# UX Research Portfolio

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# Hello!

I am a UX design researcher, equipped with qualitative and quantitative research methods.

With evidence-based research competence and solid foundation on design thinking, I understand users in their broad and deep context, and produce ideas for desirable/viable solutions.

In industrial /applied research settings, I worked on a number of problem domains including: lifestyle improvements, learning of software tools, mobile communication, product design evaluation, etc.

I am currently working as a freelance researcher based on the Bay area, CA. I earned my Ph.D. in Human Computer Interaction at Arizona State University. Before I studied Industrial Design at KAIST, Korea.

**Generative & Evaluative research**
I conduct user research for all phases of the product development process: from open explorations to validation-oriented study.

**Qualitative & Quantitative research methods**
I carefully choose methods considering both efficacy and availability. I utilize a broad set of methods, from in-depth interview to statistical modeling.

- In-depth interviews
- Diary studies
- Ethnographic field studies
- Competitive analysis
- Surveys
- Usability studies
- A/B testing

# Case Study 1.
# Fitness Tracker Use by People with Multiple Sclerosis

## Problem

People with multiple sclerosis (MS) are often inactive. In tackling this issue, a fitness tracker is considered promising. But, what challenges will patients have? What can lead to the most benefits from use of a tracker?

## Process

Explore (in-depth interview) → Ideate (affinity diagram, brainstorming) → Prototype (proof of concept) → Test (field study)

## Outcome

We proposed a tool for setting a daily goal, and confirmed demand for it. Our work was presented in a prestigious conference (CHI 2016 Conference on Human Factors in Computing Systems).

**Funding**: Agile Project Grant subaward funding received through the Health Data Exploration project (Robert Wood Johnson Foundation)

**Team**: It was a collaboration between Arizona State University[1] and PatientsLikeMe[2] (www.patientslikeme.com)

- Jisoo Lee[1]: Creation of intervention / study protocol, data analysis, extraction of insights
- Erick Hekler[1]: Research planning, key decision making
- Emil Chiauzzi[2]: Research planning, key decision making, data analysis
- Auriell Towner[2]: Conduction of interviews

**Date**: April, 2015 ~ Jun, 2015

Case 1: Tracker + People with MS

# Exploratory Interview Study

## Method

We conducted a **1-hour semistructured interview** to understand how people with MS manage their physical activity and MS challenges.

For recruitment, we invited people with MS who used a fitness tracker at least one month prior to beginning of the study.

The interview data were analyzed as follows:

- The audio recordings were converted into notes →
- Two researchers individually found high-level recurring themes, and then reviewed together to resolve discrepancies →
- A report was made to share with the team, and identify challenges to focus on.

## Results

7 participants completed the interview (female = 6, male = 1 ; age range 50 – 68). The length of time since diagnosis ranged from 9 to 37 years, with mild-to-moderate disability.

We noted that participants were suffering from worsening symptoms after “overdoing it”, and also were worried about “underdoing it.”

*" Last week I weeded the garden for 3 hours and couldn't believe it. The next day I felt so crappy that I had to skip volunteering the next day. ”*

Case 1: Tracker + People with MS

# Approach

What may resolve the **overdoing & underdoing challenge**?

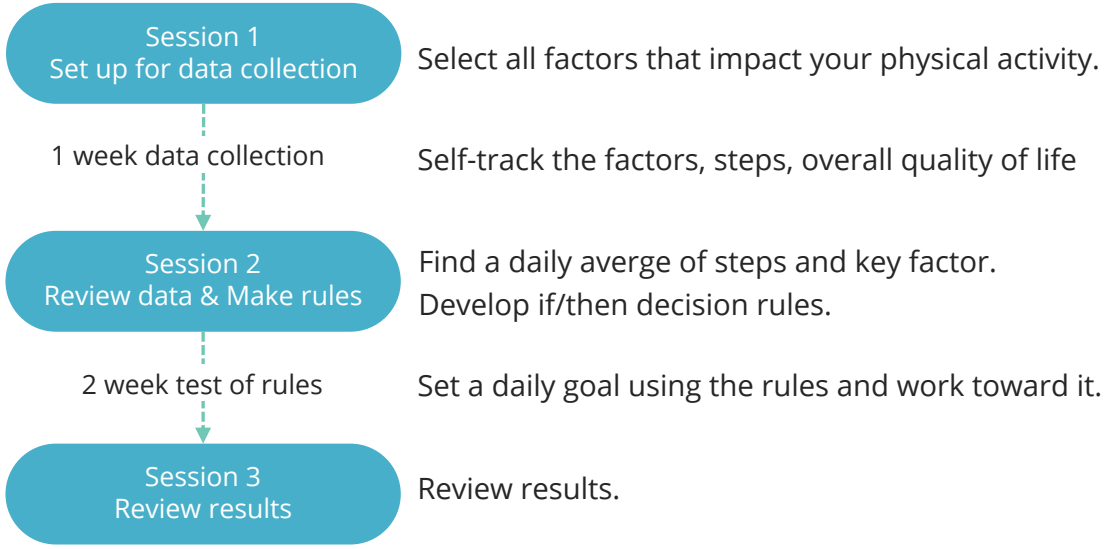
We shaped an approach that helps people with MS generate rules to define their **daily "sweet spot"** of steps to take.

