

Reaching out : Towards a sustainable allocation strategy between users and therapists

Prateek Chanda
Microsoft Research India, Bangalore

Abstract

During recent times, a wide range of mental health apps have become quite popular. While most mental health apps in recent years focuses on having self help modules to assist users towards their wellbeing, most apps do not include a dedicated system towards connecting such users with mental health experts or professionals. In this paper we hence present the idea of a socio-technical system that can act as an auxillary component to such mental health apps by providing seamless connection with therapists based on their availability and keeping in mind user privacy.

Problem Setting

A socio-technical system supporting a one-to-one message feature with varying modality (audio/text), whereby users can send a message directly to a therapist and vice-versa. Hence we investigate the allocation strategy with the below agents involved

- **Users** General users of the app or the web interface.
- **Therapists** Mental health professionals who have required expertise and can allocate some time during their daily therapeutic sessions on this app/web interface to interact with potential clients.
- **Volunteers** volunteers would be responding back to users whose message requests are in pending by the assigned professional.

Key Contributions

- A perfect allocation match for a user w.r.t a therapist.
- Minimizing therapist and volunteer burdens with too many user allocations.

Architecture

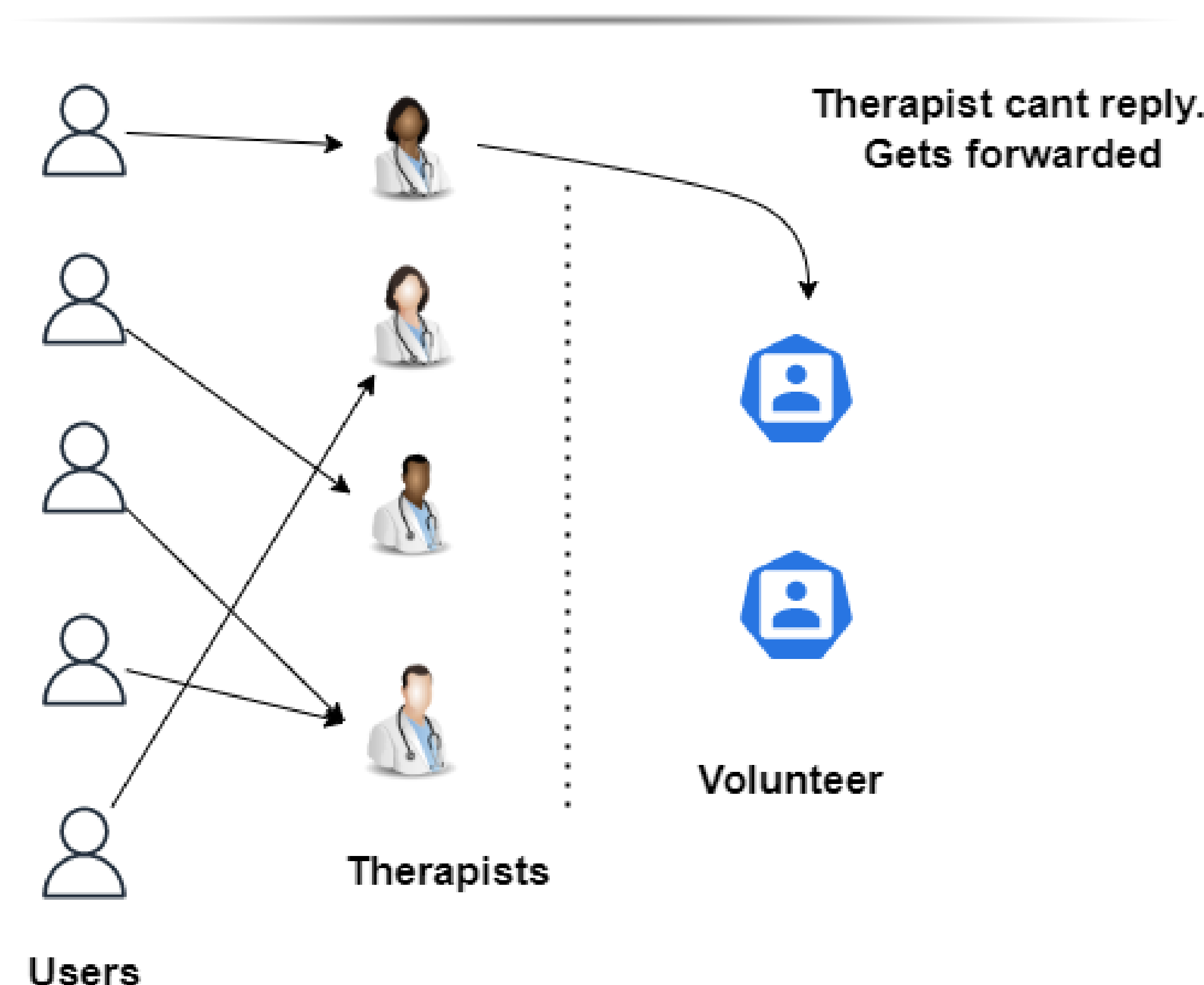


Figure 1:User Therapist Allocation Use case

Towards Fairness in Allocation

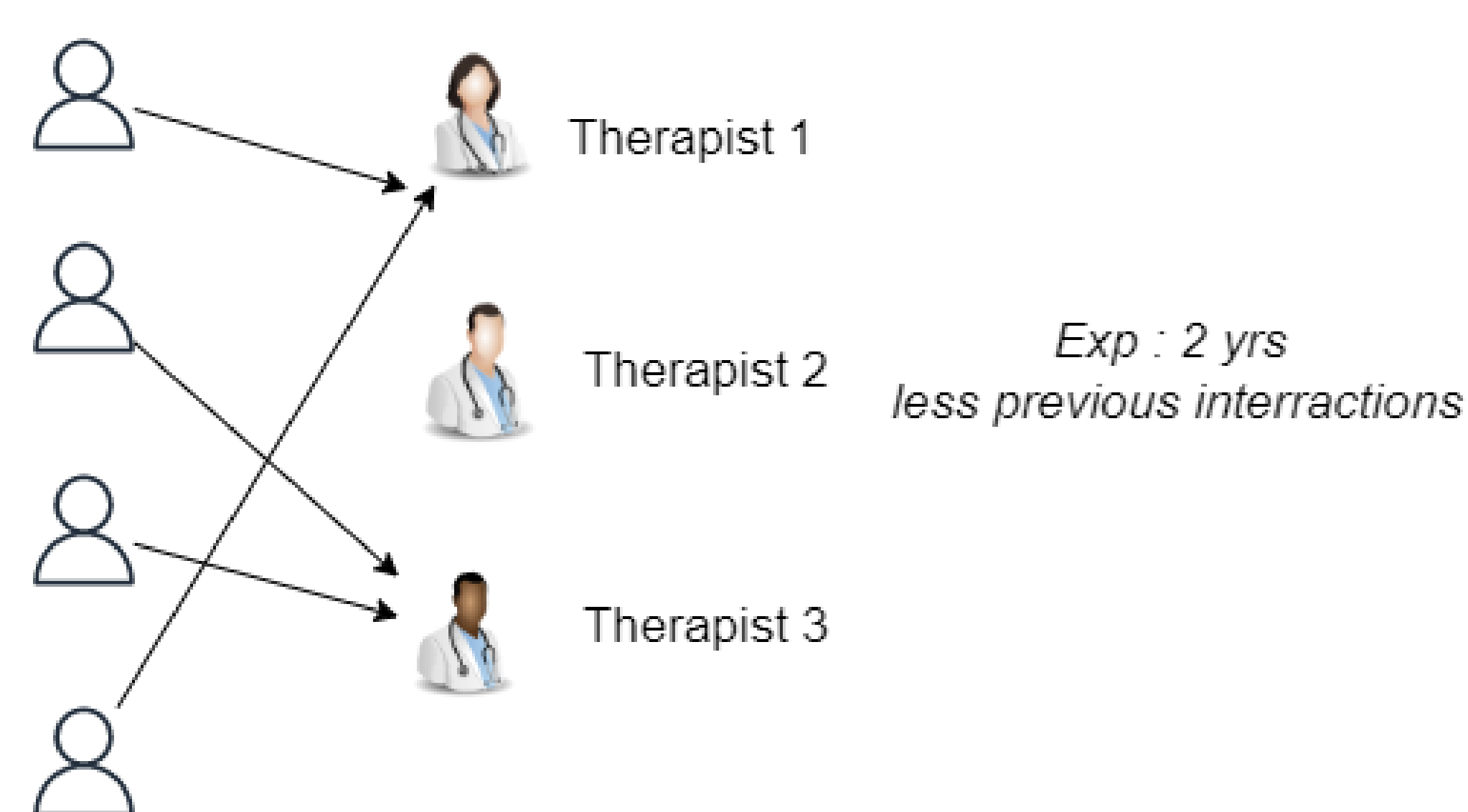


Figure 2:Therapist 2: with less years of experience and new in the system gets no requests

- How can we ensure fairness in the system such that young therapists who are new in the system get a fair share of user requests.
- Also we need to explore the pitfalls of underrepresented therapists in the distribution.

