Qualitative Surveys

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Agenda

1. Qualitative surveys
2. Qualitative vs. quantitative surveys
3. Purposive sampling
4. Data collection
5. Data analysis
6. Quality assurance

1. Qualitative Surveys

Qualitative Surveys

A **survey** is

- The study of a population through observation of its members

A **qualitative survey** is a survey studying

- Diversity (not distribution) in a population for theory building purposes

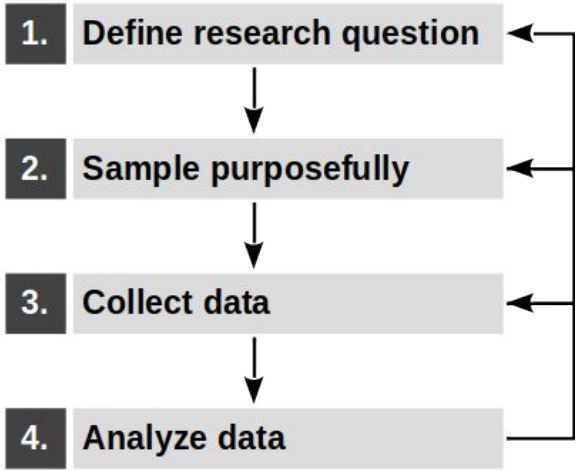
Qualitative surveys may be the simplest possible theory building methodology

- The most common variant is the interview study

Qualitative Survey Process

Qualitative surveys use defined research methods to

1. **Define research question**
2. **Create sampling model and sample**
3. **Perform data collection**
4. **Analyze data**



A qualitative survey should follow a defined methodology,

- Jansen (2010)

Open vs. Pre-structured Qualitative Surveys

Jansen (2010) distinguishes between

- Open (inductive) qualitative surveys (for theory building)
- Pre-structured (deductive) qualitative surveys for measuring diversity

Pre-Structured (Deductive) Qualitative Surveys

A pre-structured qualitative survey, according to Jansen (2010)

- Quantitatively assesses diversity in a population using established categories

As such, this type of survey is descriptive and findings have to fit the mold

Which of a set of predefined characteristics exist in a given population?

We do not consider this type of survey further (not theory building)

Example QS Episodic Volunteer Retention (EVR) RQ [1]

How do open source projects retain episodic volunteers?

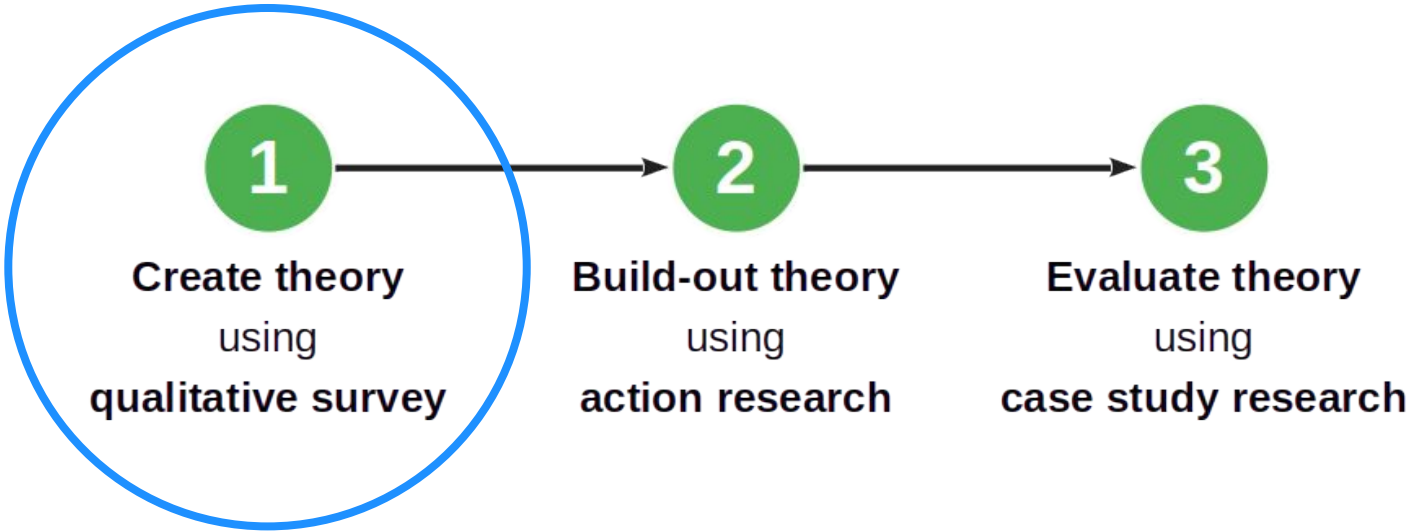
- How do these practices relate to traditional retention practices?

