

INTRODUCTION & MOTIVATION

PROJECT SCOPE

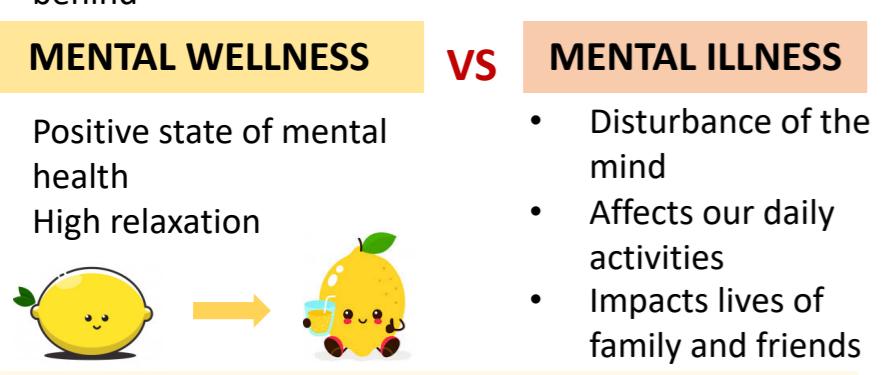
BBB Precinct (Macro)

PROJECT FOCUS

People (Social)

PROBLEM ANALYSIS OVERVIEW

- 1 in 7 Singaporeans have experienced a mental disorder
- 92% of working Singaporeans are feeling stressed
- For every suicide, at least 1 in 6 survivors are left behind



PROBLEM STATEMENT

We want to improve the mental wellness of citizens in Singapore.

PROBLEM ANALYSIS

Social

- For every suicide, at least 6 suicide survivors are left behind
- 2.8 times more deaths from suicide than transport accidents in 2018
- Suicide is the leading cause of death for those aged 10-29

Economic

- 18% of Singapore's healthcare expenditure
- Costs at least \$3.1 billion on stress-related illnesses annually

Common Misconception on Mental Wellness

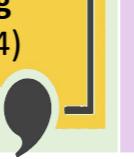
Just as someone who feels unwell may not have a serious illness, people may have poor mental health without mental illness

STAKEHOLDER MAPPING



BASIC LITERATURE

WHAT TYPE OF SOLUTIONS ARE ALREADY OUT THERE?

FITNESS ACTIVITIES	HUMAN-ANIMAL INTERACTION	CHATBOTS
<ul style="list-style-type: none"> Physical health benefits Mental health benefits Exercise releases endorphins <p>Existing Events</p>  	<p>"participation in low to moderate intensity aerobic activity has previously revealed the greatest mental health benefits for exercise participants" (Babyak et al., 2000)</p> <p>Existing Events</p>  	<p>Sense of community</p> <ul style="list-style-type: none"> Builds companionship Mood-boosting power of pets <p>"Brings about social interaction and working in teams to care for animals fostered a sense of belonging" (Jau, 2014)</p> <p>Existing Apps</p>  

EXISTING SOLUTIONS THAT ENCOMPASS WHAT OUR AUDIENCE WANTS, BASED ON OUR FINDINGS

GOODWOOF	WOOF-A-THON	WOOF-A-THON
<ul style="list-style-type: none"> Focus is on interaction with dogs Educational dog wellness talks Lack of focus on raising awareness for mental wellness Lack of human interaction focus 	<ul style="list-style-type: none"> Promoting cardiovascular benefits of dog walking Exercise and Educational cardiovascular talks Lack of focus on raising awareness for mental wellness 	<p>"the care of animals can foster social interaction and the development of social skills and by extension improve mental health and wellbeing ... could be encouraged to volunteer with animals as a way to manage their mental health, gain confidence and learn new skills." – (Jau, 2014)</p> 

REFERENCES

- Babyak, M., Blumenthal, J. A., Herman, S., Khatri, P., Doraiswamy, M., Moore, K., ... & Krishnan, K. R. (2000). Exercise treatment for major depression: maintenance of therapeutic benefit at 10 months. *Psychosomatic medicine*, 62(5), 633-638.
- Jau, J. (2014). Human-animal interaction and the benefits to mental health: A phenomenological study.
- Heron, K. E., & Smyth, J. M. (2010). Ecological momentary interventions: incorporating mobile technology into psychosocial and health behaviour treatments. *British journal of health psychology*, 15(1), 1-39.

