Therapy Journaling App Proposal

University of Rochester
CSC 212/412 Human Computer Interaction
Project Proposal
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Group Members

Name	**Field(s) of Study**	**Role**	**Skills**
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Sydney Dlhopolsky	Computer Science	Frontend, Design, Backend, Presentation	HTML, CSS, Python, Java
Hnin Oo Wai (May)	Computer Science and Business Administration	Research, Frontend, Design	HTML, CSS, Javascript, Needfinding
Liza Pressman	Computer Science and Mathematics	Research, Design, Frontend, Backend	HTML, CSS, Java, Python
Rose Cricchio	Computer Science and Economics	Research, Frontend, Presentation	HTML, CSS, Javascript, React, Vue, Java, Python, C/C++

Problem Statement

Many people struggle with stress, anxiety, depression, and other mental illnesses but lack the resources to help them manage their emotions. Therapy is a great tool but isn't an option for everyone due to financial concerns as well as the stigma around therapy. In addition for a lot of people, including one of the most stressed populations, college students, access to therapy is very limited. Journaling has been found to be extremely helpful in one's mood and can even boost the immune system and improve lung and liver functionality. Moreover, it can improve working memory, result in better grades for students, and alter social and linguistic behaviour. Although there are many benefits for journaling, many people journal but still get stuck in negative thought patterns that inhibit their improvement. Negative thought patterns are a precursor to depression but are possible to mediate with the right help. There are popular journaling app like DayOne, Momento, and TheraChat but they do not have features to provide feedback to journals. Although some of them have access to therapist, these features are not free.

Proposed Solution

Our website is going to allow users to have private journals and receive automated feedback on their journaling in order in enhance the process and improve their wellbeing. We will ask the user about their mood before and after journaling as well as few questions about their day and then allow them to write as little or as much as they want. With the information from their day, mood, and journaling we can collect data about what things make them have certain moods. For example, if someone often says they are happy on days when they also report that they exercised, we can suggest to the user that exercising is linked to their wellbeing. Another example is if they report that they are angry and in that journal entry they use lots of negative words and that does not result in a positive mood change, we could suggest that they aim for more positive words. In addition, we will search their journals for negative thought patterns and give them tips to alleviate those problems and help them reframe their thinking. We will have charts for the users to be able to see how their mood fluctuates with many other factors so they can understand their emotions better. We will use machine learning to learn what words, phrases, and activities are associated with different moods in order to help predict for the user what causes them to feel certain emotions.

The experience will be customizable to the user's needs. The user will take a short quiz to help set up the journal experience in the best way for them. For some it will be a free form emotional outlet and for some it will be guided self improvement with more structure. An important feature of this website is privacy. We will have users log into private accounts and assure them that no humans will read their journals

