Design Thinking Final Report

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Abstract

Worldwide, the healthcare industry is already dealing with massive changes, from creating a vaccination for the novel coronavirus to managing the healthcare system for aging populations and more sedentary lifestyles.

Another wave of issues to solve, however, stems from a rise in non-communicable, chronic conditions. Chronic diseases are the major cause of death and disability worldwide.

In India, chronic diseases are projected to account for 53% of all deaths. Worldwide about half of all adults are affected by diabetes, cancer or CVDs (Cardiovascular diseases).

The recent lockdowns have made it worse by inhibiting movement and created a stagnated and unhealthy lifestyle in people which is one of the leading causes of chronic illness.

Our report entails how we used design thinking principles to first ideate on possible reasons for chronic illness, investigate deeper by conducting user interviews. We gained insights into people's constraints and preventive factors that inhibited behavioural change that improved diseases management. We developed a broader understanding of the context and situation faced by both the chronic patients and their families/caretakers and then rephrased our problem statement and devised a solution that would help in chronic patient experience and shared decision making.

Introduction

Motivation

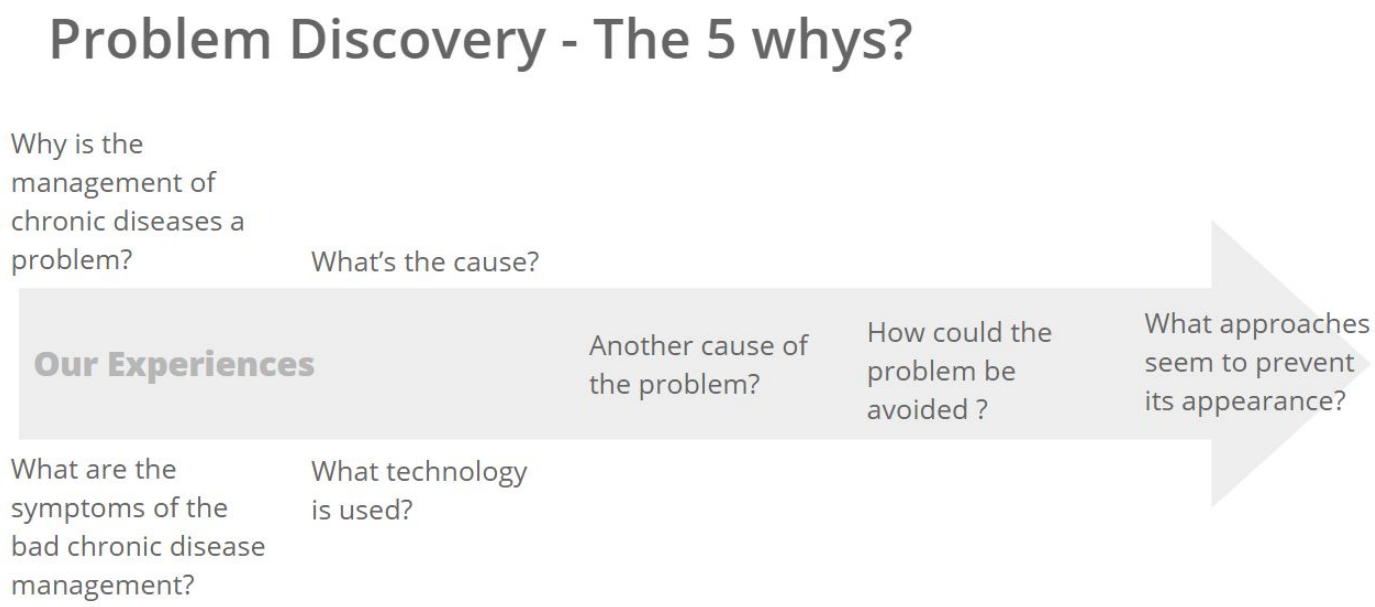
Medical services frameworks require persistent advancement to address the needs of patients and suppliers. Nonetheless, these stakeholders are not generally thought about when new interventions or framework measures are planned, which brings about products that stay unused in light of the fact that they don't represent human context, need, or fallibility. This methodology likewise likely adds to the long term gaps between intercession improvement and usage. Design Thinking offers an approach to close that gap by assisting us with consolidating user needs and input all through the development cycle.

Problem Statement

Design a solution to help individuals manage their chronic diseases by improving patient experience and shared decision making.

