Client Example ARIMA Forecasting

IMM Decision Sciences

Objective

Determine the point at which organic traffic will return to traditional levels prior to the significant drop in web traffic mid-December 2017.

Methodology

Our team ingested nearly 3 years of non-sampled Google Analytics data, specifically selecting daily organic user totals, by day, over the entirety of the period. Our exploratory data analysis highlighted high levels of weekly seasonality in the entire distribution. Looking to create distribution stationarity and reduce the noise of the historical data, we decided to move forward with an Autoregressive Integrated Moving Average (ARIMA) model on weekly user totals.

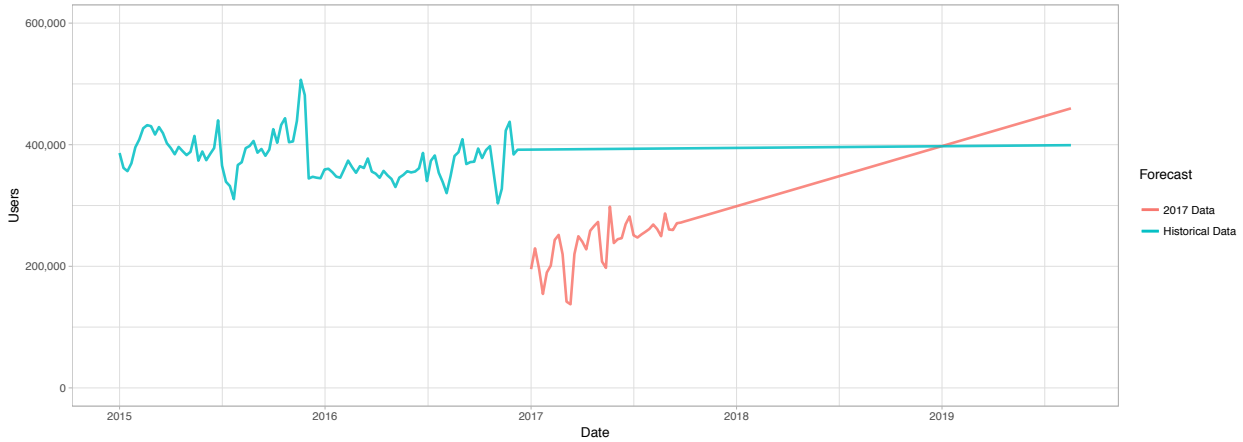
We built 2 separate ARIMA models, in order to predict both the trajectory of historical levels and that of the 2017 data. This process is attempting to find the point at which we will return to the historical user volumes.

Results

- **Historical Forecast** : Given data from January 1st 2015 to December 14th 2016, we predicted the historical level data, prior to the drop period, would have stayed at a relatively stable rate, gaining around 53 users a week.
- **2017 Forecast** : Given data from January 1st 2017 to September 24th 2017, we predicted the 2017 data, after to the drop period, will continue to increase volume at a rate of 1896 new users a week.

Looking at the visualization below, we can see that we expect to return to historical organic user volumes by the late 2018 given all inputs to this trajectory remain constant.

Organic GA User Projections



Note: We consciously decided to omit the drop period from December 15th 2016 to December 31st 2016 in order to properly forecast the 'old normal' and the 'new normal' organic user volume totals.