



GRIFFITH COLLEGE DUBLIN

Assignment Cover Sheet

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Signed: _____

Date: 06 January 2020

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Table of Contents

<u>1. Abstract</u>	4
<u>2. Project proposal</u>	4
2.1. Aim	4
2.2. Idea	4
2.3. Goal.....	5
<u>3.Original Motive</u>	5
<u>4.Original Value</u>	5
<u>5.Background Study</u>	5
<u>6.Literature review</u>	6
<u>7.Methodologies</u>	7
7.1. Software Architecture.....	7
<u>8. Theme Analysis</u>	8
<u>9. Activity Plan</u>	9
<u>10.Ethical Consideration</u>	12
<u>11. Business Plan</u>	12
<u>12. Future Scope</u>	12
<u>13. Bibliography</u>	14
<u>14. Appendix</u>	14

Behavioral Therapy for Social Media Cleansing

Abstract:

In recent times, there has been numerous debates on what is the morale approach of handling User generated content from social media. With more and more corporate moguls taking commercial stance on deploying such user generated data for profit, there has sure been sense of skepticism among people on how such practices can come anything close to being legal. Also, with the gargantuan surge of social media, it almost seems impossible for people to stall themselves from using social media anytime soon. Thus, the only genuine way to handle this situation is to use the delicate user generated content to heal something which was aggravated by social media itself in the first place, Mental Illness. So, in this paper we dissect on how Social Media influences the Mental Health of people and also try to come about with an algorithm that can be used to generate an predictive AI model based on the user generated content and use it for treating mental health by performing a Social Media Cleanse.

Project Proposal:

Aim:

With current raise of Social Media and taking its co- relation with Mental Health into consideration, the following idea is proposed to track the behavioral traits of a particular person and unveiling a Social Media cleansing Model based on the individuals Social Media Activity (peer to peer chat log).

Idea:

In this model we generate an algorithm to prompt social media cleanse based on the behavioral traits of the user in the following way:

- The user is given the Cognitive Behavioral Therapy questionnaire, in-order to organize them into distinct themes including, understanding of psychosis, on their personal strengths, their method of dealing with anxiety and depression and how they stimulate positive thinking and emotions in their life.

- Then using Natural Language Processing the texting activity of the user with another person is analyzed and AI model based on Sentiment Analysis is performed to find out the toxic impact that the person's chat has on the user, closely based on the behavioral test previously taken by the user. Polarity scores are generated from the NLP findings.
- By co-relating that CBT score of the user with the Polarity score generated from the conversation that the user had with a person, the toxic impact of that the person has on the user is predicted and the further the user is prompted to Unfriend/Unfollow the toxic person.

Goal:

Constant toxic interaction using social media by average human-beings day to day is bound to influence the person's self-esteem and does little to assuage the feeling of self-doubt. With people spending lesser and lesser time to get to therapy to take care of their mental health, it is high time that such unhealthy social media activity is regulated instantly. This tool will help people to regulate themselves from harmful and toxic interactions that they have on social media.

Original Motive:

Excess Social Media consumption is not the ideal practice for maintaining the right balance in mental health. Over-use of social media might affect a person's self-esteem, sleep cycle and much more. Toxic interaction's online can have a negative effect on the mental health of a person. To regulate such thinks from happening, this algorithm is designed in such a way that the user is provided with a model that demonstrates the toxicity of the person that they are interacting with, based on the NLP done on the user's chat conversation with that particular person.

Original value:

Social Media is dumped with millions of data and all users are free to use that service at his or her wish. Yet, there does not seem to be any sort of regulation on who can do what in social media. All users are allowed to use the service the same way no bias what so ever. Thus, this underlines the importance for the need for regulation of social media usage based on the user's preconceived emotions. Though, data tends to lose its credibility by time, human emotions seems to prevail the same way through time and none of its value fade away. That is exactly the reason why the algorithm is built based on various emotions that humans tend to experience.

