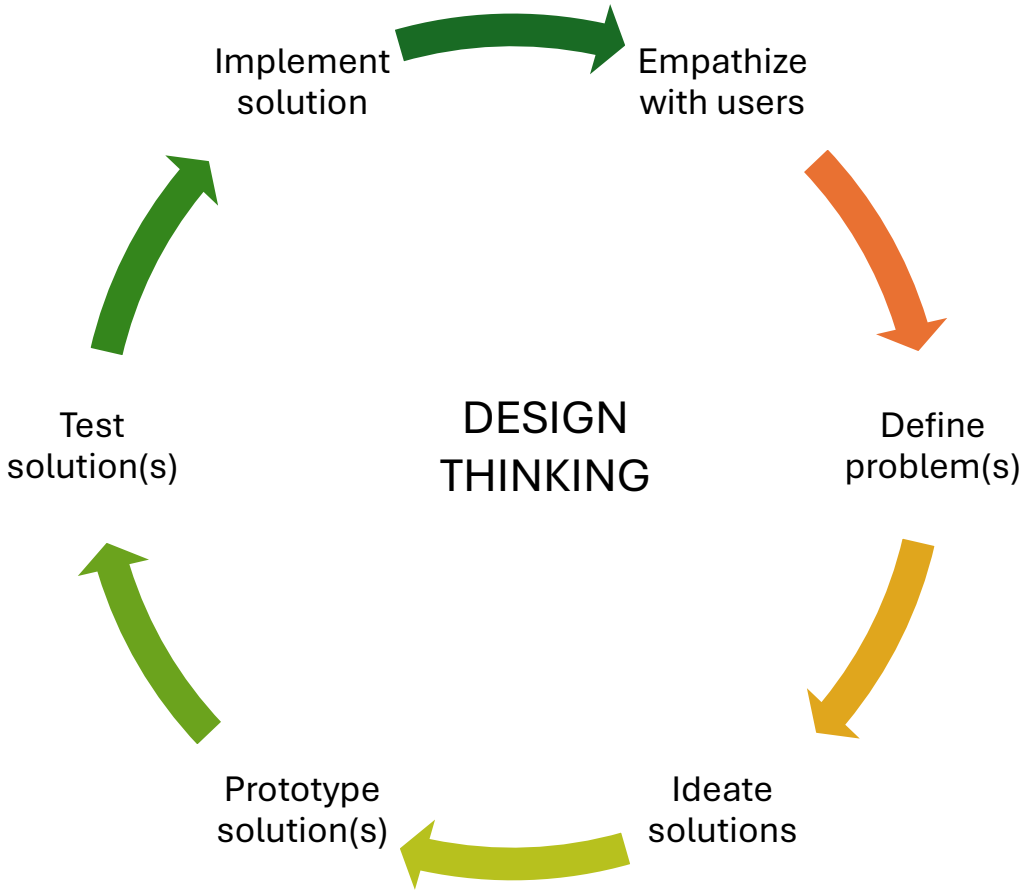
Lecture-12:
Needfinding: A crash course

CS798H: Human Computer Interaction

Logistics

- No lecture on Friday (Have to be at the Senate).
  - Make up lecture on Thursday 1830-1945, L-16.
- Post midterm:
  - 2 quizzes; no end-sem.
  - We'll spend most of our time on projects.
- Project Milestone-1 due Friday 2359 hours.
  - No drop allowed after teams have been formed.
    So if you must drop, please do before Friday
  - Don't join project teams; if you have, let your friends know.

What goes into final project?



1. Empathize with users of an existing system – define problems – ideate and prototype solutions – evaluate the prototype.
2. Empathize with users about a problem – define problem – ideate and prototype new solution – evaluate the prototype.
3. Ideate solutions for defined problem – prototype solutions – test them – implement solution.

External project: A Vision NGO

PROJECT-1: A platform for schools to upload data about their children, and for NGO folks to see this data.

PROJECT-2: A mobile app that shows student data and where volunteers can enter children eye power and choose a recommendation.

PROJECT-3: A dashboard where admin can monitor what is happening (how many children tested, how many specs need procurement, etc.)

Requirements are clear, need these implemented in a usable manner for non-tech savvy volunteers. Evaluate them with pilot users in a camp.

Involves full-stack programming.

External project: Hotdesker

- An admin at a large organization wants an easy to use system for employees to book hot-desk seats for employees that mostly work from home, but come in only on some days.
- Requirements are well understood, we need a web-based/mobile-based app for booking seats in office. The admin needs visibility into seat availability, who has booked what, and be able to allow/disallow some days. Employees need to see available seats for given time and date and book them.