METHODOLOGIES TO LISTEN

Being quick to listen is a highly valued research design thinking skill. It ensures one would arrive at a reliable and valid solution. To ensure this, our team sought to gather as much voices as possible - purposefully of course. We started with the following questions: 1) to who and how would we listen to them, and 2) why did we choose that medium to listen?

Stakeholders	How?	Why?	Type of Analysis Adopted
Students & Working Adults	Twitter API	Twitter provides a wide spectrum of public opinion on topics. Besides opinions, 'retweeting', 'replying' and 'following' other twitter users also means we can identify communities in the network of tweets. These features makes crawling twitter a highly ideal platform at listening to what's out there.	<ol style="list-style-type: none"> Network Analysis (using NetworkX) Topic Modelling (using GenSim) Sentiment Analysis (Valence Aware Dictionary and sEntiment Reasoner)
Students & Working Adults	Reddit API – r/singapore subreddit	Lots of uncensored & anonymous opinions or thoughts which are shared. Furthermore, a research paper has shown that it is possible to track mental wellness discussion over Reddit as it has provided them some meaningful insights.	<ol style="list-style-type: none"> Temporal Analysis Topic Modelling (using GenSim) Sentiment Analysis (Valence Aware Dictionary and sEntiment Reasoner)
Government Bodies/NGOs	Google Query API	To understand what are the laws, regulations or initiatives that are already devised, passed, and enforced. This will let us understand the boundary of our solution and what other values can we further create to improve Singapore's mental wellness.	<ol style="list-style-type: none"> Topic Modelling (using GenSim)
Students & Working Adults	Survey	By conducting the survey, we were able to ask specific questions regarding mental wellness and sieve out the relevance and importance of mental wellness. In addition we are also able to gather the public's general interest on what sort of solution would be suitable to improve their mental wellness.	<ol style="list-style-type: none"> Text Analysis (using Word Cloud) Machine Learning Approach (Using Decision Tree)

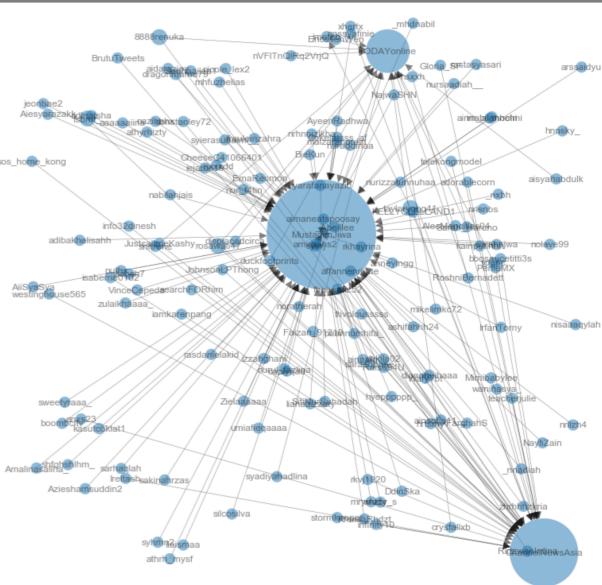
FINDINGS & INSIGHTS

TWITTER (3,878 TWEETS)

Firstly, tweets containing our list of key terms are more negatively sentimental, and they cover a very broad spectrum of topics. These include the stresses at workplaces due to COVID-19, relationship troubles, bleak bitcoin outlook and suicide. Secondly, using the Girvan Newman algorithm, we uncovered 24 communities with 20 and more users who retweet or reply to each other. Topics discovered here are as follows – citizens are affected by KPOP news, self-image, lack of awareness, people encouraging others by promoting self-care, India's politics and school bullying. It's worth sharing that there are 8 communities where users retweet across multiple shared users. One such community is displayed on the right.

REDDIT (1,210 THREADS & 12,665 COMMENTS)

Based on our list of key terms, we found three main topics of what people usually discuss about on mental wellness. The topics are government/society related, health related or relating to their personal life. We also looked at the sentiments over the years (right figure). For both Government/Society related & Health related topics, we can observe that there is a recent increase in sentiments. A deeper dive shows that most of the comments are discussing on how our health facilities are mental-wellness friendly or whether the government has prepared enough on Singaporeans' mental-wellness. This is also aligned with our findings on what we have found being done by the government bodies or NGOs.



