

Ethical Interviews in Software Engineering

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(Extended Presentation)



Outline

1. Introduction
2. Background
3. Interview Life Cycle
4. Discussion
5. Acknowledgments

(Paper and presentation available online [1](#) [2](#) [3](#))



1. Introduction



Per

- Work in “Industry” since 2006
- Software Testing since 2009
- Test Lead at Westermo
- Industrial PhD Student since 2017
 - [MDH, Västerås, Sweden](#)
 - [Software Testing Laboratory](#)

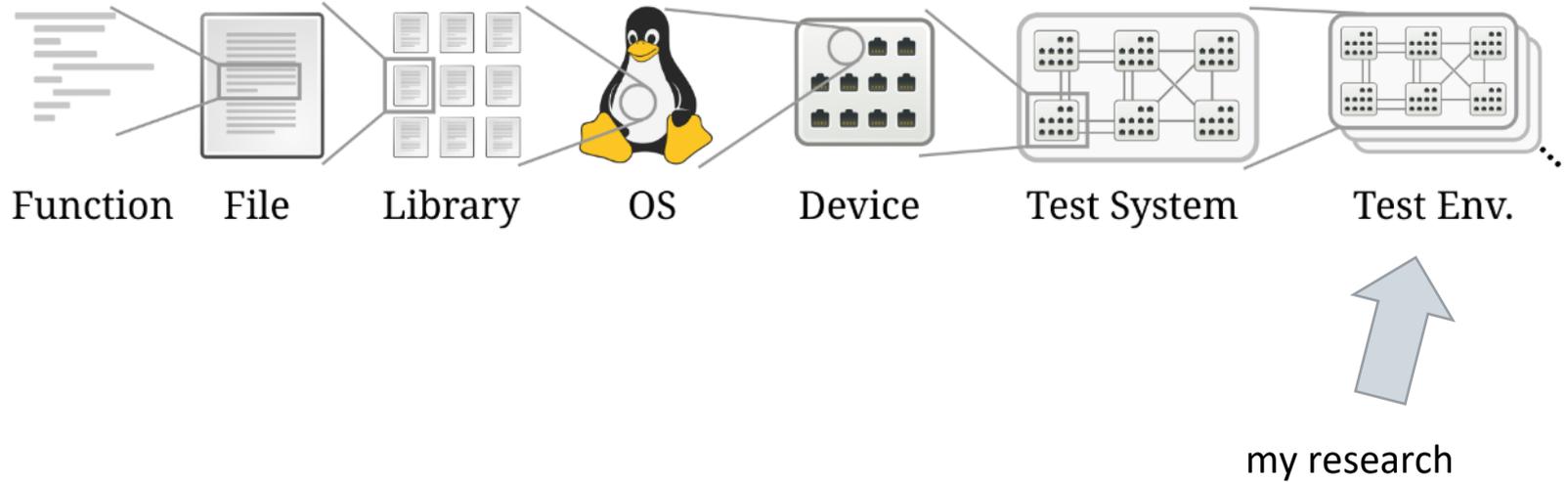


Westermo Network Technologies AB

Westermo designs and manufactures data communications products for mission-critical systems in physically demanding environments



Test Automation is not Ethics!?!



Concerned about Interview Data

- Interview Study
 - Protect interviewees (Industry Practitioners)
 - Anonymize data
 - Destroy data
- But: Was this good enough?
- Research Gap
 - Guidelines good, but not good enough (Kitchenham et al., Runeson et al., Shull et al.)
 - Gap: How handle interview artifacts

Contributions

1. Checklists for ethical interviews in software engineering
 - E.g. “Are stakeholders identified?”
2. How to anonymize interview data
3. Experiences from us and from others

2. Background



What is an Interview?

