TECHNO-DOTE:- ENSURING MENTAL HEALTH

A PROJECT REPORT

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BONAFIDE CERTIFICATE

Certified that this project report titled **"TECHNO-DOTE:- Ensuring Mental Health"** is the bonafide work of **Shubham Gupta(19BCE10261) ,Prachi Kumari(19BCE10402) ,Eshudhi Jangid(19BCE10401) ,Ayushmaan Singh Rajput(19BCE10306)** who carried out the project work under my supervision. Certified further that to the best of my knowledge the work reported here does not form part of any other project / research work on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

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The Project Exhibition I Examination is held on _____

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LIST OF ABBREVIATIONS

S.No.	Abbreviations	Meaning
1.	SOS	Save Our Souls(emergency)
2.	AAC	Adverb Adjective Combinations
3.	SQL	Structured Query Language
4.	approx.	Approximately

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ABSTRACT

The project mainly focuses on identifying people with vulnerable mental health conditions and informing their confidante and nearest police station because the main reason of increasing suicide rates and mental struggles is that the sufferers fail to take help from the right place in right time, before they cause any damage to themselves or others. A 3.4 percent increase was observed in suicides during 2019 (1,39,123 suicides) as compared to 2018 (1,34,516) and 2017 (1,29,887), the data shows. The rate of suicide (incidents per 1 lakh population) rose by 0.2 per cent in 2019 over 2018, as per the data. Therefore using technology to bridge the gap between the sufferers and the helpers will save lives and time of authorities. This will also reduce the cases of fake framing of suicide hence ensuring justice. Nearly everyone is on social media today expresses his/her point of opinion or emotional stand candidly, updating their daily life instances and much more. One such social media is Twitter, with nearly 152 million users. Here, we use twitter data to identify the amount of negative, neutral and positive tweets done by the user and if three-fourth of the tweets are found negative, the person is considered to be in the red zone and hence a SOS alert message is sent asking for help to the accurate person respectively.

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INTRODUCTION

[1.1] Mental health and emotional wellbeing is one of the most common and debilitating health challenges in the present scenario. Mental health has been observed as the reason for many brutal crimes and sufferings. Psychology is what controls our actions or decisions which may lead us to be a victim or a criminal. Owing to increasing crimes and death where mental health plays a significant role we decided to find a technical solution in this matter and hence visualised a model which can be infused as a mobile application which maximum people have close to them most of the time.

The point is even if someone is thinking of ending one's life, it is very probable that they will surf “easy ways to die”, on google or if someone is dealing with any other issue, the first place they seek help is from an online platform where their identity is concealed. Sharing daily updates with friends and family directly is non-existential and instead all daily life updates are on various social media. Even if an amateur is conspiring for some terror activity or any heinous crime, they may look for examples available on the internet or ways to implement their plan etc.
This makes our visualization more solid. We proposed fitting in a framework in mobile etc. which can scan through the tweets of the user to check for any suspicious activity that leads our machine to think that the referred person is at risk. Also, More than 70% of people in the early stages of depression would not consult the psychological doctors or inform their family.

[1.2] Our main motivation for proceeding with this project is the increasing rate of suicide - a 3.4 percent increase was observed in suicides during 2019 (1,39,123 suicides) as compared to 2018 (1,34,516) and 2017 (1,29,887), the data shows. The rate of suicide (incidents per 1 lakh population) rose by 0.2 per cent in 2019 over 2018, as per the data. Also, research reveals that more than half of the human population on the earth has been suffering from depression etc. at some point of their life. In the month of June, news of demise of a great Bollywood actor came across which went through so many conclusions because we had no proper way of determining if the death is by suicide or is actually a murder which is fakely disguised as suicide. This interrupts justice, takes away so much time from the authorities and administration, it also

creates huge chaos and an unpleasant environment all around. This incident further pushed us to continue with this idea.

[1.3] Owing to how conveniently the internet and wide usage of social media have invaded our privacy and are keeping an eye on us every time, what could be better than using it to analyse mental health challenges and prevent any lethal damage to any individual or the society. Also, the main challenge someone suffering with life-taking risk is they fail to ask for help from the right place or share it with their parents and family hence increasing the risk.

[1.4] The objective of this work is to create a model which can be expanded and infused to be used to bridge the gap between the people at risk and organisations/family who can help. It also aims at reducing not only the death rates due to suicide but also save time to authorities and ensure justice by failing any plan of fake framing of suicide.This will not only help people who are unable to reach out when in need to the family and dear ones but also the investigation department by giving them untampered authentic data in case of any inevitable tragedy.