Open source projects rely on free “volunteer” contributions

- Some of these volunteers are habitual, some are episodic

[1] Barcomb, A., Kaufmann, A., Riehle, D., Stol KJ, & Fitzgerald, B. (2020). Uncovering the Periphery: A Qualitative Survey of Episodic Volunteering in Free/Libre and Open Source Software Communities. IEEE Transactions on Software Engineering, vol. 46, no. 9 (September 2020), pp. 962-980.

Qualitative Surveys in a Larger Research Design



2. Qualitative vs. Quantitative Surveys

Qualitative vs. Statistical (Quantitative) Surveys 1 / 2

A qualitative survey studies

- **Diversity** (of variables) in a population where

A statistical (quantitative) survey studies

- **Distribution** (of variables) in a population where

Example of a Statistical Survey [1]

To what extent are the following six proposed theoretical constructs indicative of an episodic volunteers intention to remain a volunteer to a project?

1. Volunteering experience
2. Contributor benefit motivations
3. Psychological sense of community
4. Community commitment
5. Social norms
6. Satisfaction

These constructs were an outcome of the example qualitative survey research

[1] Barcomb, A., Stol KJ, Riehle, D. & Fitzgerald, B. (2019). Why Do Episodic Volunteers Stay in FLOSS Communities? In Proceedings of the 41st International Conference on Software Engineering (ICSE 2019), pp. 948-959.

Qualitative vs. Quantitative Surveys 2 / 2

Steps	Qualitative Survey	Statistical Survey
Study purpose	Diversity / insight	Distribution / hypothesis testing
Population sampling	Theoretical / purposive	(Stratified) Random
Variable scales	Nominal or ordinal	Interval or ratio
Stopping criterion	Theoretical saturation	Statistical significance
Results	Theoretical / causal insights	Correlations

Example Qualitative vs. Statistical Survey Comparison

Steps	A qualitative survey of episodic volunteering	A hypothesis-testing survey of episodic volunteering practices
Study purpose	Understand retention practices for episodic volunteers	Testing relevance of constructs for intention to remain
Population sampling	Project leaders from diverse set of projects	Open questionnaire advertised (“convenience sampling”)
Variable scales	Categorical	Interval / distribution
Stopping criterion	Saturation of learning about new practices	Time and effort
Results	A set of retention practices	A (in)validation of practices