Challenge is in keeping interface simple for non-tech-savvy admin and employees.

Involves full-stack programming.

External Project: ClientConnect

- A Global Sales Team has a tool that helps people see who is chasing what lead, what is the history of that client, and what could be done with that client to further sales.
- Their existing UI is primitive, and they need some design expertise to make it useful and usable.
- The deliverables will be Figma prototypes.

Needs someone familiar with Figma, or willing to learn it. Some engineering background is a plus.

Needs signing an NDA with IITK and the organization.

External Project: Ninja Trader

- A trading team at an investment bank deals with all kinds of news about various companies whose stocks they trade with.
- The data is rich – historical prices, national news, company specific news, industry specific news.
- They have an existing tool, need a simple UI to see all this. Ideally, the output is a simple web-app on dummy data (maybe scraped from news at some point in time) showing all this data.

Needs a team with both design and engineering expertise.

Needs signing an NDA with IITK and the bank.

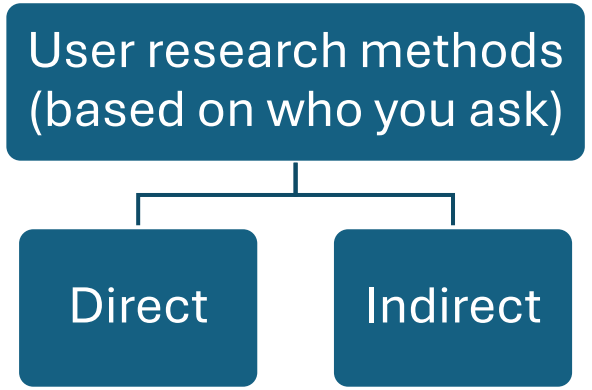
For all above projects:

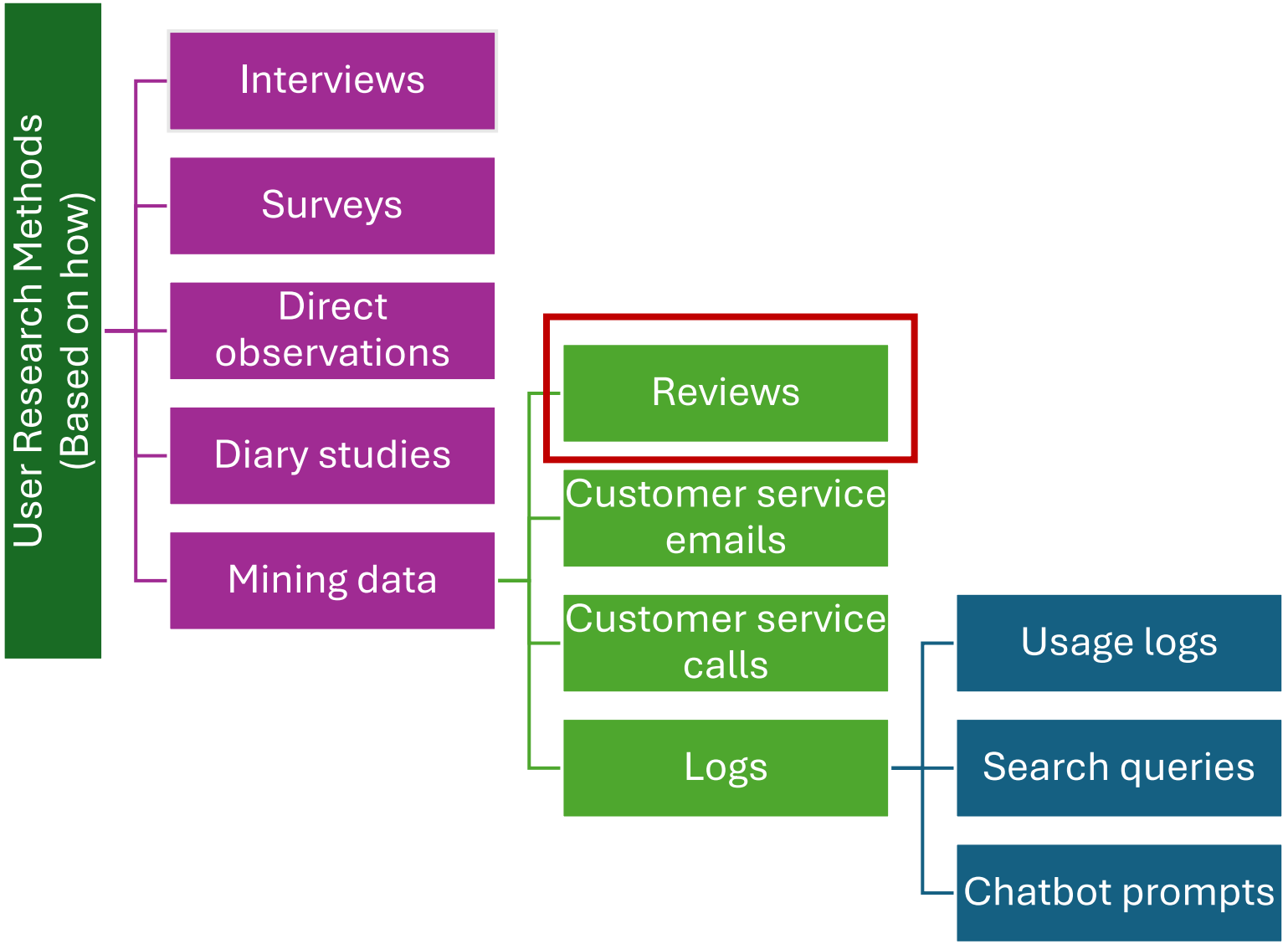
- You will need to work with customers.
- Meet with them regularly.
- Be professional – this is close to a real job.
- You can mention what you do / who you do for in your CV.
  - But NDA will not let you disclose confidential information.
- Any of this can turn into longer projects, if both parties show interest.