Develop

Problem Scoping



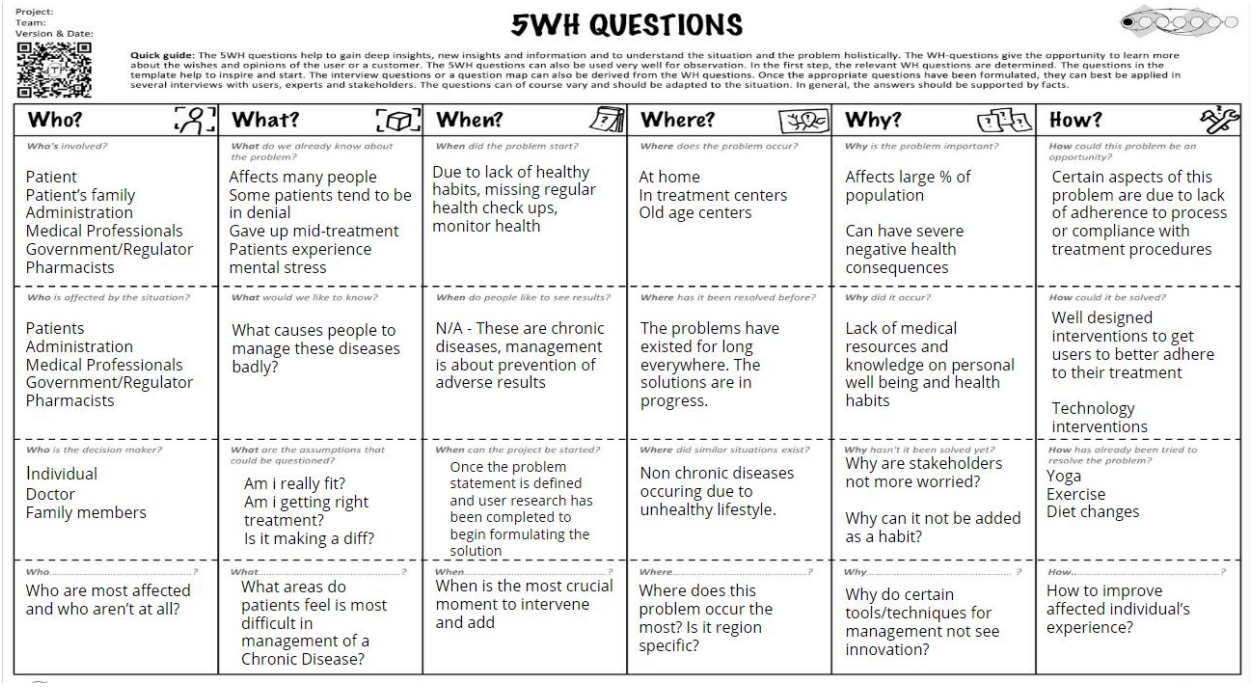
In order to understand the problem in depth, not just scratch the surface, we performed the first "5x Why" activity. Here we attempted to discover the true cause of the problem, and dig deeper and deeper to gain new and surprising insights.

Why - Management of chronic diseases, improving patient experience and shared decision making.

- Why 1
  - **Why is the management of chronic diseases a problem?** Not personalized/Can't be cured, needs to be managed regularly.
  - **What are the symptoms of the bad chronic disease management?** People forgetting to take their treatment, uncomfortable/painful methods of management
- Why 2
  - **What is the reason?**
  - A lot of people are affected and the medical infrastructure is limited and has a low doctor patient ratio.
  - Distribution/cost/access to hardware is limited
  - Current technology - Use of reminder apps , At home solutions, virtual care and regular appointments/checkups

- Why 3
  - **Another cause of the problem?**
  - Medical infra is limited because of cost.
  - Lifestyle choices/bad habits
  - Genetics
- Why 4
  - **How could the problem be avoided ?**
  - Education/awareness about one's health
  - These alternatives are easier, cheaper or addictive
  - By choosing healthier lifestyle, regular health check-ups
- Why 5
  - **What systematic approach could prevent the appearance ?**
  - Communication with stakeholders
  - Building healthy habits and taking treatment as required
  - Monitoring of one's health, visible feedback
  - Cheaper alternatives to regular check-ups - online platforms - reduce travel/ costs
  - Educating the good healthy habits

Next we performed the activity of "5WH Questions" to gain in-depth insights as well as new findings and information in order to grasp the problem or situation holistically.



Project:
Team:
Version & Date:

5WH QUESTIONS

Quick guide: The 5WH questions help to gain deep insights, new insights and information and to understand the situation and the problem holistically. The WH-questions give the opportunity to learn more about the wishes and opinions of the user or a customer. The 5WH questions can also be used very well for observation. In the first step, the relevant WH questions are determined. The questions in the template help to inspire and start. The interview questions or a question map can also be derived from the WH questions. Once the appropriate questions have been formulated, they can best be applied in several interviews with users, experts and stakeholders. The questions can of course vary and should be adapted to the situation. In general, the answers should be supported by facts.

