

# Trafan

Social Media Traffic Analysis

# Motivation

- Lots of traffic related info available on social media like facebook, twitter etc.
- This is in a disorganized and haphazard manner, thus of no use to the users.
- Trafan processes large volume of data to a user-friendly, systematic and usable form.

# How we approached?

- Access the data on traffic pages of Hyderabad, Bangalore, Kolkata, Delhi using Facebook Graph API.
- Extracted raw data is in JSON format.
- Preprocess the raw data (convert from JSON to CSV).

## Raw data (JSON)

```
{
  "data": [
    {
      "id": "147207215344994_797684536963922",
      "from": {
        "category": "Government organization",
        "category_list": [
          {
            "id": "161422927240513",
            "name": "Government Organization"
          }
        ],
        "name": "Bangalore Traffic Police",
        "id": "147207215344994"
      },
      "message": "ACTION TAKEN REPORT FROM BANASHANKARI TRAFFIC POLICE ON PUBLIC COMPLAINT:\nE mail complaint sent by:Mr. Baloo. on 10.01.2015. along with photo. \nDetails: Sir... This was shot at Ace Iyengar kitchen near Seetha circle, Hanumanthanagar/Girinagar limits. They have tampered with footpath leading to walkers tripping and falling. etc. \n\nACTION TAKEN REPORT FROM BANASHANKARI TRAFFIC POLICE:\nDear Baloo. \nWe have cleared the footpath in-front of Iyengar kitchen and booked a case under K.P. Act, the Police Notice No-0022346 to Mr. Vinay, the manager of the hotel. And strictly instructed to not to occupy the footpath again. Kindly find an attachment, and that will show the cleared footpath in the said spot.\nThanking you.",
      "picture": "https://scontent-a.xx.fbcdn.net/hphotos-xapl/v/t1.0-9/s130x130/10923501_797684240297285_4379266984590539604_n.jpg?oh=60d543eb5d6077bc4007c3abb067af12&oe=5568ECA3",
      "link": "https://www.facebook.com/BangaloreTrafficPolice/photos/a.151911704874545.36909.147207215344994/797684240297285/?type=1&relevant_count=1",
      "icon": "https://fbstatic-a.akamaihd.net/rsrc.php/v2/yz/r/StEh3RhPvjk.gif",
      "actions": [
        {
          "name": "Comment",
          "link": "https://www.facebook.com/147207215344994/posts/797684536963922"
        },
        {
          "name": "Like",
          "link": "https://www.facebook.com/147207215344994/posts/797684536963922"
        }
      ]
    }
  ]
}
```

# Data in CSV format

	A	B	C	D
1	created_time	message	id	shares/count
2	2015-02-12T04:03:14	AVOID Surrounding	147207215344994_813884195343956	
3	2015-02-12T03:07:09	Good Morning	147207215344994_813869208678788	14
4	2015-02-12T03:03:18	Sheshadri road From City Railway Station, Sangolli Rayanna	147207215344994_813868192012223	1
5	2015-02-11T13:55:39	Shri Dinesh Mohan is at	147207215344994_813631512035891	2
6	2015-02-11T13:33:50	license plate near	147207215344994_813623568703352	1
7	2015-02-11T13:33:50	BTP joint with Transport Do not use right beam	147207215344994_813623568703352	1
8	2015-02-11T13:14:06	light within city limits.	147207215344994_813616302037412	90
9	2015-02-11T11:01:39	An accident near	147207215344994_813579338707775	1
10	2015-02-11T09:56:08	A lorry upside near An	147207215344994_813563578709351	35
11	2015-02-11T08:16:15	Shri. ANIL AGARWAL, IF	147207215344994_813542818711427	1
12	2015-02-11T07:07:50	Dear Friends,	147207215344994_813527258712983	305
13	2015-02-11T07:01:27	Dear Friends,	147207215344994_813527745379601	15607
14	2015-02-11T06:38:29	"I pedal and I pedal...	147207215344994_813523385380037	1
15	2015-02-11T06:31:38	REPLY FROM	147207215344994_813522355380140	
16	2015-02-11T06:27:00	Car Pooling: Website:	147207215344994_813521708713538	442
17	2015-02-11T06:22:05	REPLY FROM	147207215344994_813520958713613	
18	2015-02-11T04:04:43	been removed from	147207215344994_813485655383810	2
19	2015-02-11T03:32:05	Slow moving traffic on	147207215344994_813476932051349	1
		Good Morning to all		

