AN INTELLIGENT MOBILE APPLICATION WITH GENERATIVE AI FEATURE THAT GIVES MEDICAL SUGGESTIONS AND IMPROVE TEENAGE HEALTH AWARENESS

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ABSTRACT

This app aims to expand teenager's awareness with common health problems and provide a platform for users to seek guidance from configured AI [4]. FlutterFlow is the service we use to build the app where users access the information pages and the survey feature. On the "Survey question" page, users are able to fill out the questions. Then all results would then be sent to GPT using the python code which would guide AI on how to generate the answer [5]. Then the answer would be generated and sent back to FlutterFlow for users to view on the "Result" page. And we use Firebase to store information of the "Topic" and "survey questions" [6]. My ultimate goal for this app is to be a secure platform where patients will get immediate diagnosis from professionals when there is an emergency, or they face trouble seeking help. And there will be a chat feature for patients to send out more detailed information including pictures.

KEYWORDS

Teenager Health, Generative AI, Mobile App, Medical Suggestions

1. INTRODUCTION

In this paper, we are trying to solve the problem of teenage girls' unawareness of a lot of health problems in areas where schools do not provide health educational programs. Such unawareness could easily sow the seeds for future health issues that could have huge impacts on their lives.

However, even in schools that provide systematic health programs, issues such as substance use, mental health, etc. are still very prevalent [7]. Undergoing brain developments and hormonal changes, teenagers usually face issues but are not always able to find a trustworthy adult for help [8]. Therefore, in the long run, if there are issues being ignored and not solved on time, it would have a negative impact on their behaviors, health, and even beliefs.

The first methodology tried to improve preventive healthcare for adolescents by using an interactive intelligent learning technology. The short coming for this solution is that it might not be intriguing for teenagers, and they may be willing to spend time on more exciting games in their free time. My project does not face this issue because users would use it when they need to seek help, therefore helping to solve more targeted problems.

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The second methodology is prevention programs in school. This methodology tries to increase teenagers' awareness with common health problems and encourages them to make better choices. However, some schools might not provide health programs, or such programs do not cover all topics teenagers need to know. My project tried to improve this problem by having AI that has less limitation on information.

The third methodology is existing mobile apps that help with users' mental health by helping users to monitor their mood. However, it has the shortcoming of not providing coping strategies. My project improves on these works by giving suggestions with evaluation to help users have a better understanding of what to do next.

Our method of solving this problem is to create a free app that could provide information about common diseases or health problems and provide a safe space where patients could easily find solutions or answers when searching for symptoms. This solution solves the problem by providing reliable information and giving people a safe space to ask when having trouble seeking help from professionals or family members. This method is different from Web pages by being interactive where users could get guidance. Our app is also more accessible to a bigger population by being free on the internet rather than merely on paper. At the same time, it is able to give simple diagnosis when seeing doctors is too time consuming and sometime financially difficult.

We conducted an experiment to test whether the trust in medical advice provided by WellBelle differs between male and female users. And a survey was sent out to collect users' trust level and gender. Our null hypothesis (H0) stated that the mean trust rating would be the same for both genders [9]. And the alternative hypothesis (Ha) would suggest a difference.

We set up a two-sample t-test in Python and got a p-value of 0.043. Therefore, the null hypothesis is rejected. And we got a conclusion that male users have a higher mean trust rating compared to female users. In addition, the standard deviation between female users is higher than male users. These findings are significant that they reflect gender-based differences in trust toward WellBelle 's medical advice feature.

2. CHALLENGES

In order to build the project, a few challenges have been identified as follows.

2.1. Time-Consuming

In Our App, We Have Included A Survey Section Designed To Help Diagnose Patients With Potential Illnesses And Provide Relevant Suggestions. However, Performing These Diagnoses Manually Would Be Extremely Time-Consuming As It Required Consolidating Vast Amounts Of Information And Conducting Extensive Research. To Address This Challenge, We Integrated An AI System Into The App [10]. This AI Acts As A Valuable Resource, Capable Of Generating Accurate And Reliable Answers Within Seconds. We Could Use This AI Technology To Offer Quick And Credible Diagnostic Assistance, Greatly Enhancing The Efficiency And Effectiveness Of Our App In Supporting Patient Care.

