Understanding factors that influence conversion rates from signup to completion for users landing on a given signup landing page

Data Science Project

Purpose

As a company, one of the key metrics for success, particularly in the sales and marketing space is the percentage of visitors who convert to users by completing our signup process.

Since this signup process has been broken into 3 states, it is important to understand conversion rates between each state and whether these rates change in different days, time of the day and through the usage of different devices.

These insights will help us understand what days we should potentially spend more on marketing to get the greatest benefits at the most cost effective price, whether to optimise the signup journey for particular devices and whether to adopt a different sales strategy in specific hours where conversion rates specifically to completion of the signup process are higher

Context

There are a few terms that need to be defined before commencing with the analysis.

There are 3 states in the signup process and a 4th state that precede these steps. These states are;

i. Session - when a user lands on the signup page in question,

ii. lead - when a user lands on a page that appears to indicate that s/he has filled in details required in the first step of the signup process,

iii. opportunity - when a user lands on pages that appear to indicate that the user has completed all form steps required to transition from lead to opportunity,

iv. complete - when a user lands on a page that appears to indicate that the user may have completed the signup process

More business context

Conversion from session to lead and lead to opportunity can both be regarded as key indicators of marketing's ability to target users with a higher intention to convert to customers. The better we are at doing this the lower our unit economics specifically for purchasing customers, this is something we would want to optimise to increase the efficiency of where we put our money, it also determines the profitability of the business, as customer lifetime value should ultimately be high enough to cover both this cost and the cost of labour associated with generating a sale (which is often not factored into acquisition cost considerations)

Conversion from opportunity to complete is an indicator of our sales team's ability to close leads, a possible indicator of whether we need to upskill or expand our sales team to help increase conversion rates. The reason this is an indicator is because the moment a user converts to an opportunity the onus shifts to the sales team to follow up on the opportunities to help them complete the signup process.

Assumptions

A key assumption made for the purpose of this analysis was that activities that had a url containing the phrase continue, this would indicate that this was an activity associated with a user in the opportunity state.

A path containing the string continue indicates that the user started the signup process, and at the very least filled in enough information to become a lead. This assumption seemed to make sense. If I created a hierarchy showing the number of people in each state, one would expect this count to resemble a pyramid with the first step at the bottom and the final step at the top. Classifying ‘continues’ as opportunity seemed to create this pyramid.

Model

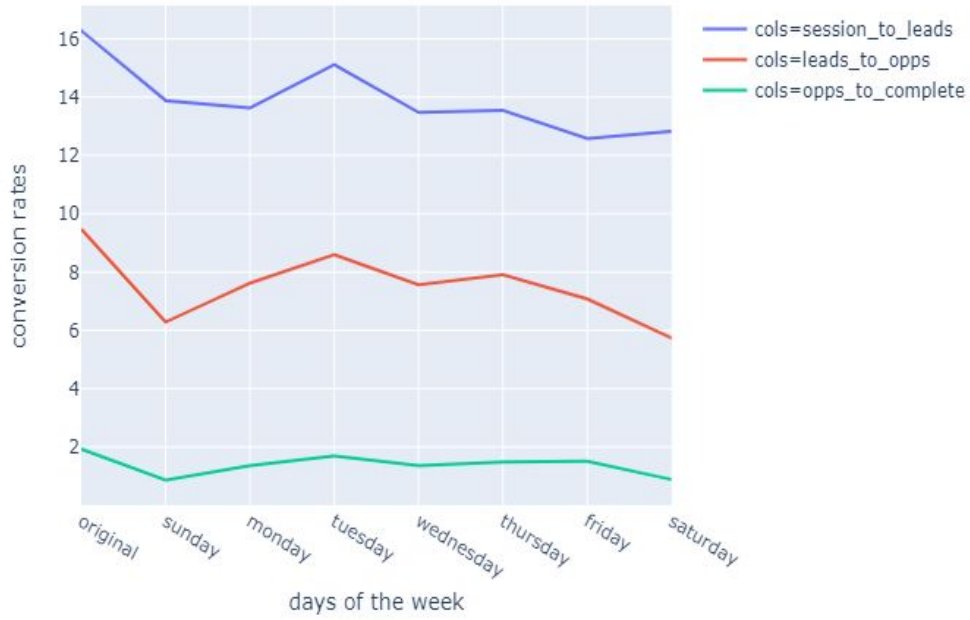
Put simply, this model looks at the probability of users moving from one state to another based on observing the data and looking at the probability distribution based on this observation.

The model takes a sample of these probabilities and uses these values to simulate hypothetical users moving through different states in the signup process.

For different simulations I used different filters based on the time of day, day of the week and device used.

Days of the week

The key questions here are whether a given day has an impact on a user's likelihood to complete the signup process



	filter	session_to_leads	leads_to_opps	opps_to_complete
0	original	16.28	9.47	1.92
1	sunday	13.88	6.28	0.86
2	monday	13.63	7.62	1.36
3	tuesday	15.11	8.6	1.69
4	wednesday	13.47	7.56	1.36
5	thursday	13.54	7.9	1.48
6	friday	12.58	7.08	1.51
7	saturday	12.82	5.73	0.88

Days of the week cont...

