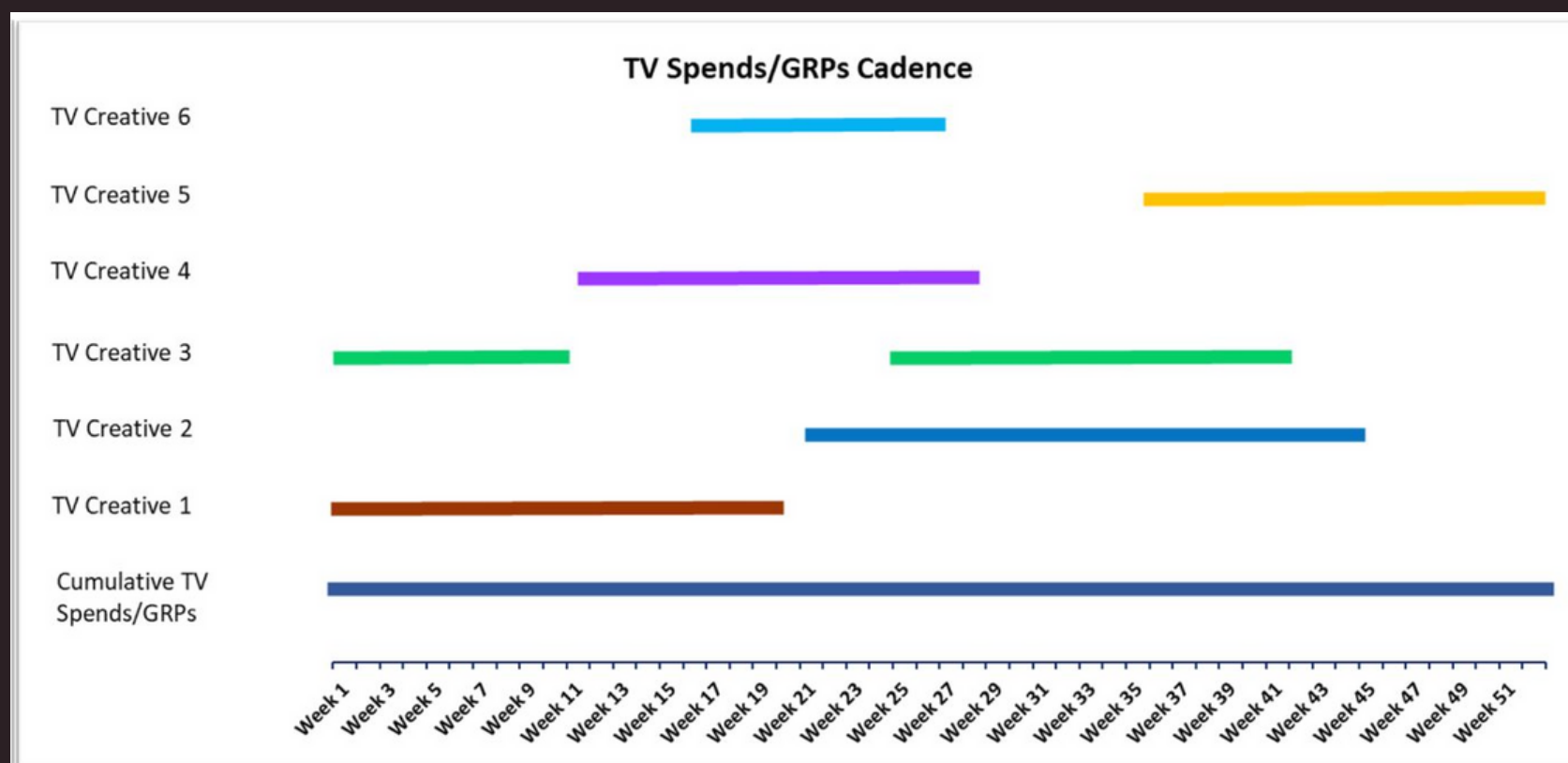
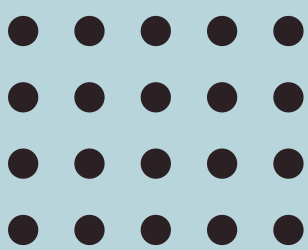


We cracked one of the hardest problem in MMM – The granularity problem



Here is how we did it





So, what is the Granularity Problem?

