OVERVIEW

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Design Thinking Phases: DEFINE // IDEATION // PROTOTYPE // EMPATHIZE // TEST

LAST WEEK'S ACTIVITIES (WEEK 8):

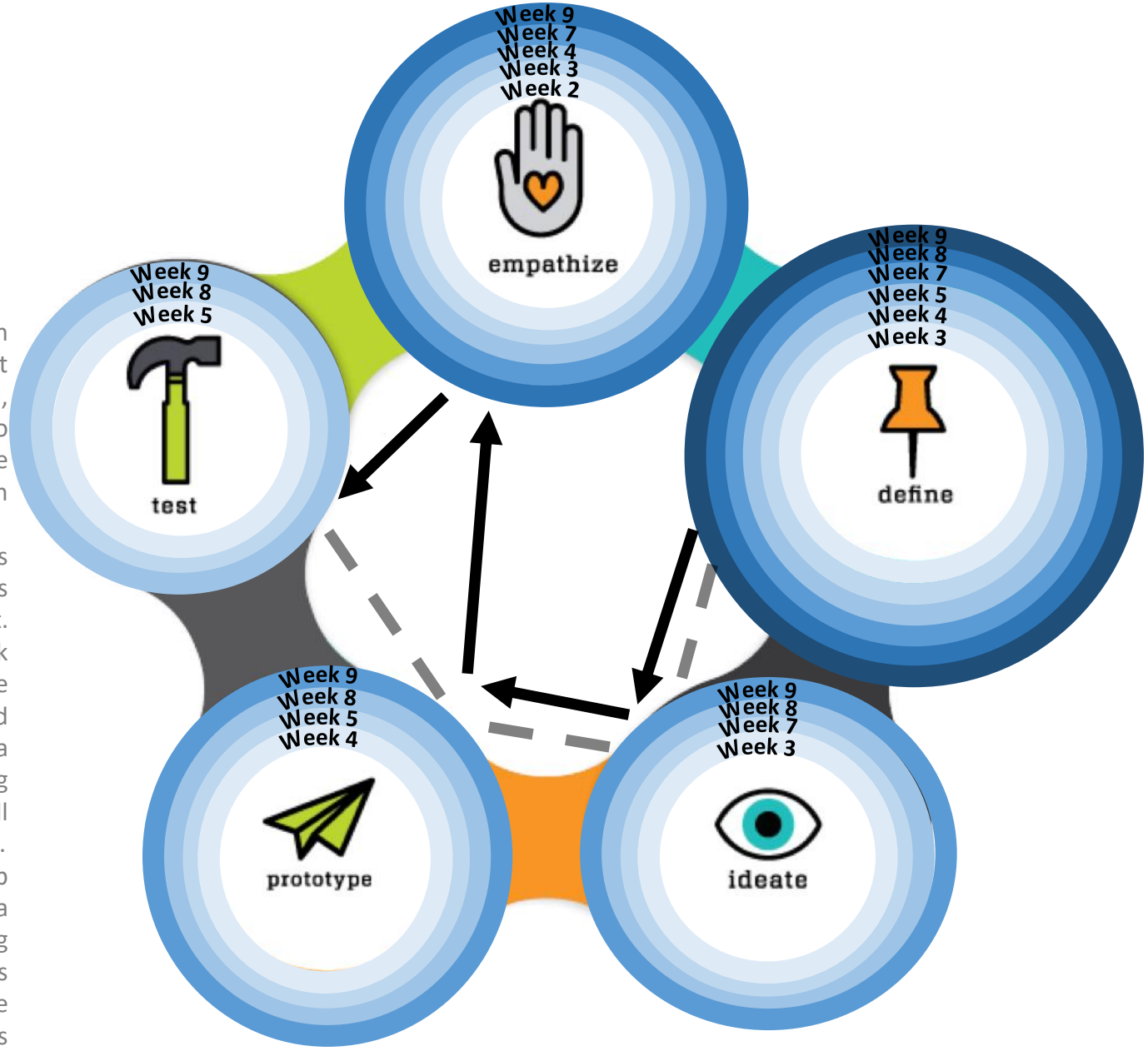
- Marked by ▬ ▬ ▬
- (Define) Affinity Diagramming, POV
- (Ideate) Brainstorming
- (Prototype) Mid-Level Prototyping
- (Test) Wizard-of-Oz Testing, Semi-Structured Interviews

