

Marketing Analytics - Homework 1

Group 12

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Agenda

1. Overview of the database
2. Evolution of fundraising from 1991 to 2017
3. Seasonality for the amount donated per month
4. Performance based on prefix
5. Geographical analysis
6. Campaigns, channels and payment method
7. Comparison of 2018 with other years
8. Segmentation analysis

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Overview of the database



The my_charity_small database contains data from 1991-01-01 to 2018-06-25 after removing the only one observation in 1971



74.615 total contacts



71.158 active contacts, composed of approximately 21,4% males and 78% females

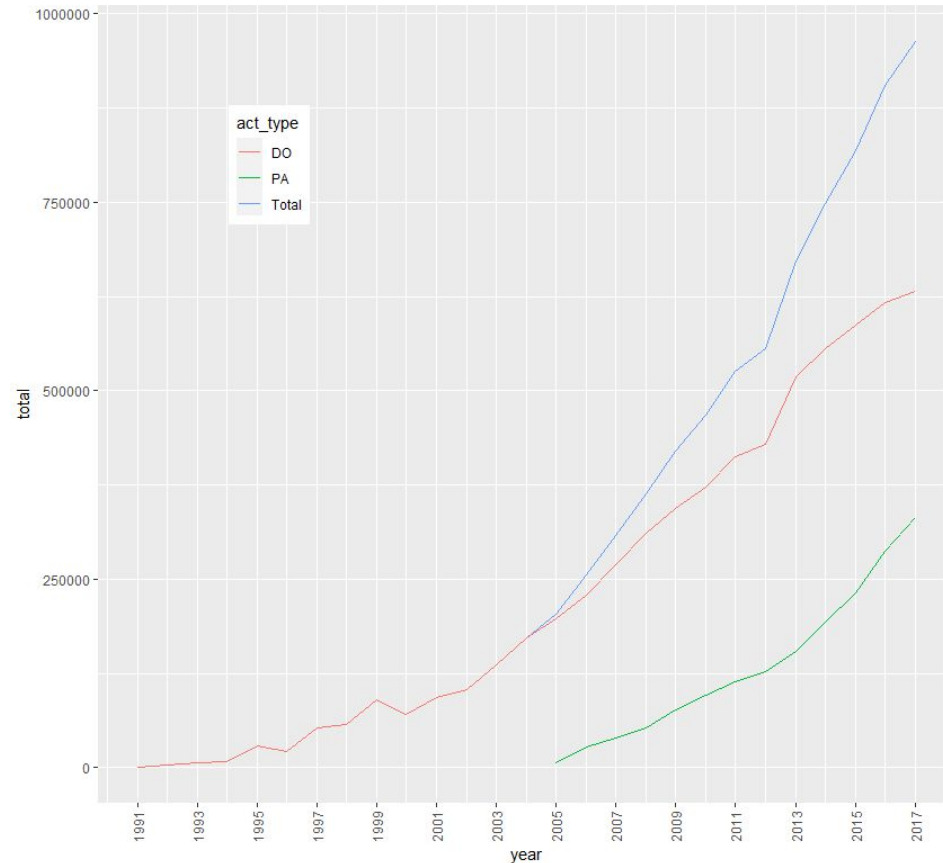


25.550 distinct donors (who have ever donated), which is more interesting since many contacts are registered but never donated

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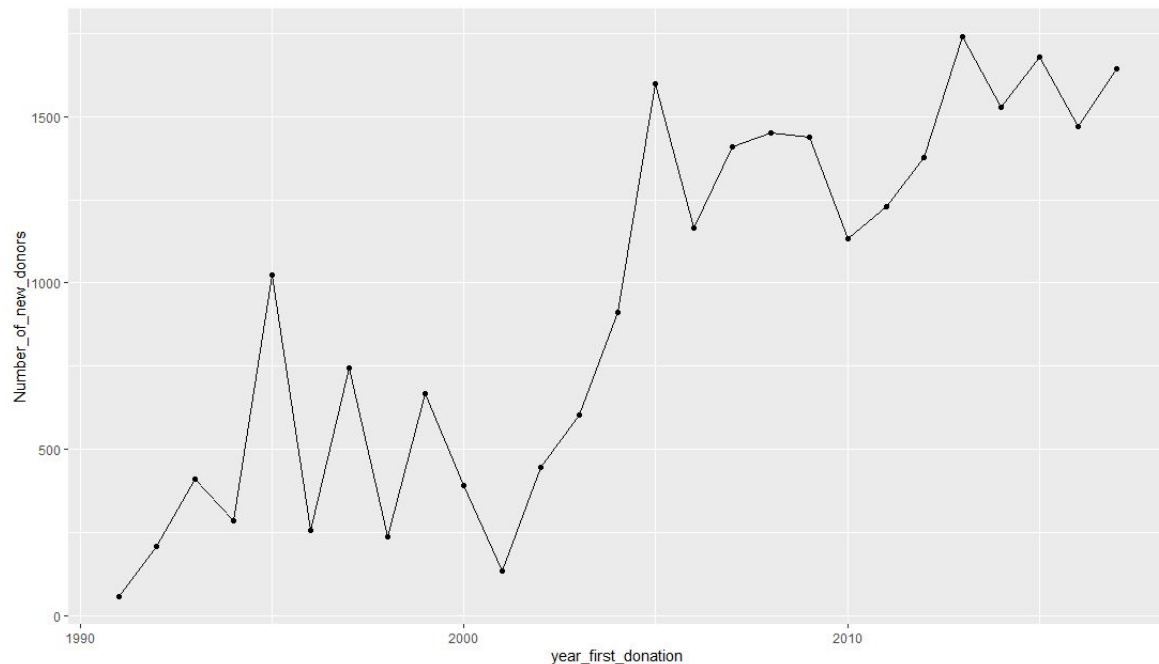
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Total Amount Donated by Year(1991-2017)



The total fundraising has been increasing over the years. There was a sharp increase from 2012 to 2013 mostly because of the donation type 'DO'. Automated deduction (PA) started in the year 2015 and has been growing rapidly ever since. Automated deduction is a successful approach to improve fundraising but since 2013 it penalised PA whose growth rate decreased compared to previous years.

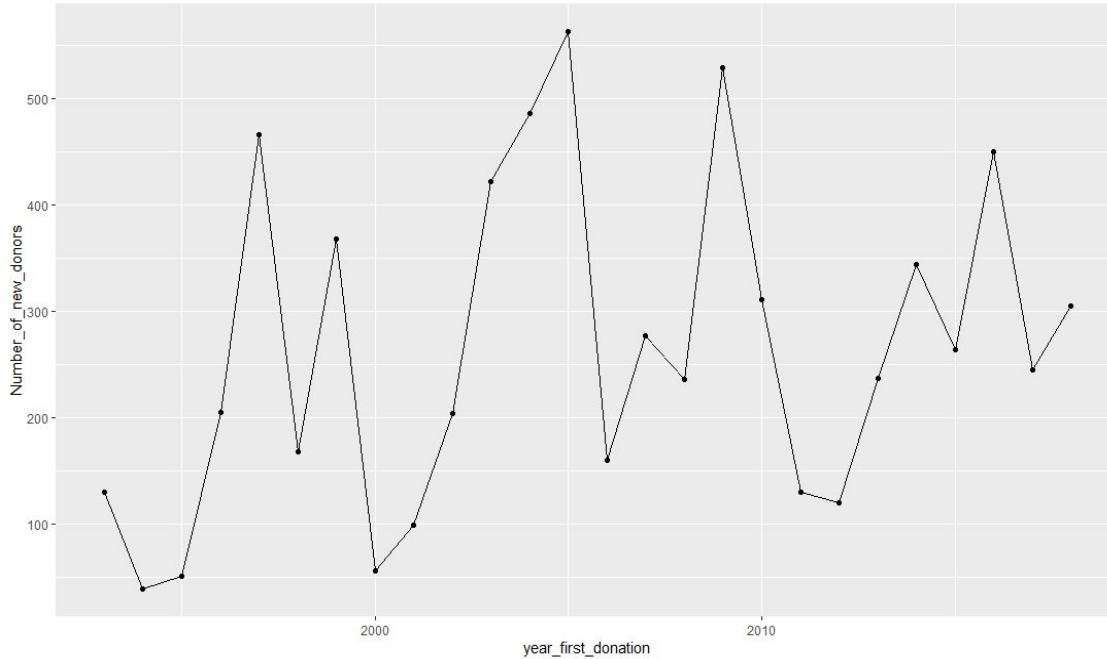
Number of new donors per year from 1992 to 2017



The number of new donors per year has been irregularly increasing over the years.