2.2. User Experience

Our app does not require users to make an account when using it. Therefore, it would be frustrating for users if they have to put in the same symptoms again and again. To let users have a

better experience and save time if they accidentally close the app, we could use a saved result page where users could come back at any time and review the answers they got. In addition, the result page would look messy when having lots of answers saved and identical answers. Therefore, there could be deleted features for each survey answer to allow users to only keep the ones they want.

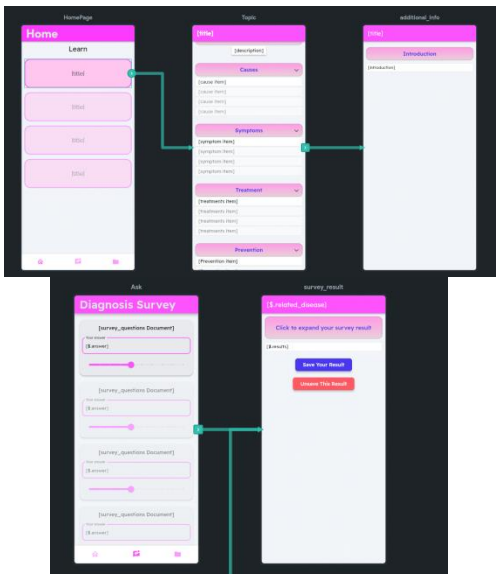
2.3. Organize And Appealing

Another challenge is to make the LEARN page more organized and appealing. To make all topics cover the same level or amount of info, we could implement the same structure for each topic, including title, description, images, symptoms, causes, prevention, treatments, and additional info. All sections are in the same order for all topics. Also, pages would look messy if all paragraphs were cramped together when first seeing them. To solve this, we could use the drop-down feature for each section so that users could click on the sections they are interested in, therefore saving time when looking for information.

3. SOLUTION

In the FlutterFlow app, users are able to put in information in the “Survey question” page [11]. All results would be sent to GPT using the python code which would guide AI on how to generate the answer. Then the answer would be generated and sent back to FlutterFlow for users to view on the “Result” page.

At the same time, our app includes a topic section that gives information on common diseases or health problems. All information appeared in this section are all stored in firebase, where we could make future changes and secure the safety for all data.



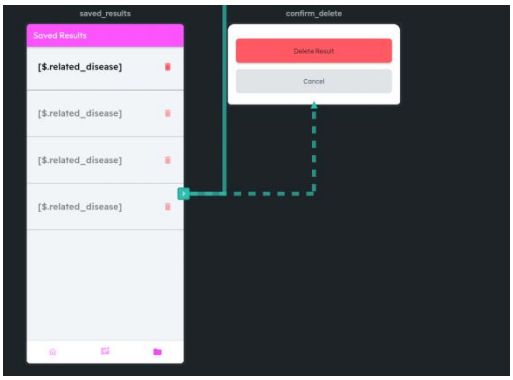


Figure 1. Overview of the solution

Flutterflow is the service we use to build the app where users access the information pages and the survey feature. Flutterflow allows us to design and make an app without using any code. It allows us to implement API access and integrate firebase to store a lot of information [15].

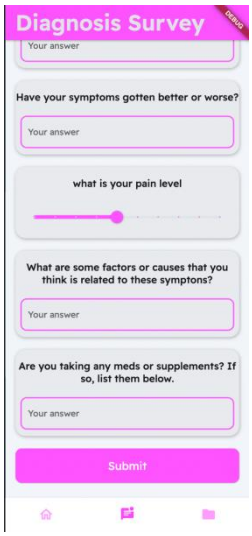


Figure 2. Diagnosis survey

When we first enter the app, the “topic” page appears as a front page and includes subpages that introduce different health topics.

Clicking on the second icon, we would enter the “Diagnosis Survey” page. When the response fields are being entered, it would turn to a separate “Survey Result” page. There users would be able to have the option to either save the result or delete it.

Clicking on the third icon at the bottom, we would enter the “Saved results” page. All results are being saved locally and users are able to see and edit past results on this page.

