

# Justine Gagnepain

# Semester project proposal

CART 360

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## Research questions

### Background and environment

*Think of a context and an environment where you would like to intervene. Where will you present your project? Who is it made for?*

The project attempts to simplify the process of building habits towards achieving desired personal goals by easing out aspects of friction we experience around doing activities that we would like to engage in, but sometimes find hard to get started on.

The artifact is thought out for individuals who have meaningful long-term goals that could be reachable through repetitive practice, but who struggle to commit to daily engagement in the practice.

The idea originated from reading «The Power of Habit » by Charles Duhigg. The book consists in a layman's overview of recent scientific research around habit building and habit changing. It provides a bare-bones recipe applicable to each person's habit-related goals. We all make New Year resolutions, become vegetarian, or start learning instruments under two illusions: that success depends on the

amount of willpower we will muster, and that we can commit to finding enough willpower to succeed. Duhigg exposes the issues with this approach and instead prescribes a somewhat science-backed approach he calls the « Habit loop ».

For a habit to take root, three elements need to be present: a cue, a routine, and a reward. In the context of a smoking habit for example, a cue, like seeing a cigarette, feeling anxious, or being bored, triggers the habit. The routine, smoking, is always the same. Finally, nicotine kicks in as the reward. To modify the habit, scientists interviewed by Duhigg say, one has to identify the cue and consciously notice when it is triggered, systematically replace the routine with another, and introduce a new reward.

I observed my own aversions to adopting daily habits that would enable me to achieve meaningful goals, and noted that most of my resistance comes not from engaging in the activity itself, but from all the decision-making I need to engage in to get started with the routine.

For example, in order to achieve my goal of not experiencing back pain, I must diligently comply with the exercise program prescribed by my physiotherapist, consisting of series of stretches and strengthening exercises to be performed every day. However, as much as I consciously want to follow through, and as high as is the goal-led incentive to comply with the program, I often either forget to practice, or I don't have the motivation to overcome the multitude of steps I need to engage in before I even start training: Opening my email to find the link towards a web application which I need to scroll through to see which exercises have been assigned, navigating in and out of the app to set timers of different lengths for each stretch, keeping track of the number of repetitions I am performing, fetching necessary accessories like tennis balls, yoga mats, and stretch bands, etc.

We aim for the artifact to remove the need for any kind of conscious thought and decision-making from the user. Most likely presented in a user's home, it will serve to provide a cue for a habit, guidance as users complete the desired routine, and a reward, for the sole purpose of helping the house's occupants to build strong habits.

## User interaction and relationship

*Think about the kind of relationship you wish to foster among and between your users and the artifact or installation. What will your project afford users and how would the experience make them reflect on themselves, their environment, society and your intentions?*

In designing the interaction, I am inspired by the work of David Rose as outlined in « Enchanted Objects ». Non-negotiable aspects of the design include having a single purpose, not being intrusive and being brutally simple. It will not require that the user learns a new skill or adopts a new habit to start using it. In addition, the artifact will not convey judgement on the user about not having completed tasks or ask them for regular commitment to using it.

I hope to garner in the user feelings of reassurance, autonomy, relaxation, and empowerment. When users interact with the artifact, they will feel a sense of relief at being taken care of, and eventually pride at accomplishing their goals.

Further research (user interviews, metaphor cards) is needed to learn which personality to imbue the artifact with to convey these feelings. However, when I myself think of the artifact as a human, I imagine it would be a bit like a 40 year old no-bullshit friend with her own family to take care of and a full time job. She understands that I'm already trying my best and holds no judgement about my

failures. She doesn't think that succeeding or failing has anything to do with personal character but rather with circumstance. Since she knows what it's like to be busy and tired, she is efficient with my time and guides me to the best of her knowledge, with kindness and humor, based on her own life experiences.