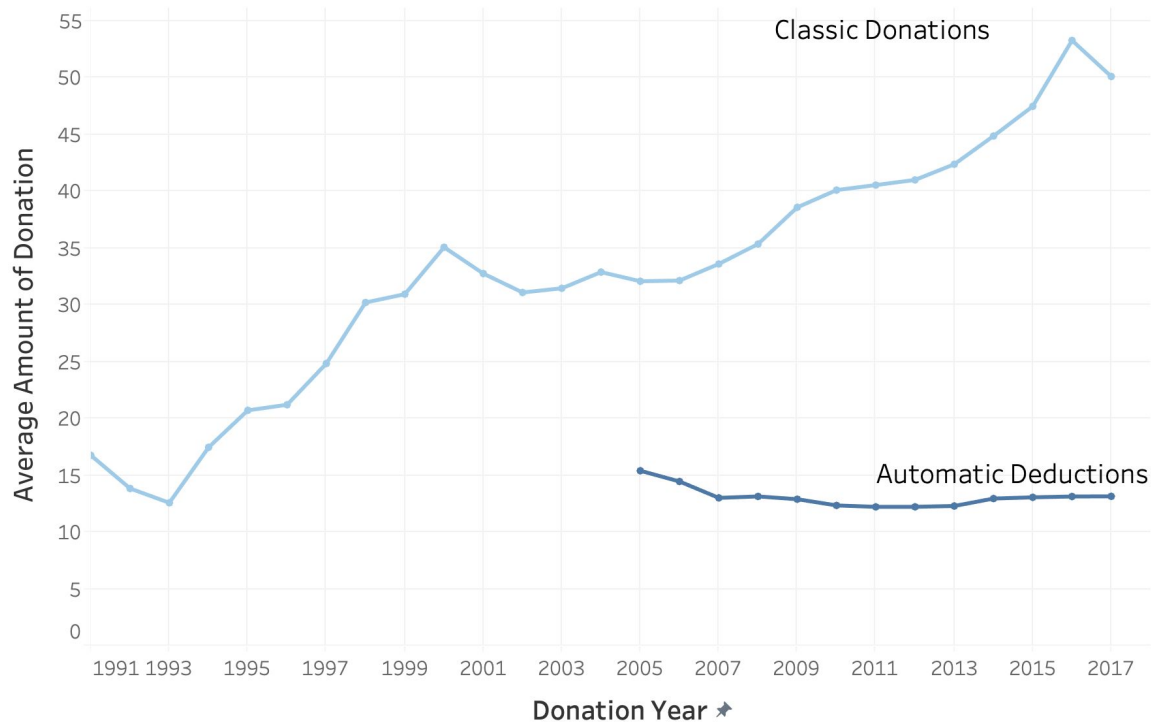
Between two sharp increases from 1992 to 1995 and from 2001 to 2005, the amount fluctuates a lot. It slightly increased from 2005 to 2017 and ranged between 13,000 and 17,500 new donors per year.

How does 2018 performs compared to prior years in term of new donors



The number of new donors, acquired from January to June, per year vary between 50 and 550 per year. It seems that this amount does not follow the trend of the graph below. between 2012 and 2018, number of new donors during the first six month of the year is on average 265 (305 in 2019). In 2017, the new donors acquired during the first six month represented less than 20% of the total amount of new donors during the year.

Average Amount of Donation by Year(1991-2017)

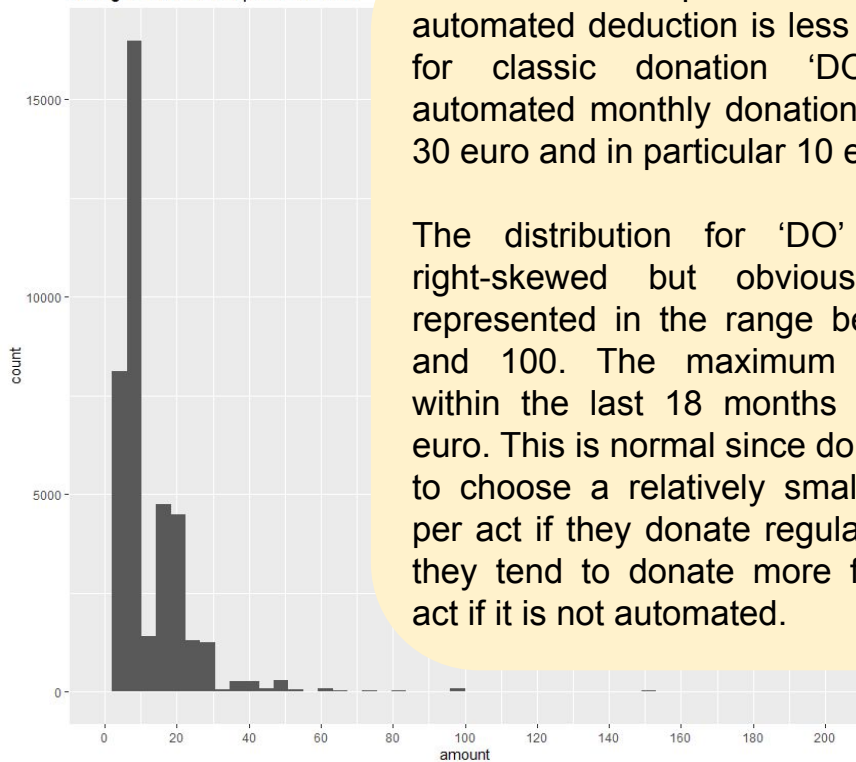


- Following an upward trend which is especially smooth after 2005, the average amount of donation in 2017 declined slightly by **5.9%**.
- Automatic Deductions have remained steady at around 12 euro over the years after an initial drop.

Distribution of the Amount per Donation for 'PA' and 'DO'

from 2017-01-01 to 2018-06-25

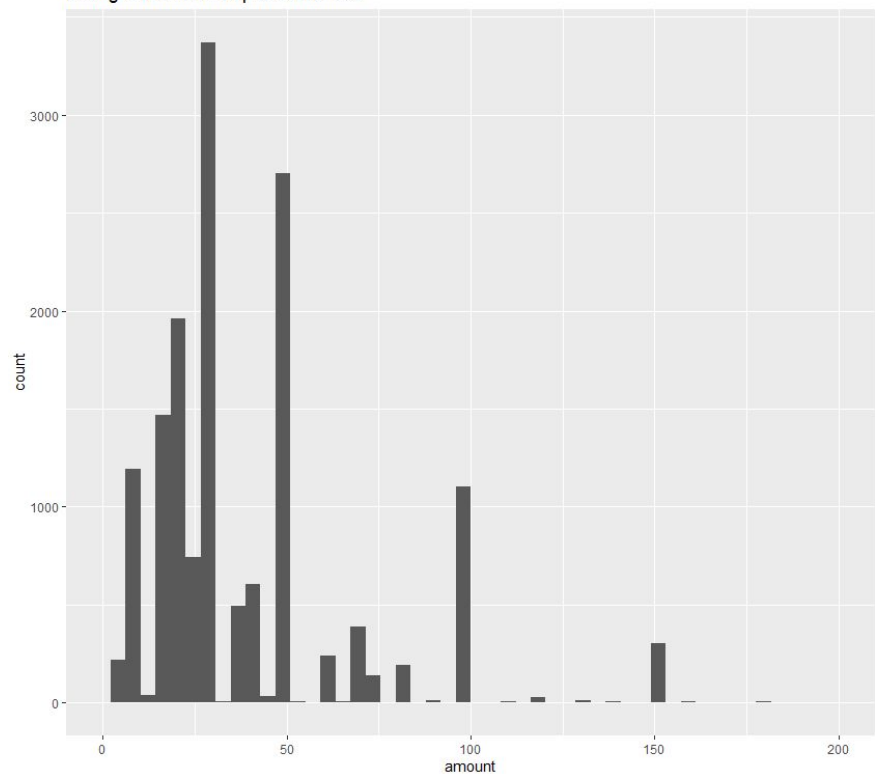
Histogram of amount per act for PA



The amount per donation for automated deduction is less than that for classic donation 'DO'. Most automated monthly donation is under 30 euro and in particular 10 euro.

