CPT208 Human-Centric Computing

05. Heuristic Evaluation, Questionnaire, and Interview

Dr Yue Li

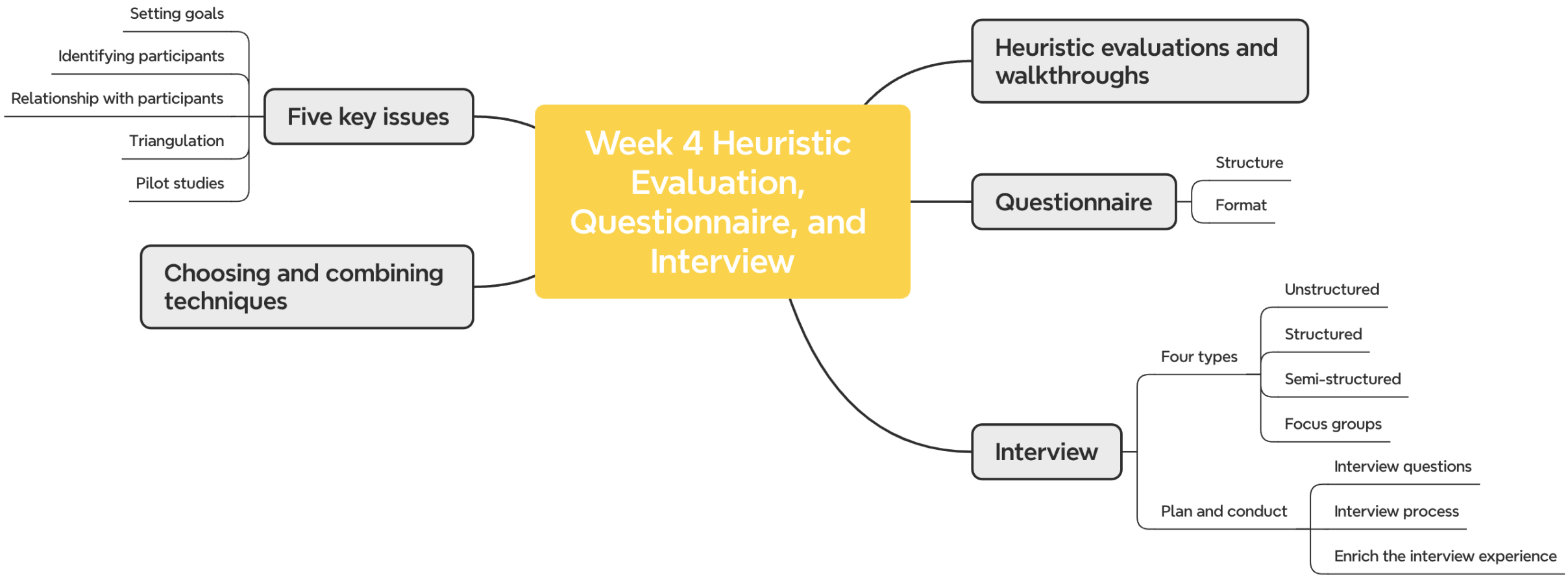
Lecture Syllabus

1. Introduction
2. Discovering requirements
3. Conceptual Prototyping and Practical Guide
4. Design Principles and Design Alternatives
5. Heuristic Evaluation, Questionnaire, and interview
6. Prototyping Fidelity and Dimensions
7. *SAT reading week*
8. *Group Project Demonstration Day*
9. Usability Testing & Experimental Design
10. Interfaces and Research Considerations
11. Field Study and Analytics
12. Flipped Classroom: Selected Coursework Demonstration
13. Revision

Learning Outcomes

1. Explain how to do heuristic evaluation and walkthroughs
2. Know how to design a simple questionnaire
3. Know how ho plan and run an interview
4. Understand how to plan and run a successful data gathering

This lecture is based on **Chapter 8** and **16** of the ID book.


Week 4 Heuristic Evaluation, Questionnaire, and Interview
Five key issues
Setting goals
Identifying participants
Relationship with participants
Triangulation
Pilot studies
Choosing and combining techniques
Heuristic evaluations and walkthroughs
Questionnaire
Structure
Format
Interview
Four types
Unstructured
Structured
Semi-structured
Focus groups
Plan and conduct
Interview questions
Interview process
Enrich the interview experience

Questionnaires

Chapter 8

We start with an example.

Module questionnaire of learning and teaching

Descriptive statistics for the module

Question	Mean	SD
The module learning outcomes were clearly stated.	3.92	1.10
The module was well-designed.	3.55	1.28
The module materials (for example, textbooks, articles, videos, etc.) were helpful.	3.85	1.10
Module assessments were explained clearly with an appropriate level of guidance.	3.56	1.44
Feedback on assessments was given and it was helpful.	4.03	1.05
Overall, I found this module a valuable learning experience.	3.89	1.15
The supporting activities and resources on Learning Mall Online were useful.	3.92	1.06

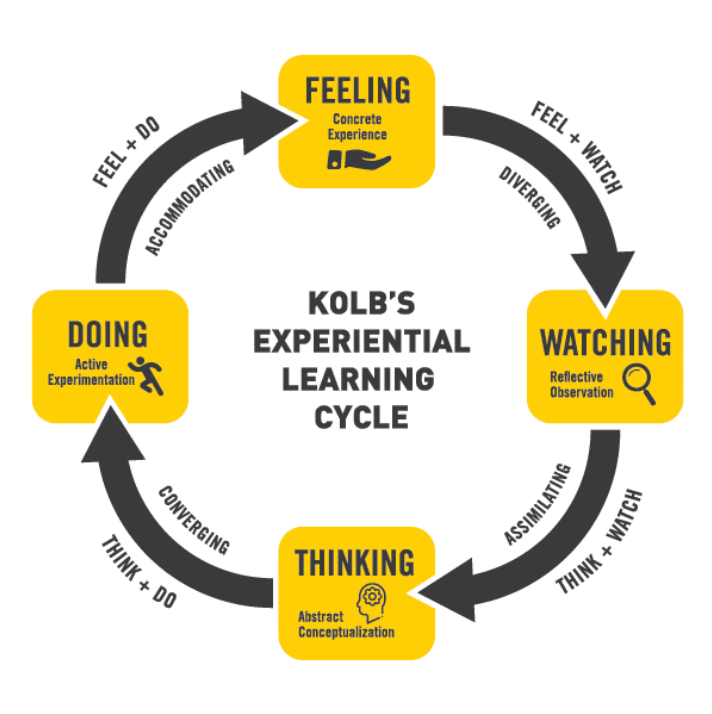
Comments/suggestions for the module

- Assessment (N=16)
  - Too much effort (N=6)
  - More instructions (N=5)
  - Not enough time (N=3)
  - Group work should have contribution score / peer review (N=2)
- Lecture delivery (N=12)
  - Too much content (N=6)
  - Less concept (N=3)
  - Disordered / unclear material (N=3)
- Good / Great (N=7)

Some quotes

- *“Please reduce the amount of presentations student have to present each week, it is way too time consuming and impractical for our online learning environment. This is damaging my mental health.”*

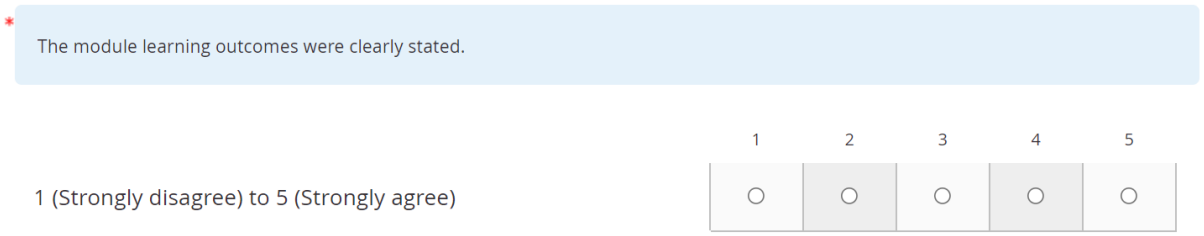
Example: module questionnaire

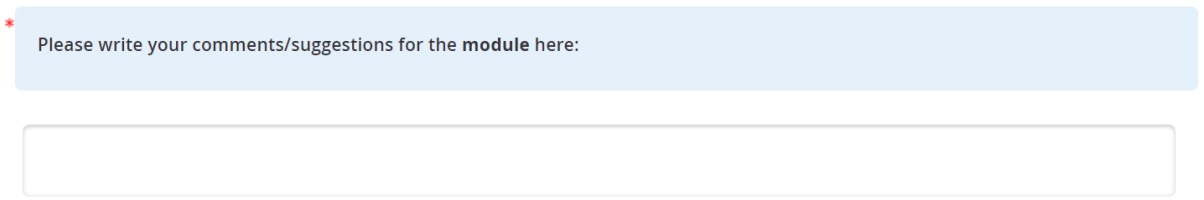


- Reflect on this module questionnaire when I introduce relevant concepts.
- Will you change anything in the questionnaire design?

