Lec 11

Data Analysis

Qualitative vs Quantitative, Statistical Analysis, Thematic Analysis

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Week	Topic	Contact Hours	Book Chapters	Project Deliverable	Assignment Deliverable
1	Introduction to Human-Computer Interaction	3	1		
2	The process of interaction design	3	2		
3	Understanding Humans: Cognitive Aspects	3	4	Topic Selection	
4*	Quiz + Hands On	3	-		
5	Emoitonal Aspects	3	6		
6	Social Aspects	6	5	Literature Review	
7	Qualitative & Quantitative Human Data Gathering Methods	3	8		1: Discovery
8*	Midterm Exam + Analyzing Human Data	3	9		
9	Discovering Requirements	-	11		
10	Data at Scale and Visualization	3	10	Proposal	
11	Interfaces + Ideation and Prototyping Techniques	6	7, 12		2: Analysis
12*	Quiz + Interaction Design in Practice	3	13		
13	Evaluation Methods (Heuristics, Usability Testing)	3	14, 15	Study Report	
14	Analytics	3	16		3: Build & Evaluate
15	Presentations	-	-		
16	Final Exam	3	16	First Draft	

Assignment 2: Analysis and Synthesis Phase

Objective

To analyze and synthesize data gathered during the Discovery phase, using various analytical methods to identify themes, user needs, and pain points. This phase will help define clear, actionable problem statements for the next phase.

Instructions

1. Data Analysis:

Quantitative Analysis:

- Organize and analyze numerical data (e.g., ratings, frequency of feedback themes).
- Create at least three statistical visualizations (e.g., bar charts, pie charts) to summarize key findings.

Qualitative Analysis:

- Perform thematic analysis to identify at least 5 recurring themes from user reviews, interviews, and observations.
- Conduct semantic analysis to extract deeper insights from user sentiments.

2. Mapping Tools:

Research Proposal & Study Design Guide

What is a Research Proposal?

> A research proposal is your detailed plan for conducting an HCI study that transforms your literature review insights into actionable research. **Your proposal should read like the "Methods" sections in academic papers** - providing sufficient detail for replication.

It's NOT:

- A vague description of what you might do
- A copy-paste of your proxy paper's methodology
- A theoretical discussion without concrete plans

It is:

- A detailed, executable plan adapted from your proxy paper
- A comprehensive design addressing your research gap
- A demonstration of rigorous HCI research capability

Goals

Transform abstract concepts into measurable variables, adapt proven methodologies to your context, plan data collection, anticipate challenges, and establish feasibility within course constraints.