The essential meaning I hope to convey with this experience is that we are harder on ourselves than we need to be, and that we accomplish more when we stop trying in such hard-minded ways. A lot of us feel some form of existential guilt that we're failing at putting enough effort into something. I'd like to explore whether perhaps it's not that we aren't capable of motivation, it's that we don't understand that that's now how our brains work; and once we do, we can stop feeling like we don't accomplish enough.

When I feel like I'm late or running after things, I feel anxious. But ironically, much of anxiety relieving technology involves committing to yet another activity, and feeling yet again disappointed with ourselves when we fail: tracking our emotions in a journal, starting a meditation program, exercising more, eating more healthy, reaching out to friends, are yet more things we need to convince ourselves to do - use our limited reserve of willpower for, in order to stop feeling anxious. Instead, the artifact will serve to take care of the user, much like a thermostat will regulate the temperature automatically in a house. Effectively, it allows the user to stop thinking about the list of things they need to do, and simply plug in to the interface for a while, follow step by step instructions, and know that if they thoughtlessly follow what the machine asks of them for a known amount of time, they will reach their goals without it taking so much effort.

# Potential for empowerment

*Think about the notion of empowerment. Is your artifact really helping or challenging users or is it just another psychological prosthesis?*

I don't believe physiological prosthetics aren't intrinsically bad. Some of us have poor memory, while others suffer from chronic and sometimes debilitating emotional and mental diseases. If technology can afford the human mind some support in ways similar to how anti-depressants, anti-psychotics, and mood stabilizers do, and if our goal is to maximize human well-being, then we should support the development of effective and accessible psychological prosthetics.

However, because this artifact is inspired by scientific research around making habits automatic, part of the evaluation of its success will revolve around determining whether long-term users can eventually stop using the device and maintain the habit as effortlessly as they did when they were using it. The research seems to suggest that a primitive part of our brain, separate from the processes we think have to do with accomplishing goals like willpower and memory, governs our habits. In order to minimize the amount of active processing that our brains need to do, we store information for and act out habits in a subconscious part of our brain which automates out actions without us having to think about it. The hope is that this artifact can not only facilitate achieving goals while we are using it, but also engrain in us the habits we want to engage in so they become automatic.

One might argue that by encouraging humans to behave like automatons, we are disempowering them by removing some of their free will. We could even be pushing humans towards the « Uncanny valley » where we can barely recognize humans from machines. We could envision envision a dystopia where humans are reduced to

appendices plugged into a computer which compels them to act most productively towards goals by training them to follow subconscious habits.

In response, I would argue that free will paradoxically can take away some of our freedom. Too much choice leads to choice paralysis, doubt, and lack of commitment. This artifact plays into user's already existing goals and empowers them in two ways: by making goals easier to achieve and by putting an end to the mistaken belief that we are the problem and that if we just tried hard enough we could get stuff done.

## Interaction design strategies

*Think about how to successfully communicate your intentions - what Interaction Design Strategies will you employ? What are you trying to tell us?*

The overarching question that I will keep in mind through the design process is the following: « How can I use my understanding of how habits work to help people easily work towards their goals without giving up? »

In order to better understand how users feel about their relationship to long-term goals and habits, I will need to conduct interviews on a varied audience. Extreme personas would include people who have no interest in self development and people who appear obsessed with it, people who are successful at maintaining daily habits, and people who try a lot but fail to persevere.

I would like to use metaphor cards with interviewees to get a better sense of the emotions and feelings they associate with habits and long-term goals, in order to guide my design of the personality of the artifact.

I will need to make analog rapid prototypes to test individual stages of interaction. Questions

I intend to target through prototyping include:

- What cue in an environment could be both visible and non-intrusive? Would it be light, movement, facial features, etc?
- During the routine, how can the artifact convey duration or repetitions remaining?
- How should the artifact dispense instructions without disrupting the user's routine?
- What are possible reward mechanisms, and which would be most effective?
- How can I convey the artifact's personality through its form and function?

As this project has a lot of moving pieces, I will work incrementally, diluting the experience to its simple form and eventually building a series of progressively more interactive MVPs. This will require that I narrow down what the essence of the artifact is.