Questionnaires

- Questions can be closed-ended or open-ended
- Closed questions are easier to analyze, and may be distributed and analyzed by computer
- They can be administered to large populations
- Disseminated by paper, email and the web





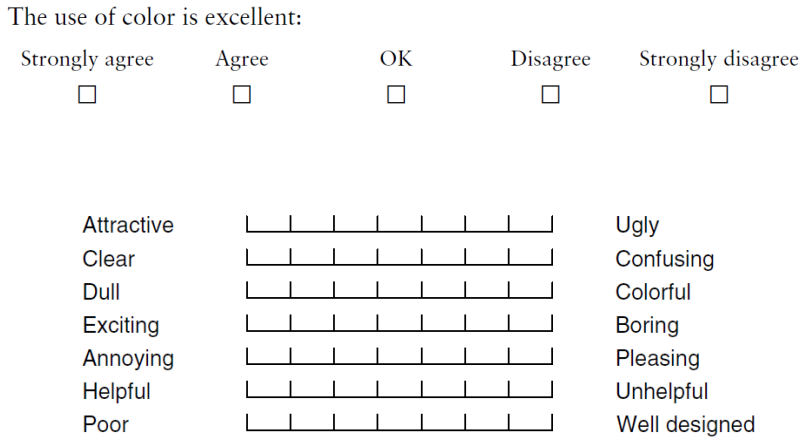
Questionnaire design

- The impact of a question can be influenced by question order.
- You may need different versions of the questionnaire for different populations.
- Provide clear instructions on how to complete the questionnaire.
- Avoid very long questions and questionnaires.
- Decide on whether phrases will all be positive, all negative, or mixed.
- Strike a balance between using white space and keeping the questionnaire compact.

Question order matters

Question and response format

- ‘Yes’ and ‘No’ checkboxes
- Checkboxes that offer many options
- Rating scales
  - Likert scales
  - Semantic scales
  - 3, 5, 7 or more points
- Open-ended responses



Encouraging a good response

- Make sure that the purpose of study is clear
- Promise anonymity
- Ensure that questionnaire is well designed
- Offer a short version for those who do not have time to complete a long questionnaire
- Follow-up with emails, phone calls, or letters
- Provide an incentive
- If mailed, include a stamped, addressed envelope

Pros and cons

1. You can collect data from a large number of people, at a relatively low cost
2. You can get an overview of a population of users in a short amount of time
3. Surveys do not require any special equipment
4. Surveys are generally approved by institutional review boards because they are typically non-intrusive

Pros and cons

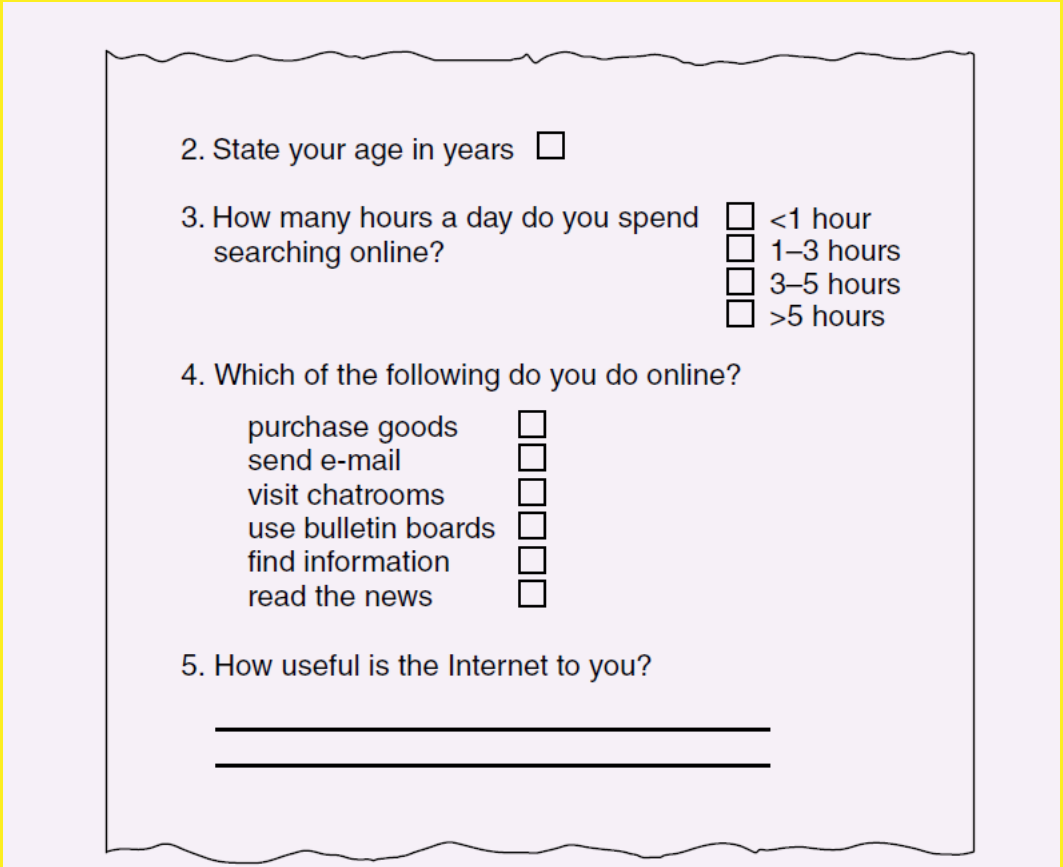
1. Surveys are good at getting shallow data from a large number of people, but are not good at getting “deep” data
2. Since surveys are usually self-administered, it is usually not possible to ask follow-up questions
3. Surveys can lead to biased data when the questions are related to patterns of usage, or feelings about a previous experience, rather than clear factual phenomena
   - → Example recall question: *how many times did you use this software application over 6 months?*

Deploying online questionnaires

1. Plan the timeline
2. Design the questionnaire offline
3. Program/complete online survey
4. Test the survey to make sure that it behaves as you would expect
5. Test it with a group that will not be part of the survey to check that the questions are clear
6. Recruit participants

Debug a questionnaire

- Identify the poorly designed features in the excerpt:



2. State your age in years ☐

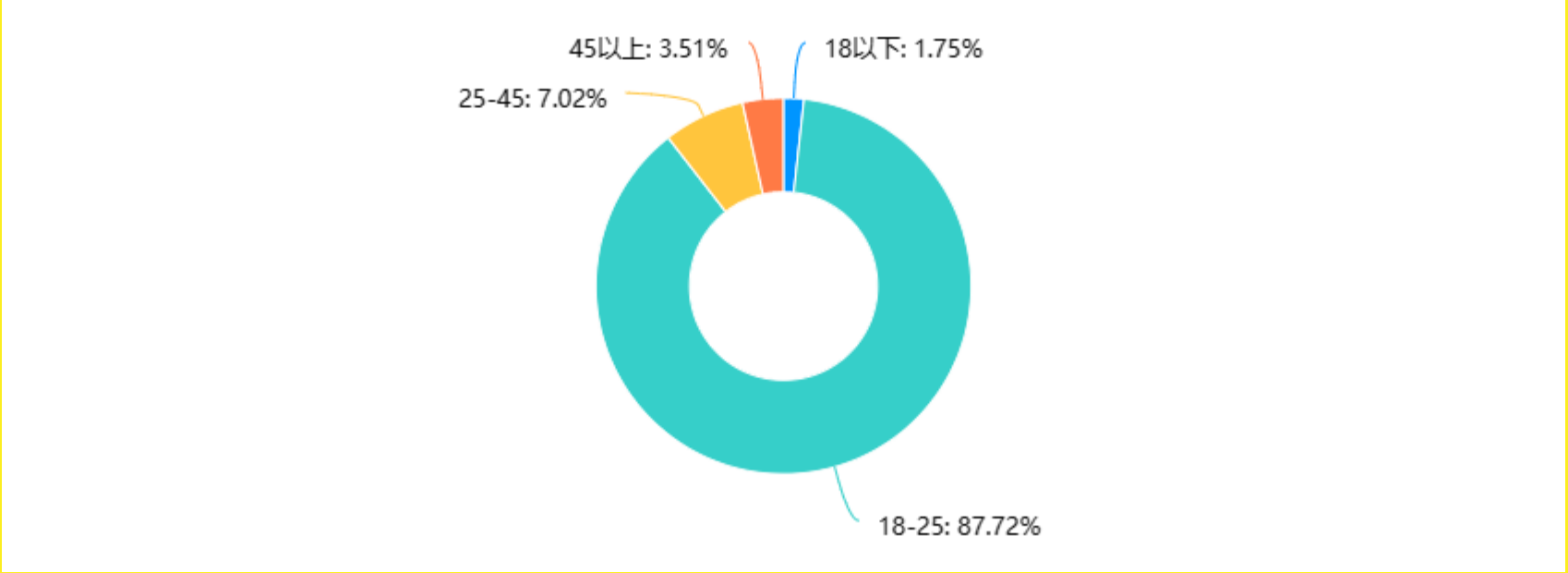
3. How many hours a day do you spend searching online?
   ☐ <1 hour
   ☐ 1–3 hours
   ☐ 3–5 hours
   ☐ >5 hours

4. Which of the following do you do online?
   - purchase goods ☐
   - send e-mail ☐
   - visit chatrooms ☐
   - use bulletin boards ☐
   - find information ☐
   - read the news ☐

5. How useful is the Internet to you?

Debug a questionnaire

- Anything wrong with this?