The second component is the Python code. The code acts as a middle ground between the Large Language Model, by sending the survey to GPT 3.5 and providing its response back to our flutterflow app [12]. First, we built an api using Flask that communicates with our flutterflow app, receiving survey answers from the app and sending the response back. Then, we used the OpenAI library to connect with ChatGPT, which we will elaborate in the following screenshot.

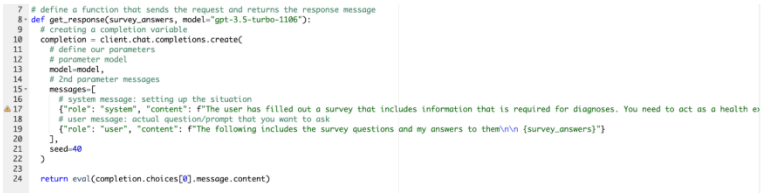


Figure 3. Screenshot of code 1

In this screenshot, the code connects with GPT. By setting up the system message, we tell it to act as a health expert to help identify a disease based on symptoms and other information given by patients. Therefore, changing the tone of the answer and making it more conversational. To make the information easier to retrieve in Flutterflow, we specified the output format of GPT's response by writing out the keys and values we need. Then the answer will be sent back and appear in the "survey answer" section in the app.

Firebase is the component where it stores information about the "Topic" and " survey questions" of the app [13]. In comparison to having all the data stored locally on the app, it is a better option to have them being stored in the cloud in terms of safety and edit reasons.

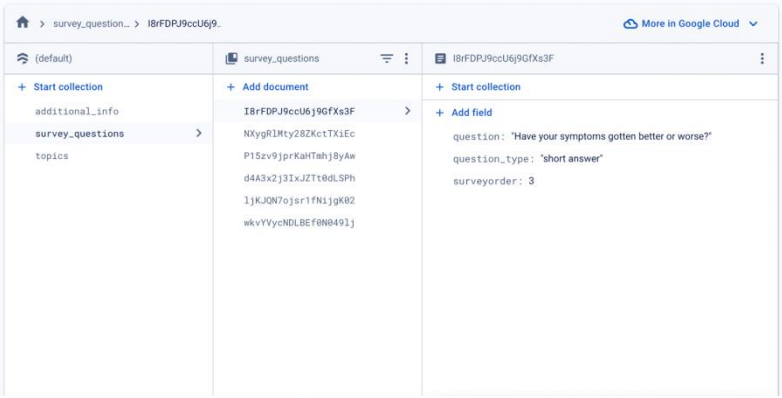


Figure 4. Screenshot of firebase

This screenshot shows where data of different fields of the app is stored. Data in Firebase are organized to the field that contains information such as "question type" and "order", making it easier for us to make later changes

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In addition, we are able to set up rules for reading, writing, etc. So that we could control who is able to see or make edits to our data, therefore making our database more secure.

4. EXPERIMENT

4.1. Experiment 1

We want to test out if the medical advices given by WellBelle is more trusted for different genders.

To set up an experiment, we conducted a survey to collect data that asks users about their opinion on how much they trust the information given by the app, as well as genders of participants. In this experiment we are only focusing on Male and Female. We set up a hypothesis test with the

null hypothesis (H0) being the mean rating of trust of the information provided in the app is the same for men and women. And the alternative hypothesis (Ha) would be the mean rating of trust being different between men and women.