# How we approached (contd.)

- Store the processed data in MySQL database.
- The table contains the following fields: id, organization name, category, posted by name, message, likes count, comments count, share count.



# Table containing the mentioned fields

id	OrganizationName	Category	PostedByName	PostingTimestamp	message	LikeCount	UserCommentsCount	shareCou
147207215344994_8529726881...	Bengaluru Traffic Police	Government organization	Bengaluru Traffic Police	2015-05-02	Dear Friends, ¶Chances of drizzlin...	649	101	1
147207215344994_8529609747...	Bengaluru Traffic Police	Government organization	Bengaluru Traffic Police	2015-05-02	IPL T-20 match on TODAY :¶TRAF...	47	1	
147207215344994_8529399214...	Bengaluru Traffic Police	Government organization	Bengaluru Traffic Police	2015-05-02	"The all new BTP Traffic Info Andr...	77	11	
147207215344994_8529143547...	Bengaluru Traffic Police	Government organization	Bengaluru Traffic Police	2015-05-02	video link shared by Deepika Bhan...	99	0	
147207215344994_8529136014...	Bengaluru Traffic Police	Government organization	Bengaluru Traffic Police	2015-05-02	IPL T-20 match on TODAY :¶TRAF...	51	0	
147207215344994_8522832681...	Bengaluru Traffic Police	Government organization	Bengaluru Traffic Police	2015-04-30	Due to rain slow moving traffic at...	84	2	
147207215344994_8522760448...	Bengaluru Traffic Police	Government organization	Bengaluru Traffic Police	2015-04-30	Slow Moving Traffic at Majestic du...	34	1	
147207215344994_8522749915...	Bengaluru Traffic Police	Government organization	Bengaluru Traffic Police	2015-04-30	Due to water logging slow moving...	43	2	
147207215344994_8522417681...	Bengaluru Traffic Police	Government organization	Bengaluru Traffic Police	2015-04-30	à²-à²à²à²;à²à²à²;à²à²-à²à²à² à²à²à²...	1414	43	3
147207215344994_8522296448...	Bengaluru Traffic Police	Government organization	Bengaluru Traffic Police	2015-04-30	Dear Friends, ¶Chances of heavy r...	1082	138	4
147207215344994_8521521281...	Bengaluru Traffic Police	Government organization	Bengaluru Traffic Police	2015-04-30	Normal traffic due to Transport Str...	66	2	
147207215344994_8518587448...	Bengaluru Traffic Police	Government organization	Bengaluru Traffic Police	2015-04-29	Message from Dr. M A Saleem,IPS...	11536	2199	5
147207215344994_8518134815...	Bengaluru Traffic Police	Government organization	Bengaluru Traffic Police	2015-04-29	ENDORSEMENT FROM PULAKESHIN...	43	0	
147207215344994_8518083115...	Bengaluru Traffic Police	Government organization	Bengaluru Traffic Police	2015-04-29	IPL T-20 match on TODAY :¶TRAF...	43	1	
147207215344994_8517897515...	Bengaluru Traffic Police	Government organization	Bengaluru Traffic Police	2015-04-29	We would like to share this apprec...	16299	501	
147207215344994_8517677748...	Bengaluru Traffic Police	Government organization	Bengaluru Traffic Police	2015-04-29	Dear Friends, ¶Chances of drizzlin...	489	67	1
147207215344994_8517621482...	Bengaluru Traffic Police	Government organization	Bengaluru Traffic Police	2015-04-29	IPL T-20 match on TODAY :¶TRAF...	56	4	
147207215344994_8517341782...	Bengaluru Traffic Police	Government organization	Bengaluru Traffic Police	2015-04-29	Carpool with verified users and he...	42	1	
147207215344994_8517304748...	Bengaluru Traffic Police	Government organization	Bengaluru Traffic Police	2015-04-29	Face book complaint of Arijit Cha...	105	4	
147207215344994_8516918515...	Bengaluru Traffic Police	Government organization	Bengaluru Traffic Police	2015-04-29	IPL T-20 match on TODAY :¶TRAF...	66	4	
