

Project Proposal Report

Team No:

27

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Project Name:

Every Mind Matters (E2M)

Project Synopsis:

Web app designed to provide supplementary resources for people struggling with their mental health. It includes a chatbot to counsel people with suicidal thoughts, a social network and a panic button.

Project Description:

There is a shortage of volunteers at the local and state offices for the national suicide prevention hotline. The volunteers receive training for incoming calls and texts from people looking for help. While there is space for many people to work at a time, the emotional weight of the work discourages people from signing up and sometimes even drives people away. The goal of our project is to assist leaders and make their workload more manageable. We believe that a well built and trained AI chatbot can do approximately the same job as a human volunteer participating in the texting program. This involves some advanced natural language processing and extensive training of AI. This will be hosted on the same platform as the rest of the project.

The second part of our project is a social network. Many studies show that social media usage can amplify stress and disordered thinking for many people. This network is specially designed for people affected in this way and provides them a platform to connect, relate, and share their stories and advice without fear of being “trolled”. This network will be protected by rules and regulations that prevent trolling or harmful messages. The end result of the project will be an app containing these two elements, hosted on a cloud platform.

The third part of the project is a panic button that will alert a pre-specified number of people, sending them the location of the person when the button is pressed in a specific sequence.

Project Milestones:

Semester 1:

- Research algorithms and requirements for all parts – 10/1/21
- Plan interfaces and UI/UX - 10/18/21
- Initial coding, have shell of Social Network functioning - 10/29/21
- Initial stories, have a basic bot functioning – 10/29/2021
- Implement restrictions, alter themes, specialize network - 11/26/21

Semester 2:

- Implement the panic button – 3/14/2022
- Build and train chatbot on cloud - 3/14/2022
- Complete design of the Social Network - 3/14/2022
- Launch of social network and Chatbot on mobile app - 4/15/2022
- Add Device management UI on the mobile app - 4/15/2022

Project Budget:

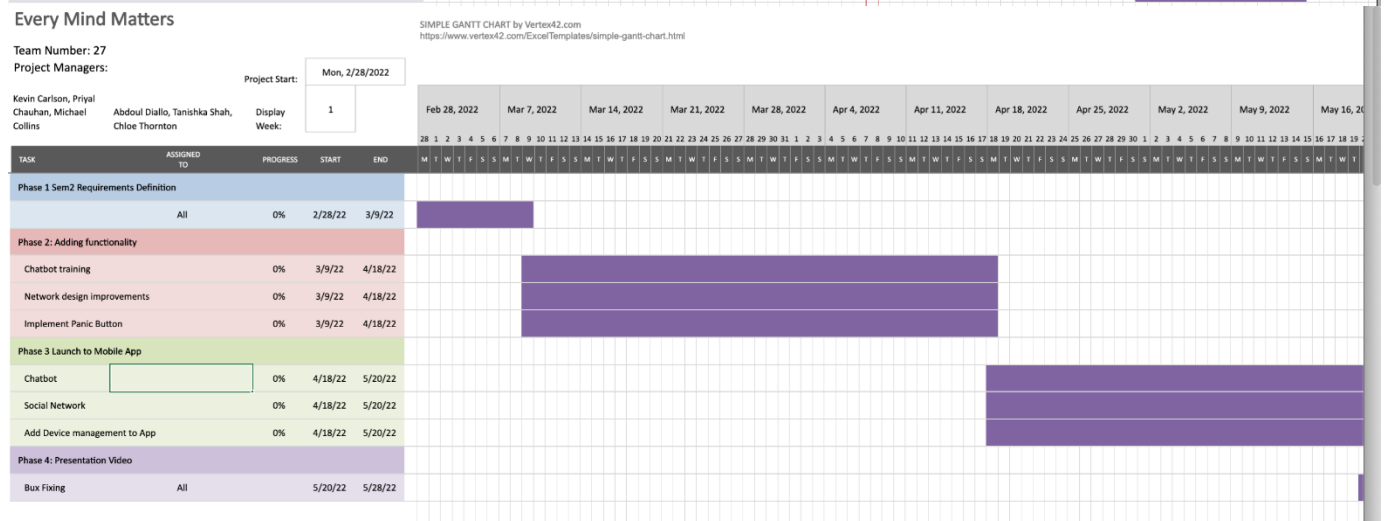
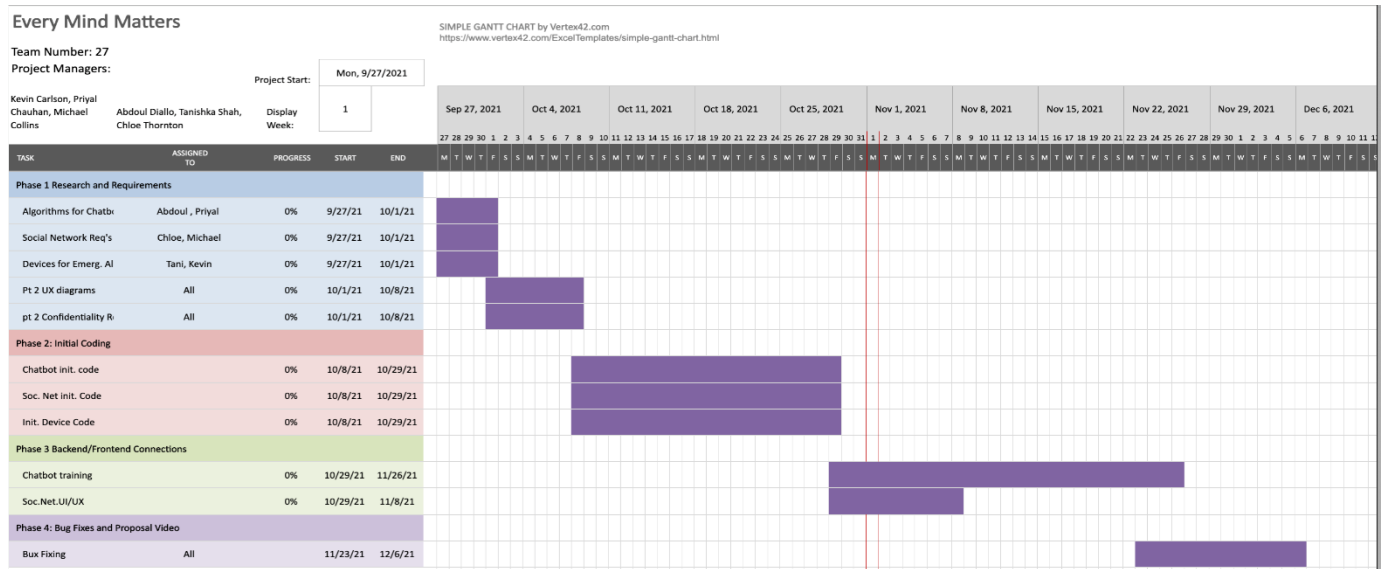
Network Host Platform:

- HumHub – free

Cloud Platform:

- AWS - \$10 / Domain Services - \$5/month

Project development schedule:



Preliminary Project Design

The project consists of 3 parts: a social network, a chatbot and a panic button.

Social Network [Xpress]:

The social network is built using HumHub, an open-source platform for building social networks. HumHub provides a modular platform based on the "Yii2" Framework. The modular part of HumHub allows developers to add new features or change the behavior of existing core features by means of custom modules.

Languages used throughout the platform are:

- PHP
- JavaScript
- SQL (MySQL/MariaDB)
- HTML
- CSS/LESS

HumHub is based on the Model-View-Controller (MVC) pattern and uses frontend frameworks such as:

- jQuery
- Bootstrap 3
- Less
- Fontawesome.

Social Network setup:

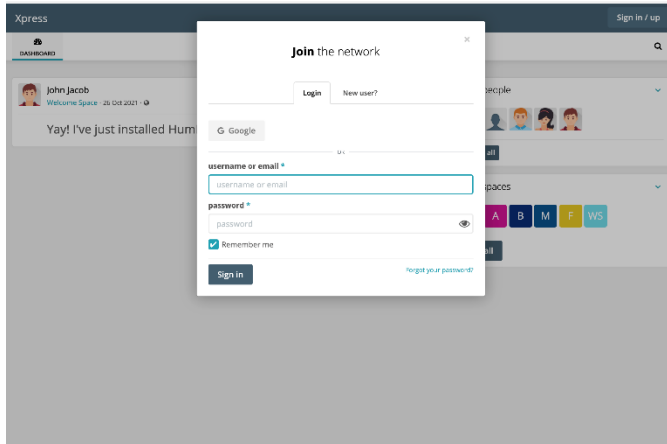
The social network has a dashboard that will be the main page for the user. They will be able to see random content from each of the spaces they belong to. Spaces are groups that a user can be part of. In our social network every disorder has a space of its own and the user can join as many spaces as they want to join. Each space will have certain terms and conditions that the user will have to agree to before they can access the space. Spaces can only be created by admins. A user can request the admins for a space to be created using a poll or a personal message. Depending on potential uses, the space will be created. Because this was a social network based on mental health issues, we decided not to allow users to send friend requests to each other. All a user can do on the social network is post, like posts, comment, reply, bookmark posts and participate in tasks and polls. We installed a variety of modules to make our social network possible and to bring ease of experience for the users. We chose to add multiple ways for authentication. Those are via email, Gmail, Facebook, Discord, and using username and password. We were able to add features that add more to our users' experience such as the weather forecast. HumHub uses:

- weatherwidget.io:
 - So that users can see the weather outside.