Interviews

Chapter 8

Interviews

- Unstructured: Not directed by a script. Rich but not replicable.
- Structured: Tightly scripted, often like a questionnaire. Replicable but may lack richness.
- Semi-structured: Guided by a script, but interesting issues can be explored in more depth. Can provide a good balance between richness and replicability.
- Focus groups: A group interview

Interview questions

- Two types:
  - ‘Closed questions’ have a predetermined answer format, for example, ‘yes’ or ‘no’
  - ‘Open questions’ do not have a predetermined format
- Closed questions are easier to analyze

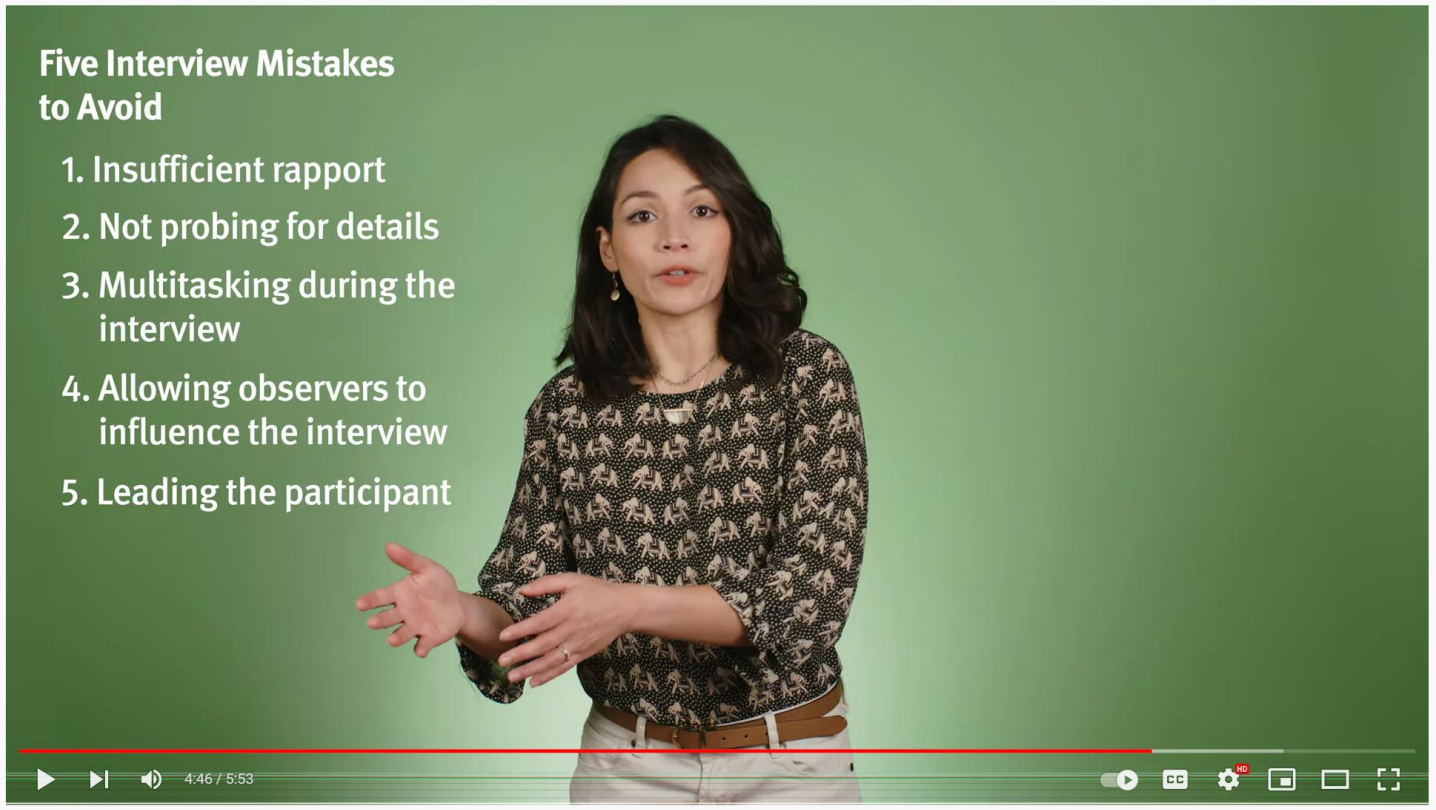
Interview questions to avoid

- Long questions
- Compound sentences
  - Split them into two
- Jargon and language that the interviewee may not understand
- Leading questions that make assumptions
  - For example, why do you like …?
- Unconscious biases
  - For instance, gender stereotypes

Running the interview

1. Introduction: Introduce yourself, explain the goals of the interview, reassure about the ethical issues, ask to record, and present the informed consent form.
2. Warm-up: Make first questions easy and non-threatening.
   → Build rapport (a close and harmonious relationship)
3. Main body: Present questions in a logical order
4. A cool-off period: Include a few easy questions to defuse tension at the end
5. Closure: Thank interviewee, signal the end, for example, switch recorder off.

Interview examples (good & bad)



Five User Interview Mistakes to Avoid (in 5 Minutes)

6,199 views • Apr 9, 2022 • Probing vs. leading. Saying enough to make your participant comfortable, but not so much you derail the research. 5 pitfalls in the user interview process are demonstrated so that you can avoid them the next time you talk with users.

https://www.youtube.com/watch?v=yBYd5USasXg

Other forms of interviews

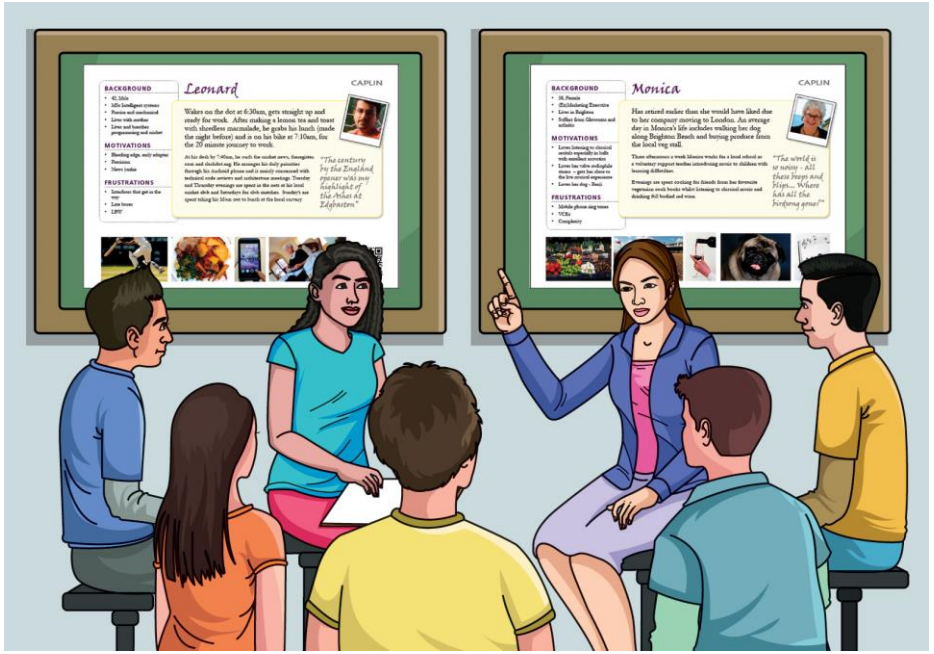
- Digital conferencing systems such as Skype, Zoom, email, and smartphones can be used to conduct interviews. Some advantages are:
  - Participants are in their own environment so are more relaxed
  - Participants don't need to travel
  - Participants don't need to worry about what to wear
  - For interviews involving sensitive issues, it is easier for interviewees to be anonymous

Pros and Cons

- Pros
  - Go deep: encourage reflection and consideration
  - Flexible: open-ended and exploratory
- Cons
  - Skill to manage
  - Time and resource intensive
  - Data analysis
  - Recall problems
    - Separated from the task and context under consideration

