Hunter Douglas
Customer Experience Project

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Company Overview

- Employs over 17,000 people worldwide
- Operates in more than 100 countries
- Composed of 168 companies with 68 manufacturing and 100 assembly plants and marketing organizations
- Over $2.5 billion in sales
- Worldwide manufacturer of architectural products (acoustic ceilings, rain screens, building facades) and window coverings
- Headquarters in Rotterdam, the Netherlands
- North American Headquarters –Pearl River, NY, USA

Problem Description

Predict the most significant drivers of Dealer Growth

Hunter Douglas has thousands of dealers. Our goal is to help them find out the dealers with high performance so that they can put more efforts and marketing costs on those dealers to increase the sales and profits.

Ho

Hypothesis

Deal Performance is associated with sales data and dealer infographic

- We aim to help Hunter Douglas understand their customers by performing customer segmentation.
- We aim to identify the most significant drivers of dealer growth. Hunter Douglas would be able to identify potential “big” customers with this information.
- Once the model is built successfully, it should be easily applicable to the prospective customer's data.

Architecture & Approach

Tasks

Sales & Product Mix Data

Dealers Own Business

Quote To Order Pricing

Preprocessing

Replace empty cells with 0

Remove duplicates and records

Remove outliers

Extract key information from NAICS

Transform NAICS into NAICS num

Merge datasets together

Principal Component Analysis

Feature Engineering

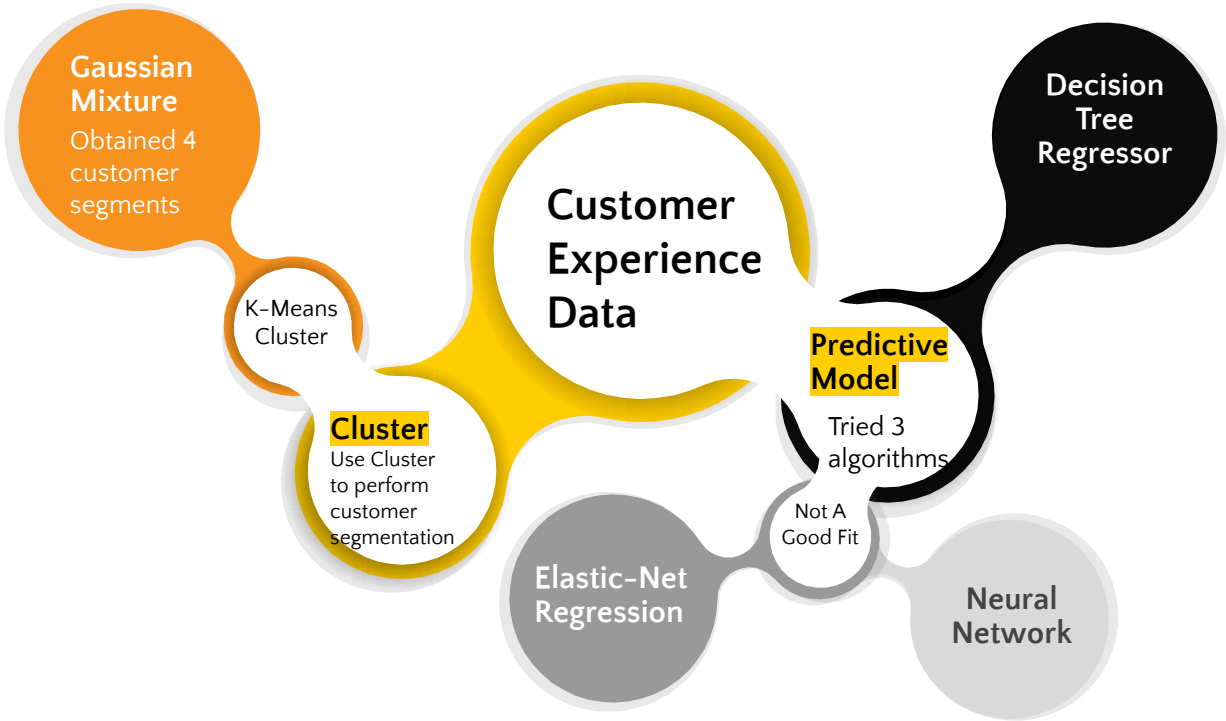
Create new features: Compounded Annual Growth Rate & Quote to Order Rate