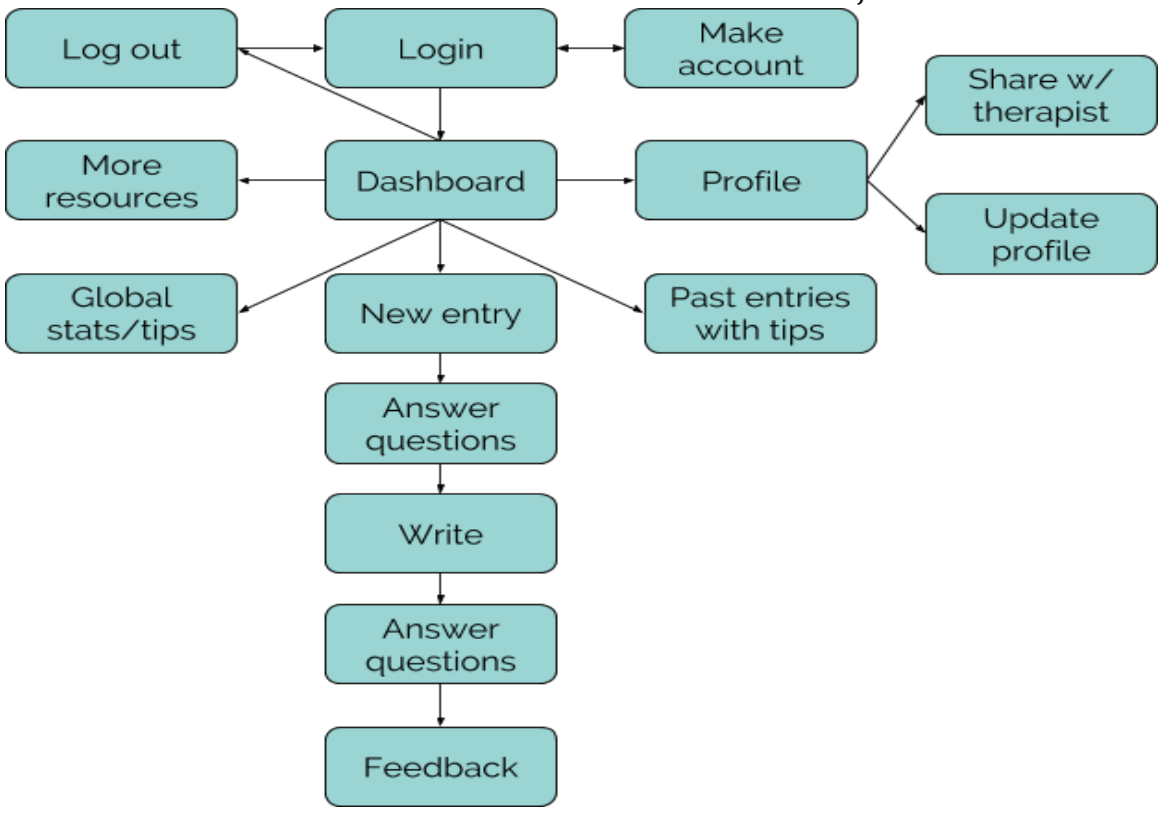

Figure 1: User Tasks Overview

Needfinding

We will use two main needfinding techniques, surveys and interviews, to help refine and adapt our product to best fit the user's needs. We have a few stages of goals. The first stage of our needfinding will be conducted in the early phase of our product design with two main goals in mind: the first being to figure out who we will be marketing our product to or what audience will be most helped by our product; and the second being to find out what applications or features would be most needed from our intended user. Our second stage will consist less of user side feedback and more on expert opinions. We intend to conduct a series of expert interviews with psychology professors and counselors at UCC who are well versed in the field of mental health. The goal of this stage would be to get a perspective from mental health professionals on the benefits and the drawbacks to journaling in general, and then also our proposed product design. This stage will also involve asking specific questions about what other things would be beneficial for our product to include. We hope to be able to talk with experts and gauge what problems exist currently surrounding our topic that we could potentially try to solve through our website.

Survey Questions:

1. What methods do you use to cope with stress?

a. Talking (with friends or family)
b. Talking (with a counselor)
c. Journaling
d. Relaxation techniques (meditation, mindfulness)
e. Exercise
f. Sleep
g. Drinking/smoking
h. Partying
i. None
j. Other (please specify):

2. How would you rank your stress levels over the last two weeks?

a. Very low
b. Low
c. Moderate
d. High
e. Very High

3. How well-equipped are you at dealing with stress?

a. Not at all
b. Not very
c. Moderately
d. Very
e. Extremely

4. How would you rank your access to mental health resources (e.g. counseling or any other methods you might wish to take advantage of)?

a. Nonexistent
b. Lacking
c. Adequate
d. Good
e. Excellent

5. What are the biggest barriers to students using mental health resources?
a. Lack of access
b. Lack of time
c. Lack of desired results
d. Financial concerns
e. Stigma
f. Other (please specify):

6. How beneficial is journaling when dealing with problems such as stress, anxiety, depression?
a. Not at all
b. Not very
c. Moderately
d. Very
e. Extremely

We are designing a website to allow users to have private journals and receive automated feedback on their journaling in order to enhance the journaling process and better improve their wellbeing.