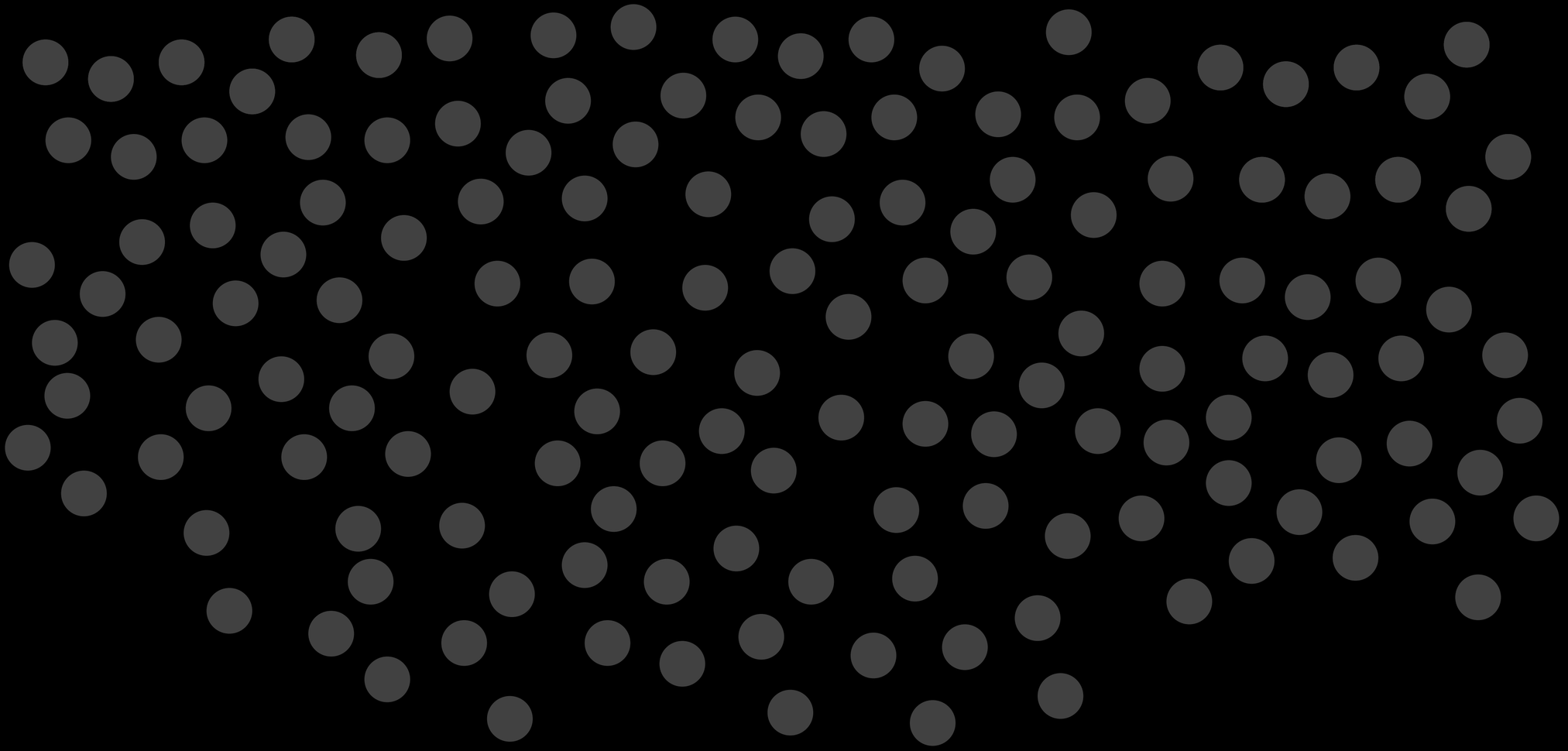
Building on Your Literature Review

Your proxy paper serves as your **methodological template**. Extract the core method, adapt to your context, address