Enriching the interview process

- Use devices for prompting interviewee, for example, use a prototype, scenario



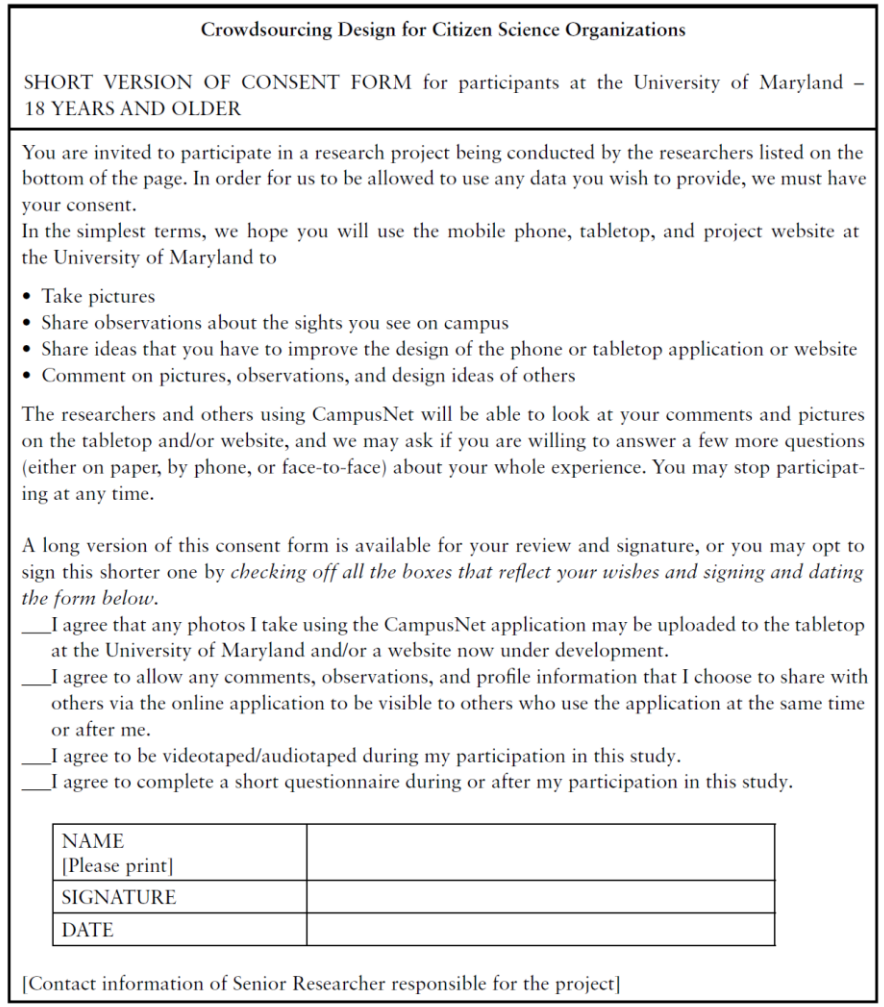
Choosing and combining techniques

- Depends on the:
  - Focus of the study
  - Participants involved
  - Nature of the technique(s)
  - Resources available
  - Time available

Technique	Good for	Kind of data	Advantages	Disadvantages
Interviews	Exploring issues	Some quantitative but mostly qualitative	Interviewer can guide interviewee if necessary. Encourages contact between developers and users.	Artificial environment may intimidate interviewee. It also removes them from the environment where work is typically being done.
Focus groups	Collecting multiple viewpoints	Some quantitative but mostly qualitative	Highlights areas of consensus and conflict. Encourages contact between developers and users.	Possibility of dominant characters.
Questionnaires	Answering specific questions	Quantitative and qualitative	Can reach many people with low resource requirements.	The design is key. Response rates may be low. Unless carefully designed, the responses may not provide suitable data.
Direct observation in the field	Understanding context of user activity	Mostly qualitative	Observing gives insights that other techniques don't provide.	Very time-consuming. Huge amounts of data are produced.
Direct observation in a controlled environment	Capturing the detail of what individuals do	Quantitative and qualitative	Can focus on the details of a task without interruption.	Results may have limited use in the normal environment because the conditions were artificial.
Indirect observation	Observing users without disturbing their activity; data captured automatically	Quantitative (logging) and qualitative (diary)	User doesn't get distracted by the data gathering; automatic recording means that it can extend over long periods of time.	A large amount of quantitative data needs tool support to analyze (logging); participants' memories may exaggerate (diary).

Five key issues

1. Setting goals
   - → What information to collect
   - → How to analyze data once collected
2. Identifying participants
   - → Decide from whom to gather data and how many
3. Relationship with participants
   - → Clear and professional
   - → Informed consent when appropriate
4. Triangulation
   - → Look at data from more than one perspective
   - → Collect more than one type of data, for instance, quantitative data from experiments and qualitative data from interviews
5. Pilot studies!!!!!!



Crowdsourcing Design for Citizen Science Organizations

SHORT VERSION OF CONSENT FORM for participants at the University of Maryland – 18 YEARS AND OLDER

You are invited to participate in a research project being conducted by the researchers listed on the bottom of the page. In order for us to be allowed to use any data you wish to provide, we must have your consent.
In the simplest terms, we hope you will use the mobile phone, tabletop, and project website at the University of Maryland to

- Take pictures
- Share observations about the sights you see on campus
- Share ideas that you have to improve the design of the phone or tabletop application or website
- Comment on pictures, observations, and design ideas of others

The researchers and others using CampusNet will be able to look at your comments and pictures on the tabletop and/or website, and we may ask if you are willing to answer a few more questions (either on paper, by phone, or face-to-face) about your whole experience. You may stop participating at any time.

A long version of this consent form is available for your review and signature, or you may opt to sign this shorter one by *checking off all the boxes that reflect your wishes and signing and dating the form below.*

___I agree that any photos I take using the CampusNet application may be uploaded to the tabletop at the University of Maryland and/or a website now under development.
___I agree to allow any comments, observations, and profile information that I choose to share with others via the online application to be visible to others who use the application at the same time or after me.
___I agree to be videotaped/audiotaped during my participation in this study.
___I agree to complete a short questionnaire during or after my participation in this study.

NAME [Please print]	
SIGNATURE	
DATE	

[Contact information of Senior Researcher responsible for the project]

Figure 8.1 Example of an informed consent form

Research Ethics Application

XJTLU is fully committed to the advancement of high quality academic research and to carrying out its research within a comprehensive ethical framework. Research which involves human (including human participants, survey respondent, *human genetic resources and personal data) or animals will always require formal ethical clearance.

Research Involving Human Genetic Resources:

For research involving human genetic resources, please kindly note that administrative approval from Ministry of Science and Technology (MoST) and XJTLU ethical approval might be required.

As stipulated by National Regulations on the Management of Human Genetic Resources (中华人民共和国人类遗传资源管理条例) and Implementation Rules of National Regulations on the Management of Human Genetic Resources (人类遗传资源管理条例实施细则), human genetic resources include human genetic resource materials and human genetic resource information.

The term "human genetic resource materials" means a range of genetic materials that contain human genomes and genes, such as organs, tissues and cells. The term "human genetic resource information" includes human gene and genome data, as well as other information and data generated utilizing human genetic resource materials. Clinical data (临床数据), image data (影像数据), protein data (蛋白质数据) and metabolic data (代谢数据) are not included in human genetic resource information.

All academic staff could submit ethics application via the Research Ethics Application System. For student research which requires formal ethical consideration, the ethics application should be initiated online by student's supervisor.

If you have any doubts as to whether the research requires ethics approval after reading all of the above information, please contact ethics@xjtlu.edu.cn for support.

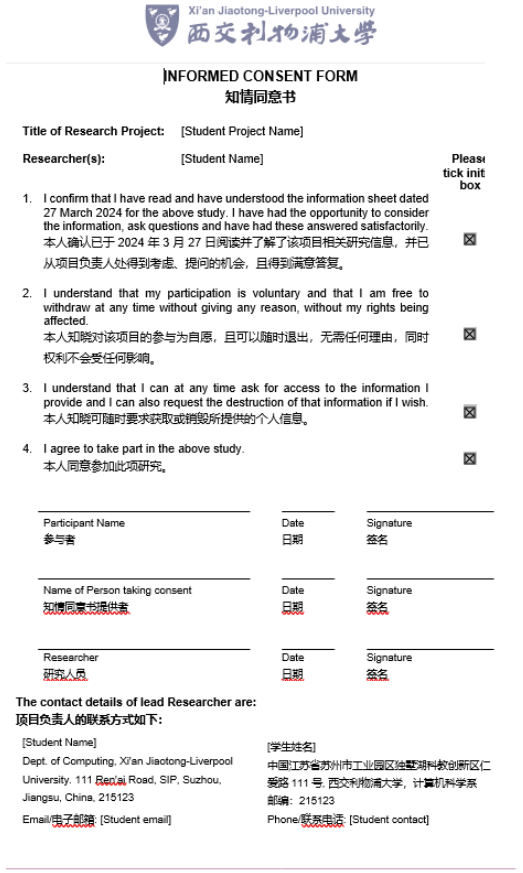
Next >>

Research Ethics

LRR-Research Involving Human Participant, Survey Respondent or Personal Data

Checklist:

1. Participant information sheet
2. Informed consent form
3. Survey tool (such as questionnaire or interview scripts)



Xi'an Jiaotong-Liverpool University
西交利物浦大學

INFORMED CONSENT FORM
知情同意书

Title of Research Project: [Student Project Name]

Researcher(s): [Student Name]

Please tick init box

1. I confirm that I have read and have understood the information sheet dated 27 March 2024 for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.
本人确认已于 2024 年 3 月 27 日阅读并了解了该项目相关研究信息，并已从项目负责人处得到考虑、提问的机会，且得到满意答复。 ☒

2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my rights being affected.
本人知晓对该项目的参与为自愿，且可以随时退出，无需任何理由，同时权利不会受任何影响。 ☒

3. I understand that I can at any time ask for access to the information I provide and I can also request the destruction of that information if I wish.
本人知晓可随时要求获取或销毁所提供的个人信息。 ☒

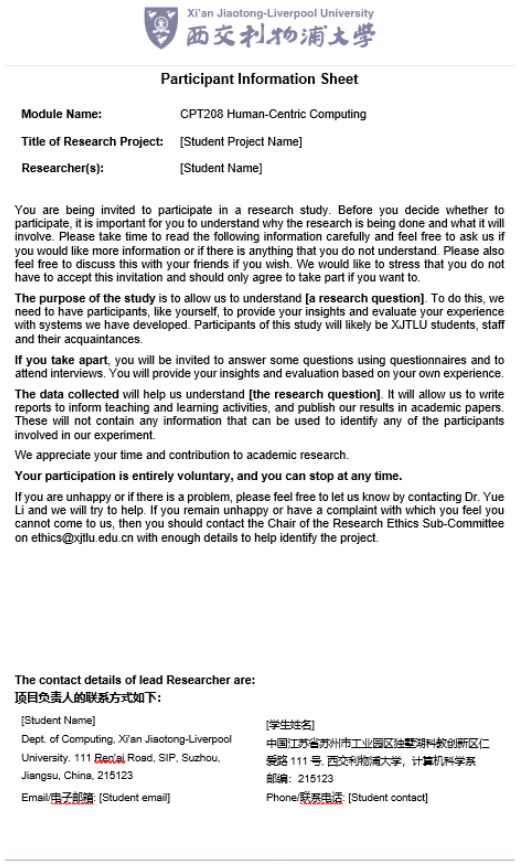
4. I agree to take part in the above study.
本人同意参加此项研究。 ☒