147207215344994_8516619415...	Bengaluru Traffic Police	Government organization	Bengaluru Traffic Police	2015-04-29	BMTc Bus off road atop Marathalli...	59	2	
147207215344994_8513521682...	Bengaluru Traffic Police	Government organization	Bengaluru Traffic Police	2015-04-28	Dear Friends, ¶Chances of drizzlin...	236	4	
147207215344994_8513168216...	Bengaluru Traffic Police	Government organization	Bengaluru Traffic Police	2015-04-28	ENDORSEMENT FROM ADUGODI T...	57	10	
147207215344994_8513114916...	Bengaluru Traffic Police	Government organization	Bengaluru Traffic Police	2015-04-28	This App details is for your inform...	325	35	1
147207215344994_8513112182...	Bengaluru Traffic Police	Government organization	Bengaluru Traffic Police	2015-04-28	ENDORSEMENT FROM HULIMAVU...	30	1	
147207215344994_8508353749...	Bengaluru Traffic Police	Government organization	Bengaluru Traffic Police	2015-04-27	REPLY FROM BANASHANKARI TRAF...	31	5	
147207215344994_8508310316...	Bengaluru Traffic Police	Government organization	Bengaluru Traffic Police	2015-04-27	Road users may refer this Carpool...	46	0	
147207215344994_8507520816...	Bengaluru Traffic Police	Government organization	Bengaluru Traffic Police	2015-04-27	Face book complaint by Manoj Jai...	67	5	
147207215344994_8507230916...	Bengaluru Traffic Police	Government organization	Bengaluru Traffic Police	2015-04-27	PRESS NOTE:¶Traffic re-arrangem...	86	86	1
147207215344994_8507162983...	Bengaluru Traffic Police	Government organization	Bengaluru Traffic Police	2015-04-27	TRAFFIC AT 10:00AM, Sagar Jn on...	17	2	
147207215344994_8506911316...	Bengaluru Traffic Police	Government organization	Bengaluru Traffic Police	2015-04-27	Traffic AT 08:50AM, RMC yard Tu...	18	0	
147207215344994_8502967550...	Bengaluru Traffic Police	Government organization	Bengaluru Traffic Police	2015-04-26	PRESS NOTE:¶Traffic re-arrangem...	48	40	
147207215344994_8502736883...	Bengaluru Traffic Police	Government organization	Bengaluru Traffic Police	2015-04-26	Dear Friends, ¶Today also chance...	447	31	1
147207215344994_8502398883...	Bengaluru Traffic Police	Government organization	Bengaluru Traffic Police	2015-04-26	As per the weather forecast report...	180	4	
147207215344994_8501988050...	Bengaluru Traffic Police	Government organization	Bengaluru Traffic Police	2015-04-26	The press note which published e...	56	1	
147207215344994_8501755717...	Bengaluru Traffic Police	Government organization	Bengaluru Traffic Police	2015-04-26	19 IPS probation officers from Nat...	22	0	
147207215344994_8501785283...	Bengaluru Traffic Police	Government organization	Bengaluru Traffic Police	2015-04-26	PRESS NOTE:¶Traffic re-arrangem...	93	21	
147207215344994_8501313217...	Bengaluru Traffic Police	Government organization	Bengaluru Traffic Police	2015-04-26	Good Morning Friends, Ensure saf...	461	9	
147207215344994_8498645884...	Bengaluru Traffic Police	Government organization	Bengaluru Traffic Police	2015-04-25	SC road - KINO theater road is clo...	407	22	
147207215344994_8498645884...	Bengaluru Traffic Police	Government organization	Bengaluru Traffic Police	2015-04-25	SC road - KINO theater road is clo...	407	22	
147207215344994_8498503584...	Bengaluru Traffic Police	Government organization	Bengaluru Traffic Police	2015-04-25	TRAFFIC AT 6.50 PM Crafts circle t...	12	1	
147207215344994_8498465450...	Bengaluru Traffic Police	Government organization	Bengaluru Traffic Police	2015-04-25	Four Trees uprooted on K.R road j...	545	14	1