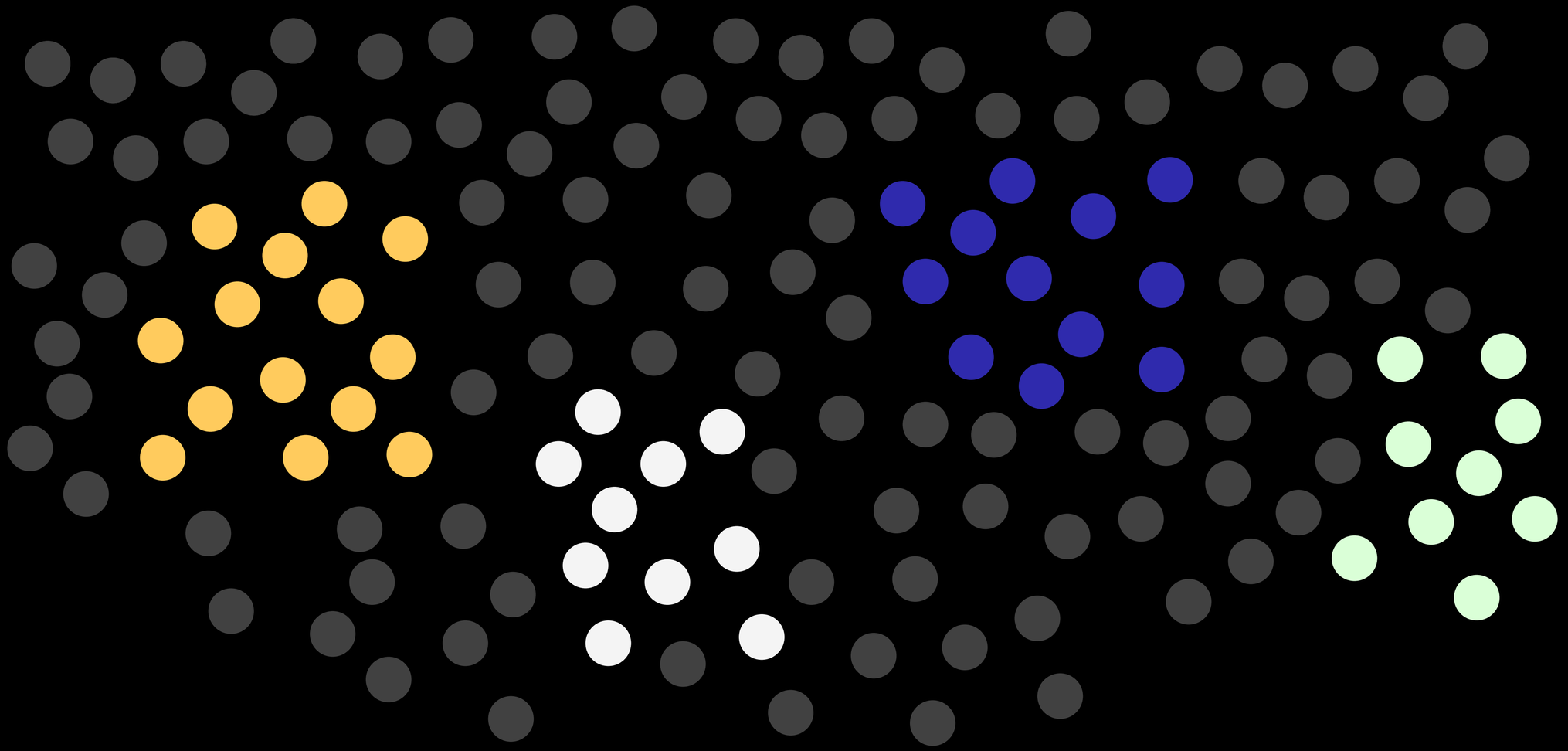
In Today’s lecture

- Intro to the define phase
- What is the goal of the define phase
- What are the different types of gathered data
- What are the different types of analyses
- What are some analytical frameworks?
- How to present data effectively
- Common pitfalls in data analysis.

You have collected a lot of data



Now, you want want to **“make sense of the mess”**




CRIME INVESTIGATION
CRIME INVESTIGATION
CRIME

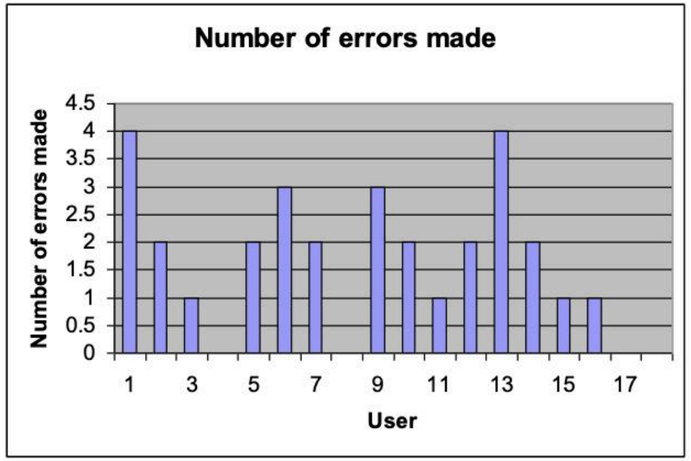
Multiple ways of analyzing data

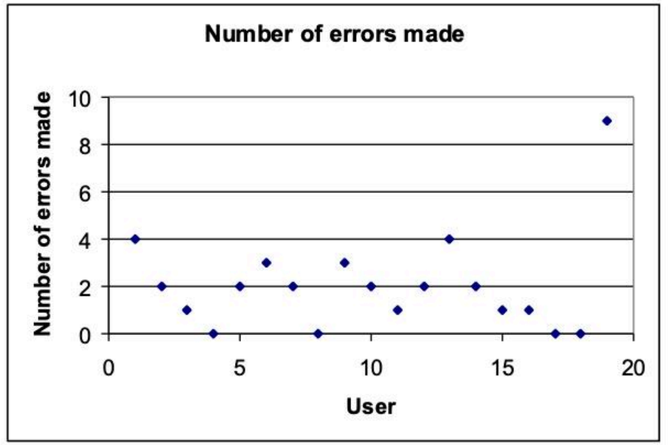
- Statistical Analysis
- Sentiment Analysis
- Thematic Analysis
- Coding (not programming)
- Mapping
- ...

