second harvest HEARTLAND

Drive Donation with Media

Better Help Facing Hunger

Team

Balvinder Singh Uppal, Caitlyn Yen, Divyansh Tripathi, Khalil El-Hafi, Priyanka Saraswat

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Problem Description

How do different media channels drive donation outcomes?

691 Total Sources In 728 Days

Solution Approach

Earned Media Sources

Know your important media sources

Our solution model focuses on streamlining your efforts of targeting important media sources, which could be pursued to drive higher donations

Data Preprocessing

1. Aggregation

Option 2: Linking each donation with the **past week's** media
- Sparsity reduced in the data

Option 1: Linking each day's donation with each day's media
- Matches are quite low, making the data sparse

2. Source Selection

Option 2: Focus on the Frequent or Recurring Media Sources
- Top 16 cover 44% of Articles and Rest 690 covers only 56% Articles
- Keeping an experimental threshold of 15 days

Option 1: Use all Media sources regardless of frequency
- Difficult to target all , can lead to misleading results

01 Aggregation

Focusing on the activity of each selected media sources per week.

URL	Date	Source	Reach	Features
Article-1	Timestamp-1	Source-1	1213	...
Article-2	Timestamp-2	Source-2	2312	...
Article-3	Timestamp-3	Source-1	9034	...
Article-4	Timestamp-4	Source-2	8901	...
Article-2	Timestamp-5	Source-1	4312	...
Article-4	Timestamp-6	Source-2	4975	...

Media Data - at the article level

Week	Source	Aggregated Reach
Week-1	Source-1	10437
Week-1	Source-2	2312
Week-2	Source-1	4312
Week-2	Source-2	13786

Aggregated for the major sources (weekly frequency)

01 Aggregation

Donation with Media

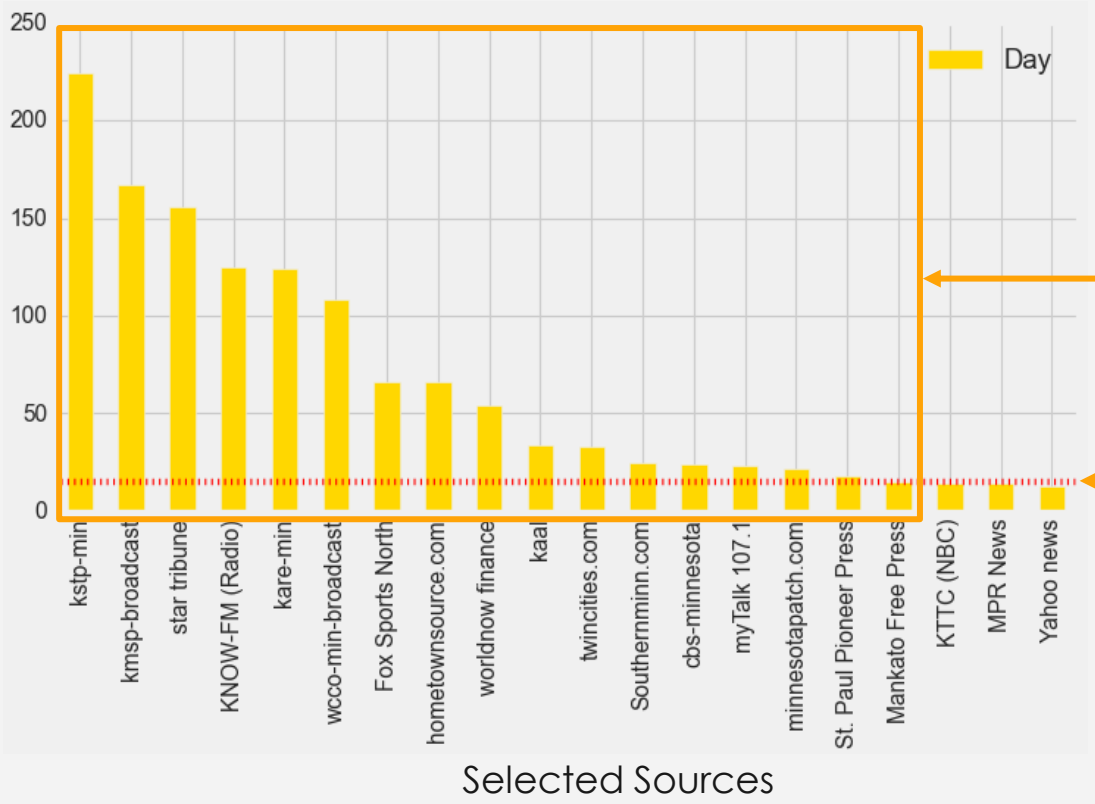
The donations in the current week are attributed to the reach in the previous week.

