Spectrum Enterprise

Model Based Fiber Network Expansion

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Presenter

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Nishant is the Director of Advanced Analytics at Spectrum Enterprise, and has been a SAS power user for 15 years. Nishant leads the development of model based strategies and customer insights for Market Analysis at Spectrum in Charlotte, NC.

Prior to coming to Spectrum, Nishant worked at Ally Financial and Willis Re, Inc. in the credit, collateral and catastrophe risk modeling space.

Nishant has a Master's degree in Operations Research from The Ohio State University, and a Bachelor's degree in Mechanical Engineering from MITS, India.

Charter Communications/Spectrum: $42B Revenue, Fortune 97 Company

Second largest cable service provider in the US

Spectrum Residential

23 million Customers, $33B

Spectrum Business

1.6 million Customers, $3.7B

Spectrum Enterprise

114K Accounts, $2.2B

Internet Access

Network Solutions

TV Services

Voice Solutions

Cell Tower Backhaul

Cloud Services

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Dense Fiber Reach Nationwide

- 32 Metros across 41 States
- 230,000+ fiber route miles

Next Generation Technology & Expertise

- Fiber, cloud and IT infrastructure solutions and managed services
- 800+ IT certifications
- 20 years of managed services

Award Winning Industry Leader

- 2017 Analyst Award winning Ethernet
- 4th Largest U.S. Ethernet Provider
- CRN Coolest Cloud Vendor

Analytics @Spectrum Enterprise

Marketing:

Campaign Optimization

Sales:

Sales Channel Optimization, Territory assignment

Market Development:

Fiber network expansion

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Network Expansion Strategy

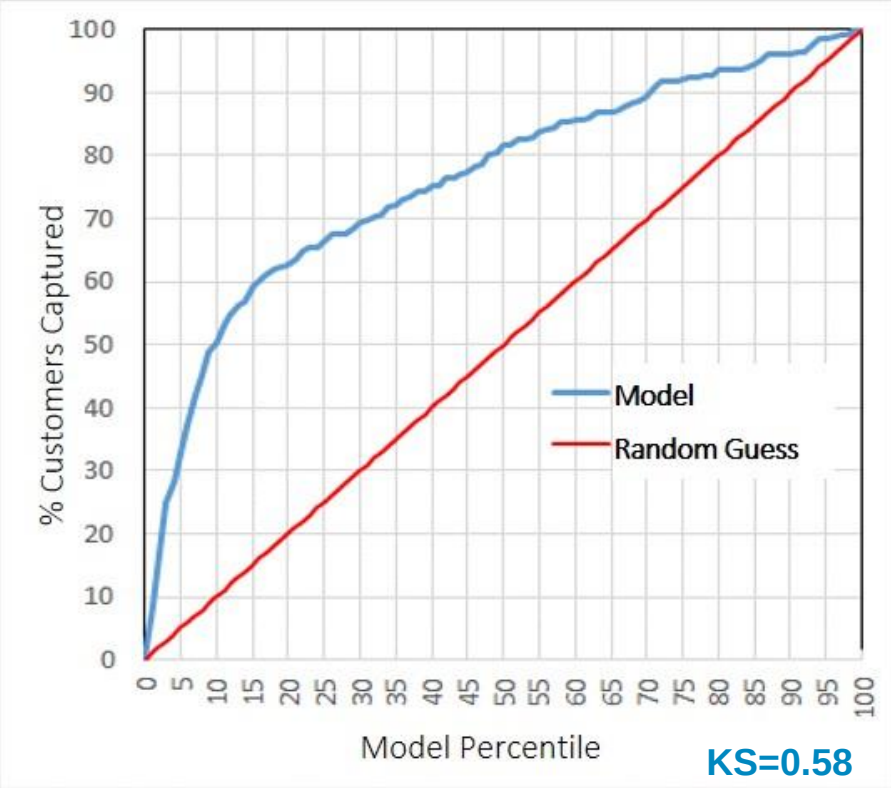
- Identify best prospects and their location using models based on Logistic Regression
- Calculate cost of expanding fiber to each building from fiber access point using model based on Linear Regression
- GIS Integration to determine obstruction identification, and building neighborhood and density using Resolution Reduction Algorithm.
- Choose the option with the best Return of Investment and routing.