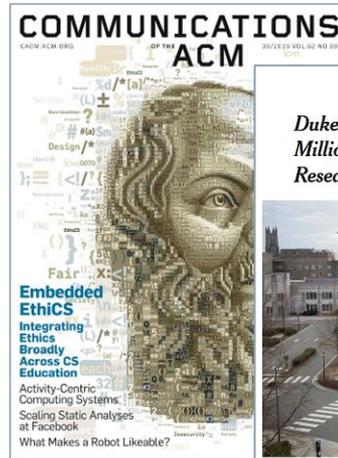
- At least one Interviewer
- At least one Interviewee
- Talk to each other

- Common Approaches
 - Structured
 - Semi-structured
 - “Instrument”

- In this paper: Record, Transcribe and Analyze the Audio

Relevance of Ethics

- Media
- Poor Ethics
 - Mistrust of results
 - Lost funding
 - Retract Papers
 - Harm
 - Physical
 - Risks to privacy, personal values, ...
- Industry practitioners
 - Harm to Companies



Cover of Communications of the ACM Aug 2019 ([link](#))
NY Times March 2019 ([link](#))
BMJ Open 2019 ([link](#))

Is Software Engineering Special?

- Well, No...
 - We need to care about ethics
 - We (often) do research on people
- ...but actually, Yes.
 - Not as mature as medicine.
 - Greater participant – researcher distance
 - Different scale, speed, distribution and opacity than medicine
Smart phone data: dating history, economic information, etc.

Ethical Principles in Research

- Consent
 - Voluntary participation, withdrawal. Informed consent.
- Beneficence
 - Welfare of participants, and the greater good for society, should be considered.
- Confidentiality
 - Privacy and confidentiality.
- Scientific Value
 - Avoid unnecessary research
- Researcher Skill
 - Researchers should have adequate skills.
- Justice
 - Experiment on group A, benefits for B.
- Respect Law
 - Relevant laws should be obeyed.
- Ethics Review
 - An independent ethics board should comment on, guide and approve studies involving humans.

Based on: "Menlo Report..." and the Menlo Companion [9, 10]. "Declaration of Helsinki " and "Declaration of Taipei " [16,17]. "ACM Code of Ethics...", 2018 [20]. Kitchenham et al., Runeson et al., Shull et al. [24, 34, 38]. [27] Belmont report..., 1978. [27]. "Nuremberg Code" 1949 [46]

More Background/Related Work in the Paper

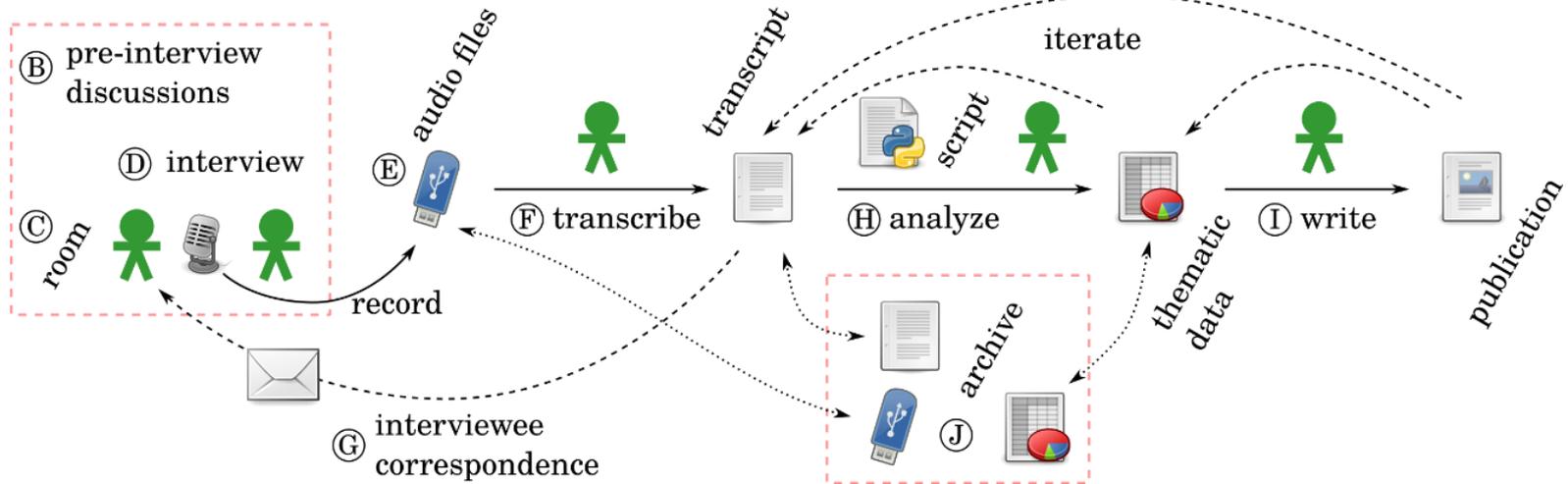
- Anonymization
- De-Anonymization
- Drawbacks of Anonymization
- Legislation and/or Ethics
- Institutional Review Board

