OVERVIEW

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

LAST WEEK'S ACTIVITIES (WEEK 9):

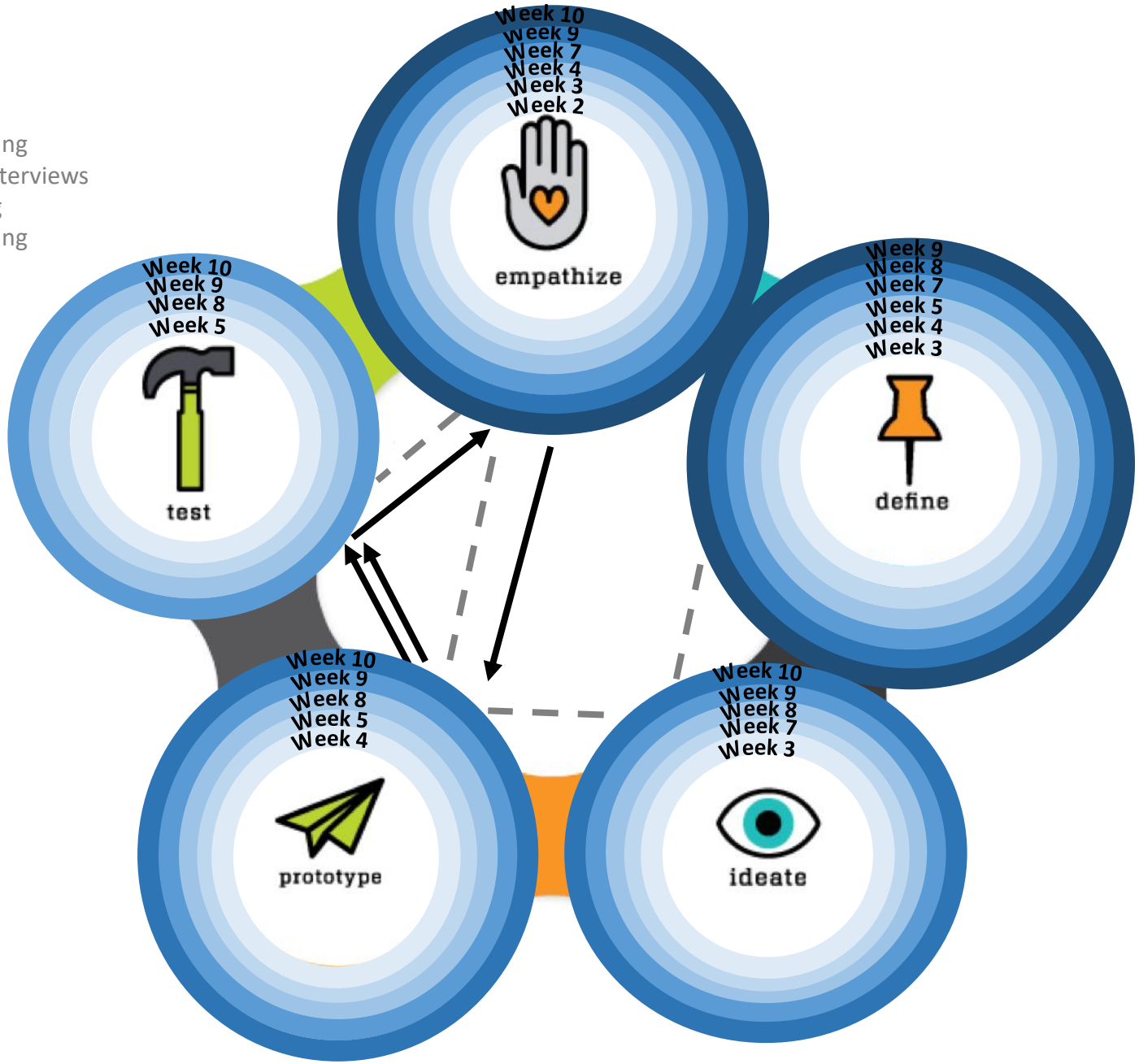
- Marked by
- (Define) POV
- (Ideation) Brainstorming
- (Prototype) Arduino/Other
- (Empathize) Interviews, Observation
- (Test) Wizard-of-Oz, A/B

