

Introduction to HCI
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Qualitative Data Analysis Affinity Diagrams

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Learning goals

- ▶ Describe the difference between data types in terms of subjective/objective and qualitative/quantitative
- ▶ Be able to give examples of each combination of data types on the spectrum for different analysis techniques
- ▶ Describe methods for performing qualitative analysis, including the process and outcomes involved
- ▶ Describe affinity diagrams as an analysis method
 - ▶ Understand when and why we use affinity diagrams vs. Thematic analysis
 - ▶ Explain how to analyze data using the affinity diagram method

Types of data that HCI methods provide

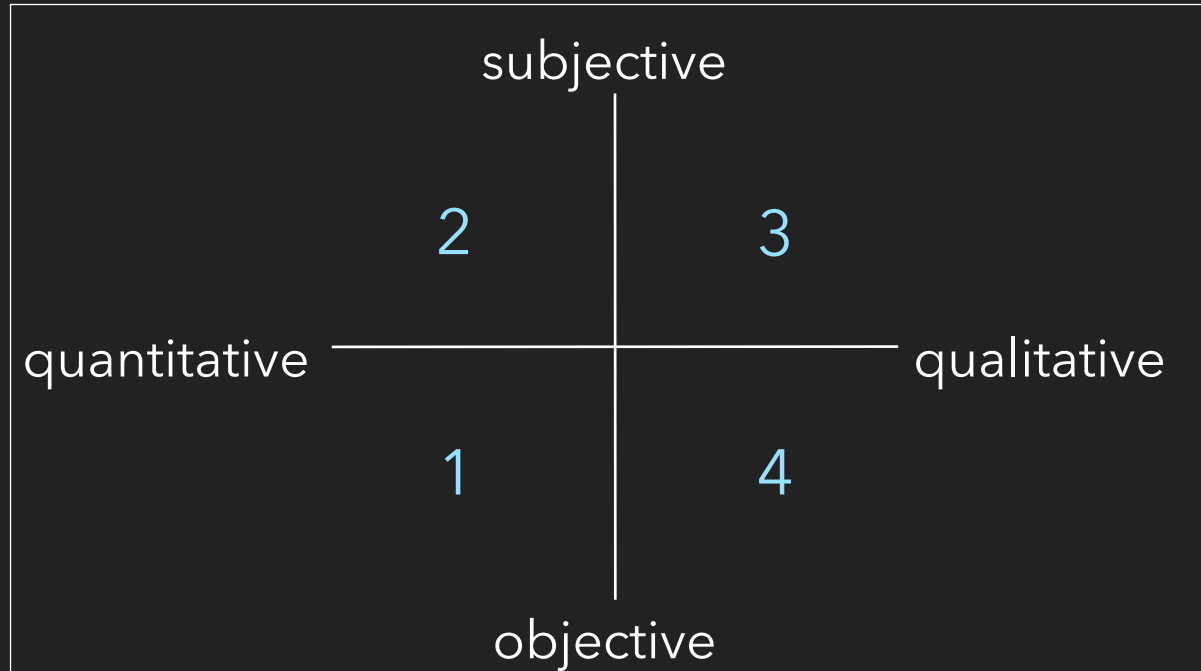
▶ Qualitative:

- ▶ Users describe/report X, to extent they are aware
- ▶ You observe X, that users may not be fully aware of
- ▶ Where X can be: behaviors, processes, usability challenges...

▶ Quantitative:

- ▶ Measure task performance with existing tools / methods:
 - ▶ e.g., Speed, errors, dead-ends, learning curves for novices ...
- ▶ Numerical data from user-reported answers: e.g., # of emails/day
- ▶ Counting observed occurrences: e.g. # of times looked at instruction

Types of data that HCI methods provide



Controlled observations - of time to complete task?

Unstructured observations - of observed steps to complete a task?

Unstructured interviews - of user telling stories?

Questionnaire - self report numbers of times do something?

Triangulation

- ▶ A strategy to enhance validity:
use the multiple perspectives available from complementary sources



Use multiple:

- ▶ data sources
people, places, times
- ▶ data collection
methods
- ▶ researchers/evaluators

Analyzing & interpreting data

Qualitative data – interpreted to tell a “story”

- ▶ Categories, themes, patterns, etc.