Encode into numerical variables

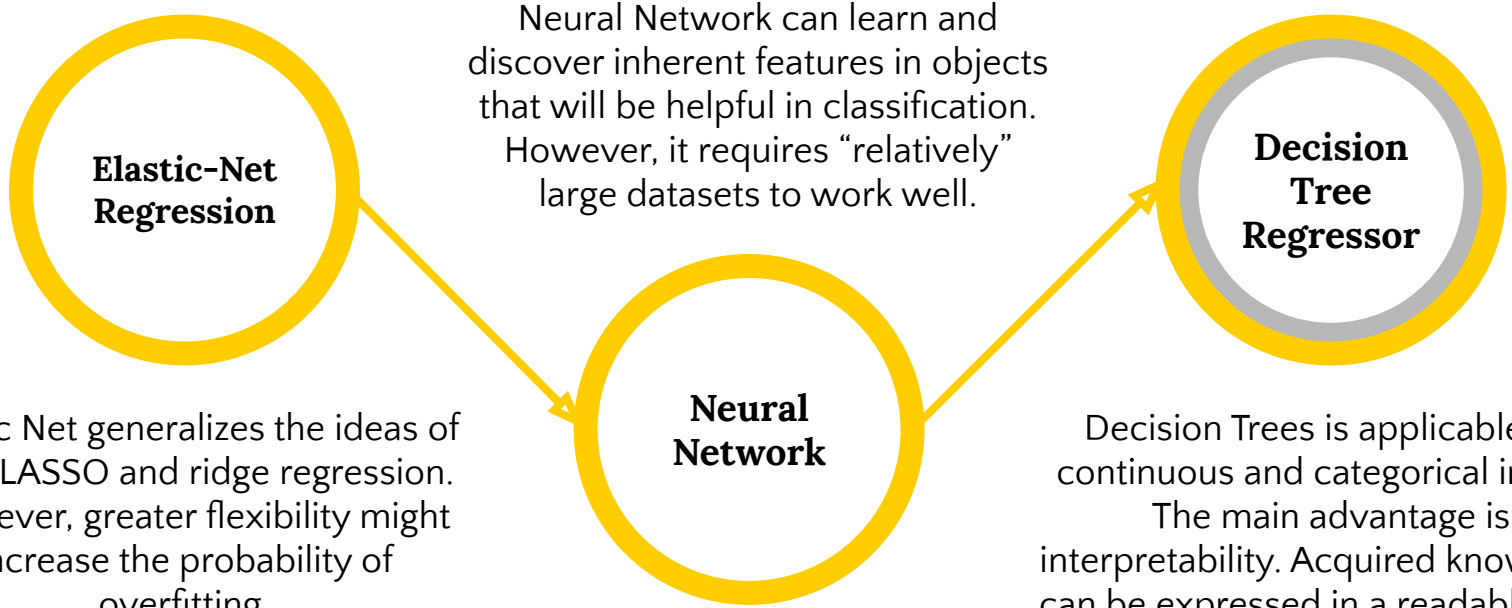
Target Variable

Compounded Annual Growth Rate

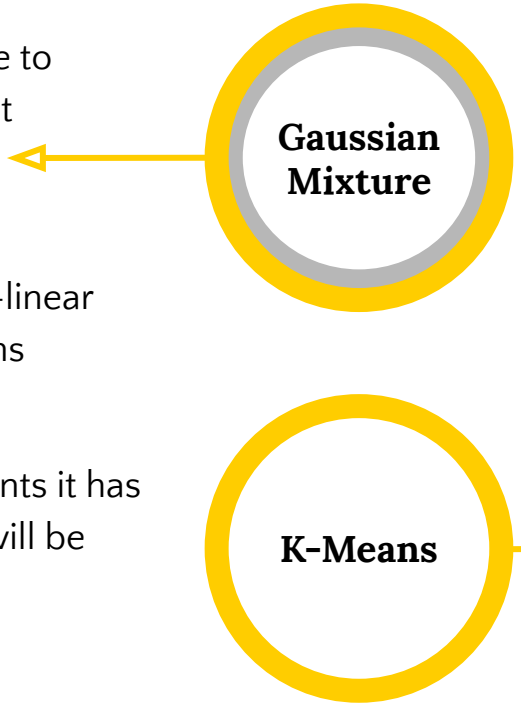
Architecture & Approach



Architecture & Approach
Predictive Model



Architecture & Approach
Cluster Analysis



Uses probability of a sample to determine the feasibility of it belonging to a cluster.

- Pros

  Works well with non-linear geometric distributions

- Cons

  Uses all the components it has access to, the result will be hard to interpret

Classifies samples based on attributes/features into K number of clusters.