LITERATURE REVIEW

[2.1] This section illustrates other similar work related to analyzing sentiments and ensuring mental wellbeing. Most of these approaches analyze sentiments as positive and negative while some approaches are in research level and few more are commercially available.

[2.2] The project targets the society of all age groups. As per the data acquired from google, all age groups are vulnerable for mental health issues who use technology specially phone,tab, laptop etc.

[2.3]**Adobe Social Analytics -** Adobe Social Analytics basically measures the impact of social media on businesses by understanding how conversations on social networks and online communities influence marketing performance. After capturing and understanding the conversations going on, it correlates the impact of those conversations with key business metrics such as revenue and brand value. Other than that it measures the interactions that businesses have with their customers in social media including how Facebook posts drive site visitors and purchase behaviors. Adobe Social Analytics uses a natural language processing algorithm to implement sentiment analysis.

Brandwatch Sentiment Analysis - Brandwatch is also a sentiment analysis tool developed by a team of PhD qualifiers in the United Kingdom; this is also commercially available currently. Through this tool they are trying to access whether a sentiment is positive, negative or neutral.

Sentiment140 - This is an online tool for analyzing sentiments on Twitter social network. This tool allows discovering the sentiment of a brand, product or topic on Twitter. This was created by three Computer Science graduate students at Stanford University and their main focus is analyzing the languages English and Spanish. Sentiment140 basically states whether the specified brand, product or topic is positive, negative or neutral.

Social Mention - Social Mention is a social media search and analysis platform which analyses user sentiments through social media. This is also an online tool that allows tracking what people are saying about a particular brand, product or topic in real time. This tool allows the user to define a time period in which to analyze user sentiments.

TweetFeel- TweetFeel is also a web tool that analyzes sentiments of the given input through the twitter social media. This gathers real time data on Twitter, about the search items and evaluates those tweets into positive and negative categories in real time. This uses machine learning based sentiment analysis which enables us to get much clearer feelings about sentiments. Determining the Semantic Orientation of Terms through Gloss Classification Sentiment classification is a recent sub discipline of text classification which is concerned not with the topic a document is about, but with the opinion it expresses. In this approach of sentiment classification it uses a method that is based on the quantitative analysis of the glosses of such terms, i.e. the definitions that these terms are given in on-line dictionaries, and on the use of the resulting term representations for semi supervised term classification.

Sentiment Analysis using Adjectives and Adverbs - While most work in sentiment analysis determine its polarity using specific parts of speech such as adjectives, verbs and nouns, in this approach it uses Adverb-Adjective Combinations (AACs) to determine the strength of subjective expressions of a sentence. Instead of aggregating scores of both adverbs and adjectives using simple scoring functions, it proposes an axiomatic treatment of AACs based on the linguistic classification of adverbs. Three specific AAC scoring methods that satisfy the axioms are presented.

The specialty of our project is, it does not only analyze the sentiments, and instead it uses the analyzed sentiment scores to determine the mental state of the user and if anything found vulnerable, an instant message is sent to the number fed so that help reaches to the sufferer ASAP before any damage is done.

[2.4] There are so many other algorithms present in the market which provide a feature to keep an eye on users for vulnerable signs for depression and mental health issues but lacking to ensure their safety as there is no backup if the user did not get aware of her/his situation.

SYSTEM ANALYSIS

[3.1] The application tracks the social connections of the user through technology while making sure if any suspicious activity is traced the family and friends are informed as soon as possible for the safety of the user aiming for heavy decrement in death rates which might be able to be tracked down through keeping an eye on social platforms of the individual.

[3.2] Facebook AI is working on suicide prevention but is limited to providing only a robot asking questions like “Are you fine?” etc. We have apps such as Calm, Breathe2Relax,Happify, etc and many others which focus on mental health, providing a motivational quote every morning in the notifications, having bots to chat but it fails to provide any reliable consolidation to the sufferer. Also, they will not be able to monitor any criminal, revengeful or terror track driving of the mind. Though many bloggers claim that digitally we can curb the unwanted fatal eruption of our mind, we are yet to see any real technology available as of now.