*Example of user-generated rules*

> "With 3000 average daily steps, if pain is mild then stick with the average, if no pain then goal=3,500, if pain is severe goal=2,500"

# Intervention

For testing of the approach, we implemented a course-based intervention, which consists of **three sessions over a three-week period**.



# Field Study > Measures & Analysis

We evaluated the intervention with people with MS: 3 criteria, qualitative and quantitative measures

| Evaluation Criteria | Measures | Analysis |
|---|---|---|
| Demand<br><br>Practicality | (Qualitative data)<br>• Daily journal records<br>• Exit interview* | Combination of deductive and inductive coding (i.e., grouping by topics of interest a priori & data-derived themes based on participant perspectives) |
| Efficacy | (Quantitative data)<br>• Target steps<br>• Tracked steps | Descriptive summary of tracked steps (mean, median, coefficient of variation)<br><br>Daily match success or failure (concordance between daily goals with device measured activity within a +-20% range) |

*The interview involved:
- understanding the patient's perception of what they felt they learned the past 2 weeks
- how the rule impacted them on a daily basis,
- if they felt they found their sweet spot
- a brief discussion related to their overall experience with the course (what worked and did not work).

Case 1: Tracker + People with MS

# Field Study > Results

19 participants started, and 12 completed the course (female = 11, male = 1; age range 44 – 64).

**Demand**

Participants appreicated the rules idea.

> *"I gained more insight into myself and what motivates me...what hinders me more than any other time in my life"*

**Practicality**

Some commented on the burden of daily measurement, and difficulty to fully anticipate issues that would arise later in the day.

**Efficacy**

We found mixed results in the mating rating; 6 out of 12 participants achieved their "sweet spot" target 50% of the time or greater.

| Participants | Days | Mean | CV[1] | Match | Match Rate |
|---|---|---|---|---|---|
| 1 | 13 | 3589 | 47 | 9/13 | 69% |
| 2 | 14 | 6978 | 12 | 12/14 | 86% |
| 3 | 13 | 5117 | 33 | 3/12 | 25% |
| 4 | 15 | 2019 | 40 | 4/13 | 31% |
| 5 | 14 | 14,625 | 15 | 9/14 | 64% |
| 6 | 13 | 2694 | 48 | 1/10 | 10% |
| 7 | 14 | 5400 | 32 | 4/9 | 44% |
| 8 | 14 | 3290 | 26 | 9/14 | 64% |
| 9 | 20 | 4163 | 62 | 2/13 | 15% |
| 10 | 14 | 2225 | 29 | 9/14 | 64% |
| 11 | 14 | 13063 | 31 | 5/6 | 83% |
| 12 | 13 | 3644 | 25 | 3/11 | 27% |
| Mean | | 5567 | 33 | - | 49% |

[1]CV (Coefficient of variation) = Standard deviation (SD)/mean a measure of variability in relation to the mean.

Case 1: Tracker + People with MS

# Design Considerations

There was **a need for a rule-based adaptive goal-setting strategy** for people with MS, and plausibly other patients with chronic pain.

There should be a tool that allows users to collect **data with less burden**, and find **meaningful aspects easily** to define/refine better goal-setting rules.

It may be necessary to devise rules that can be even more adaptive to fluctuations within the day. This could enable **"half- successes",** especially for people with higher variability in symptoms.