## Initial technical evaluation

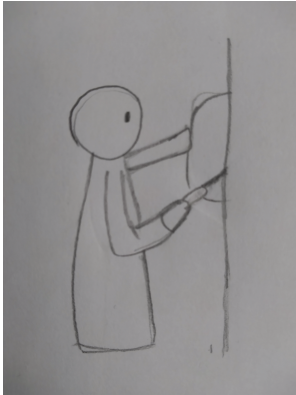
- **The cue.** An intuitive, fast, non-intrusive indicator of whether the task has been completed already. I would like to experiment with different interfaces, most likely visual to not be intrusive. It could be lighting in the form of LEDS or indicators moving with motors or servo-motors
- **The routine assistant.** Guides users through their routine step-by-step while providing directions. It is important that users are able to complete the routine while following instructions, without interruption. An initial prototype could use LEDS to display steps and speakers to speak out directions. Another solution would be to use an LCD screen. A pico-projector could

eventually project images for instructions.

- **The confirmation mechanism.** If a routine contains multiple steps, the user needs to be able to let the device know that they are done with one step and can move to the next. This could be achieved through voice activation and therefore require a voice input. It could also be achieved through buttons, or gesture detection with a camera.
- **The reward.** A quick review of the scientific literature on the link between reward and motivation did not allow me to confirm whether explicit tangible and non-tangible rewards (sweets, beverages, the right to engage in a specific activity, points, badges, etc) are more motivating than implicit rewards (positive feelings) or whether they lead to decreased motivation. I would like to test this hypothesis by creating a prototype that incorporates a lock box that unlocks when the user completes the routine. This would require motor actuators for the lock box. Another prototype could incorporate a camera taking short videos of the user performing the habit so they can see a motivating retrospective
- **Loading routines.** Initial prototypes will come with a pre-loaded routine. In a full-fledge product, users should be able to create their own routine with a cloud-based software. This will require that the program be connected to the cloud to receive updates.



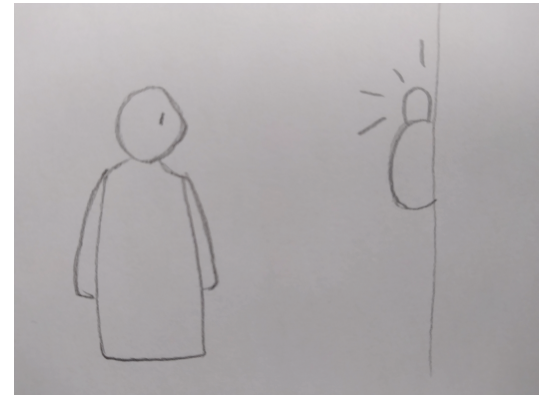
# Interaction storyboard



User places device in the location where they want to perform the activity.



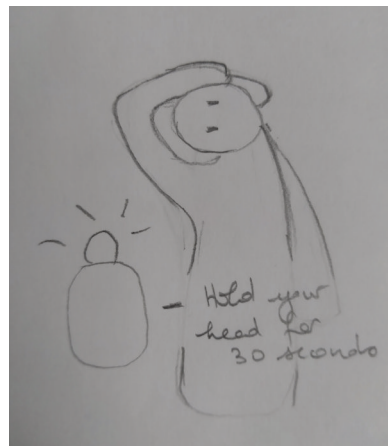
User programs their routine on a simple cloud-base drag & drop interface.



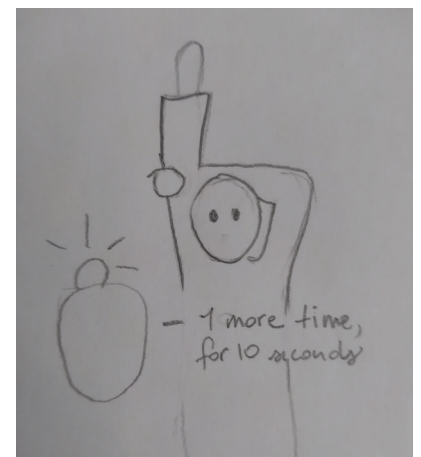
User comes home and notices the routine cue is on.