Background Study:

The impact of mental health has always been undermined by the people know matter what demographics they are from. All this arises due to the fact that various symptoms such as anxiety, depression and stress all being forms of mental illness has never been seen has a real

threat to the human beings similar to a physical injury. These illnesses not being visible to the human eyes, does not seem to help the case too.

Mounting Evidence suggests that antecedents of adult mental disorders can be detected in children and adolescents. The development of policies for child and adolescent mental health have lagged, due to various reasons including lack of knowledge about child development and childhood mental disorders, relatively weak advocacy, lack of training and in many parts of the world, absent financial and professional resources for program development and implementation. It is evident with current knowledge that the state of affairs must be changed to meet the needs of contemporary civilization.[1]

Even with diagnosed patients with mental health issues, there has been a huge crisis in the number of therapists that are available in treating the patients. As part of the Affordable Care Act, more Americans than ever are eligible for mental-health coverage, and yet fully half of counties across the nation currently have *no* mental-health professionals at all, Thomas Insel, director of the National Institute of Mental Health, tells the *Post*. [2]

Developing effective recruitment strategies for a mental health population is no easy task due to the stigma and vulnerability associated with this cohort. The sensitivity and ethical considerations in relation to recruiting participants for mental health studies must be carefully considered, particularly when functional impairment caused by illness reduces a participant's capacity to provide informed consent [3].

Literature Review:

Usage of Social seems to be determining the character building in young children. It is important to note that the adolescents' use of social media occurs simultaneously with their development while developing identity, emerging physical sexual characteristics and moral consciousness. While the benefits of the internet are well known, the relationships between the use and adolescents' mental health have been a source of concern to researchers. Studies conducted by Campbell, Cumming and Hughes (2006) and Lam and Peng (2010) revealed that students with depressive symptoms used internet much more than those without symptoms. [4].

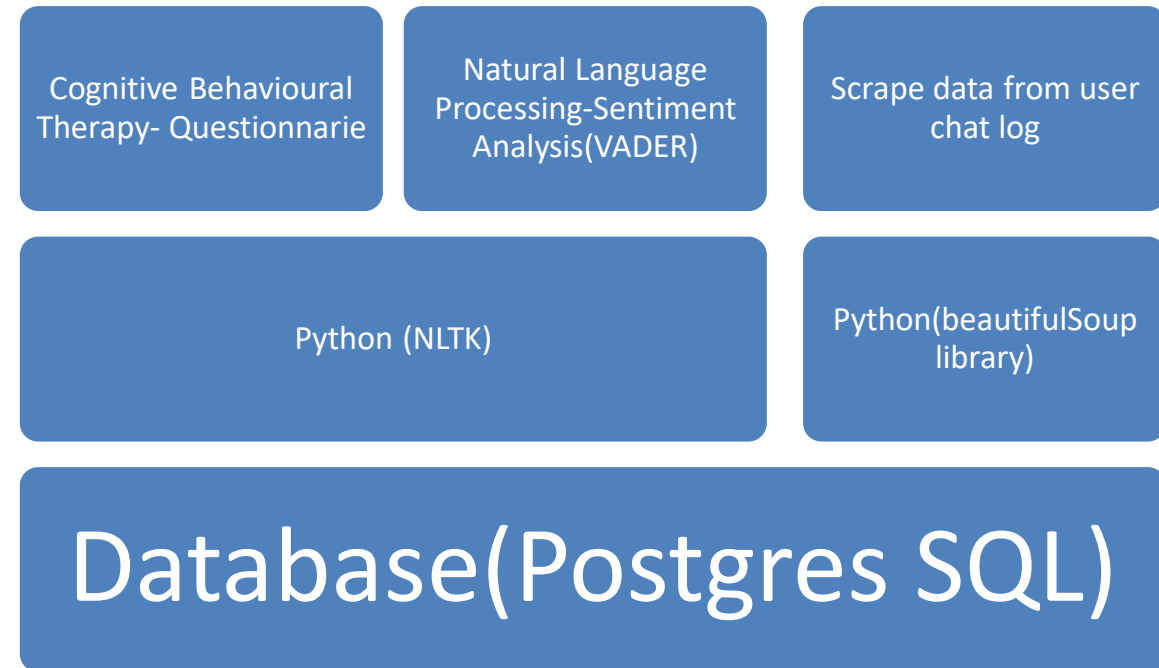
With all this being said there has been previous efforts made in providing mental health counselling through social media. It was called HORYZONS. It was the first online social intervention service ever done. The process was done in a suave way by selecting participants that were found to be compatible to take up this process. Meanwhile during the process, the participants were encouraged to communicate with one another and with peer and expert moderators through the online social network or 'Café' to foster social support. Expert moderators (clinicians) are identifiable as a separate user class within the network. Each participant creates their own profile with images and can visit the wall of fellow users, where their posts and general activity are displayed. Posts can include 'icebreakers' (to encourage social interactions, eg, What's the worst gift that someone gave you?), user-generated threads, 'reactions' (designed to facilitate social support, eg, 'I get you' and 'thinking of you') as well as content related to mental health (eg, recent steps taken by others) or general interest.[5].