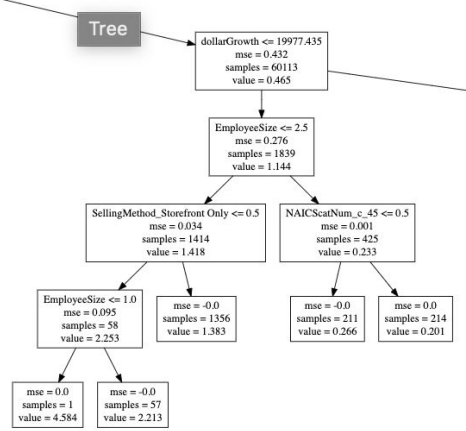
- Pros

  Better for high dimensional data / Easy to interpret

- Cons

  Does not work efficiently with most non-linear data

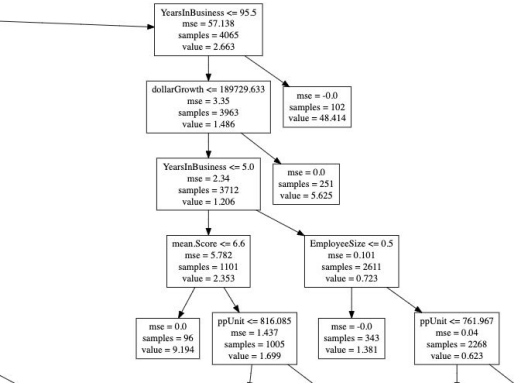
  Hard Assignment might lead to mis-grouping



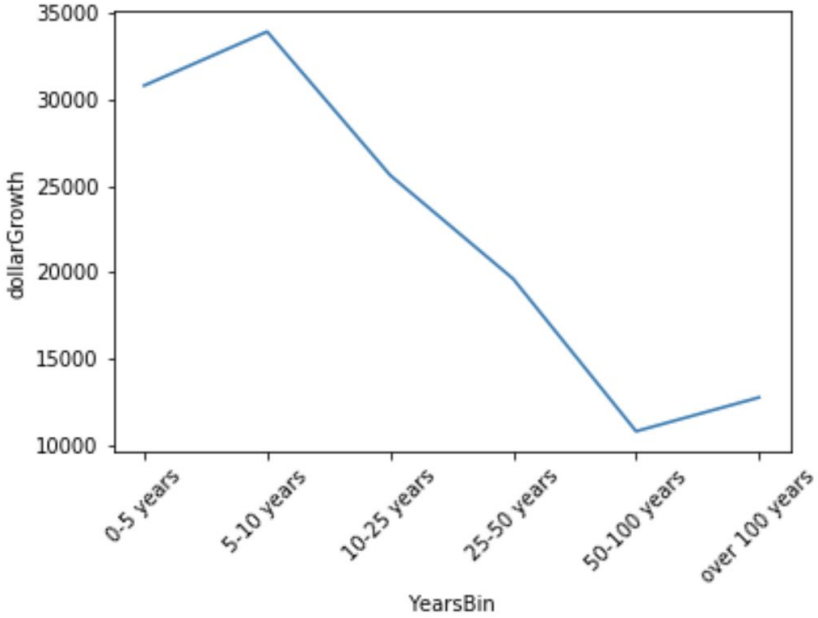
Predictive Model

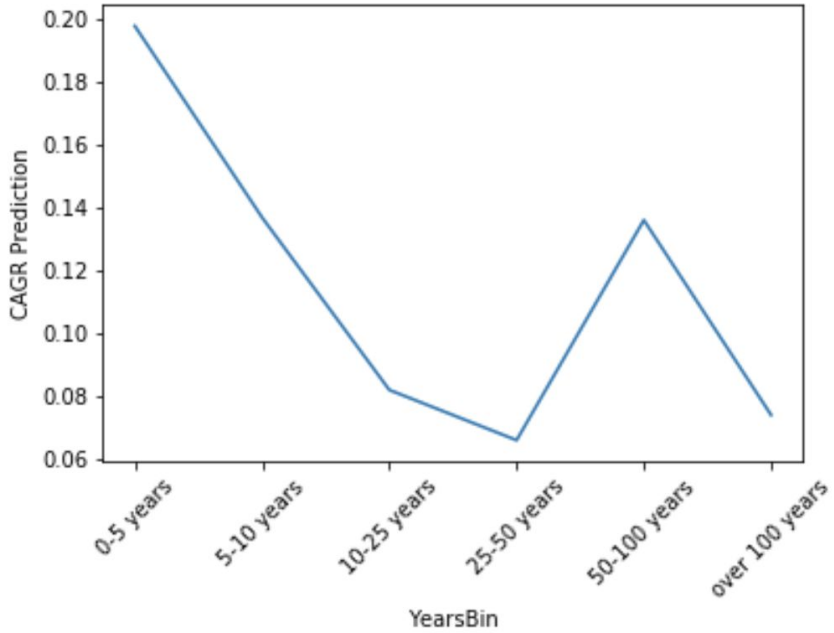
Decision Tree Regressor

Predict the most significant drivers of Dealer Growth (%)