Week	Source	Total Reach	Attributed Amount
2022-08-05	Star Tribune	200	$8,000
2022-08-05	WCCO	100	$4,000
2022-08-12	Star Tribune	250	$6250
2022-08-12	WCCO	150	$3,750

The earned media in the prior week influences the donors

Week	Donation-Amount
2022-08-12	$12,000
2022-08-19	$10,000

02 Source Selection (Threshold)



Why?
More frequent publishing sources would be willing to cover SHH and hence result in lower probability of wasted effort

Local Sources cover SHH much more frequently
(9/10 selected sources)

Frequency cutoff for choosing media sources

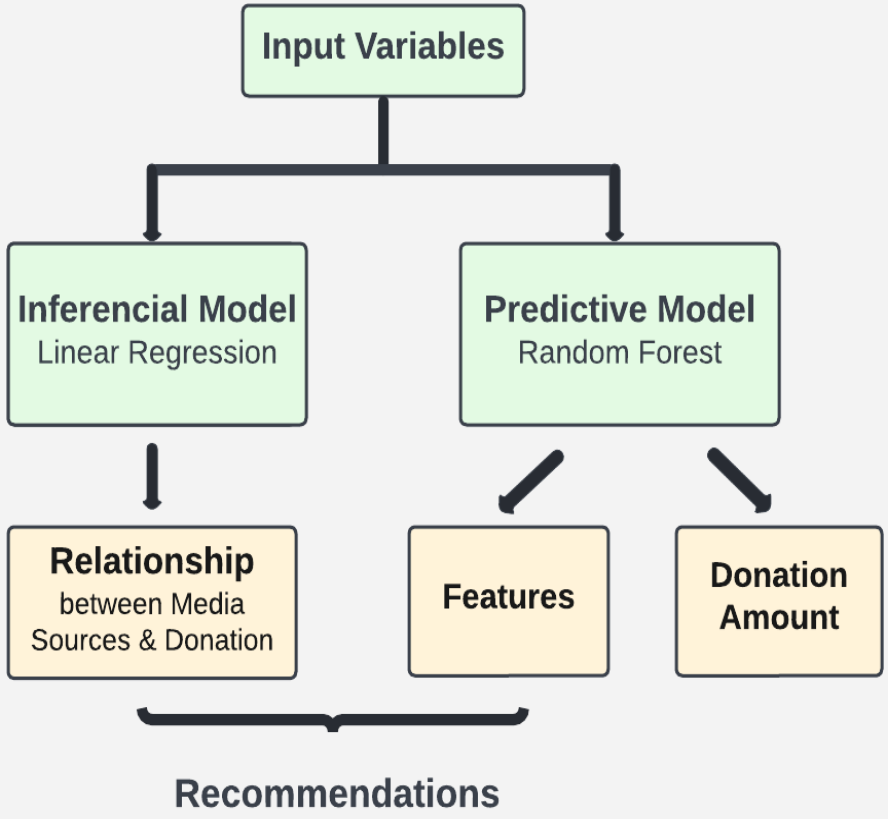
Modeling Plan

Linear Regression

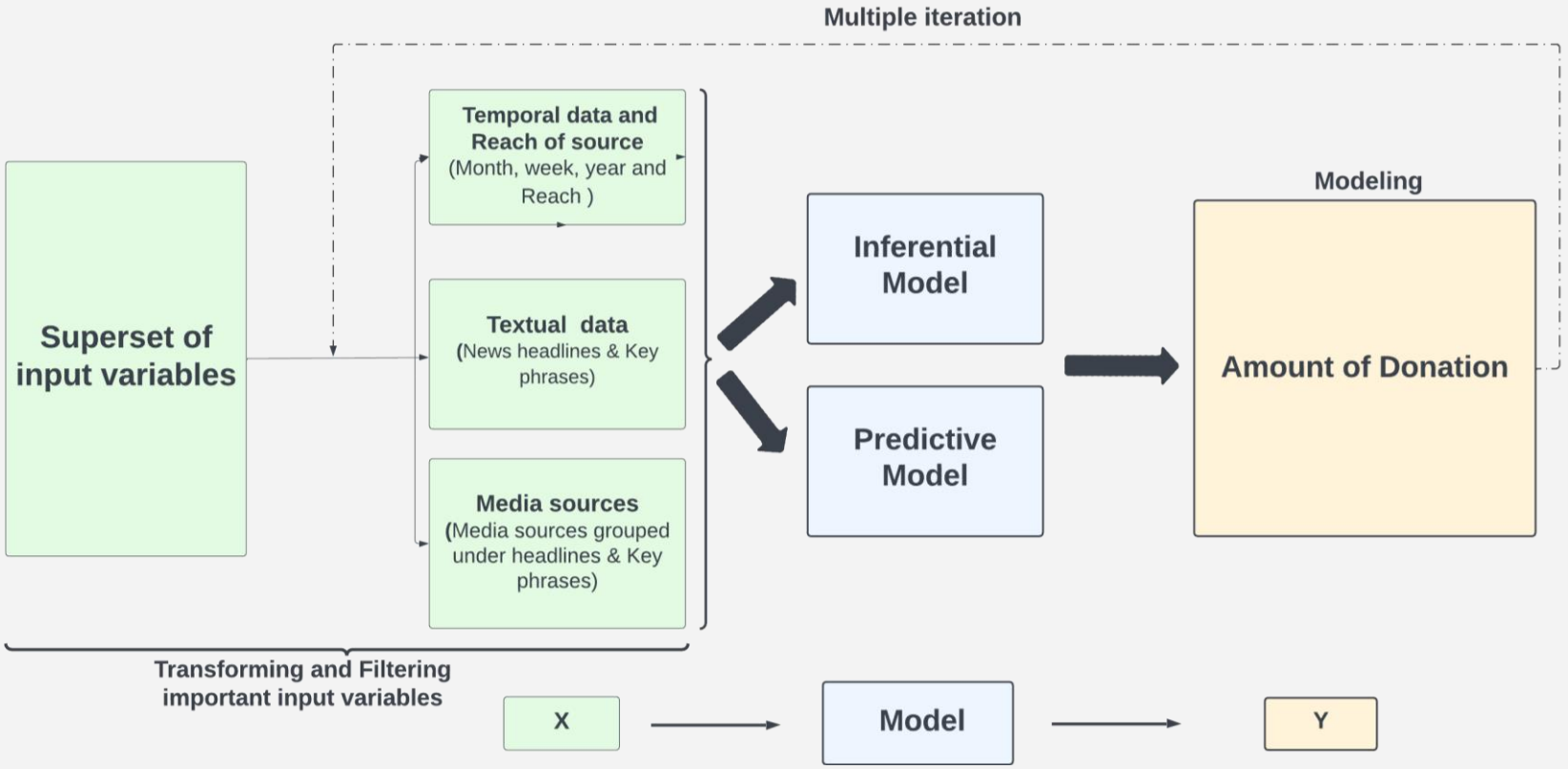
Find Potential relationships between different media channels and donation outcomes.

Predictive Model

Predict the donations based on various information from media channels and exposure.



