

Introduction to Human Computer Interaction

Course on NPTEL, Spring 2018

Week 4.1

Ponnurangam Kumaraguru (“PK”)

Associate Professor

ACM Distinguished & TEDx Speaker

[Linkedin/in/ponguru/](https://www.linkedin.com/in/ponguru/)

[@ponguru](https://www.facebook.com/ponnurangam.kumaraguru)



How to understand user needs?

Cognitive walk through

- Assume that you are the user, how will you do things
- Good way to start the design thinking
- Not a comprehensive method

#ToKeepInMind Are you a representative user?

How to understand user needs?

- ❑ Survey / Interviews / Focus group discussion
 - To get a quick understanding
 - Helpful in making some decisions
 - Not completely generalizable
- “If I’d asked people what they wanted, they would have said a faster horse”
 - Henry Ford
- “It’s really hard to design products by focus groups. A lot of times, people don’t know what they want until you show it to them.” – Steve Jobs

Interviews

- Next to Cognitive walk through
- Limited number of participants
- Narrow down the scope of options / directions

Focus Group Discussions

- ❑ Similar to Interviews, 8 – 10 participants together
- ❑ Helps in narrowing down further with arguments back and forth

Survey design – Why?

□ Why do we need to do a survey?

Survey design – Why?

□ Why do we need to do a survey?

- Collect quantitative data for the topic of interest
- Gather information that is not available otherwise (secondary)
- Statistical representation of population of interest
- Same questions asked among every participant

Survey design

□ How does it relate to what we covered until now in class?

Survey design - Modes

- Personal
- Telephone
- Mail
- Web
- Hybrid

Survey design - Personal

- Take the questionnaire and collect data in person
- High response rate
- May allow for longer survey

- Most time consuming and costly
- Interviewer presence

Survey design - Telephone

- Random Digit Dialing samples
 - Less expensive than personal
 - Shorter time than personal
 - Interviewer administration
-
- Looks only at people with phones
 - Questionnaire constraints – sensitive or complex



Survey design - Mail

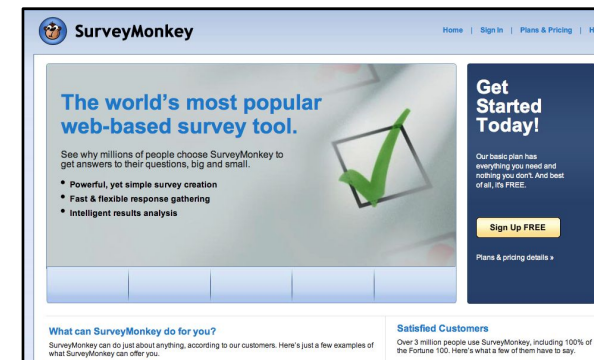
- Lower cost than personal and phone
- Data can be collected from population that is difficult to reach and locate
- Respondents can take more time in responding
- Least response rate
- Slower data collection than telephone



Survey design – Web

- ❑ Low cost (probably lowest)
- ❑ International participants
- ❑ Complex skip pattern/logic can be designed
- ❑ Larger sample size

- ❑ Only people with computer
- ❑ Difference in OS, browser, etc.



The screenshot shows the SurveyMonkey website homepage. At the top, the SurveyMonkey logo is on the left, and navigation links for Home, Sign In, Plans & Pricing, and Help are on the right. The main content area features a large banner with the headline "The world's most popular web-based survey tool." and a green checkmark icon. Below the headline, there is a sub-headline "See why millions of people choose SurveyMonkey to get answers to their questions, big and small." and a list of three bullet points: "Powerful, yet simple survey creation", "Fast & flexible response gathering", and "Intelligent results analysis". To the right of the banner is a dark blue sidebar with the text "Get Started Today!" and a "Sign Up FREE" button. Below the banner, there are two columns of text: "What can SurveyMonkey do for you?" and "Satisfied Customers".

Survey design – How to decide the mode?

- What is the population that you want to study?
 - Sample frame / Sample
- What type of questions that you want to ask?
- What is the response rate you are looking for?
- What is the budget?
- What is the time duration that you have?

Questionnaire design

Why create a questionnaire?

- Collect qualitative or quantitative data
- To understand respondents' views
- More information from the respondents is good for research

Questions - Types

Closed

Open ended

Closed questions

How many emails do you receive per day?

< 10

11 – 40

41 – 100

> 100

- Computer aids
 - Radio button
 - Drop down

Closed questions

- The options should be mutually exclusive
- Could be simple yes/no, approve/disapprove, 3 or more options

Closed questions – Advantages

- Restricted to finite set of responses
- Easy to answer
- Quick to answer
 - More questions can be asked in short time
- Easy to code and analyze the data

Closed questions – Disadvantages

- ❑ Introduce bias
 - To choose from given options
- ❑ Do not allow for creativity
- ❑ Does not allow respondent to qualify the response
 - Number of emails (Ham/Spam/Phishing)
- ❑ Skills to create questions
 - Mutually exclusive

Open ended questions

What do you like most about this course?