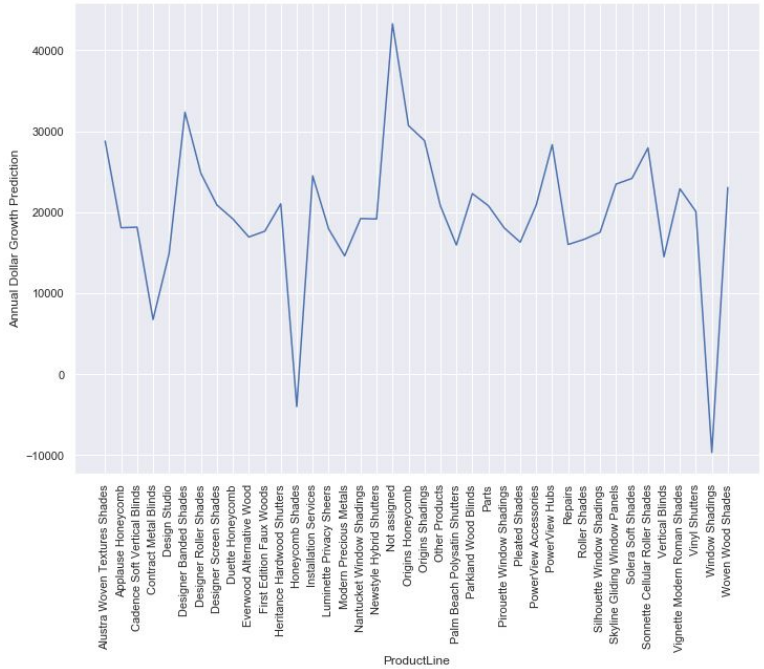
Years in Business

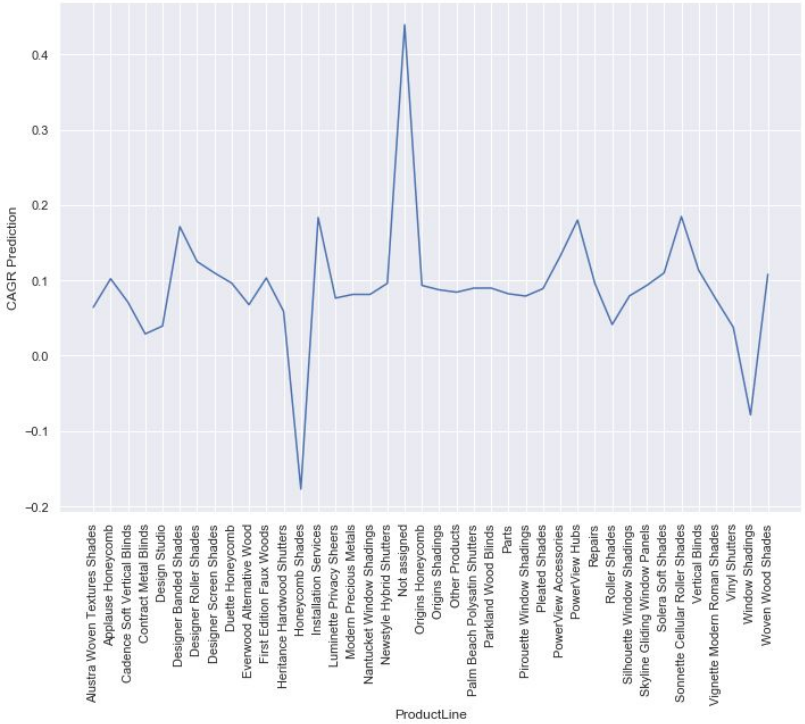




Product Line

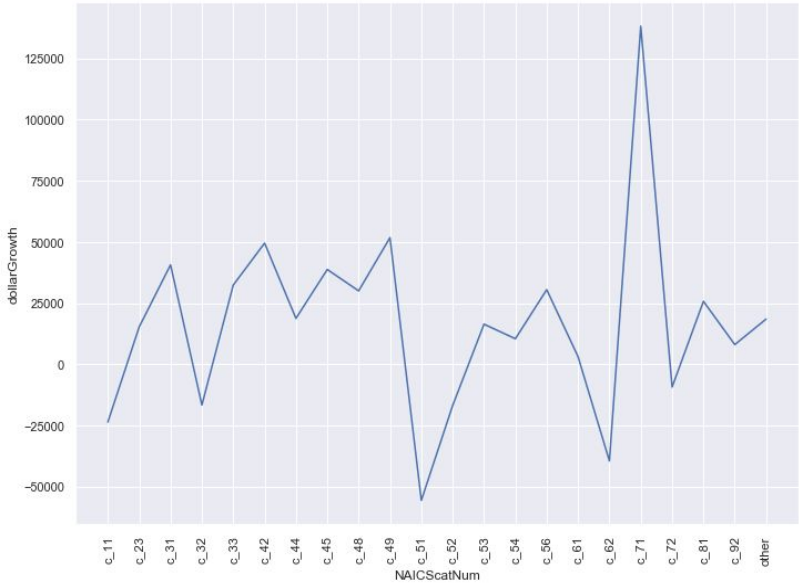
CAGR Prediction and Dollar growth prediction

