Improving Patient Care Experience Using Feedback Survey Data

ANJALI SHAH

INSIGHT FINAL PRESENTATION

FEBRUARY 01, 2016

Problem Statement

Problem Statement

- In partnership with Calibrater Health, my Insight project focuses on:

  – Finding the right ratio of patients each provider sees a day, such that:
    - Patients receive adequate time and attentive care from their providers
    - Patients respond with best scores on feedback surveys

  – Predicting patient volumes based on past trends

Algorithm and Data Analysis Approach

Algorithm Stages and Pipeline

Aggregated Data → Data segregation and Feature extraction → Model Training Regression & Time Series Analysis → Validation & Testing → Custom Actionable Insight
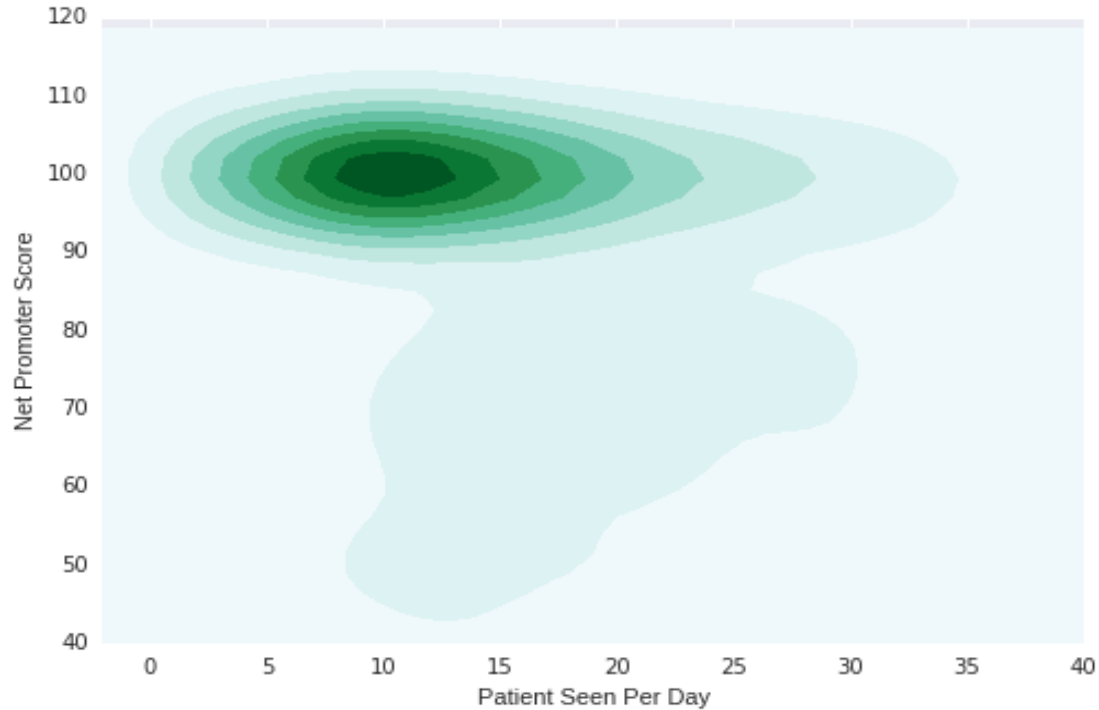
Features

- Customer ID
- Site ID
- Provider ID
- Patient ID
- Visit ID
- Date Seen
- Score