THIS WEEK'S ACTIVITIES (WEEK 10):

- Marked by
- (Prototype) Arduino; Mid-level Prototyping
- (Test): "In the Wild" ; Semi-Structured Interviews
- (Empathize): Observation; Bodystorming
- (Prototype) Arduino; Mid-level Prototyping
- (Test) "In the Wild" ; Questionnaire

CRITICAL REFLECTION

- In the past nine weeks, we have generally started our activities with EMPATHIZE or DEFINE and proceeded clockwise from there. This approach stemmed from a desire to adhere to the learned order of the phases, which has kept us organized and systematic in our design process so far. However, it has perhaps limited our exploration of the full potential offered by each phase. This week – and to some extent last week – we experimented by deviating from the usual order. We started with the PROTOTYPE phase, which we identified as needing the most attention. From there, we moved to "In the Wild" TESTING and EMPATHIZING with users.
- Another way we deviated from our usually approach was by returning to certain phases more than once in the same week's activities. On our diagram to the right, the second arrow between PROTOTYPE and TEST highlight a second round of mid-fidelity prototyping and evaluations we did after EMPATHIZING. Moreover, our first "In the Wild Testing" was successful and revealed several small things we needed to change in our redeveloped prototype.
- In terms of the TEST phase, returning to it twice allowed up to employ new methods (such as User Experience Questionnaires) that we did not prepare when we TESTED the first time around. It was helpful to compare data from both our approaches; in the end, we learned that a short interview alongside a short questionnaire helps get users talking to us but, at the same time, can prohibit users from being overtly critical; perhaps a better way for more critical feedback would be to leave a questionnaire on the table and let them answer before we approach. We will try this next week to see if we get different results.



METHODOLOGY

Method(s) used: (Prototype) Arduino; Mid-level Prototyping (Test) “In the Wild” ; Semi-Structured Interviews (Empathize) Observation; Bodystorming; (Prototype); Arduino; Mid-Level Prototyping (Test) “In the Wild” ; User Experience Questionnaire

PROTOTYPE

- *Mid-Level Prototyping:* Working on Rhinoceros – a design platform which Mina is fluent in – we redeveloped certain features of our prototype and created multiple iterations for comparison. For each of these iterations, we returned to our data and reflected on how accurately each design related to our users’ perspective. After deciding on which iteration to pursue, we went to the FabLab and had our design laser-cut. We used three sheets of 3mm wood and ensured each of the pieces fit perfectly before leaving.
- *Arduino:* Following our mid-level prototyping, we worked on our code. Focus was placed on having a two-button system put in place – one for hints and one to check answers (more on why we did this in results). The code for the hints was (for the most part) finished last week, so much of our attention was pointed at developing the check answers code that would be activated through a series of touch sensors. Since each of us had our own Arduino kits, we were able to work on the code independently and share our results in a GitHub repository. We then met at the library to incorporate the code into the physical prototype.

(PROTOTYPING)
Mid-Level Prototyping (1)

TEST

- *“In The Wild”:* After we opened a line of communication with the library staff about deploying our prototype, we performed “In The Wild” testing at the center entrance. The prototype was able to sit on a table given to us by the library staff, and we decided to sit on nearby steps to make it look like we were students on a break. Occasionally, we would move spots to see interactions from different angles (see images to the right). .. When users approached our device, we wanted to observe the different level of interest each user displayed before either engaging or walking away. Therefore, we stayed away from them as long as we could before eventually making ourselves known. Photography was used to capture this process.
- *Semi-Structured Interviews:* A short list of questions were developed for those who stopped to play the game. Following a similar procedure to our interviews last week, one of us asked the questions while the other tried to capture as many observations as they could. These interviews/observations would be discussed between the two of us following each evaluation and taken into account for future tests.

