

# Needfinding

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# What do users need?

1. What do people do now?
2. What values and goals do people have?
3. How are these particular activities embedded in a larger ecology?
4. Similarities and differences across people
5. ...and other types of context, like time of day

# Why needfinding?

- Uncover needs that people have which they **may or may not be aware of**
- Guide innovation efforts
- Identify someone to design for
- Discover the emotions that guide behaviors

# Requirements Definition

- Work to understand a user's experience by learning about their lives
- Define the detailed requirements for the system being developed
- Gather data about what users need to do or accomplish
- Analyze and represent data
- Interpret the results and use that in design decisions
- Iterative process

# Some data gathering techniques

- Observation
  - Direct (Field vs. Controlled)
  - Indirect
- Ethnography
- Surveys & Questionnaires
- Interviews
- Focus Groups

# Observation

- Watch users do what they do
  - Typically from a distance
- Video recording
  - May require editing or coding the video later
  - Transcription
- Take lots of photos, notes, sketches
  - Focus on specific task-relevant behaviors in notes
  - Later convert to abstract subtasks



# Hawthorne Effect



- Tendency to perform or perceive differently when one knows they are being observed
- Users may become nervous and may not behave the way they do normally
- May be thinking more about being observed than doing the task



# Direct Observation

- Researcher is the observer, recording what is being watched
- Controlled Setting
  - Controlled environment, possibly lab-based experiment
- Field Setting
  - In the natural environment of the user
  - Information gained is impossible to gather in the lab

# Controlled vs. Field Settings

**Controlled (Lab) Setting**



**Field Setting**



# Indirect Observation

- Researcher relies on the reported observation of others (incl. self-observations)
- Observing the effects or results of the behavior rather than the behavior itself
- E.g. food diary, app logging usage

**SHEKNOWS**  
**FOOD DIARY**

WEEK OF:

|           | TIME | FOOD/DRINK | MOOD | QTY | CALORIES | OTHER |
|-----------|------|------------|------|-----|----------|-------|
| MONDAY    |      |            |      |     |          |       |
| TUESDAY   |      |            |      |     |          |       |
| WEDNESDAY |      |            |      |     |          |       |
| THURSDAY  |      |            |      |     |          |       |
| FRIDAY    |      |            |      |     |          |       |
| SATURDAY  |      |            |      |     |          |       |
| SUNDAY    |      |            |      |     |          |       |

NOTES:

# Ethnography

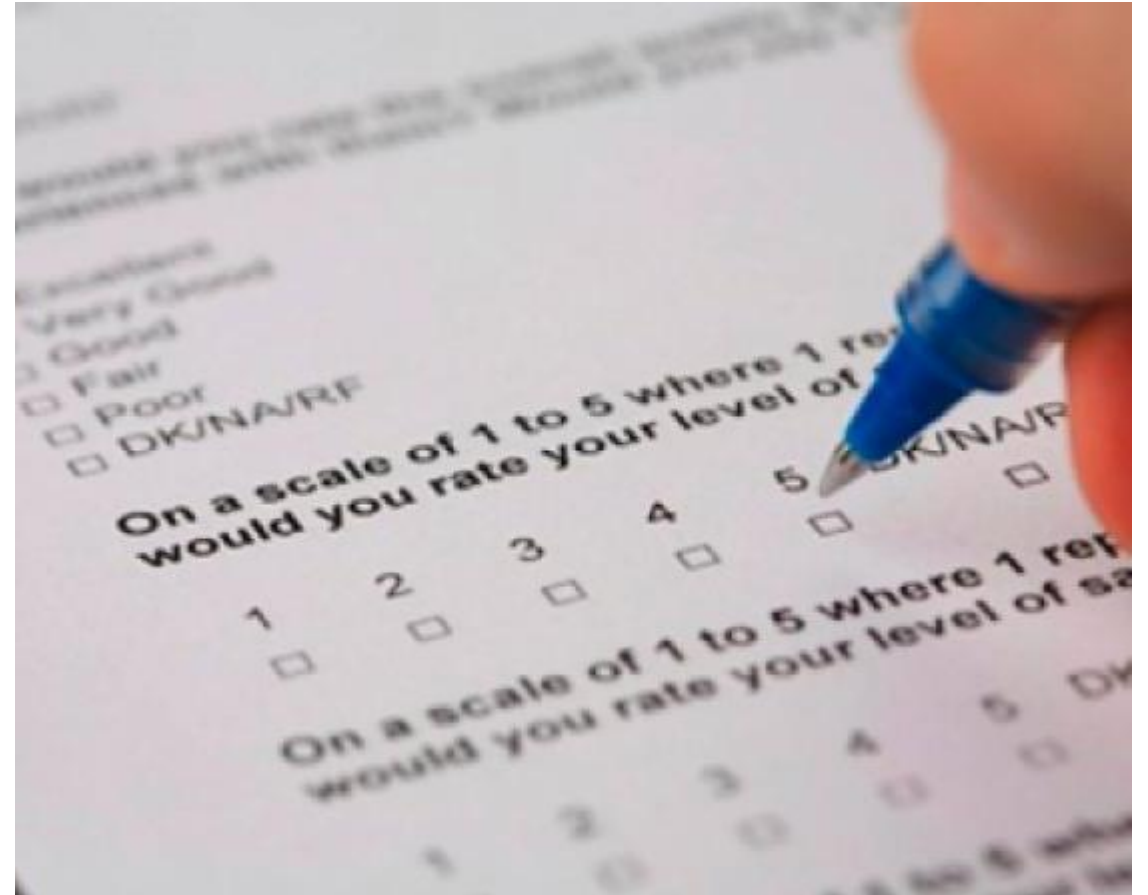
- Techniques based in sociology and anthropology – the study of humans
- Deeply contextual inquiry
  - “Wallow in the data”
  - “Live among” the users
- Understanding the full complexity of behavior, in its complete social context