This method deemed to be feasible, engaging and safe but yet the impact of the social intervention has found be short lived for patients. That was to be improved in the next cycle of this social experiment.

Methodologies:

Software Architecture:

There are numerous algorithms that are involved in building of the AI model.
Software Architecture



Cognitive Behavioural Therapy-Questionnaire:

Numerous Profile of Mood State [6] such as the Dr.Sigmund Freud Personality Type Test[7], The Brumel Moods State Personality Rating[8], The Big Five Inventory[9], basic Therapy Counselling Therapist questionnaire(transaction analysis) and much more personality tests are to be researched and the Questions are formulated. To validate the legitimacy of the questions a survey is done and it is circulated among peers and various linear regression model is to be constructed and the accuracy is calculated.

Linear regression Model: In statistics, **linear regression** is a linear approach to modeling the relationship between a scalar response (or dependent variable) and one or more explanatory variables (or independent variables).

In linear regression, the relationships are modeled using linear predictor functions whose unknown model parameters are estimated from the data. Such models are called linear models. Most commonly, the conditional mean of the response given the values of the explanatory variables (or predictors) is assumed to be an affine function of those values; less commonly, the conditional median or some other quantile is used.

Like all forms of regression analysis, linear regression focuses on the conditional probability distribution of the response given the values of the predictors, rather than on

the joint probability distribution of all of these variables, which is the domain of multivariate analysis.

Scraping of data:

The chat log history is scraped using the Python library BeautifulSoup.

beautifulSoup: It creates a parse tree for parsed pages that can be used to extract data from HTML, which is useful for web scraping. It is available for Python 2.7 and Python 3.

Natural Language Processing:

Sentiment Analysis:

The Python library *Natural Language Tool Kit* is used to do this process. In this case, we perform sentiment analysis on the chat log of the user. By using the nltk library-VADER(Valence Aware Dictionary and sentiment Reasoner) algorithm we come up with a polarity score of the chat conversation.

VADER: It is a lexicon-based rule that used to perform sentiment analysis. It is used to calculate the sentiments expressed in a particular English sentence. It is often used to calculate sentiments expressed in social media.

Sample:

Sentence	Polarity (compound) score
The food is good	0.44
the food is GOOD	0.56
the food is GOOD!	0.60
the food is GOOD!!	0.63
the food is GOOD!! :)	0.80

Database:

For the purpose of this project, for time being we store the chat data of the user in PostGres SQL. But for future implementation of this feature in social media sites, Block Chain Technology can be used to store this data for encryption storage and transaction of data.

PostGres SQL: It is a free and open-sourced, Relational Database Management system.