# Is the problem solved?

- No not yet, we now have all info in a single place.
- Many users get bored reading long posts (messages and subsequent comments).
- Our task is to summarize the post in an effective manner to give the users a gist of the post and convey the message.



# Summarizing the post ( primitive steps)

- First, remove the stop words.
- What is a stop word? – stop words are words which do not contain important significance to be used in search queries (eg. a, the, and, etc.)
- Next, remove words not in English dictionary for instance name of persons, localities etc.

# Summarizing the post (main part)

- We tried the standard TF-IDF algorithm.
- TF-IDF stands for *term frequency-inverse document frequency*, and the TF-IDF weight is a weight often used in information retrieval and text mining. This weight is a statistical measure used to evaluate how important a word is to a document in a collection or corpus. The importance increases proportionally to the number of times a word appears in the document but is offset by the frequency of the word in the corpus.

# Summarizing the post (main part)

- Combine the message and following comments into a single field (after primitive steps).
- Using TF-IDF algorithm, store the top six words.

# Results we got (using TF-IDF)

- **Message:** Hyderabad Traffic Police giving First Aid to a person who got an injury in an small accident at 6 Number Junction.
- **Keywords:** job good proud helpful cops great

# Results we got (using TF-IDF)

- **Message:** ENDORSEMENT FROM PULAKESHINAGARA TRAFFIC INSPECTOR ON FB POST:

Posted By: Deepak Nanwani, A resident of gover road .

Post details: We Residents Of Gover Road cox town Are Suffering Of Cars Coming Up And Down As if this is a main road. Also the speed they drive in its become scary to even have our kids stand outside alone. etc.

REPLY GIVEN:

Respected Sir, I have gone through the problem you face I will definitely study situation and ask the sector officer to check the vehicle on that road.

Thank you

POLICE INSPECTOR,

PULAKESHINAGARA TRAFFIC POLICE STATION,

BANGALORE.

- **Keywords:** express queens surrounding marks avoid indian

# Our proposed algorithm

- 1) Store each unique word of the post in a dictionary with the word as the key and the number of times it occurs in the post as the corresponding value.
- 2) Take a particular word from the dictionary (key), scan through the comments, if there is a match, increment the corresponding value by one for every such match.
- 3) In this way, we get the total number of times every unique word from the post has appeared in the post and following comments.
- 4) Sort dictionary based on the value.
- 5) Store the top K words.

# Illustration of our algo

- **Message:** Attention: Disturbing video of horrible Accident:  
Kindly take extra care when you drive/ride by the side of big vehicle or when you overtake it.

attention	1	care	1
disturb	1	drive	1
video	1	ride	1
horrible	1	side	1
accident	1	big	1
kind	1	vehicle	1
extra	1		



# Illustration of our algo

- **Comments:** unfortunate accident :(so uneven pavement issue bangalore? uneven sides roads roads asphaltd 1 2 ft ground levels problem?bikers care small space ms squeeze guy hit car today ??????bharath jagadeeshwaran idiot talking yesterday fact dash cam didnt truck drive prove guilty bars happening time bigger vehicle face charges write advisory post disturbing visuals people mild hearts skip viewing stupid people left lane totally open guy overtake truck dear mayank pratap left allowed dear btp 2 whelers driver sin city care left overtaking? guess agree point raised bjoy varghese wheeler riders 2 inch gap direction doesn matter bangalore traffic police rule overtaking depend side driving isnt right?.....