1. Patients seen by provider per day
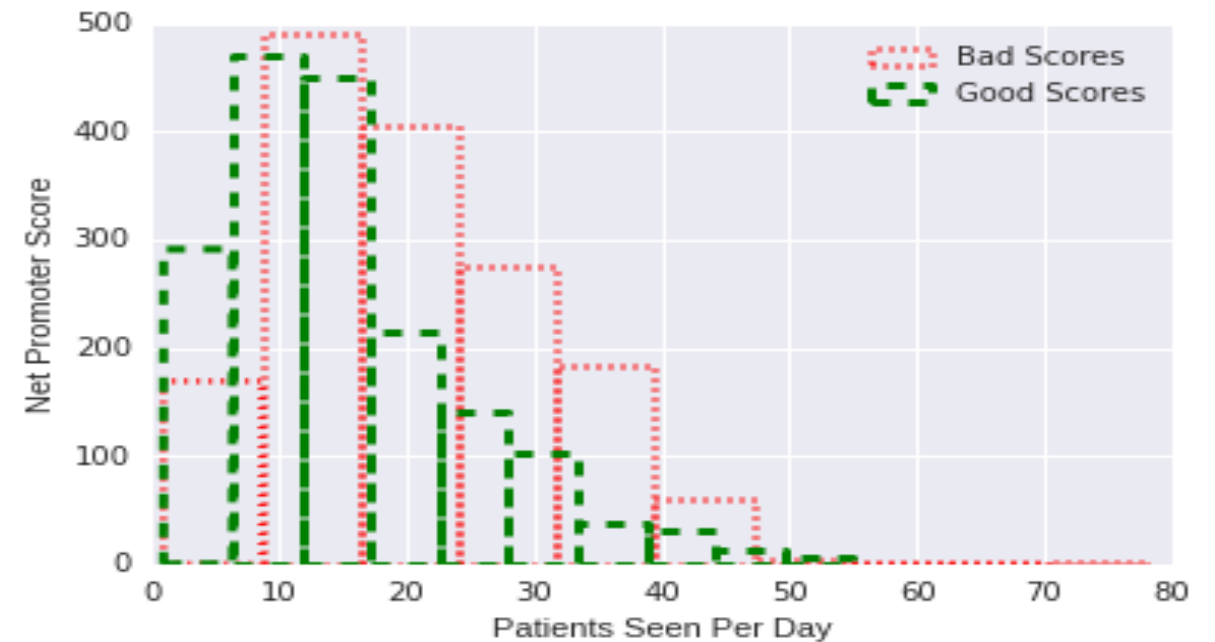
2. Day of the week
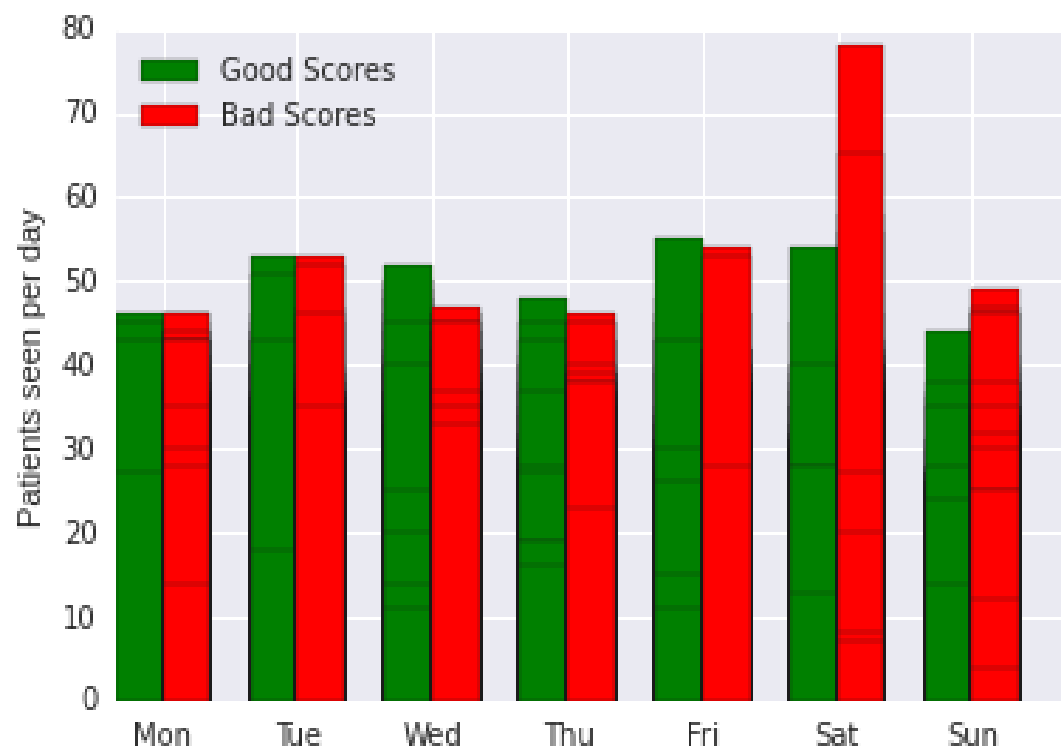
3. Net promoter score

