retention due to a lack of timely insights into satisfaction levels. Without understanding who is unhappy and why, it's difficult to intervene effectively.

Our project aims to address this by predicting customer satisfaction based on their behavioral data, allowing companies to proactively identify and engage at-risk customers.

Project Objectives

1

Data Preprocessing

Prepare raw customer data for machine learning models.

2

ML Model Development

Apply various machine learning techniques to classify satisfaction levels.

3

Feature Importance

Identify key factors that significantly influence customer satisfaction.

Dataset Overview

Our dataset encompasses a rich collection of customer information, including demographic details and comprehensive service usage patterns. This extensive data serves as the foundation for our predictive models.

The critical target variable for our analysis is "Satisfaction," which is classified into two distinct categories: "Satisfied" and "Not Satisfied." Our models are designed to accurately predict this crucial outcome.



Data Preprocessing Steps

Handling Missing Values

Addressed null values and removed duplicate entries to ensure data quality.

Categorical Encoding

Transformed categorical variables into a numerical format suitable for machine learning algorithms.

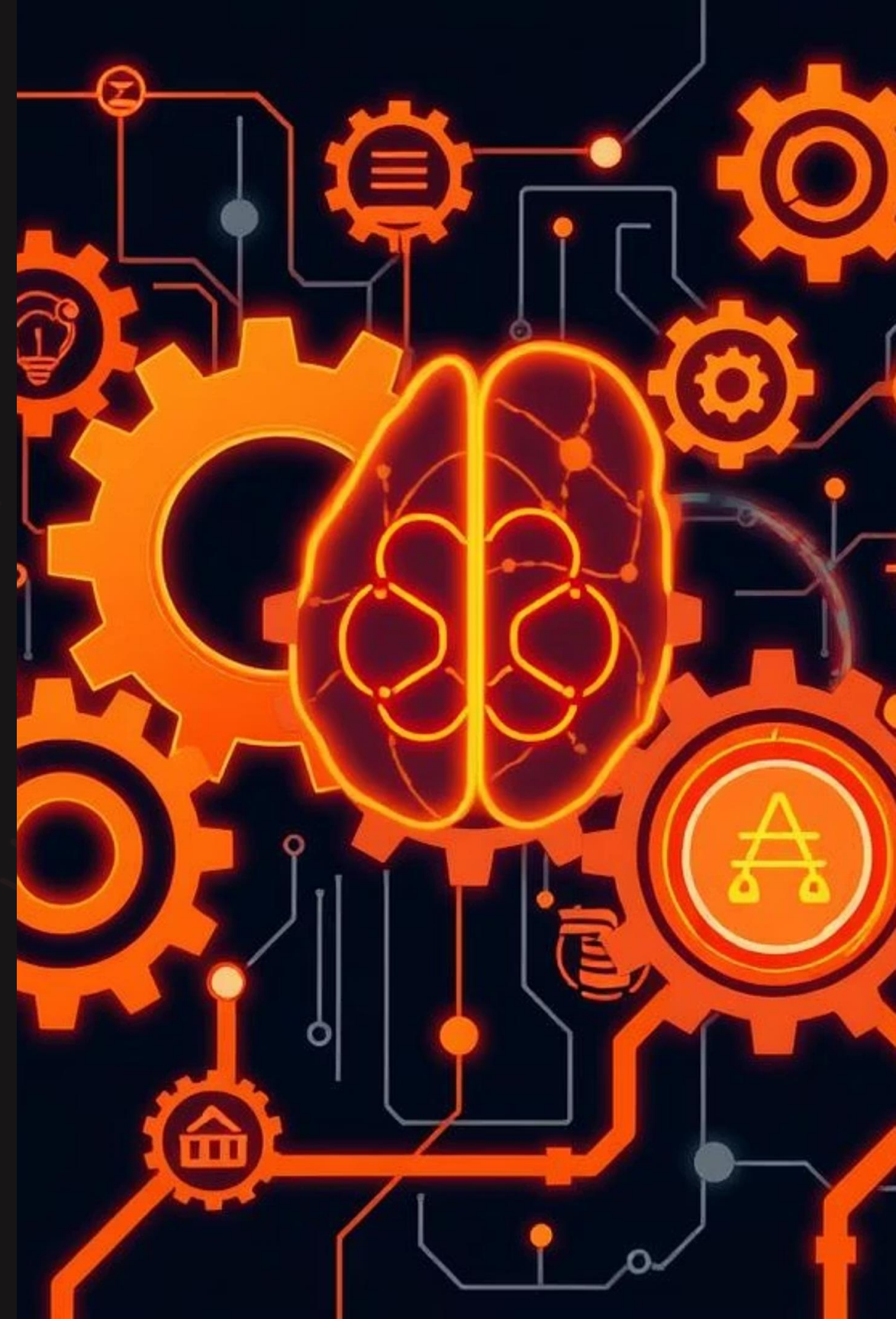
Feature Selection

Identified and selected the most relevant features to improve model performance and reduce noise.

