ElecKart Business Operation Optimization using Market Mix Modelling

Agenda

- Objective
- Background
- Key findings
- Model and KPI
- Recommendations
- Appendix:
  - Data sources
  - Data methodology
  - Data model evaluation

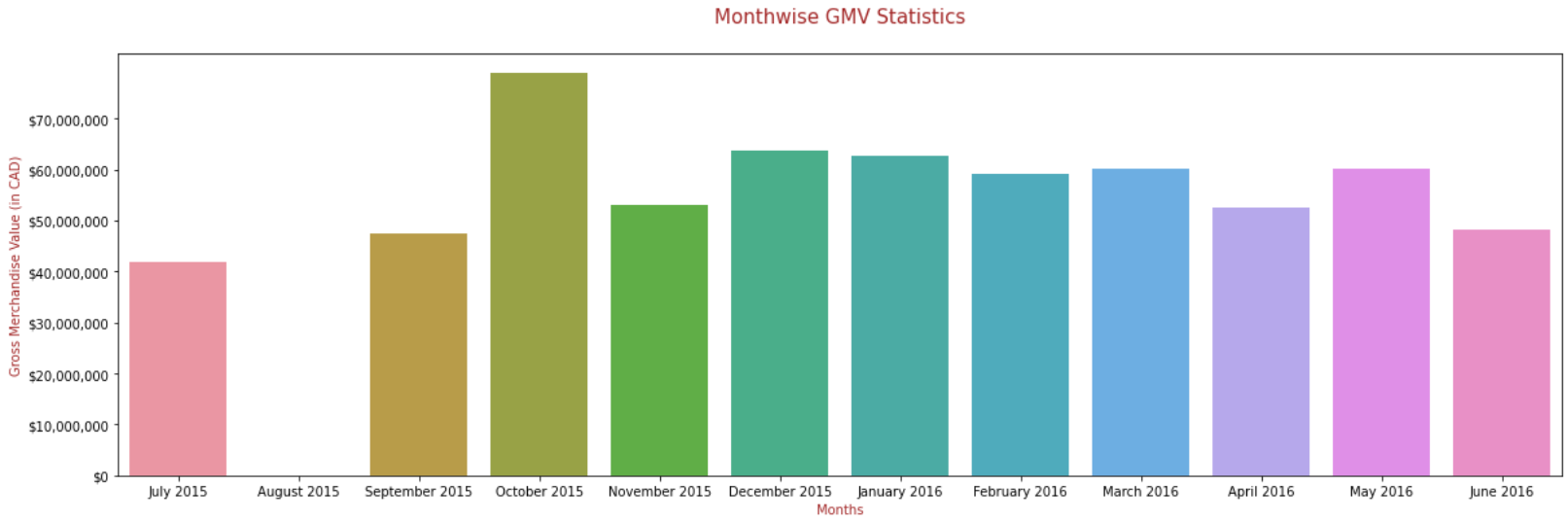
Objective

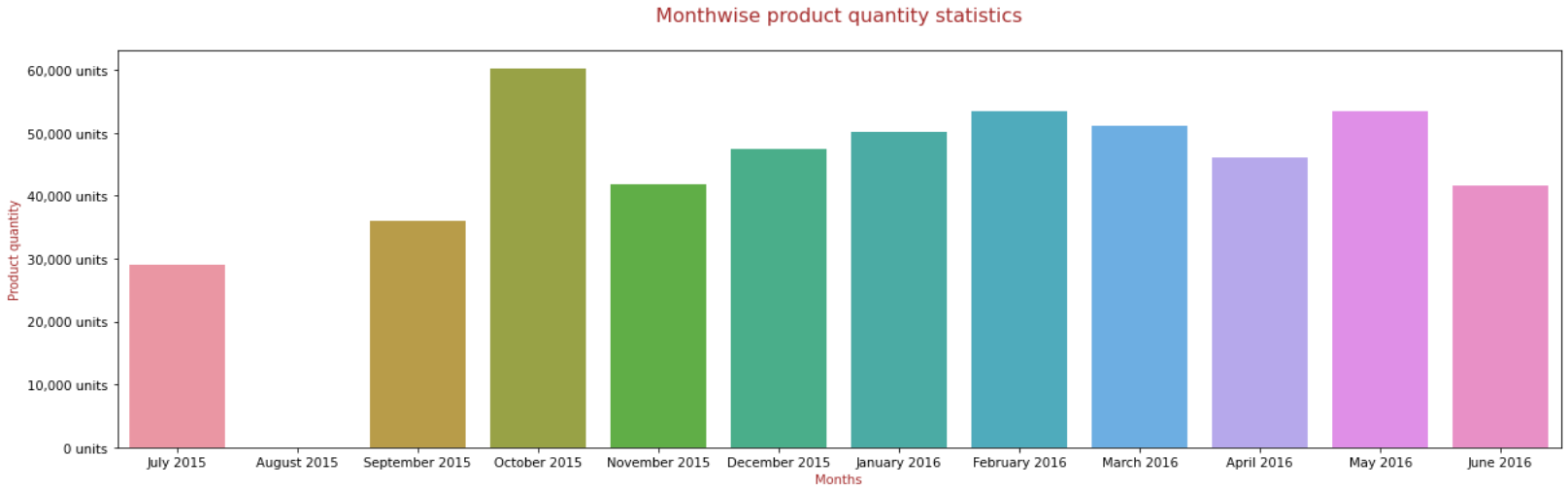
- Understand the financial situation and marketing outcome
- Derive KPI affecting the Gross Merchandise Value
- Optimize the amount of money spent on marketing and promotions