General Model Flow

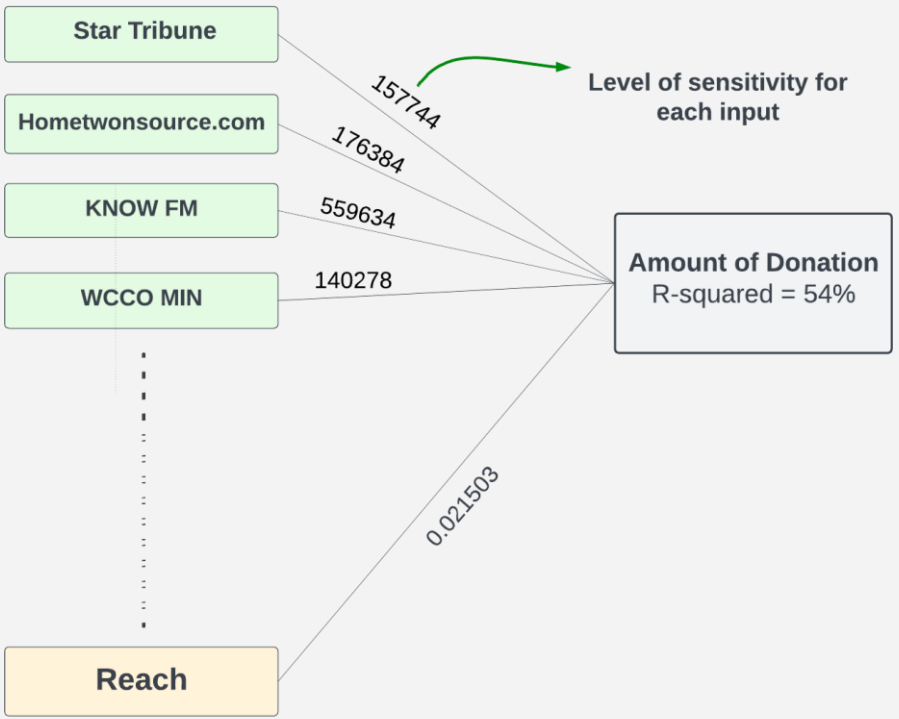


Inferential Model: Linear Regression

R-Squared : The portion of variation of the Amount of Donation explained by the current model

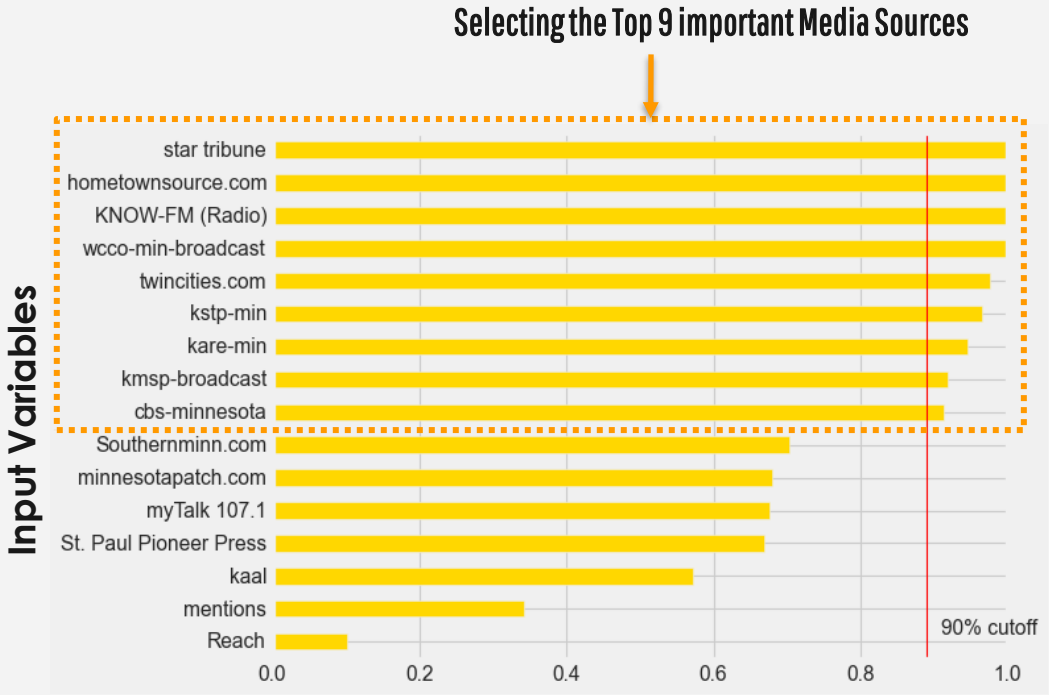
Level of sensitivity : For source indicators, the sensitivity is measured in comparison to the base source