3. Purposive Sampling

Purposive Sampling

Sampling is

- The selection of members (the sample) of a population for investigation

Purposive sampling is sampling in which the selection

- Is purposeful for theory building

Theoretical sampling is a variant of purposive sampling

- Used in grounded theory research

Sampling Model and Population

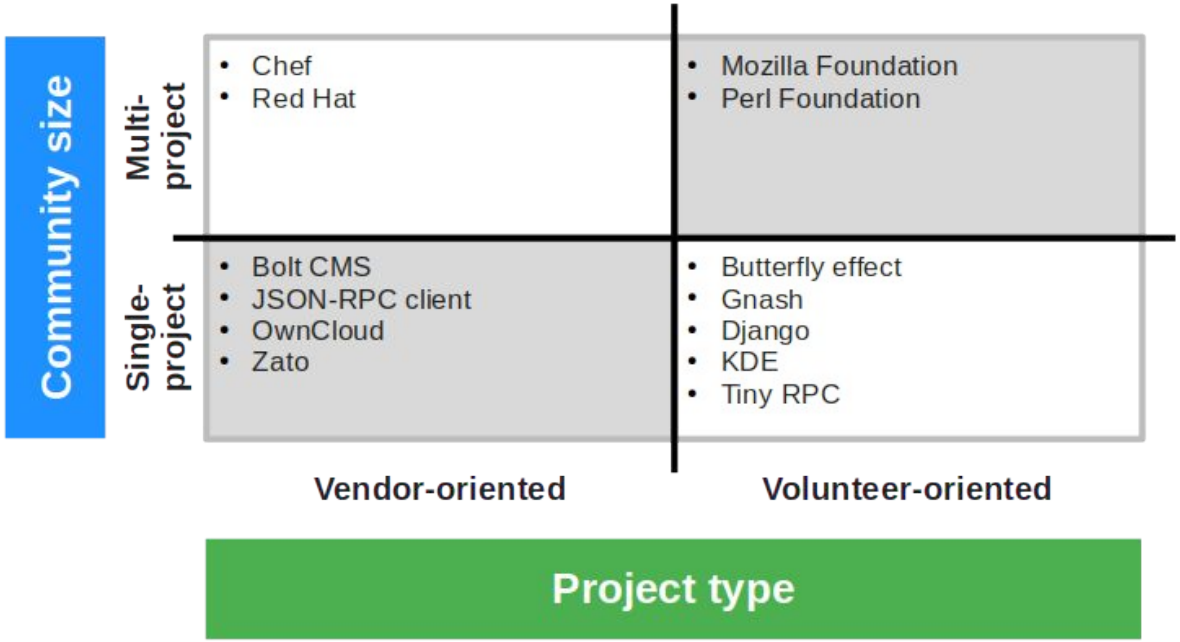
A **sampling model**

- Is a model of the population designed to sample from
- Focuses on the properties of relevance to the research question

The **population** is

- The set of elements characterized by the sampling model

Example QS EVR Sampling Model with Sample



How to Build a Sampling Model?

The sampling model already incorporates assumptions (biases) about the domain

- It should be derived from prior work, for example, a systematic literature review

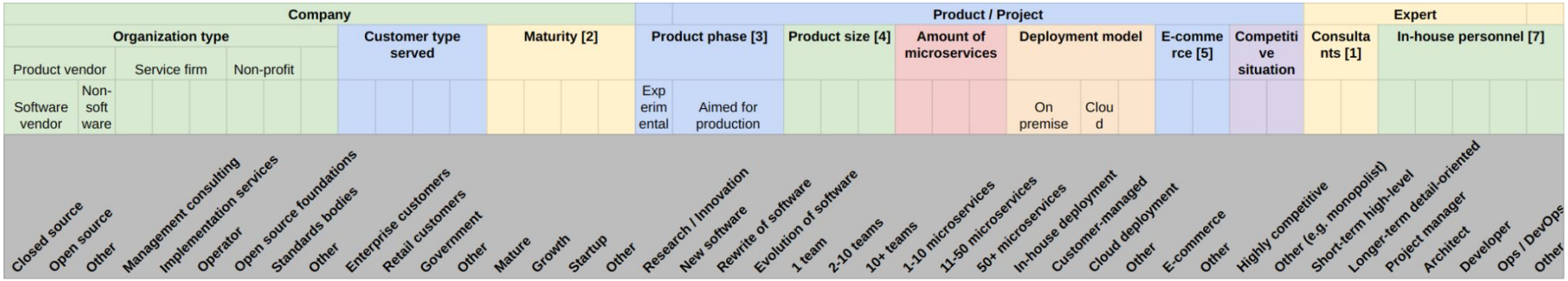
In situations of high uncertainty, start with a small model and revise over time

Example Microservice Integration Sampling Model

Interview study of domain experts on best practices of microservice integration

Population were experts of microservice architectures

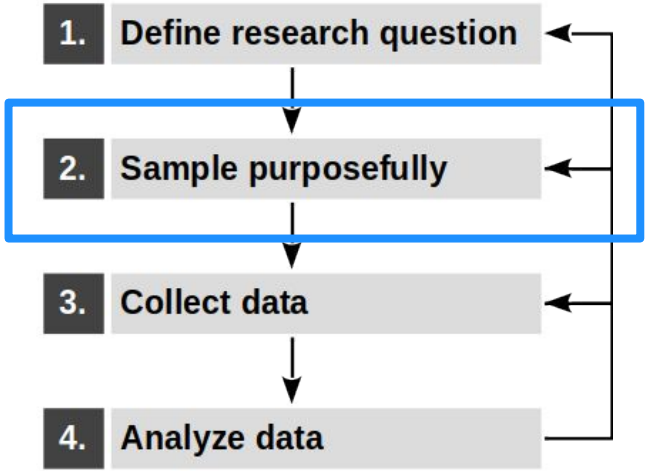
Diversity sought out was captured by model