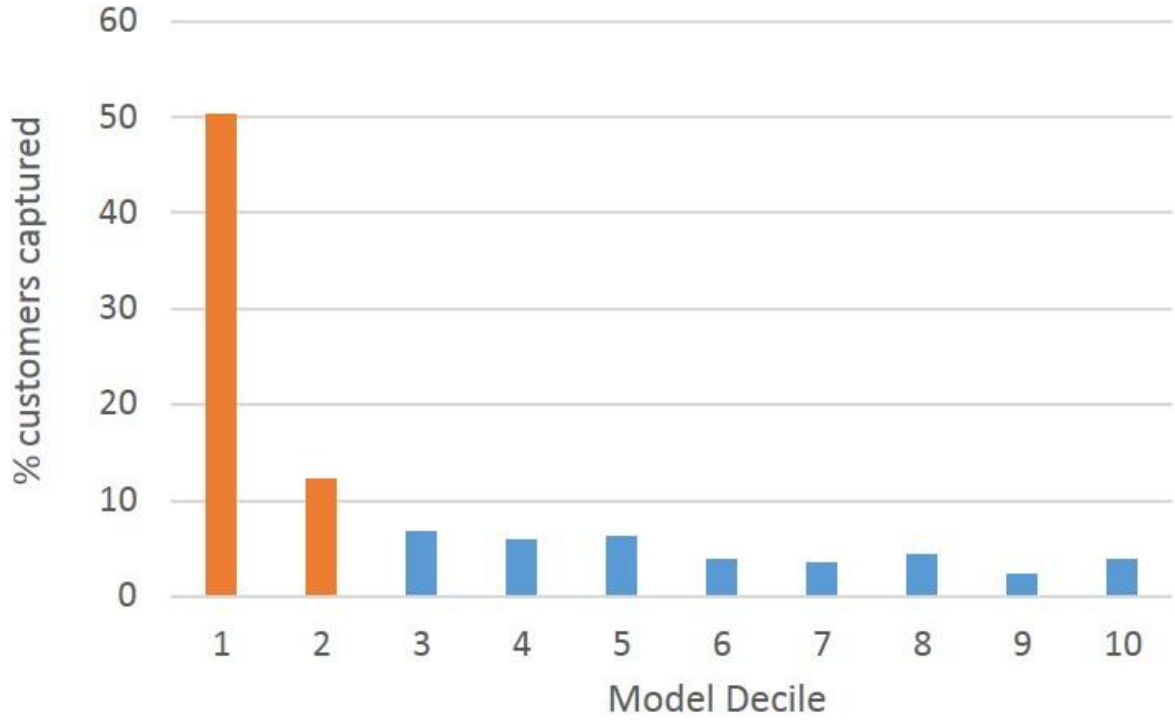
Customer Acquisition Model

Probability to Buy Products: f (firmographic variables, demographic data, GIS based data)