3. Interview Life Cycle



Main Interview Elements

Ⓐ planning



Based on: Aldridge et al. [1], Becker-Kornstaedt [3], Carusi and Jirotko [7], and Strandberg et al. [43].

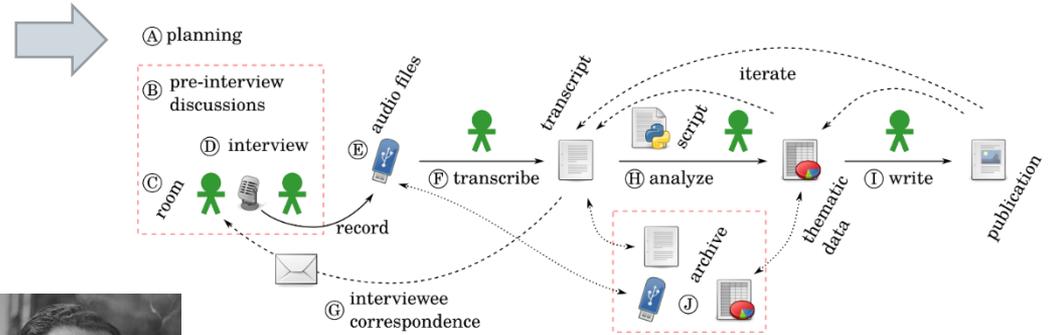
Interview Study by Alice, Bob, Carol and Dan



- Interviews at a Helicopter Company
- Topic: Embedded SW Quality
- Alice: doctoral student
- Bob: post-doc
- Carol: professor (part time at company)
- Dan: manager at company

Alice, Photo: FORTEPAN / Urbán Tamás ([link](#)) Creative Commons Attribution - Share Alike 3.0 Unported license.
Bob, Photo: charllegolonkiewicz ([link](#)) Creative Commons Attribution 2.0 Generic license.
Carol, Photo by U.S. federal government in Public Domain, ([link](#))
Dan, Photo by Ragge Strand, National Archives of Norway, ([link](#)) Creative Commons Attribution 4.0 International

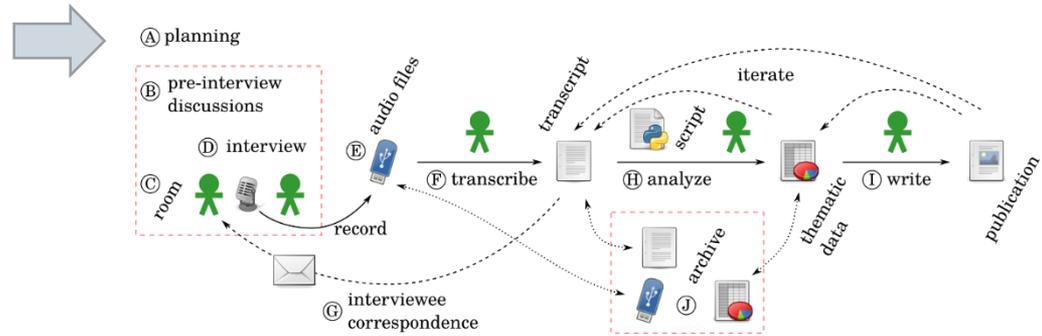
A: Planning



- Alice drafts instrument over lunch
- Bob and Carol adds three questions
- Dan recruits interviewees