attention	1	care	4
disturb	2	drive	7
video	5	ride	1
horrible	1	side	8
accident	5	big	2
kind	1	vehicle	8
extra	1		

# Illustration (contd.)

- Keywords we get : top six words with highest value from the above dictionary.
- => vehicle side drive video accident care

# Results we got (using customized algo)

- **Message:** Hyderabad Traffic Police giving First Aid to a person who got an injury in an small accident at 6 Number Junction.
- **Keywords:** junction accident aid giving number person

# Results we got (using customized algo)

- **Message:** ENDORSEMENT FROM PULAKESHINAGARA TRAFFIC INSPECTOR ON FB POST:

Posted By: Deepak Nanwani, A resident of gover road .

Post details: We Residents Of Gover Road cox town Are Suffering Of Cars Coming Up And Down As if this is a main road. Also the speed they drive in its become scary to even have our kids stand outside alone. etc.

REPLY GIVEN:

Respected Sir, I have gone through the problem you face I will definitely study situation and ask the sector officer to check the vehicle on that road.

Thank you

POLICE INSPECTOR,

PULAKESHINAGARA TRAFFIC POLICE STATION,

BANGALORE.

- **Keywords:** sector resident respected inspector speed check

# Comparison: Traditional vs Customized

- Traditional TF-IDF based algo doesn't seem to work well. We can't make much sense out of summarized post.
- Our algorithm gives much better results and we can decipher what the post conveys to the user.

# Further improving our results

- To enhance the results we get, we do lemmatization.
- The goal of both stemming and lemmatization is to reduce inflectional forms and sometimes derivationally related forms of a word to a common base form. For instance:
  - car, cars, car's, cars' => car.
  - fish, fishes, fisher => fish.

# Technologies used

- This concludes the backend part.
- The code for this part is written in Python using Natural Language Toolkit (NLTK 3.0) which is a leading platform for building Python programs to work with human language data.
- The front end part is written in HTML, CSS and the connection between front end and back end is made through JavaScript and PHP.
- We use CanvasJS API for plotting graphs.