THIS WEEK'S ACTIVITIES (WEEK 9):

- Marked by ➔
- (Define) POV
- (Ideation) Brainstorming
- (Prototype) Arduino/Other
- (Empathize) Interviews, Observation
- (Test) Wizard-of-Oz, A/B

CRITICAL REFLECTION

- Each ring on the diagram to the right demonstrates one week's worth of design activities. While we previously choose to color-coordinate each ring based on what week it was (i.e., week four's rings were orange, week three's rings were green, etc.), we have opted for a new design that highlights the total amount of work put into each phase. For each phase, the light blue rings represent early work that was done for our project; as new, darker rings are added for additional work done, we can easily see how much attention has been given to each phase.
- There are two reasons why this design is particularly helpful for us. Firstly, phases with only a few rings highlight where we need to do more work. For instance, this week we specifically saw the need to TEST, as we had only two rings around it. Secondly, phases that have lots of rings reveal where we have done good work and/or are stuck. In the case of EMPATHIZE, we have added many rings and have been able to "take weeks off" or divert our main attention elsewhere when needed (a sign that we are consistent but not necessarily stuck here). In the case of DEFINE, a ring has been added almost every single week (a sign that we are perhaps struggling with this phase and constantly need to return to it). Ideally, after this week we will move our attention towards PROTOTYPE and TEST and somewhat away from DEFINE.
- Alongside the rings, two sets of arrows (one for last week and one for this week) help expose certain patterns in the way we work. For instance, both weeks include a DEFINE, PROTOTYPE, and TEST combination, with attention to EMPATHIZE changing between each week. While we might not necessarily be "stuck" on EMPATHIZE, this week's arrow responds to our lack of "why" questions in last week's TESTING. As the arrow helps demonstrate, this week we actively use EMPATHIZE methods before/during TEST to ensure the users stay at the heart of our evaluations.



METHODOLOGY

Method(s) used: (Define) POV (Prototype) Arduino/Other (Test) Wizard-of-Oz Testing, A/B Testing; (Empathize) Interviews, Observation

DEFINE

- *POV:* Feedback from last week stated that we have not sufficiently incorporated concrete insights from our design activities into our POV. The user NEED and QUALITIES were criticized for being defined "arbitrar[ily]" rather than being defined by our users. Therefore, we returned to our design data – POV Evolution Chart, Affinity Diagram, Empathy Map, Space Saturate, Interviews, Observation templates, etc. – and redefined our POV. To justify our new POV choices, we broke down each part of the POV after redefining it. This was meant to help us actively reflect on the different ways we believe this new POV takes into consideration the perspective of the user, not our own.

IDEATE

- *Brainstorming:* This week, we used insights from our weekly design articles – especially the articles from Reading Week #3 – to reflect on different materials we can utilize over the final three weeks. The material for our design can tell part of our narrative itself, and we opened a line of communication with library staff about using discarded books for the structure of our design (more reflection on why this is important in results). Image searches on the internet were used to help us, as well as new conversation with participants from previous brainstorming sessions.

PROTOTYPE

- *Arduino:* This week, we focused on developing Arduino code that will 1.) reveal hints and/or displays correct answers on an LCD screen when a button is pressed, and 2.) turn on lights when certain conditions are met. We split up the work between the two of us and developed the code independently. Attempts at executing the code were first tested away from the prototype and then incorporated later when we had correctly created the code we wanted. Code we could not finish/figure out was left out of the prototype (for now) with the plan to use "Wizard-of-Oz" testing in our evaluations until solved.
- *Other*: We returned to recorded interviews/notes from the previous week's evaluations to redevelop features of our prototype. For each change that was made (based on user's feedback/our observations, etc.), we added notes to our Space Saturate on Miro. Particular attention was then given to these changes in this week's evaluations.