Background

- Major decline in revenue has been observed by ElecKart business for last one year
- Customer churn ration has increased due to lack of understanding of customer needs and demographics
- Money spent on the marketing and promotion has not contributed to revenue growth

Monthly Sales and GMV

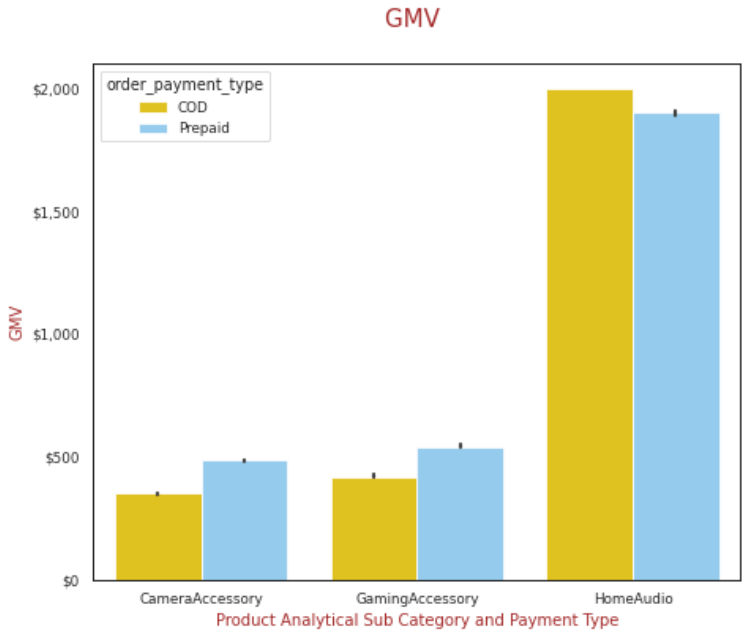


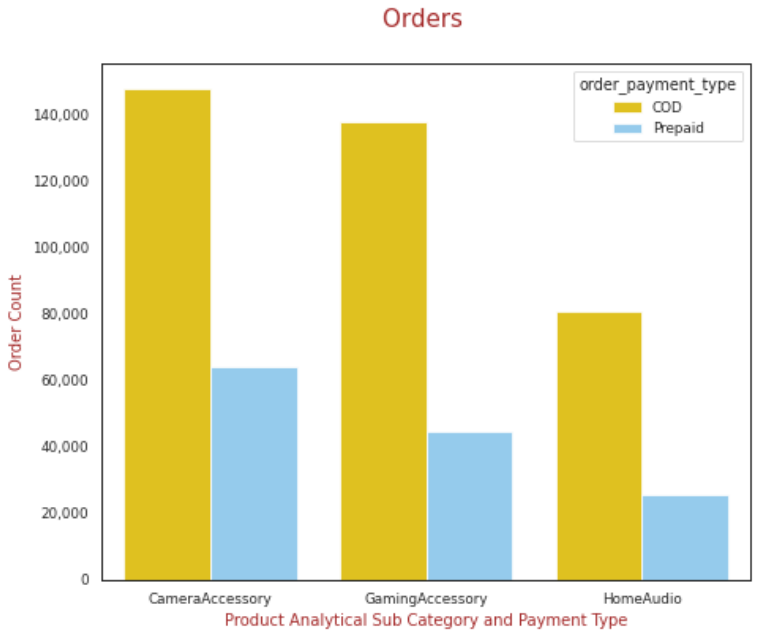


- October and December months contribute to highest GMV as these are the festive and holiday months
- Comparatively more number of products were ordered during October, February and May as company launches special sales in these months
- In the month of August the number of products ordered is lowest which has resulted in low GMV