While pursuing scientific rigorousness for this so-called self-experimentation, designers should not forget individuals' different **capabilities / preferences** in handling it.

# Case Study 2.
# Will technology-augmented “self-nudging” be helpful?

**Problem**
We had developed tools to support people’s creation of habit change solutions. Then, it was required to investigate effectiveness of them.

**Method**
7-week experiment comparing three conditions (one control, two treatments)

**Outcome**
We confirmed the effectiveness of our proposals, and obtained insights on how to improve them.
Our work was presented in a prestigious conference (CHI 2017 Conference on Human Factors in Computing Systems).

**Funding**: Google Research Faculty Award (Principal Investigator: Hekler).

**Team**: I took a key role working through from the whole process, under guidance of Eric Hekler.

**Date**: Mar, 2015 ~ Sep, 2015

Case 2: Technology Nudge

# Our Proposals

We established two levels of a behavior change solution, and developed a support for each: tutorial for behavioral plans and toolkit for just-in-time apps.

**Tutorial for behavioral plans**

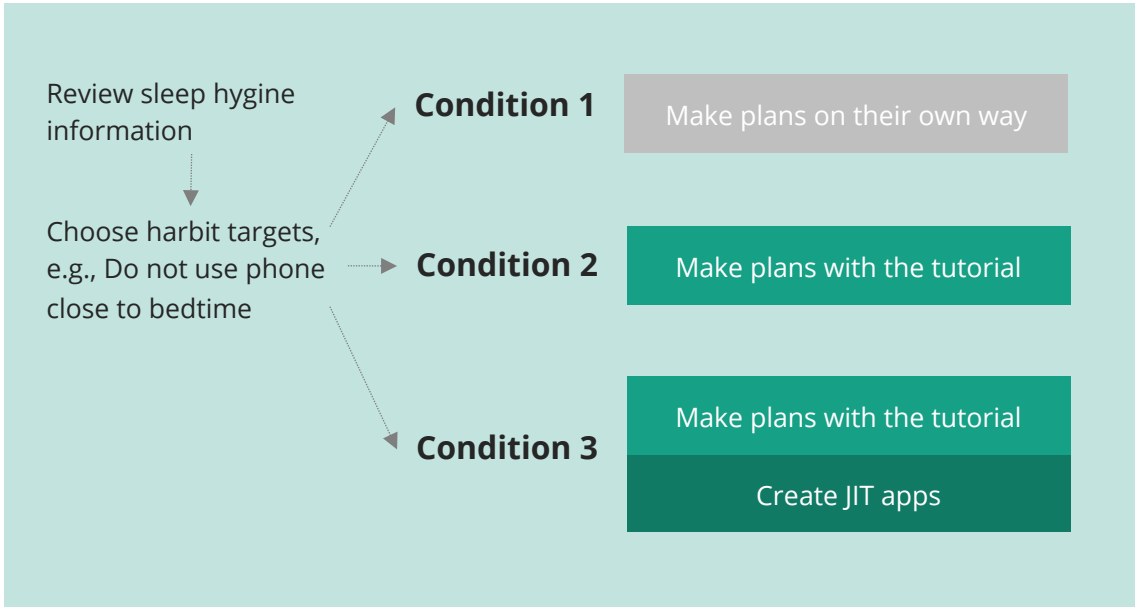
Step-by-step planning with behavior change techniques presented with text and audio.


**Toolkit for just-in-time (JIT) apps**

Prototyping of simple rule and event-based systems that include physical sensing, data storage, and media event components.

# Experimental Conditions

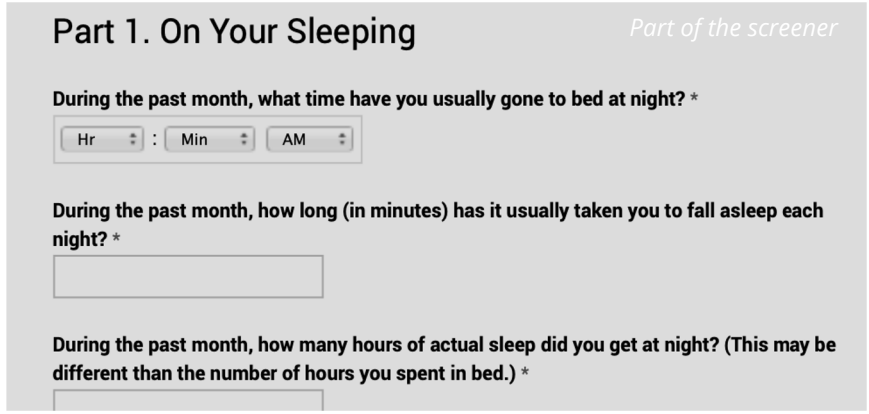
We conducted a **comparative field test**. Improving sleep quality was chose as a study domain. Participants were randomly assigned to one of three conditions.