Purposive Sampling Strategies

Purposive sampling strategies

- Typical case sampling
  - Chooses a common representative case
- Critical case sampling
  - Chooses outlier cases for theoretical insight
- Polar sampling
  - Chooses sets of elements based on opposing attributes



Sample Sizes

The initial sample should broadly cover the existing diversity

- Grow sample (add more elements) as you work towards saturation

Heuristics for initial sample sizes

- Recommendations by other experts in the domain
- Recommendations from qualitative methodologist
- Prior knowledge about reaching saturation

Recommendations for Sample Sizes

Some recommendations by qualitative methodologists for

- Grounded theory research
  - Creswell (2007): At least 20 to 30 interviewees
  - Denzin and Lincoln (2005): About 30 to 50 interviews
  - Morse (2000): About 20 to 30 interviewees.
- Case study research
  - Creswell (2007): Max. 4 or 5 cases and 3 to 5 interviewees per case

4. Data Collection

Qualitative Surveys as Interview Studies

Types of interviews

- Unstructured
- Semi-structured
- (Fully) structured

Types of interviewees

- Individual person
- Groups of people

Unstructured Interviews

Unstructured interviews

- Have open-ended questions, are “in-depth interviews”
- Allow order of questions, emphasis, and depth to vary by interview
- Are managed and adapted in the situation by the interviewer
- Do not impose any prior categorization on collected data

Structured Interviews

Fully **structured interviews**

- Have a predetermined question set, with little room for variation
- Have a predetermined order and no variation between interviewees
- Contain closed questions (fixed set of answer choices)
- Are created from an existing coding scheme for the responses
- Aim to categorize behavior within pre-established categories

Structured interviews are not used in theory building

- They are effectively a statistical survey

Semi-Structured Interviews

Semi-structured interviews are

- Interviews with both a structured and unstructured part

Theory building (unstructured part) tends to dominate

- Structured part to add some statistical data to better understand the population

Why an Interview Study?

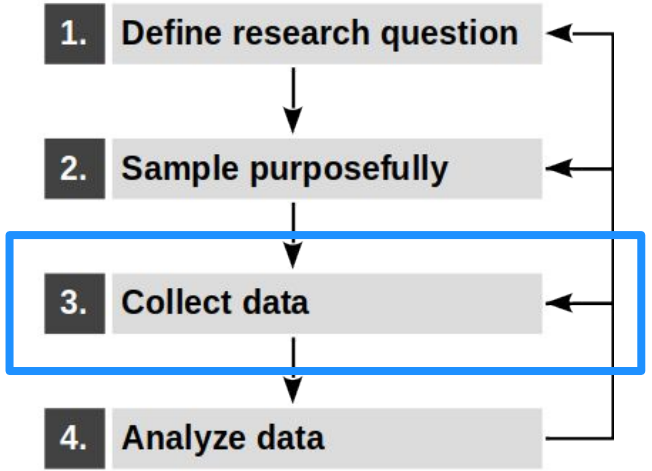
“Industry [1] is where the research data is.” [DR]

[1] Or just “practice”

Interview Study Process (for Theory Building)

For each selected interviewee

1. **Prepare protocol**
   a. Setup protocol, prepare questions
   b. Updated questions if needed
2. **Perform interview**
   a. Interview current interviewee
   b. Capture and transcribe interview
3. **Analyze results**
   a. Perform qualitative data analysis
   b. Check saturation, iterate if necessary



1. Prepare Protocol

Prepare protocol

- Document all relevant meta-data, for example, interviewee name, etc.
- Outline (if doing it for the first time) or amend process

Prepare questions

- What and how to ask based on research question
- Structure questions into categories, have order
- Usually start with some demographics
- Go from the general to the specific
- Have a closing, follow-up, thank you

2. Perform Interview 1 / 3

Follow your interview guide (questions)

- Introductory comments
  - Clarify purpose of interview
  - Ask for permission to record interview
  - Explain purpose of recording
  - Allow for off the record remarks
  - Inquire about use of quotes
- Interview conversation
  - Record the spoken word (audio)
  - Take notes on non-verbal information
  - Prefer open-ended questions

Example QS EVR Interview Protocol [1]

Guide for community managers

1. *Introduction*
2. *Establish subject's authority*
3. *Understand what the interview subject means by volunteering*
4. *What types of episodic volunteering are present*
5. *What does episodic volunteering look like*
6. *How are episodic volunteers managed*
    a. Which activities are best suited to episodic volunteers
    b. Which activities are not suited to episodic volunteers
7. *Conclusion*

