

## Domains

1. **Taking ownership of health:** With healthcare systems often difficult to access and medical misinformation on the rise, it's more important than ever for individuals to understand their own bodies and have intuitive, user-friendly tools to take charge of their own health in a safe and contained way. I want to empower people to track aspects of their daily physical health and present the resulting information in meaningful ways to identify patterns, reduce health anxiety driven by online fear-mongering, and have clear, data-informed conversations when they are finally able to meet with healthcare professionals.
  - **Poor quality of sleep:** Having personally dealt with insomnia, I found it incredibly difficult to keep track of my sleep patterns, even with basic qualitative journaling. Without a reliable method to track and quantify these issues, I had no way of effectively communicating them to my doctor beyond sporadic personal accounts, making it harder to intervene before the negative effects of poor sleep began to accumulate. *However, recording any physiological signals that can act as true indicators of sleep would require a significant, calibrated hardware solution such as a smartwatch and potentially more. I would prefer to work on a project that can have a very software-heavy implementation.*
  - **Data-driven management of chronic pain:** Chronic pain is a complex and frequently invisible condition that affects millions of people, yet it is frequently misunderstood and dismissed by healthcare providers. The subjective nature of pain makes it difficult to evaluate, as people tend to struggle to accurately describe their experiences. There is also difficulty in presenting consistent data over time, preventing patients from helping medical professionals understand the severity and progression of the condition. *I believe that there is a gaping need for tools to track and communicate chronic pain, considering that patients are even denied appropriate care because they are unable to accurately articulate what they are feeling on a regular basis.*
    - I. **Feature** – BodyMap: Users are presented with a visual map of a human body outline which they can customise to match their body's dimensions. Everyday, they can highlight areas where they feel pain and rate each one on a scale of 1 to 10, relative to the previous day's scores.
    - II. **Stakeholders** – Patient (the user who experiences chronic pain and interacts with the app); Inner Circle (someone personally close to the user who tends to hear about their condition regularly); Healthcare Professionals (someone who will be asked to review the data collected and analysed by the app); Insurance Companies (someone who may be asked to cover more treatment if the app is successful); Advocacy Groups (someone who may use the data from the app to support their cause for awareness). Impact: Both Patient and Healthcare

Professionals suffer from poorly presented data, but Patient suffers from lack of validation and subsequent medical treatment of their condition. Inner Circle presumably cares about Patient's well-being so they may benefit from Patient's healthcare needs being met. Insurance Companies will be less than thrilled about the app's success as it would mean more coverage for some current customers, but could also gain new customers.

### III. Citations

['I was told to live with it': women tell of doctors dismissing their pain](#): An article about women dealing with years-long pain that drastically affected their quality-of-life and still not being believed by doctors.

[Evaluating Differential Effects of Specific Pain Dismissal Interactions with Physicians](#): A research paper that examines how doctors react to and perceive different kinds of physical pain negatively and how adolescent patients feel about pain dismissals.

[Women and pain: Disparities in experience and treatment](#): An article about women tending to experience more stigma and discrimination on average when seeking treatment for chronic pain.

[Gaslighting in women's health: No, it's not just in your head](#): An interview with multiple doctors and pain specialists about how and why patients are not believed when they report conditions like chronic pain, specifically women.

[The downgrading of pain sufferers' credibility](#): A review paper discussing how 'epistemic injustice' can manifest as systemic discrimination against chronic pain sufferers, reducing their credibility and preventing them from receiving appropriate care.

[When Nobody Believes You](#): A personal account of a psychologist who discusses her patients' experiences with dismissals of chronic pain as 'fake' or purely psychological issues to overcome.