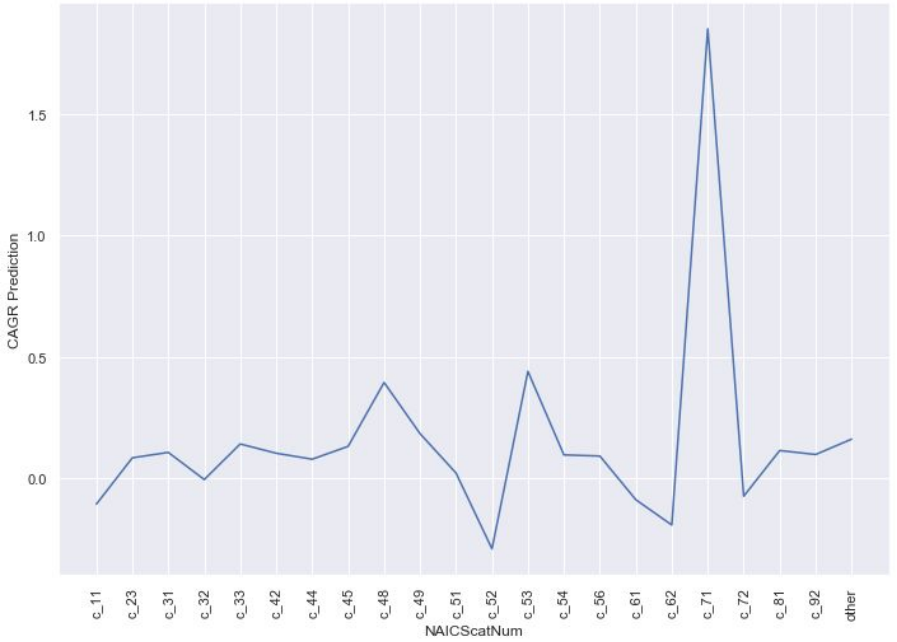




NAICs category

CAGR Prediction and Dollar growth prediction



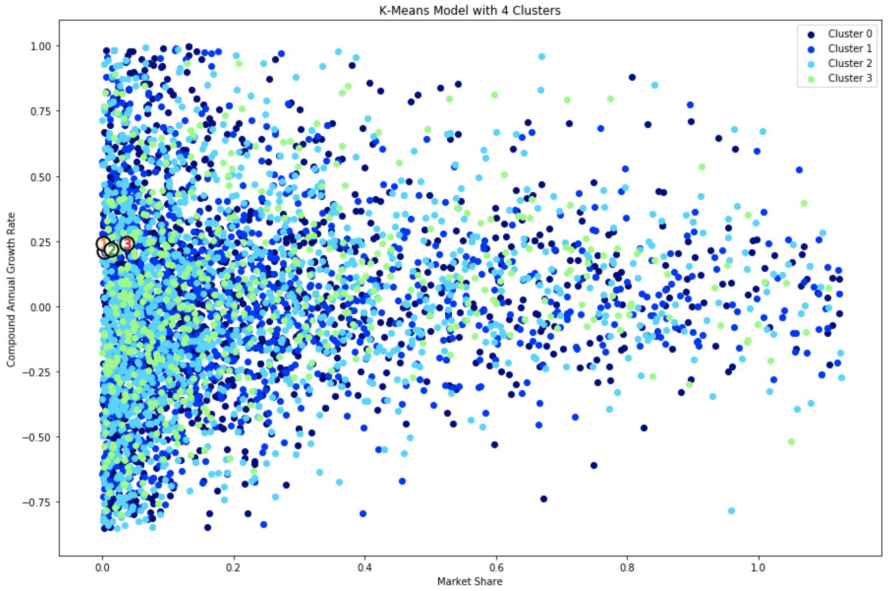


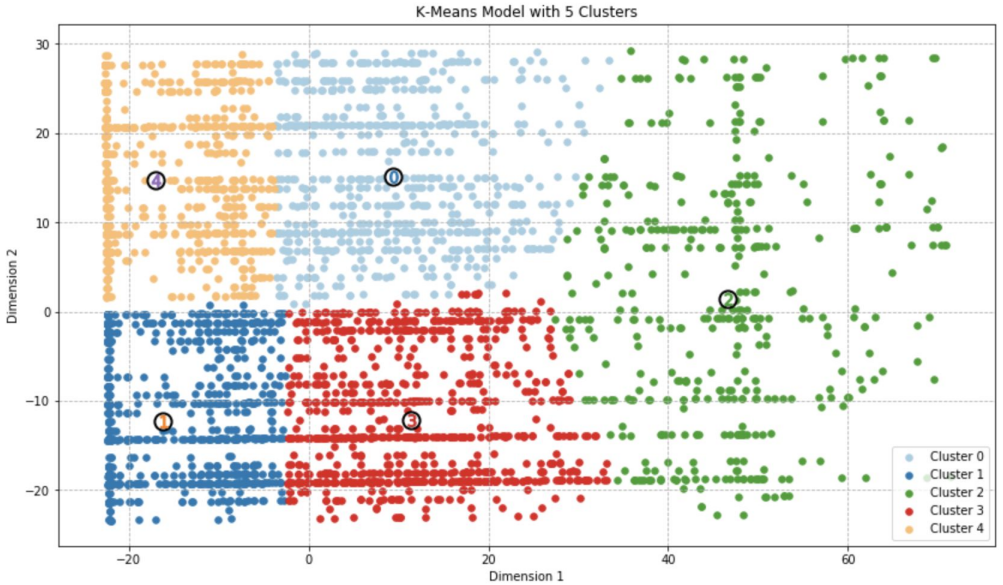
C_71	Performing arts companies
C_53	Property managers
C_48	Shipping companies and transportation
C_51	Movie entertainment and telecommunication
C_52	Real estate agencies and Insurance
C_62	Health Care providers

Cluster Analysis

Cluster Analysis to segment the dealers into different groups

Segment	CAGR	Q2O	BTI	YIB	ES	NAICS	State	Industry	MS
0	0.0023	0.4393	0.5832	11.6175	2.3569	8.5906	39.3172	6.8182	0.2106
1	0.0014	0.4446	0.3782	34.6536	3.9894	8.8354	16.2363	6.8044	0.2409
2	0.0138	0.4177	0.5210	6.3857	1.8372	8.7750	10.9609	6.9899	0.2169
3	0.0369	0.4102	0.3535	67.1636	5.5899	7.5960	25.7919	7.0646	0.2419





Segment 0

Primary customers are hardware stores that attribute to manufacturing.

low CAGR | 11 years in business | targeted in Puerto Rico

Segment 1

Primary customers are hardware stores that attribute to manufacturing.

low CAGR | 35 years in business | targeted in Kansas

Segment 2

Primary customers are hardware stores that attribute to manufacturing.