User starts routine by scanning their hand under the device.



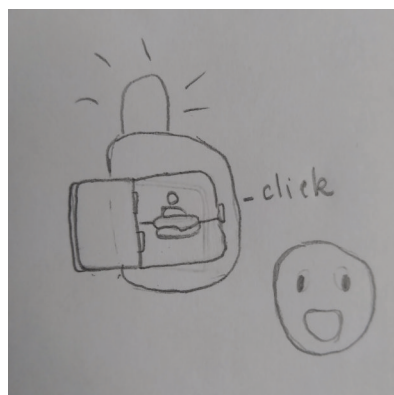
Device projects the first pose and counts required time.



Device projects the second pose and counts required repetitions.



Throughout, the cue signal progressively changes to indicate completion.



When the routine is complete, the device releases the lock to a reward box.

# Suxrvey of existing related projects

## Digital habit trackers

Seeing the hundreds of habit trackers available in the Apple store makes it obvious just how much we want to hold ourselves accountable to our self-development commitments, and perhaps also exemplifies the intense neuroticism and anxiety so common around habits. Each mobile application has a particular approach to habit tracking.

With Habitify, users set up habit goals, enter whether they succeeded in completing the activity each day, and are rewarded with compelling graphs outlining their trends, completion percentages and streaks. It relies entirely on implicit rewards like noticing progress and looking back on performance to cement habits.

Another application, Habitica, gamifies users' lives into RPGs, complete with points, levels, streaks, pixel-art avatars and pretend medieval objects available for purchase with amassed gold.

Beeminder attempts to motivate the user by introducing tangible penalties for not sticking to your promises: self-declare your failures and pay a fee each time you fail.

I suspect Habitshare might have taken inspiration from Foucault's *Discipline and Punish*, as it shares your successes and failures with your social circle so that they can encourage or shame you into submission.

Some applications provide cues in the form of notifications throughout the day so you remember to do certain activities - *It's 3:00 pm, time to take your ten breaths!* I suspect that depending on how many habits one is trying to

start on, the disruption caused by notifications can become non-negligible, though that in itself might become a good incentive - *Better get this done before my phone rings again...*

As for tracking compliance, most applications require users to track completion themselves, but a few support integration with devices like smart watches, smart sneakers and door cameras, as well as other software like GitHub, Instagram, or your phone's operating system. These integrations are limited and require a bit of creativity to use, but to me they are indispensable because without them, one has to make tracking into a habit in itself before getting anywhere.

## Analog trackers: the bullet journal

I might have what the software industry has in recent years coined « App fatigue ». It makes me tired just thinking about having to turn on my phone so many times a day and I am starting to grow an aversion towards using apps at all. So when I started thinking about habits, I used a paper-format bullet journal to keep track of mine.

A bullet journal is a standard notebook in which users keep lists for all aspects of their lives and follow templates shared online by other bullet journalists. It is usually visually appealing, clean, and follows a color or icon code throughout. The journal keeps track of anything. There is a template tracking mood over a year, in which you draw a matrix on one of the pages with as many squares as days in the year, and each day, you color one of the squares either red, yellow, or green, to indicate how you felt. There are templates for listing friend's birthdays, groceries and todo items, templates for weekly, monthly, and yearly calendars, and of course, for tracking habits.

Usually, habits are tracked in a table with the list of habits on the vertical axis, and the days

of the month on the horizontal axis. Because the journal only requires you to draw a cross next to the activities you did complete on a given day, it is relatively quick to fill out, and it's easy to go overboard with the number of activities you check yourself on. A quick google search for « Habit tracking bullet journals » will return articles like « 74 Bullet Journal Habit Tracker Ideas You Need To Try », with ideas as varied as « learn something new », « eat breakfast », « « didn't spend money », and « scheduled social media posts ».

