

Lab 4: Interrogating User-Centered Design

Overview

There's no single industry standard for what developers consider to be good user-centered design. Generally, it's defined by a focus on understanding users and their needs to incorporate them into all stages of the design process. While understanding and incorporating user needs and feedback is fundamental to responsible programming, it's also difficult to test and measure success in this area. Reasonable developers may disagree with each other and with users on what counts as a user need and what constitutes 'good' user-centered design. In class, we have talked about some of these issues, in particular, when and whether technology should uphold individual agency or guide users with a paternalistic hand.

In Lab 4, you'll tackle how to practice and measure user-centered design head-on. You'll be creating a **wireframe for the user interface (UI) of a time management application** by choosing from a set of features that we give you. When choosing features, you should consider what you think constitutes good user-centered design and what your application hopes to achieve. You'll then need to **explain how your choices interact** with or uphold different normative facets of user experience related to values like agency, transparency, and empowerment. Lastly, you'll need to come up with a **testing plan** to verify that your UI actually promotes or protects the values you had in mind.

While we'll leave most of the decision-making to you, the time management application should at a minimum:

- Take in information about tasks users need to complete and how much time they have to complete them
- Strive to help users manage their time
- Help users achieve some sort of productivity goal

In essence, this app should help keep people 'on track' to meet their productivity goal, using the information it is told by or collects about the user. How exactly you do this will depend on what options you choose from the feature menu below. Still, some common patterns in these kinds of applications include restrictions on internet access for set periods, alarms, nudges, reward systems, and gamified interfaces.

Some context on values in user-centered design

In the process of creating the front end of an app, developers and UI-UX designers face a variety of design decisions that affect how users will interact with the app and, in turn, how the app shapes their behavior in intentional and unintentional ways, and how effective it is in doing so. In aggregate, many of those choices have a profound impact on how technology integrates into our lives: whether it helps or hinders us in achieving our ends or goals we have set for ourselves, or whether it even shapes what we value in the first place.

In light of those impacts, **any design will necessarily be normative**: it is not neutral but instead implicitly encodes value-judgments on what goals are important and what behaviors are encouraged and discouraged. In other words, as a designer and developer, you face a variety of normative choices about how your artifact engages with and shapes its users.

Those choices commonly (but not exclusively) touch upon the above-mentioned values of agency, transparency, and empowerment.

1. **Agency**-centered values focus on the user as an autonomous, self-determining agent, and ask what it takes for their choices and actions to reflect truly autonomous decisions and when autonomy matters most.
 - a. What does the user (actually) *want*?
 - b. What is *good for* the user? How does it compare to their expressed preferences?
 - c. What choices should the user be able to make no matter what?
 - d. What (if anything) should the user be protected from, even if it compromises user autonomy?
 - e. Which (if any) agent-stakeholders other than the user are affected by those choices and how should their interests factor into the decision-making?
2. **Empowerment** is related to agency but centers on providing users with the means to flourish. In other words, what does it take (in terms of support, tools, etc.) for users to achieve a goal or make changes to their lives and routines that align with their self-image and desires? Conversely, how might technology undermine individuals' capacity or disposition to take those actions?

3. **Transparency**, finally, encompasses the notion that, as rational, self-determining agents, individuals have a claim to be aware of the factors that affect and shape their choices. In other words, individuals should be able to identify *by whom, for what purposes, by what means* they are being influenced. As with all of those values, the value of transparency is not necessarily absolute and unconditional (transparency may undermine other normative goals), and it will be your responsibility to make a call when transparency is warranted.

Why focus on those values?

Reflecting on those values is important in order to paint a clear and specific picture of what goals your app pursues (what does it want to enable users to do) and what assumptions it makes about the psychology, desires, priorities, and vulnerabilities of its users (what constraints does it have to navigate). As usual, all those choices come with trade-offs -- e.g., complete user autonomy is generally incompatible with paternalistic safeguards against harmful usage modes and patterns -- and as a designer, you must consciously reflect on the cost of those choices and justify them transparently.

Design dimensions

We don't expect you to comprehensively design and describe all aspects of your time-management app's interface and UX in this assignment. Instead, we ask you to describe and explain your design in light of the following **four design dimensions**:

1. **Consent procedure**: How will you ensure that users provide *meaningful consent* to the collection and processing of their personal data for the purpose of the app? Consider the mode of consent (e.g., implicit, tacit, active, informed, ...) and the logistics of the procedure that aims to implement it (e.g., timing, general interface design, amount and structure of information, ...).
2. **Attention-related invasiveness and addictiveness**: When and how does the app engage users' attention? Does it (materially or psychologically) reward sustained and repeated attention? If so, is it necessary and can it be justified in light of the purpose and goals of the app?
3. **Manipulation of user behavior and nudging**: Does the app rely on non-/sub-rational means of influencing users' behavior? Are the goals pursued aligned with users' goals or good? How transparent and invasive are the nudges?
4. **Prescriptive vs. user-defined goals**: Does the app rely solely on users defining their own time-management goals or does it also "suggest" good (by some

external standard) time management patterns (e.g., modes which suggest or help users prioritize “valuable” activities and spend less time on others)?

You will have to make concrete choices (and trade-offs) on what your app aims to achieve on each of those four dimensions.

Those choices will be reflected in the concrete features and design-patterns you chose for your design. When you explain your design, you should highlight and reflect on those concrete choices and how they support the aims you have set for your app design with regard to the four design dimensions above.