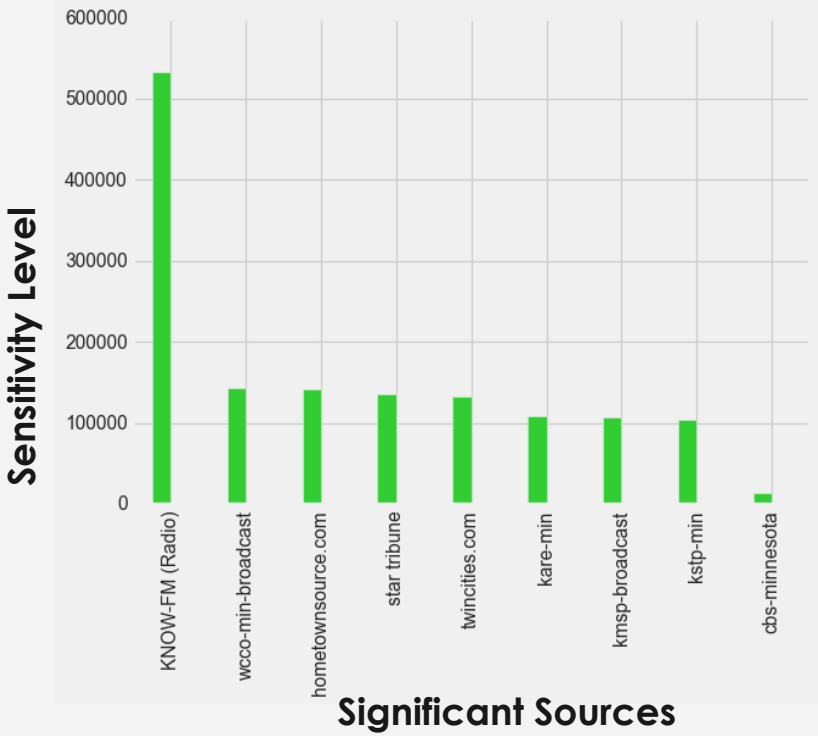
Relationship between Media Sources & Donation



Recommendations backed by Linear Regression

Prioritize the media sources based on the impact on upcoming weeks' donation.





Predictive Model

35% accuracy improvement from the naïve model

Best Model: Random Forest R^2=0.54

The naïve model is the most basic model that does not account for or learn any patterns but just predicts the average amount for all donations.

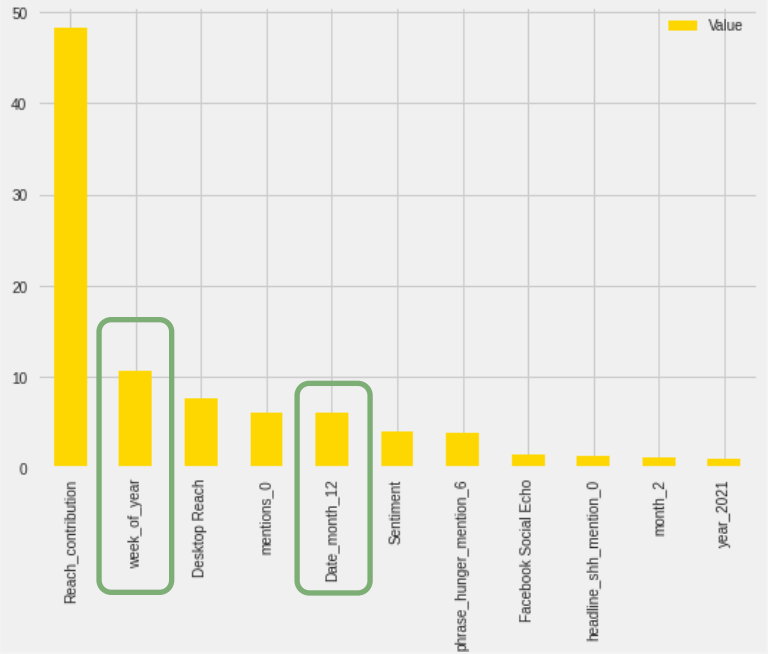
Recommendations backed by Predicitve Model

01

Add more personnel for media outreach at the end of the year (given the high seasonality effect).

