

MILESTONE 2.1 – CLIENT NOTES

Please complete this worksheet in your corresponding team document.

MILESTONE 2.2 – RESEARCH ASSIGNMENT

Team Number:

Thurs 18

Complete this worksheet individually before coming to Design Studio/Lab B for Week 8.

1. Include your research assignment in the space provided

One of the key challenges of client-based design work is understanding the client and the context in which they will be using your potential solution. In any design project, designers rarely have unlimited access to the client and the information we obtain is limited by the questions that we think to ask. To address this challenge, designers often do additional external research so they can better understand the client's activities and environment, appropriate vs inappropriate materials, existing devices on the market etc.

Based on your notes from the client visit, identify and answer one question that:

- Can be answered by external research (external = not class materials)
- Is distinct from the questions being researched by your teammates
- Will help you in your design work

Good questions would be:

- What are the physical properties of art supplies used by our client (e.g., diameter, magnetism, friction)
- How do other artists with physical limitations work?

A bad question would be:

- What TV shows does my client like to watch? [Why is this bad? It cannot be answered by external research and it is irrelevant to the design process]

Your research assignment:

- State the question you plan to answer through your research
- Summarize your research findings (answer). Your answer should be a coherent, well-written summary of your research, not a "brain dump".
- You may include images, but don't forget to cite them properly.
- Aim for a length of about 500 words
- Properly cite your sources using IEEE formatted references and in-text citations. For information on referencing formats and choosing sources, see Design and Communication Workshop 1.

At the beginning of Design Studio/Lab B, we will be asking that you copy-and-paste the same research assignment into **Milestone Two Team Worksheets**. It does seem redundant, but there are valid reasons for this:

- Each team member needs to submit their research assignment with the **Milestone Two Individual Worksheets** document so that it can be *graded*
- Compiling your individual work into this **Milestone Two Team Worksheets** document allows you to readily access your team member's work
 - This will be especially helpful when completing the rest of the milestone

Team Number: **Thurs-18**

Name: Vaisnavi Shanthamoorthy

MacID: shanthav

*What is your question?**What are some current devices available that can assist individuals to cope with fibromyalgia?**What is your answer?*

Fibromyalgia is a disorder characterized by widespread musculoskeletal pain accompanied by fatigue, sleep, memory and mood issues [1]. Researchers demonstrate that fibromyalgia amplifies painful sensations by affecting the way the brain and spinal cord process painful and non-painful signals [1]. The principal symptoms of fibromyalgia include widespread pain, fatigue, and cognitive difficulties [1].



Figure 1: Tender Points

Source: Adapted from [2]

As the pain caused by fibromyalgia varies in both its location and intensity, it is imperative that the technologies available are most effective on an individual basis [3]. Figure 1 showcases the common tender points where several individuals with fibromyalgia feel pain when pressed [2]. Some common technologies to consider include the following: anti-vibration seats and gloves, chairs with head support, forearm supports, speech recognition software, and writing aids [3]. Aids such as walkers or wheelchairs have also been available to aid individuals who experience decreased stamina and fatigue. In addition, individuals suffering from fibromyalgia often deal with anxiety and increasing levels of stress, which can heavily impact their performance at work or in school [3]. Some helpful technologies for managing these symptoms include the following: apps (such as Stop, Breathe, Think), fitness trackers, simulated skylights, and windows, and more [3].

As mentioned in the client visit, Alanna states that holding smaller objects such as her more precise paintbrushes are harder to grip, and that she prefers something with a wider surface for an easier grip. When researching the current devices available to potentially provide a solution

for this roadblock, the Grip-Aid was an option that minimized the client's issues. The Grip-Aid is designed to ease the pain and difficulty of holding smaller objects such as eating utensils, or writing tools, by providing a built-up grip for a greater graspable area [4]. To use the Grip-Aid, you simply squeeze the side to make the opening larger, insert the object of your choice into the Grip Aid, grasp however it is comfortable, and begin use [4]. With its compact size, it is deemed as a highly portable device, which will be an incredible benefit for the client to have. The one challenge is the inability of the Grip-Aid to securely hold all objects equally because of the variance in the size of the objects used [4]. This is something we could potentially adapt to any size tool the client wishes to use.

Another available device is the Avacen 100 Class II medical device which provides relief throughout the entire body through an Avacen treatment method. This device is non-invasive as it safely infuses heat into the circulatory system to relax muscles and increase microcirculation in the body [5]. A study testing the efficiency of Avacen 100 consisting of 22 people who had fibromyalgia revealed that there was a reduction of widespread pain of over 40% and in the average tender touch points from 15% to 9% [5]. Incorporating a heat infusion device to relax the body's muscles while the client takes part in her daily activities could potentially play a part in our device. All in all, these findings will aid in developing a device that offers a solution to prioritizing pain minimization for the client through a comfortable, adaptable, and portable device. As a team, we hope to use these findings to produce a potential solution while taking into account the successful and unsuccessful aids present in society today.