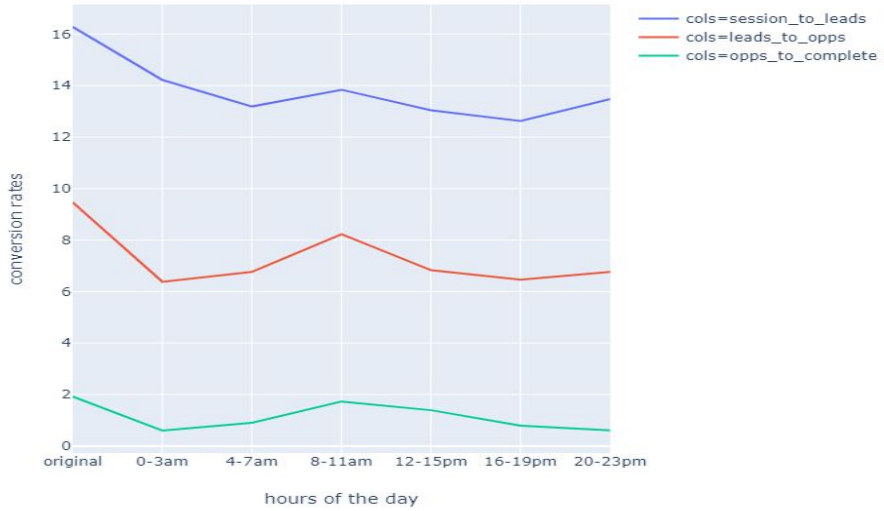
From this analysis we see higher conversion rates across the board (for all state transitions) on Tuesday. While a possible explanation of this might be that people start the signup process on weekends, stop and continue the signup process in the beginning of the week, this theory would presumably indicate a higher conversion rate on Monday as opposed to Tuesday. Higher conversion rates especially from session to lead and lead to opportunity on Tuesday might indicate a need to experiment with different spending patterns based on the weekday, i.e maybe increasing spend for ads tailored towards conversion (as opposed to brand awareness for example) on days with higher conversion rates in the session to lead and lead to opportunity stages.

Days of the week cont...

Conversion rates do appear to drop on weekends. However, one could argue that this drop may not be substantial enough to scale down marketing efforts to zero on weekends. Users will still convert from session to lead, lead to opportunity but conversion to complete will be less than half of that on weekdays.

Time of the day

The key questions here are whether or not the time of day has an impact on a user's likelihood to complete the signup process



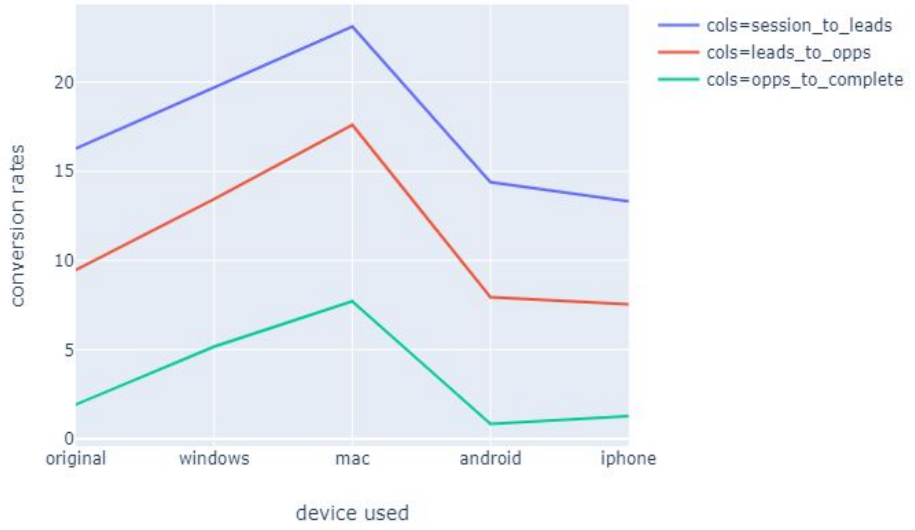
	filter	session_to_leads	leads_to_opps	opps_to_complete
0	original	16.28	9.47	1.92
1	0-3am	14.22	6.38	0.6
2	4-7am	13.19	6.76	0.9
3	8-11am	13.84	8.23	1.73
4	12-15pm	13.04	6.83	1.39
5	16-19pm	12.63	6.46	0.79
6	20-23pm	13.48	6.76	0.61

Time of day

I believe this analysis is specifically more useful for sales to understand how to maximise their efficiency. From this analysis we see a higher lead to opportunity conversion rate between 8 and 15pm. Assuming the assumptions about what defines an opportunity are true, these are the hours when the sales team is likely to convert opportunities to the complete state. Given that the sales team operates between 9 and 6pm, this makes a lot of senses and does not give any true insights aside from confirming what is most likely intuitive to the sales team.

Devices used

The key questions here are whether a particular device has an impact on a user's likelihood to complete the signup process



	filter	session_to_leads	leads_to_opps	opps_to_complete
0	original	16.28	9.47	1.92
1	windows	19.67	13.45	5.17
2	mac	23.12	17.6	7.71
3	android	14.39	7.94	0.83
4	iphone	13.31	7.55	1.26

Device used cont...

For this analysis it is more important to focus more on the mobile vs laptop split. It is clear that conversion rates are substantially lower on mobile devices (particularly android devices). Since this is evaluating conversions over a 2 year period, this could be an indicator of a signup process that has traditionally not been tailored towards mobile users.

Interestingly we also find that users behave differently based on the devices they are using. Mac users seem to convert at a higher rate than Windows users. One could speculate about the possible reasons this appears to be the case (e.g socio-economic status). This could indicate a need to use marketing targeting by device parameters more aggressively to further test this hypothesis.