The donations are 123% higher in November and December as compared to the other months

Feature Importance from predictive model



Recommendations backed by Predicitve Model

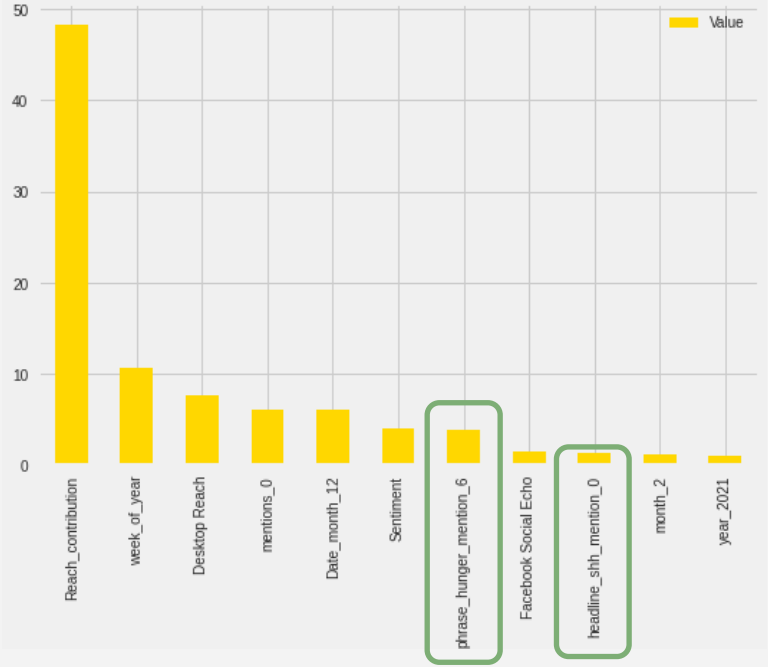
02

Nudge publishers towards including key phrases like "SHH" and "Hunger" both in headline & text as it is expected to have relatively higher impact on donation

Only 7% of articles actually mention Second-Harvest in the headline, and 33% mentioned it in any phrasing.

Only 5% of articles actually mention Hunger in the headline, and 18.3% mentioned it in any phrasing.

Feature Importance from predictive model



Conclusion

01

Prioritize the media sources based on the impact on upcoming weeks' donation.

02

Add more personnel for media outreach at the end of the year (given the high seasonality effect).

03

Nudge publishers towards including key phrases like "SHH" and "Hunger" both in headline & text as it is expected to have relatively higher impact on donation

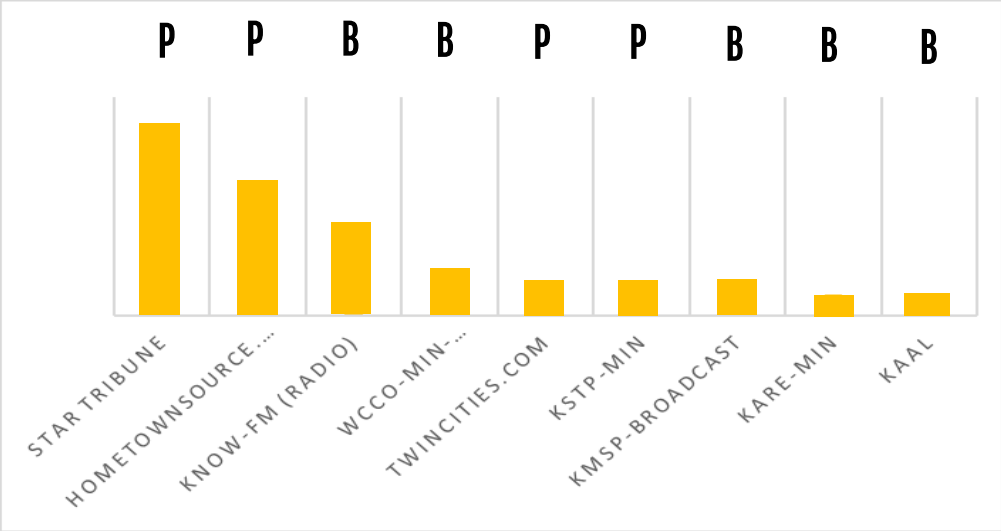
THANKS

Questions?