(TESTING)
“In the Wild” (1)

EMPATHIZE

- *Bodystorming:* Alongside our interviews/evaluations and observations, we also decided to return to other empathize methods, such as bodystorming (a practice we had not done in a number of weeks). We tried to engage with this method by specifically keeping our prototype in mind - each of us took turns “studying” in the library and coming down to play. In particular, we hoped this practice would give us a fresh look at questions surrounding the device’s location, size, and general appeal.

PROTOTYPE/TEST (SECOND)

- *Notes:* Some features of our prototype needed to be redeveloped after user feedback. We also noticed some errors during the evaluations (such as some mistakes in the code). We meet up at the library on 7/12 to discuss changes. While we still have a few small errors that need to be fixed, we were able to evaluate the prototype with a few more users. For these users, we had prepared User Experience Questionnaires they could fill out. This then lead to a short discussion of their answers.

RESULTS

PROTOTYPE

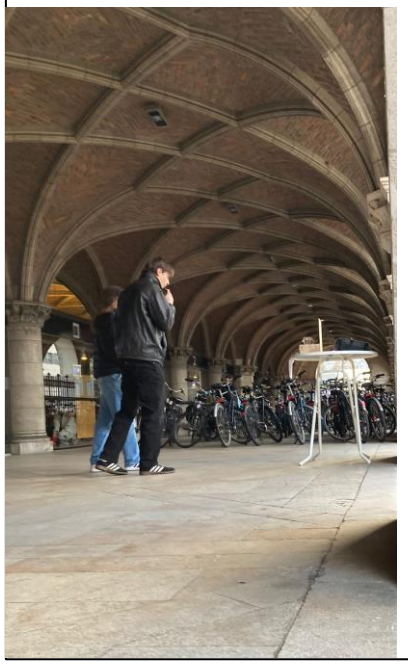
- *Mid-Level Prototyping:* Our new prototype deviates from old models, but only in matters of fidelity. The same idea is largely there, but we were able to physically implement features we had previously only been able to do by Wizard-of-Oz. This included space for the buttons and LCD screen. Additionally, we made the prototype smaller and more sturdy by giving it walls as well as an internal support system.

TEST

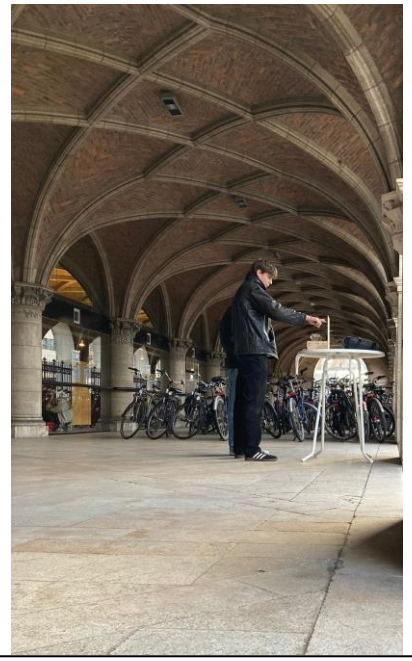
- *"In The Wild":* Our "In the Wild" Tests were very successful. For the most part, our users were students outside the library and either on a study break or coming to the library to study. The images to the right demonstrates how many students engaged with our design. In this case, two male students came outside from studying to smoke; they noticed our design and slowly approached to play. … Students found the game very fun; sometimes while we would be interviewing, more students would show up and want to play. As a fun side note, the director of the library even saw us evaluating and decided to try the game out for herself ☺
- *Semi-Structured Interviews:* The semi-structured interviews were helpful, but we wish we had prepared better. Our questions were too specific to certain concerns we had surrounding the design ("What do you think of this" etc. etc.). In the future, we should plan our questions out BEFORE we prototype (it is clear that prototyping concerns were directly on our mind and therefore influenced our questions).