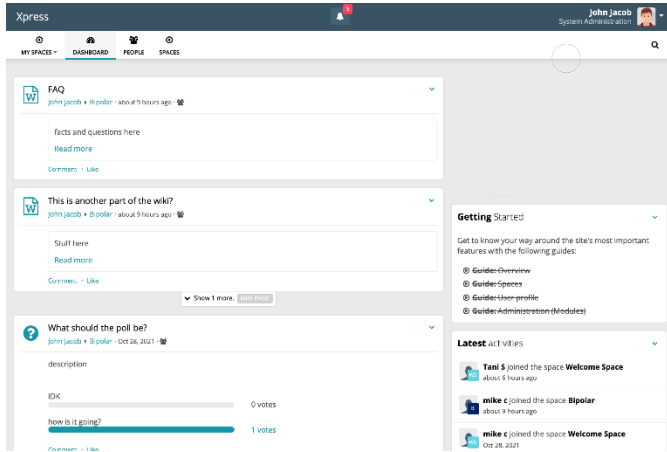
- Google Firebase for push notification
 - For notifying users whenever there is change in content that they posted.
- Legal Tools
 - Legal tools is a module that helps us specify legal Terms and Conditions, Privacy Policy, Imprint, Cookies notification, Legal Update notification, and Age of Consent for our social network and have users read and accept it before entering. The Terms and Conditions for each space is also set by 'space' administrators.
- Polls
 - For users to have statistics over different tools, resources, methods other people use that help them in their daily lives and in times of crisis.
- Tasks
 - This is more of a goal setting for each and all members of a space. For instance, people can set goals to achieve by a certain date and update it.
- Report
 - For users to report other users that are breaking rules and not following the terms and conditions.
- Spotify
 - For users to create playlists they find soothing that they can share with others. This is a way to add more interactions and connections among members of a space.
- Content bookmarking
 - Allows users to bookmark content and access it from their profile.
- Scroll up:
 - Allows you to scroll up in one action for app ease of use for users.
- Wiki for spaces
 - Allows admins to have a page within the space with information about the disorder in the space and other things like who to contact, articles to read and latest news.

Below are pictures of what the user interface looks like. All these are subject to change:

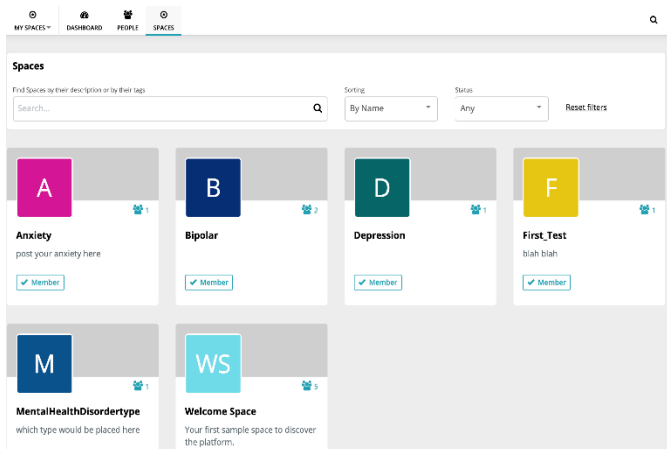
Login:



User Dashboard:



Spaces:



Chatbot:

We used RASA open-source and RASA X to build the chatbot. RASA is an open-source machine learning framework for automated text and voice-based conversations. Understand messages, hold conversations, and connect to messaging channels and APIs. As our project requires, we use Rasa X which is a tool installed on top of Rasa Open-Source that serves a great purpose for Conversation-Driven Development (CDD). Rasa configuration files are written in YAML. There are 3 main parts in building and training a rasa bot in the data folder, which are:

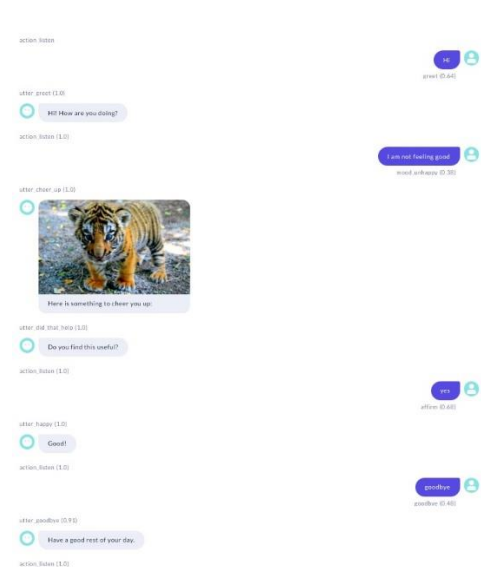
- nlu.yml for the listing intent examples and labeling keywords among those examples
- stories.yml for conversation examples that the bot can use to communicate.
- rules.yml for specifying what the chatbot should do for each intent.

There are two other important parts of the configuration. The config.yml where we determine the “pipeline” that is followed by the chatbot to take input from the user and analyze it. We use the pre-loaded model Spacy for our language model. That is because it has pre-trained English word vectors and doesn’t require us to have a lot more training data. The “Domain” (domain.yml) is “The domain defines the universe in which your assistant operates. It specifies the intents, entities, slots, responses, forms, and actions your bot should know about”.

Below are pictures of a sample story and what the conversation with the bot would look like. All these are subject to change:

Sample Story & Conversation:

```
- story: sad path 1
  steps:
  - intent: greet
  - action: utter_greet
  - intent: mood_unhappy
  - action: utter_cheer_up
  - action: utter_did_that_help
  - intent: affirm
  - action: utter_happy
- story: sad path 2
  steps:
  - intent: greet
  - action: utter_greet
  - intent: mood_unhappy
  - action: utter_cheer_up
  - action: utter_did_that_help
  - intent: deny
  - action: utter_goodbye
```



Panic Button:

That panic button is going to consist of a device and implementation in the web app. The user will be able to configure a series of emergency phone numbers to be notified in case the button is pressed. The button itself will be placed in an object that the user can wear such as a bracelet or necklace. Each user is automatically assigned a Google voice phone number through which the notifications will be sent. The user can give the number to their emergency contacts before so that they know the importance of notifications from that number. They will be able to configure the sequence in which the button is pressed to send out the notifications. Once the button is pressed in that sequence it will trigger the web app that will then get the location of the button and send it to the emergency contact numbers.

Design Constraints:

Our project has design constraints in a few ways. Firstly, the platform we used to build our social network HumHub, needs a webserver with PHP and SQL integration to function properly. The platform used to build the chatbot, RASA requires python versions 3.6, 3.7 or 3.8.

It also requires the python module Spacey. A business constraint that applies to our project is the deadline by which we need to have the project completed. We need to be done with the project by early April.

Ethical Issues

Qualifications:

One possible issue with the project is the ethics of an AI bot counseling someone in one of the most vulnerable times of their life. If we were to launch this to the public, we would have to have a person or team of people monitoring the actions of the bot and constantly updating its actions. We would also need to run multiple studies comparing the abilities of the chatbot with the abilities of a human volunteer to evaluate its capabilities to register emotions. This is possibly the biggest issue with the project and would require the highest levels of approval from different organizations and the most frequent updates and re-evaluation over time.

Trolling:

Another issue we could face is trying to deal with people who would join the social network just to troll the members. If we don't handle this correctly, it could render our network pointless, since the whole idea is to protect people who are at their most vulnerable. It will likely be difficult to monitor the network efficiently and effectively if there are many users on the site at a time. While this might not be the case right away, we would still probably need a large team of moderators to read between the lines of people's comments and posts and find out if they're being honest or just trying to mess with people.

Intellectual Property Issue

A possible issue that could come up with this project is the fact that we used the open-source platforms HumHub, Rasa Open Source and Rasa X to implement our project. While this is completely ethical and acceptable for the constraints of this project, if we ever decided to try to profit off the app or launch it publicly this could cause some issues. We anticipate having to buy the source code from HumHub or sign a lease-like contract that says we can use it for a given amount of time. This also goes hand in hand with the ethical issues we might be facing, as the company may not want to be associated with our project.

Change Log

We originally planned to design and code the social network ourselves but thought that using an open-source platform would be easier as it would still accomplish our goals but would take less time and we wouldn't run into many issues.