The distribution for 'DO' is also right-skewed but obviously more represented in the range between 0 and 100. The maximum donation within the last 18 months is 10000 euro. This is normal since donors tend to choose a relatively small amount per act if they donate regularly, while they tend to donate more for single act if it is not automated.

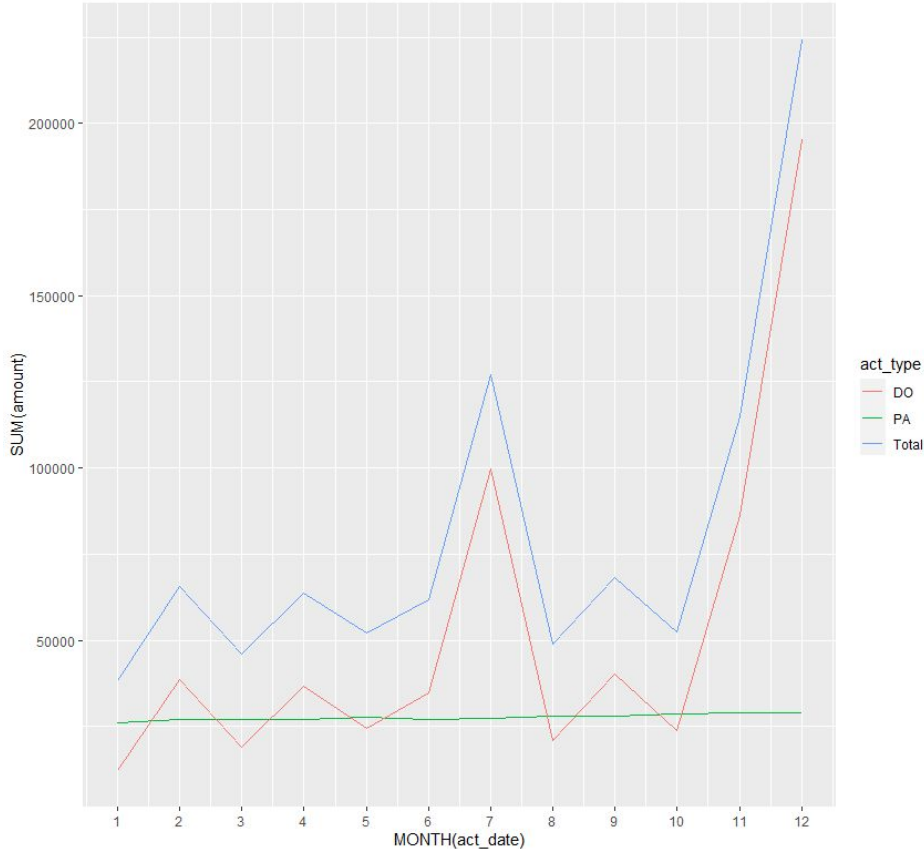
Histogram of amount per act for DO



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Monthly fundraising patterns



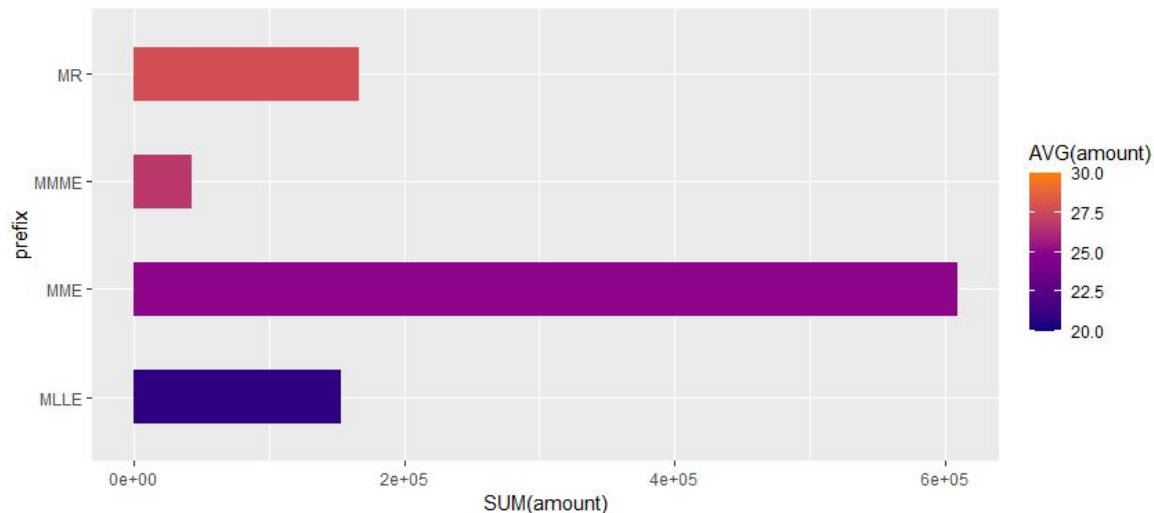
This graph shows the total fundraising in the year 2017. The monthly automated deduction remained nearly constant throughout the year. Other donations fluctuated with month. January is the lowest month and December is the highest month because of tax issues. The company has to take this effect out in order to better analyze the performance of each month. But surprisingly, July experienced a dramatic increase, and it slumped in the next month.

A similar pattern is shown in other years as well as the average of the sum of the amount donated per month from 2008 to 2017 (10 years). The company needs to consider possible factors that can influence monthly donation.

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Total amount of donation per prefix



MME(Madame) accounted for the most fundraising, more than the sum of all the other categories. MR and MLLE are the next represented categories. MR donated on average the most (per act), almost 30 euro, while MLLE donated the least, around 20 euro.

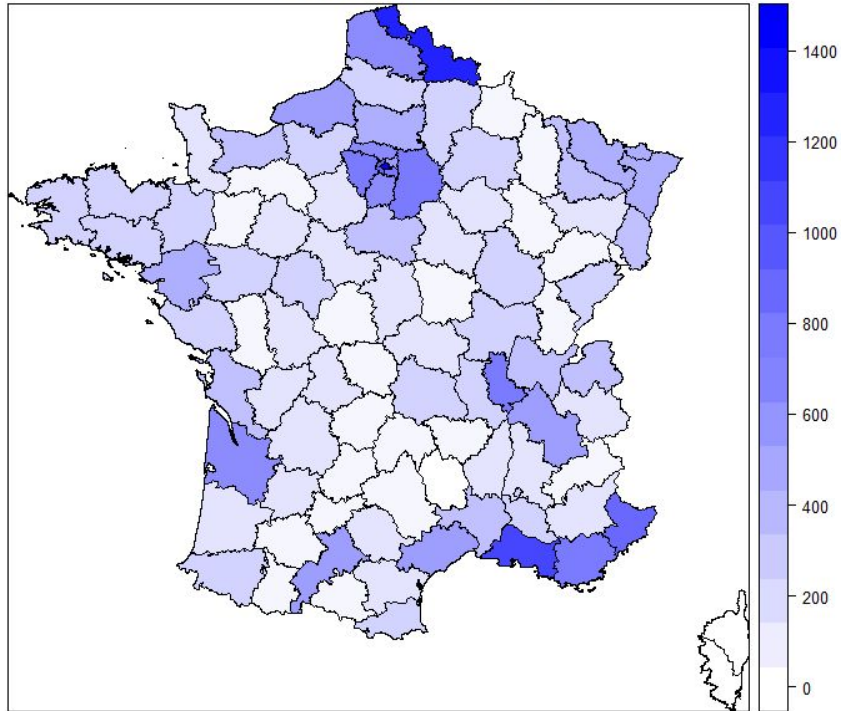
After excluded a few donors with prefix DR(doctors), AU(others) and NA(not indicated), this bar chart illustrates the total amount of donation from 2017-01-01 to 2018-06-25.