GOVERNMENT BODIES / NGOs (192 ARTICLES / WEBSITES)

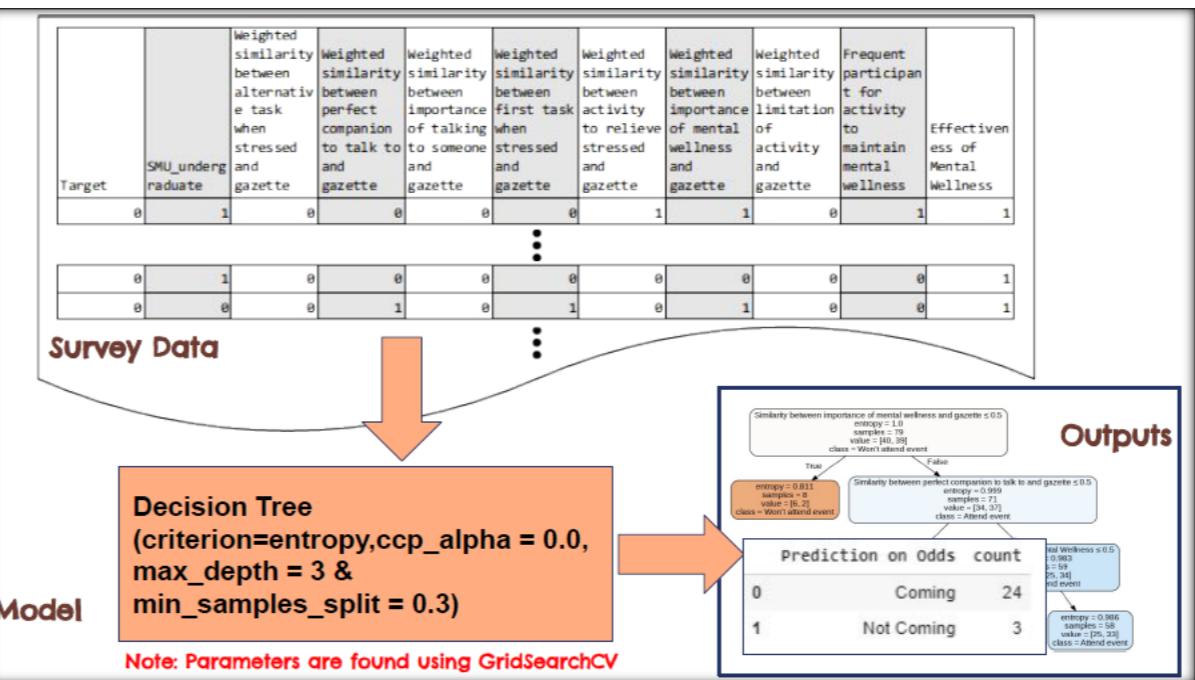
We discovered that government has been investing funds for mental wellness infrastructure/initiatives. We also found out that they are raising mental wellness awareness among the schools and healthcare industries. We also learn that they are formulating policies to improve Singaporean's mental wellness. This relates to our finding from Reddit that there is an increase in sentiments for Government/Society-related topics.

SURVEY via Qualtrics™ (106 RESPONSES)

SMU STUDENTS	NON-SMU STUDENTS	WORKING ADULTS
When asked about their importance of speaking to someone when they face personal struggles, most responded that they wanted some sort of opinion or advice. Most of the other responses were mainly related to how they were feeling such as "validation" and "encouragement".	Many respondents prefer to have someone to talk to whenever they face personal struggles and problems. They want to seek advice from the person they are sharing to, and learn from their perspective. They feel good after knowing someone is listening. The responses mainly relates to "share", "advice" and "perspective".	All felt that mental wellness is important to a varying degree. However, compared to students, the working adults seem to strongly value more objective advice than emotional and mentioned "guidance", "perspective" and "suggestion".

MACHINE LEARNING APPROACH

WILL PEOPLE ATTEND OUR EVENT? WHO ARE THEY?



INPUTS
MCQs: Conducted data wrangling techniques such as integer-encoding or binary mapping on multiple answers and likert-scale questions.