Who?	What?	When?	Where?	Why?	How?
Who's involved? Patient Patient's family Administration Medical Professionals Government/Regulator Pharmacists	*What do we already know about the problem?* Affects many people Some patients tend to be in denial Gave up mid-treatment Patients experience mental stress	*When did the problem start?* Due to lack of healthy habits, missing regular health check ups, monitor health	*Where does the problem occur?* At home In treatment centers Old age centers	*Why is the problem important?* Affects large % of population Can have severe negative health consequences	*How could this problem be an opportunity?* Certain aspects of this problem are due to lack of adherence to process or compliance with treatment procedures
Who is affected by the situation? Patients Administration Medical Professionals Government/Regulator Pharmacists	*What would we like to know?* What causes people to manage these diseases badly?	*When do people like to see results?* N/A - These are chronic diseases, management is about prevention of adverse results	*Where has it been resolved before?* The problems have existed for long everywhere. The solutions are in progress.	*Why did it occur?* Lack of medical resources and knowledge on personal well being and health habits	*How could it be solved?* Well designed interventions to get users to better adhere to their treatment Technology interventions
Who is the decision maker? Individual Doctor Family members	*What are the assumptions that could be questioned?* Am i really fit? Am i getting right treatment? Is it making a diff?	*When can the project be started?* Once the problem statement is defined and user research has been completed to begin formulating the solution	*Where did similar situations exist?* Non chronic diseases occuring due to unhealthy lifestyle.	*Why hasn't it been solved yet?* Why are stakeholders not more worried? Why can it not be added as a habit?	*How has already been tried to resolve the problem?* Yoga Exercise Diet changes
Who.....? Who are most affected and who aren't at all?	*What.....?* What areas do patients feel is most difficult in management of a Chronic Disease?	*When.....?* When is the most crucial moment to intervene and add	*Where.....?* Where does this problem occur the most? Is it region specific?	*Why.....?* Why do certain tools/techniques for management not see innovation?	*How.....?* How to improve affected individual's experience?

Our group then performed an activity “Become aware of your knowledge” to become cognizant of what we thought that we know and what we don't know about the needs of the users.

Here, we listed what we know for sure, and would like to validate, what we are not sure about, but have assumptions or hypotheses that we would like to test, what we do not know, and would like to find out.

Know for sure (need to validate):

- Management of chronic diseases is uncomfortable
- Patients will have situations of non-compliance to treatment procedures
- Lack of motivation - giving up mid-treatment
- Patients experience mental stress in process of management
- Financial costs are a burden?

Not sure about:

- Exactly how bad are current management techniques/tools?
- How much can lifestyle changes impact specific chronic diseases?
- What are current cost structures per disease/type?
- Which diseases can be “cured” and which can’t?

Do not know:

- The main chronic diseases and the current ways in which they are managed
- Individual priorities and decisions
- Effectiveness of treatments per disease?
- Side-effects of treatments and how they affect patients

Based on our above initial group activities, we came up with an exhaustive set of problem statements. Out of these we filtered them to 3 main areas based on our understanding of the stakeholder’s pain points.

1. Find a way to encourage users to adopt healthier lifestyles (yoga ,meditation and good nutrition food).
2. Create a mechanism to remind users to take their medicine on time.
3. **Connect people with information/ others who are in a similar situation to better help manage the disease.**
4. Spread accountability to more stakeholders.
5. Wearable tech for accessibility in reminders/monitoring.
6. Create affordable mechanisms for regular check-ups with specialist doctors
7. **Empowering senior individuals who are suffering from chronic diseases to manage their own care and improve their quality of life.**
8. **Can we manage the mental stress of dealing/living with a chronic disease**

We framed a design brief by expanding our problem statement using the following structure:

Problem – Why? How might we reduce financial/mental burden of CI patients

Target customer – Who? Elderly, senior citizens (age group 60+)

Goals – What? To manage their own care and improve their quality of life

Available material – With what? Retirement homes data, Insurance, professional Mental Consultation, best practices/techniques, Collaboration with NGOs