Quantitative data – presented as values, tables, charts and graphs

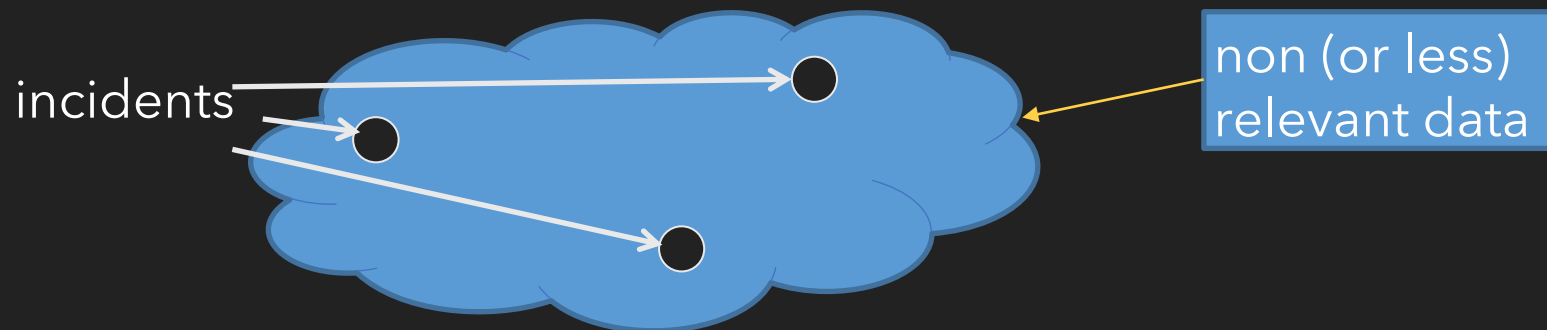
- ▶ Counts (e.g., Summary of total # of errors)
- ▶ Simple statistical analysis (e.g., Averages)
- ▶ Advanced statistical analysis (e.g., Linear regression)
... more on quantitative coming later this term.

Methods for qualitative analysis

- ▶ From simpler (less effort) to more advanced (more effort):
 - ▶ Identify critical incidents
 - ▶ Simple categorization
 - ▶ Categorization - themes, patterns
- ▶ In all cases your aim is to interpret the data in ways that encapsulate and document your understanding.
- ▶ Level of effort depends on your goal.
- ▶ Many methods often used in combination

Qualitative analysis methods: Finding critical incidents

- ▶ **Identify and focus on the most significant incidents**
 - ▶ Efficient when you have lots of data
 - ▶ Incidents can be either desirable or undesirable
- ▶ NOT about summarizing all incidents that occur
 - ▶ More like finding tiny gold nuggets in buckets of sand
 - ▶ Appropriate for usability studies, where qualitative is not primary analysis



Qualitative analysis methods categorizing data

- ▶ Typically used on transcripts (observations, interviews, etc.)
 - ▶ At non-granular level of detail to find stories or themes
 - ▶ At fine-grain level of detail focusing on words, sentences, gestures, etc. (E.G., Discourse analysis)
- ▶ First data are 'coded' according to a scheme of categories
 - ▶ Can be predetermined, or arise from the data
 - ▶ At a high level: affinity diagram

Example of coded transcript Mid- to low-level of detail

own home
alone / lonely
people around
When you move into your own home, you're alone. There is no bustle of people around the
house. I miss having someone to chat to when I get home. I put the TV or some music so
there's some background noise. the silence makes me feel so alone. Sometimes I will be sat
watching trash TV and thinking I should be out doing something rather than watching this
rubbish. I read a lot but sometimes I am too tired and just want to veg out. But it's been good
to move out of mum and dad's as it's not healthy to rely on them as they won't last forever. I
become independent and made my own decisions. It's good they still there when I need them.
It's good to have some distance as when I was at home I was arguing a lot with my dad and
that was made me decide it was time to go.

Very informative, but time consuming!

Affinity diagrams

- ▶ A tool for organizing field data and consolidating insights from collected data.
 - ▶ Common technique to find recurring patterns/themes
- ▶ Arranges the notes from interpretation sessions into a **hierarchy** that reveals common issues and themes across all users.
- ▶ Can be used for many purposes (including analysis)
 - ▶ brainstorming about design ideas
 - ▶ comments from users
 - ▶ problems observed/reported by users



When affinity diagrams?