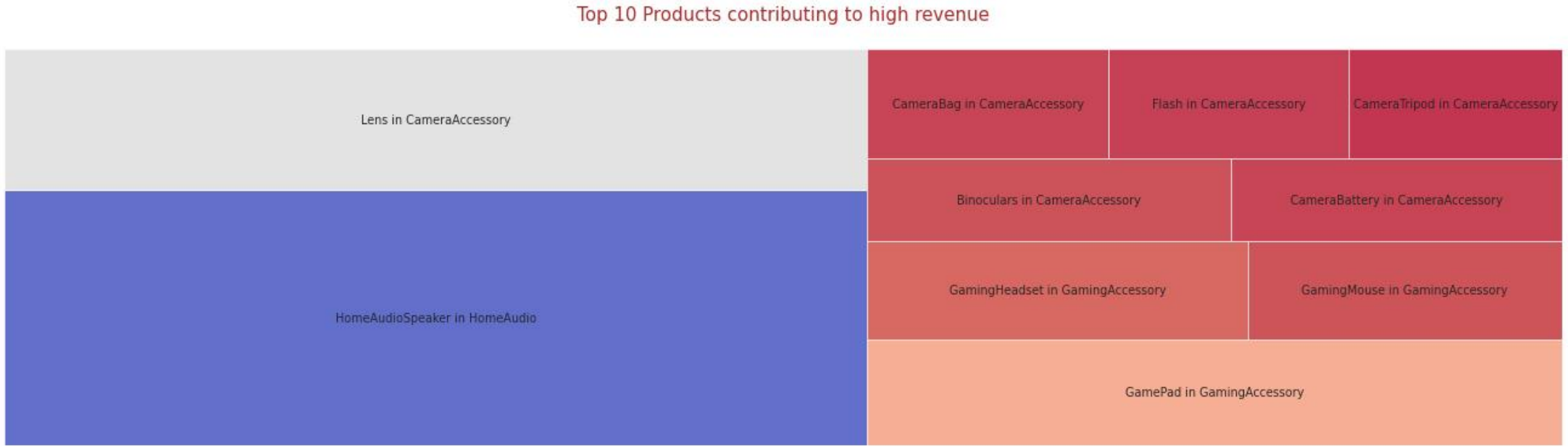
Product Analytical Sub Category statistics

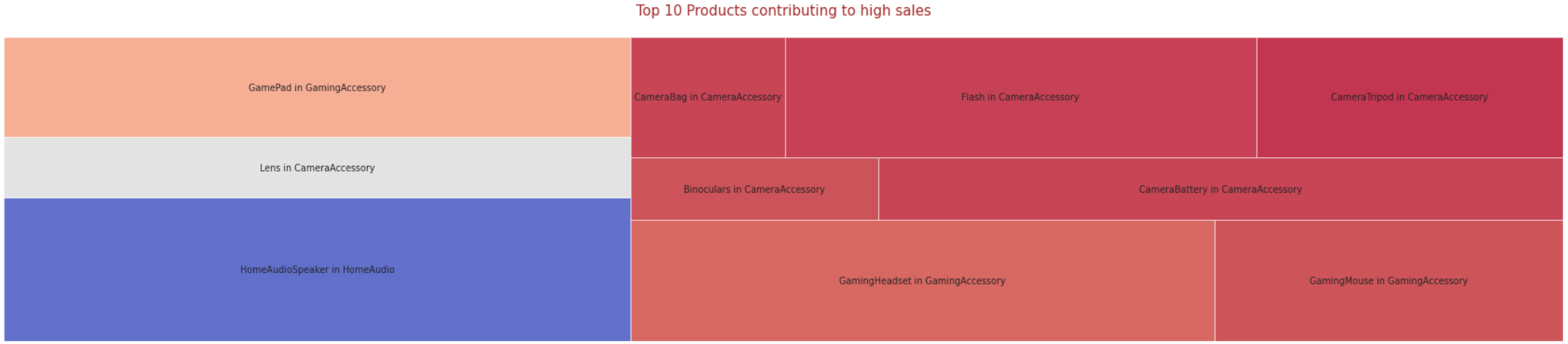
- Significant amount of revenue is generated by Home Audio product sub category whereas number of products ordered which belongs to Camera accessory or Gaming accessory are much higher than Home Audio products
- Majority of the customers prefer cash on delivery option as number of products ordered in all three sub categories are higher for COD than prepaid payment type
- Customer prefer prepaid payment type for high sales price products i.e. products in range of 1,000 to 2,500 CAD





