Intro to Modeling: Course Project

IBM [Case Study](): Continental Foods

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July 15, 2020

Overview

Continental Foods has been a leading food provider since 1987. A giant in the packaged foods industry across Europe, they distribute food products such as soups, stocks, bouillons, sauces, and dessert mixes. Like many consumer-based industries, the food industry centers around taste preferences. While a particular product or packaging may excel in one part of Europe it may fail in another perhaps due to culture or season. Continental Foods has built its empire on this exact understanding of how the countries and regions containing its biggest customers differ in taste preference. With consumers in Belgium, France, Germany, Sweden, and Finland, Continental Foods learned quickly that though they were mass producing their goods and scaling their operations, they were to think locally with every product.

While this idea helps to provide an exceptional customer satisfaction rate, it also comes with a vast set of challenges. Localizing consumer preferences is a sure way to maintain a great customer base but a huge problem becomes sustainability of this consumer base. Continental Foods had to reassess whether producing at smaller quantities was cost efficient and sustainable for many years. In order to succeed in this new business platform, Continental Foods wanted to be able to quickly change products in and out of productions depending on product performance. They wanted to gain detailed insight to create an efficient budgeting process and enhanced decision-making process.

This very problem space was what prompted Continental Foods to look to IBM Planning Analytics to optimize budgeting and use of historical and projected data. Continental Foods uses this Planning Analytics software to track actual sales and compare them with forecasts on a monthly basis. Every quarter, the company reviews its budget and updates its forecast for the year. Using historical data from the past five years, Continental Foods assesses how different

business areas grow or contract over time, giving it groupwide insight into performance. With this software IBM is able to generate insightful reports instantly and every quarter so Continental Food managers can access a comprehensive set of information in order to make effective strategic decisions.

Data Collection

In order to perform the right analysis, it is first important we have the proper data. Because Continental Foods is a supplier and not a direct company a normal person can buy from, we will need to collect data from multiple sources and aggregate the data into a clean data set. In addition we will need to obtain any satisfaction surveys that were distributed prior to the IBM/Continental Foods partnership to validate our models and predictions.

Model 1: Principle Component Analysis

Considering the functionality of the IBM software, there a couple of models that were probably combined in order to perform these this recurring analysis. In order to analyze the sales data as well as the consumer data that contributes to taste preference, we must use principle component analysis (PCA) to determine the most important attributes or factors that influence sales in each region.

- **Given** the total revenue for the past quarter, year, and five years, the type of products sold, the units produced, the individual product revenues, and the units produced, customer age, gender, location, all other demographic and consumer attributes accessible through online purchasing
- **Use** principle component analysis
- **To** obtain the important and relevant factors used to predict consumer behavior

We can perform our analysis on a dataset which contains information about our consumer's product purchases and the set of characteristics which had influenced their

purchasing decision. Because Continental Foods thrives on localized decision making for the products they will release to consumers, they need to be able to understand their consumers and their preferences especially as they evolve over time. However, because there will be numerous factors coming into play that Continental Foods may have on each customer, it's important we pick out those that are the most telling of behavior.

Model 2: Regression Tree Analysis

In addition, we can look at the likelihood of products being purchased based on historical data using a regression tree.

- **Given** the total revenue for the past quarter, year, and five years, the type of products sold, the units produced the individual product revenues, and the units produced, demographic information of customers (location, gender, age, purchase frequency)
- **Use** regression tree analysis
- **To** understand the product predictions based off of other product preferences

This will allow Continental Foods to determine which products are good to be sold together and to which populations. For example, if tomato soup and vegetable stock are both sold to the population of people under the age of 30, perhaps we should sell to a city like Amsterdam where there is a large millennial population as opposed to a city that is on the outskirts of the country and centered around an older population.

Model 3: Triple Exponential Smoothing

Finally, because we are monitoring historical trends and seasonality of data over time as it pertains to performance, we will need to use a time series model. We can measure growth of

products over time as well as look at the seasonal trends to figure out when to release certain products at the peak of sales and when to pull the products at the trough of sales.

> - **Given** the total revenue for the past quarter, year, and five years, the type of products sold, the units produced the individual product revenues, and the units produced.
> - **Use** triple exponential smoothing
> - **To** understand the cyclical patterns of product sales in its different customer countries across Europe

We can use exponential smoothing to forecast sales of the future. Given a certain set of products, we can track the sales over our five-year data set to understand the cyclical patterns of the product sales. This will help us predict how many units should be produced to maximize profits and minimize unsold inventory.

With all of these models, data changes quickly and Continental Foods wanted to be able to understand performance of products locally. As stated on the IBM Case Study site, these tests are refreshed quarterly giving Continental Foods up to date insight on how products have performed in the last quarter as well as in the longer term past in addition to how products will perform in the next quarter as well as the longer term future. With this continuous insight four times a year, Continental Foods is gaining invaluable insight on customer demands and its implications for different geographies of its customer base, adapting its strategy of agility to succeed its competitors.