MARKETING MIX MODELLING

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"Half the money I spend on advertising is wasted; the trouble is I don't know which half."

- John Wanamaker (Father of Modern Advertising)

Abstract

Companies face the challenge of allocating their fixed marketing budget among various marketing channels. The idea of Market Mix Modelling(MMM) can be used to tackle the situation. It is a time-tested method for measuring the impact of your marketing, it is a statistical and analytical tool to qualify the impact of past marketing decisions and predict futures of past marketing decisions, and predict future sales impact for different marketing scenarios. Over 80% of the businesses in India have had a negative impact due to the pandemic followed by the lockdown. Since these businesses are heavily dependent on sales for their livelihood, they need to be looked upon and provided with some techniques to boost their sales. Marketing Mix Modelling has extensively been used by product-based companies to boost up their sales. The proposed service is used to optimize advertising mix and promotional tactics concerning revenue or profit.

1. Problem Statement

The problem statement is to apply Marketing Mix Modelling to quantify the impact of marketing variables and optimize marketing spending by maximizing Return on Marketing Investment(ROMI). This in turn helps increase the sales conversions and thus generate more revenue.

2. Market/Customer/Business needs Assessment

The Covid-19 pandemic and the lockdown have negatively affected start-ups. They have been forced to shut down the company early, due to the significant and rapid decrease in sales. Therefore to get into the market, it is evident that they should increase their sales. Therefore, by using this technique, we aim to provide start-ups with useful insights from the available data and ways to generate more revenue and also optimize their marketing budget.

3. Target Specification

The proposed service will provide the stakeholders with some techniques so that their sales boost up and they no longer have to go through any financial crisis. It helps them to identify new potential areas of investment, based on the modeling, so that their company's sales conversions increase.

4. External Search

The sources I have used as a reference for researching the modeling technique,

- [How Does Marketing Mix Modelling Work?](#)
- [Market Mix Modelling (MMM) — 101](#)
- [Market Mix Modelling](#)
- [Accenture-Market-Mix-Optimization](#)
- [Marketing-Mix-Modelling](#)
- [Marketing Mix Modelling Master Classes](#)
- [Marketing Analytics](#)
- [Marketing Mix Model Guide](#)
- [The 5-Minute Guide to Marketing Mix Modeling](#)

4.1 Benchmarking

Over the past 20 years, many large companies have adopted Marketing Mix Modelling. This technique would also be beneficial when applied to the start-ups since they need the method the most to enter the market for which they are aiming.
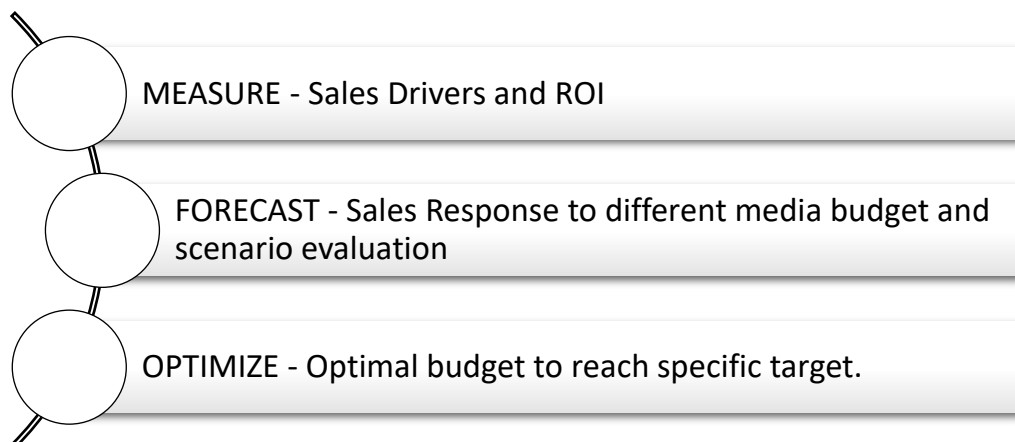
5. Business Opportunity