Any other questions on project?

Recap

- Need finding
  - Finding user needs, in a context, for given task(s)
  - First step in user-centred design




User Research Methods (Based on how)
Interviews
Surveys
Direct observations
Diary studies
Mining data
Reviews
Customer service emails
Customer service calls
Logs
Usage logs
Search queries
Chatbot prompts

Content analysis (Qualitative)

- Organizing content into themes, to answer questions
  - What are users complaining about?
  - What do our users like and dislike about our app?
- Qualitative analysis
  - Thematic analysis: finding themes in content (||| to adding tags).
  - You could then count, group tags for further analyses.
- Can also be used for other kinds of data
  - Customer service emails
  - Customer service calls (after you've transcribed audio to text, or directly by listening in to audio)
  - Interviews, Surveys, Observations, Diary studies

Interviews

What are interviews?

- Researcher asks users questions directly, and the participant responds back in real time.
- For any study/method, we must consider:
  - Population → Where do we get participants from?
  - Sample → Who are the participants (all or some)?
  - Sampling → Which ones to choose as participants?
  - Sample size → How many participants?
  - Recruitment → How do we get the participants?
  - Study design → What questions to ask / topics to discuss / etc.

You want to build an IITK Freshman App...

- To help newcomers navigate IITK better

For the “freshman app” need-finding:

- Population → All 800+ UG freshman and 200+ PG incoming students.
- Sample → All 1000, or a small representative group?
- Sample size → Until theoretical saturation! Typically, 10-15 for interviews.
- Sampling → Random, purposive, stratified, convenience, snowball
- Recruitment → Emails, Flyers, social media, voluntary or not, etc.
- Study design → What questions to ask / topics to discuss / etc.

Interview questions: some guidelines

- Ask questions that elicit details and not one words
  - Do you find difficulties navigating the campus? - BAD
  - Do you find difficulties navigating then campus, if so, which ones?
  - What difficulties do you generally find when navigating around the campus?

- Avoid generic questions that provide too many generic answers. Anchor in the truth, ask details of specific instances to get more details.
  - What difficulties do people face when navigating the campus? - BAD
  - What are some difficulties you have faced when navigating around the campus?
  - Can you tell me about a time (or the last time) you struggled finding your way around the campus, or got lost?

Interview questions: some guidelines

- Avoid biases, and don’t try to get the answer you desire. Instead, keep an open mind and seek to understand.
  - Do you think an app would help you navigate the campus? - BAD
  - What do you think would have helped you navigate around the campus?
  - What do you wish you had / institute did to help navigate around the campus?