# Surveys & Questionnaires

- Subjective answers in a quantitative format
  - Mix of qualitative and quantitative formats
- ## Questions
- Exploratory vs. confirmatory
  - Open-ended vs. categorical (exhaustive)





# Example Survey Questions

- Rank the importance of each of these tasks (give a list of tasks)
- List the four most important tasks that you perform (this is an open question)
- List the pieces of information you need to have before making a decision about X, in order of importance
- Are there any other points you would like to make? (open-ended opinion question; good way to end)

# Question Formats

- Objective Questions
  - Quantifiable, countable
  - Check boxes to select one or more options
  - Multiple-Choice questions
  - Yes/No, True/False questions
- Subjective questions
  - Response open ended, in one or more sentences
- Semantic Scales
  - 1- lowest score to 5- highest score
- Likert Scale
  - Agree Strongly - Agree Somewhat - Indifferent - Disagree Somewhat - Disagree Strongly



# Semantic Differential Scale

**Please place an X in the area that best fits your beliefs about Nike shoes:**

Well made    \_\_\_ : \_\_\_ : \_\_\_ : \_\_\_ : \_\_\_ : \_\_\_ : \_\_\_ : Poorly made

Inexpensive    \_\_\_ : \_\_\_ : \_\_\_ : \_\_\_ : \_\_\_ : \_\_\_ : \_\_\_ : Expensive

Uncomfortable    \_\_\_ : \_\_\_ : \_\_\_ : \_\_\_ : \_\_\_ : \_\_\_ : \_\_\_ : Comfortable

Durable    \_\_\_ : \_\_\_ : \_\_\_ : \_\_\_ : \_\_\_ : \_\_\_ : \_\_\_ : Non-durable

- ☐ A type of itemized rating scale
- ☐ Common in marketing surveys especially when measuring brand image, product, company images
- ☐ Try to avoid “halo effect” by rotating positive & negative sides
- ☐ Respondents often confused how to respond
- ☐ Requires researcher to identify bi-polar adjectives (often difficult to be exactly opposite)



# Likert Scale

|     |   | Strongly Disagree                   |                                     |                          |                                     | Strongly Agree                      | Scale Position | Calculation | Score Contribution |
|-----|---|-------------------------------------|-------------------------------------|--------------------------|-------------------------------------|-------------------------------------|----------------|-------------|--------------------|
| 1.  | I think that I would like to use this mobile app frequently.                      | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | 4              | 4-1         | 3                  |
| 2.  | I found this mobile app unnecessarily complex.                                    | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | 2              | 5-2         | 3                  |
| 3.  | I thought this mobile app was easy to use.  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | 5              | 5-1         | 4                  |
| 4.  | I think that I would need assistance to be able to use this mobile app.           | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | 1              | 5-1         | 4                  |
| 5.  | I found the various functions in this mobile app were well integrated.            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | 4              | 4-1         | 3                  |
| 6.  | I thought there was too much inconsistency in this mobile app.                    | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | 2              | 5-2         | 3                  |
| 7.  | I would imagine that most people would learn to use this mobile app very quickly. | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | 5              | 5-1         | 4                  |
| 8.  | I found this mobile app very cumbersome/awkward to use.                           | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | 1              | 5-1         | 4                  |
| 9.  | I felt very confident using this mobile app.                                      | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | 4              | 4-1         | 3                  |
| 10. | I needed to learn a lot of things before I could get going with this mobile app.  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | 1              | 5-1         | 4                  |