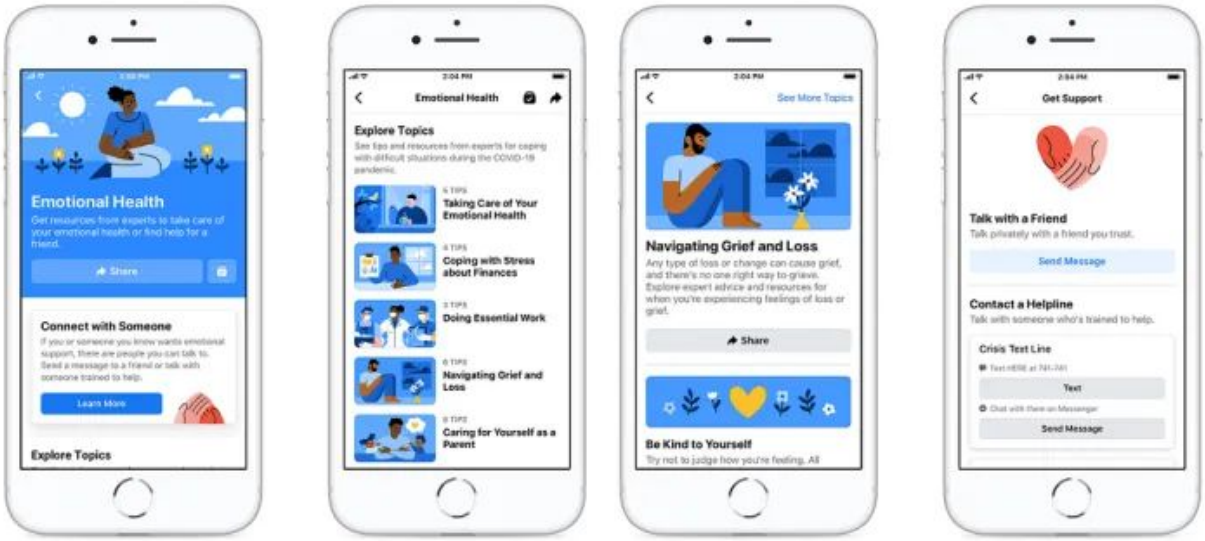

fig:Facebook mental healthcare feature

We have applications which work on face detection, voice classification, mood trackers but they are not being used for the identical purpose as ours. The mood trackers are there but with the drawback that one has to feed how they are feeling themselves for the application to give any output which is merely some feel good text or advice which it does not ensure has been followed.

[3.3] This is a model and simulation based project by end of which we aim to attain a application/software which keeps the track of the person's reactions, online presence, social media activity, browsing history, online acquaintance etc.making sure that we sustain the privacy of the person by not storing any data and only scanning through all the activities unless anything suspicious is found or the threshold frequency of trigger points is reached according to the database the machine has been trained with.
The second thing we focus upon is as soon as the threshold is crossed, alert messages will be sent to contacts one can confide in (Mother, father etc. or the most dialed contact). Further, If the device detects no improvement or no positive action taken, immediately within a span of a day or two - alerts will be sent to the nearest police station.

[3.4] The project is tended toward a working prototype with an ability to scan for suspicious activities related to mental health issues and sends an alert to some confidante (family members) and related authorities(if needed).

SYSTEM DESIGN AND IMPLEMENTATION

[4.1]We have tried to create a prototype of our vision by using Python and SQL. Here, we show that an already extracted file can be fetched inside the code and scanned for the required purpose.

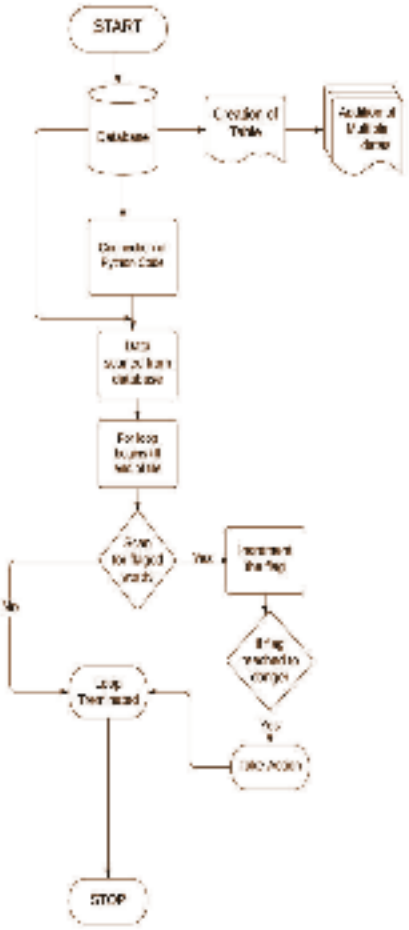

Fig:-Representation of Module 1

We created a database where we stored the required datasets. These datas are then stored in the form of Table, then we connect our database to Python code where the code will scan the file for the suspicious comments and if it gets any then it will increment the value of flag. When the flagged value reaches its peak then action will be taken.