Agenda

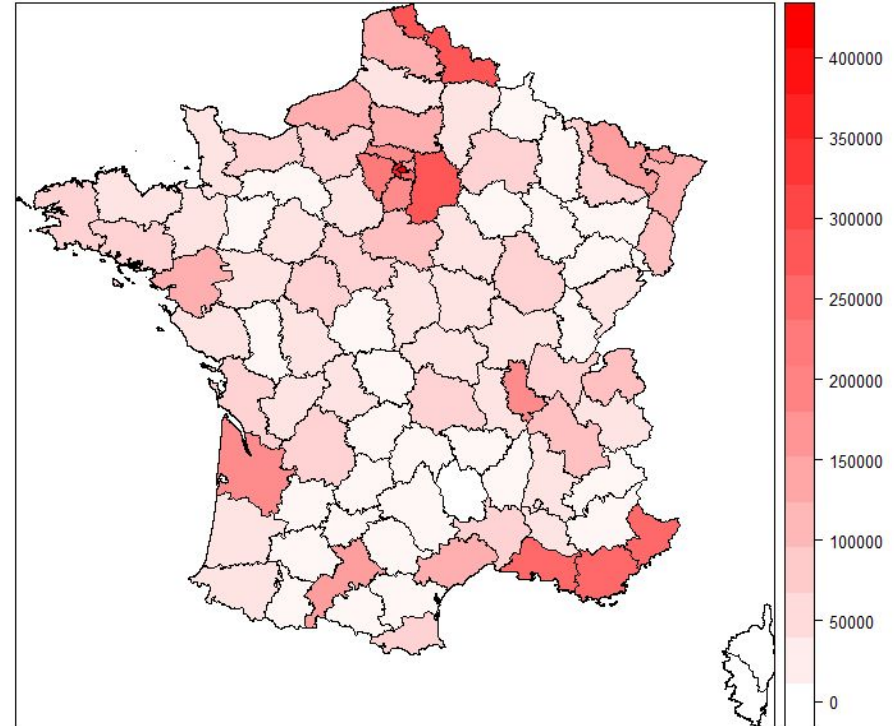
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Number of donors and total amount of donation per department

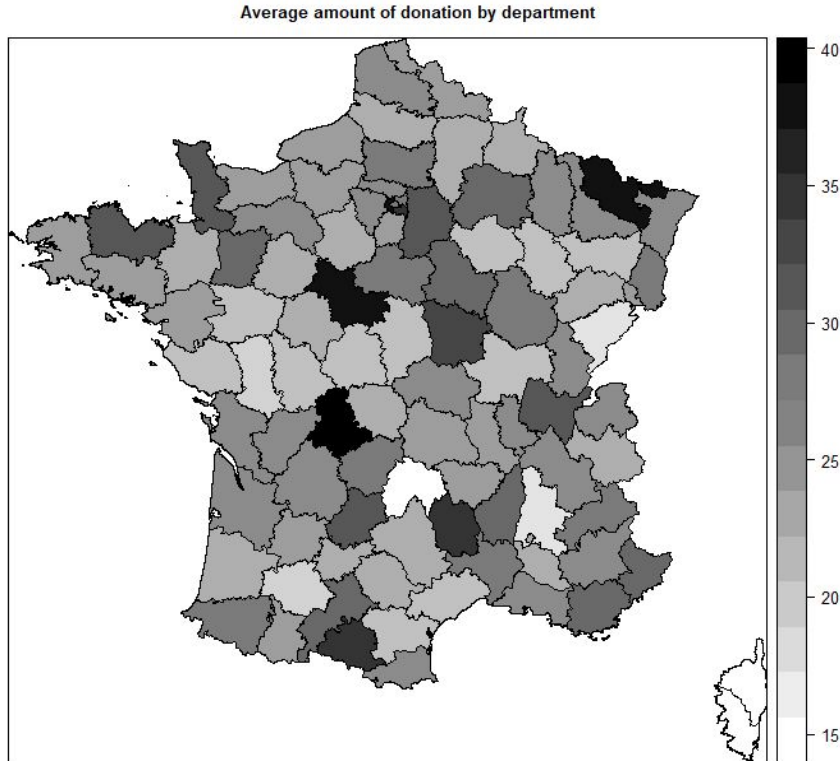
Number of donors by department



Total amount of donation by department



Average amount of donation by department



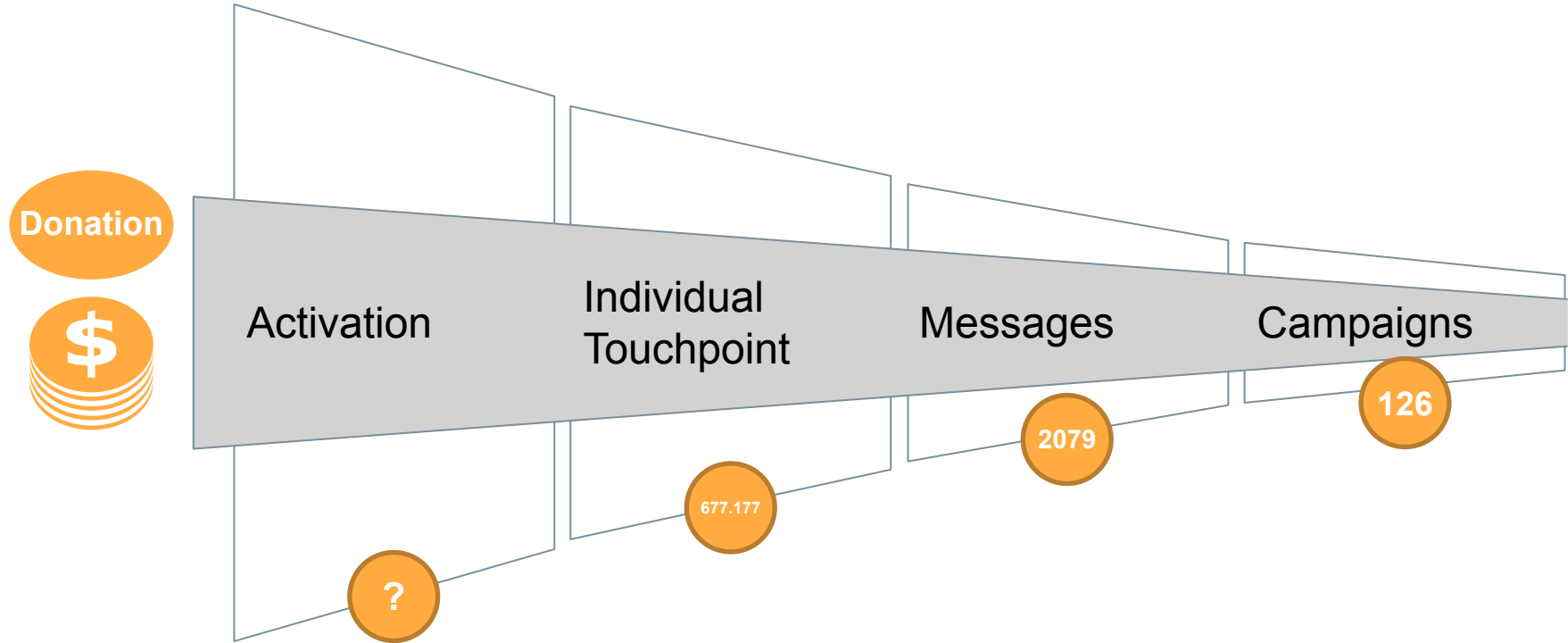
The first two maps show the number of donors by department and the total amount of donation by department since 1971. They seem logically strongly correlated and we can see that Paris, the Nord department and East-South departments seem to give more.

It is interesting to see on this last map that the departments where more donors are present are not the ones where donors give the more. This difference could be explained by a difference in wealth, and this could show where donors tend to make higher donations and in which region and department more people are willing to give to the charity.