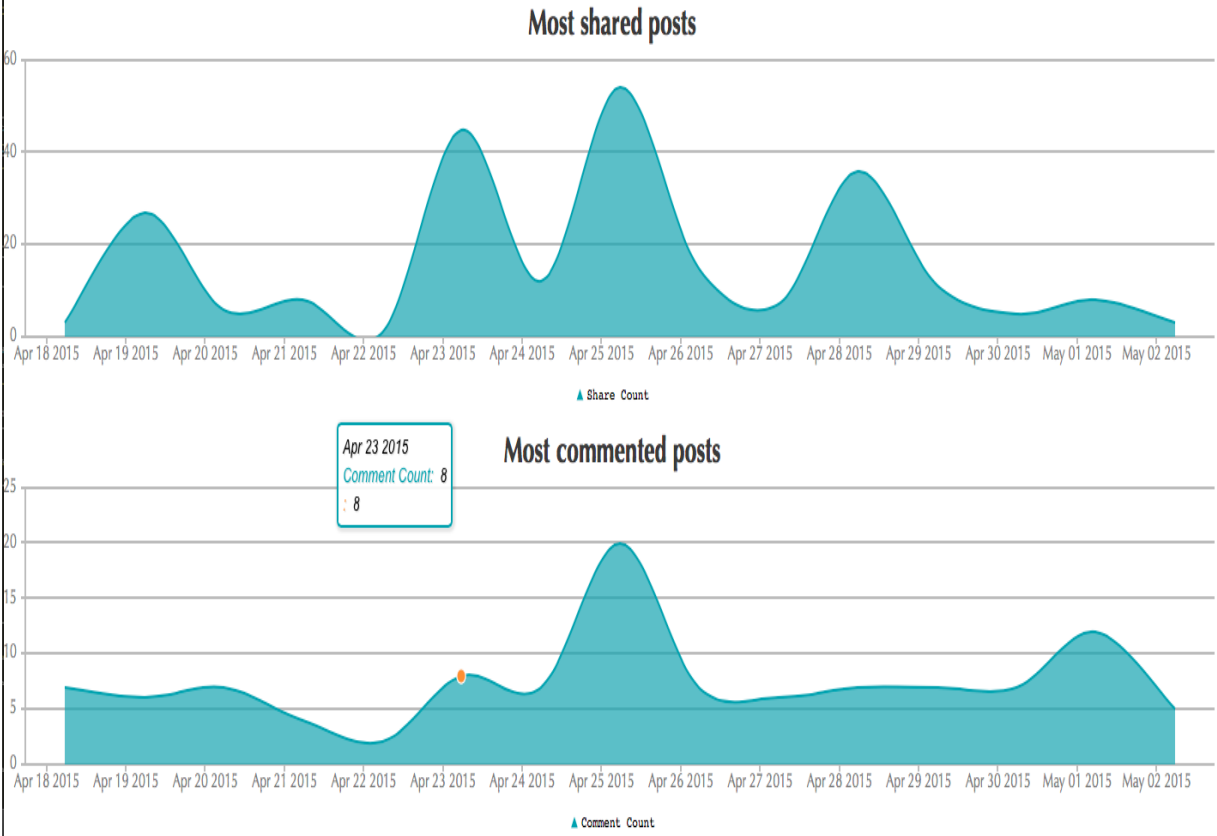
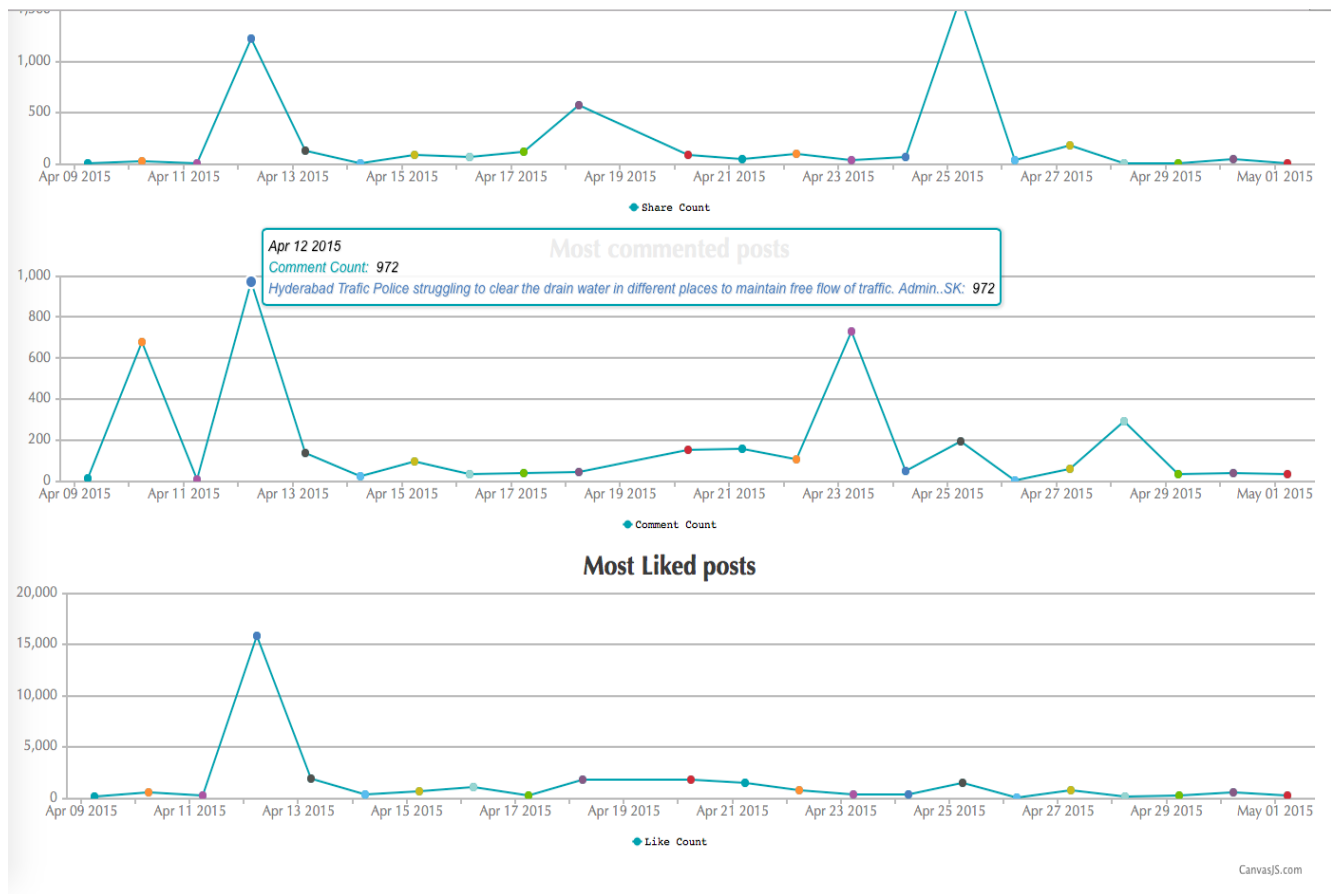
# What the user sees?