One of the complaints many have with respect to MMM is that it does not provide granular insights.

Let's take the example of TV. Many brands spend lot of money on TV ads and the below are typical scenarios:

Scenario 1 - different ads/creatives run concurrently.

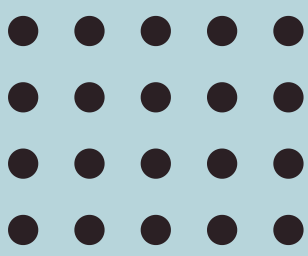
Scenario 2 - the ads/creative run at different cadence across the whole time period.

The latter leads to data sparsity and often warrants use of cumulative TV spends/GRPs at the model level.

The usage of cumulative spends in the model thus means that we lose information at the creative level.

This is the granularity problem in MMM.





How does it impact the MMM model?

Most brands often ask, if there are ways to discern the effect of individual campaigns.

The cumulative spends do not answer the question "which campaigns are more effective?".

Statistically, inclusion of these sparse data could lead to problems of:

- **Multicollinearity**
- **Poor model fit**
- **Overall wrong attribution**

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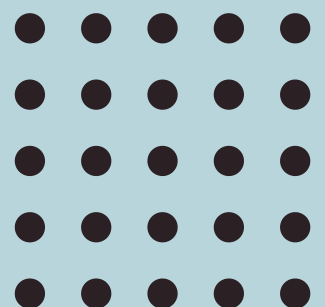
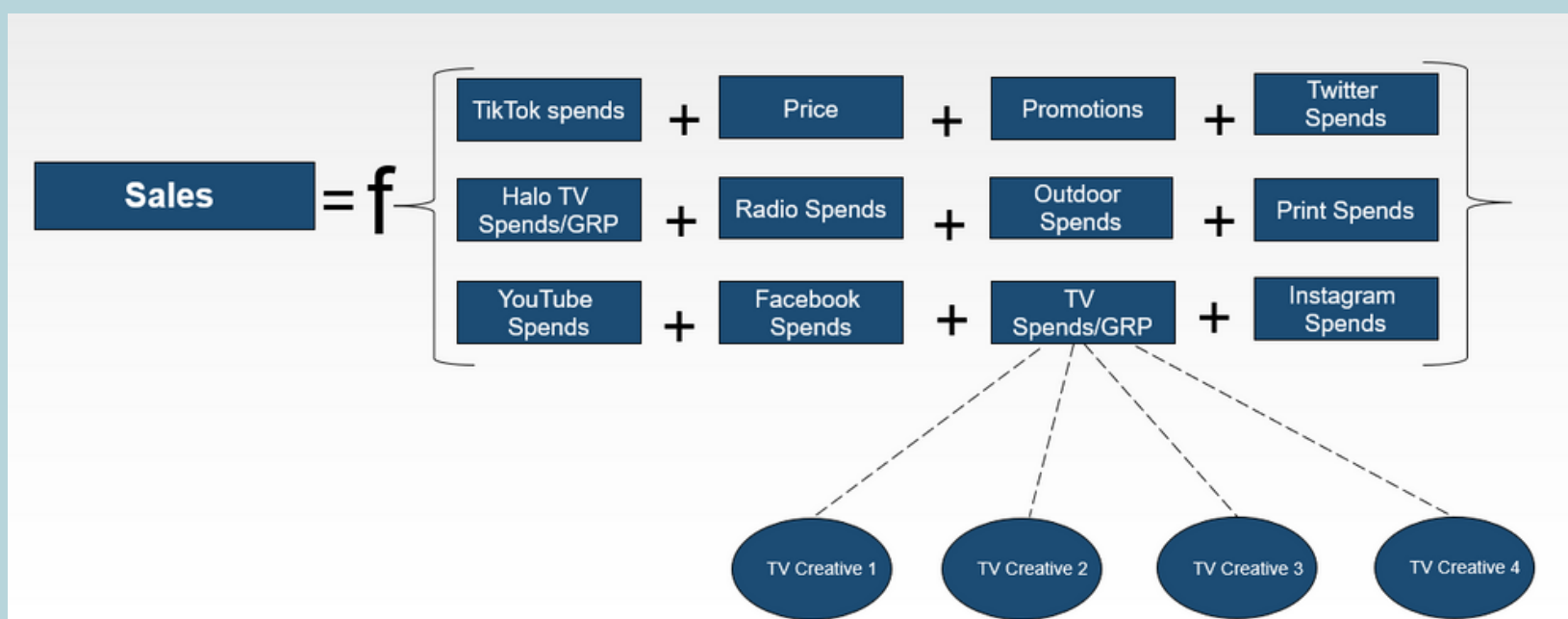
The innovative solution