Machine Learning Model Building

We explored several machine learning algorithms to find the most effective approach for predicting customer satisfaction. Our primary models included Logistic Regression and Random Forest.

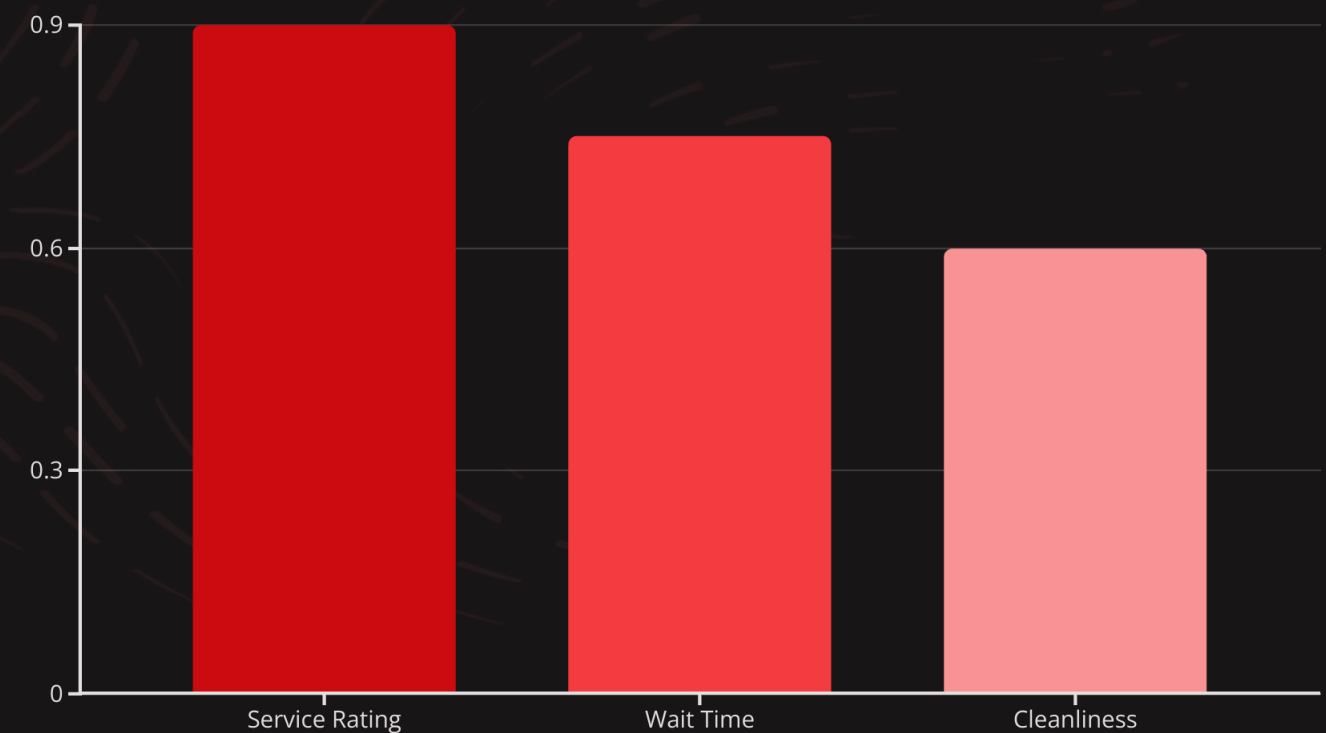
Models were rigorously trained and tested, with performance evaluated using key metrics such as accuracy and F1-score to ensure robust and reliable predictions.



Key Results and Insights

Our analysis revealed that the Random Forest model delivered the best performance, achieving an impressive accuracy of approximately 85% in predicting customer satisfaction.

The most influential features identified were service rating, wait time, and cleanliness, highlighting critical areas for businesses to focus on to enhance customer experience.





Conclusion: Empowering Businesses with ML

Machine Learning proves to be an effective tool for accurately predicting customer satisfaction. This capability can significantly benefit companies by enabling them to identify and target unhappy customers proactively, before they churn.

Future Enhancements



Web Application Deployment

Develop a user-friendly web application for real-time satisfaction predictions.



Deep Learning for Sentiment

Incorporate deep learning models to analyze sentiment from customer feedback for richer insights.