Group Project 3: Marketing Campaigns and Price Optimization (due 30 October at 6pm)

"Half the money I spend on advertising is wasted; the trouble is I don't know which half."
John Wanamaker (1838-1922), pioneer retailer

In the field of direct marketing in B2C setting, in practice, performance KPI of campaigns are poorly measured. Even though the most common use of analytics in most companies is to target increasing the revenue line, the measurement for impact of campaigns is not rigorous. This is due to many factors.

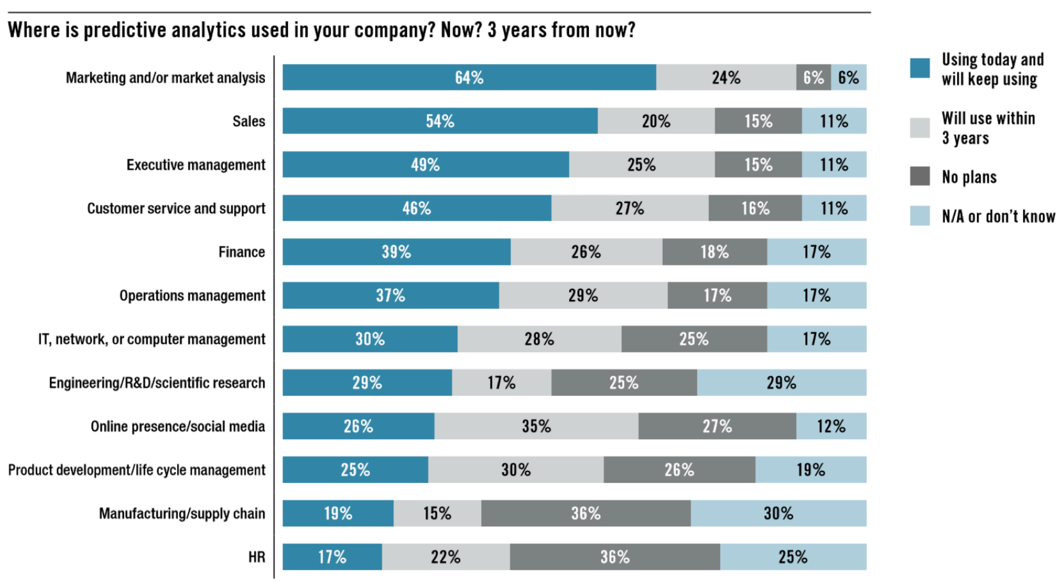

Figure 3. *Based on 126 active respondents.*

Fig 1 - Survey by TDWI in 2014

Firstly, in B2C, cost of direct marketing has dropped significantly with the use of emails and other electronic means including mobile app notification (zero cost). The cost of digital marketing campaigns has dropped significantly. Thus, some marketing practitioners have used their entire customer database as a target with minimal selection. Differentiation is only in the messaging content and timing of message delivery to make it more relevant to the target customer. This results in a poor incentive to measure ROI of campaigns. Intuitively, there is an implicit cost to mass campaigns (SPAM) that is not personalized and not relevant.

Secondly, the tendency to increase target size has removed any incentive to set aside control groups and carefully planning for the control groups. As the frequency of messages sent to the same customer increases, it is difficult to measure a campaign with customers that were not targeted before in previous campaigns.

Thirdly, poor definition and structure of campaigns have resulted in 'inflated' response rates. In a case where 2 sequential messages are sent to a single customer that resulted in a purchase, the response rate is commonly calculated as 100% instead of 50% as illustrated below.