7. Would you use this product? Why or why not?

8. Do you believe any of these features would be beneficial to you?
a. Mood tracking
b. Sleep tracking
c. Exercise tracking
d. Word usage feedback
e. Recommendations (ex: If the computer notice you reported you were happier when exercised more it would recommend exercise)
f. Personalized journaling prompts
g. Freestyle journaling
h. None of the above
i. Other (please specify):

Interview Questions:

1. Do you suggest journaling to patients/students? If so, what causes you to suggest it (specified disorders or certain criteria/personality)?
2. Do you see the benefits of journaling in your patients? If so, what are they?
3. What other techniques do you suggest to your patients to try at home?

4. When you are reading a patient's journal, what patterns or language do you look for and what do those typically indicate about the patient?
5. Can you think of anything we have not included that would be beneficial to our users?

Background information on each professional interviewed will be collected along with the questions. This information will include job title, types of patients they work with (if any), what courses they teach (if any), how long they've been in the field, etc.

Implementation

Technology Stack:

We decided to do a web rather than a mobile application mainly because our group as a whole has more experience with web development. The other reasons we chose web are that the application won't require downloading or owning a particular (iOS/Android) device, and our idea seems to lend itself better to a website: it may require a fair amount of typing being that it is journal-based which is easier on a computer.

We are planning to use a MERN stack: MongoDB, Express, React, and NodeJS. We were interested in using React since it is such a popular library and therefore has good support with documentation and tutorials, and it is also mentioned as a desired skill by many businesses so many be useful in the future as well. MERN is a common stack that uses React and is one that a couple of our group members also have experience with which is why we settled on it. We also discussed using certain NLP-based Python packages such as TextBlob for the machine learning part of the project, which will be more solidified once we start looking into that aspect.

Technical Requirements:

- Create frontend UI using React + CSS framework (Bootstrap)
- Create database schema and interact with database using MongoDB, which will store user info: account information, journal entries, sleep and exercise info
- Use machine learning/natural language processing (probably utilizing Python packages) to search user's entries for positive/negative words and phrases and give personalized feedback
- Monitor information such as sleep and exercise data and present graphs and feedback to user

Features:

- Login screen to prompt for basic info (name, email, password)
- Information screen for first time users to enter certain baseline metrics (general mood, features they would like to use- e.g. tracking sleep, diet, or exercise)
- Main screens to create journal entry (freestyle or with prompting questions) and enter additional (sleep, exercise) info + receive feedback
- Screens to view charts/ representations of past data, e.g. mood tracking over weeks/months (will have to use dummy data for this) or past journal entries with feedback

Technical Challenges:

The main challenge we have identified has to do with the machine learning aspect of the project. The feature we are hoping sets this project aside from other similar ones is the ability to get tailored feedback on journal entries: we plan to search the user's entry for positive/negative words and phrases and give commentary or suggestions based on the input. We are aware of some python packages such as TextBlob that can help with natural language processing tasks, but we do foresee having some troubles with this as it is not something any of us have experience using. To help make this process go smoothly we plan to start with simple tasks such as only looking for positive or negative words in an entry, then moving onto phrases, then onto more individualized feedback for different phrases.

Another challenge is user testing- if we do get actual users to test it we would not be able to read the entries ourselves due to privacy concerns, so would need a way to only view certain extracted data (such as amount of positive/negative sentiments) and only with permission of the user. We will likely end up using a large amount of test data to simplify this situation.

Prototyping and User Study/Evaluation

Three main prototyping stages will be employed after the final design decision. From low to high fidelity, the iteration starts with an interactive wireframe using Invision App where user could navigate through pages. This is followed by high fidelity mockup with colors and design. The final iteration concludes with a fully functioning website.