Feature menu

Here’s a **menu of feature options** you can choose from in the description of your design:

- Restrictions on app or internet access
- Alarms and notifications
- Nudges, rewards
- Gamification
- Statistics and aggregated data insights
- Visually highlighting and hiding options
- Social features
- Distribution of information and content across different parts of the app

Note: You don’t have to include all of those options in your design and you don’t have to include design elements which go beyond those covered by the menu options. If you do go beyond the options from the list and or you include all of the options from the feature menu, this will be rewarded in the form of *plant-extra-credit* (i.e., you’ll get a baby plant from Julia). Make sure to highlight your claim to plant-extra-credit in your submission!

On Social Impact Testing

As computer scientists, we have a lot of tooling to test our software for correctness and speed. While there is more and more being written about how to measure the impacts of specific technologies on users, we lack standard guidelines on how to test for and measure the social impacts of the code we are writing.

Broadly, social impact testing should define a structured way to measure and verify an effect of interest of a given software, feature, or technology on a group of users. In this assignment, we want you to start thinking about what it might look like to incorporate social impact testing into the software development process. In doing so, you'll be contributing to an ongoing investigation into what established standards for such testing might look like.

First, it is helpful to think about what you are testing for. What value or standard would you like your feature to uphold, and what metric could you use to check for it? (For the purpose of the assignment, you should use the user-centered design values and the concrete choices you made on each of the four design dimensions as your guide.) If you're testing for how a feature affects user empowerment to direct their attention in ways that are meaningful to them, what kinds of user feedback or measurements would you require in order to draw a satisfactory conclusion? Would it be enough to ask people how they feel (happy, anxious, self-conscious) while using the app? Would you need to survey them before and after some usage period? How long is that period?

Just like standard software tests, you might find it helpful to break these social impact tests down into units. It is more useful to understand a **specific way in which technology impacts constituents of a particular group**, rather than abstracting impact to the societal or citizen level. Considering the role that groups of stakeholders like workers, educators, voters, students, doctors, patients, and others play in the use and development of technology. This will also likely help you shape what kinds of metrics or questions make sense.

Assignment Roadmap

Step 1: Choose the features of your time management application from the [feature menu](#), and create a simple **wireframe** using **Figma*** to showcase their implementation, operation and interactions with one another (when applicable) within the context of the app.

Focus on features addressing the four design dimensions described in the [previous section](#). Think about how your features would apply to the three broad categories of values we aim to prioritize in our interpretation of user-centered design: user agency, empowerment, and transparency (as outlined [above](#)).

Your wireframe submission should contain:

- Key pages of the app (i.e. sign-in page, homepage, user profile, pages required for the time-management features you focus on, etc.)
- A brief description of the app's overall features, themes, and design.
- A name/title accompanying each page. This could be done by giving the window an appropriate name / using a post-it.
- A short description accompanying each of the more complex pages, briefly explaining its features and purpose.

Here is a [basic wireframe template](#), built with Figma's FigJam board. We know that using 'Design files' on Figma to build wireframes is more common in industry, so feel free to use that instead if you are comfortable with it. We find that a FigJam board wireframe is easier for beginners.

Here is a FigJam wireframe [example](#) for your reference. Prioritize a clearly structured and well-annotated wireframe with clearly identifiable features over an aesthetically pleasing but complicated one. We're not judging how nice your wireframe looks!

**Follow this handy [setup guide](#) if you have not set up Figma before!*

Step 2: In a separate document, describe **why you chose each feature** and justify its inclusion. Use this [template](#) to format your answer. In your answer you should address **at least two** of the design dimensions and **one** of the three values (agency, empowerment, transparency) **for each feature**. Specifically, we want you to explain how this feature impacts users, why you think it reflects user-centered design, and how it helps your application achieve its goal.

As a reminder, the goal of this isn't to design the 'perfect' or most user-centered application, but rather to investigate the normative design decisions embedded into the technology we interact with and create. So don't shy away from mentioning trade offs or flaws with your application, if applicable.

Step 3: Now, think back to the description of Social Impact Testing above. We want you to give us a description of a social impact testing plan for **three of your chosen features** that you find especially intriguing or important. While there are many ways to test social impact, we want you to focus on user interviews for the purpose of this assignment.

For each feature:

1. Identify and explain the **specific impact(s)/outcome(s) that you are testing for**. Provide any necessary context.

2. Specify **five or more questions that you would ask in an interview** with a user to learn more about how this specific feature has impacted them.
 - a. Remember, your goal is to assess whether the feature is successful in upholding or promoting specific goals or values or preventing adverse outcomes. Think about what questions you would have to ask in order to receive information that allows you to judge whether your features actually achieves what you intended it to achieve.
 - b. Include follow up questions (if applicable).
 - c. Explain any limitations of your questions or the data you might obtain. Think about what you can and what you can't learn from testing your design in this way.
3. **Specify additional data** (if any) that you would obtain from a user (or other non-user stakeholders) to better understand the social impact of that specific feature. Examples include 'screen time' data and diary entries, etc.

For this section of the assignment, we are most interested in the questions that you would ask your users. We are looking for questions that consider a comprehensive scope of impact (i.e., going beyond very short-term immediate impacts on users), and are able to provide nuanced and targeted insights/data into the effectiveness of your design.

Note: Remember that social impact testing has no established standards, so you should think in the spirit of social impact testing as defined above, rather than adhering to any strict guidelines. This question is more of an extension on your learning and an opportunity for you to think about what an eventual standard for social impact testing might look like.

Hand-in and Grading

Please type up your answers for all three steps in a Google or word document. Again, you're welcome to use the [template we made](#) if you find it useful. When you're finished, submit your document on Gradescope.

Grading:

- Step 1: **Wireframe (40%: 20 pts)**
- Step 2: **Feature Explanation and Justification (40%: 20 pts)**
- Step 3: **Social Impact Testing plan (20%: 10 pts)**