high CAGR | 6 years in business | targeted in Georgia

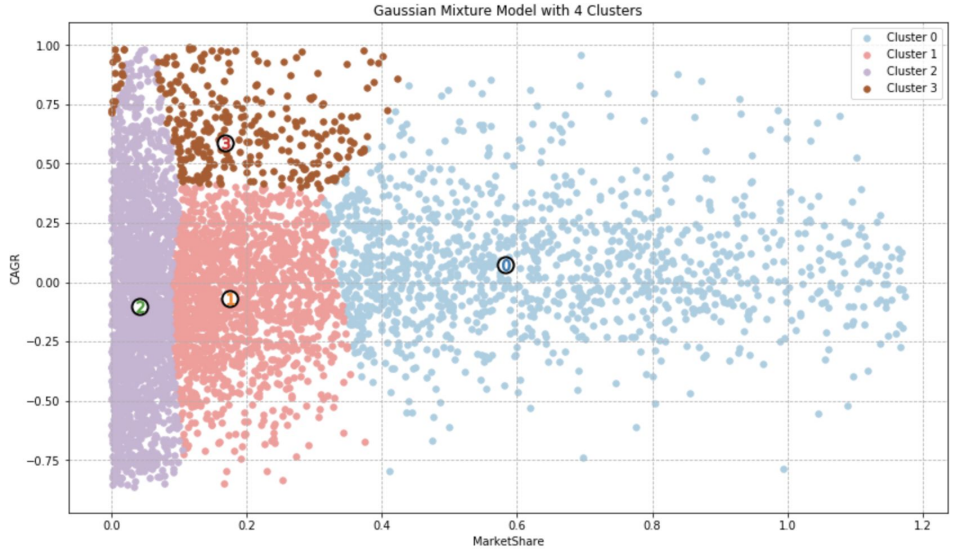
Segment 3

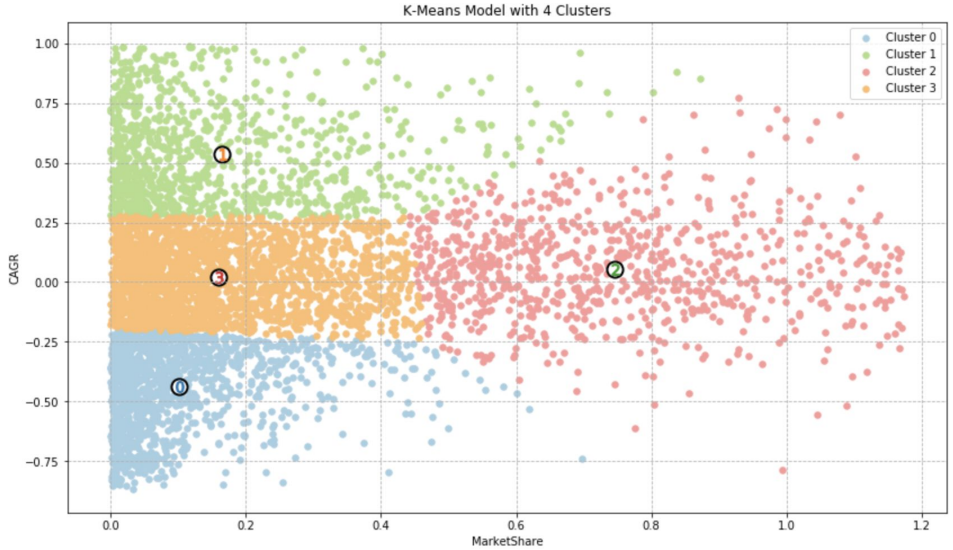
Primary customers are home builder that attribute to retail trade..

high CAGR | 67 years in business | targeted in Missouri

Algorithm Comparison

Better





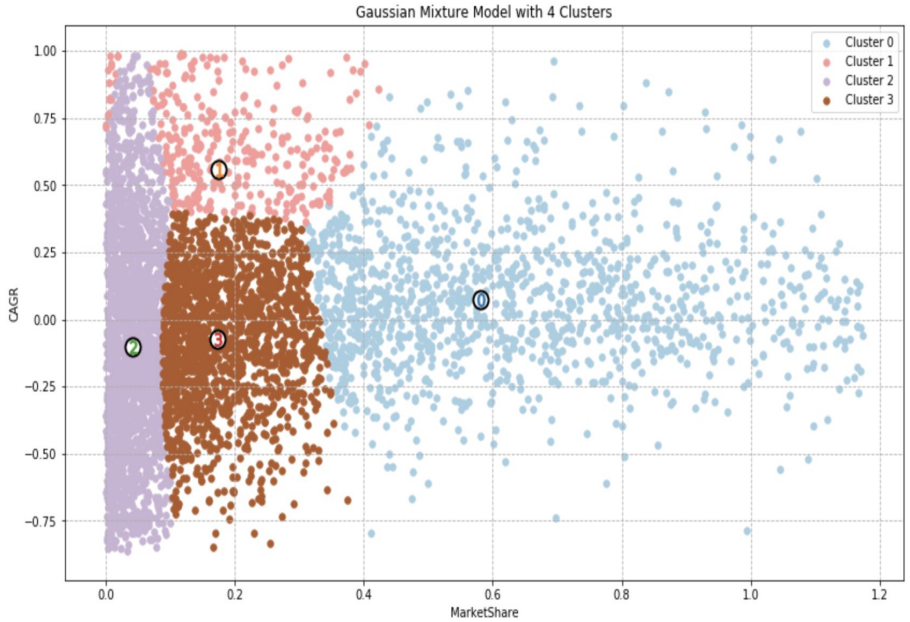
K means will start with the assumption that a given data point belongs to one cluster.
Mixture of Gaussian uses probability of a sample to determine the feasibility of it belonging to a cluster.

