



MM ANALYTICS FIRM

SHOPPING CART ANALYSIS

JULY 2021 // PREPARED BY MARTA MERAUJE



OVERVIEW

The shopping cart analysis aims to assist Market Basket managers to understand and identify top-selling products and highlight the customers' purchasing patterns. This analysis identifies product combinations that are frequently bought together. An understanding of this analysis can help the company to boost profitability through cross-selling, promotions, and even the placement of products in the store.

The objectives of this analysis are to identify:

1. Top-30 most bought product during the time period
2. Top-5 most promising product association rules that involves top-**14th** most frequently bought product

METHODOLOGY

This analysis used data set of one month real-world point-of-sale data of Market Basket grocery company. Data consists of 9835 transactions and 196 products. Data set are being analyzed using the product association rules that consists of the following key metrics:

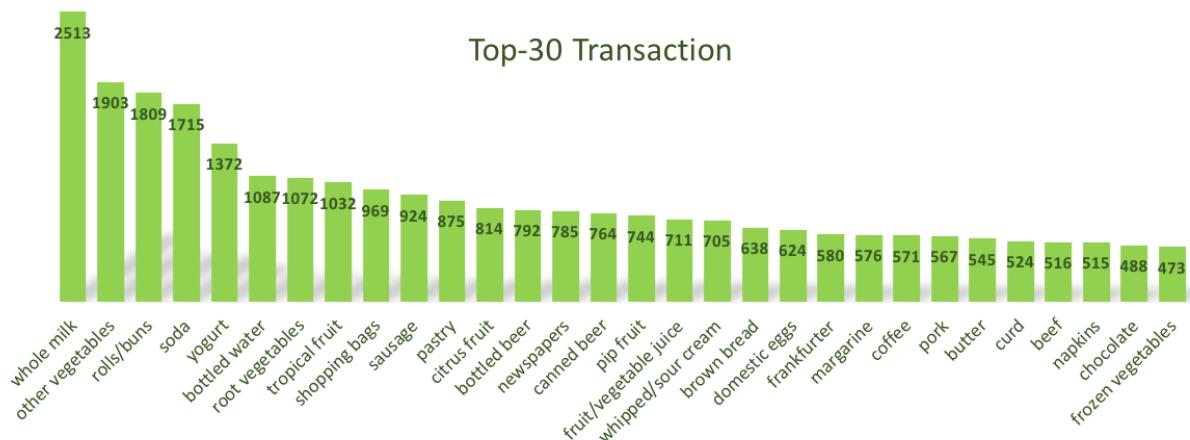
Support: the relative frequency of a product appears in all of the product transactions

Confidence: The probability of two or more products bought together

Lift: the expected ratio of one product being sold depending on other product being sold

TOP-30 MOST BOUGHT PRODUCT

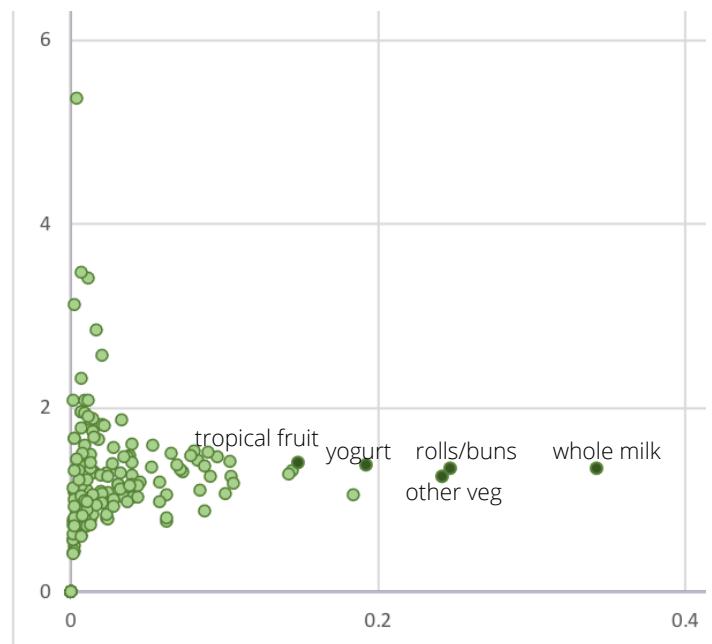
Market basket's top-selling products include fresh produce, beverages, meat, bakery, & miscellaneous. These products need to be replaced on a regular basis to retain long-term sales. The Market Basket can do private label on some of the top-selling products such as coffee to increase profitability.



TOP-5 PRODUCTS ASSOCIATED WITH THE-14 MOST BOUGHT PRODUCT

The-14th most bought product is **Newspaper** (see appendix 1). Analysis showed that the 5 products often bought together with the newspapers are shown in the table. (see appendix 2 for detailed confidence & lift of each product)

Market Basket needs to ensure that these products are accessible in the customer journey before they reach the cashier. This will increase cross-selling which will result an increase in profit.



SOLUTION



APPENDIX

1. FINDING THE TOP-30 & THE 14TH MOST BOUGHT PRODUCT

Product Name	# Transaction
whole milk	2513
other vegetable	1903
rolls/buns	1809
soda	1715
yogurt	1372
bottled water	1087
root vegetable	1072
tropical fruit	1032
shopping bags	969
sausage	924
pastry	875
citrus fruit	814
bottled beer	792
newspapers	785
canned beer	764
pip fruit	744
fruit/vegetable	711
whipped/sour	705
brown bread	638
domestic eggs	624
frankfurter	580
margarine	576
coffee	571
pork	567
butter	545
curd	524
beef	516
napkins	515
chocolate	488
frozen vegetab	473

To find the top-30 most frequently bought product, we first calculated the total transactions of each product, then list the transactions from large to small. We highlighted the first 30 rows ((or 31 if included column title). We then looked at the row 14th (or 15th if included title column) to find the 14th most bought product's number. In this case, it's column 15 with the product name "Newspaper" and the number of transactions is 785.

2. FINDING THE 5 PRODUCTS ASSOCIATED WITH NEWSPAPER

We first need to list (horizontally) number of each product sold every time Newpaper is sold (NAB). After that we find support, confidence & lift of each product. The function used in excel for each key metrics in the table.

A	B	C	D	E
Product	frankfurter	sausage	liver loaf	ham
	580	924	50	256
NAB	frankfurter	sausage	liver loaf	ham
	49	79	2	24
Support	0.079817	=FH2/9835		
Confidence	0.06242	0.100637	0.002548	0.030573
Lift	1.058456	1.071174	0.501146	1.174562
	=B5/\$FH\$2			
	=B5*9835/(B2*785)			

Note that the cell FH2 contains the number of transaction of newspaper

We created a scatterplot of rows Confidence and Lift as variables results showed the top-5 most associated product as follow

1. Whole Milk : (0.34, 1.34) (Lift, Confidence)
2. Rolls/Buns : (0.25, 1.34)
3. Other Vegetables: (0.24, 1.25)
4. Yogurt : (0.19, 0.38)
5. Tropical Fruit : (0.15, 1.41)