At each prototyping state, 15 minutes of contextual inquiry will be carried out on 10 users. The contextual inquiry entails interviewing acting as a humble learner and the participant as the mentor. The participant will be given a task to enter journal entry. The interviewer will observe the participant click behavior and note any verbal note the participant makes about what work well and what doesn't. At the end of each inquiry, the user will be asked to fill out the Website Usability Scale survey. Thus, both qualitative and quantitative feedbacks can be gathered.

For reliable data, the user pool is divided as follows:

a) 5 stratified random users (longitudinal study)
- These users will participate in all the three iterations.
- They are enthusiasts of therapy journaling who are or would like to do regular therapy journaling.

b) 5 stratified random users (horizontal study)
- These users will only participate once.
- They do not do regular therapy journaling and have no intention to do so in the near future.

Iteration Cycle Table

Iterations	Testing Environment	Evaluations
Wireframe: Monochrome interactive navigations	One interviewer and one participant. The interviewer will observe while the participant works through a given task. The participant will fill out the survey at the end.	-Is it easy for the user to navigate? -Is the overall service solving the problem? -Further suggestions to improve the task
High Fidelity Mockup: With added visual and color designs using InVision.	One interviewer and one participant. The interviewer will observe while the participant works through a given task. The participant will fill out the survey at the end.	-Are visual designs and colors doing their work to attract users? - Further improvements in the design and user experience.
Actual Website:	One interviewer and one participant. The interviewer will observe while the participant works through a given task. The participant will fill out the survey at the end.	-Overall performance and design aesthetics will be evaluated by asking the participants to fill out Website Usability Scale survey. -Open ended questions will be asked to the participants of to what extent do they feel the website is useful.

The baseline that we are going to use for comparison against our work is conventional journaling where the user doesn't get any feedback from the application. In order to get less biased results, we will use counterbalancing technique for our evaluation. This means that we need a good number of people to use our product for a considerable time which might not be possible. If some of the users decide to walk away in the middle of the process, our results will lack precision and will be less trustworthy.

Alternate Solution

One of the possible setbacks of the project is natural language processing difficulties. While we will make sure to spend enough time on this aspect of our project, we are not sure how good the available tools are and how much we would be able to utilize them. Moreover, in order to be able to relate different words and phrases to different

moods using machine learning techniques, we will require a big dataset. If we fail to acquire such a dataset, we might instead reason about the correlation between phrases and words that users write and their moods.

If we fail to analyze the phrases and sentences in users' journals, there are two alternative solutions: 1) We can just extract the positive and negative words using Google Word Cloud. 2) Limit to simple journaling and mood logging. Extracting positive and negative words can provide overall sentiment to the user. By seeing the sentiments after each entry, the user can reflect on how their days go. As for the second method, there would not be any textual analysis. Instead, the user will log how they feel before and after journaling. They can observe whether they feel better or not.

Timeline & Deliverables

Deliverable	**Date Due**	**Members**
Needfinding: surveys	3/10/19	Liza, Rose
Needfinding: interviews	3/18/19	Liza, Rose
Wireframe	3/20/19	Sydney, Liza
Test wireframe	3/24/19	May, Mohsen
Interactive prototype	3/27/19	All
Test prototype	3/31/19	May, Mohsen
Login system	4/1/19	Rose, Mohsen, Liza
Dashboard	4/1/19	Sydney, Mohsen, Liza, Rose
Database schema + storage functionality	4/8/19	Mohsen, Sydney
Create + use test data	4/15/19	Rose, May
Machine learning algorithm	4/15/19	May, Mohsen
Presentation video script	4/20/19	Rose, Mohsen
Presentation video	4/23/19	Rose, Mohsen, Sydney
Presentation slides	4/23/19	All
Presentation poster	4/23/19	All
Final presentation	4/23/19	All