Top products in accordance with revenue and sales





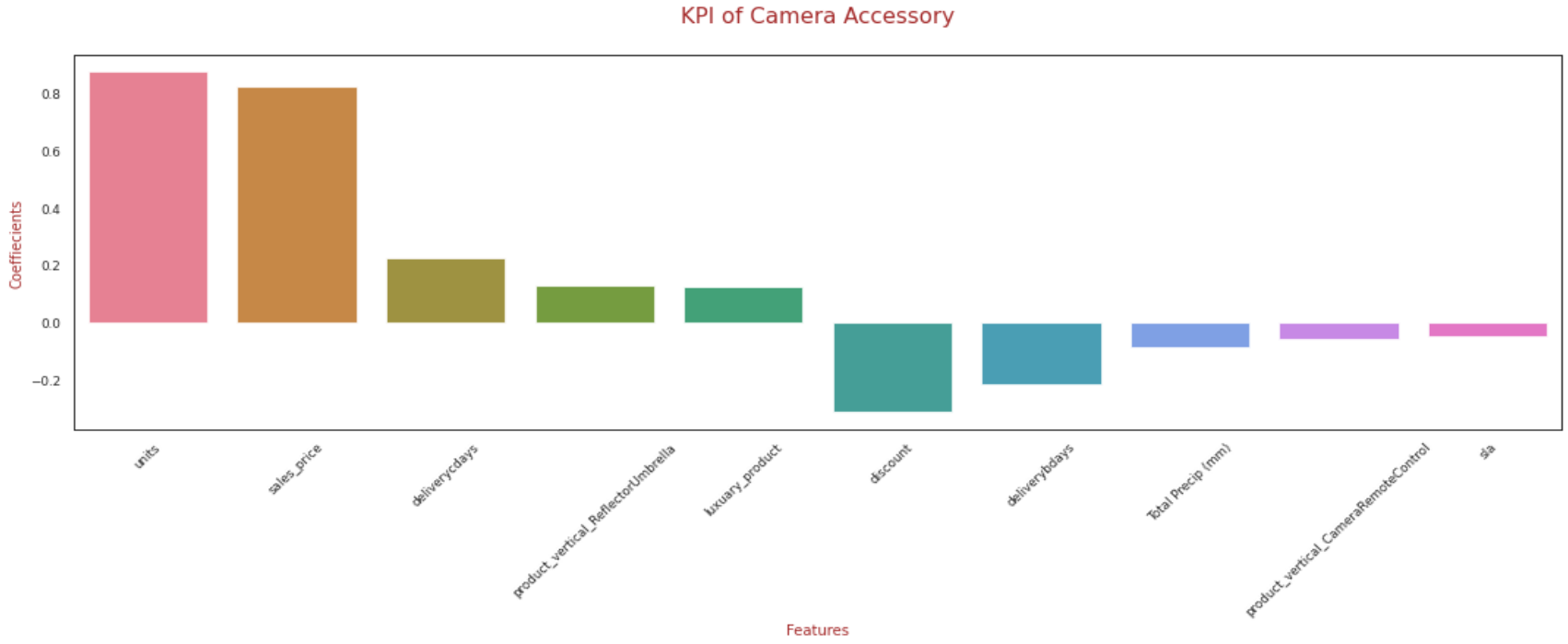
Model and KPI

- Multiplicative model gave the highest accuracy for Camera accessory and Gaming accessory product sub categories whereas Additive model gave the highest accuracy for Home Audio product sub category
- In Multiplicative model there exists some interaction between the KPIs which tells us the growth of revenue vs the interactive growth of the KPIs for Camera accessory and Gaming accessory
- Additive model tells us Home Audio data has an additive response of KPI towards revenue

