Author: Srila Maiti

Title: From Prophecy to RealiT, harnessing the power of machine learning in consumption forecast

Audience: Store Managers, Sales Planners at Healthy Foods Market LLC

Abstract:

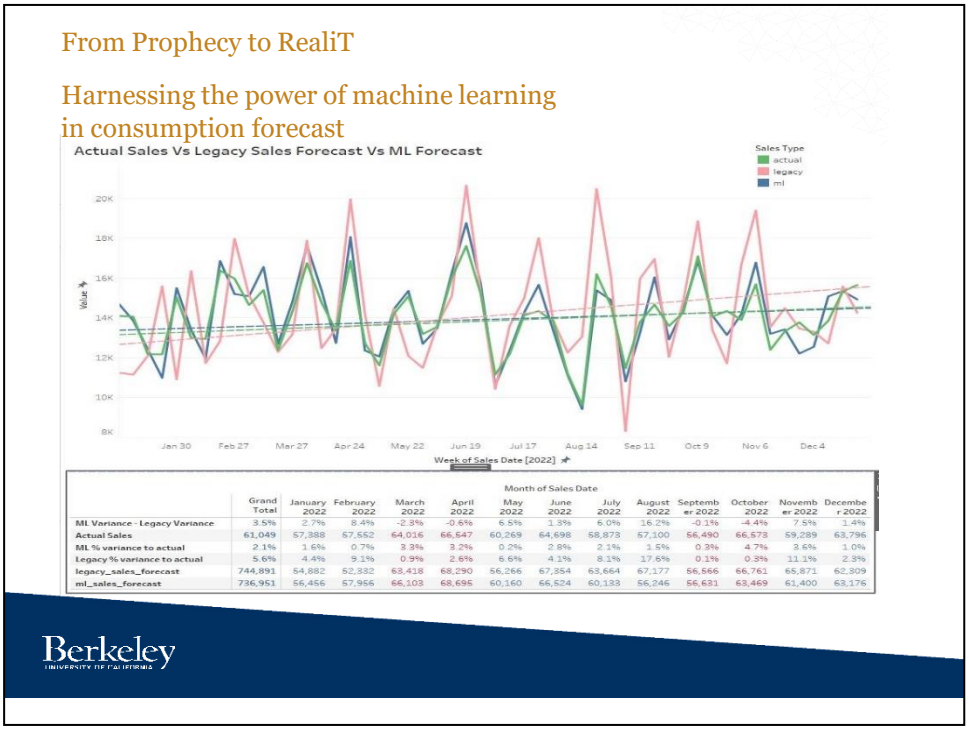
Over the last year, our company's sales dropped significantly by 15%, and we lost our market share by 10% for major categories like coffee, cream cheese, deli meat. The lack of better sales planning tools caused this issue. We failed to capture what our customers are buying most and when, how efficient our pricing strategy is over our competitors, what market is worth focusing on, what products are price-sensitive, what promotions we should run in which market, and when we should run them.

The norm of sales planning to predict consumption has changed. We can no longer follow the age-old "**Jury of Executive Opinion"** method, where the executives are responsible for forecasting sales figures through estimates and experiences, or "**Sales Force Opinion"** where the salesperson, is close to the consumers and the market is estimating consumption forecast. Neither the processes are relying on factual data. None of the processes are data-driven, rather driven by "gut feeling". Forecast accuracy solely depends on the efficiency of the person in charge.

To bring our sales back on track and gain market share, I propose to embark on a data-driven journey where we will be leveraging our historical sales data, promotion event data and use machine learning methodologies to predict consumption more effectively while cutting down the human judgment errors significantly. We have done a PoC of the machine learning approach with an 80% forecast accuracy which entails a larger profit margin (10% revenue increase), a higher market share (70% market share) yearly.

The goal of this analysis is to identify the underlying factors that drive our consumption including price point, promotion, market, media spending, holiday, weather, customer orders, customer inventory, the consumer price index, etc., and build a machine learning model to perform consumption forecast. The level of detailed understanding of the driving factors involved in consumption prediction would help us make tailored planning based on product, geography, and customer. For example, we may choose not to run an expensive promotion for a non-price-sensitive item, or we factor in customers' inventory burn-out while predicting.

The analysis will consist of an exploratory data analysis of past sales data, promotion data, media spend data, customers inventory data fortunately all the required data are already available within the company, so there is no additional data collection cost. We will leverage this existing data and build the model. The end deliverables will consist of a sales forecast at the store-item-week level along with the estimated % breakdown of each contributing factor/driver. It will also include forecasts at higher levels like the product category, market, region levels as well. The higher-level forecast will be helpful to predict the overall picture whereas most granular forecasting will help us track business performance at the ground level.



Audience: Store Managers, Sales Planners at Healthy Foods Market LLC

Although we do our due diligence in the sales planning and predicting consumption, it's not enough. Over the last year, our company's sales dropped significantly by 15%, andwe lost our market share by 10% for major categories.

To bring our sales back on track and gain market share, I propose to embark on a data-driven journey where we will be leveraging our historical sales data, promotionevent data and use machine learning methodologies to predict consumption more
effectively while cutting down the human judgment errors significantly. We have done a PoC of the machine learning approach with an 80% forecast accuracy which entails a larger profit margin and a higher market share yearly. Our data-driven approach utilizesthe underlying factors that drive our consumption and understanding driver importancewill help us make tailored planning based on product, geography, and customer.

https://drive.google.com/file/d/1NxQn7l1EY7pbh7ZrAtnd6amK8-OJiE20/view?usp=sharing