- We give the user three options :
- Social search
- Social trends
- Social analysis.

# Social trends

- We give the user the option to select a city (Hyderabad, Bangalore, Kolkata, Delhi) and to select the type of graph (line, curved line, area, curved area).
- Based on the user input, we plot the graphs: Most shared posts ( Post which has maximum shares on a particular day), Most commented posts (Post which has maximum comments on a particular day), Most liked posts (Post which has maximum likes on a particular day).
- For each of them, when the user hovers over the peak, a tool tip appears which shows the corresponding post's message.


# This is how it looks



# Social search

- We give the user an option to choose a word (from a set of some predefined keywords) and display all the posts which are related to that particular word.
- We give an advanced search option which takes a word from the user and display all the posts which are related to that word.
- We also give “*see more*” option which when clicked directs the user to the actual Facebook post.

# How it looks



Kolkata Traffic

search

Browse

[advanced search](#)

On 21st April 2015 at about 15.00 hrs a rally followed by procession from Raja Subodh Mullick Square towards Lalbazar along N.C. Street - B. B. Ganguly Street. Expected strength - 500/700. [...see more](#)  
2015-04-21

On 10th April 2015 at 16.00hrs a rally / procession from Raja Subodh Mallick Square to Sovabazar crossing via N.C.Street > College Street > Bidhan Sarani (Hatibagan). Expected strength:- 400/500. [...see more](#)  
2015-04-10

On 28th March 2015 at 17.00hrs - 20.00hrs a religious procession from 58M, Kailash Bose Street, Kol- 6, & move along Raja Ram Mohan Roy Sarani > Vivekananda Road > APC Road > Sahitya Parishad Street [...see more](#)  
2015-03-28

On 11.03.15. at about 18.00hrs a procession will be taken out from Bhuter Raja Hotel near Patuli fire station, expected strength 250/300. Regards. [...see more](#)  
2015-03-11