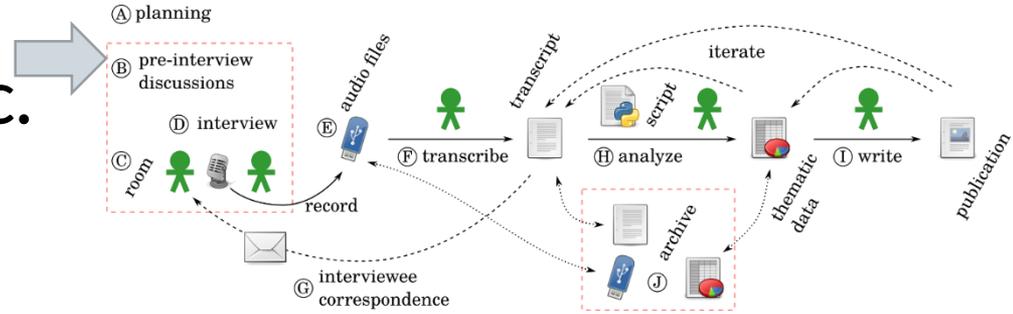
A: Planning

- Minimize Harm
 - Harm/Benefit Analysis
 - Identify Stakeholders
- Ethical challenges exist
- Decisions on Ethics
- Ethics Review
- Validate Instrument



- Check-list
 1. Are stakeholders identified?
 2. Are ethical challenges considered?
 3. How will the challenges be addressed?
Do sponsors and supervisors agree?
 4. How will the instrument be validated?
 5. Has an IRB been consulted?

B: Pre-Interview Disc.



- Alice and Bob informs interviewees
 - Purpose and Topic
- One Interviewee does not want to be part of the study
 - After pep talk he gives a good interview

B: Pre-Interview Disc.

- Informed Consent

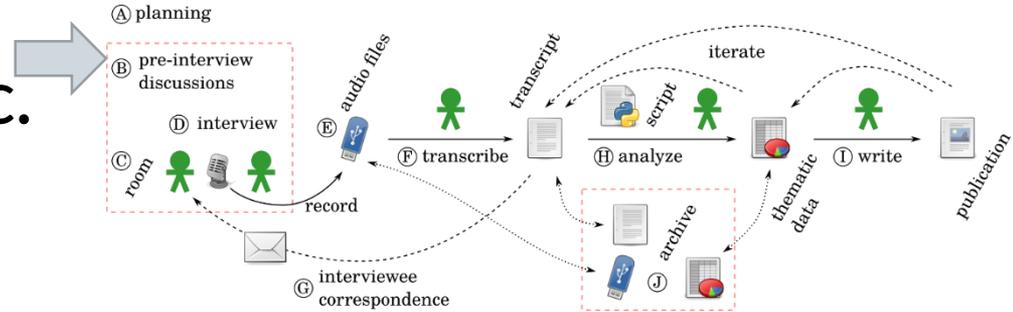
- Withdrawal
- Purpose
- Topic
- Coercion
- ...

- Risk of de-anonymization

- If topics are covered in blogs, forums, court cases

- Deception?

- Might be motivated sometimes.
- (Details in paper.)

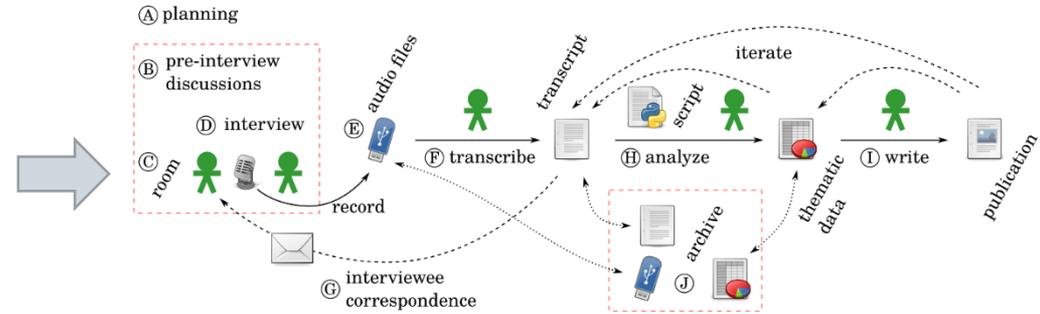


- Check-list

6. How will informed consent be obtained?
7. How will any participant withdrawals be handled?
8. Are the interviewees informed about purpose, possible positive outcomes, possible harm, ... etc.?
9. What promises, with respect to third party access to interview data, will be made? Is there a plan for a potential research quality audit?