Finding the Cut-off

Kernel Density Estimation

Actionable Insights

- t-statistic is -15.840 and the p-value is 0.000
- Good Scores: (14 – 15 patients a day)
- Bad Scores: (19 – 20 patients a day)

Finding the Cut-off

Scores by day of the week and volume

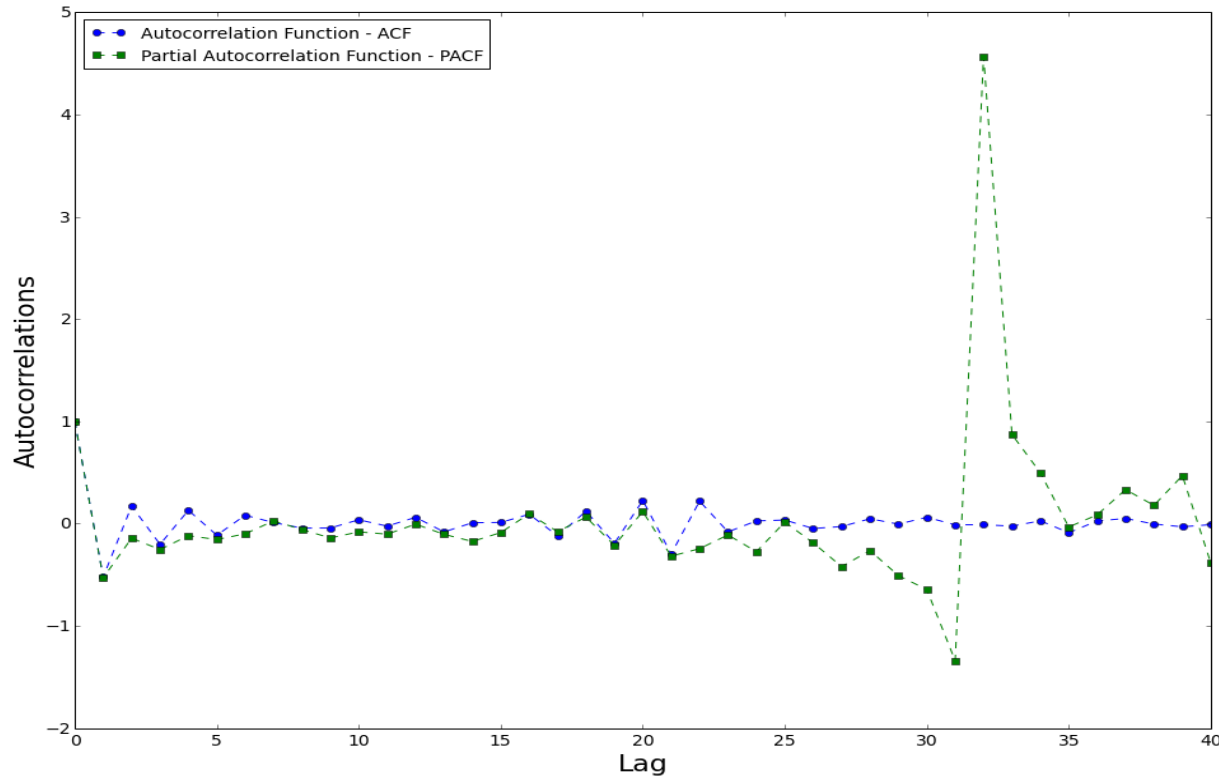| Actionable Insights	
Logistic Regression Model Coefficients	[[0.59407195 -0.05640736 -0.03836962]]
Model Classification Summary	precision recall f1-score support 0.0 0.60 0.45 0.52 465 1.0 0.61 0.74 0.67 541 avg / total 0.61 0.61 **0.60** 1006
Cross Validation Score Using 10-fold Cross-validation	0.668506488322