List of sources:

- [1] "Fibromyalgia-Symptoms and causes - Mayo Clinic." <https://www.mayoclinic.org/diseases-conditions/fibromyalgia/symptoms-causes/syc-20354780> (accessed Mar. 10, 2021).
- [2] "Fibromyalgia Pictures: Flare Ups, Rash, Trigger Points, and More." <https://www.webmd.com/fibromyalgia/ss/slideshow-fibromyalgia-overview> (accessed Mar. 10, 2021).
- [3] "Common Assistive Technologies - Fibromyalgia - LibGuides at University of Illinois at Urbana-Champaign." <https://guides.library.illinois.edu/c.php?g=1019918&p=7388256> (accessed Mar. 10, 2021).
- [4] "Get a Grip on Your Hand Mobility – ND Assistive." <https://ndassistive.org/blog/get-a-grip-on-your-hand-mobility/> (accessed Mar. 10, 2021).
- [5] "Avacen receives Health Canada nod for fibromyalgia pain relief device | Medical Design and Outsourcing." <https://www.medicaldesignandoutsourcing.com/avacen-health-canada-nod-fibromyalgia-pain-relief-device/> (accessed Mar. 10, 2021).

MILESTONE 2.3 – REFINED PROBLEM STATEMENT

Please complete this worksheet in your corresponding team document.

MILESTONE 2.4 – FUNCTIONAL ANALYSIS

Please complete this worksheet in your corresponding team document.

MILESTONE 2 .5 – CONCEPT EXPLORATION

Team Number:

Thurs-18

Complete this worksheet during Design Studio/Lab B for Week 8.

1. Include multiple images of your concept exploration, if needed
 - Include 2 distinct concepts
 - Include necessary annotations to help in the communication of your ideas
 - These can be photos of hand sketches, photos of initial prototypes, screen grabs of basic CAD models
 - Include your Team Number, Name and MacID on each concept
2. Insert your photo(s) as a Picture (Insert > Picture > This Device)
3. **Do not include more than two concept images per page**

During this Design Studio, we will be asking that you copy-and-paste the same photos into **Milestone Two Team Worksheets**. It does seem redundant, but there are valid reasons for this:

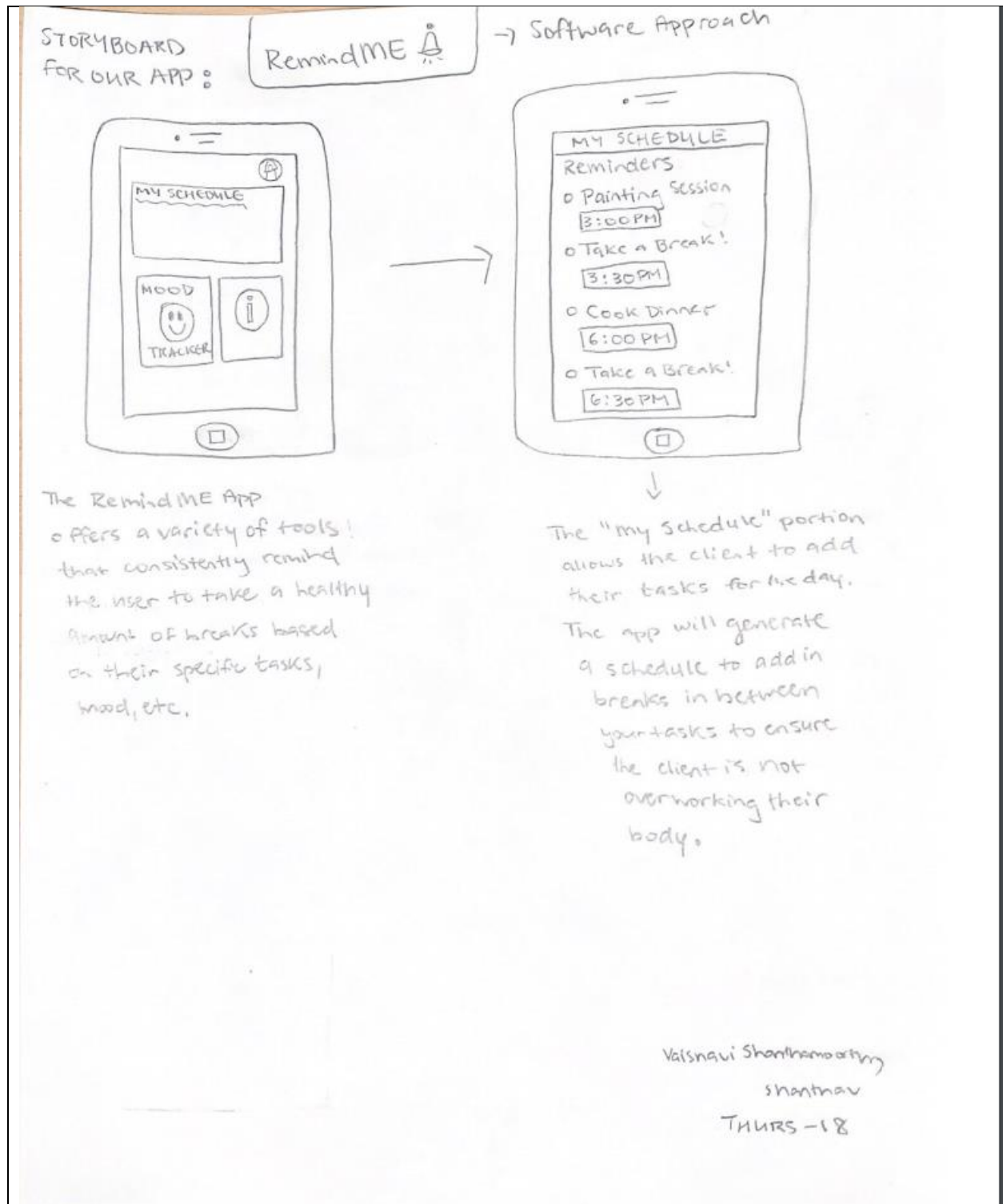
- Each team member needs to submit pictures of their concept with the **Milestone Two Individual Worksheets** document so that it can be *graded*
- Compiling your individual work into this **Milestone Two Team Worksheets** document allows you to readily access your team member's work
 - This will be especially helpful when completing the next milestone

