# A Holistic Analytics Approach for Determining Effective Promotional Product Groupings

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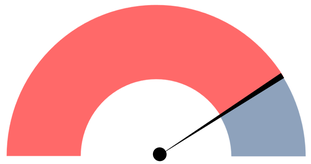
## Abstract

The study develops an ideal promotional product grouping strategy for a Fortune 500 consumer products company. The motivation of this research stems from a desire to increase the utilization of machine learning to identify the drivers of bundling in the industry and predict what label should be assigned to an SKU. Furthermore, an optimization model is designed to maximize the revenue generated from these bundles.

## Introduction

Selecting appropriate pricing tactics for promotions can have a significant impact on the bottom line. However, the promotional analysis is currently handled manually. Our research aims to establish a computationally efficient method that takes various drivers into account and ultimately maximizes revenue



**80%** of the promotions generate no noticeable lift in sales, or dilute margins

## Research Questions

1) How can we identify the most successful promotion grouping amongst different competitors?
2) What are the factors that drive a successful promotion?
3) How can better predictions of promotional groupings provide decision-support to the business?

## Literature Review

| Study | Optimization | Driver-Identification | PPG Generation |
|---|---|---|---|
| 1995, Rosenthal | ✔ | | ✔ |
| 2012, Bhargava | | | ✔ |
| 2013, Sheikhzadeh | | ✔ | ✔ |
| 2017, Ye | ✔ | | ✔ |
| Our Study | ✔ | ✔ | ✔ |

Previous studies conducted in related areas either do not explain the drivers of promotion product group success or do not consider business sense behind the study. Our study aims to help the company identify the drivers of successful product groupings and subsequently generate PPGs that maximize their revenue.

