2022 MMA Datathon

Case Challenge: Digital Ad Space at a Omnichannel Grocery Retailer

Background

The retail industry has been through a huge transformation in the last two decades with consumers increasingly interacting with retailers through digital channels such as online stores, mobile apps, and social media. The more nimble brick-and-mortar retailers have quickly adopted an omnichannel business strategy allowing consumers to interact with them seamlessly between digital and offline channels. This allows consumers to browse, order, pick-up or deliver items via their preferred method whether that be in-store, online, or any combination of the two. This seamless experience allows retailers to build stronger relationships with their customers, hopefully garnering a larger share of wallet.

At the same time, the move to digital interactions opens opportunities to better serve customers by collecting and analyzing their behavior. Traditionally, the data collection has been done through a store-branded loyalty card that is presented at time of purchase. From the customer's point of view, the loyalty card offers discounts either directly on select products or via a points system. From the retailer side, in addition to increased share of wallet, the loyalty card allows to link customer transactions together giving a more holistic view of the customer. Naturally, this process also extends to digital interactions where the same customer account is linked via logging into the retailer's website or app.

Grocery retail is an inherently low margin business due to competition and various other factors. Profit margins in grocery are generally in the low single digit percentages of total revenue, and retailers generally make their money on volume. Most grocery retailers find other means to improve their profit margins such as diversifying into other categories such as drugs (over the counter medicines) and general merchandise (e.g., clothing, personal care products, seasonal goods, home décor etc.), which generally are non-perishable, higher margin products. The use of private-label brand also command higher margins vs. their branded national alternatives.

Another widespread practice is utilizing trade promotion in which manufacturers utilize their marketing budgets by subsidizing marketing activities such as temporary price reductions, coupons, in-store displays, rebates etc. at a retailer in order to boost sales of the manufacturer's products. In many cases, this increases customer purchasing volume at the retailer (due to lower prices or additional marketing efforts) without dramatically impacting their margins.

MM&A's Supermarket

You and your team have been brought in as consultants of MM&A's Supermarket, a national supermarket chain serving mostly suburban and rural areas throughout the southeastern United States with approximately 600 stores nationwide. Most of MM&A's stores use the traditional supermarket format offering a full line of groceries, meat and produce with additional

departments for general merchandise, drug, and health & beauty. MM&A's also sells gasoline at many of their locations.

MM&A has been using their own store brand loyalty card for well over a decade with their per transaction penetration rate at over 70% by most recent estimates. Additionally, they have adopted an omnichannel approach with most of their loyalty members using the MM&A app as their primary digital touchpoint. The app provides a streamlined e-commerce experience to allow customers to browse, order, and schedule delivery or pick-up. It also features top products and specials primarily based on the weekly in-store promotions. The MM&A app, and to a lesser extent the corresponding member email newsletters and social accounts, provide a powerful communication channel to reach their customer base and incentivizing them towards purchasing, not only more at MM&A, but also targeted products and brands.

MM&A management thinks that their digital channels are an underutilized asset. A major part of their strategy is to leverage their strong loyalty program and digital assets to offer digital advertisement inventory to manufacturer brands. This would allow manufacturers to buy digital "ad space" on their app, newsletter, or social channels to advertise or promote their products (usually with an associated discount) using trade promotion. In addition to the increase in product sales, these digital ads offer the ability to granularly track ROI (Return on Investment), target the most profitable customers, and generate insights from data that traditionally were not possible. This strategy has been similarly adopted by industry leaders such as Amazon and Instacart and resulted in a significant source of revenue.

Your task is to analyze the given data and recommend which manufacturers MM&A team should partner with to pilot the digital ad program. The primary consideration should be finding a manufacturer with a strong national brand(s) and a large trade promotion budget to spend. Additional considerations should be given to the type of product(s), advertisement / promotional content, and their suitability for the existing customer base. Provide your reasoning and any insights into the data that led you to your recommendation. The audience for the presentation will be senior management team from MM&A.

Dataset

The dataset contains a sample of approximately 2500 loyalty members transactions from MM&A stores recorded over two years. Each transaction consists of one or more line-items – one for each unique product purchased – consisting of approximately 2.5M records. Each line-item information about the transaction such as the purchase price, discounts, quantity etc. as well as metadata about the product such as the manufacturer and product category. Additionally, demographic data for a subset of the households is included.

The dataset used in this case is a subset of the Dunnhumby – The Complete Journey dataset. Please refer to Terms & Conditions for further details. To prepare the dataset, please follow the instructions in the accompanying `MMA_2022_datathon_data_prep.ipynb` Python notebook. Additionally, please see the accompanying data dictionary for more details.

Deliverables

- A presentation of up to 15 slides in PPT or PDF format with appendix. While the Appendix is not limited in size, the relevance of every page in the Appendix and how it supports the main body of your presentation should be very clear to the audience (reader). Note that your presentation should be self-contained: the only reason a reader would open the appendix is to get more details on some of the results/visualizations presented in the main body; the reader should not need to open the appendix to understand the statements made in the main body of the presentation.
- You can use analytical tools of your choice.
- Submit presentation via Quercus website.

Appendix A: Dataset Notes

The variable *sales_value* in the `transactions` table is the amount of dollars received by the retailer on the sale of the specific product, taking the coupon match and loyalty card discount into account. To calculate the original product prices, use the formulas below:

- Loyalty card price = (*sales_value* – (*retail_disc* + *coupon_match_disc*)) / *quantity*
- Non-loyalty card price = (*sales_value* – *coupon_match_disc*) / *quantity*

The example below demonstrates how to calculate the original shelf price of the product:

- Line 1 – When this product was purchased the *retail_disc* and *coupon_disc* were both zero, meaning the price of the product is the same as the amount received by the retailer.
- Line 2 – Two items of this product were purchased, and there was a retail discount applied due to a loyalty card. To determine the regular shelf price of the product (exclusive of loyalty card discount) we take the sum of the amount paid and the discount, then divide it by the quantity. ($2 + $1.34)/2 = $1.67.
- Line 3 – The original shelf price of each product here is ($2.89 + $0.45)/2 = $1.67.

Household Key	Basket ID	Day	Product ID	Quantity	Sales Value	Store ID	Retail Disc	Trans Time	Week No	Coupon Match Disc
2381	35730137393	534	819063	1	1.67	32004	0	2025	77	0
1431	41756231898	671	819063	2	2	446	-1.34	1740	97	0
888	36027750817	540	819063	2	2.89	401	0	1254	78	-0.45