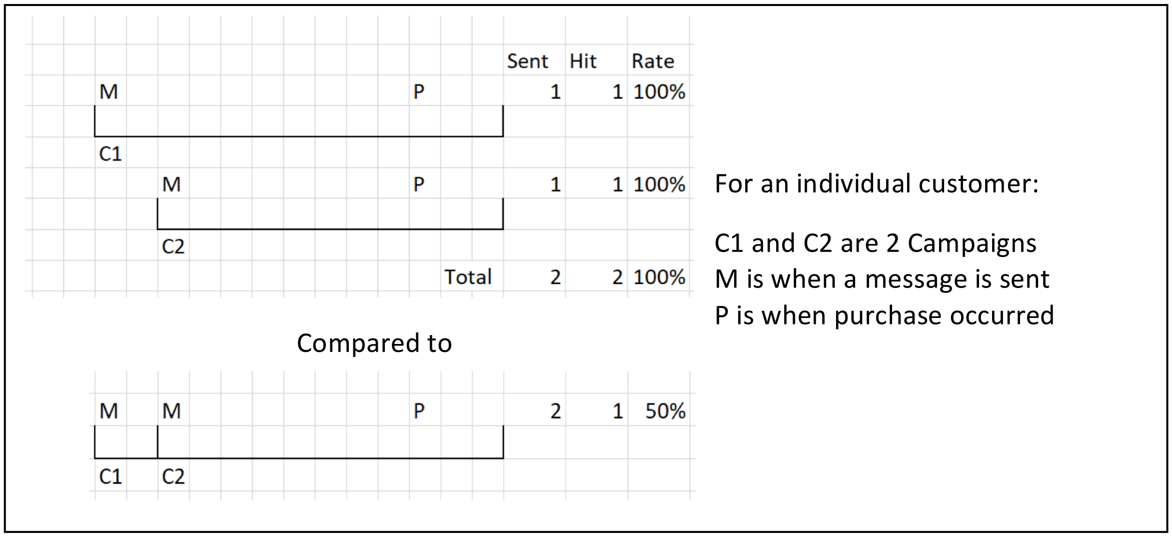

Fig 2 – Inflated response rate due to overlapping campaign periods

In a campaign that comprise of many target customers, the response rates are inflated from the true response when a message is sent to a single customer in multiple overlapping campaigns. When the digital marketing service is outsourced and response rate is the KPI, the more messages sent in sequence to the same customer will yield an inflated response rate.
The measurement of attribution of success to the events leading up to the purchase (target behavior) is called media attribution. Media attribution helps to properly allocate success rates to cost of campaign in different channels, thereby increasing the accuracy in allocation of media budgets.

The most common type of attribution of messages to purchase events is "last click" attribution where 100% of attribution is allocated to the last trigger event that led to the purchase. In the case of the example above, the response rate of Campaign #1 is ZERO% and that of Campaign#2 is 100% for the case of a single customer.

Fourthly, where control groups are applied to measure the success of a campaign, it is often applied by using the “before”, “during” and “after” campaign measurement method. Under this method, if the campaign period that required a response is 7 days, then the before period is also set to be 7 days before and after period is 7 days after. However, at the before and after period, the same customer may have been targeted by other campaigns as well which makes the measurement ineffective and unreliable.

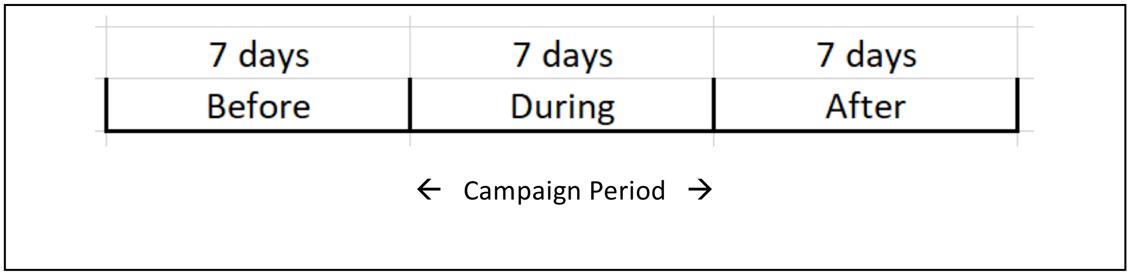

Fig 3 – Measuring Campaign effectiveness comparing before, during and after

In short, measurement of performance is difficult and highly inaccurate in fast moving B2C businesses with large customer base and intense promotion campaigning. The incentive for a company to have a good measurement is very relevant. Most companies with direct marketing function struggle between having an in-house function or sub-contracting it out. Every time a company moves the function from in-house to sub-contract or vice versa, the previous performance data is thrown out and a new performance KPI is developed. In such a case, the true performance of the campaign management over a longer term is not measured or becomes un-comparable.

One way to have a consistent measure of campaign effectiveness is to develop a consistent and robust measurement system using control groups set up:

1. Measurement is part of performance management score keeping function
2. Efficient in use of control group
3. Robust measurement method that is reliable

Exercise Objective:
The challenge placed before you is to measure the campaign effectiveness during the campaign periods and use the results in pricing optimization. Thus, you need to find optimal price discrimination for the company.

The data that you have been given is a subset of data derived from a retail chain of 150 stores covering 35 cities in one country. The subset provided is only for a single city.

The data is extracted from 2017-04-01 to 2017-11-01 and includes the Ramadan period. The Ramadan period is a period of peak sales activity in that country. During the Ramadan period, a control group of 1,233 of customers was set aside to measure Ramadan campaign performances against a group of 9,920 customers that were subjected to the usual intense direct marketing campaigns in the same period. Ramadan campaigns are defined as campaigns that fall between and including campaign start dates of 2017-05-19 to 2017-07-02. Sales and marketing activity before and after this period had no special treatment.

The data is in **retail.zip**, the data items are explained in **data_dictionary.csv** (both of these files are on IVLE). The maximum length of the report is 4 pages, not including possible appendixes. The analysis can be done by Excel, SPSS, SAS, Python, or R. Submit the report and the estimation file by IVLE, one submission per group. **Please have the names and the student numbers on the cover page.**