In this cluster of four related, smaller, slide decks, we will look at different design philosophies.

The focus in this deck will be on a bigger-picture view of these topics.

It is followed by a deck on what ***not*** to do if your goal is good design, and some of the pathological habits that have historically lead to poor design.

That will be followed by two decks which will introduce examples of better approaches, and will be our main focus going forward.

We don’t start from a tool and invent needs and capabilities.

There are many ways in which we can think about how to design a tool.

Some elements of slide deck were inspired by things that HCI pioneer Ben Shneiderman has said about Artificial Intelligence, but any ideas he has mentioned in that context are presented here in a more generic scope.

Human-Centered Design of Tools

Before we go into specifics about how to design tools with needs and capabilities in mind, some overarching thoughts…

We should be considering big-picture questions such as "Human Values" but also more narrowly-focused questions about the Goals of Individual Users.

We will soon see some specific approaches to keeping our users and their tasks in the forefront of our thoughts and design approaches, but first we should discuss some bigger-picture issues that apply broadly to technology design.

These will apply to software interfaces and experiences, but also to raw algorithms and hardware.

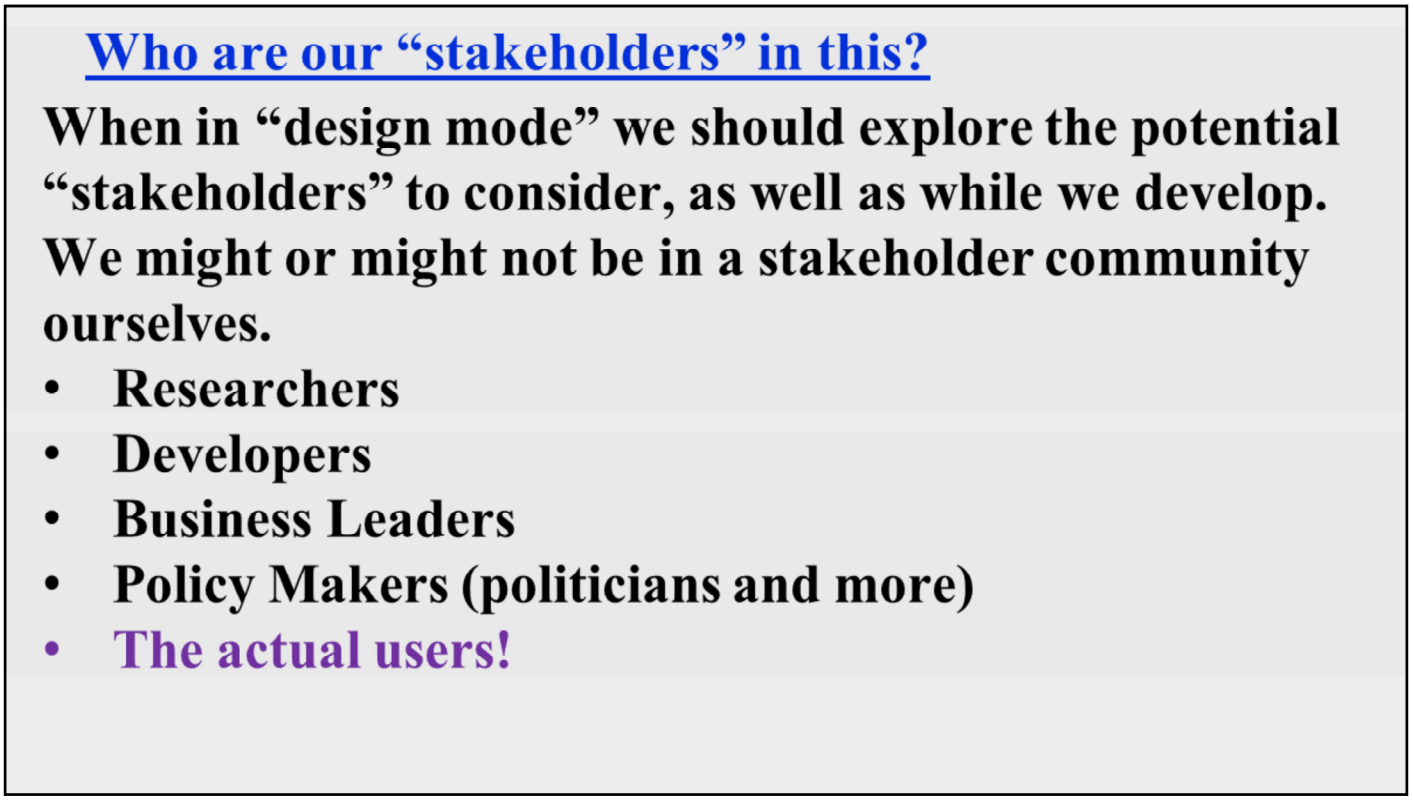
What are our design aspirations?