Model back-testing result

For new customers acquired in Sep-Nov ; Scored in Aug 2017





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Fiber Cost Model

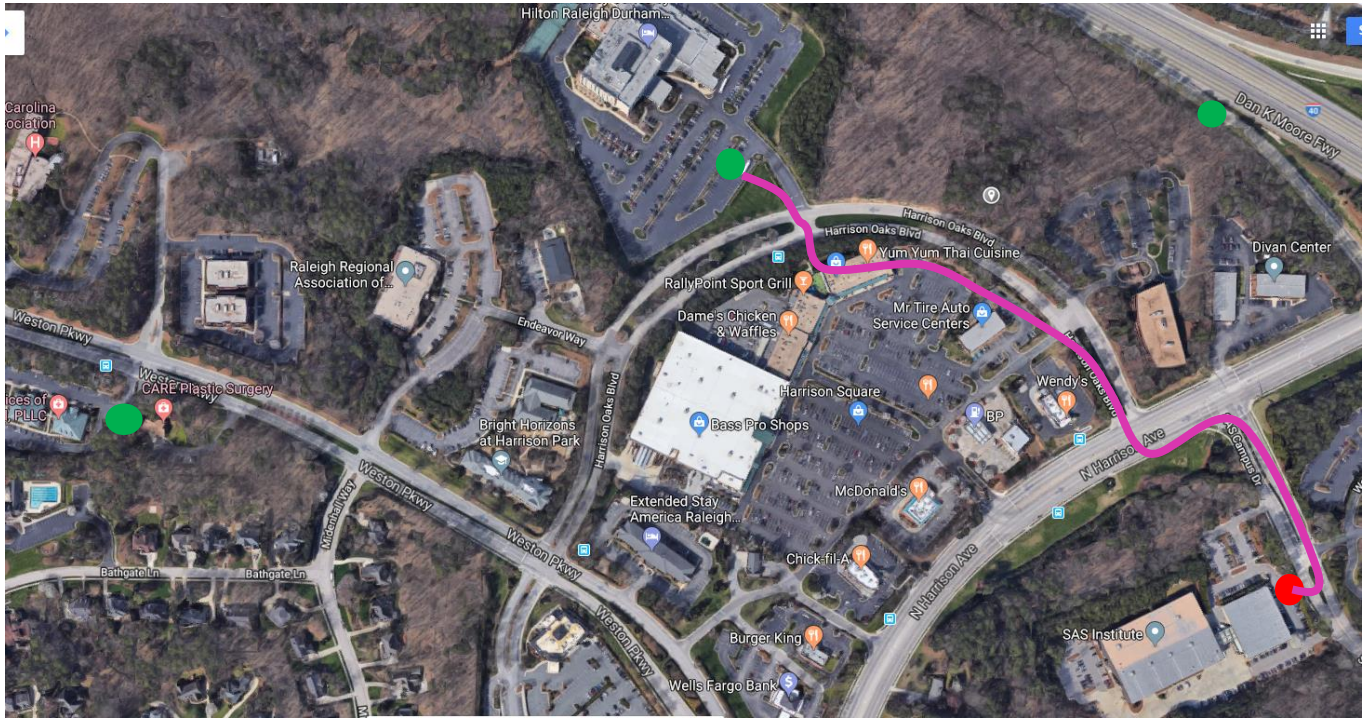
Model Variables:

Amount of Fiber Cable work needed, Firmographic data, Geographical data,

GIS Integration: Obstacle detection, Resolution reduction algorithm for density

Example: (Not based on actual data)