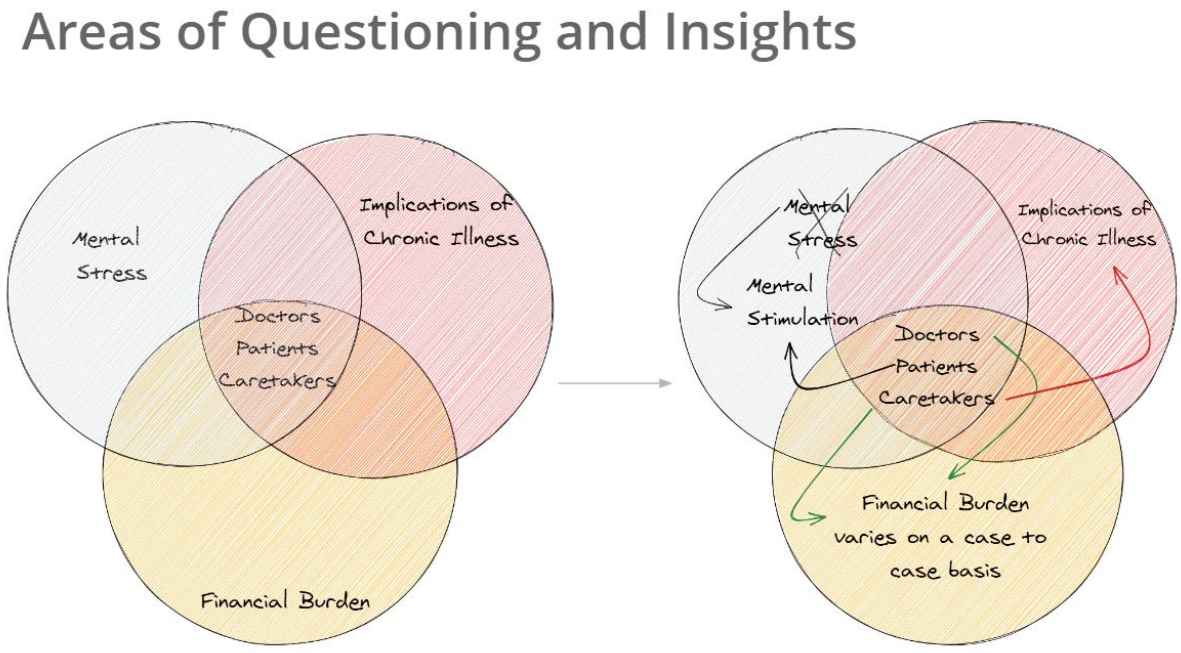
Competition, alternatives – Who else? Mental health/medical health apps

Budget, restrictions – How much? distribution, licensing, favourable policies?

Schedule, scenarios – When? Situations where seniors may not have access to financing or suffer from mental stress due to e.g. loneliness.

Next steps – How? Validate assumptions through interviews

User Interviews



Patient Name - Gurmeet Singh

Age - 62

Chronic Illness - High Blood Pressure, Thyroid

The interviewee answered all the questions very patiently. We observed that our initial problem statement was not actually a problem for the user. As the patient used to get pension every month, and using that money they could easily afford their treatment expenses. Also after every 15 days, charitable dispensaries are set up and they can buy medicines at very low price from there.

Also, we observed a moment of silence, when the interviewee was telling about the problems he is facing due to his illness. He took a deep breath, and mentioned " Financial expenses does not stress me much. It's the daily routine like food habits, regular checkups, medicines that stresses me and sometimes I feel mentally drained out".

Patient Name - Radha Rautray

Age - 61

Chronic Illness - Diabetes type 2, High blood pressure, Hypertension

The patient suffers from diabetes type 2, high bp, hypertension. She has dietary restrictions and consistently follows most of them. She has to avoid white rice and other carbohydrate rich foods and sweets. All the medicines are being provided by the hospitals owned by Indian Railways. We were able to gather the cost structure of Medicines she consumes for her health condition.

1. Metformin hydrochloride 500mg, 90 per 10 tabs, 2 per day before food, 540/- monthly
2. Linagliptin 5mg, 500 per 10 tabs, 1 per day after food, 1500/- monthly
3. Telmisim 40mg Tablet, 50 per 10 tabs, 1 per day after food, 150/- monthly

When we enquired about her mental health implications due to her illness, she added that she wasn't that much stressed about it. She mentioned that the environment plays an important role in mental peace. After she shifted to a gated society from a single bungalow, the gap of engagement with people has reduced. She engages with the society ladies regularly. They do yoga, exercise, walking, jogging together on a daily basis. They also discuss health related stuff, remedies, diet.

She shared interesting facts about being a chronic patient that she used to be reluctant to get frequently tested (full body test) should any new disease may crop up because diabetes happened to her even when not leading an unhealthy lifestyle. She did not avail any private health insurance as they are covered by the Indian Railways.

Interviews with Doctor

We interviewed a Diabetologist through Practo, Doctor told us that cost of treatment depends from patient to patient, and on average financial cost for diabetes is a minimum of yearly ~6000 in a rural area and ~10000 in urban areas (he thinks the main difference between urban and rural is consultation cost and test costs) and most of the patients won't follow proper diet habits and won't do regular basic exercises like walking and jogging. He hasn't encountered many cases with patients who got depressed because of financial burden.

Brainstorming

Chronic Disease Management was a challenging problem to solve. After gathering the information and data we refined our problem statement. The next step was to start brainstorming different ideas to solve the problem. We defined the problem into two subproblems :-

1). To increase mental stimulation of elderly people

2). To decrease the loneliness among elederly people.