Theme Analysis:

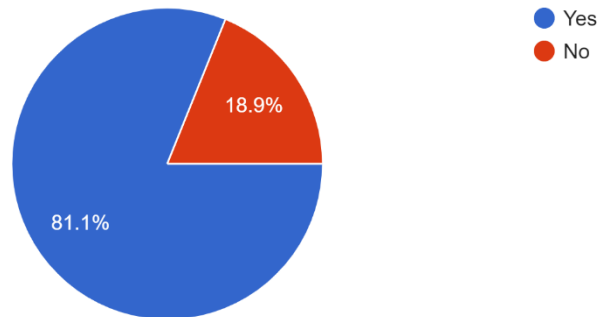
Survey:

In-order to determine the credibility of the algorithm and the awareness of mental health among people a feasibility survey was conducted and it was circulated online.

The Survey until this people has been taken by 179 people and the attendees varied in age groups from 18 to 65+. The entire tone of the survey was to determine whether social media has an impact on mental health and 82% of the people seemed to believe the same.

Do you believe that Social Media affects your mental health?

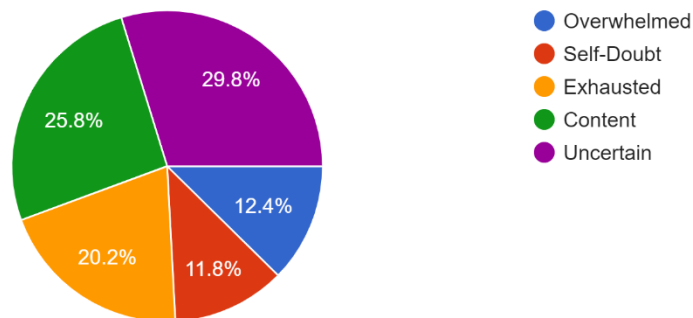
180 responses



Further the mood state of people while using social media was questioned there seemed to be an even distribution among 5 mood states formulated from the Brumel Mood state chart [8].

Describe your mood while using Social Media

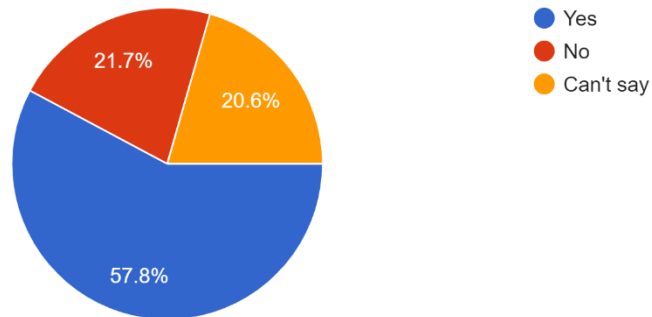
178 responses



Further, the belief that people have on Counselling therapist was projected through the survey. 58% wanted therapists to deal with mental health. For 21% that choose cant say, can be assumed to have not much knowledge on the Mental Health or on Therapists.

Do you believe in Counselling therapy for Mental Health?

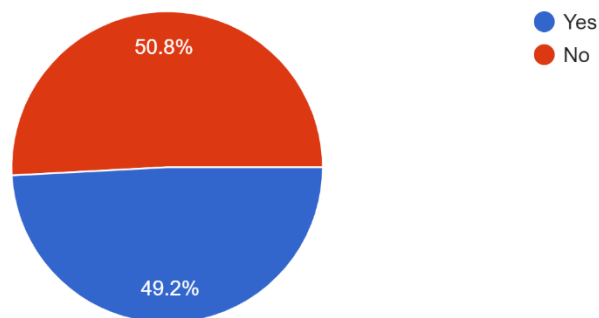
180 responses



There was an almost even 49-51 % split in favour of people Not wanting for Virtual Therapy. But with proper explanation, people can be made to change their opinion on that.

Do you believe in Virtual therapy for Mental Health?