EMPATHIZE

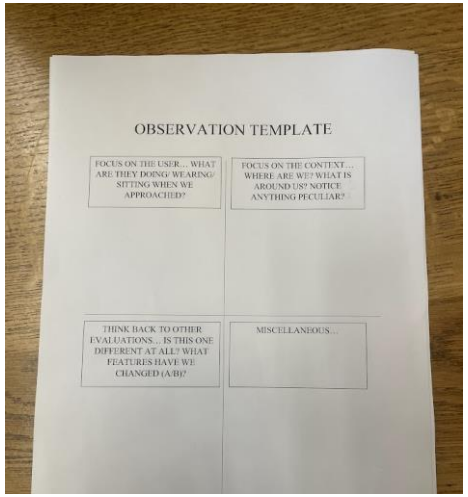
- *Interviews/Observations:* In our feedback from last week, we were reminded to never stop asking users "why", especially when they test our prototype. This week, we focused on asking "why" in our evaluations/interviews by reviewing EMPATHIZE methods directly before our evaluations. This was helpful, as we were reminded to "avoid neutral questions" and "explore emotions." Additionally, while one of us asked users questions (which were discussed between us before each evaluation), the other made notes of what the user was actively doing, not saying. To help ensure these observations were captured, we made an "observation template" that could be filled in during the interviews/evaluations (see image to the right). Our goal was to write down at least 10 insights during each evaluation. Observation templates were reflected upon after each evaluation and influenced our questions for following evaluations.

TEST

- *Wizard-of-Oz Testing, A/B:* Because we were dealing with different illnesses this week, we had to test in a different location from where we intend to deploy our design. From our new location (the entrance inside the library), we interacted with people who aren't directly apart of our user group (i.e., tourists and students inside the library). In general, these participants were presented with the design without instruction so we could see how intuitive features of our redeveloped prototype were for them, though we still needed to occasionally step in and explain/act out underdeveloped features that did not yet work by themself (i.e., the Arduino code we did not complete). Additionally, between each evaluation, we changed a couple of features (A/B testing) to see how users responded differently. Insights were captured on the observation template discussed above, as well as through photography/videography.

(PROTOTYPING)
Mid-fidelity Prototyping with Arduino

(EMPATHIZE)
Observation



RESULTS

DEFINE

- *New POV:* Anna NEEDS a refreshing and rewarding way to engage with the library's history on her study breaks BECAUSE her current interactions with Leuven are mainly limited to studying in the Grote Leeszaal, attending courses, and going home most weekends.
- *POV Break Down: Who is our USER?* → Anna is a Flemish student who sits/stands outside the library on her study breaks. We know that she does this for 10-15 min. in order to refresh her mind for more studying; we know she goes home (somewhere in Flanders) most weekends. *What is her NEED?* → We know Anna wishes she knew more about the library; We know she needs some form of distraction in order to feel refreshed. *What is UNIQUE about her?* → We know she feels overwhelmed by her studies; we know she doesn't have enough time to do a full tour of the library; we know she believes the library is a beautiful place and comes here to feel inspired; we know she feels accomplished when she successfully completes a task/challenge.

IDEATION

- Based on the data collected so far, we know that most students who actively study inside the library admire its status as a historical building and feel inspired by its aesthetic beauty. As one student outside the library told us, "I feel like [the library] is really beautiful and kind of motivating to study in this environment." In order to capture this feeling, we brainstormed with others about different ways we can aesthetically develop our design. Considering the books within the library contribute to the feeling of beauty and generally are not used by students for reading (please note we have quotes on this from our interviews), one participant suggested that we glue pages from old books onto our prototype; however, while promising, it was decided that this would make things too muddled. Nevertheless, we decided to build of this idea and turned our attention to whether old books could be used for part of the prototype's physical structure, possibly a front piece in which the board can be rested upon (see future actions for an image). We spoke with a library staff member who told us that he could get us some Dutch/French books that have been taken out of the library's circulation. A meeting for next week (4/12) has been set up to look at these books.