Structure of an interview

- Three kinds:
  - Structured → fixed set of questions
  - Semi-structured → initial set of questions, but interesting tangents followed and follow-up questions asked based on responses
  - Unstructured → no initial set of questions
- Semi-structured are the most useful in user needs elicitation

Structure of a (semi-structured) Interview

- Greet the participant, introduce yourself, set the context of the study
  - Allows participant be mentally prepared for what's coming
- Grand-tour questions
  - Broad and easy-to-answer questions for participants to "get into the groove"
  - E.g., Tell me about yourself as an IITK student – which branch, year, hostel, etc.
  - E.g., How has the first week of the college been?
  - E.g., It's a large and beautiful campus – how are you finding it?
- Specific questions
  - Preferably, set in the context of participant already said in the previous question(s).
  - E.g., You said you're still getting used around here. Did you mean the campus, or the people, or the culture? Can you tell me more about it?
  - When unclear, ask for clarifications (examples, elaborate, did you mean X or Y, etc.)
  - Ask for follow-up questions to gather more details until you are satisfied.
  - E.g., How do you go about doing this now?, How did you find your way back to hostel?
- Closing questions
  - Is there anything else you'd like to add about… ?
- Thank the participant.

Some other flavours of interviews

- Show and tell → interview + see some artifacts they have
  - E.g., “You said you use an app to do X. Can you show it to me and walk me through what it does and how you use it?”
- Contextual inquiry → You wait for an event to happen, and then ask questions about that event.
  - E.g., You want to know about how people react to actual emails ending up in spam. You go to participant when that happens, and then you could ask questions about that event –about contents of email, how they found, what are the consequences, why they think it got tagged as spam, etc.
- Telephonic, remote video-conference interviews happen!
- Occasionally, interviews also happen over back-and-forth emails (Recruitment across time zones, poor internet, etc.)

Common mistakes, pitfalls and gotchas

- Do not interrupt! If you have a follow up question, make note.
- Keep an open mind, do not nudge participant to give an answer.
- Do not lead participants (don't give examples or put thoughts into their mind or words into their mouth).
- Some participants talk too much or too little – it's an art to keep it in track. Use phrases such as "Going back to…", "You mentioned X earlier, I'd like to hear more about it.".
- Sometimes responses to a question is already there – you could skip, or you could say "you already mentioned X, is there anything else"?

Logistics

- Be seated in a comfortable place.
- Avoid noisy surroundings for clear hearing. Minimize distractions and interruptions to you and participant.
- Record the interview, so you don’t have to bother about remembering or keeping notes.
- Keep a script of questions, track what has been asked and not.
- Write down follow-up questions to ask; that way you won’t interrupt the participant’s flow and won’t forget to ask.
- Common to transcribe (type down) interview text verbatim.

We can then go through the interview script for finding qualitative themes.

Interviews are…

- Great…
  - To get detailed responses, and some more from follow-up questions
  - When we know little about a topic and want to explore
  - To garner subjective opinion
  - To seek information about past experiences
- BUT, they are…
  - Limited in sample size (and so less generalizable to overall population)s
  - Costly to conduct
  - Susceptible to biases of interviewers and interviewees (people forget, etc.)
  - Primarily qualitative, hard to gain quantitative insights
  - Dependent on how comfortable interviewee can talk about the subject

Methods: Strengths and weaknesses

	Interview	Survey	Observations
Time per participant	High	Low	High
No. of participants at once	One	High	One
Level of details	Rich details	Not rich	Very rich details
Time covered	Present + past	Present + past	Only what is observed in present
Scope for follow-up questions	Yes	No	No
Truthfulness / reliability	Recall errors / bias	Recall errors / bias	What happens is for the researcher to see

These methods have complementary strengths and weaknesses, so we typically mix methods.
(E.g., interviews + survey, observations + interview)

Why mixed methods?

- Gather Additional / Complementary Data
  - Qualitative vs. quantitative (interviews for what, surveys for how many/much)
  - Observations for “what happens”, interviews for “why it happens”

- Triangulation
  - Arrive at the same results through multiple methods/sources/ways
  - Minimizes biases, offsets limitation of one method
  - E.g., geometric constructions, trigonometry, coordinate geometry, rotational geometry could all ascertain some property of circles/ polygons
  - E.g., conduct a larger survey to confirm data from small interview study is generalizable to the larger population.

Surveys

- A direct method for empirical data collection
- Participants provide responses to a list of pre-decided questions
- Typically, takes <10min, compared to interviews that typically last 60-90 minutes.
- Less detailed, but can be sent a lot of people
- Great for quantitative results (e.g., X% of population)
- Great for generalizability (get results from way more people than in interviews)

Next class..

- Surveys
- Observations
- Sum up on mixed methods