TOTAL  
x 2.5

35  
87.5

# Online Surveys




**Customer Satisfaction Survey**

Thank you for visiting our site. You've been randomly chosen to take part in a brief survey to let us know what we're doing well and where we can improve.

Please take a few minutes to share your opinions, which are essential in helping us provide the best online experience possible.

Required questions are denoted by an \*



1: \*Please rate **how well usbank.com is organized**.

1=Poor                      Excellent=10

1 2 3 4 5 6 7 8 9 10 Don't Know

2: \*Please rate the **options available for navigating** usbank.com.

1=Poor                      Excellent=10

1 2 3 4 5 6 7 8 9 10 Don't Know

3: \*Please rate how **quickly pages load** on usbank.com.

1=Poor                      Excellent=10

1 2 3 4 5 6 7 8 9 10 Don't Know

4: \*Please rate the **consistency of speed from page to page** on usbank.com.

1=Poor                      Excellent=10

1 2 3 4 5 6 7 8 9 10 Don't Know

5: \*Please rate your perception of the **accuracy of information** on usbank.com.

1=Poor                      Excellent=10

1 2 3 4 5 6 7 8 9 10 Don't Know

6: \*Please rate the **quality of information** on usbank.com.

1=Poor                      Excellent=10

1 2 3 4 5 6 7 8 9 10 Don't Know

7: \*What is your **overall satisfaction** with usbank.com?

1=Very Dissatisfied                      Very Satisfied=10

1 2 3 4 5 6 7 8 9 10

- Responses can be tracked
- Data analysis is easier
- Reach a wider audience easily
- Errors can be corrected

- Survey Monkey  
<https://www.surveymonkey.com/>
- Google Forms  
<https://www.google.com.sg/forms/about/>

# Surveys & Questionnaire Tips

- Do not make questionnaire very long
- Use fewer but better questions
- Ensure anonymity and clear motivation
- Start from research goals

# Surveys & Questionnaire Issues

- Which users to target, how to target?
- Cheap but difficult to administer
- Response rate may be low
- Response bias
- Data entry or analysis issues
- Questions may be ambiguous
- Users may be dishonest

# Interviews

- Engage the user more than by just watching
- Rich data directly from the user, adds a lot of context
- Meet and ask questions face-to-face
- May be video or audio recording
  - May require editing or coding the video later
  - Transcription of audio
- Issues of bias and honesty



# Interviews

- Structured interviews
  - There is a set of questions (script)
  - Efficient, but requires training
- Unstructured
  - There is no script
  - Might be difficult to follow and conduct
  - Inefficient, but requires no training
- Semi-structured
  - There is a script
  - Interviewer can explore answers more by deviating from script
  - Good balance, often appropriate

# Interview preparation

- Objectives, goals, *research* questions
- Methods
  - E.g. phone, in person, email, etc.
- Interview questions
  - Design questions carefully, to get good data (not too vague)
  - Test questions before asking
- People: Moderator/interviewer; participant(s); scribe(s)



# Interview Phases

- Introduction
- Warm-up (ramp up)
- Interview “proper”
- Cool-down (glide)
- Summary and wrap-up



# Effective Interview Questions

- **How** do you perform task x?
- **Why** do you perform task x?
- What **information** do you need to...?
- **Who** do you need to communicate with to...?
- What do you **use** to...?
- What happens **after** you...?
- What is the result or consequence of **NOT**...?