Appendix-1

Recommendations

01



P - Print
B - Broadcast

Prioritize the media sources based on the impact each source has on the upcoming week's donation

Appendix-2

Premise

Transformations are applied as per the following considerations:

1. Media is assumed to have an influence period of 1 week, in which they can drive donations

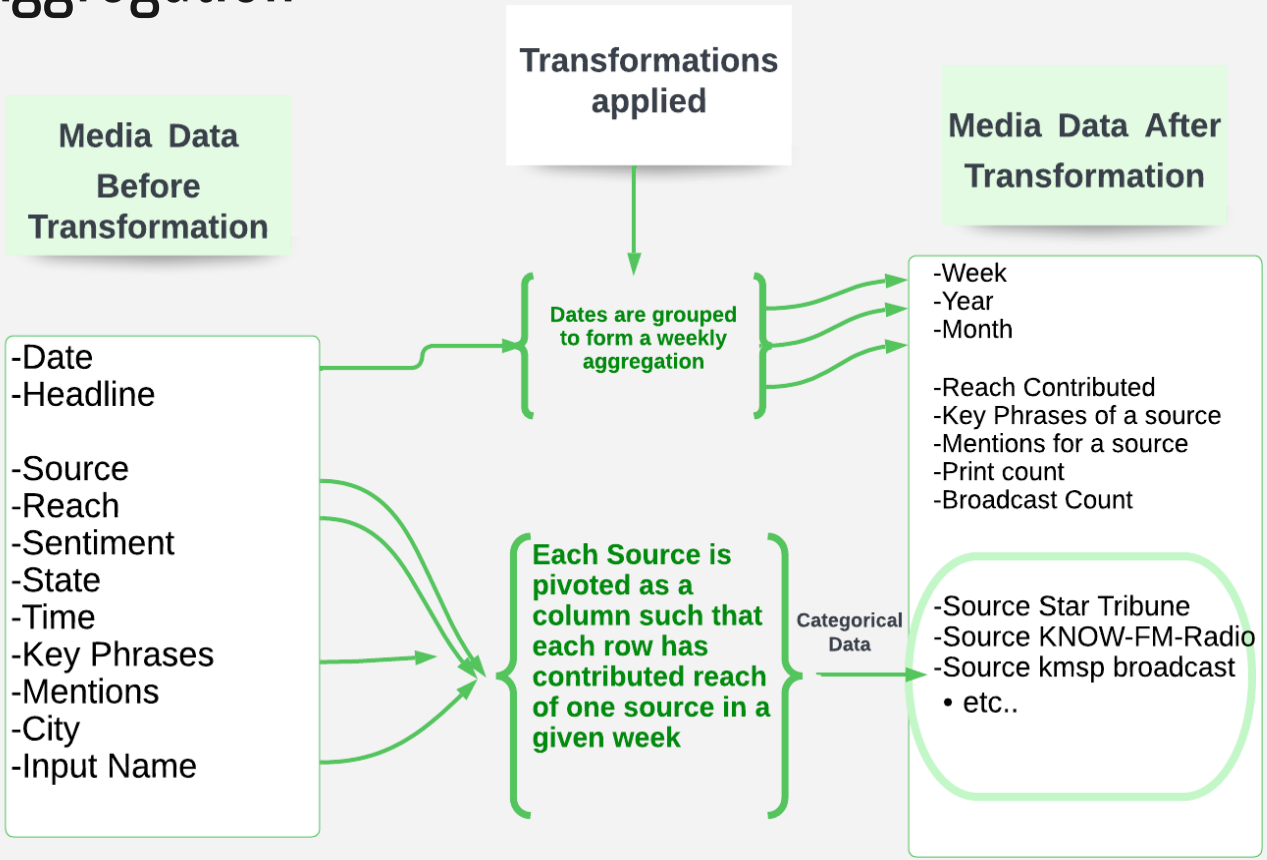
2. Focusing on the activity of each selected media sources per week.

3. Filtering out sources that are less frequent based on the experimental threshold value of 30 days

Appendix-3

Aggregation

Media Data



Appendix-4

Media Reach