Participant Name 参与者	Date 日期	Signature 签名
Name of Person taking consent 知情同意书提供者	Date 日期	Signature 签名
Researcher 研究人员	Date 日期	Signature 签名

The contact details of lead Researcher are:
项目负责人的联系方式如下：

[Student Name]
Dept. of Computing, Xi'an Jiaotong-Liverpool University. 111 Ren'ai Road, SIP, Suzhou, Jiangsu, China, 215123
Email/电子邮箱: [Student email]

[学生姓名]
中国江苏省苏州市工业园区独墅湖科教创新区仁爱路 111 号, 西交利物浦大学，计算机科学系
邮编：215123
Phone/联系电话: [Student contact]



Xi'an Jiaotong-Liverpool University
西交利物浦大學

Participant Information Sheet

Module Name: CPT208 Human-Centric Computing

Title of Research Project: [Student Project Name]

Researcher(s): [Student Name]

You are being invited to participate in a research study. Before you decide whether to participate, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and feel free to ask us if you would like more information or if there is anything that you do not understand. Please also feel free to discuss this with your friends if you wish. We would like to stress that you do not have to accept this invitation and should only agree to take part if you want to.

The purpose of the study is to allow us to understand **[a research question]**. To do this, we need to have participants, like yourself, to provide your insights and evaluate your experience with systems we have developed. Participants of this study will likely be XJTLU students, staff and their acquaintances.

If you take apart, you will be invited to answer some questions using questionnaires and to attend interviews. You will provide your insights and evaluation based on your own experience.

The data collected will help us understand **[the research question]**. It will allow us to write reports to inform teaching and learning activities, and publish our results in academic papers. These will not contain any information that can be used to identify any of the participants involved in our experiment.

We appreciate your time and contribution to academic research.

Your participation is entirely voluntary, and you can stop at any time.

If you are unhappy or if there is a problem, please feel free to let us know by contacting Dr. Yue Li and we will try to help. If you remain unhappy or have a complaint with which you feel you cannot come to us, then you should contact the Chair of the Research Ethics Sub-Committee on ethics@xjtlu.edu.cn with enough details to help identify the project.

The contact details of lead Researcher are:
项目负责人的联系方式如下：

[Student Name]
Dept. of Computing, Xi'an Jiaotong-Liverpool University. 111 Ren'ai Road, SIP, Suzhou, Jiangsu, China, 215123
Email/电子邮箱: [Student email]

[学生姓名]
中国江苏省苏州市工业园区独墅湖科教创新区仁爱路 111 号, 西交利物浦大学，计算机科学系
邮编：215123
Phone/联系电话: [Student contact]

Participant Information Sheet v1.0
March 2024

Summary

- ➔ Questionnaires may be on paper, online, or telephone
- ➔ Interviews may be structured, semi-structured, or unstructured
- ➔ Focus groups are group interviews
- ➔ Observation may be direct or indirect, in the field, or in controlled settings
- ➔ Techniques can be combined depending on the study focus, participants, nature of technique, and available resources and time
- ➔ Data may be recorded using handwritten notes, audio or video recording, a camera, or any combination of these
- ➔ Data gathering sessions should have clear goals
- ➔ An informed consent is needed
- ➔ Five key issues of data gathering are: goals, choosing participants, participant relationship, triangulation, pilot

Heuristic Evaluation

Chapter 16

Heuristic evaluation

- Developed by Jacob Nielsen in the early 1990s
- Based on heuristics distilled from an empirical analysis of **249 usability problems**
- These heuristics have been revised for current technology by Nielsen and others for:
  - Mobile devices, wearables, virtual worlds, social media, …

Heuristic 英 [hju'rɪstɪk] 美 [hju'rɪstɪk]
adj. （教学或教育）启发式的； （计算机程序）探试的，探索的
n. 启发式步骤（或方法）

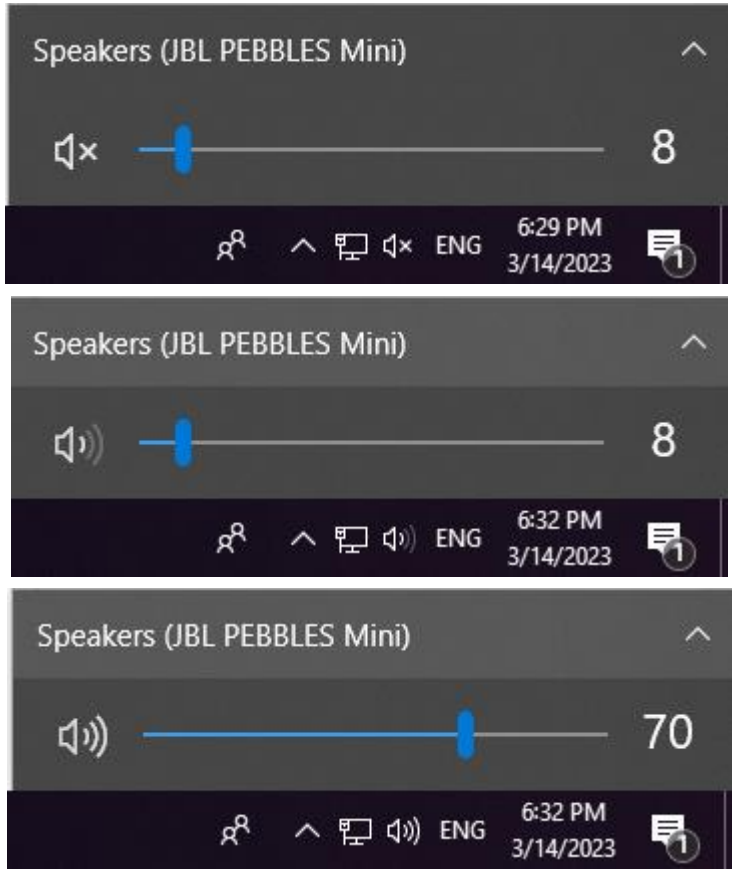
Nielsen’s heuristics

1. Visibility of system status
2. Match between system and real world
3. User control and freedom
4. Consistency and standards
5. Error prevention
6. Recognition rather than recall
7. Flexibility and efficiency of use
8. Aesthetic and minimalist design
9. Help users recognize, diagnose, recover from errors
10. Help and documentation

1. Visibility of System Status

The design should always keep users informed about what is going on, through appropriate feedback within a reasonable amount of time.

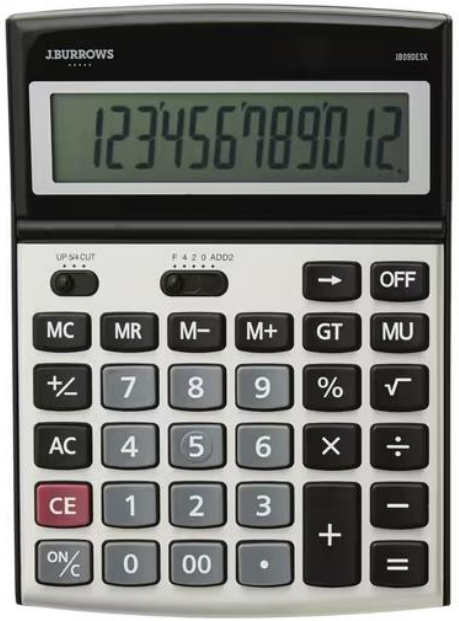
Example: Visual and auditory feedback when adjusting the PC sound volume.



2. Match Between System and the Real World

The design should speak the users' language. Use words, phrases, and concepts familiar to the user, rather than internal jargon. Follow real-world conventions, making information appear in a natural and logical order.

Example: Calculators on your smartphone.