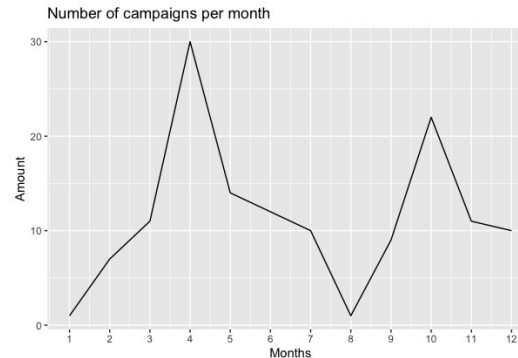
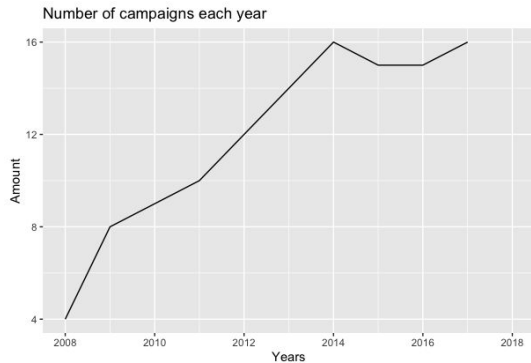
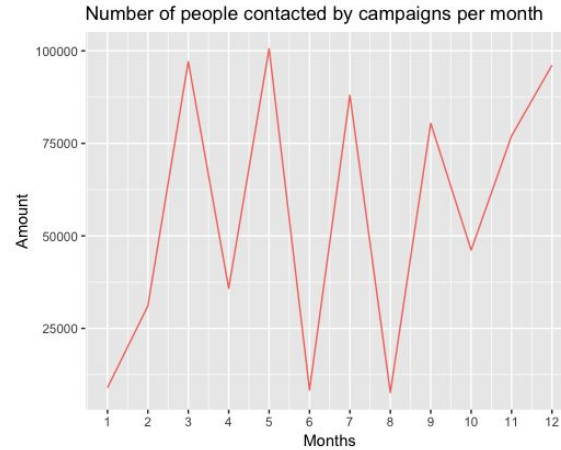
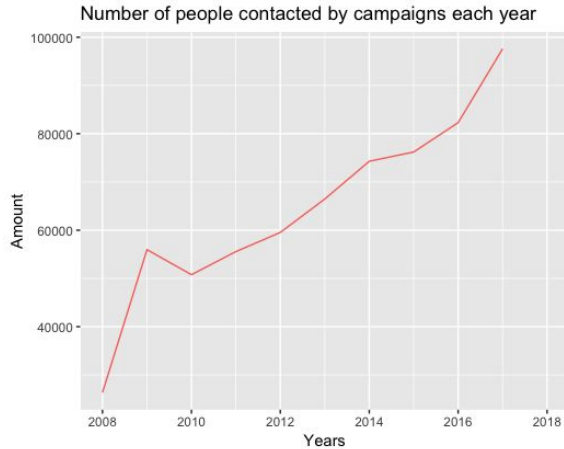
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Outcome and effect of marketing campaigns



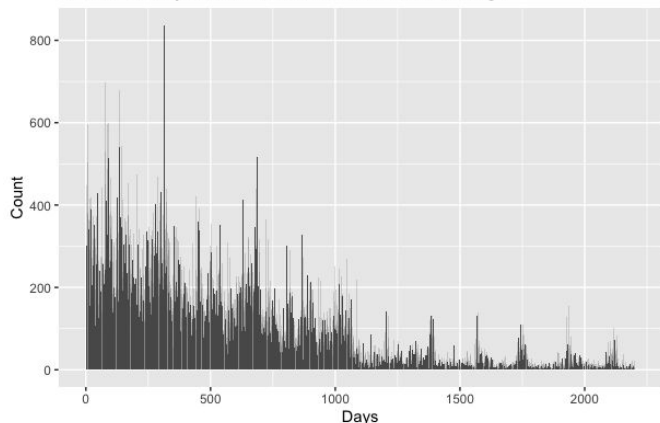
Number of people targeted by campaigns and number of campaigns started (per year and month)



- The number of people contacted with campaigns grew steadily over the years (one slight dip in 2010), whereas the number of campaigns sent out stagnated as of 2014
- January is a month with almost no campaign activity, whereas the end of the year shows strong activity
- Strangely, April shows the most campaigns started but a low number of people contacted
- Generally, campaigns targeted from as little as 48 (C44) donors up to as much as 13.484 donors (C158)

Frequency of contact with donors after their last donation and in terms of their value contribution

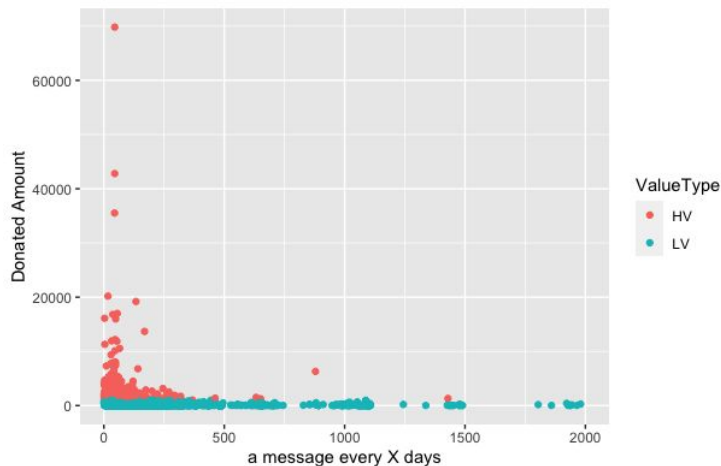
Number of days between last donation and message



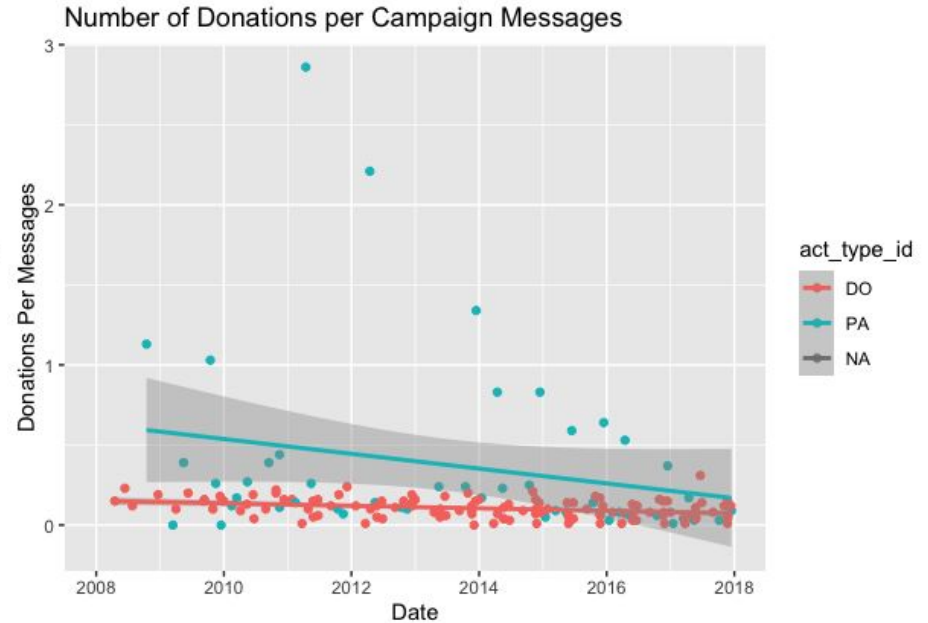
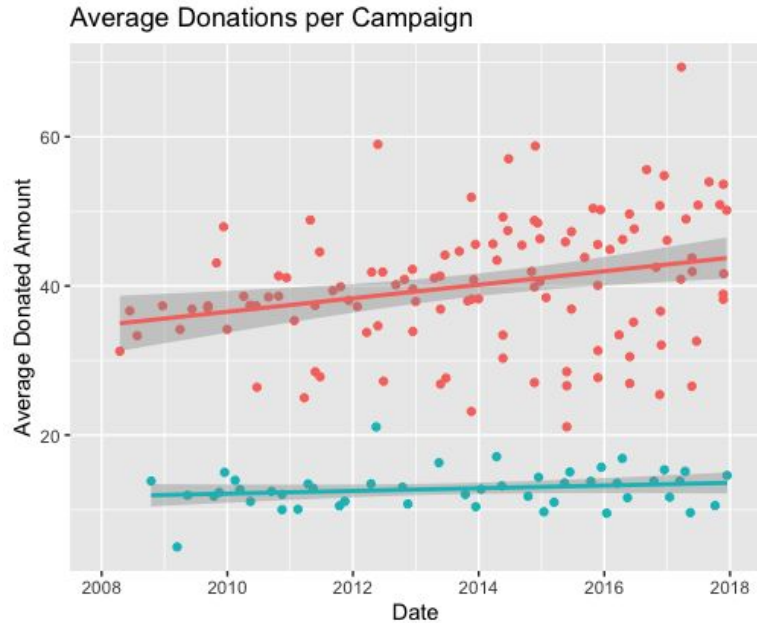
- Our donors have received between 1-109 messages in total, on average 29.85
- After starting with 3.22 messages per contact in 2008, our contacts received between 4.63 and 5.79 messages per year in all following years (2017 showing the highest count)
- High outliers result in an average last message sent 1003 days after the last donation, with an average of 11.2 messages sent after the last donation was made