[Healthcare Professionals' Perceptions of Challenges to Chronic Pain Management](#): An empirical study that reports low healthcare provider confidence in managing pain and limited knowledge about use of opioids for chronic pain

- **Getting ahead of cognitive decline**: My grandfather was diagnosed with Parkinson's Disease, and, as is often the case with neurological disorders, the early signs were present but went unrecognized, making timely intervention impossible. Cognitive decline, often associated with such conditions, tends to progress gradually, often remaining unnoticed

until it has significantly impaired daily functioning. By the time these symptoms become evident, the chance for early intervention is frequently lost, making it more challenging to delay the progression of the disease. [I think that this delay in identification underlines the need for proactive monitoring in earlier stages of life and scientifically backed personalised strategies to preserve cognitive function.](#)

- I. **Feature** – MentalGym: An NYT app-style gamification of common neurological testing batteries that can be administered without physician oversight. Users gain points on accuracy and consistency in taking these tests. Personalised trends such as streaks and abnormal results are maintained as user data and users are notified about any statistically significant decline in performance.
- II. **Stakeholders** – Player (user who plays the games regularly and engages with the app); Inner Circle (someone who is close to the user and may receive recommendations to try this app); Healthcare Providers (someone who may handle users' concerns if the app reports abnormal results); Insurance Companies (someone who may have to cover healthcare appointments scheduled due to app's analytics). Impact: Similar to the chronic pain problem. All stakeholders also suffer from false alarms since it is still based on a predictive model.

### III. Citations

[Age-associated cognitive decline](#): A paper reviewing the effect of aging on cognitive function and what normal phenotypes of cognitive aging look like.

[The characterisation of subjective cognitive decline](#): A paper reviewing the symptoms of very early stage cognitive decline and how they can manifest differently based on the individual.

[Early Detection of Cognitive Decline Using Machine Learning Algorithm and Cognitive Ability Test](#): An empirical study on using a combination of physiological factors and results on a Cognitive Ability Test as a predictor of cognitive decline.

[Mobile Technologies in the Early Detection of Cognitive Decline](#): A paper discussing how daily life activities such as solving crossword puzzles can improve memory and delay or prevent cognitive decline.

[Early detection of cognitive decline in higher cognitively functioning older adults: Sensitivity and specificity of a neuropsychological screening battery](#): An empirical research paper on using a test battery to determine early markers of CNS disease in elderly patients.

[Seven Lifestyle Interventions Evaluated by the WHO for Preventing Cognitive Decline and Dementia](#): An article identifies cognitive interventions, including a range of activities such as mental stimulation and lifelong learning, as a viable method of preventing cognitive decline.

2. **Starting new hobbies as an adult**: There is an emerging generation of adults facing the challenges of social anxiety and the pressure of perfectionism. They experience a strong need for

relaxation and stress relief outside of work, but are often hesitant to pursue hobbies that might expose them to failure or judgment. This creates a paradox: while they are in need of healthy outlets to unwind, the fear of being publicly bad at something holds them back, preventing them from fully exploring activities that could reduce stress.

- **Developing a green thumb:** Gardening or simply growing plants in a room as a hobby is a rewarding yet daunting process for many, especially for those who feel intimidated by the idea of caring for plants. For beginners, the vast variety of plant species, care routines, and potential mistakes can feel overwhelming. [Creating a space where they can make mistakes in isolation with digital guidance and overcome the initial self-consciousness could turn this into the fulfilling and therapeutic hobby it is meant to be.](#)

I. **Feature** – PlantWhiz: Select your plant from a library of common garden plant species the day you get it. The digital plant will model how your plant should look as it grows and the app will give you customised reminders based on the plant for when to water it, how much sunlight it needs, etc. Continue this for every plant you get and you have a digital garden living on your phone to model your real garden's healthiest state and help you course correct.

II. **Stakeholders** – Gardener (user who is just learning to garden and engages with the app); Inner Circle (someone who is close to the user and may be placed in charge of caring for their plants occasionally); Neighbours and Passers-by (someone who may be able to view the user's real garden if they grow their plants outdoors). Impact: Gardeners may feel more supported knowing that the app is taking care of their plant by proxy and monitoring each one's needs. Inner Circle members can also use the app as a guide when given the responsibility. Neighbours may be inspired to adopt the app upon seeing Gardener's progress. If the app fails to enable Gardener to take care of plants, all three stakeholders will suffer from feelings of failure (Gardener), unwanted responsibility (Inner Circle), and potential eyesores (Neighbours and Passers-by).