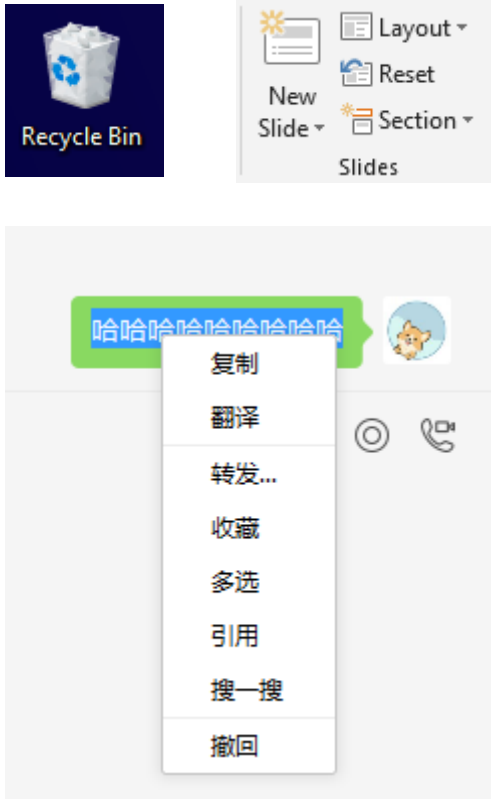


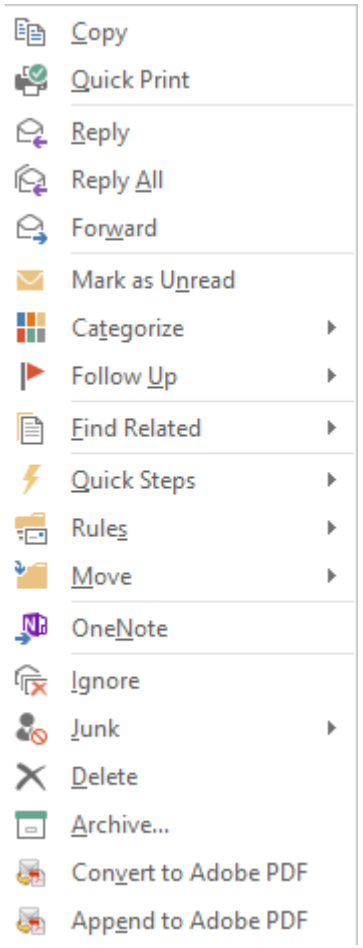
3. User Control and Freedom

Users often perform actions by mistake. They need a clearly marked "emergency exit" to leave the unwanted action without having to go through an extended process.

Examples:

- ➔ Restore a deleted file
- ➔ Reset a slide layout
- ➔ Recall a message/email?



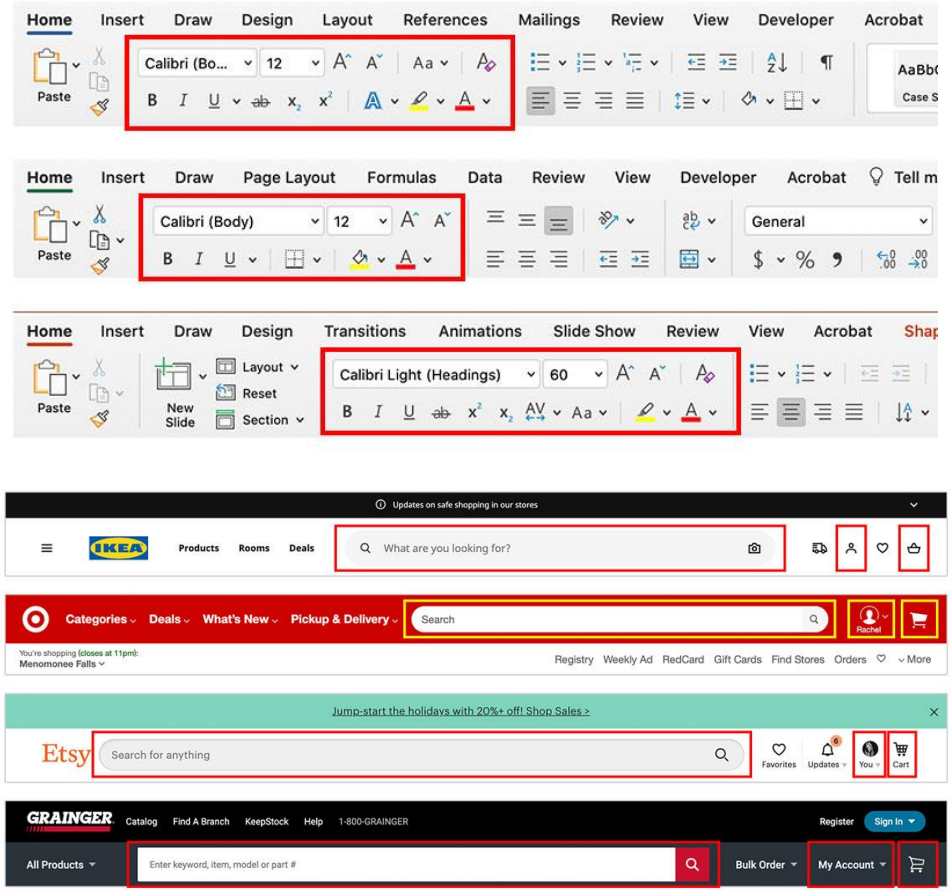


4. Consistency and Standards

Users should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform and industry conventions.

Examples:

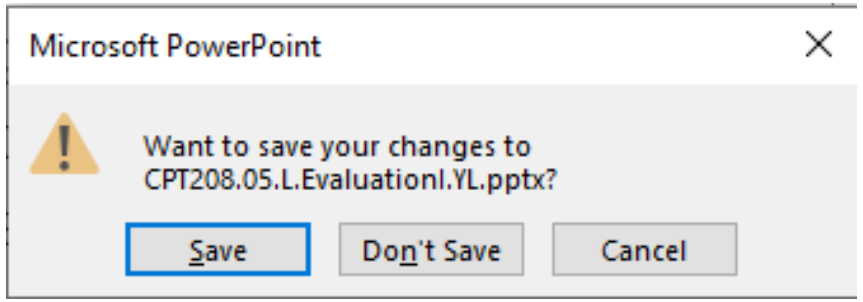
- ➔ Internal consistency within Microsoft Office
- ➔ External consistency in ecommerce utility navigation



5. Error Prevention

Good error messages are important, but the best designs carefully prevent problems from occurring in the first place.

Example: *National Geographic VR* showed a confirmation message to protect users from accidentally leaving the activity and losing progress. (It would be even better if, in addition, the progress was automatically saved.)



6. Recognition Rather than Recall

Minimize the user's memory load by making elements, actions, and options visible. The user should not have to remember information from one part of the interface to another.

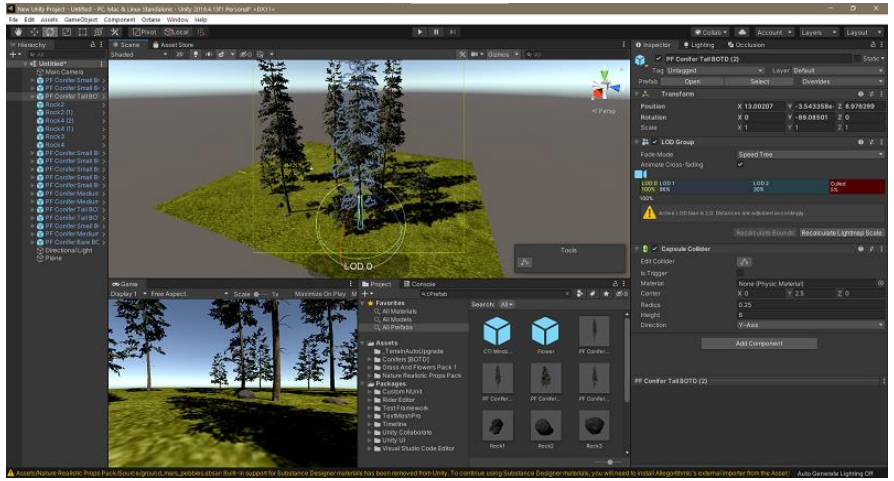
Example:

- ➔ Excel sheet without the header
- ➔ Search history

C	D	E
1	1	1
1	1	1
1	1	1
1	1	0
1	1	1
1	1	0
1	1	1
1	1	0
1	1	1
1	1	1
1	1	0
1	0	0
1	1	0
1	1	0
1	0	0
1	1	0

7. Flexibility and Efficiency of Use

Shortcuts hidden from novice users may speed up the interaction for the expert user such that the design can cater to both inexperienced and experienced users.
Allow users to tailor frequent actions.

