



smartAd

Objective



Increase brand awareness

SmartAd Increase the brand awareness using the new creative and interactive approach.



Test the performance

Simulate the smartAd BIO (brand impact optimizer)

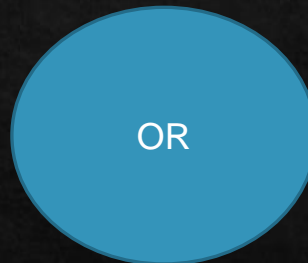


Conclusion

Does the new creative approach have an impact in brand awareness ?

Method

A/B Hypothesis Testing is a way to compare two versions of something to figure out which performs better.



Data

◆ The BIO data for this project is a “Yes” and “No” response of online users to the following question

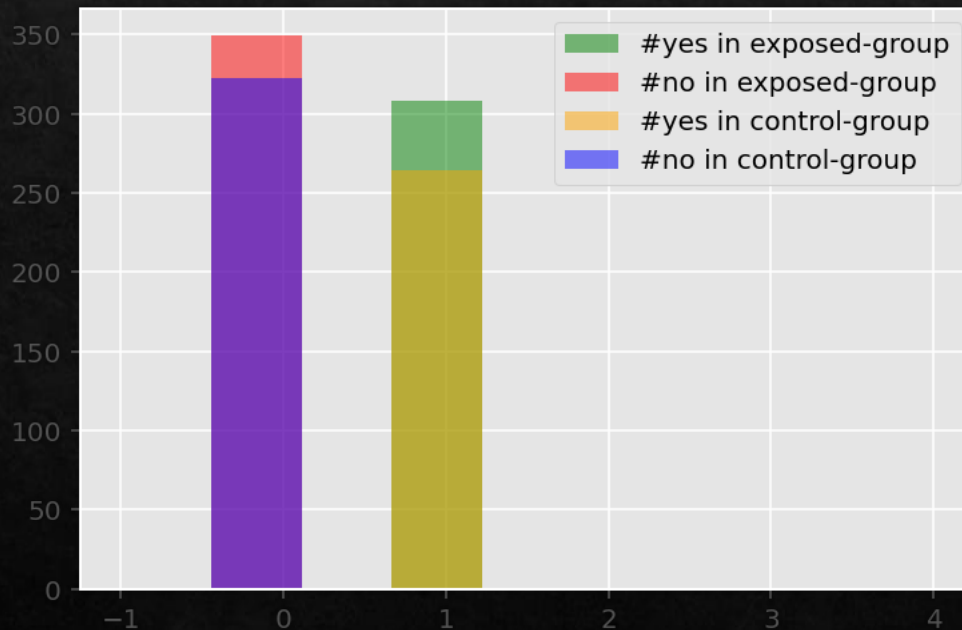
◆ *Q: Do you know the brand SmartAd?*

◆ ☐ Yes

◆ ☐ No

Variable	Description	Metrics
Experiment	Which group the user belongs to - control or exposed.	String(binary)
Date	The date in yyyy-mm-dd format	Day
Hour	The hour of the day in hh format.	Hour
Device_make	The name of the type of device the user has	String,cat_variable
Platform_os	The id of the os the user has	String, cat_variable
Browser	The name of the browser the user uses	Int(cat_variable)
Yes/no	1 if the user chooses the “yes” or “no”radio button for the bio questionnaire	Int(binary)

We may say the smartAd creative approach has an impact ... but what A/B test say ?

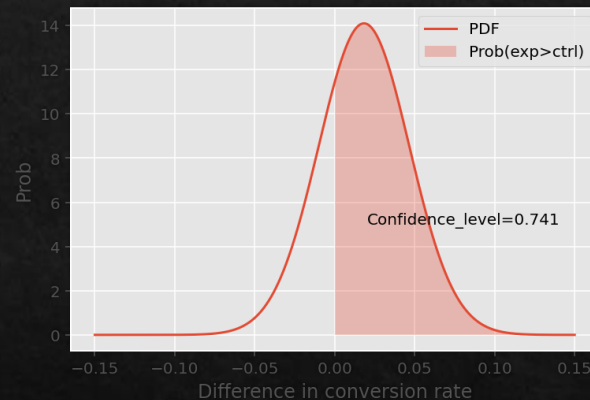


Experiment	Converted	Total	Conversion rate
Control	264	586	45%
Exposed	308	657	47%

Classical A/B approach

Classical A/B

- ◆ We can say 74 % of the time the new creative approach of the smartAd has an impact to the brand awareness but that is **not efficient** to conclude.
- ◆ The total data we have taken is 1243 replies of users , this may also affect the result.
- ◆ To be sure our conclusion at 95% confidence and given conversion rate ,we need at least 11, 660 data reply of users.



can we take the result of the classical A/B test as it is ?

- ◇ Classical A/B test considers only the experiment and the target variable ,so how we can be sure the result is only the impact of the new creative smartAd approach not other variables impact i.e browser, platform os, device type etc.
- ◇ So, we need new approach to consider all impacts ,which is that ?..