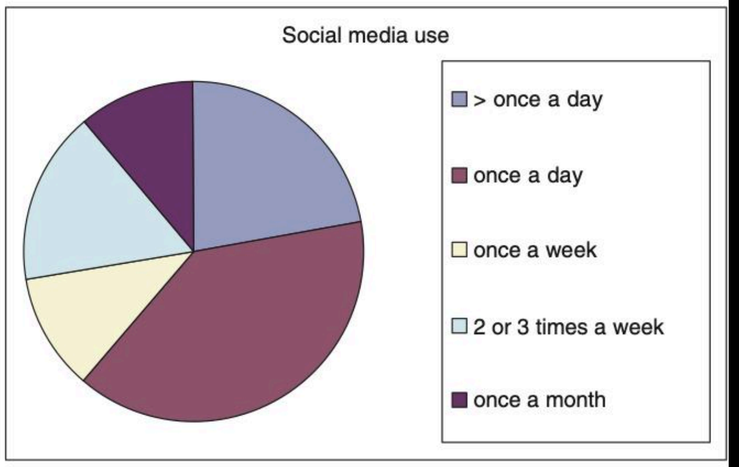
Quantitative vs Qualitative

Quantitative

- Expressed as numbers
- Numerical methods to ascertain size, magnitude, and amount
- Measures include averages, percentages, ranges ..