[4.2]Firstly we prepared the python code which worked for a proposed idea. Afterwards when it was time to link social media platforms , we were only able to connect twitter with a twitter developers account which gets some preproproposed data to work on. We get twitter sentiments for keywords depression, anxiety, mental health,Store twitter sentiments in a text file, Got 3500 tweets.We compared the pre-proposed data saved to "TWEETDATA.txt" with the prepared dictionary named "DICTIONARY.tsv" consisting of vulnerable words and texts we found while the research work and marked the the vulnerable tweets with '-1' and safe tweets with '1' and saved the data in excel sheet "SENTIMENTS 2.xlxs". Now we counted the total numbers of '-1's in the python code, If the count is greater then the 3/4th of the total tweet counts, then a key word '1' will be uploaded to the Firebase Realtime Database . Now the android application will retrieve the uploaded data as a string and compare it with setted value '1'. If the output is true then a message will be sent to the respective family members and in some cases to the related authorities.The application consists of few more operations for the convenience of the user.The app contains two buttons ,one for SOS call and second for SOS message, followed by two menu options , One for online government website for Mental Health related issues and other for activity containing MAHANAGAR helpline numbers (MAHANAGAR includes Delhi ,Mumbai, Kolkata ,Chennai).

[4.3]We build up a Python code which will check for the positive and negative thoughts and then it will gather all the negative thoughts and if the count of the negative thoughts is greater than 3/4th of the total tweet counts then '1' will be store over the database and form that database our application will perform the SOS task

PERFORMANCE ANALYSIS

[5.1] In this nougat we will be discussing the performance and analysis of our project. We will also discuss the growth of mental health issues and analyze it too through the graphs and the tables.

[5.2]The program gives an output for the TWEETDATA containing approx 3500 tweets and gives output for 1900+ suspicious tweets for mental health issues. The application provides a supportive SOS call and message function with special helpline numbers for MAHANAGAR cities and an online help and support system from the government.

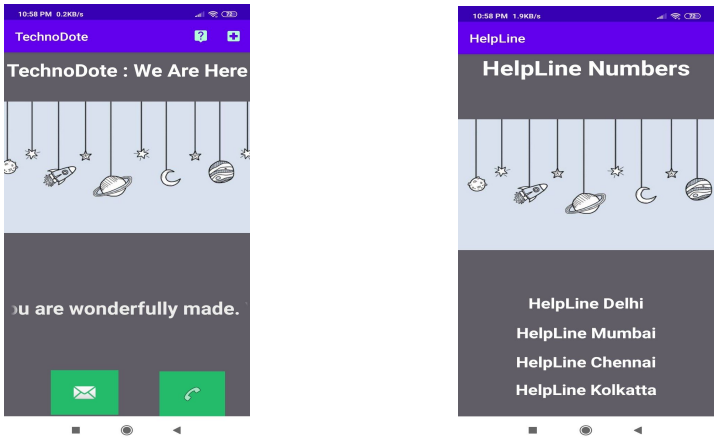

fig:Application Sample

[5.3] The suicide retes of different countries are given below.

Related chart – suicide rates since 1950 for select countries. This chart provides available estimates from the WHO on suicide rates from 1950 to 2003.

Country	Suicide rate in 1990 deaths per 100,000	Suicide rate deaths per 100,000
Guyana	22.01	26.07
Haiti	11.10	8.55
High SDI	13.09	11.38
High-income	13.05	11.63
High-income Asia Pacific	14.79	16.37
High-middle SDI	17.00	8.98
Honduras	5.89	4.40
Hungary	33.81	14.28
Iceland	14.22	9.61
India	20.20	15.60
Indonesia	4.02	3.12
Iran	7.22	5.45
Iraq	8.15	4.09