(Gordon & Gill, 1992; Graesser, Lang, & Elofson, 1987)

# Interviewing Tips

- Manage the conversation
- Focus on data, stay on track
- Listen more, talk less
- Use examples, but not too long
- Set expectations and boundaries, establish trust and comfort (“safe zone”), then get to the tough questions
- Always meta-monitor the situation



# Focus Groups



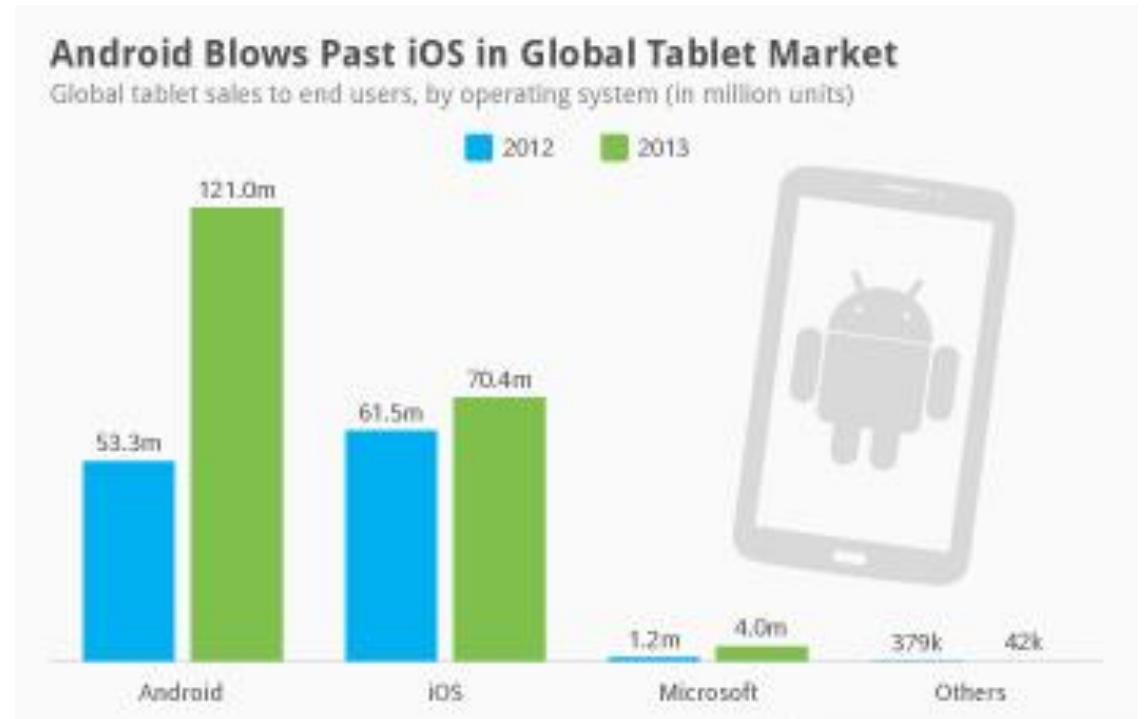
- Structured interview with groups of individuals (3 to 10 persons)
- Use several different groups with different roles or perspectives
- Audio or video record, with permission
- Manage the interaction
  - Facilitate and motivate people to talk
  - Avoid few people dominating the discussion
  - Focus on preferences and views, not performance
- Relatively low cost, quick way to learn a lot

# Other Methods

- Document mining
  - Often contains description of how the (current) tasks should be done
  - Users may not necessarily follow them
  - E.g. Standards documents, Manuals, Histories, Best Practices
- Data logging
  - Automatically tracking how the task is being done
  - Keystroke/mouse clicks, timers, logs of transactions, physical location, movement trackers
- Competitive product review
  - Similar and existing products
  - What are the good and bad ideas?

# Analyzing & Reporting Data

- Digest and represent the data
- Infer results from collected data
- Use figures, charts, statistics and descriptions
- Use data to improve new design



# Summary

- Define the detailed requirements for the system being developed
- Gather data about what users need to do or accomplish
- Analyze and represent data
- Interpret the results and use that in design decisions

# Methods Summary

| Technique                | Description | Data collected                        | Pros   | Cons |
|--------------------------|-------------|---------------------------------------|--|------|
| Direct Observation       | ?           | Both quantitative and qualitative     | ?  | ?    |
| Indirect Observation     | ?           | ?                                     | No disturbance to user, can be done for extended periods | ?    |
| Surveys & Questionnaires | ?           | ?                                     | ?  | ?    |
| Interviews               | ?           | Mostly qualitative                    | ?  | ?    |
| Focus Groups             | ?           | Mostly qualitative, less quantitative | ?  | ?    |



# Video Observation

**Rich's Commute** (Stanford D.School video)

Write down everything that you hear that is important to the person being interviewed

# Video Debrief

1. What did you learn about the user?
2. What surprised you about the user?
3. Did the user ever contradict themselves?
4. If you could ask additional questions what would you ask?
5. How can we use what we learned in this video to inform designing for this user?