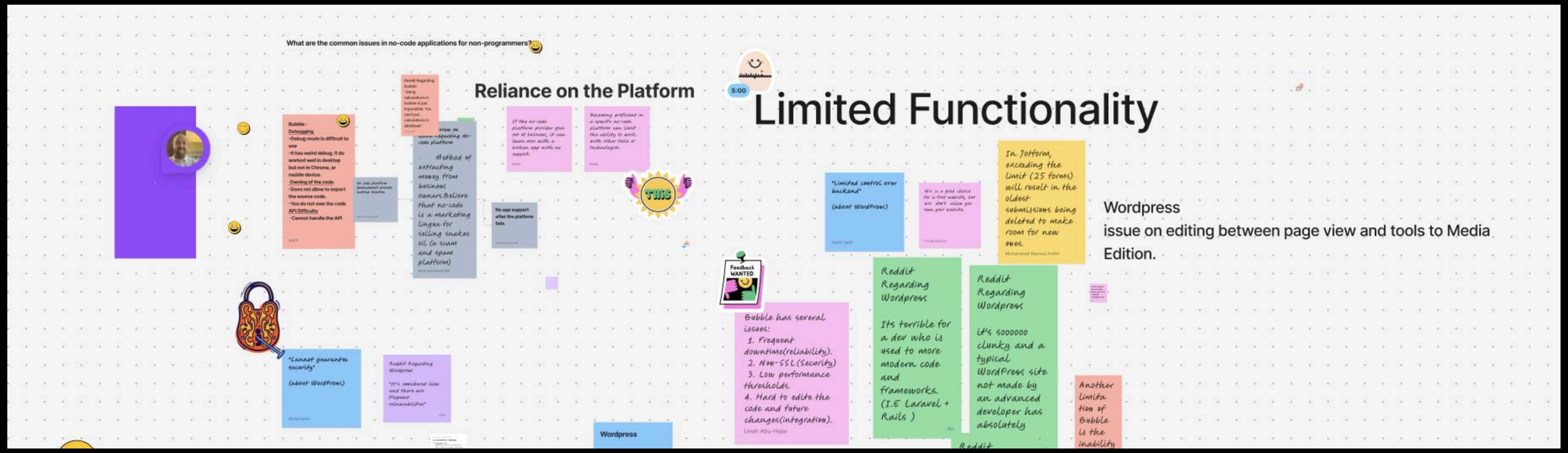




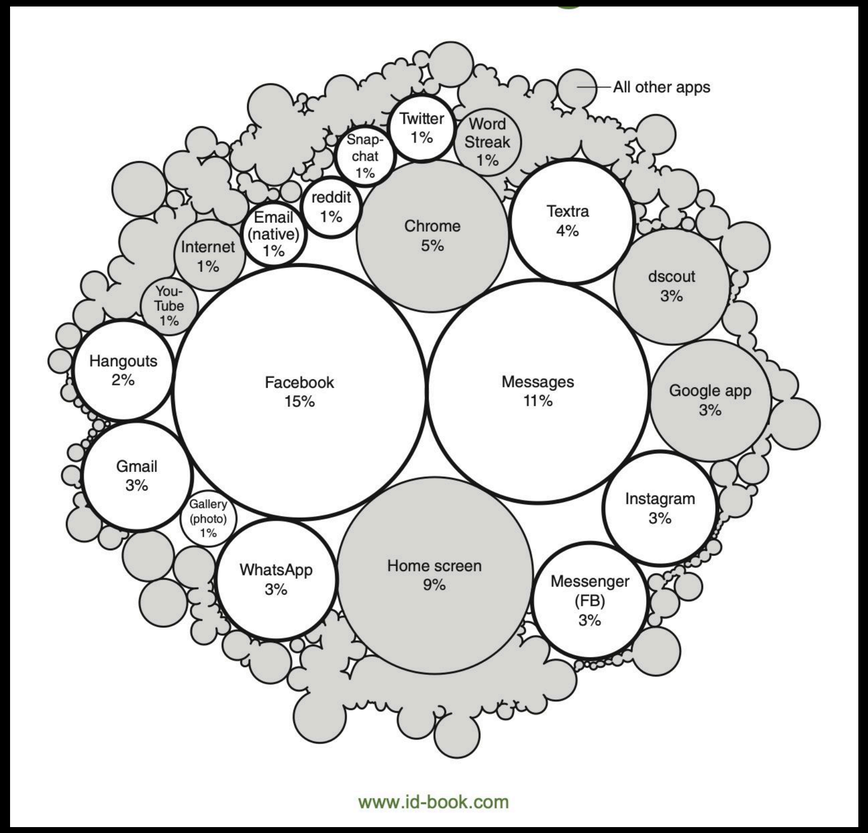


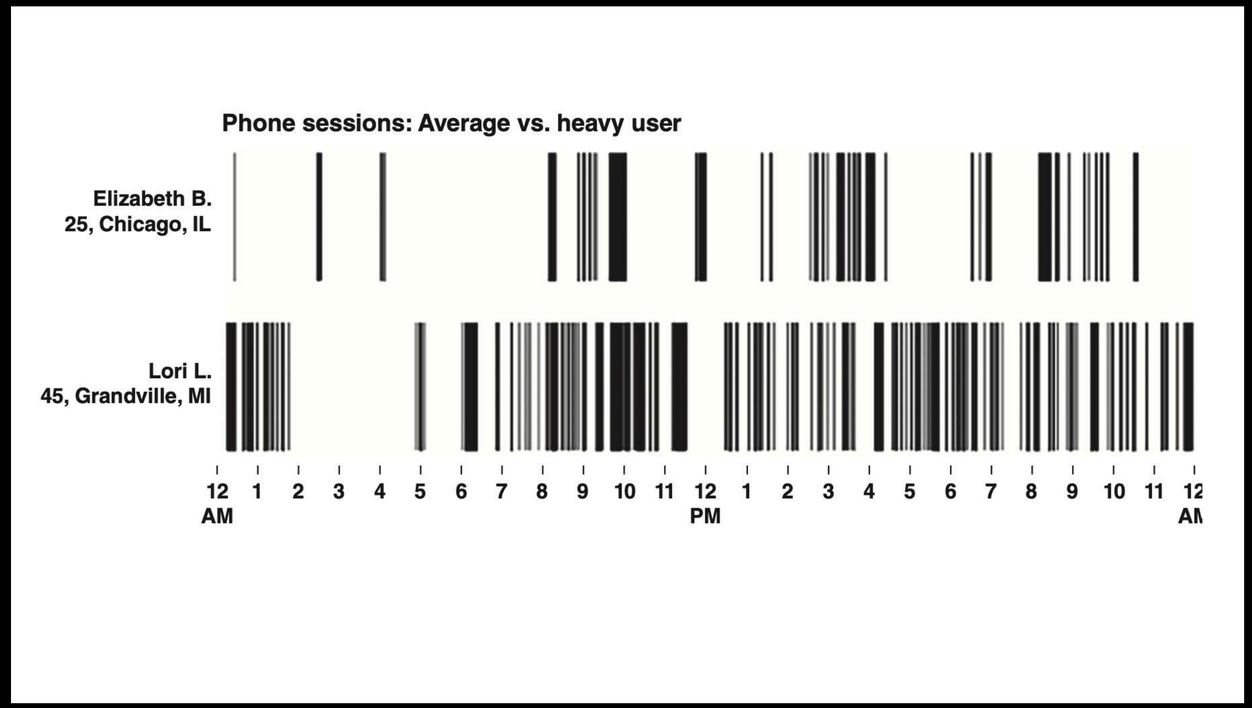
Qualitative

- Looking for critical incidents
- Identifying themes
- Deductive vs inductive analysis