OPEN ENDED: Conducted feature engineering with Fuzzy Wuzzy Algorithm to do similarity match between responses and the keywords which indicated likelihood to join our event.

FOR RELATED QNS: Used weighted similarity score by multiplying similarity score of open ended and the new data wrangling features.

MODEL
We used Decision Tree and our parameters were found using GridSearchCV.

OUTPUTS
Our model will provide a probability of whether the respondent is coming and not coming using odds. We are also able to visualize the features of the respondents in a tree.

BLUE OCEAN STRATEGY

For our Blue Ocean Strategy, we compared it against two other competitors, Woof-a-thon and Goodwoof. We came up with a list of factors: heart-related event, affordability, diversity of activities, educational level, difficulty of challenge, human to human interaction, mental support and also competitiveness of challenges which we have ranked against our competitors in the following graph.

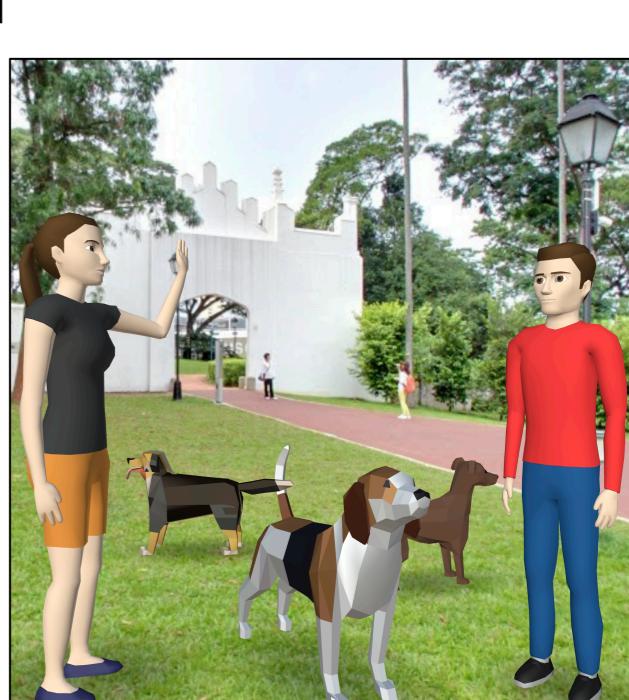
From our survey data, most of them cited that humans and dogs were their top 2 perfect idea of a companion. Therefore, we have included these elements into our strategy and ideated a solution that involves interacting with other humans and dogs.

THE PAW-SITIVITY RACE™

Who let the dogs out? The citizens did. Evidence from our data highlights that people 1) adopt exercising as a form self-care, 2) they rate humans as perfect companions and 3) they prefer confiding in others when in seasons of difficulty. Hence, we concluded that bringing people together for a session of fun and games would be the ideal solution for our problem statement. However, we wanted our proposed event to have a stronger pull factor as a majority of citizens indicated they had insufficient time to practice self-care, according to our survey. Hence, we decided to include a third element – dogs!

While pets are not the primary companion we hear from citizens, they are second most popular. In addition, our basic literature gives evidence that dogs can bring about positive impacts to people's mental wellness.

Combining these 3 elements gave rise to THE PAW-SITIVITY RACE™. We believe it's here where participants can unwind and boost their mental wellness, be educated on the struggles of it, and be taught how to self-care. More essentially, this would raise public awareness on the issues of mental wellness in Singapore.



IMPLEMENTATION & CONCLUSION

IMPLEMENTATION
The main venue that would house participants, refreshments, and open and close the race, would be at the SMU Connexion building. The race will subsequently take teams around Fort Canning Park which is spacious and distant from nearby residential areas. Should there be no urban restrictions, our team envisions expanding the race and taking dogs beyond Fort Canning and into the urban areas of the BBB Precinct.

CONCLUSION

Since embarking on this project, conversations on the importance of mental wellness have sprung forth from within our team and friends. As citizens recognize its importance as well, we truly hope that our proposed solution would contribute to it and the impacts which existing mental wellness campaigns have started. Creating societal value lies not only in the event itself, but in the events that come after. With that, we thank all peer helpers and citizens on their efforts to promote mental wellness in our little red dot – Singapore.

Additional Resources:



Scan to view our solution simulation!



Scan to view our topic modelling!