Case 2: Technology Nudge

# Participants

We recruited users with sleep complaints but no diagnosed sleep disorder.



Part 1. On Your Sleeping

*Part of the screener*

**During the past month, what time have you usually gone to bed at night?** *

Hr : Min AM

**During the past month, how long (in minutes) has it usually taken you to fall asleep each night?** *

**During the past month, how many hours of actual sleep did you get at night? (This may be different than the number of hours you spent in bed.)** *

**Inclusion criteria:**

1) Significant complaints with their sleep
2) Smartphone (i.e,. Android or iPhone) to be used to gather self-tracking data
3) No plans to travel during the 7 weeks of the study.

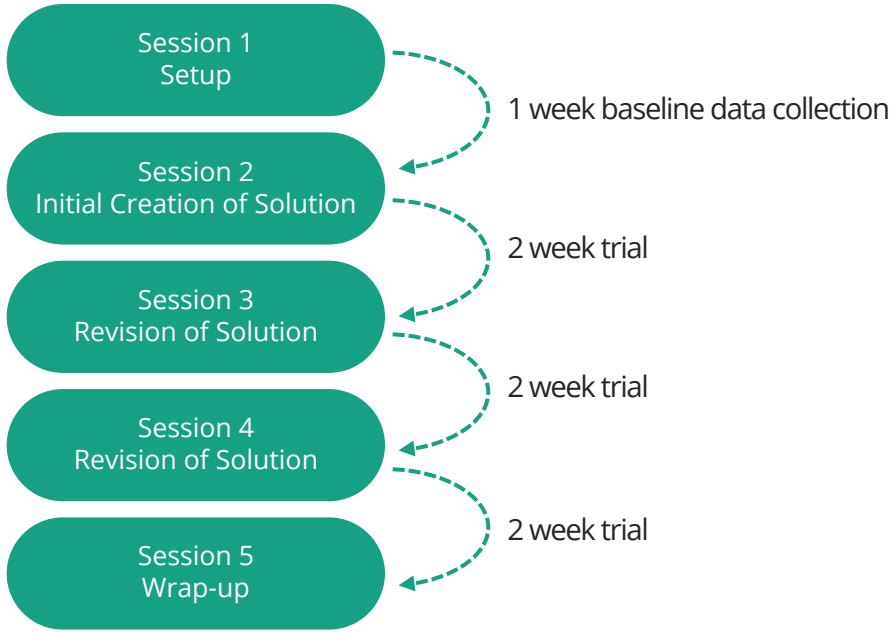
**Exclusion criteria**

1) Diagnosed sleep disorder
2) Co-sleeping with someone else in the same bed/bedroom
3) Disruptive and uncontrollable sleep schedules, such as night shift workers.

In total, 27 participants (14 male, 13 female) completed the study, 9 for each condition.

# Procedure

The study For 7 weeks, pariticipants joined 5 sessions for setup / creation or revision of their solution to attainment of chosen habt targets.