- ▶ Affinity diagram
 - ▶ When we don't have a lot of time and a less rigorous analysis is acceptable
 - ▶ Not typically used for research paper that is purely qualitative
 - ▶ Common for research where the qualitative analysis is secondary

Why affinity diagrams?

- ▶ Lighter-weight / discount method (as done by HCI researchers, Holtzblatt describes a relatively rigorous process though)
- ▶ Physicality promotes discussion
- ▶ Relatively good quality result in less time

“ You can read a good affinity from beginning to end to see every issue in the practice and everything the team has learned so far, all tied to real instances. There is no better way to see the broad scope of the problem quickly...”

Holtzblatt, K., and Beyer, H., 2016

Affinity diagrams considerations

- ▶ The affinity is built bottom-up (inductive)
 - ▶ We don't start with known categories such as 'quality' that might be familiar to the team
- ▶ Keep group notes small: 4-6 notes per group
 - ▶ Make more groups, finding more issues or more insights
- ▶ Label each group, use a different color for labels
 - ▶ Group into hierarchical structure that breaks the data about the topic/user into manageable chunks.
- ▶ Larger group
 - ▶ Wider range of perspective

Affinity diagrams process

Important:

- ▶ To start with the project/research focus.
 - ▶ The meaning a team reads in a note and the way they group them are driven by the project/research focus.
- ▶ To let groups emerge, rather than start with predefined groups.

Affinity diagrams process

- ▶ Record each idea/observation/problem/etc. On an individual card or sticky note (in random order).
- ▶ In team, arrange the notes into a **hierarchy**.
 - ▶ Look for notes that seem to be related.
 - ▶ Sort notes into groups until all used.
 - ▶ **Give them a label representing the insight suggested by the group.**
 - ▶ The label is the synthesis of the detailed data
 - ▶ Labels written from the user's perspective
 - ▶ Labels will drive design
 - ▶ Sort and resort into larger clusters subgroups as necessary
- ▶ **Note:** Place notes one at a time; as each note is placed, other team members may add similar notes in close proximity.

We plan our trip together

We share the job of researching where to go

We plan the trip as a group

I take responsibility for booking all or just part of the trip

T01-26 After a conversation about pros and cons of Victoria and Vancouver, decided Victoria would not work out and returned to their original plan to go to Vancouver.

T01-45 The closest friends-in the core team do all the planning and define the date. The second tier (people invited often by core team to come) get added to the email chain to work out details of when arrive, where stay, and overall logistics after the date is set.