PROTOTYPE

- *Arduino:* Our Arduino code successfully published hints on an LCD screen when a button was pressed. Each hint was designed to help users correctly "divide the library." Additionally, we developed a code that would turn on lights and reveal the correct answers at the end of the game, though we had to wizard-of-oz this for many of the books (i.e., we did not have it set up for every book, only two). Physically deploying the code was helpful and revealed some limitations we had not thought about before; for instance, our design currently has space for 16 books, but we realize we would not have enough space on the Arduino board to show correct answers for this many books. We will therefore need to redevelop our board so it focuses on less books overall. Link to code: https://github.com/jrmoose3/Design-Making-and-Thinking.git
- *Other:* Alongside developing code, we redesigned the books by adding arrows to them. These arrows help indicate that books must slide to the left or the right (something users could not intuitively figure out in earlier evaluations). We also added a descriptive board that contextualizes the game.

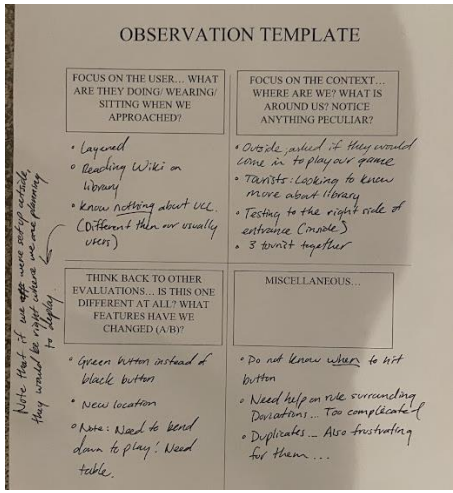
EMPATHIZE

- *Interviews/Observations:* See image to the upper right. Visibly frustrated by certain books (duplicates and donations); Need to bend down to play (not realistic for when we need to do in the wild testing); Took a very long time to make decisions, even though playing as a group of three.

TEST

- *Wizard-of-Oz Testing, A/B:* In general, we observed that users knew how to play the game with each hint and intuitively moved the books based on the arrows we added. However, in terms of the button we tested, there was still some confusion about *when* it should be hit (i.e., before or after moving the books). This showed us that we need more clear direction and possibly should even print a new button that is a different color. (One user told use they didn't like the button and when we asked why, told us the green distracted her. When we asked why again, she said it made her want to immediately find out what it was rather than first focus on the game itself).

(EMPATHIZE)
Observation



(TEST)
Wizard-of-Oz Testing

FUTURE ACTIONS

KEY TAKE AWAY: MORE PROTOTYPING NEEDED

This week was very productive in that we redefined our POV, successfully ideated with others, reflected on some of our design readings on material choices, and created code that can be implemented into our hints. Moreover, we also performed some testing that informed us more about how users interact with our design. However, in the future, we need to prototype more. We have a number of promising ideas based on all of our work and collected data, but we now need to ensure we implement them in our design before we do our “In The Wild Testing.”

Tangible Steps for Next week

1.) Over the weekend, we will use Inkscape to redevelop the board our game is played on and create “walls” that will hold it in place (right now, the support system is much more flimsy). Ideally, it will be smaller and able to smoothly implement the Arduino code we are developing. We will also send an email to the library staff about getting a table outside the library entrance in which our prototype can be placed upon for “In The Wild Testing”.
2.) Monday 4/12 → We will laser cut the new pieces we have developed on Inkscape and redevelop the prototype accordingly. We will also meet with a library staff member about using discarded books for a front piece of our design. The image to the right represents what we will do with these books (image taken from internet).
Tuesday 5/12 → We will focus on our Arduino code and ensuring it works in our redeveloped prototype. If anything needs to be cut again or redeveloped based on our activities the day before, we will go to the fablab again.
3.) Wednesday 6/12 → We will perform our “In The Wild Testing” at the library. We will write up our findings on our Space Saturate and begin filling out our WDP with our progress.
4.) Thursday 7/12 → We will finish the WDP if it is not completed the night before.
5.) Friday 8/12 → Come to class prepared to talk about our findings / other tasks required of us.

Potential Ideas for Structure of the Design