C: Room

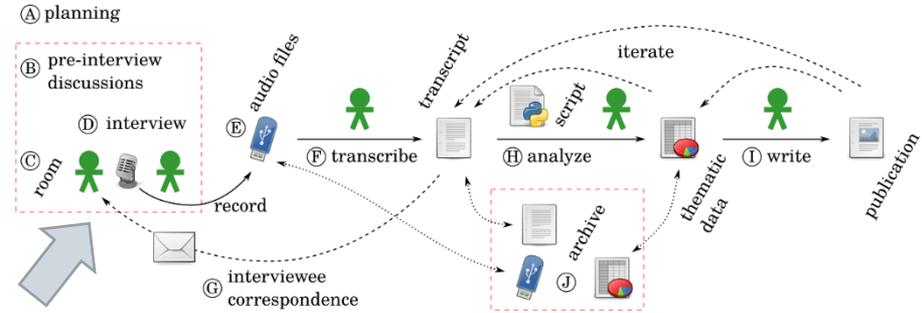
- Internal Anonymity
- Manager Dan comes in
- Book the room long enough



- Check-list
 - 10. How will internal anonymity be addressed?
 - 11. Are managers informed that their participation might have a negative impact on the research?
 - 12. Are interview artifacts removed after interviews?

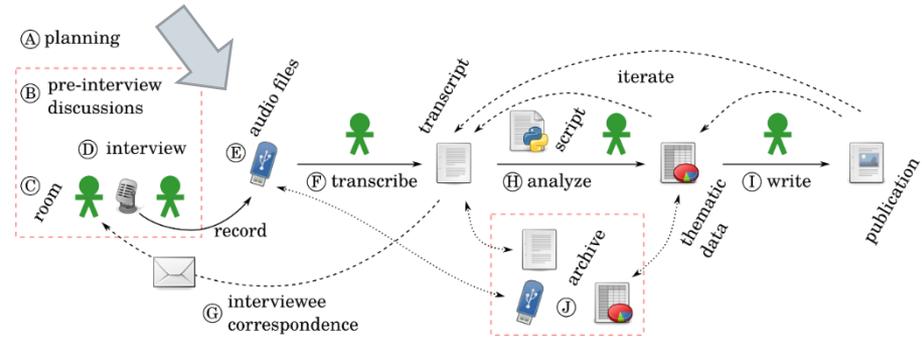
D: Interview

- Researcher Skill
- Data Minimization
- More than one researcher



- Check-list
 - 13. Do the researchers have adequate skills?
 - 14. How will data minimization be addressed?

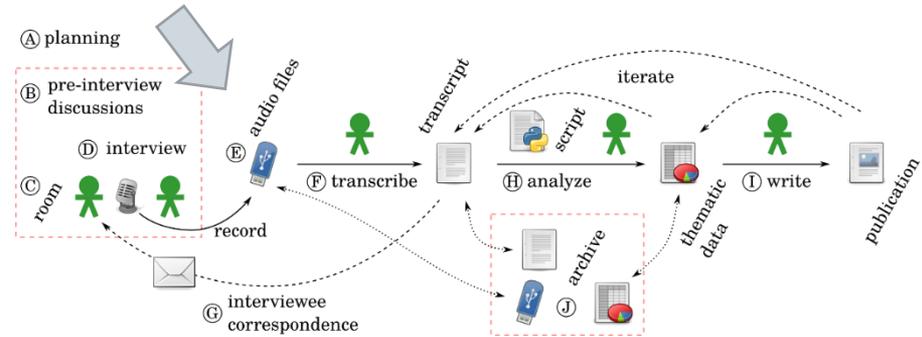
E: Audio Files



- Alice and Bob record audio with a smartphone
- An interviewee requested a copy
 - Alice sent it as an attachment from her personal email account (already configured in phone)

