

# TheraThrive

## Integrated Therapy Software



Alex Gribble | BME



Grant Guernsey | CS



Ricky Roberts | CS



Kyle Woods | EET



Thavishka Gamage | CS

### Clinical Problem

Major Depressive Disorder is a serious mental health condition that affects approximately 280 million people globally. Depression is characterized by long-lasting feelings of sadness, hopelessness, and a loss of interest in everyday activities. Arising from a mix of biological, psychological, environmental, and social factors, depression leaves patients lacking motivation to do everyday activities and withdrawing from the people close to them.

### Treatment gap

The rising demand for mental health care has outpaced the supply of professionals. Digital Cognitive Behavioral Therapy (CBT) solutions have emerged to fill this gap by offering affordable, always-available support. However, they lack the real-life connections that are crucial for overcoming depression, highlighting the need for an integrated approach, one that combines CBT with social support and accountability.

### What is CBT?

Cognitive Behavioral Therapy (CBT) is a structured, goal-oriented approach that focuses on the present to change negative thought patterns and behaviors. CBT is based on the idea that our thoughts, feelings, and behaviors are all deeply connected. CBT works through all three by enabling therapists and clients to work together to identify, challenge, and replace negative automatic thoughts and behaviors through strategic growth experiences.

### Target user

- Major Depressive Disorder, may not have formal diagnosis
- On their smartphone or laptop often, technology proficient
- Disconnected from supportive social relationships
- Has a quiet isolated environment at home
- 12-49 years old

### Market opportunity

**\$6.25 billion**  
U.S. mental health apps market in 2023

**15.2% growth**  
expected each year

**\$0.015** estimated cost of API usage for 1 hour conversation

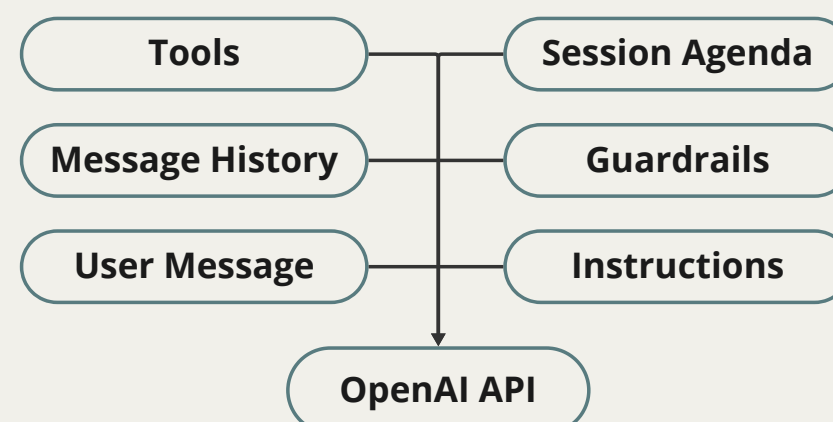
Our competitive differentiator is that we combine CBT with relationship building support for holistic psychological and social treatment of depression

### Our Solution

TheraThrive Integrated Therapy Software combines the benefits of computerized CBT with social support. Users log in to a convenient website to chat with an AI-powered assistant for weekly hour-long therapy sessions. The chatbot uses a structured agenda, agenda-item specific prompts, and tools to provide effective therapy and relationship building support, enabling the treatment of depression from both a psychological and social dimension.

### Conversational Intelligence

The software provides the API accessed AI with greater awareness of the conversation structure by passing in an agenda, instructions for agenda items, and a current agenda item status. General conversation instructions and guardrails are also passed into the API along with the message history and most recent user message. Function calling tools provided to the API allow the model to mark agenda items complete or detect user self harm to activate a crisis intervention response.