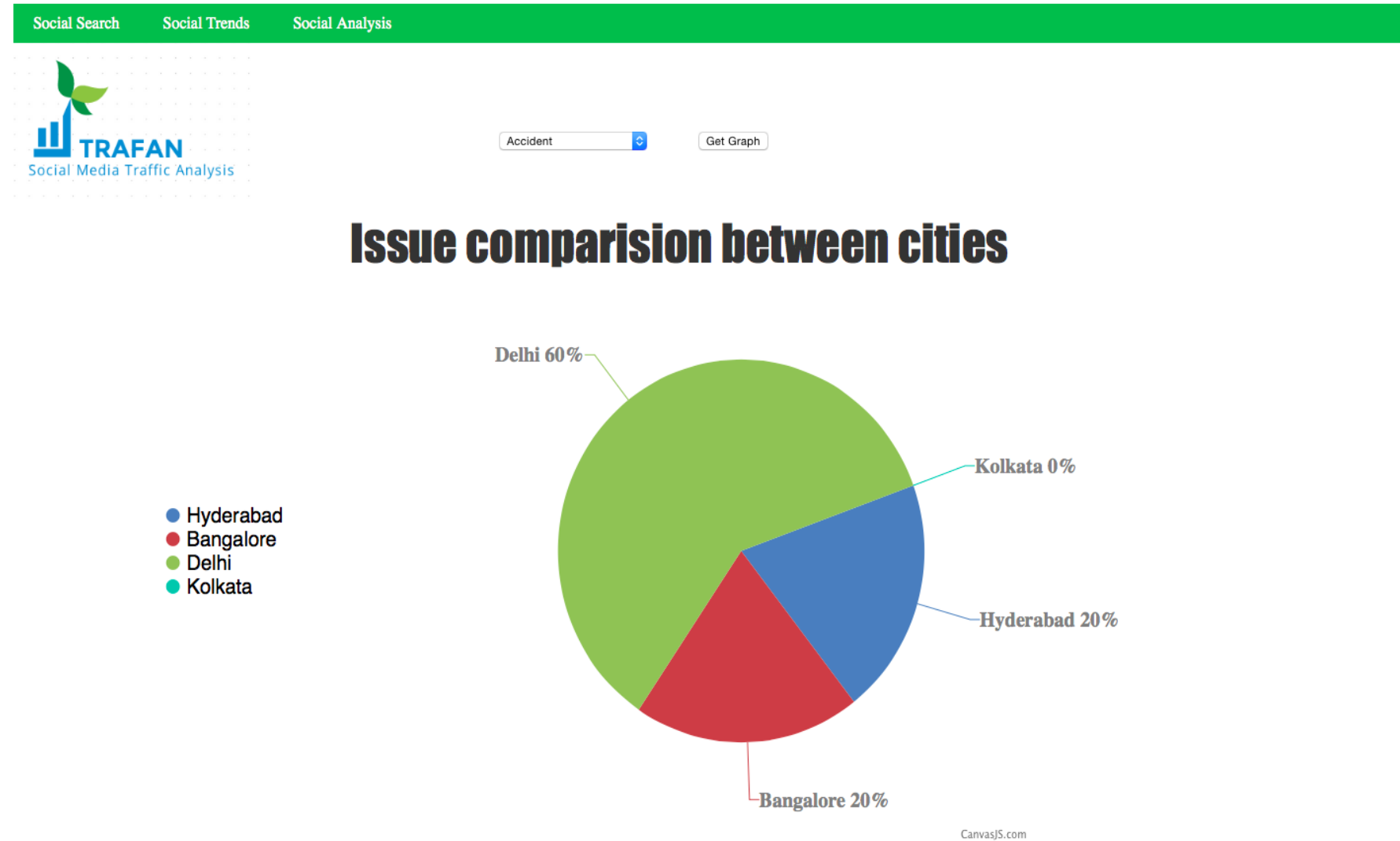
On 11th February 2015 at 12.00hrs a procession from R.S.M. Square to Dharmatala. Earlier procession from Howrah & Sealdah Railway Station. Expected strength:- 3000. (a) From Sealdah Railway Station t [...see more](#)  
2015-02-11

On 03.02.15. at about 13.00hrs a procession will be taken out from 121 K. C. Sen Street

# Social analysis

- This feature allows the user to compare the intensity of an issue across multiple cities.
- We give the user an option to choose a word (from a set of some predefined keywords) and we compare the number of posts related to that word among all cities and present the result in the form of a pie chart.
- Here also we give an advanced search option similar to that in Social search.

# How it looks





# Future work

- Extracting data from other sources like twitter and in general any publicly available data.
- Android and iOS app.

# Thank you

## Team members:

Y Bharath Kumar Reddy

Akilesh B

Swarna Jeevan

T Raja

K Anudeepthi

## Mentor:

Dr. Manish Singh