Presenting findings



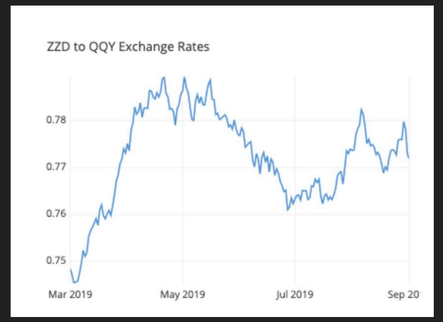


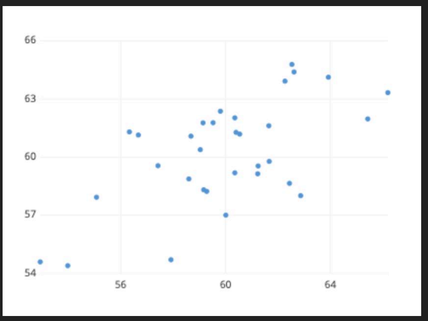
Presenting Findings

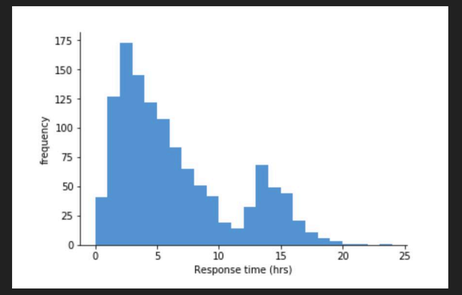
- Summarize findings using a range of notations
- Different charts show different aspect
- Stories are easy and intuitive approach to communicate ideas

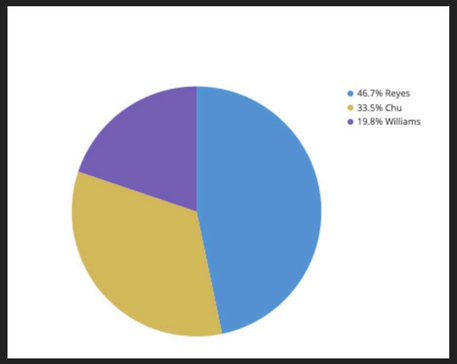
Presenting Findings

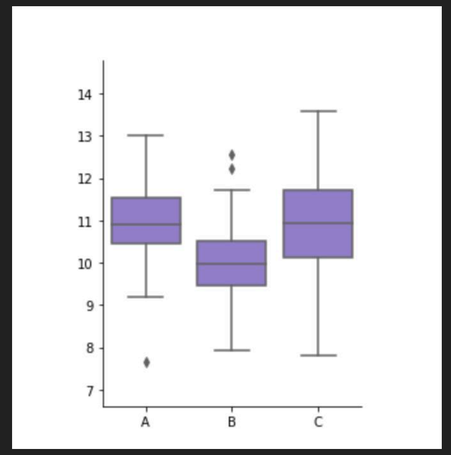
Chart Type	Best For
Bar Chart	Comparing categories
Line Chart	Trends over time
Scatter Plot	Correlation between two variables
Histogram	Distribution of a single numeric variable
Pie / Donut Chart	Part-to-whole breakdown
Box Plot	Comparing data distributions across groups

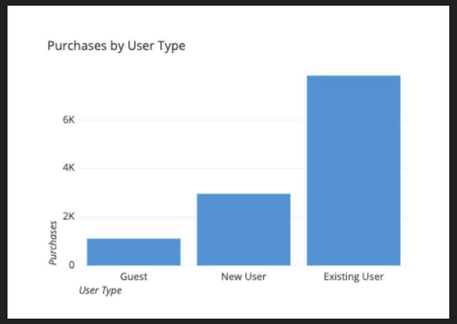












Thematic Analysis

Theme is something important about the data in relation to the study goal. It represents a pattern of some kind, perhaps a particular topic or feature, found in the dataset, which is considered to be relevant and even unexpected with respect to the study goal

Tips on Affinity Diagramming

- Be concise and specific
- Ask around and be active
- Read other’s work
- Use visual aids if possible
- Ok to revise while iterating
- Gradually create clusters

🔗 Group Thematic Analysis

What are the common issues of the natural language programming applications for non-programmers?

- Open the Figma board from BB.
- Start searching for user reviews on social media & app stores
- Create a post-it that includes one piece of information (review summary, saying, number, .. etc)
- Add it to the closest group (if no group put it alone)

Questions after clustering

- Is an overall narrative starting to emerge, or are the themes quite disparate?
- Do some seem to fit together with others?
- If so, is there an overarching theme?
- In doing this, some of the original themes may not seem as relevant and can be removed.
- Are there some themes that contradict each other? Why might this be the case?