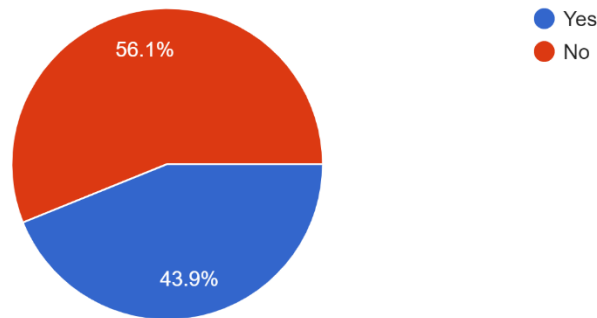
179 responses



Although people still don't trust the idea of tracking allowing third person to track their social media activity and by following proper protocol and by choosing the right prove of statement that can tend to change.

Are you willing to allow your Social Media Activity Data to be used to heal your mental health?

180 responses



Brainstorming:

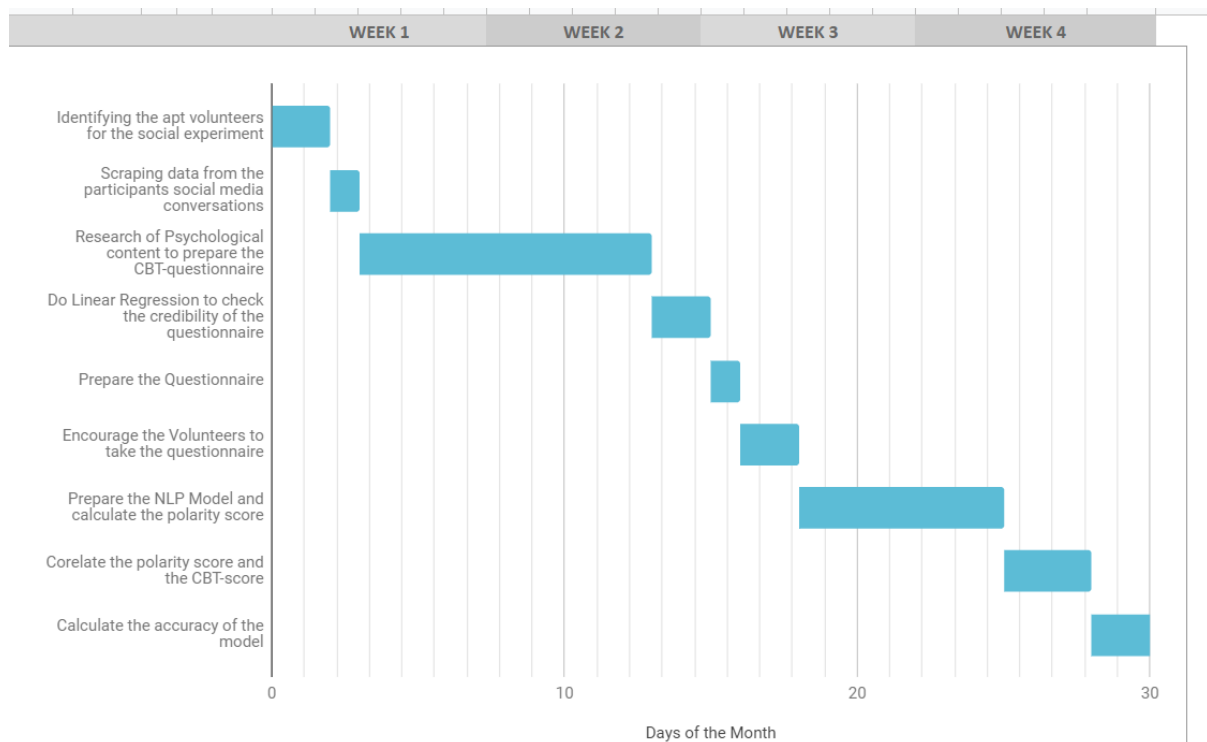
The brainstorming was conducted among group of 4 and the idea seemed to resonate the same way as the survey conducted above.

Also, a fellow graduate master's student pursuing MSc in Computer Science from University of New Haven interested in the following project by taking the survey, come into contact and a brainstorming session was conducted via mobile phone. Valuable takes on how the behavioural test should be conducted and the scope of Artificial Intelligence was discussed in that meeting.