As we all were working remotely, we used the tool ‘JamBoard’ to generate a lot of divergent ideas that solved either one or both of the above subproblems. Each team member wrote a number of creative ideas on their boards In this step we focussed on quantity over quality. As a team we diversified our ideas and deferred judgement. We allotted a time of one day to generate as many ideas as each team member can. We all have crazy imaginations and this is where we got to use them. Some of our team members generated a lot of crazier ideas while others came up with only a few ideas. We tried to unleash our creative potential and harnessed the strengths of people on our team.

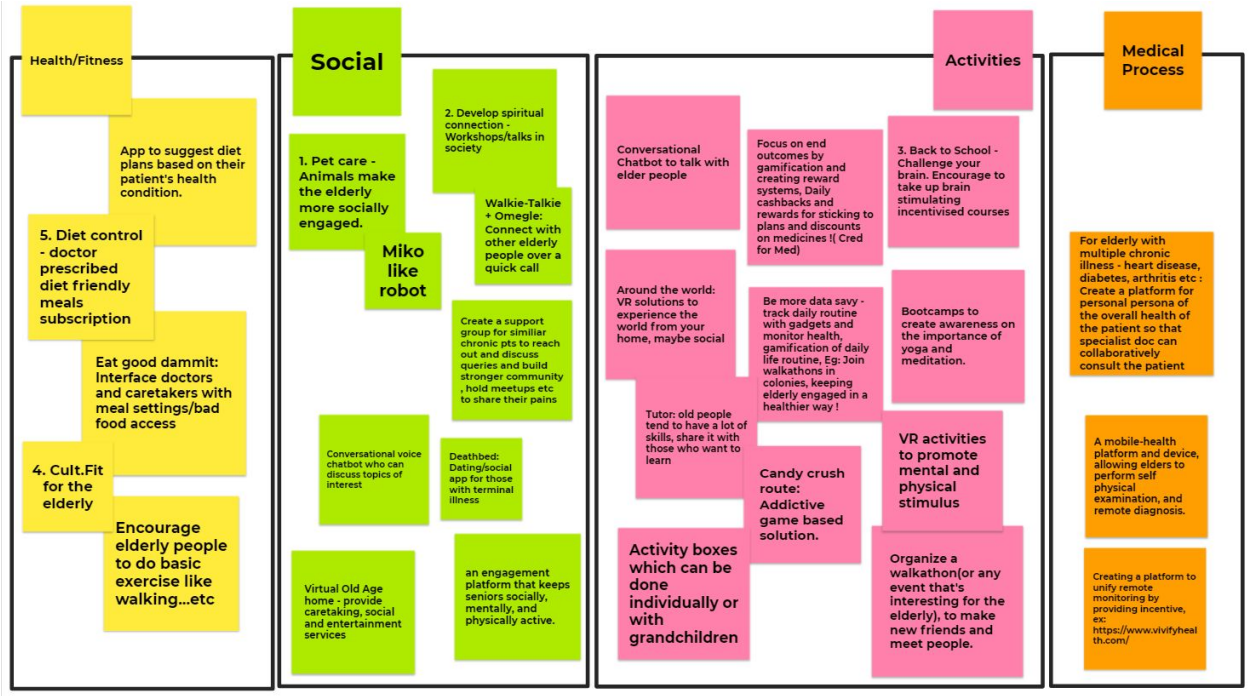
After different ideas were generated, we did Top-5 idea generation activity in which we allotted 1 hour to each team member to select only top 5 ideas from their set of ideas that were actually feasible and relevant to the above two subproblems.

Clustering

Our group tried to come up with 5 ideas from each member based on our problem definition and user interviews. For the process of clustering, we attempted to club and group the solutions generated during the individual Top-5 idea generation activity based on similar underlying themes. We discussed and analysed the ideas together to identify the themes. Since most of the team members were remote, we performed this activity using Google Jamboard again.

Finally, we were able to bucket our ideas into broadly 4 categories. These clusters we came up with are as follows:

1. Health/Fitness
2. Social
3. Activities
4. Medical process



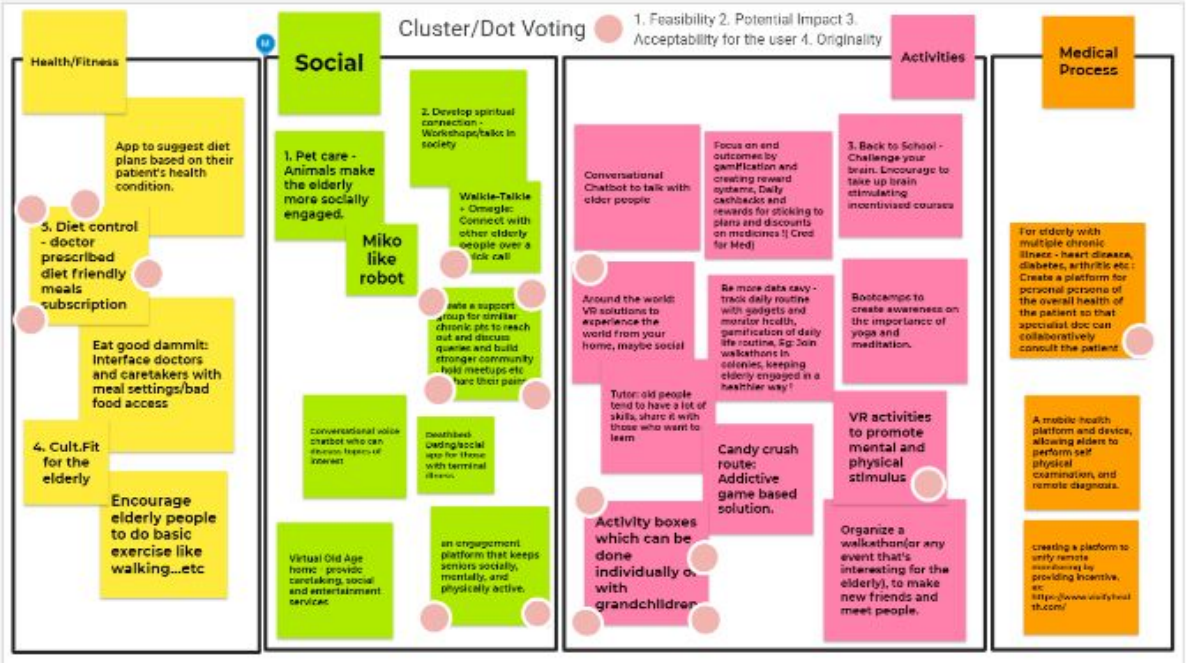
Selection of primary problems

Initially, we started focusing on mental health and financial burden as primary problems for patients, but after having interviews with doctors and patients, we realized that loneliness and lack of physical activity are the primary problems with patients suffering from chronic illness and we tried to come up with 5 ideas from each member based on our problem definition and user interviews and we were able to bucket our ideas into broadly 4 categories: health, social, activities and Medical process.

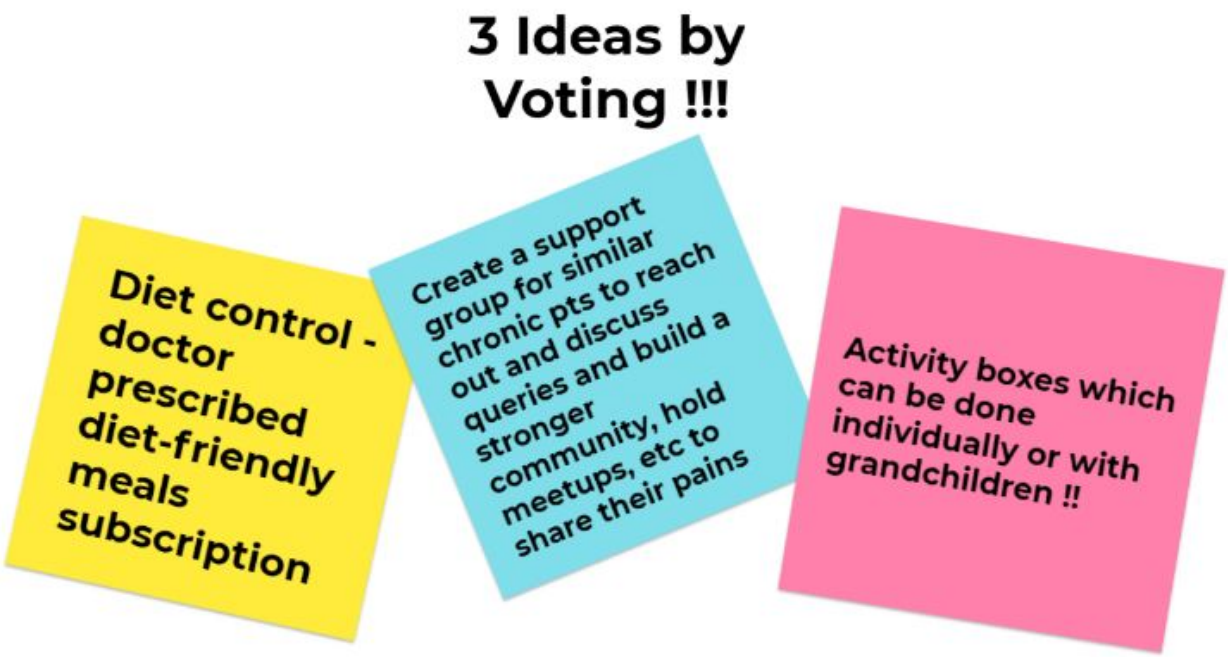
Finalizing Solutions

We used the Dot-voting technique, which is a fast and easy polling system, also known as "sticker voting", "dotmocracy" or "voting with dots", to bring out our group's opinions regarding the highest priority items on a list.