Product Analytical Sub category	Linear Regression Model	Cross Validation used	R- squared on Test dataset	Normalised RMSE
Camera Accessory	Multiplicative	Yes	0.96	0.00000003
Gaming Accessory	Multiplicative	No	0.98	0.00000005
Home Audio	Additive	No	0.99	0.02

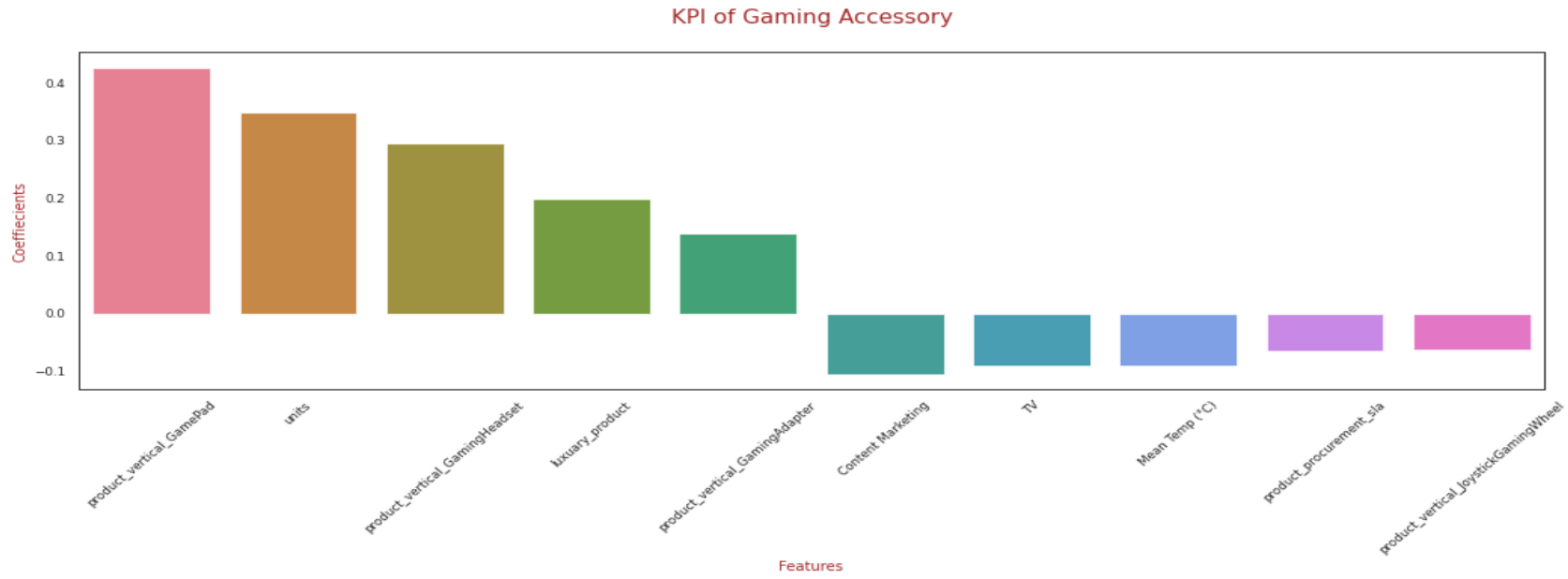
Camera Accessory Recommendation

- Product Vertical Reflector Umbrella and luxury products with price above 2,000 CAD contribute to high revenue. So, company should look after the availability and marketing of these products.
- Customer prefer to order products with minimum SLA/ delivery days. So, company should check for the product availability in the nearest warehouse of the region from where the orders are high.
- During high precipitation the demand of the camera accessories is low so company can provide discount during this period and gain customers.