(TEST)
"In The Wild"

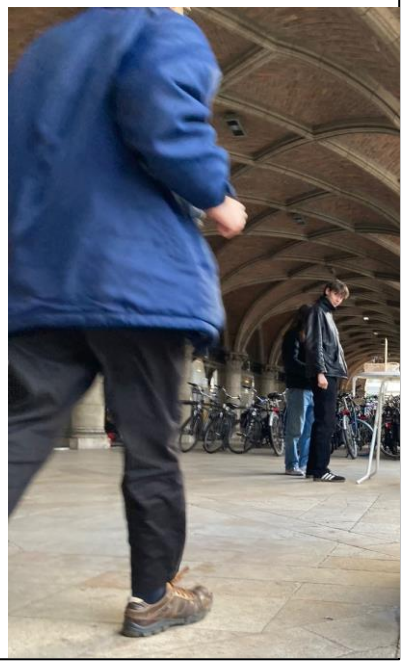
1.) User Interest



2.) Engagement



3.) Running over for Semi-Structured Interview



EMPATHIZE

- *Observation:* We noticed that many student who were leaving the library to go home or elsewhere (i.e. somewhere on their bikes) would not stop and play our game. Instead, almost all the students who played our game were on study breaks. At first, we were concerned when we saw so many people walk by, but then realized these aren't even the students we have been prototyping for – we have kept students who are on a study break at the heart of our design and were glad to see that the results matched the data we have gathered.
- *Bodystorming:* In bodystorming with our user's POV in mind, we felt that the table/stand was particularly welcoming; its large size made approaching the device quite easy, and its neutral color made the device stand out a bit. In terms of the location, we felt that having it right near the center was the most eye-catching and one of the easiest spots to walk towards while on a study break. In previous weeks, we interviewed students at the left/right entrances, two other good spots, but one's not as easily accessible as this one (bodystorming is what helped us find this insight).

PROTOTYPE/TEST (SECOND)

- *Arduino:* We returned to our Arduino board with the hopes of figuring out the code for the sensors. For the most part, it is correct with the exception of one small problem – a text we want to appear when a button is pressed appears on the screen immediately after we execute the code (i.e., before the button is pressed). Additionally, while we were able to correctly hook-up one touch sensor that calculates the correct number of books a player has each time they play the game, we need to fix its location on the board to ensure it is regularly sensed when the books are moved. Ideally, we also need two more touch sensors.
- *User Experience Questionnaires:* The evaluations we conducted after fixing features of our code were accompanied by User Experience Questionnaires. Responses were mostly positively, and we feel that our presence alongside the user when they filled them out may have shaped responses. If we can get the code finalized this upcoming week, we can be more absent from our In the Wild Test (i.e., not needing to step in to explain any small mistakes in the code). Maybe then we can have them fill out questionnaires without us being as present.

FUTURE ACTIONS

KEY TAKE AWAY: MORE PROTOTYPING /TESTING NEEDED

We learned much from this week's activities, especially our "In the Wild Tests". We need to continue implementing the feedback we have received and will therefore, in the future, continue to focus on Prototyping and Testing. Nevertheless, because this is our final week, we will also return to our POV, Affinity Graphs, Empathy Maps, and more to ensure every decision we make/have made is based on our user's needs and perspective. Ideally, alongside our finished prototype, we can clean up our Space Saturate so it tells a clear narrative of our work (whether through different groupings or another method).

Tangible Steps for Next week

1.) Over the weekend, we will work on the placement of our touch sensors to ensure all "correct" answers are revealed when the user plays. We will also work on our code to ensure there are no errors.
2.) Last week we discussed the idea of adding old books to the device for an aesthetic appeal. We were able to get these books and want to add them. On Monday, we will look at how realistic this is given that a saw or knife will be needed to cut the books. If possible, we will spend this day working on adding these features
3.) On Tuesday, we will perform more "In the Wild" tests. Ideally, our code will be correct, and users can engage with it completely (i.e. without any assistance). We will have Questionnaires these users can fill out and will have the users fill them out without us hovering around them.
4.) Wednesday, We will glue the walls together and ensure the pieces of our prototype are as sturdy as possible. We will begin our WDP and submit if possible.
5.) We will clean up our Space Saturate and look overall all of our data. We will add new data, as well. We will finish our WDP if left unfinished.
6.) We will come to class prepared for our final lecture.