Predicting Patient Volume (monthly data)
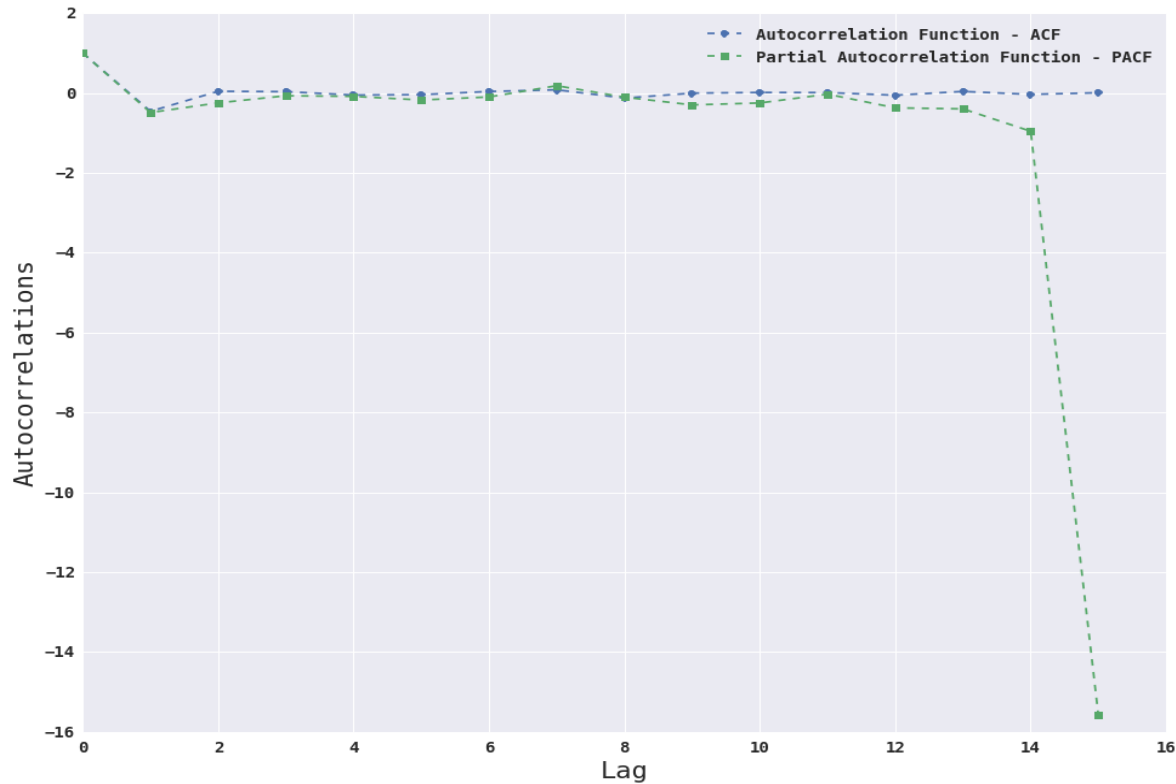
AR(2) Model