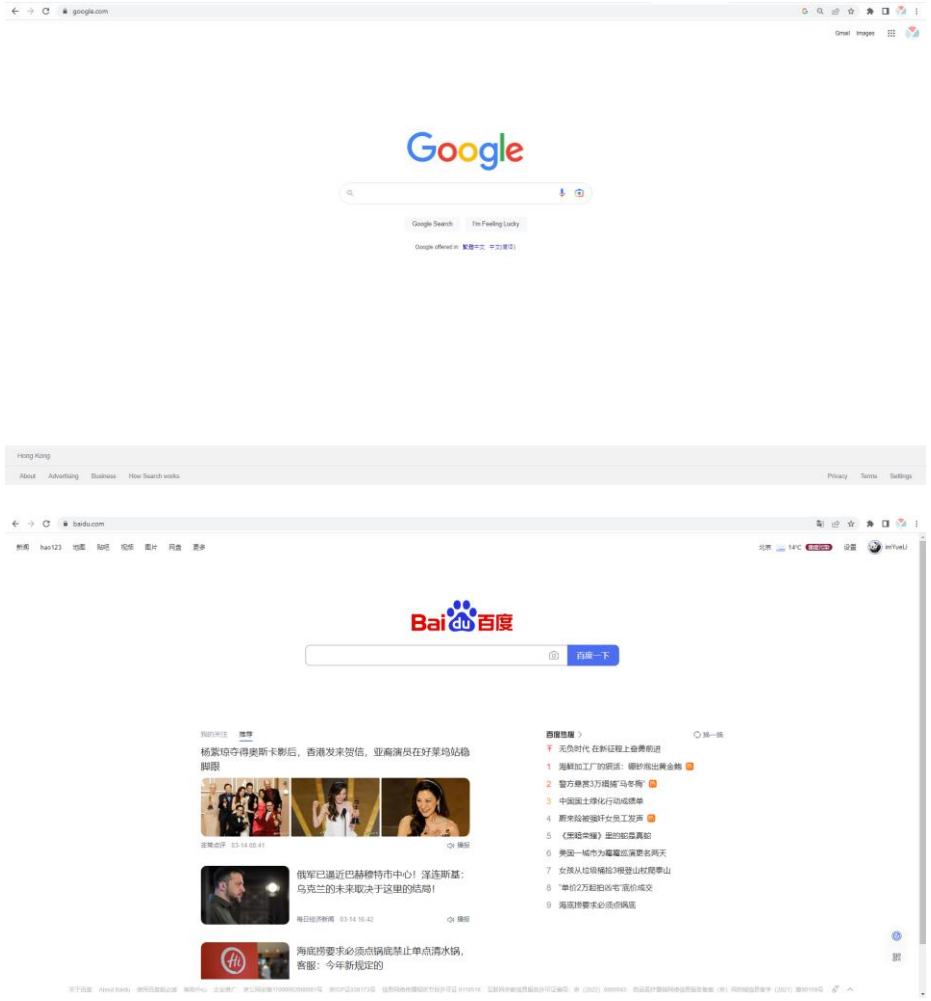


Example:

- ➔ Adjust different window size and layout in Unity.
- ➔ Blender shortcuts for experienced users.

8. Aesthetic and Minimalist Design

Dialogues should not contain information which is irrelevant or rarely needed. Every extra unit of information in a dialogue competes with the relevant units of information and diminishes their relative visibility.



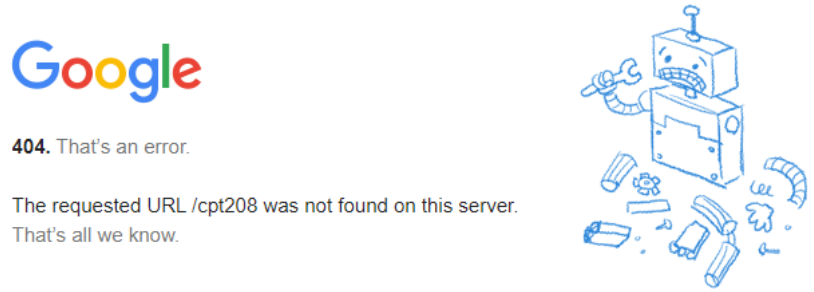
Example:

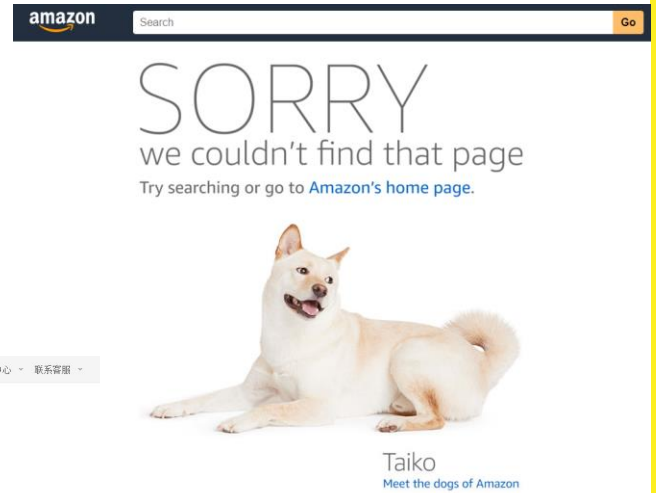
- ➔ Google's minimalist homepage was tailored to user's primary action – search.
- ➔ Baidu has more information cluttered on the homepage.

9. Help Users Recognize, Diagnose, and Recover from Errors

Error messages should be expressed in plain language (no error codes), precisely indicate the problem, and constructively suggest a solution.

Example:
Check out the design of 404 pages.

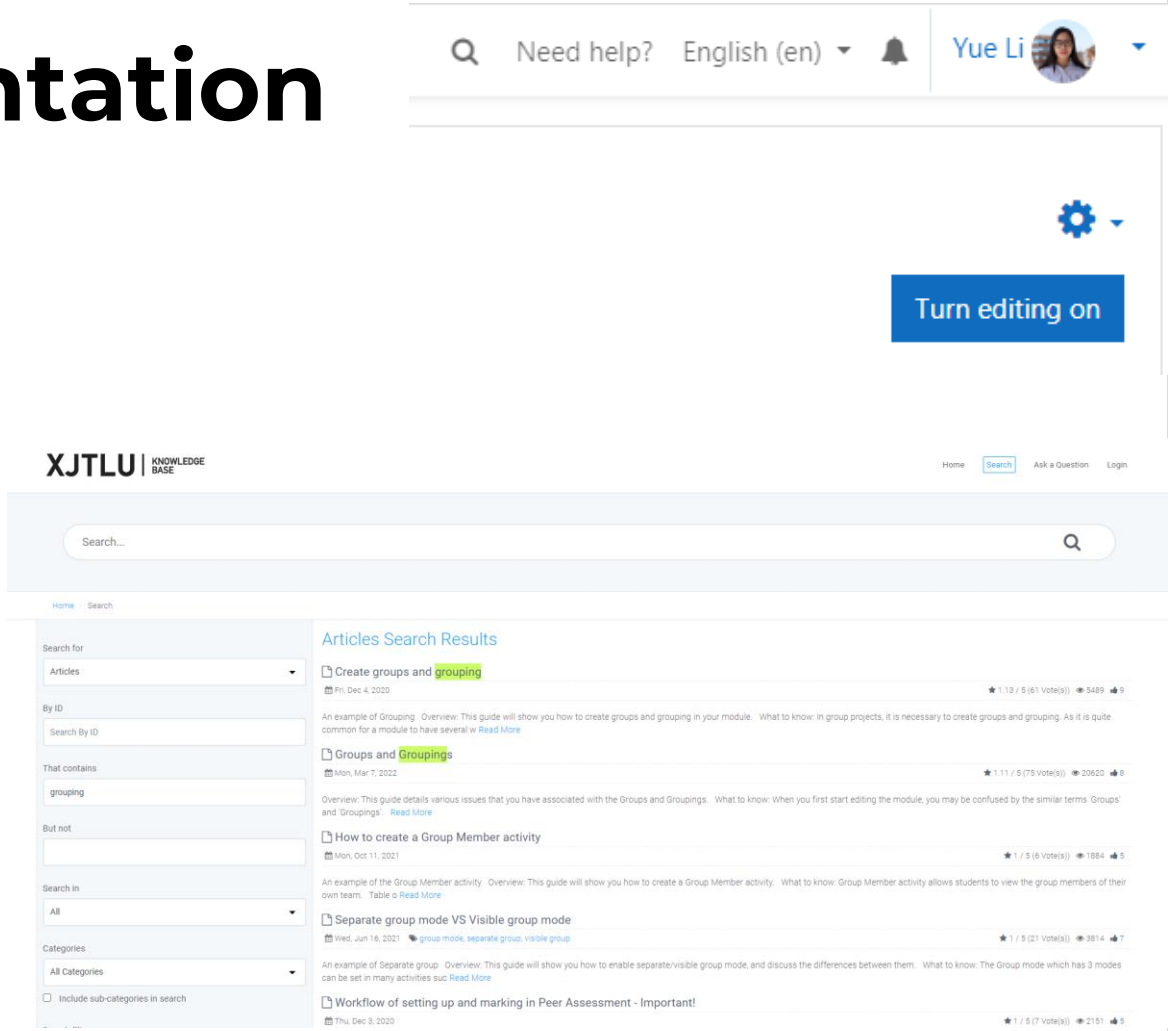




10. Help and Documentation

It’s best if the system doesn’t need any additional explanation. However, it may be necessary to provide documentation to help users understand how to complete their tasks.

Example:
Learning mall provides a knowledge base to help teachers set up activities.