- Low-Value donors (<1000\$ in total donations) received a message every 115 days on average, whereas High-Value donors (>1000\$) received one every 59 days (roughly twice as often).
- The average donated amount for LV-donors is 174\$ and for HV-donors it is 2.152\$

Donated Amount vs. a message every X days



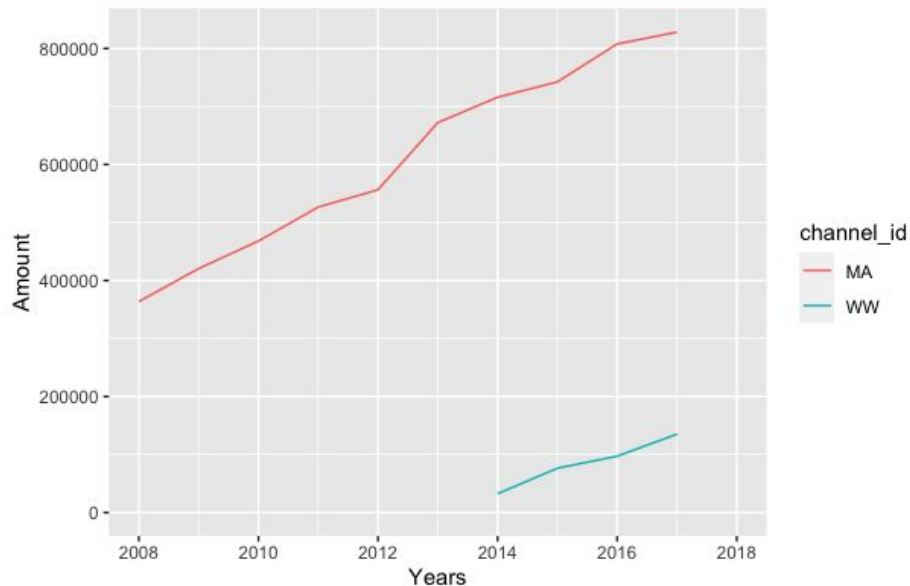
Average donations per campaign go up for classic donations, some campaigns attracted high numbers of PA donations



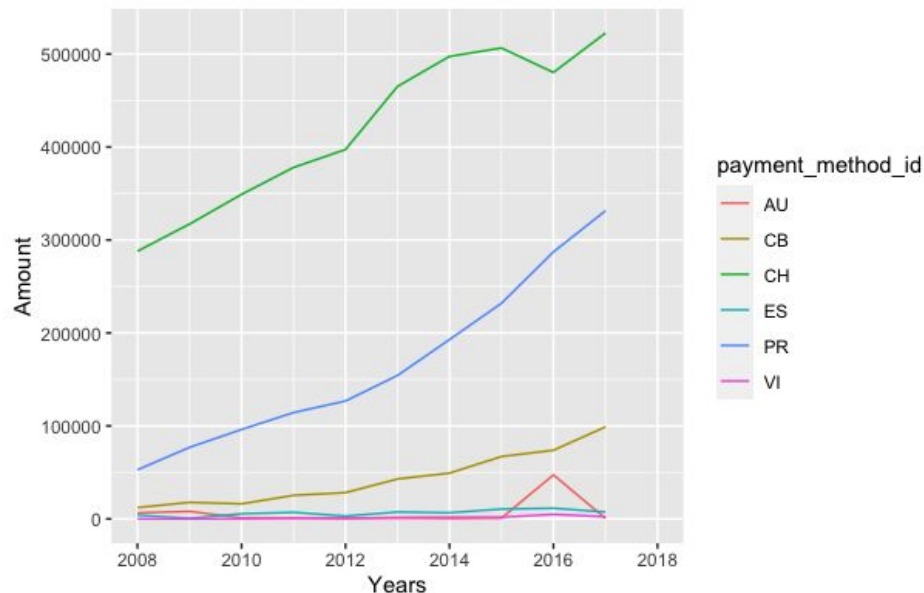
PA donations stay relatively stable in terms of their average donation amount, whereas classical donations increase. At the same time PA donations exhibit a downwards slope in terms of donations per campaign, attributable though to exceptionally high ratios for some campaign around 2012-2014.

The internet hasn't really taken off yet for donation collections and cheques are still the dominating payment method

Development of channels for donations



Development of payment methods for donations



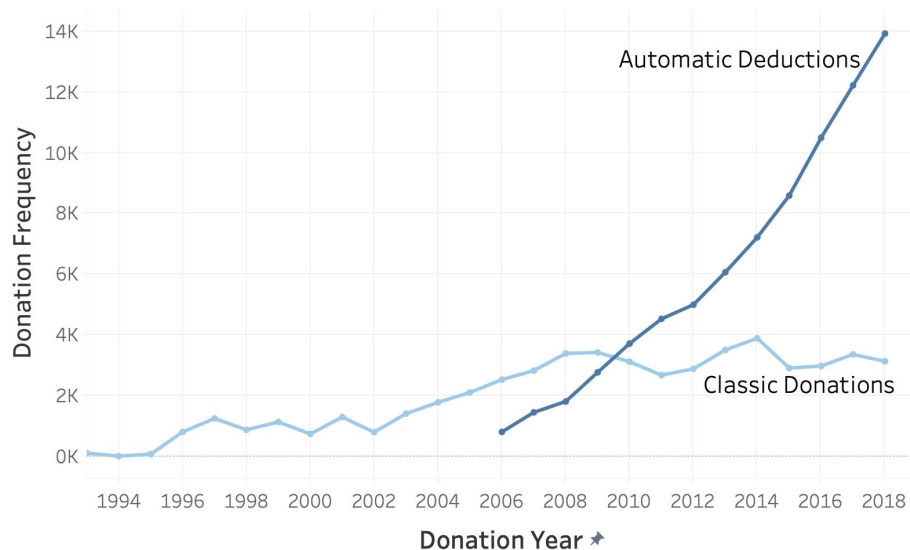
The internet has set in very late for this donation collector, only starting in 2014 and since then growing moderately in terms of total collected sum of donations per year. Cheques are still the predominant payment method and growing, followed by debiting. Also credit card donations have been growing moderately.

Agenda

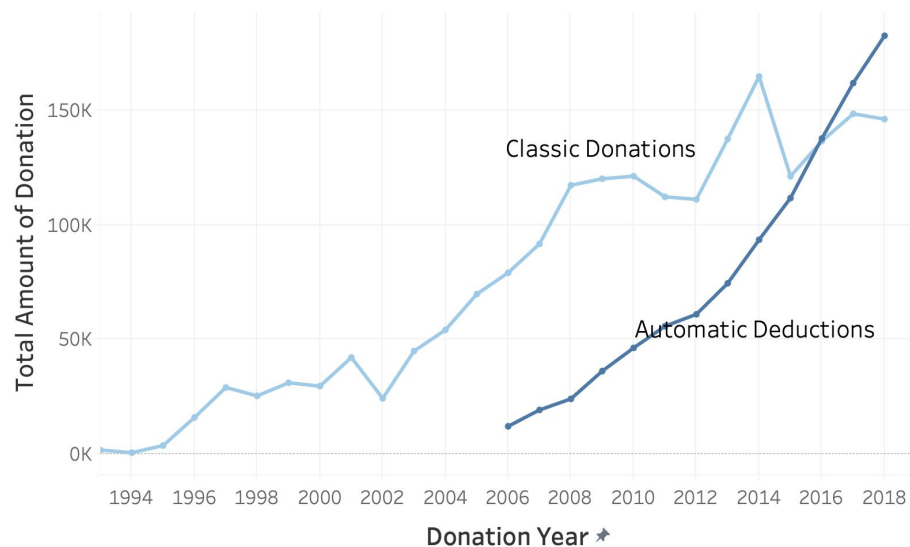
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How does 2018 perform compared to prior years in the same time period?