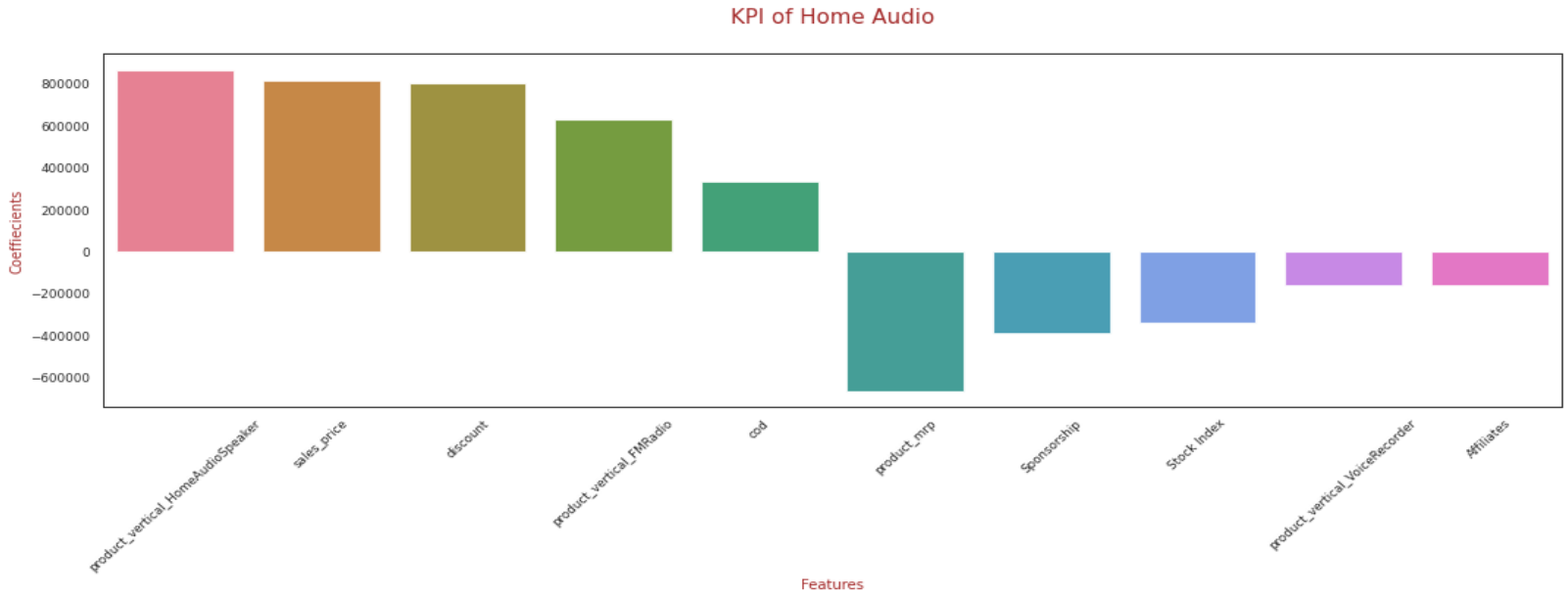
Gaming Accessory Recommendation

- Products like Game Pad, Gaming Headset, Gaming Adapter and luxury products contribute to high revenue. So, company should look after the availability and marketing of these products.
- During the winter i.e.(low temp) customer prefer to buy more gaming accessories so comapny can increase the sale price according to the demand.
- Company should revisit the content marketing strategies and TV ads as they have negatively impacted the revenue.



Home Audio Recommendation

- Home Audio and FM Radio are product that positively contribute to the revenue whereas Voice Recorder has negative impact on revenue.
- Customer prefer opting for Cash on delivery. Providing discounted on home audio products has affected in high revenue.
- Sponsorship and Affiliates have negatively affected the revenue. Also during high stock index the revenue has seen a dip.



Appendix: Data Sources

- Here is a snapshot of our data dictionary.
  - Consumer Electronics data for the year 2015 and 2016 consisting of date, order id, GMV, MRP, delivery days, SLA and different product categories
  - Monthly spend on various advertising channels
  - Days when there was any special sale on products
  - Monthly NPS score
  - Stock index of the company on a monthly basis
  - Climatic information of Ontario during 2015 and 2016