Idea Generation - Clustering and Dot Voting

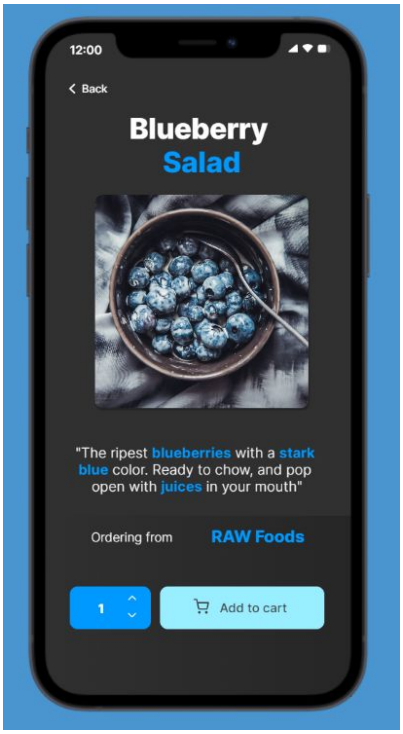


We selected the top 3 ideas.


3 Ideas by Voting !!!
Diet control - doctor prescribed diet-friendly meals subscription
Create a support group for similar chronic pts to reach out and discuss queries and build a stronger community, hold meetups, etc to share their pains
Activity boxes which can be done individually or with grandchildren !!

Prototypes

An integrated food platform for chronic patients



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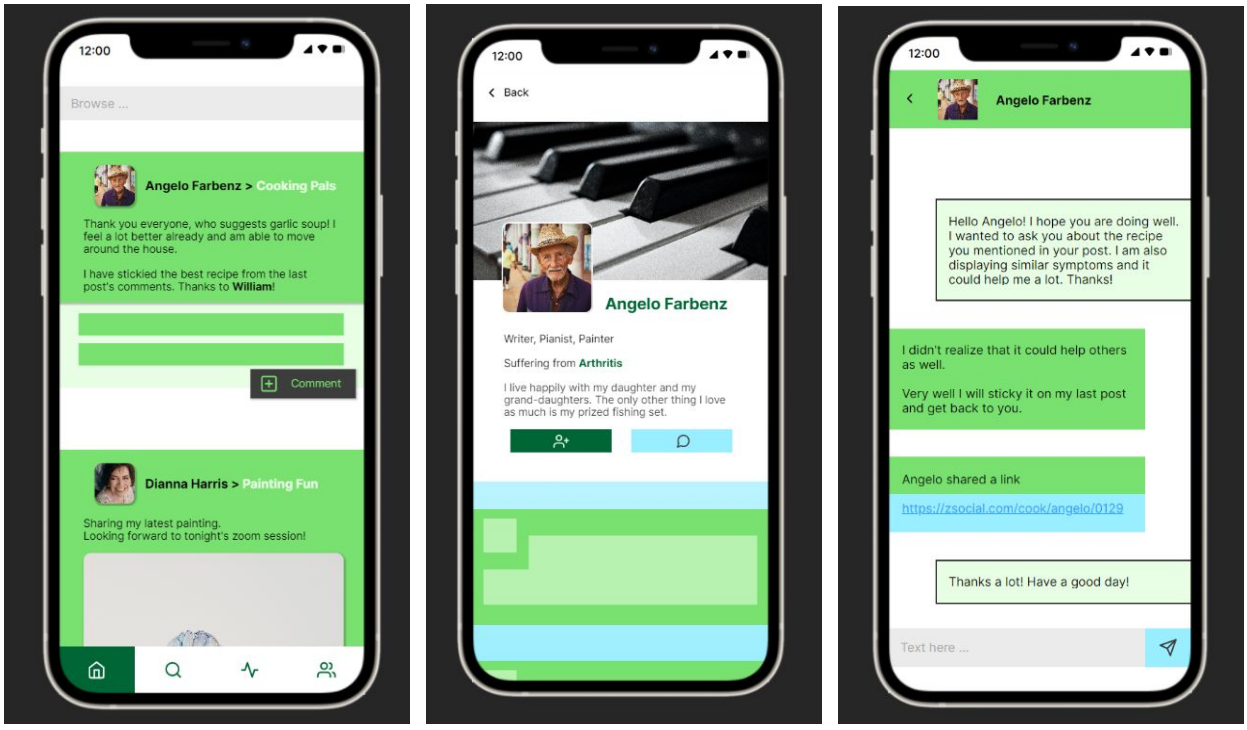
This solution aims to improve the health of chronic patients with healthy foods. The service will be designed to make the patients feel like they didn't lose a thing when it comes to food. Delicious cuisines will be planned that use ingredients that benefit each chronic disease. A general plan based on individual ailments can then be suggested, and the user will not be able to see any other cuisines on the platform. The focus will primarily be on medicinal and overall healthy foods. Through restricting bad choices, we expect to see overall happy and healthy customers.