Donation Frequency

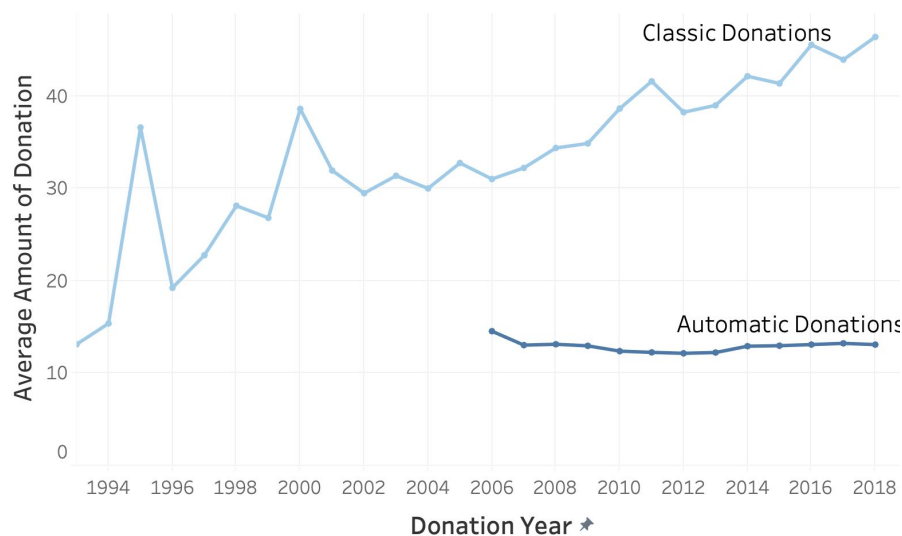


Total Amount of Donation

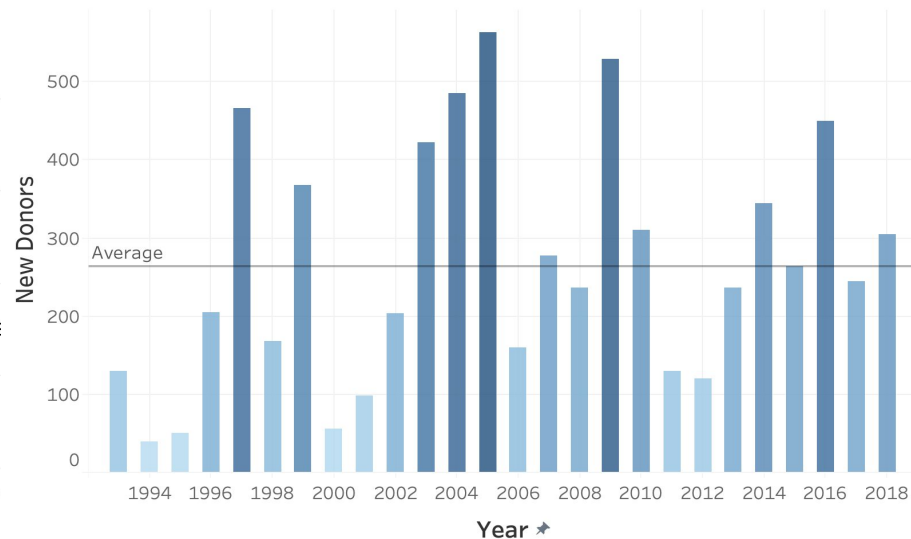


How does 2018 perform compared to prior years in the same time period?

Average Amount of Donation



New Donors



Period-over-Period Comparison

Classic Donations:

- While donation frequency and total donation amount in year 2018(Jan - June) drops by roughly 6.7% and 1.5% over previous period, these two metrics still retain **a long-run upward trend**.
- In contrast, average amount rises by **5.5%** in 2018.

Automatic Deductions:

- Following a steep upward trajectory, donation frequency rises steadily by almost **14%**.
- Similarly, total donation amount grows by **13%**.
- Average amount of donation has been levelled off from 2007. It falls by a modest 1% over previous period.

New donors:

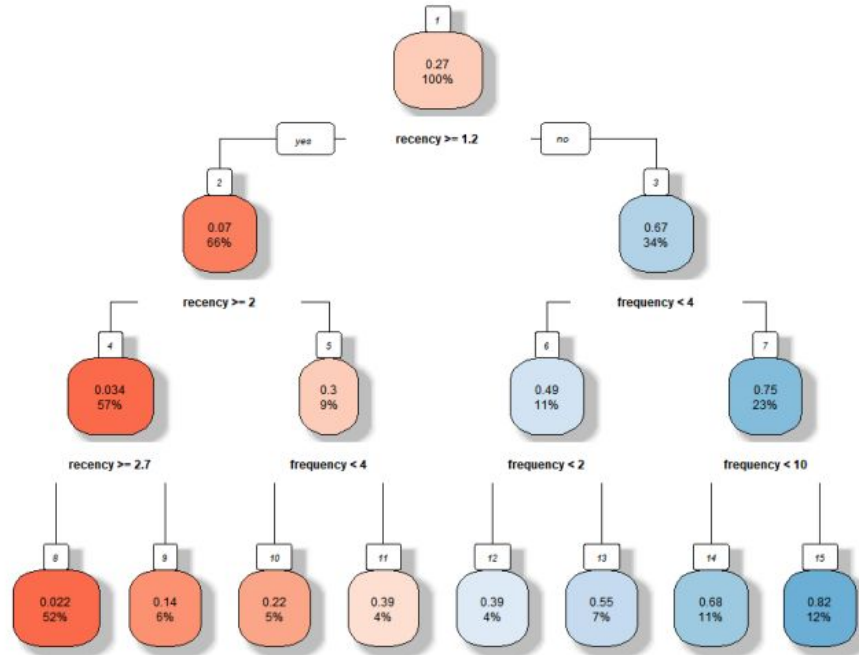
- **24.5%** period-over-period increase in the number of new donors

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Segmentation analysis

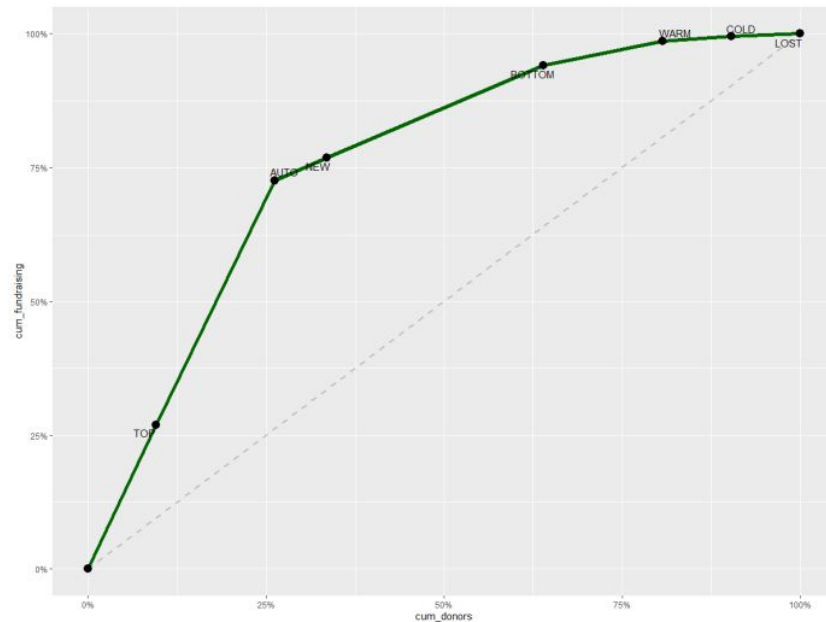
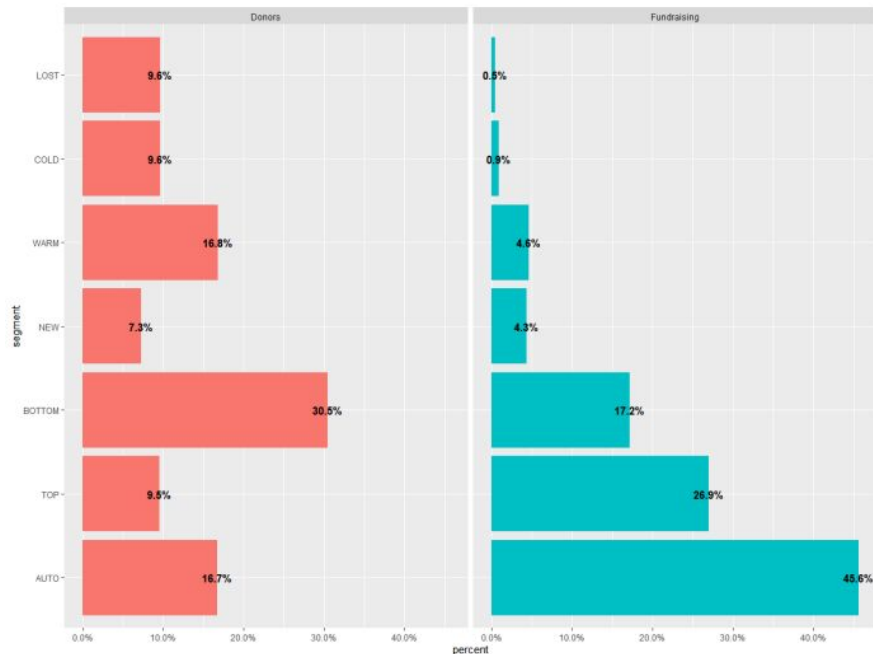
----- Predictive segmentation(CART))