## Methodology

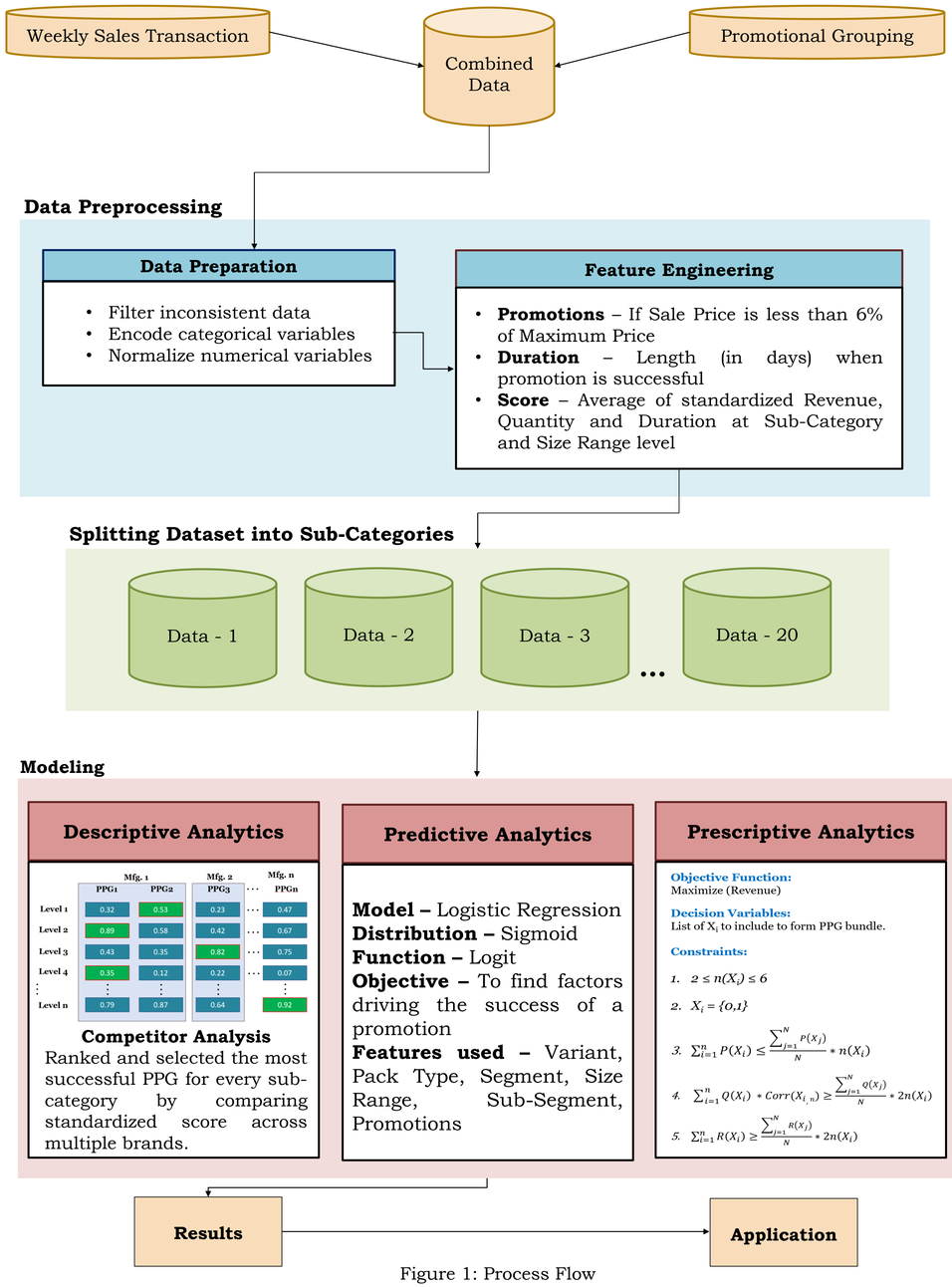



Figure 1: Process Flow

## Results

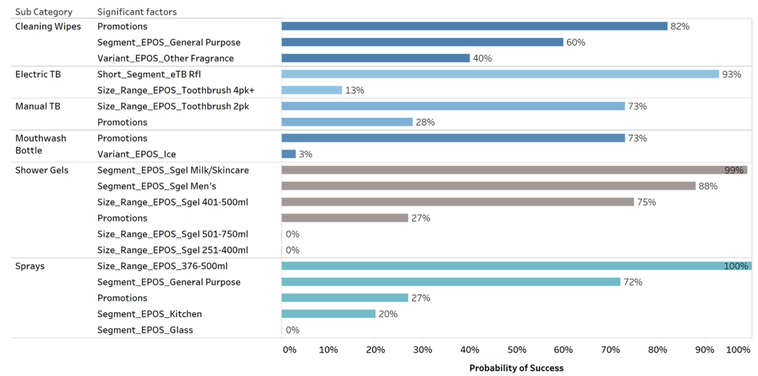



Figure 2: Factors driving the success of promotion for selected sub-categories

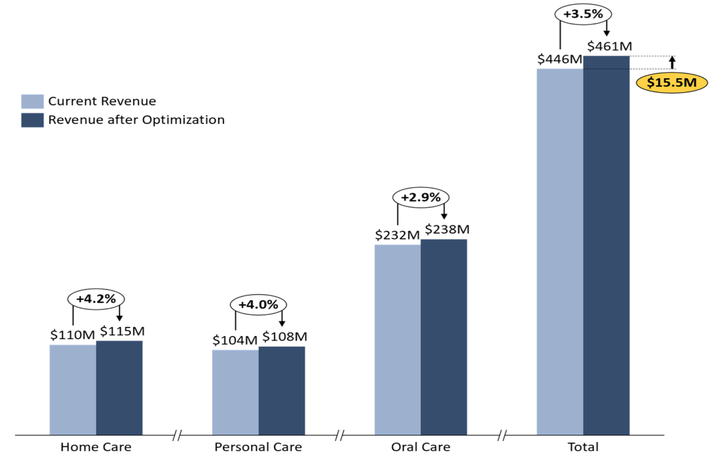



Figure 3: Growth in revenue due to optimized PPG bundle for each product category

## Conclusions

- With an improved data driven approach of forming PPGs, the company has the potential to increase the revenue and quantity by 3.5% i.e., $15.5 million per year.
- The model can be extended to products within different sub-categories and brands to create attractive PPGs.
- Our study can be across multiple industries to identify opportunities to boost revenue.

## Acknowledgement

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