.....

.....

- Respondent has to fill in the details

Open ended questions - Advantages

- Express respondents ideas in their language
- Very useful in exploratory studies

Open ended questions - Disadvantages

- Difficult to respond
- Difficult to analyze
 - Coding of data
- Handwriting may be difficult to read

General guidelines

- Keep the vocabulary simple
 - Avoid acronyms, too much technical terms
- Keep the questions short
 - 25 words or less
- Avoid double-barrelled questions
 - Do you think the training material that was presented to you was engaging and effective?
 - Yes to one and No to another

General guidelines

Avoid hypothetical questions

- Would you use Latex for writing HWs in other courses?

Don't tax respondents memory

- How many hours have you spend reading research papers in the last month?

Avoid double negatives

- Students should not be allowed to speak in class
 - Agree / disagree

General guidelines

- ❑ Avoid overlapping response categories
 - 10 – 20; 20 – 40; 40 – 60 years
- ❑ Avoid leading questions
 - You wouldn't say that the training material was poorly designed, would you?
- ❑ Be as clear as possible
 - What do you think about IIIT-D? ✘
 - What recommendations would you have to improve your experience at IIIT-D? ✔

General guidelines

- Keep demographics at last
- Ask some critical questions in multiple ways to check for consistency of response

Checklist for questionnaire

- Will the question provide any useful data?
- Is the question unbiased?
- Is the response at the level that is needed for analysis?
- Do pilot run with the questions
 - Will respondents understand the questions
- Will respondents provide answers?
 - Sensitive / risky

Checklist for questionnaire

- Does the questionnaire have any leading questions?
- Is the language clear and simple?

Demographics

- Age
- Gender
- Highest education
- Occupation
- ...

Sample. From the same IRB approved study

□ <http://www.surveymonkey.com/s.asp?u=220862099351>

References

- ❑ Dillman, D. (1978). Mail and Telephone Surveys: The Total Design Method. New York: Wiley.
- ❑ Dillman, D. (2000). Mail and Internet Surveys: The Tailored Design Method. New York: Wiley & Sons.
- ❑ <http://www.srl.uic.edu/seminars/Intro/introsrm.pdf>

Task Analysis

- ❑ Task analysis is a systematic series of questions to help you find out:
 - who users are
 - what tasks they need to perform
- ❑ Create scenarios of actual use
- ❑ This lets us try new ideas *before* building software
 - Get rid of problems early in the design process while they are still cheap to fix
- ❑ Complementary to CI

Task Analysis

- Who is going to use the system?
- What tasks do they now perform?
- What tasks are desired?
- How are the tasks learned?
- Where are the tasks performed?
- What's the relationship between user & data?

Task Analysis

- What other tools does the user have?
- How do users communicate with each other?
- How often are the tasks performed?
- What are the time constraints on the tasks?
- What happens when things go wrong?

Task Analysis

- ❑ Choose real tasks users face
- ❑ Have a mix of simple and complex tasks
 - easy tasks (common or introductory)
 - moderate tasks
 - difficult tasks (infrequent or for power users)
- ❑ Good tasks essential to good usability
 - does system support key desired tasks?
 - how well does your system support these?
 - we'll see more of tasks in evaluation

Writing up Tasks

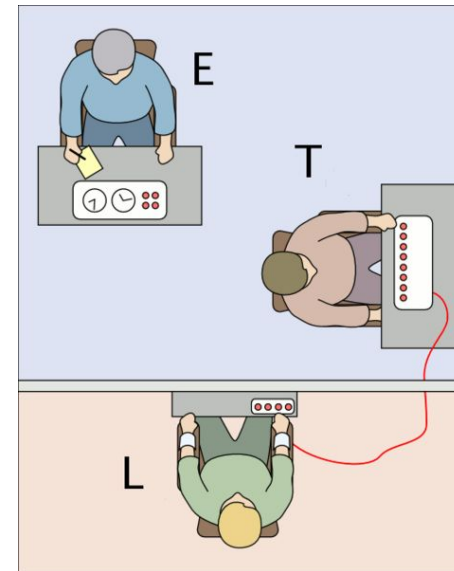
- ❑ Use a combo of Easy, Medium, and Hard tasks and form a cohesive story
- ❑ Easy tasks
 - Create an account, Login
 - Find product, add to shopping cart
- ❑ Medium
 - Checkout, change shipping address
- ❑ Hard
 - Refund an item
 - Cancel a purchase

Ethical issues

Ethical issues

□ Milgram experiment

- 1961, Yale university
- Participants to obey Experimenter
- Shock
- 65% went to give 450V



Ethical issues

- Stanford prison experiment
 - Prisoner and guard
 - 1971
 - 24 UGs in the basement of a building
 - Authoritarian and draconian behavior
 - Many had emotional disturbances

Ponnurangam Kumaraguru (“PK”)
Associate Professor
Indraprastha Institute of Information Technology
New Delhi – 110078
pk@iiitd.ac.in
precog.iiitd.edu.in