Lessons Learned

- Segmenting customers can have dramatic effects on a company's perception of who their best customers are
- Pivoting is much more useful than aggregating in some cases
- Webgraphviz is a powerful platform to visualize complicated tree models
- Need to be mindful when creating categories that the created categories are meaningful
- PCA is a fantastic tool to convert multiple attributes to 2-Dimensional, which is easier to understand cluster analysis visually.
- Projecting benefits in an unpredictable economy are inherently risky

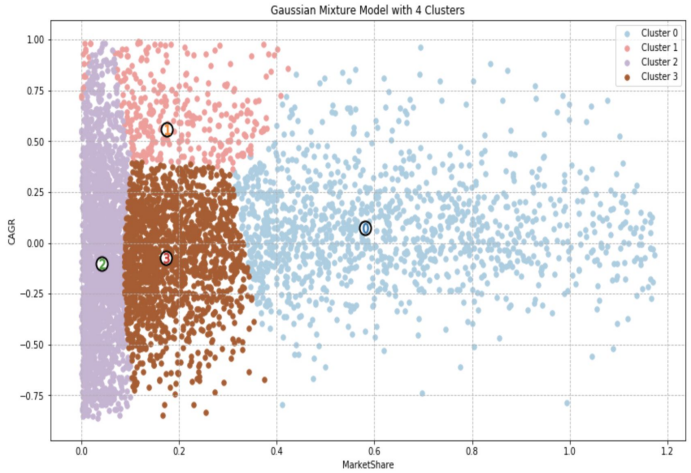
Economic Impact Model

Cluster Analysis

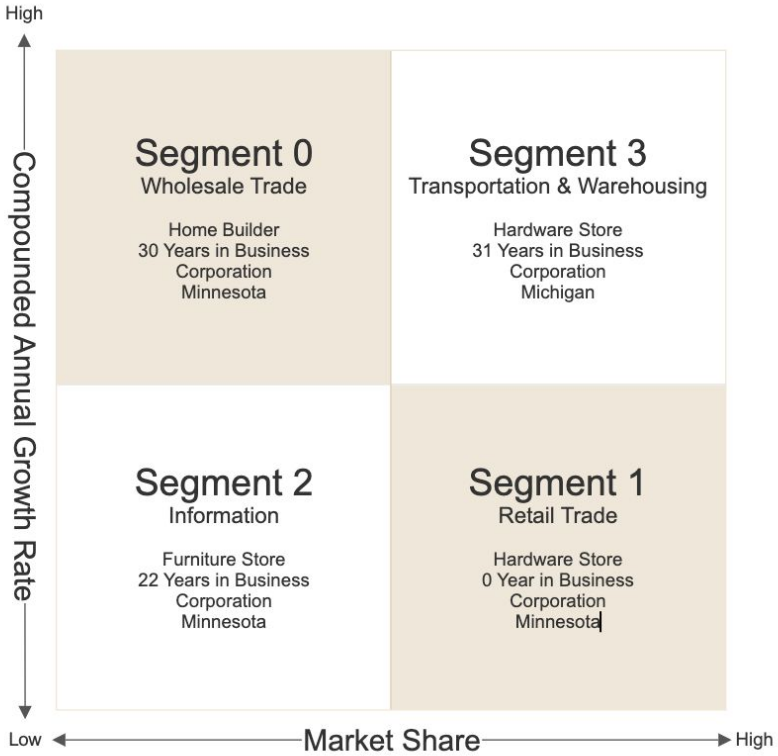


Boston Consulting Matrix

Economic Impact Model



Segment	CAGR	MS
0	0.0045	0.2584
1	-0.0131	0.1893
2	-0.0133	0.0708
3	0.0641	0.3434



Economic Impact Model

Assumptions

- Dealer On-Boarding Cost is $20,000
- Gross profit for Hunter Douglas is 40% for each dealer
- 500 Preferred customers will receive $6,000 in marketing budget and potential price incentives
- 2000 will receive $3,000
- Potential dealers in the pipeline is 1000 at one time

Goals

- Target "cash cow" and "star" dealers with incentives
- Evaluate future of relationship with "question marks" and "dogs"
- 5% reduction in new dealer pipeline costs
- Shift incentives towards profitable dealers

Benefit Analysis

Figure 3. Total Five Year Benefits

Dealer Pipeline Efficiency Increase	$	5,204,040
Increased revenues from $3,000 budg	$	42,336,000
Increased revenues from $6,000 budg	$	21,000,000
	$	-
	$	-

Economic Impact Model

Conclusion and next steps

- Hunter Douglas should evaluate their relationship with every dealer to determine if it is profitable and symbiotic
- Continue to analyze information on their customers to determine predictive characteristics of what makes a successful dealer to improve on-boarding efficiency