Multi Objective Optimization

Maximize overall user interests and matching

$$\max Match(\mathbb{U}, \mathbb{T}) \forall u_i \in \mathbb{U}, t_i \in \mathbb{T} \quad (1)$$

Minimize therapists burden - too many requests

$$\min TBurden(\mathbb{T}, \mathbb{A}_{\mathbb{T}}) \quad (2)$$

Minimize volunteer burden - too many requests

$$\min VBurden(\mathbb{V}, \mathbb{A}_{\mathbb{V}}) \quad (3)$$

\mathbb{U} = Set of all users in the system

\mathbb{T} = Set of all therapists in the system

\mathbb{V} = Set of all volunteers in the system

$\mathbb{A}_{\mathbb{T}}$ = Indicates allocation matrix of each therapist w.r.t users

$\mathbb{A}_{\mathbb{V}}$ = Indicates allocation matrix of each volunteer w.r.t users

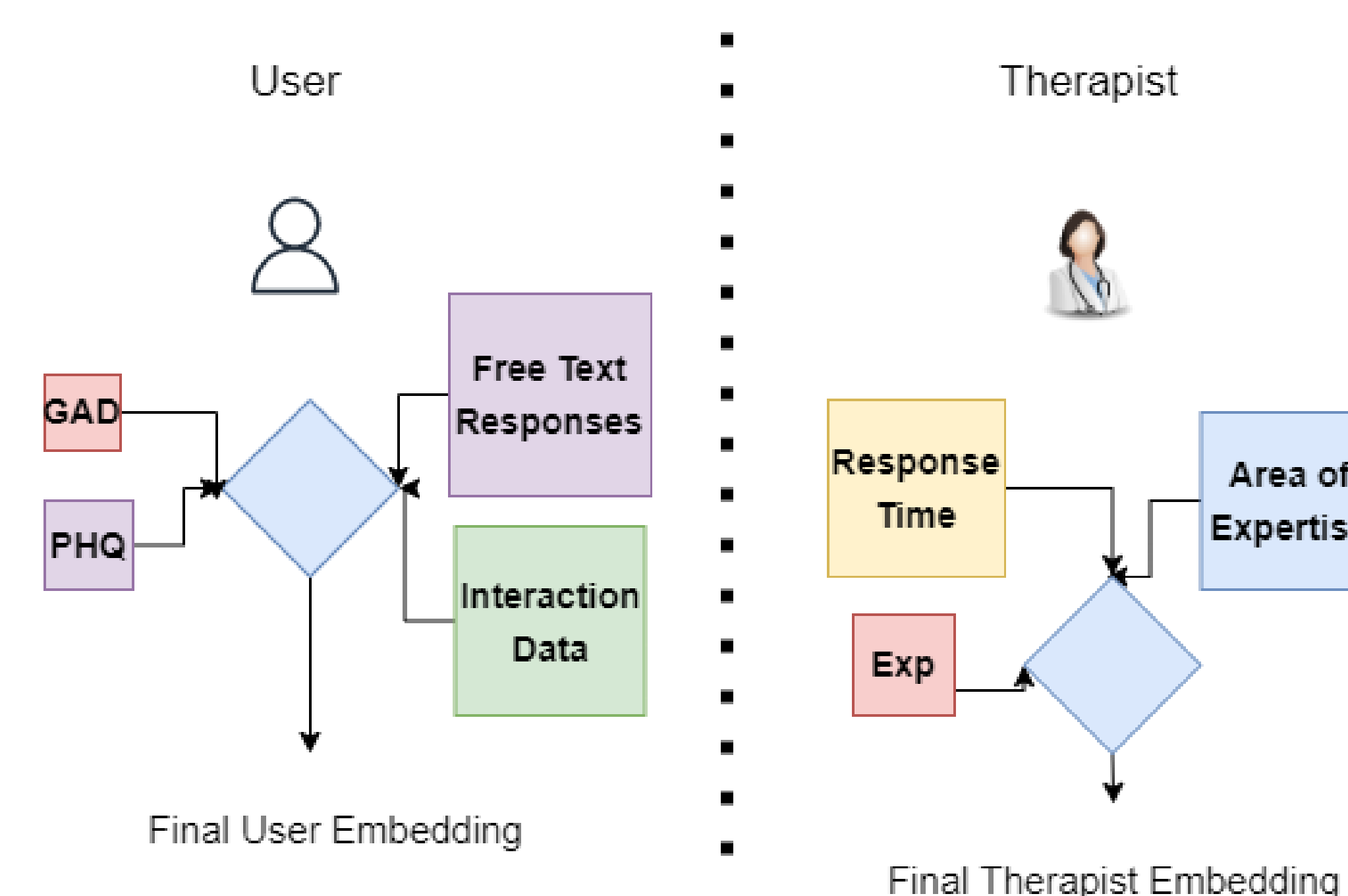


Figure 3:Individual Profile Embeddings

A Solution Towards Public Health

While in-person interactions with therapists maybe preferable for someone, often due to certain circumstances, therapy at home via online medium may be a better viable option. This is particularly relevant during recent times due to the global pandemic where in-person interactions have been highly compromised. Existing therapists/professional experts can thus employ through such an online system to connect with more clients who need their help much more efficiently, while users can easily connect through an app with a therapist, without having to face any barriers towards finding any such resources.

Related Work

- Recent mental health applications focus more towards empowering an individual through self-help which is often unguided.
- Automated therapy *Woebot*, *Wysa* may be of limited help, but real user connection is always required in mental health.