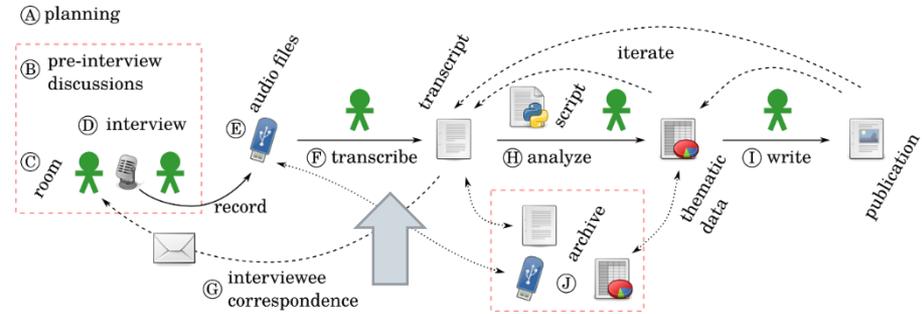
E: Audio Files

- Audio could be stolen
- Data storage plan
 - Encrypt audio?
 - Backups?
 - Delete?
- We used an off-line recorder
- Stored in laptops and locked areas
- Alternative: central storage with encrypted connection



- Check-list
 - 15. What is the data storage plan?
 - 16. Has the number of people with access to data been limited?

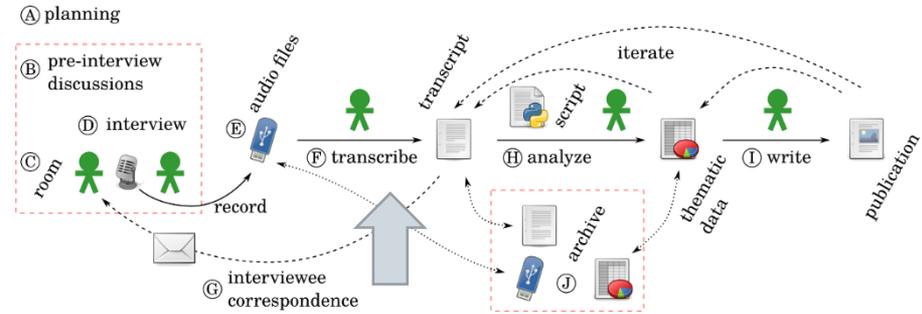
F: Transcribe



- Alice and Bob divide work
 - Transcribe some recordings
 - Quality check the other's transcript
- Bob recruited students for some of his part

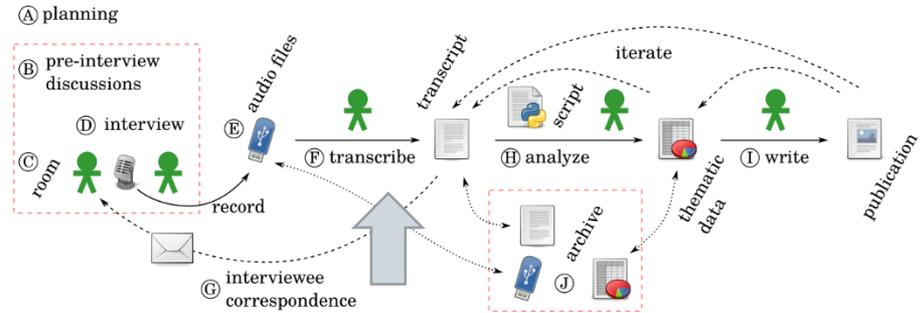
F: Who Transcribes?

- “Boring and takes time”
 - Well yes, but actually no.
 - 10-15 h of work per h of audio
 - Compare with 2 years
 - Grounded theory: “immersion in data”
- Why not students?
 - NDA
 - Quality control + Fill-in transcription (system under test → system A test)
- Do the transcription yourselves!
 - “Everyone” says so



F: What to Anonymize?

- Three data protection principles
 - Data privacy: Limit access to data
 - Data anonymity: Examination of data does not lead to de-anonymization
 - Anonymity of participation (internal anonymity)
- De-anonymization is easy if details are kept or with a small population
- Anonymize *while* transcribing
- Pseudonymize (sister → mother)



- Our top categories: Names or jargon of Tools, Products, Organizations, or Domains
- Also: technical details, names of places and people, numbers of points in time, and off-topic discussions.
- Surmiak: occupation, place of work, nationality, religion, hobbies, military rank, gender, zodiac sign, dietary restrictions, and periods of illness.