- Fiber Access Point
- New Customer Location
- New Fiber Line



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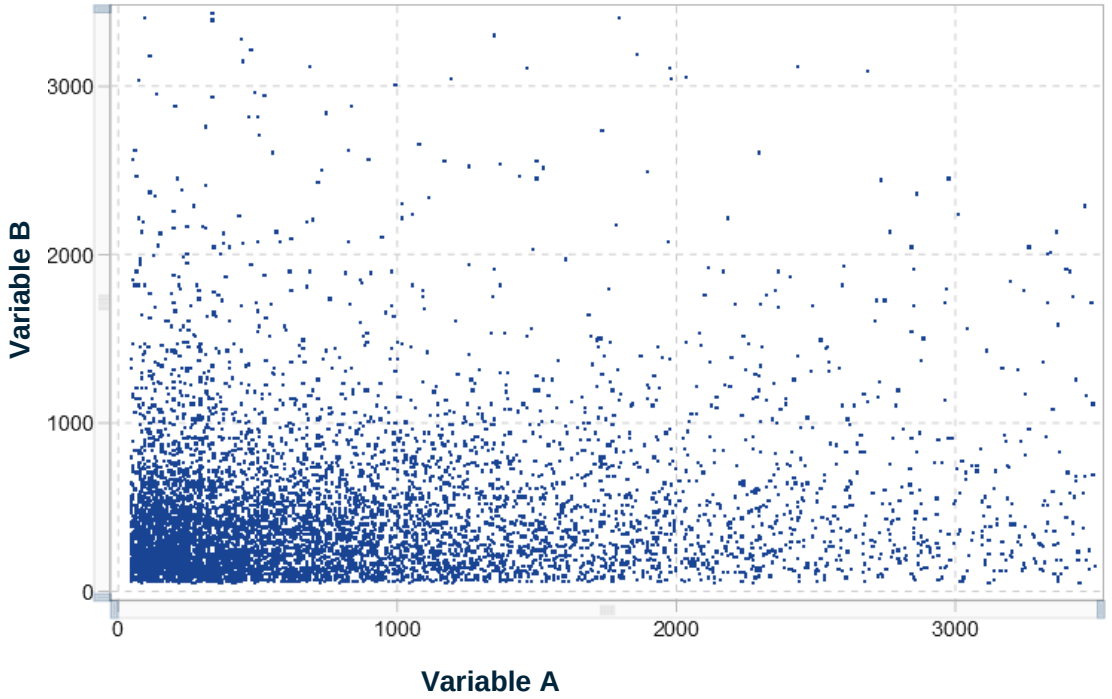
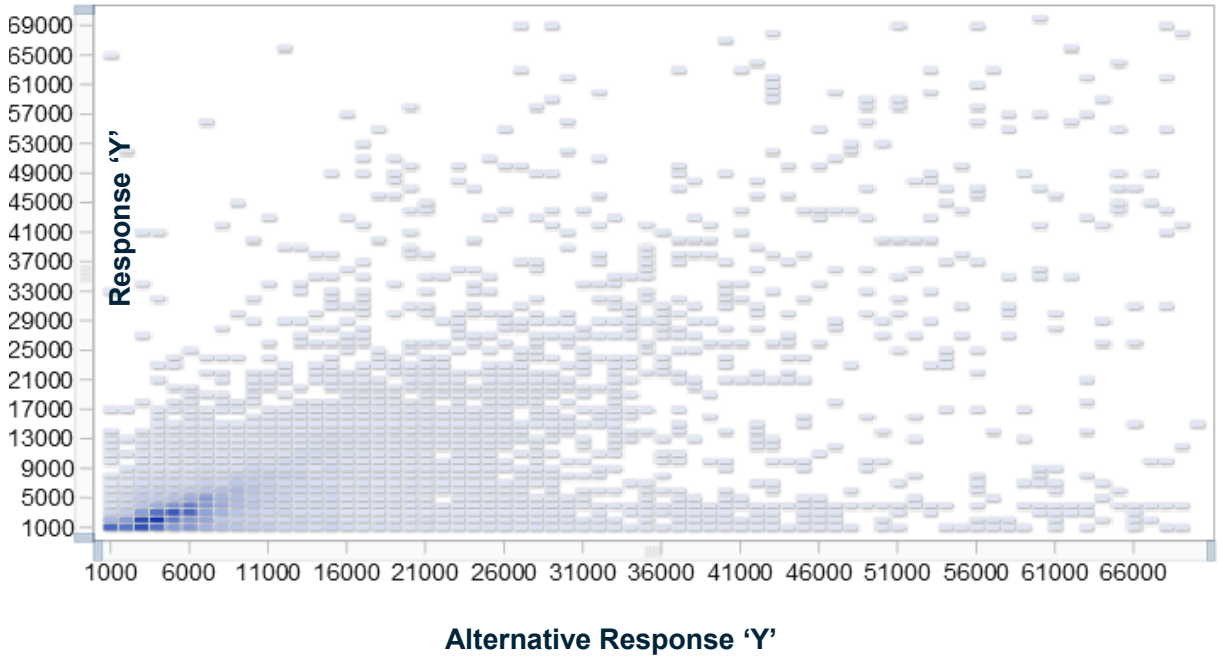
SAS VA Scatter Plots





- SAS VA provided a much faster platform for repeated creation of scatter plots, histograms, and an easy data filter application.
- This saved a lot of time and effort in creating different model versions and intense data analysis, than doing in just Enterprise Guide.