Guide for episodic volunteers

1. *Introduction*
2. *Episodic volunteering pattern in a community*
3. *Motives and Intentions*
    a. What initially inspired you to volunteer
    b. Do you intend to continue to volunteer
    c. How do you make that decision
4. *Experiences*
5. *Practices*
6. *Volunteering identity/behavior*
7. *Conclusion*
    a. Do you have additional insights

[1] See https://ieeexplore.ieee.org/ielx7/32/4359463/8477174/appendix-uncovering-periphery.pdf

2. Perform Interview 2 / 2

Follow interview guide (questions) but do not be afraid to

- Reorder questions
- Rephrase, reiterate questions
- Go off course if answers warrant it!

Be open-minded, avoid leading questions, etc.

- Let the interviewee talk but pull them back to the topic if they digress

2. Perform Interview 3 / 3

After the interview

- Transcribe the audio recording; your options
    - Manually convert audio to text
    - Use an auto-transcription tool
    - Outsource to transcription service
- Check the transcript manually
    - Correct the sentences if necessary
    - Delete off-the-record parts
- Send the transcription to the interviewee to get confirmation

Other Data Sources / Primary Materials

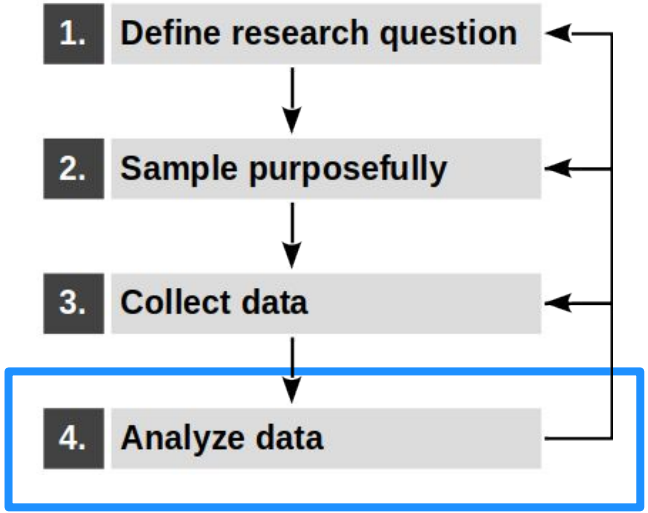
- Existing documents / documentation
- Workshop notes / transcripts
- Participant observation
- Outside observations
- …

5. Data Analysis

Interview Study Process (Continued)

For each selected interviewee

1. **Prepare protocol**
   a. Setup protocol, prepare questions
   b. Updated questions if needed
2. **Perform interview**
   a. Interview current interviewee
   b. Capture and transcribe interview
3. **Analyze results**
   a. Perform qualitative data analysis
   b. Check saturation, iterate if necessary



Three Levels of Diversity Analysis

There are three levels (types) of analysis according to Jansen (201)

- Unidimensional description (of collected data)
  - Data → Object, Object → Dimensions, Dimensions → Categories
- Multidimensional description
  - Concept-oriented and case-oriented description
- Explanation
  - Qualitative data analysis

Coding Paradigm Comparison

Grounded theory (Corbin & Strauss, 2008)	Thematic analysis (Braun & Clarke, 2012)	The qualitative survey (Jansen, 2010)
Open coding	Initial coding and collation	–
Axial coding	Searching for themes	Upward coding Downward coding
Selective coding	Reviewing themes	–

Until Saturation is Reached

Until saturation criterion tied to analysis method is reached

Example QS EVR Saturation Criterion

After 14 interviews (out of 20 in total) all codes were set

6. Quality Assurance

Quality Assurance

Quality assurance is tied to the individual research methods

- Systematic literature review → sampling model and sampling
- Qualitative data analysis → data analysis

Examples QS EVR Quality Assurance

First iteration

- Two coders, with the second coder recoding the first coder’s work

Second iteration

- Same procedure, with the second coder being a distributed coding team

In each iteration, the codebook was discussed and revised

Summary

1. Qualitative surveys
2. Qualitative vs. quantitative surveys
3. Purposive sampling
4. Data collection
5. Data analysis
6. Quality assurance

Thank you! Any questions?

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