Case 2: Technology Nudge

# Measures

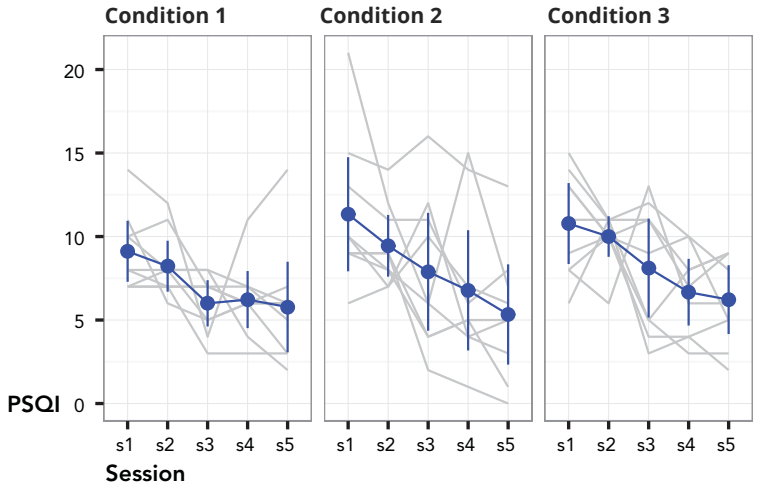
| Questions | | Measures |
|---|---|---|
| **Outcome** | Degree of sleep quality chage | PSQI score* measured in each session |
| **Process** | Degree of target achievement | Participants' ratings to the question, Rate how well you achieved your goals on a 0 to 10 scale |
| | Quality of planning / solutions | • Paticipants' ratings on 7-point scales to the questions: 1) Overall, I am satisfied with my goal; 2) The plan fits my lifestyle well; and 3) The plan will be essential for me to achieve my goal.<br>• (Behavioral plan) Occureances of target changes<br>• (Behavioral plan) Occureances of plan adjustments<br>• (JIT apps) Components included |
| | Perceived benefits / difficulties in using JIT apps | Semi-structured Interview (usefulness, usableness) |

* Pittsburgh Sleep Quality Index (PSQI) 0~21 score; the lower, the better sleep

# Analysis

## Survey data

**PSQI scores measured in each session (blue line, mean for each session with 95% CI)**

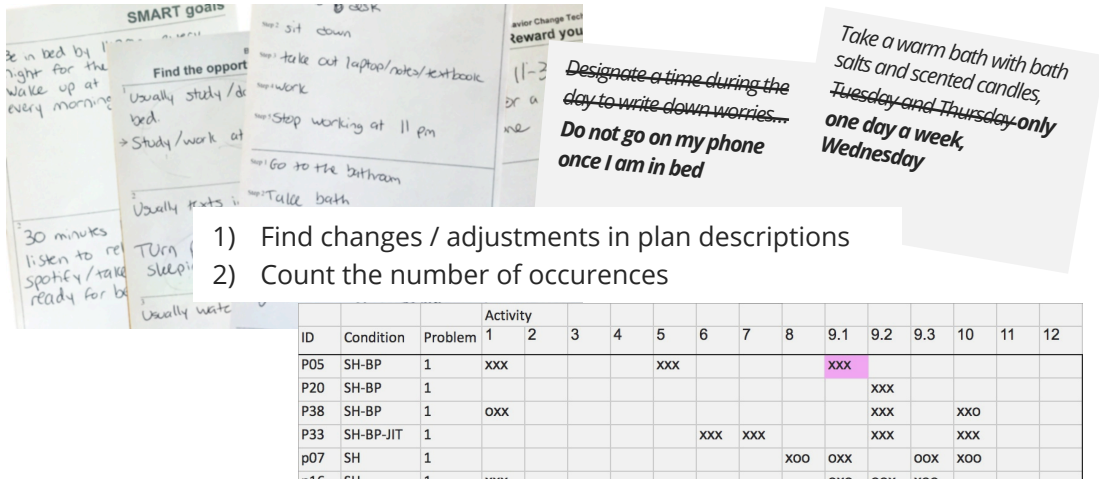



**Ratings on target attainment, mean (SD)**

| | Condition 1 | Condition 2 | Condition 3 |
|---|---|---|---|
| Session 5 | 6.4 (2.9) | 6.8 (1.8) | 8.4 (1.2) |
| Session 5-Session 3 | .8 (1.2) | 2.9 (2.4) | 1.9 (2.0) |

## Content data

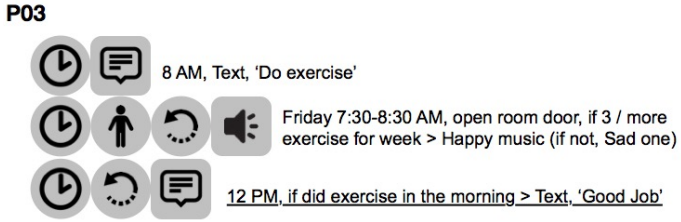
**Frequency of habit target changes / plan adjustments**