III. **Citations**

[Reducing Anxiety with Nature and Gardening \(RANG\)](#): A paper examining the positive impacts of gardening on anxiety among U.S adults during the pandemic

[Gardening as a mental health intervention](#): A review article on how gardening-based mental health interventions are highly beneficial and improve quality of life.

[The Connection between Gardening and Outdoor Activities during the COVID-19 Pandemic and Emotions of Hope, Hopelessness, and Levels of Anxiety and Depression](#)

[Effects of Plant Activity on Mental Stress in Young Adults](#): An empirical study establishing that simply being in the presence of plants, even indoors, reduced stress.

[Interaction with indoor plants may reduce psychological and physiological stress by suppressing autonomic nervous system activity in young adults](#)

- **Painting:** Painting tends to have a steep learning curve when taking lessons from an instructor. Traditional classes often focus on skill mastery rather than simply exploring paint as a creative medium, which can discourage casual learners and people who would prefer to treat it as a relaxing hobby. *However, there are already several apps and resources that cater to this kind of relaxed learning where users can set their own pace, with highly developed functionalities (e.g. Procreate).*
  - **Multimedia (Art + Music) creation:** Users face inhibitions about creative expression, often due to fear of judgement. *Personally, I don't find this to be an interesting problem as it has been tackled many times and is very similar to the previous problem.*
3. **Anxiety:** Anxiety is a widespread condition that tends to be highly misunderstood. The complexity of anxiety ranges from general unease to chronic disorders like panic attacks or social anxiety, making it difficult to manage on one's own. As someone with clinical anxiety, I believe that it's important to have tools that can compliment a therapy setting and allow people to feel in control of their condition.
- **Managing social media screentime while maintaining feelings of connectedness:** Screentime, on social media specifically has been empirically proven to be a significant proponent of anxiety in teenagers. Even for teenagers who would like to reduce the amount of time spent on social media, they are left with almost no halfway options on the spectrum of social connection, from addicting, personalised, never-ending feeds to solely physical contact which can leave them feeling like they are unable to quit. *However, I believe that any kind of middle-ground platform would be extremely difficult to convince users to adopt, because of the very reason that popular social media is designed to be highly addictive and people tend to not realise that they are actually addicted.*
  - **Panic attack detection and personalised interventions:** Panic attacks can often catch people by surprise, even if they have a known anxiety disorder. They are also often reliant on surrounding people to help them calm down, many of whom may not even know how to identify a panic attack. *However, there is always the possibility that alerting anxiety-sufferers to the possibility that they may be about to have a panic attack could actually induce high stress and trigger one.*

- **Negative thinking patterns:** People with Generalised Anxiety Disorder (GAD) tend to experience spirals of negative thought patterns that they find difficult to break out of. Cognitive Behavioural Therapy (CBT) has been shown to help prevent this kind of spiralling, but a patient cannot have their therapist on call all the time. It is important to also have tools that enable people to be self-starters in calming their minds, recognising negative thought patterns that are highly personalised to the user. *However, I believe that there is not much scope in creating a solution for this problem beyond implementing an LLM-based measure which acts as the user-authenticated version of ChatGPT, essentially remembering past conversations and alerting users to their tendencies based on user-provided prompts.*
- 4. **Intersectionality of recommendations:** Creating social circles for discussing specific intersectional genres and themes of books, e.g. historical fantasy, mystery + comedy.
- 5. **Social connection during remote work:** Combatting loneliness during periods of remote work.
- 6. **Taking personal steps towards sustainability:** Providing suggestions on how to reduce your carbon footprint, how to make your home more energy efficient, etc. based on empirical evidence from user-provided data.
- 7. **Edutainment:** Interactive games for children to build their general or subject-specific knowledge.
- 8. **E-commerce:** Providing small businesses with a platform to advertise and grow.
- 9. **Gaps in transportation:** Reporting areas that are not walkable or bike-able to make the city more friendly to non-vehicle users.
- 10. **Content filtering on social media:** Accurate hate speech identification and filtering with a karma system.