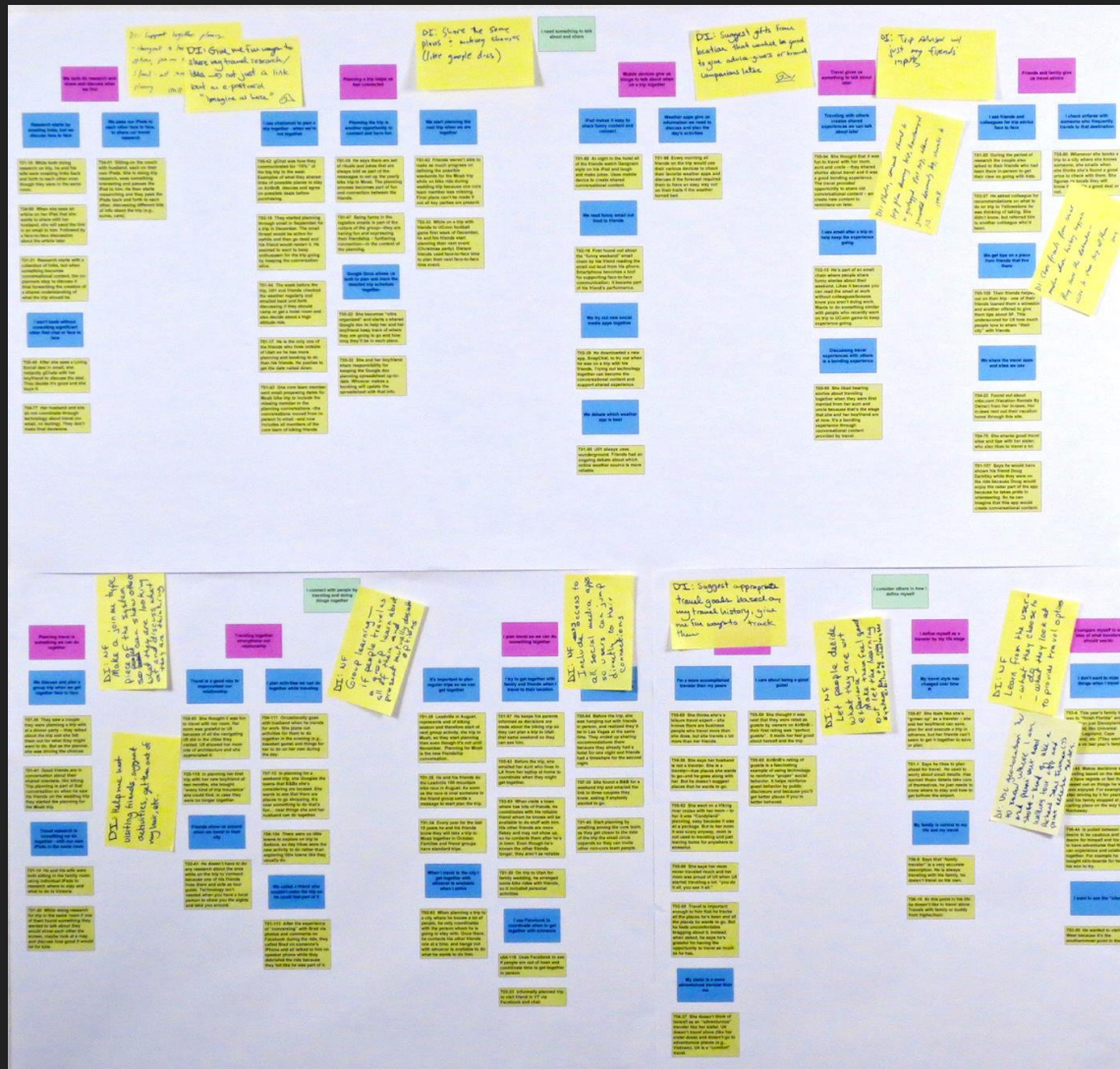
T05-34 Because the AirBnB profile contains her boyfriend's email and personal info, he does most of the research and all of the contact with the owners through the site.

T01-24 Over several days researched Victoria compared to Vancouver. They emailed each other from work with additional details and links and called each other on the phone after emails to discuss. The pattern of research, share, and talk was repeated when they were not co-located.

T01-62 Emails his friends to see if they want to do a ride on the last morning of the trip because if they do he will take the later flight, otherwise he will book an earlier flight that gets home at a better time.

T05-48 Boyfriend had to stay in constant contact with AirBnB owners (using AirBnB website messaging) to make sure they'd have a place to stay in each of the cities they were visiting.

T01-27 After they decided to



Holtzblatt, K., & Beyer, H., 2016

Example

Using the team room to create an immersive experience.



How far do you take analysis?

- ▶ *As far as is helpful for your needs*
- ▶ Useful until you have uncovered with some rigor, e.g.,
 - ▶ What are the most important activities/tasks to support
 - ▶ Where task dependencies occur
people, resources, order
 - ▶ What is essential vs. nonessential in an implementation
 - ▶etc.
- ▶ From here, key elements for design begin to emerge

In-class activity

- ▶ Create an affinity diagram based on the information provided in the worksheet
- ▶ Work in groups
- ▶ Link to the worksheet - <https://tinyurl.com/rkktf55t>

Additional Information

What makes a good affinity?

- ▶ Hierarchical structure
- ▶ Clear language of the labels
 - ▶ Short, succinct, invite immediate understanding
- ▶ Story language
 - ▶ Moving through data quickly so that the mind can be free to generate ideas
- ▶ Communicative
 - ▶ Bridges the gap between data and design

Optional Reading

- ▶ Holtzblatt, K., and Beyer, H. (2017). Contextual design: Design for life, Elsevier.
 - ▶ Chapter 6
 - ▶ <https://tinyurl.com/3cevxmhn>