Bullet journals differ from software in that users can interact with a personalized physical object that they treasure and make beautiful. Integrating journaling as part of your day is an opportunity to relax and consciously reflect so users can look forward to that time, an experience that phones cannot provide. However, they still require users to make a habit of tracking themselves.

Also, it takes a particular kind of person to find gratification in coloring squares, in underlining headlines using a ruler with fluorescent markers, and in drawing flowers and writing inspirational quotes in margins (although I certainly do). While bullet journals may suit studious over-achievers who relieve their anxiety by organizing life in lists, they don't meet the needs of most people.

## Smart speakers

While I could not find any single Google Home or Alexa skill that would achieve all aspects of the habit loop (cue, routine, and reward), I found applications which behave similarly to the artifact that I propose for individual domains.

There exists skills that assist users continuously as they perform a routine. For example, *Work Time Tracker* allows user to set

durations of work, and have their smart speaker let them know when they should start working, and when they take a break. *Everyday Workout* guides users through a continuous workout routine follow. When you ask a Google home for a recipe, it will offer to guide you as you prepare the recipe, first listing all the items you need, and then reading each step, waiting for you to say « I'm done » to start the next step.

In fact, one could argue that we do not need to build a specific artifact and instead could use smart speakers to provide cues, guide users through their routines in a linear fashion and link the speaker app with a tracking and rewards platform.

However, smart speakers are designed to manage all kinds of tasks, like a Swiss army knife, so they have the same issues as phones filled with apps that one never remembers to use. You have to awkwardly ask Alexa to « Start my habit app », and can only do so if you remember the name of the application in the first place. The speaker cannot be imbued with the personality described in the previous section.

Also, not all information can be conveyed through voice. It can be a slow and unintuitive way to interact, as demonstrated by the google home listing all of the ingredients to make a chili one at a time in a robotic voice.

## Coaches

While not a project or alternative per se, some companies like coach.me offer habit building and tracking services. They will call you for cues, guide you through routines - *I just want to stop running* - *No one more mile you got this!* - and make you accountable.  $\Sigma$

# Differentiators of the proposed artifact

In creating the artifact, I aim to recognize and get inspiration from aspects of existing projects that make their user interaction effective and pleasant, while learning from their shortcomings to inspire more frictionless solutions.

Unlike software and applications, the artifact is a tangible object that doesn't require to look at a screen. I will experiment with form and behaviors to draw an emotional and soft response from users.

The artifact is a single-purpose object that does not compromise form and function for versatility. From A to Z, each design decision will be made to favor a habit-related interaction. This is not the case of the smart speaker or the mobile phone.

Few of the solutions explored above made specific provisions for each step of the habit loop: cue, routine, and reward. Some of the projects went against this theory and favored a « stick » approach of financially or socially punishing users for their shortcomings. The projects that used tracking as a reward seemed to go along with the notion that conscious willpower, not a self-enforcing routine habit that works with our primitive brain, is the only ingredient to success, thereby inevitably opening the door for guilt and feelings of failure.

Because the artifact is engaged in the habit routine itself, it does not require that the user log their completion of a task, removing the need to make a habit of tracking habits. I hope that the artifact will not intrude in the user's usual life. In addition, favoring immediate reward instead of the supposed benefits of seeing compliance curves removes the need

for tracking entirely, and with it comparison and guilt at failing.

I want to experiment with prototypes to find non-intrusive ways of providing cues. Unlike cell phone notifications, the artifact should be an « Enchanted object » in that it lives in the environment and is imbued with a task-appropriate personality without distracting the user.

I also need to research how to guide routines through multi-modal interaction so that, unlike smart speakers, the artifact can use an appropriate mode of communication for different tasks (e.g. visual for explanations, auditory for conveying transitions).

Finally, unlike bullet journals, users should not need to have a specific interest in tracking or personal habits to want to use or benefit from the artifact. Ideally, it will not require users to change anything to how they are already behaving.