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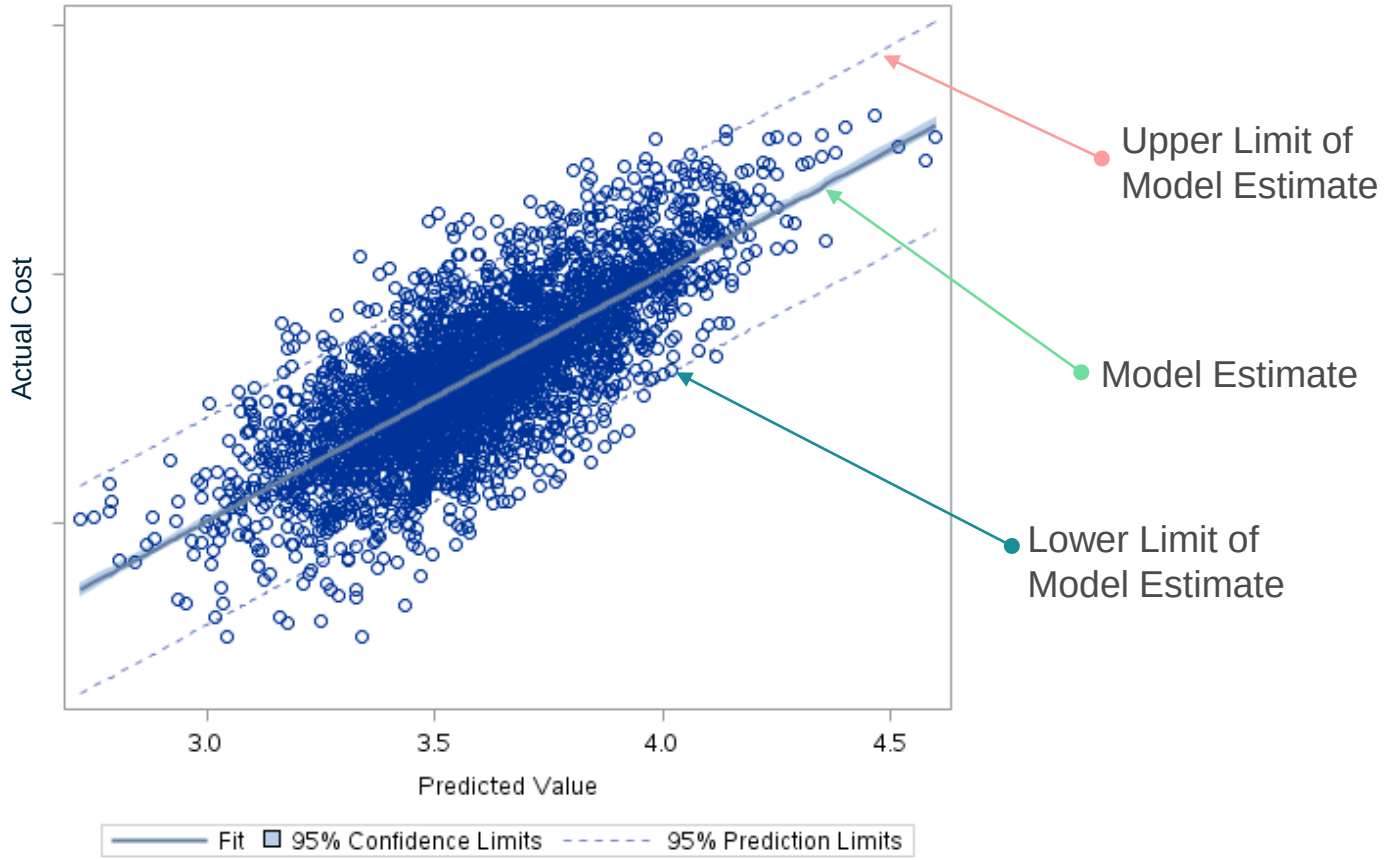
Fiber Cost Model Fitness

Model was tested on the Validation data set to check for error in the Estimate vs Actual Total Cost.

Model is able to account for 75% of the variance in the data (R-Square value).

The plot below is from SAS Enterprise Guide.



Model in Production

Competing estimation process overestimated the actual construction cost by an **average of 56%**

The model overestimated the actual construction cost by an **average of only 8%**, and with a lower variance

Thank you.

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