The platform will have trending foods that would also promote a sense of belonging. Users will be able to bookmark their favourite foods for easy access and even subscribe to customizable meal plans.

In the future, the platform can be hooked up with individual doctor's recommendations. Going to a doctor, he would not just suggest an existing "plan", he would have the control to easily personalize it based on your exact needs.

A social support group for chronic patients



You may try it here, please access it on a **desktop** for best results.

This solution aims to give the chronic patients a place they can belong. Sharing their stories with communities that can really understand and feel for them.

Here, they have access to people with the same ailments, similar age-group and likes. We will design the platform such that sharing in such communities brings the least friction for all parties involved. Our customers should have the best experience, and in their enjoyment make the community grow. Letting them plan meetups, organize virtual sessions and so on. The goal is to make them feel wanted, important and inspired.

In the future, this platform can also be leveraged for the invaluable knowledge that they might have for the young learners. The elderly population that we target especially has vast experience from throughout their lives and connecting them to people who are starting to explore their lives is the best of all worlds.

Challenges - Design Thinking in the Time of Covid

Many of the design thinking techniques and processes which we learnt were created under assumptions which in other years would be valid, such as being able to collaborate with multiple people in a room together. Such restrictions amongst others caused us to have to navigate the Design Thinking process more differently than it's traditional prescribed methods. In certain cases techniques had to be adapted and others forgone. Below is a brief outline of the challenges we faced and the areas in which we attempted to, dare I say, innovate on the Design Thinking process.

Initial Discovery

The given prompt around the management of Chronic illness patients was loaded with a clear path forward for discovery - a chronic illness specific approach. However, our team challenged themselves by digging deeper to see if we can find another angle of attack to this problem and we settled on selecting a target audience based approach rather than a disease specific one. Though this was a self imposed challenge, it was one which helped us derive more unique insights and make the process more engaging.

User Research

Interviewing potential users to understand pain points and difficulties faced by different key stakeholders was challenging due to time and geographical constraints imposed by the course and the pandemic respectively. Hence, we utilised a 'first-degree' of contact approach, by contacting family members, relatives, friends and doctors on digital platforms we prioritised ease of access and proximity to the interviewer in order to get insights both quickly and effectively through the reduction of interviewing friction due to familiarity with the interviewer.

Unfortunately, the time constraints also meant a fairly limited sample size and hence little validation of the research we obtained. Additionally, by contacting different user groups with opted for a breadth of information across stakeholders rather than

Collaboration

Covid restrictions meant that we as a team couldn't get out the whiteboard, post-it notes and craft materials to collaborate together in a room. Hence, we resorted to many digital interventions to substitute more traditional techniques. All communication had to be done through video conferencing tools such as Zoom and Google Hangouts. Such communication platforms were

supplemented by online visual collaboration tools such as Jam Boards to use digital versions of whiteboards and post-its. An interesting adaptation we came up with was to use small circles on the Jam Boards to perform Dot Voting.

Certain methods were selected to further allow both remote and asynchronous collaboration to enable team members to more quickly, for example we selected the 'Top 5' method over traditional brainstorming to continue the idea generation process while taking into account the various work schedules of team members. By doing so we could set deadlines and frameworks which individuals adhered to which otherwise would have been achieved together in a face-to-face meeting. The flexibility enabled by such decisions created a more efficient work flow for the team as we only had meetings when certain goals were met. We believe that such a process may have also given members of the team better time to mull over problem statements and ideate to produce more fruitful results on their own accord.

Further Work

Given time constraints we only managed to get so far with the problem statement. At the end we created 3 solutions which we arrived at through Dot Voting. Our further plans would be to use the prototypes of these solutions for user testing in order to see if they hold water. Through such research at the prototyping stage we would get the initial pulse of the users to decide on the features which are most effective.

After such feedback we can consolidate and embark on a rapid prototyping workshop to develop the final prototype and then proceed to refine the solution through a feedback loop with users.

Final Words

The Design Thinking process is a brilliant framework to provide a direction and general guidelines, though we have only gone so far in the process, it has been eye opening as an approach to problems using a flexible structure. However, there are opportunities for innovation and adaptation for various use cases which have been brought to light due to the nature of the pandemic. Seeing these changes take place organically and to a large degree of success has been exciting for the team and we hope to see how the future of Design Thinking evolves.