As we design from a human-centered standpoint, our aspirations should include things such as:

- Build reliable software and infrastructures.
- Take into consideration how to make the use of the technology safe (to the users and to those around them).
- Aim to have your creation seen as trustworthy by those who will hear about it.

While “profit” or “change the world” might be common aspirations we think of, there should be some fundamental ones which will hopefully support those.

This slide lists some core ideas. Take some time to reflect on what other such ideas could be.



We often want to consider what people and communities might have an interest or concern related to our design. This is sometimes discussed in the context of investors, but I would like us to think about this more broadly.

Again, the slide here presents some examples. Consider what others might be.

The bullet list has the actual users last, but we should be putting them first ☺

What threats should we keep in mind?

We should also be actively exploring what threats might be associated with our creation and what societal impact it could have.

- People or organizations that might seek to intentionally causes harm through what you are building.
  - Cybercriminals?
  - Hacktivists?
  - Terrorists?
  - Internet Trolls?
- Having biases built into your interface or algorithms.
- Software that has flaws that could lead to loss of service.

In the cybersecurity filed, there is often talk of “threat actors” or “malicious actors” who aim to exploit weaknesses in systems and carry out disruptive attacks in some scope. The first bullet on this slide provides examples of those. However, I then go on to introduce other types of threats.

Also, I would like to raise the importance of considering societal impact as we design. I have made some modest attempts to inject the idea that new computing projects (especially ones asking for federal funding) should be required to have “societal impact” statements, just as various other types of projects are required to have “environmental impact” statements. I have been unsuccessful so far in convincing others of this need. I encourage you to reflect upon this idea and form your own opinion.

In addition to what is listed here, are there more threats and dangers for us to discuss in this design context? Even more, a potentially controversial question has come up I previous semesters, asking whether what we discuss as “threats” are always bad?

Empathy Mapping

As we begin this topic, consider the idea of the four empathy mapping categories:

- **Says**: When talking about what they want to accomplish, what do user say?
- **Thinks**: What is the user thinking when they are trying to accomplish a goal?
- **Does**: What do the users physically do in pursuit of accomplishing a task?
- **Feels**: What is the motional state of the user during their experience with the software/hardware?

These will be important as we explore user- and task-centered design.

We want to keep these in mind as we discuss user-centered and task-centered design. Observing users and creating such maps can assist designers greatly. The gathering of this type of information can also help us craft user personas, which we will explore soon.

Imagine a person shopping for a laptop in person, with the goal of designing an online commerce site to better sell laptops.

- Says to a salesperson might include “what is the right size to get?” “what brand do you like?” “I need something that will not need to go in for repairs.”
- Thinks might include “if this dies mid-semester I’m toast” “does this person think I’m dumb for asking this?” “I hope I’m not missing an obvious question to ask”
- Does might include searching online before going to the store, figuring out a budget range, trying some out in the store, asking others for suggestions
- Feels might include fear and/or anxiety about making the wrong choice, boredom of having to do this, distrust in the salesperson, etc. (basically, think about everything from Inside Out 1 and 2)

For a more in-depth discussion, please visit and read https://www.nngroup.com/articles/empathy-mapping/