1) Find changes / adjustments in plan descriptions
2) Count the number of occurences

| | | | Activity | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ID | Condition | Problem | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9.1 | 9.2 | 9.3 | 10 | 11 | 12 |
| P05 | SH-BP | 1 | xxx | | | | xxx | | | | xxx | | | | | |
| P20 | SH-BP | 1 | | | | | | | | | | xxx | | | | |
| P38 | SH-BP | 1 | oxx | | | | | | | | | xxx | | xxo | | |
| P33 | SH-BP-JIT | 1 | | | | | | xxx | xxx | | | xxx | | xxx | | |
| p07 | SH | 1 | | | | | | | | xoo | oxx | | oox | xoo | | |

**Types / quantity of components**



Case 2: Technology Nudge

# Results

## Sleep quality change

A one way ANOVA on PSQI score change from session 2 to session 5 suggested there were no significant differences between condition means ($F(2,24) = .84$, $p = .44$).

Bayesian analysis indicated:

The treatments are better than the control? Fairly likely

Any difference between the treatments? Highly unlikely

## Experience with JIT apps

Most participants found JIT apps beneficial, with two overall themes in their reports:

**Remind**

P31, 'Yeah, like if I was distracted, playing video game or working on the homework, it was nice to get that text message…and then I **realize it's late** [sic]…'

**Inspire**

P13 (music play to reminder her about prep for the next day, when she came home after work), 'Not necessarily about snack/lunch prep. Now you're are at home… **now [I am] relaxed**[sic]',

Case 2: Technology Nudge

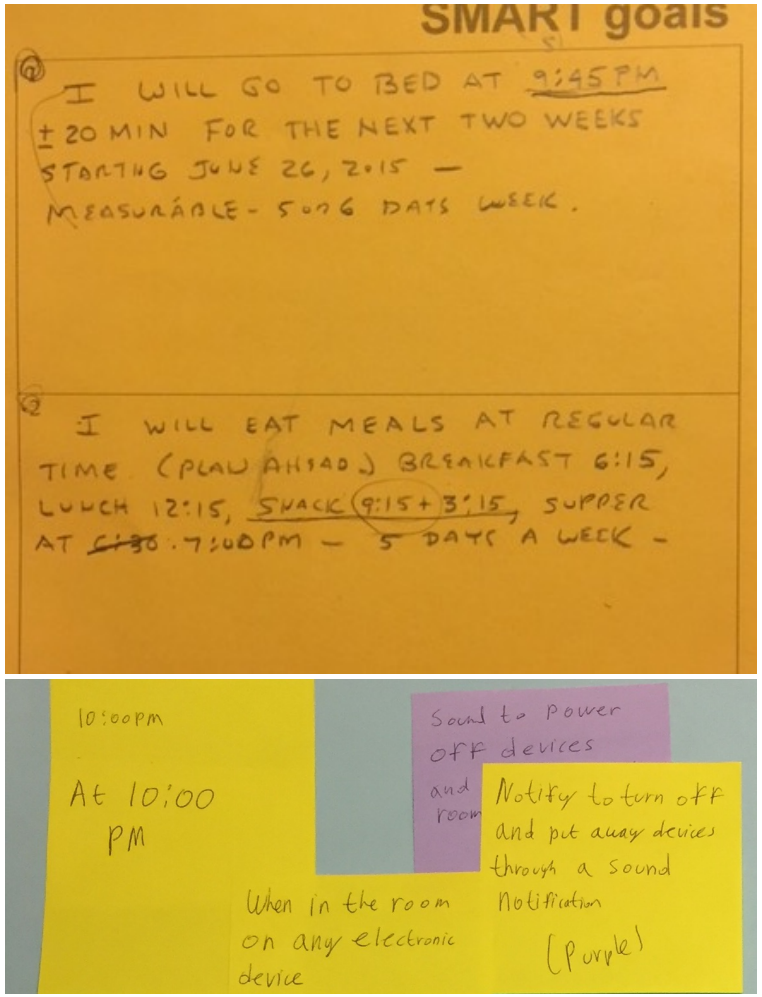
# Design Considerations

It appeared that our tutorial resulted in **more realistic, specified and personalized plans**, which translated to better attainment of habit targets and improved sleep quality.

We found that future work on JIT interventions should focus more on better facilitating **people's creativity** (more use of sensors, greater iteration of designs).

In supporting people's creativity, we considered the following approaches promising:

- Provide a tool with **simple functionality**
- Prompt users to **start small and continue building up**
- Present ready-made **examples** for instant use



# Thank you!

If you have any questions, please feel free to contact me:

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