More examples

- 10 Usability Heuristics Applied to Complex Applications
  https://www.nngroup.com/articles/usability-heuristics-complex-applications/
- 10 Usability Heuristics Applied to Virtual Reality
  https://www.nngroup.com/articles/usability-heuristics-virtual-reality/
- 10 Usability Heuristics Applied to Video Games
  https://www.nngroup.com/articles/usability-heuristics-applied-video-games/

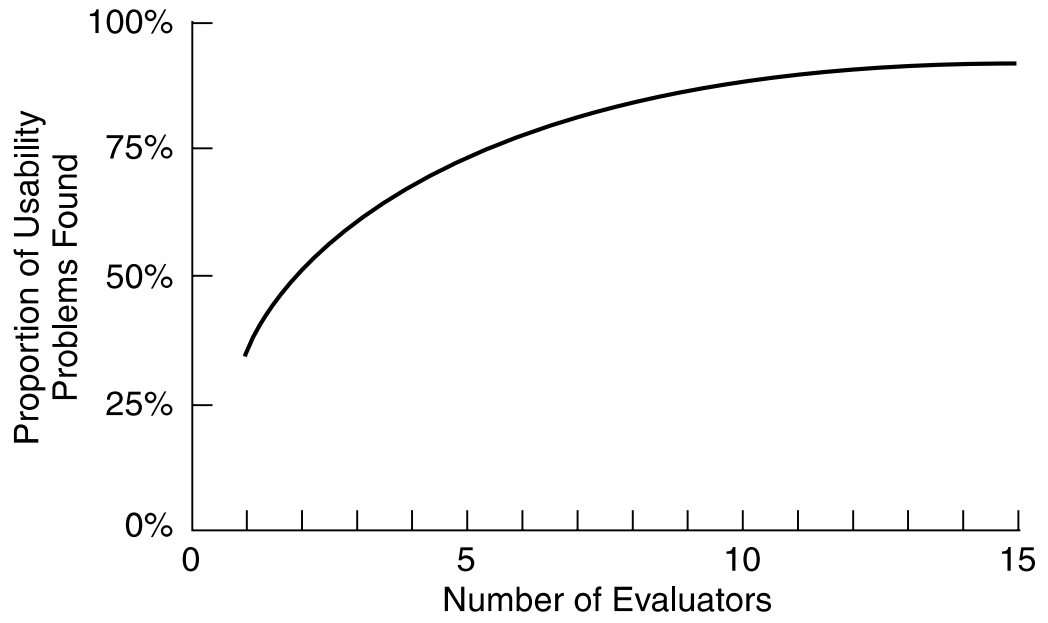
Shneiderman’s Eight Golden Rules

1. Strive for consistency.
2. Seek universal usability.
3. Offer informative feedback.
4. Design dialogs to yield closure.
5. Prevent errors.
6. Permit easy reversal of actions.
7. Keep users in control.
8. Reduce short-term memory load.

https://www.cs.umd.edu/users/ben/goldenrules.html

Number of evaluators and problems

Curve showing the proportion of usability problems in an interface found by heuristic evaluation using different numbers of evaluators



Number of evaluators

- Nielsen suggests that on average five evaluators identify 75-80 percent of usability problems
- Cockton and Woolrych (2001) point out that the number of users needed to find 75-80 percent of usability problems depends on the context and nature of the task problems

Doing heuristic evaluation

1. Briefing session to tell experts what to do
2. Evaluation period of 1-2 hours in which:
   - → Each expert works separately
   - → Take one pass to get a feel for the product
   - → Take a second pass to focus on specific features
3. Debriefing session in which experts work together to prioritize problems

Doing heuristic evaluation

- Suggesting tasks may be helpful, but can be difficult if the evaluation is done early in design when there are only screen mock-ups or a specification.
- A second researcher may record the problems identified.
- Strategies such as 'think aloud' can be used, and the process can be video recorded.

Advantages and problems

- Few ethical and practical issues to consider because users are not involved
- Can be difficult and expensive to find experts
- Best experts have knowledge of application domain and users
- Biggest problems:
  - Important problems may get missed
  - Many trivial problems are often identified, such as false alarms
  - Experts have biases

A more detailed procedure with 8 steps

1. Know what to test and how – Whether it's the entire product or one procedure, clearly define the parameters of what to test and the objective.
2. Know your users and have clear definitions of the target audience's goals, contexts, etc. User personas can help evaluators see things from the users' perspectives.
3. Select 3–5 evaluators, ensuring their expertise in usability *and* the relevant industry.
4. Define the heuristics (around 5–10) – This will depend on the nature of the system/product/design. Consider adopting/adapting the Nielsen-Molich heuristics and/or using/defining others.
5. Brief evaluators on what to cover in a selection of tasks, suggesting a scale of severity codes (e.g., critical) to flag issues.
6. 1st Walkthrough – Have evaluators use the product freely so they can identify elements to analyze.
7. 2nd Walkthrough – Evaluators scrutinize individual elements according to the heuristics. They also examine how these fit into the overall design, clearly recording all issues encountered.
8. Debrief evaluators in a session so they can collate results for analysis and suggest fixes.

https://www.interaction-design.org/literature/topics/heuristic-evaluation

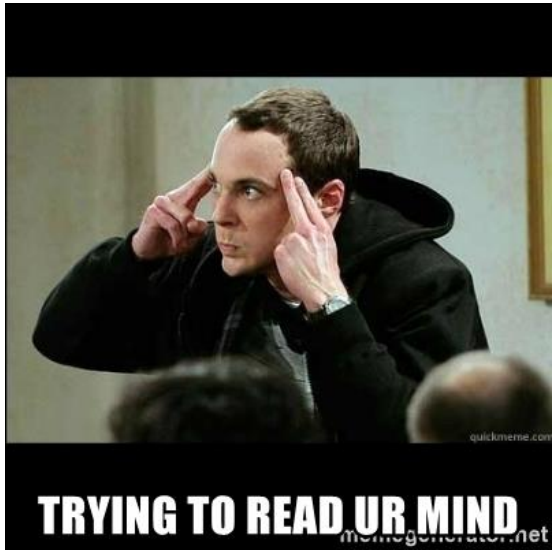
Walkthroughs

Chapter 16

Cognitive walkthroughs

- ➔ Simulating how users go about problem-solving at each step in a human-computer interaction
- ➔ Focus on ease of learning

Cognitive 英 ['kɒgnətɪv] 美 ['kɑːgnətɪv]
adj. 认识的，认知的

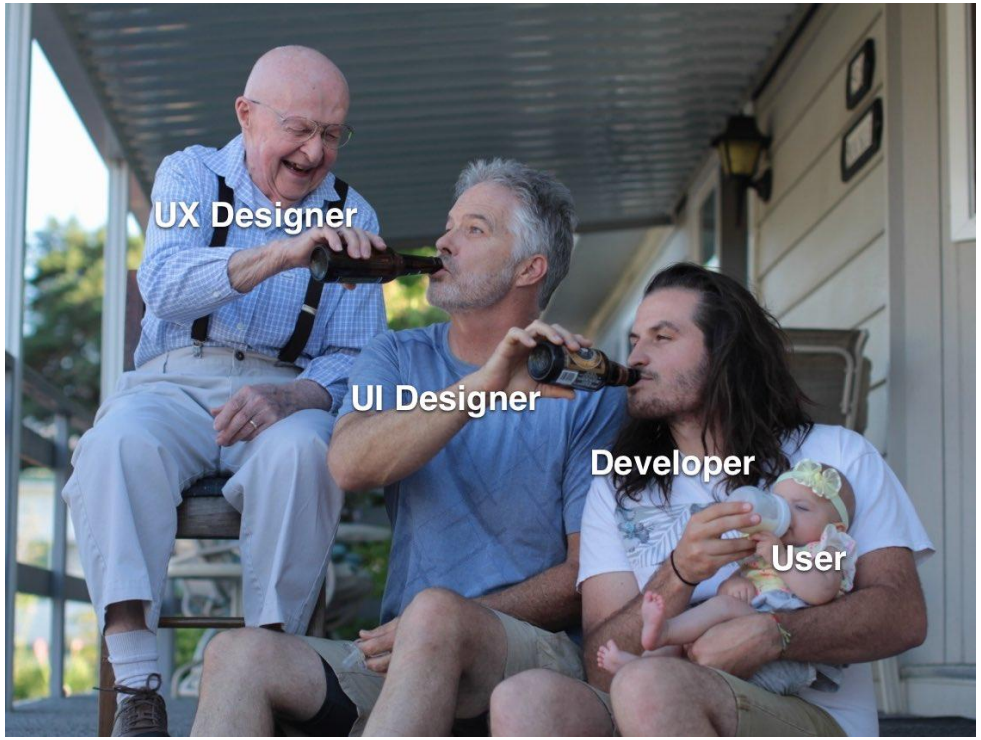


Cognitive walkthroughs procedure

1. Preparations
   - → Identify and document the characteristics of typical users.
   - → Develop sample tasks, focusing on the aspects of the design.
   - → Produce a description, mock-up, or prototype of the interface to be developed, along with a clear sequence of the actions needed for the users to complete the task.
2. A designer and one or more researchers come together to do the analysis.
3. The researchers walk through the action sequences for each task, placing it within the context of a typical scenario. As they do this, they try to answer three questions.
4. Compile a record of critical information – assumptions, notes of issues and design changes, etc.
5. (Check with real users and) Revise the design to fix the problems presented.

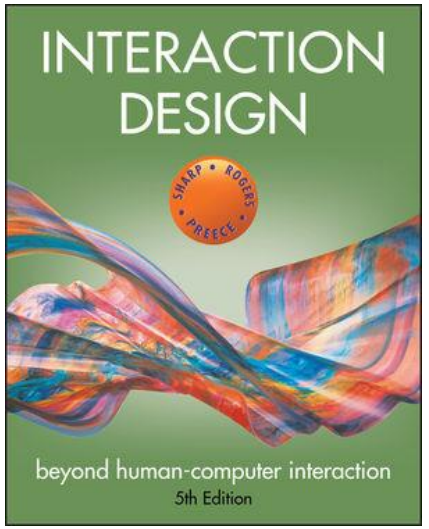
The three questions

1. Will the correct action be sufficiently evident to the user?
   → *Users know what to do*
2. Will the user notice that the correct action is available?
   → *Users know how to do it*
3. Will the user associate and interpret the response from the action correctly?
   → *Users understand the feedback*



Readings

- Chapter 8: Data Gathering
- Chapter 16, section 2: Inspections: Heuristic Evaluation and Walk-Throughs



Any Questions?

Email: yue.li@xjtlu.edu.cn
Office: SD457