Machine Learning

Models

XgBoost

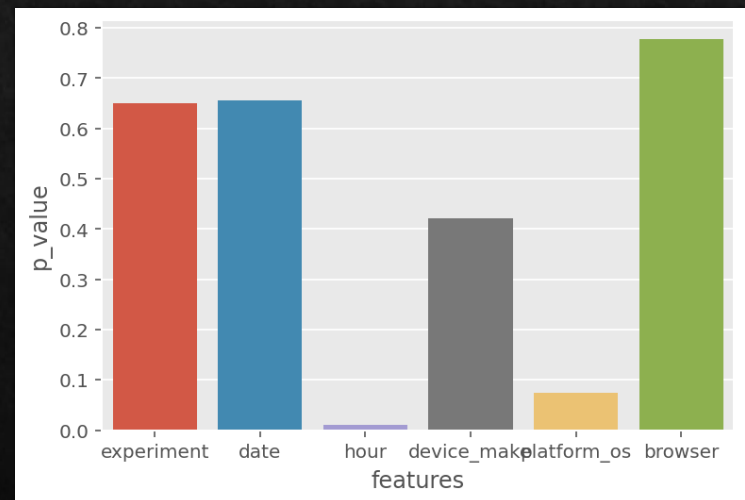
Logistic Regression

Decision Tree

Logistic Regression

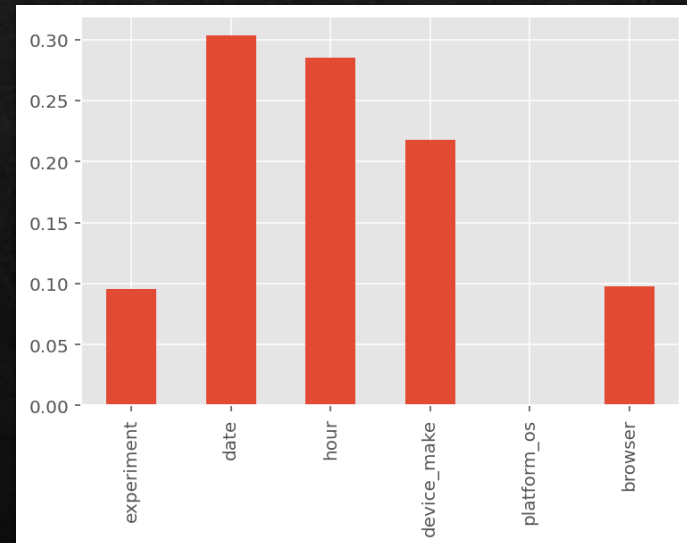
As the p value decrease the feature is the most important

Hour is has more impact to increase the brand awareness than the smartAd new creative approach



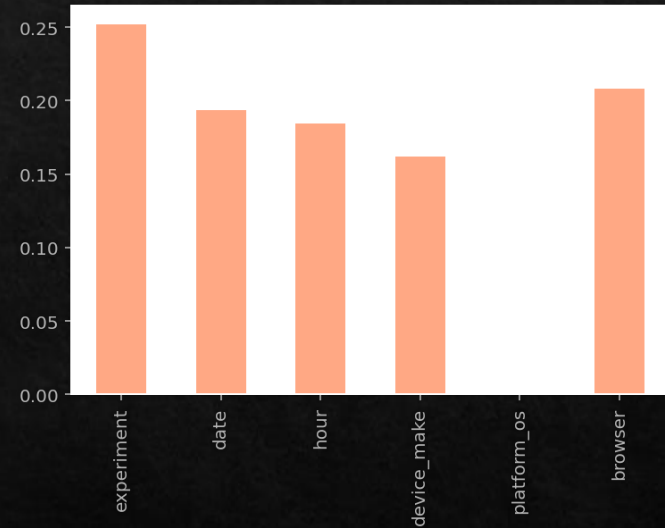
Decision Tree

- ◇ date has more impact to increase the brand awareness than the smartAd new creative approach



XGBOOST

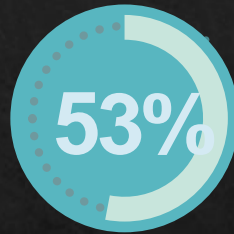
- ◆ The smartAd new creative approach has an impact to increase the brand awareness



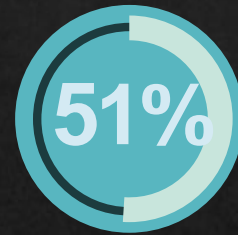
Accuracy of Models



Logistic Regression



Decision tree



XGBOOST

Compare the classical and ML approach

- ◆ A major issue with traditional, statistical-inference approaches to A/B Testing is that it only compares 2 variables - an experiment/control to an outcome. The problem is that customer behavior is vastly more complex than this. Customers take different paths, spend different amounts of time on the site, come from different backgrounds (such as the browser they have), and more. This is where Machine Learning excels - generating insights from complex systems.

Conclusion

- ◇ Other factors have more impact to increase the brand awareness rather than the new approach of the smartAd.
- ◇ But still the new approach of the smartAd has relative impact

Reccomendation

- ◊ Rather than only consider the new creative approach ,considering other impacts and working on those is more effective.
- ◊ Or. need redesign the new approach to achieve the desire goal if the new approach is needed to consider.
- ◊ And mainly, need to take time and take more data to be confidently conclude the situation.

Limitation

- ◇ The data was very limited
- ◇ The models weren't efficient

Reference

- ◇ <https://www.business-science.io/business/2019/03/11/ab-testing-machine-learning.html>
- ◇ <https://towardsdatascience.com/the-math-behind-a-b-testing-with-example-code-part-1-of-2-7be752e1d06f>