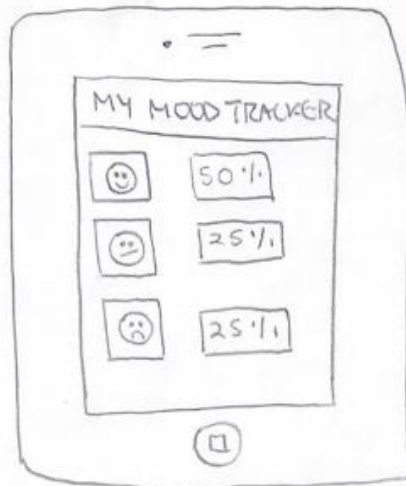
Team Number:

Thurs 18

Concept 1

Name: Vaisnavi Shanthamoorthy	MacID: shanthav
<i>Insert screenshot(s) of your concept below.</i> <i>Means included: Coded reminder app, schedule app</i> <i>*first sketch is on the next page</i>	





My Mood Tracker

- will ask you a series of questions
- will generate a percentage of your current moods
- if the highest percentage is towards the Mood: Tired, the app will offer a suggestion to take a break or to go rest.

Resources

- offers numerous suggestions in terms of websites for seeking advice/tips or activities that you can take part in to take a break from all the stress present in your life.

VAISNAVI SHANTHAMURTHY

Shanmav

THURS-18

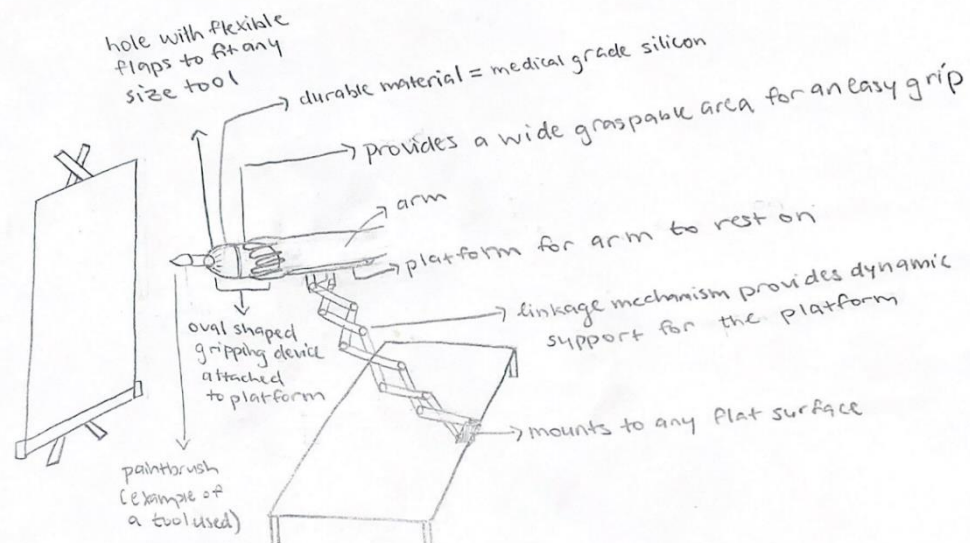
Concept 2

Name: Vaisnavi Shanthamoorthy

MacID: shanthav

Insert screenshot(s) of your concept below.

Means included: Custom gripper that fits around objects with a *dynamic arm brace*



Vaisnavi Shanthamoorthy
shanthav.
THURS-18