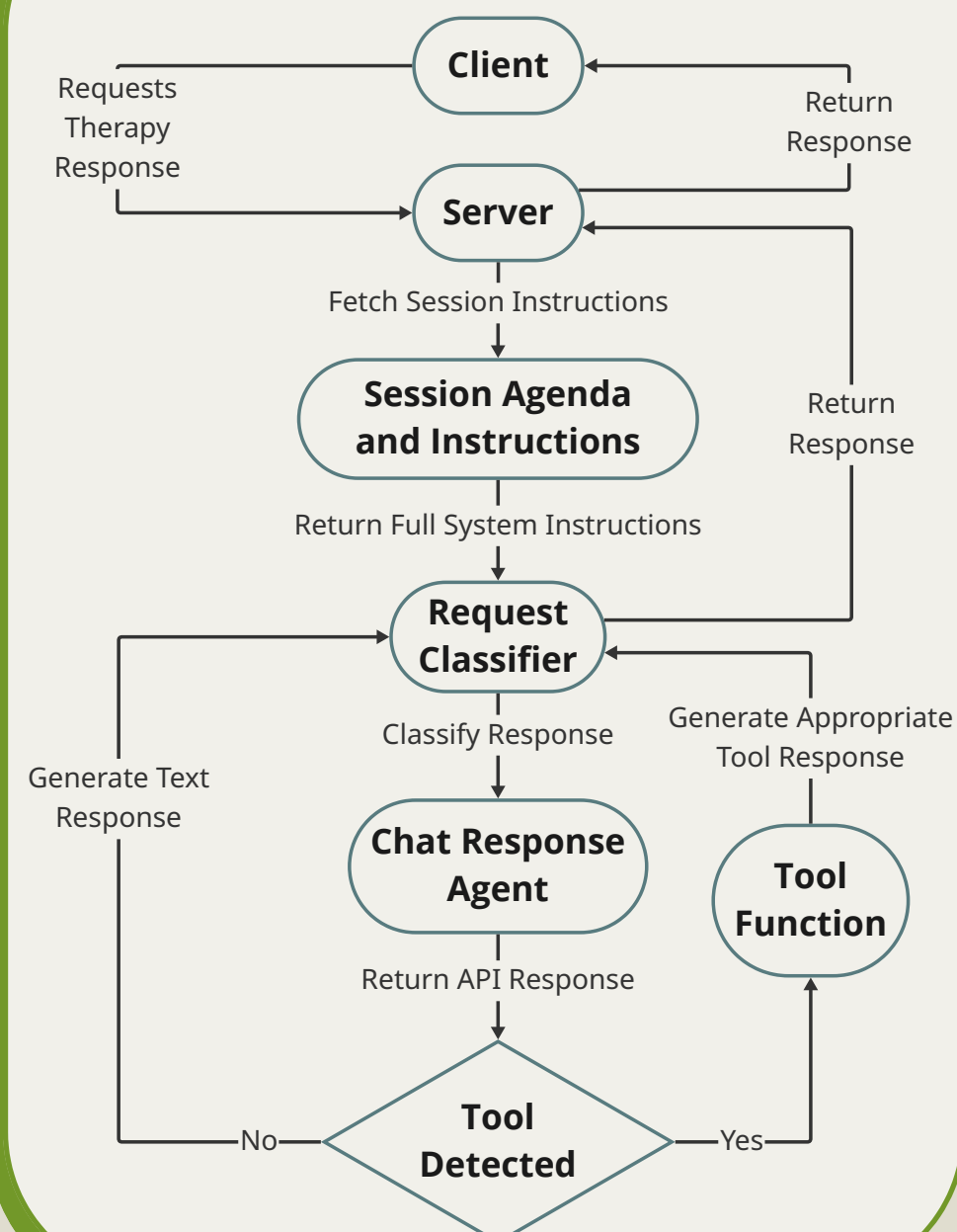


### Technology Used

- **Django**: Powers the back-end server with a robust framework for handling API requests in Python
- **React**: Drives the user interface, delivering a dynamic and responsive experience in JavaScript
- **Postgres**: Serves as the reliable database system for efficiently storing and managing user data
- **RESTful API**: Enables seamless communication between the front-end and back-end, ensuring scalable architecture
- **OpenAI**: Integrates advanced Large Language Models within an Agentic framework to power the virtual therapist



### Conversation Response Diagram



### Challenges Faced

- **Tool call misfires** - An OpenAI technology called tool calls was used to identify when agenda items are complete, but they did not activate as precisely as anticipated
- **Cross disciplinary collaboration** - Differing schedules and capstone requirements required strategic collaboration
- **Prompt engineering** - Designing system prompts to correctly guide behavior and establish effective guardrails

### Improvements

- Programming more CBT sessions and techniques
- Additional relationship building guidance
- User interface
- Mobile app integration
- User testing for more informed design decisions

### Features to add

- Co-creation of conversation agenda with user and chatbot
- Negative Automatic Thoughts journal
- Time elapsed prompt input for better conversational flow
- Accountability partner messaging