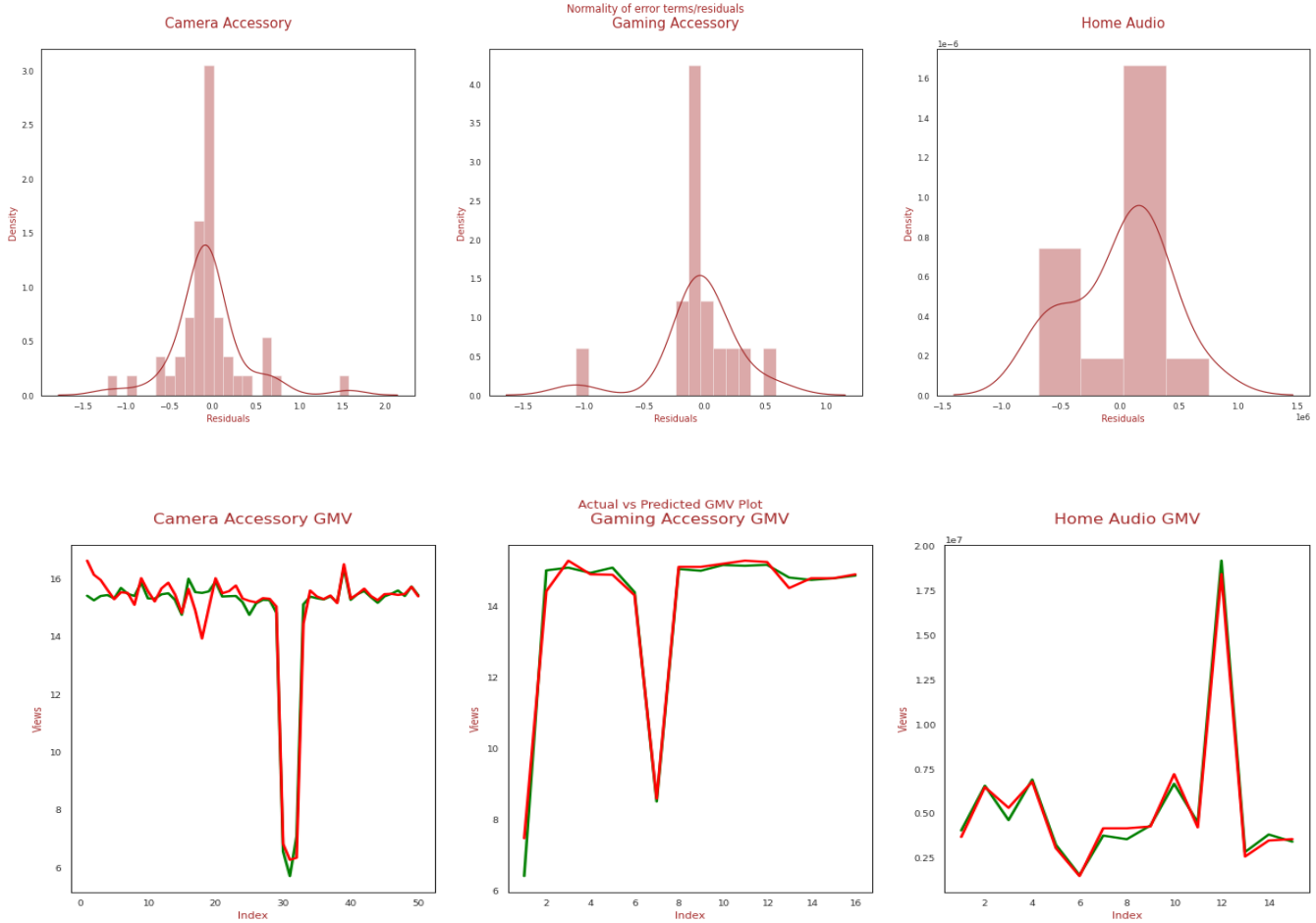
Appendix: Data Methodology- 1

- Reading only required data from the excel and pdf files
- Cleaning the dataset
  - Correcting invalid datatypes
  - Correcting invalid data values
  - Missing value Imputation
- Handling the outliers in data by capping the whole data between 1 to 99 percentile
- Deriving new features from the data like week, holiday, luxury products, discount, payday, sales price and order status
- Exploratory Data Analysis
  - Distribution of GMV and sales price
  - Distribution of product analytical sub categories - Camera accessory, Gaming accessory and Home Audio across all the features
- Data Preparation
  - Mapping the binary variables to 0 and 1
  - Dummy encoding of the categorical variables

Appendix: Data Methodology- 2

- Creating separate datasets for Camera accessory, Gaming accessory and Home Audio records
- Checking for correlation between the features and dropping the highly correlated one
- Re-scaling the features to standardize the data
- Linear Regression Model building w/o k-fold cross validation
  - Additive Model
  - Multiplicative Model
  - Koyck Model
  - Distributive Lag Model (Additive)
  - Distributive Lag Model (Multiplicative)

Appendix: Data Model Evaluation



- All the assumption of linear regression were satisfied
  - Error terms are normally distributed
  - Error are independent of each other
  - Error terms have constant variance