**Project Proposal – Marketing Mix Modelling**

**INTRODUCTION**

As a team of four, we will be working on a project that focusses on the concept of Marketing Mix Modelling. The core concept of Marketing Mix Modeling lies in helping brands optimize their marketing channels to get the best mix of investments across their various marketing channels to maximize their profit.

In our project, we're looking at how businesses can best spend their money on advertising to make more money. It's like figuring out the best way to spend your grocery budget to make sure you get all the healthy foods you need.

We'll look at information from the past to see what worked before. This will help us suggest which types of advertising—like TV, online ads, or billboards—might bring in more customers and sales. It's a bit like thinking about which meals made you feel good in the past and choosing to eat those more often.

Here are the main things we want to find out:

- How should a business split its advertising money between different types of ads to get the best results?

- Should a business spend more or less money on certain types of ads to make more money?

- When does spending more money on ads stop helping?

We're also going to think about the 4Ps of marketing in selling things:

1. Price: How much something costs.

2. Promotion: How you tell people about what you're selling, like ads or special deals.

3. Product: What you're selling, what it does, and why it's good.

4. Place: Where you sell your product, like in a store or online.

We want to figure out which ads work best and give advice on how to spend money on ads in the future. It's tricky because it's hard to tell which ads are really helping to sell more. We hope to make this clearer for businesses so they can use their money in the best way possible.

Getting to stakeholders, the primary stakeholder of such a project is the CEO and the top heads of the brand – given they are the ones who would like the profits to rise. Additionally, there could be other stakeholders in the project – someone who holds shares in the company, the marketing team, the product team – all of whom can be stakeholders in one way or the another.

From our research, we realized that most of the marketing mix modelling in practice involves multiple linear regression and the datasets that are used for these purposes contain a lot of noise. Our aim is to minimize the impact of noise and use multiple models to determine what is the best solution to the business problem.

Our new approach involves looking closely at how past ads have worked and using this to guide future decisions. We think this method will work well because it's based on real examples of what has already been successful.

If we get this right, it could make a big difference for businesses. They would know better where to spend their advertising money to increase sales and profits. This means they can make smarter choices and possibly save money while still reaching more customers.

**LITERATURE REVIEW**

Today, businesses often use a mix of experience, guesswork, and basic analysis to decide where to spend their advertising money. They might look at sales data and try to connect the dots between when they advertised and when they saw more sales. But it's not always clear if those sales were directly caused by the ads.

The problem with this approach is that it's not very precise. It's hard to tell exactly which ads are working and which aren't, especially when you're using many different types of ads at the same time. Also, ads can have effects that last a long time or interact with each other in ways that are hard to see.

So, while businesses are trying their best with the tools they have, there's a lot of room for improvement in understanding the true impact of their advertising efforts.

**The Current Situation:**

In today’s world, marketing mix modelling is predominantly done using additive techniques or multiple linear regression algorithms. Not all companies consider the adstock effect or saturation effect in their model building and that is something we will be doing. We will also incorporate seasonal and cyclical trends that might affect the sales of our product.

Most of the currently available models do not consider the adstock effect or the saturation effect into account. The Adstock effect captures the prolonged and cumulative impact of advertising, enabling marketers to fine-tune campaign timing and effectiveness. Saturation Effects helps in identifying the point of diminishing returns on marketing investments, which is crucial for efficient budget allocation.

In our methodology, we will be taking a Bayesian approach to building our model, gathering new insights from data, and then adding them to the models. We will also be considering budget allocation, adstock effect and saturation effect as we build the model.

There are several open-source libraries like mamimo, Py-McMarketing and LightweightMMM that could be of use to us while we take this Bayesian approach to modelling.

**Stakeholders:**

1. Chief Marketing Officers (CMOs) and Marketing Teams: CMOs are under increasing pressure to demonstrate the value of marketing efforts, especially in challenging economic conditions. They need MMM to justify marketing spend by showing its impact on sales and to make informed decisions on budget allocation across various channels to optimize media performance.

2. Finance Departments: Finance teams are interested in understanding the return on investment (ROI) of marketing activities to ensure that budgets are used efficiently. They require clear, reliable metrics that link marketing spend to sales outcomes, helping in financial planning and forecasting.

3. Brand Managers: Individuals responsible for specific products or brands within a company need to understand how their marketing efforts are contributing to brand awareness, customer acquisition, and sales. They require granular insights into the effectiveness of different marketing tactics for their specific brand context.

4. Sales Teams: Sales departments benefit from understanding how marketing activities influence customer behavior and sales cycles. They need data that helps them align sales strategies with marketing efforts to maximize overall business performance.

5. Data Analysts and Statisticians: These stakeholders are involved in the technical aspects of MMM, including data collection, model building, and analysis. They need access to quality data and robust analytical tools to build accurate models that can predict the impact of marketing activities on various performance metrics.

6. Product Development Teams: Insights from MMM can inform product development by highlighting features or benefits that resonate with customers. These teams need information on how marketing for existing products impacts customer preferences and perceptions, which can guide the development of new products or improvements to existing ones.

By addressing the specific needs of these stakeholders, MMM can provide a comprehensive view of marketing effectiveness, guiding strategic decisions across the organization to maximize ROI and support long-term growth.

**Risks:**

When working on projects that help businesses figure out the best way to spend their advertising money, several challenges can come up. First, making sure all the information we use is correct and complete is crucial. If the data has problems, like missing details or errors, our recommendations might not be accurate. We need to clean up and organize the data before we use it.

Another challenge is making sure our methods for analyzing the data are right. We use complex math to understand how different types of advertising affect sales. But if our methods aren't correct, we might make wrong conclusions. To prevent this, we'll check our work using different tests to make sure it's reliable.

The world of advertising is always changing, which means what worked yesterday might not work tomorrow. Our project needs to keep up with these changes by regularly updating our methods and information.

Privacy rules are also something we need to think about. With new laws, it's harder to use detailed data about individuals. Our project uses broader data to respect privacy while still giving useful advice on where to spend advertising money.

Sometimes, our math might show a strong connection between two things when there isn't one, or it might be too focused on small details, missing the bigger picture. There may be some causal variable involved that makes this correlation stronger. We'll keep an eye on these issues by regularly reviewing our work and making sure it makes sense in the real world.

Finally, understanding how the impact of an ad fades over time or how spending more on an ad doesn't always mean more sales can be tricky. We'll experiment with different approaches to find what works best.

If we run into problems, we'll go back to the drawing board, look at our assumptions, and see if we missed anything. Talking to experts and staying open to new ideas will help us adjust and improve our project.

Marketing Mix Modelling fails to provide granular level insights on the effect of individual campaigns accurately, so it is always paired up with other modelling options like Multi Touch Attribution to get the best desired results.

Additionally, marketing mix modelling does not consider competitor activities and new law regulations that might affect a product. However, we proceed into this project fully aware of all the limitations involved in such a model.