Fig-Suicide Rate since 1990 to 2017

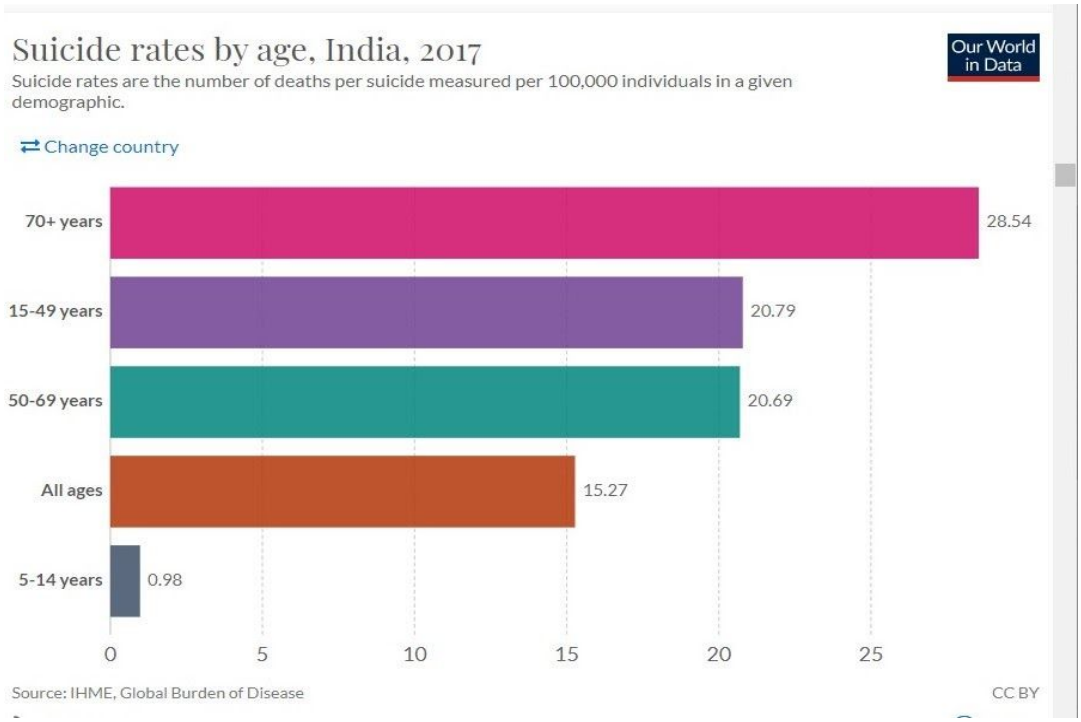

Fig:- A graph Suicide rates by age, India 2017

Country	70+ years deaths per 100,000	50-69 years deaths per 100,000	All ages deaths per 100,000	5-14 years deaths per 100,000
Guinea	55.03	25.64	6.31	0.38
Guinea-Bissau	54.69	30.55	7.58	0.49
Guyana	49.05	40.15	25.52	1.06
Haiti	21.84	15.25	7.07	0.45
High SDI	24.56	19.83	14.84	0.48
High-income	24.66	19.85	14.88	0.50
High-income Asia Pacific	40.78	31.13	23.83	0.47
High-middle SDI	26.48	14.75	10.74	0.53
Honduras	13.18	6.66	3.71	0.19
Hungary	39.69	32.27	20.82	0.33
Iceland	29.24	15.63	11.82	0.24
India	28.54	20.69	15.27	0.98
Indonesia	8.09	4.19	3.07	0.19
Iran	9.14	5.32	5.81	0.44
Iraq	6.97	5.47	3.49	0.13
Ireland	7.16	13.63	9.32	0.25
Israel	14.95	9.41	6.06	0.17
Italy	13.47	8.16	7.14	0.12

Fig:- Tabular representation of Suicide rate by age, India 2017

And here we are expecting to see some significant reduction in the suicide rates.

FUTURE ENHANCEMENTS AND CONCLUSIONS

[6.1] Our app is able to give alert to family while there are many other updates we can add so that the user gets comfortable with the application and as well as the surety of user's safety increases .

[6.2] The work here is restricted to only gathering the preprocessed data and comparing it with the labeled excel file for marking positive, negative or neutral words and thereby calculating the chance of risk. The message sent through the apk file must have already fed relevant numbers and cannot determine the most appropriate number for SOS on its own.

[6.3] Determining the contacts for SOS alerts to be sent using the nearest police station detail using a GPS system and simultaneously identifying the trustworthy contacts(parents usually), the message can be sent to. The sentiment analysis can be done for various media platforms like Instagram etc.

[6.4] The app is made to keep an eye on the social media platforms used by the user and with regular updates to the application and connected code the result will be more accurate and real time which may turn to a software later on.The app has a vision of providing alerts for any threats related to mental health and ensure safety through technology of the user.

APPENDIX A

All Codes and related files are uploaded on google drive accessible through given link:-

https://drive.google.com/drive/folders/1CrUp-8r4PCxr3_-emhWes_fWoipaVECG?usp=sharing

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