Actionable Insights
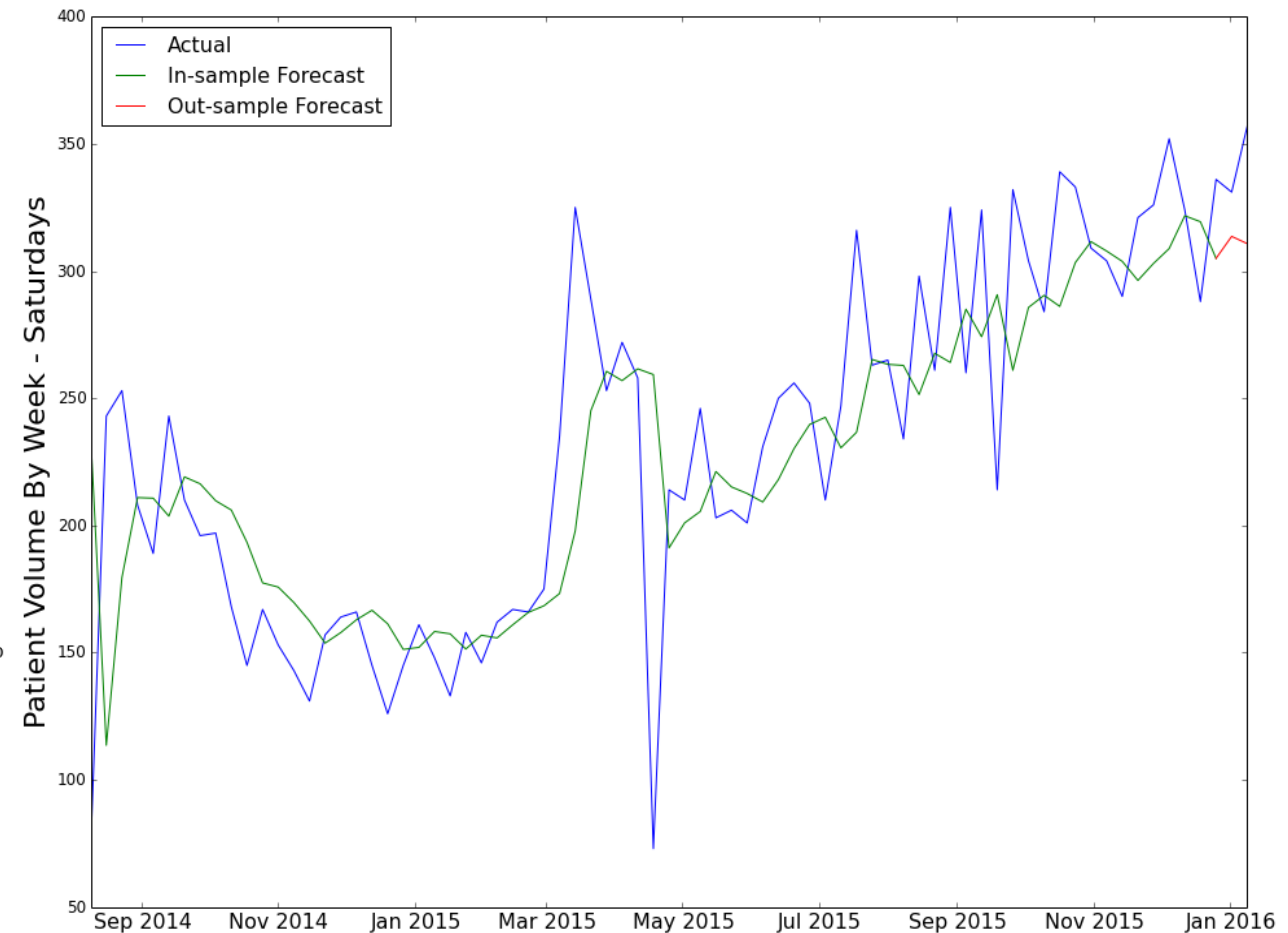
- MAPE = ~17%
- Predicted volume for 2016-01-31: 1320 patients

Predicting Patient Volume (weekly data)

ARMA(1,0,1) Model

Actionable Insights

- MAPE = ~17%
- Predicted volume for 2016-01-16: 330 patients

About Me

PhD

- Biomedical Informatics

Masters and Bachelors

- Computer Science and Engineering

Professional Experience

- 8+ years of professional experience across Financial Services, Healthcare, Telecom and Education sectors

Former Employers

My Passion

Travel and…

Scrapbooking