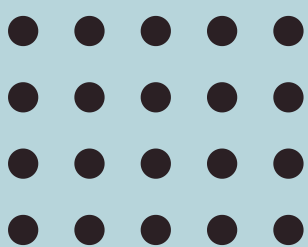
Because the creative variables can't be included in the full model due to sparsity issues, we took an innovative approach.

We decided to solve the problem through a game theory framework.

We used a variant of SHAP (Shapley additive explanations) to tackle this approach.

Let's get into the details.



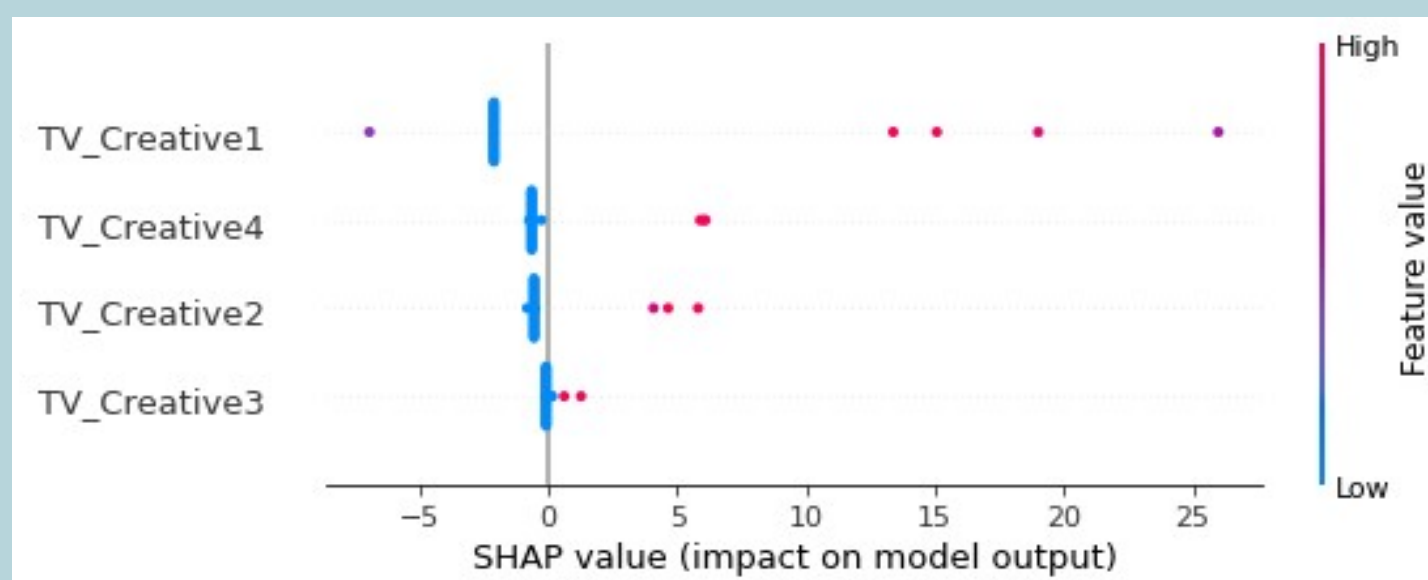
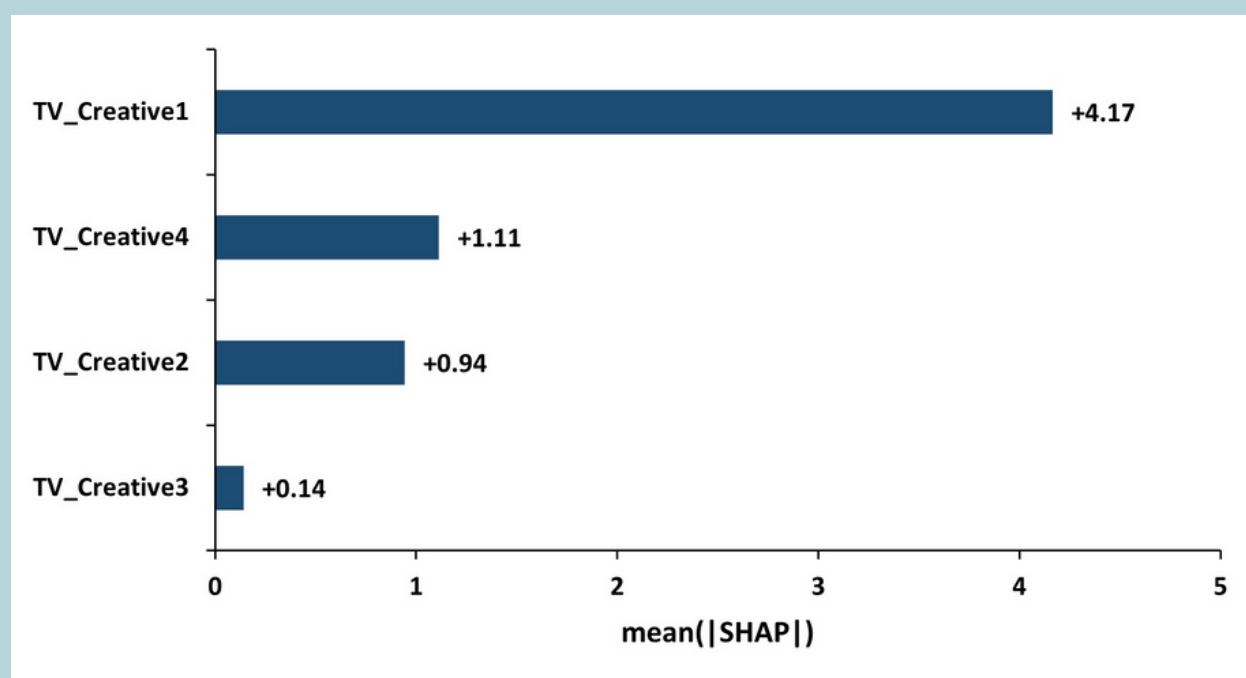