Through classification and regression tree, the data (from June 26, 2017 to June 25, 2018) has been split into 8 'leaf nodes'. and the tree also implied that 'recency' and 'frequency' are the important factors that tells which donor is loyal or not. When looking into the outcome, we could also draw the conclusion that most of the donors are the recent donors, as expected.

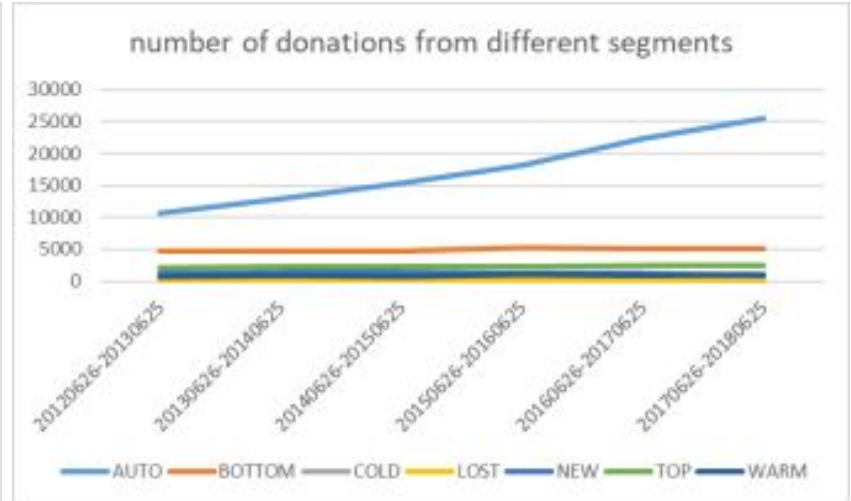
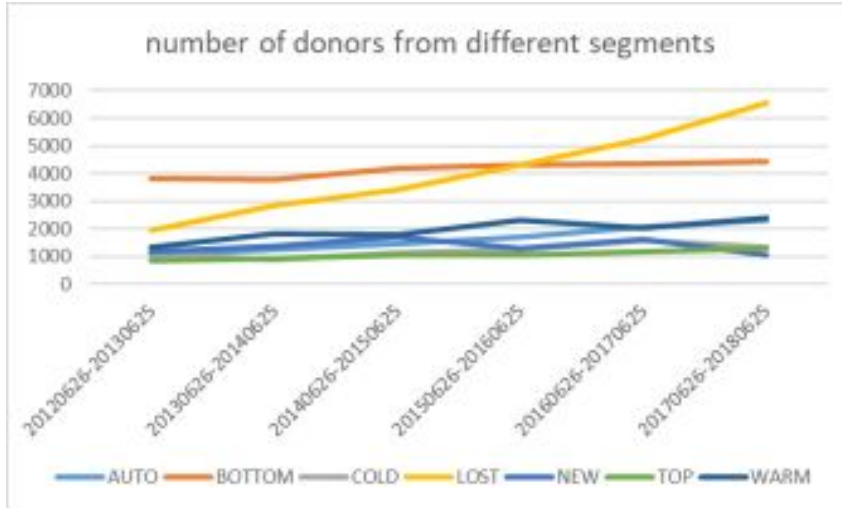
AD HOC SEGMENTATION

Details about the segments from June 26, 2017 to June 25, 2018



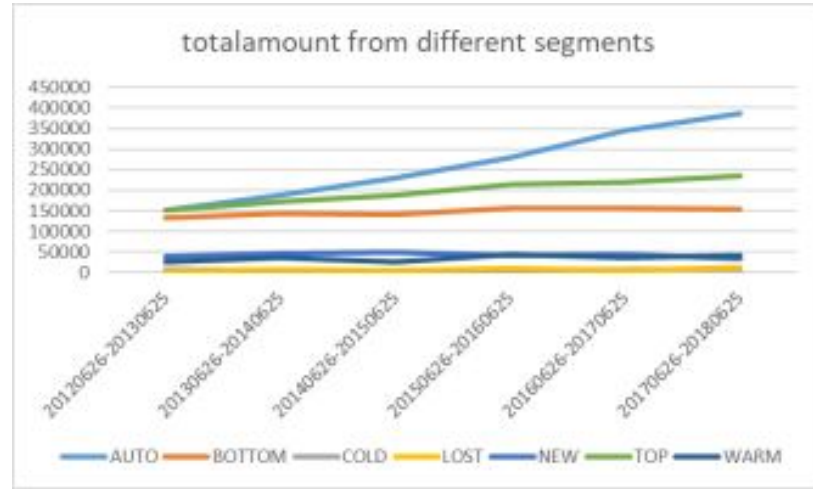
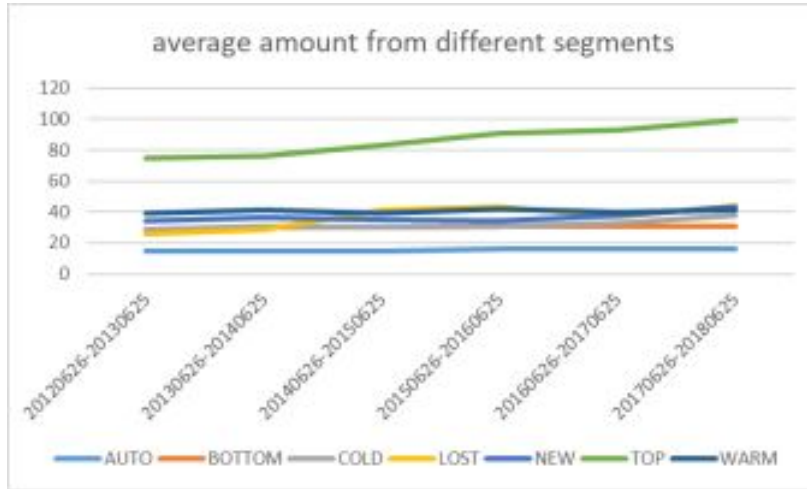
Segmentation is made based on 'recency' and 'frequency'. Even though 'TOP' and 'AUTO' donors don't take a large proportion, but they contribute most of the funds.

AD HOC SEGMENTATION



When it comes to segments change during the last 6 years (from June 26, 2012 to June 25, 2018), We could find that those 'new' donors and 'warm' donors are the most mutable, their number has fluctuated during the test period.while 'LOST' donors meet with a dramatic rise from 2000 to nearly 6500,as well as their donations.

AD HOC SEGMENTATION



Those 'TOP' donors are those whose average amounts are always the highest, far exceed other segments during this years. As well, the 'TOP's and 'AUTO's totalamount are keeping rise from June 26, 2014 to June 25, 2018. Meanwhile, 'NEW's totalamount fell slowly.

Main learnings & actionable recommendations

Learnings

1. Be aware of the fact that female donors are presumably the more generous ones
2. 2018 shows promising signs in some metrics (e.g. new donors & average donation amount)
3. Automated donations fall behind ad-hoc donations
4. Although Paris and the South are expectably strong, average amounts are higher in other departments
5. Reactivation campaigns are not as successful as needed

Recommendations

1. Continue growing the internet channel
2. Invest in higher recurring revenues with increased automated donations amounts
3. Find more promising ways to re-engage and re-activate donors with medium-long cool-off periods since their last donation