The above method is being used by many well-known product-based and service-based companies, thus this can be extended for product-based and service-based start-ups. Therefore, this service has a fair chance of being a great business tool to make a difference for the specific company.
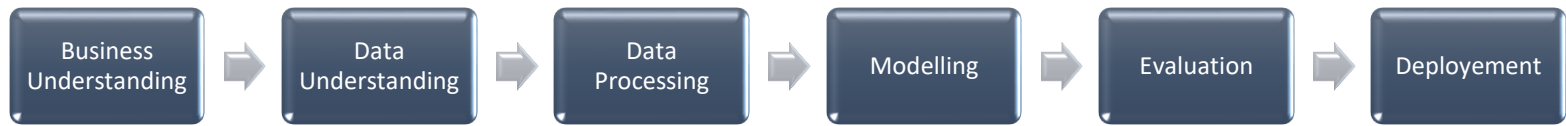
Every business that depends on sales can and would want to opt for using this service to increase their revenue. The emergence of every start-up makes this service a great business opportunity.

6. Final Product Prototype

FUNDAMENTAL BLOCKS OF MARKETING MIX MODEL –

MEASURE - Sales Drivers and ROI

FORECAST - Sales Response to different media budget and scenario evaluation

OPTIMIZE - Optimal budget to reach specific target.

WORKFLOW –

| Business Understanding | → | Data Understanding | → | Data Processing | → | Modelling | → | Evaluation | → | Deployement |

Business Understanding –
- Determine Business Objectives
- Assess Situation
- Determine Data Analysis Goal

Data Understanding –
- Collect Initial Data
  - Base Variables
  - Incremental Variables
- Describe Data
- Explore Data

Data Processing(EDA) –

- Select Data
  - Weekly Period Data(for approx. three years)
- Clean Data
- Construct Data
- Integrate and Format Data

Modeling –

- Select Modelling technique
- Generate test design
- Build Model
- Assess Model

Evaluation –

- Evaluate results
- Review process

Deployment –

- Plan Deployment
- Plan monitoring and maintenance

Machine Learning Algorithm(MODELLING) –

Market Mix Modelling uses the principle of Multi-Linear Regression. The dependent variable could be Sales or Market Share. The independent variables usually used are Distribution, price, TV spending, outdoor campaigns spend, newspaper and magazine

spending, below-the-line promotional spends, and Consumer promotions information, etc. Nowadays, the Digital medium is highly used by some marketers to increase brand awareness. So, inputs like Digital spending, website visitors, etc. can also be used as inputs for Marketing Mix Modelling.

An equation is formed between the dependent variables and predictors. This equation could be linear or non-linear depending on the relationship between the dependent variable and various marketing inputs. The betas generated from Regression analysis, help in quantifying the impact of each of the inputs. The beta depicts that one unit increase in the input value would increase the sales/profit by Beta units keeping the other marketing inputs constant.

Variables like TV GRP do not have a linear impact on sales. An increase in TV GRPs will increase sales only to a certain extent. Once that saturation point is reached, every incremental unit of GRP would have less impact on sales. So, some transformations are done on such non-linear variables to include them in linear models. TV GRP is considered as a non-linear variable because according to marketers an advertisement will create awareness among customers to only a certain extent. Beyond a certain point, increased exposure to advertisement would not create any further incremental awareness among customers as they are already aware of the brand. To consider modeling inputs, it is transformed into adstock.

ADSTOCK –

Diminishing Returns – The non-linear relationship between the predictor variable and the dependent variable is shown by taking the exponential of the prediction.

- Methods – Atan2, Exponential

Carry-over effect or Decay effect – It describes the prolonged advertising as being stored in the memory of the consumer and impacting purchase behavior. It is applied to media variables that are it to host the carry-over effect, e.g. TV GRP, outdoor billboards, press insertion.

$$\text{Sales} = \text{Intercept} + \beta_1 \ast \text{Pricing} + \beta_2 \ast \text{Distribution} + \beta_3 \ast \text{TV} + \beta_4 \ast \text{Digital} + \beta_5 \ast \text{Non-Digital} + \beta_6 \ast \text{Promotions} + \beta_7 \ast \text{Discounts} + \beta_8 \ast \text{Seasonality} + \varepsilon$$

7. Conclusion

Using Marketing Mix Modelling, you can convert your data on impressions, clicks, conversions, etc. into actionable recommendations: how much to spend on marketing advertisements, how much to spend on which media, etc. which you can use to support your marketing decisions and protect defending marketing budgets, getting the budget approved, doing the right investments and maximizing return on marketing investments.