The approach in detail

We build the full MMM model through robust econometric ways. This yields the Beta coefficient for TV.

We then use Beta coefficient of TV (translated in terms of sales due to TV) as a payoff and we treat the creatives as 'players'. The analytical problem is now that of to apportion the payoff among the creatives in a fair manner.

The solution to the problem provides us the answer – which of the creatives drove 'sales due to TV' the most.

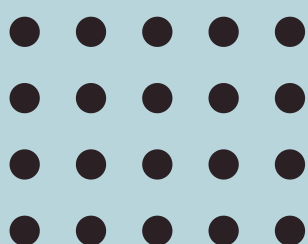


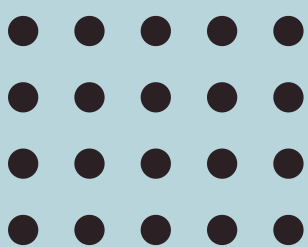
How we validated the results

Because this was an innovative approach, we validated the results in a more heuristic fashion.

We compared the creative importance coefficients to the spends proportion of the creatives. In our experiment with real client data, we found that the creatives with mostly high spends were the ones driving most sales.

Please note that this is not sufficient condition. Sometimes a creative with less spend can also have the high impact on sales. However, this internal calibration check is more like the Decomp.RSSD metric in Meta's Robyn. This is more like a business goodness of fit.





Seamless MMM integration

If the granularity issue was holding you back from adopting MMM, we have some good news.

MMM no longer has the granularity problem 😊

We are already implementing this technique with our existing clients and also helping prospective clients with pilots.

We would be glad to help you solve the granularity problem and adopt MMM seamlessly.

You can reach out to us at contact@arymalabs.com or just DM us on LinkedIn.

You can also reach out to us at <https://www.arymalabs.com/>