Further, psychological inputs were added by hosting a brainstorming session with an undergrad student pursuing Sports Medicine in Ramachandra Medical College Chennai, majoring in Sports Psychology.

Activity Plan:

TASK NAME	START DATE	END DATE	START ON DAY*	DURATION* (WORK DAYS)
Behavioral Therapy for Social Media Cleansing				
Identifying the apt volunteers for the social experiment	1/17	1/19	0	2
Scraping data from the participants social media conversations	1/19	1/21	2	1
Research of Psychological content to prepare the CBT-questionnaire	1/21	1/31	3	10
Do Linear Regression to check the credibility of the questionnaire	1/31	2/2	13	2
Prepare the Questionnaire	2/2	2/3	15	1
Encourage the Volunteers to take the questionnaire	2/3	2/5	16	2
Prepare the NLP Model and calculate the polarity score	2/5	2/12	18	7
Corelate the polarity score and the CBT-score	2/12	2/15	25	3
Calculate the accuracy of the model	2/15	2/18	28	3



Ethical Considerations:

The huge concern would be is to respect the rights and the respect of all the people that use this service. The data must not in any circumstance be misused for any marketing purpose. Encryption of data at both ends is done so that the data is stored in a secured. The idea of employing Block-Chain Technology in future extension of project is proposed to resist modification and tempering of data.

Business Plan:

Although the fundamental idea is only to use this algorithm for healing mental health, there is future scope of monetizing the project. But there can never be direct monetization of the process. Considering the optimistic chance of the algorithm being used in Social Media platforms, this gives a new dimension to the exponentially growing social media convention. This social intervention project might help in the churning of new users and can also increase the usage traffic of the existing users.

Future Scope:

The inevitability of controlling the obsession of people towards social media is slowly looming towards near impossibility. Social Media seems to be reaching new horizons and yet there still is no adequate protocols to regulate its potentials. Regulation of Social Media is the only right way for this huge social commodity to move further. The foundation of Social Media being Human Emotions, the only thing that seems fair to do is to quantify these human emotions using Artificial Intelligence and use that to heal the emotional bruises, which social media are

responsible for causing in the first place. But for the Social Media companies the scope to help people seems ample but the intent to help seems to be feign most times if not always.

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6. Robert Wood, "Profile of Mood States (POMS) Questionnaire." Topend Sports Website, February 2017, <https://www.topendsports.com/psychology/poms.htm>, (Accessed 05 January 2020)
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9. John, O. P., & Srivastava, S. (1999). The Big-Five trait taxonomy: History, measurement, and theoretical perspectives. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality: Theory and research* (Vol. 2, pp. 102–138)

Appendix:

1. Survey link: <https://docs.google.com/forms/d/e/1FAIpQLSeP-SJy6MVngqWP-VvgZGEmlPj38X2fsAHO64mo6eXJzSjodw/viewform>
2. Video Link:

Check List

Elements of the Assignment Work

Element & Activity	Check
Clearly articulated project idea Project idea aims & objectives. What it is; who is this for (users); what additional benefits & functionality it will provide.	✓
Literature Review Must include citations and bibliography.	✓
Review of the idea in light of the literature review.	✓
Quantitative Research Identify all stakeholders Description of the information do you intend to capture. Undertaking quantitative research by <u>developing</u> , <u>conducting surveys</u> and then <u>reviewing</u> the findings.	✓
Review of the idea in the light of quantitative research.	✓
Qualitative Research Plan, develop and conduct brainstorming sessions with stakeholders Perform theme analysis and present findings; discuss these findings.	✓
Review of the idea in the light of qualitative research.	✓
Final Version of the Proposed Project Idea	✓
Are there any ethical considerations?	✓
How will you do this project? How will you Develop it? Work breakdown structure, timeline, GANT Chart	✓
Business Plan Costing and Resource Estimation Initial Investment Return of Investment	✓