Data analysis, interpretation and presentation

Overview
• Qualitative and quantitative
• Simple quantitative analysis
• Simple qualitative analysis
• Tools to support data analysis
• Theoretical frameworks: grounded theory, distributed cognition, activity theory
• Presenting the findings: rigorous notations, stories, summaries

Quantitative and qualitative
• Quantitative data – expressed as numbers
• Qualitative data – difficult to measure sensibly as numbers, e.g. count number of words to measure dissatisfaction
• Quantitative analysis – numerical methods to ascertain size, magnitude, amount
• Qualitative analysis – expresses the nature of elements and is represented as themes, patterns, stories
• Be careful how you manipulate data and numbers!

Simple quantitative analysis
• Averages
  – Mean: add up values and divide by number of data points
  – Median: middle value of data when ranked
  – Mode: figure that appears most often in the data
• Percentages
• Graphical representations give overview of data

Simple qualitative analysis
• Unstructured - are not directed by a script. Rich but not replicable.
• Structured - are 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.

Visualizing log data
• Interaction profiles of players in online game
• Log of web page activity
Simple qualitative analysis

• Recurring patterns or themes
  – Emergent from data, dependent on observation framework if used
• Categorizing data
  – Categorization scheme may be emergent or pre-specified
• Looking for critical incidents
  – Helps to focus in on key events

Tools to support data analysis

• Spreadsheet – simple to use, basic graphs
• Statistical packages, e.g. SPSS
• Qualitative data analysis tools
  – Categorization and theme-based analysis, e.g. N6
  – Quantitative analysis of text-based data

• CAQDAS Networking Project, based at the University of Surrey (http://caqdas.soc.surrey.ac.uk/)
Individual model
Activity - Motive
Action - Goal
Operation - Conditions

Engeström’s (1999) activity system model

Presenting the findings
• Only make claims that your data can support
• The best way to present your findings depends on the audience, the purpose, and the data gathering and analysis undertaken
• Graphical representations (as discussed above) may be appropriate for presentation
• Other techniques are:
  - Rigorous notations, e.g. UML
  - Using stories, e.g. to create scenarios
  - Summarizing the findings

Summary
• The data analysis that can be done depends on the data gathering that was done
• Qualitative and quantitative data may be gathered from any of the three main data gathering approaches
• Percentages and averages are commonly used in Interaction Design
• Mean, median and mode are different kinds of ‘average’ and can have very different answers for the same set of data
• Grounded Theory, Distributed Cognition and Activity Theory are theoretical frameworks to support data analysis
• Presentation of the findings should not overstate the evidence