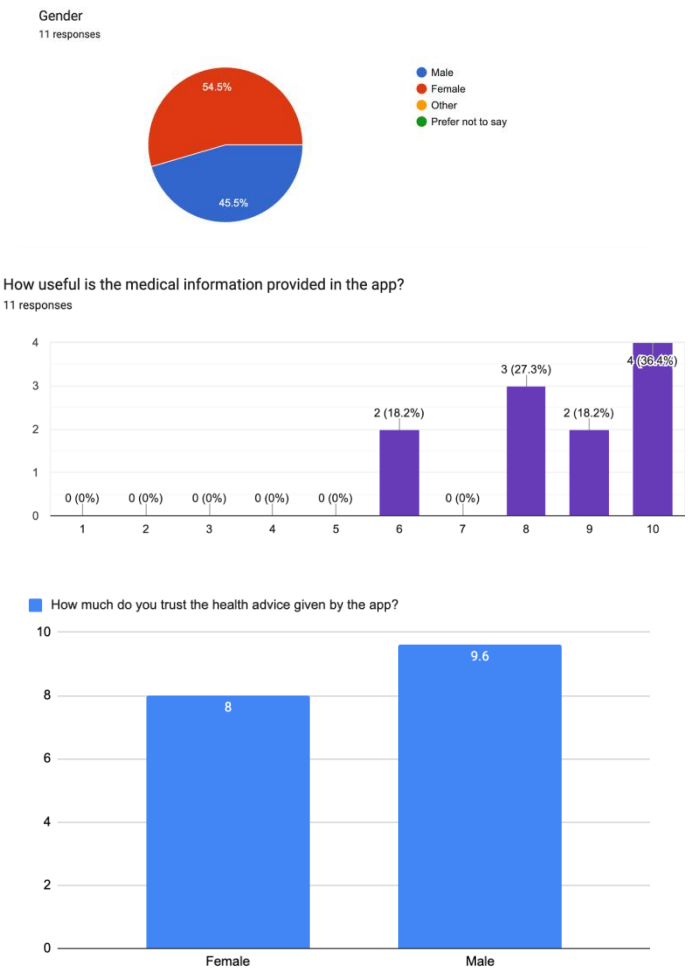

Figure 5. Figure of experiment 1

We ran two sample t-test in python and the p value is 0.042. Therefore, on a 5%significance level, we reject the null hypothesis and conclude that the mean of trust in health advice given by the app is higher among male users than female users. And according to the graph that shows mean values of the two genders, females' mean value is at around 8 whereas men's is at 9.6. Within each gender, the standard deviation of females is 1.291, and standard deviation for male is 0.489. Therefore, there is bigger standard deviations between female users.

5. RELATED WORK

Researchers had created interactive intelligent learning technology that uses AI to track how adolescents engage with adaptive technologies, therefore personalize the the preventive healthcare. One example in the article is a interactive narrative video game on smartphone. This solution could be effective by being a fun and interactive way for educating adolescent health issues. However, there are also challenges such as issues of privacy, ethics, encoded bias, and

integration into clinical workflows and adolescent lives. In addition, teenagers may not be interested in spending their free time on games that are for education purposes instead of more popular and exciting games [1].

My project is different by meeting different needs. It will be used when teenagers are trying to seek help. Therefore, it helps solve more targeted problems, being more efficient when solving health problems.

Prevention programs in school is another way for improving teenage health. This solution is very efficient by being a systematic education program that covers all kinds of topics relating to adolescent health.

“Together, these school-based prevention programmes have shown effects in reducing aggression, crime, alcohol and tobacco use, unwanted pregnancies, sexually transmitted diseases, and mental health symptoms and disorders, and have shown increases in secondary school completion, educational attainment, and income” [2].

However, there are still limitations where some schools might not provide such programs or these programs not covering all topics that adolescents need. My project will not face such problem by using AI that has an extremely wide range of information.

There are a lot of existing mobile apps that aim to help with mental health. One example is an app that presents users’ self-evaluation. Users use the app to monitor their mood, stressors and coping strategies on a day-to-day basis. Such method is effective for users to have a better understanding of their mood change and which coping strategies would be effective for them. However, the app is not able to suggest coping methods based on analysis of the data given by users. In addition, some of these apps are not research-based or subject to regulatory assessments or evaluations, thus their effectiveness cannot be verified. Therefore there still need to be more evaluation and development needed for them to be more effective.

My app improves by giving useful feedback to users and guiding them as a first step when they need help[3].

6. CONCLUSIONS

All diagnosis made by our app is done by AI, therefore there will be limitations in terms of accuracy [14]. In addition, our diagnosis is unable to analyze pictures and will only be based on words provided by patients. A solution for this problem is to have professionals answering questions and doing online diagnosis live. To have that, we would have to have time to advertise our app and get support from professions who are willing to spend time doing online diagnosis.
In our research, we have gathered data and wrote educational articles relating to common health problems. We added AI that is able to answer questions or use information provided by users to give a basic diagnosis.

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