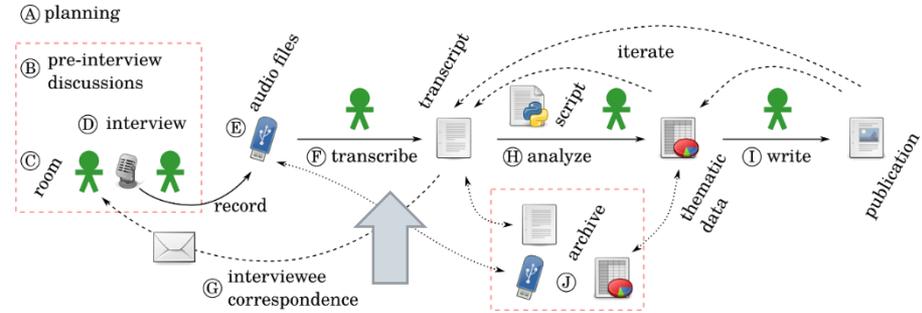
F: How to Anonymize?

Strandberg-style

[28:54]

Q: The next part is on testing and test results. We've covered some of this perhaps. Err... But could you give an example of a typical test case?

A: Actually, we should have a look into, into `<requirements management tool>` to see what it looks like. But I mean, for example a `<vehicular mechanism>` sequence.

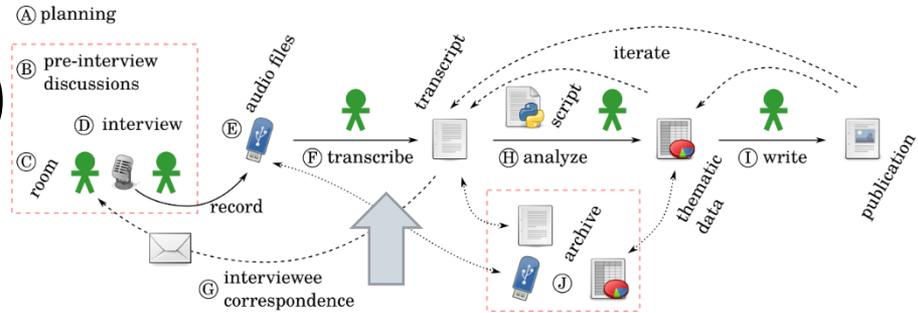


Saunders-style

[...]

Actually, we should have a look into **ReqTestTracker** to see what it looks like. But I mean, for example **the safe full stop for maintenance** sequence.

F: Transcribe (summary)



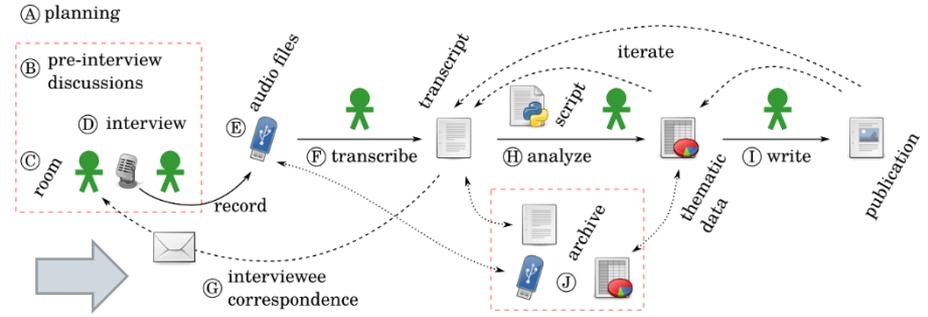
■ Check-list

17. Who will transcribe the audio?
18. How will meta information (such as separation of speakers, timestamps, etc.) be added to the transcripts?
19. How will consistent transcription over interviews, and over researchers, be achieved?
20. What will be anonymized?

■ Contributions

1. Checklists for ethical interviews in software engineering
2. How to anonymize interview data
3. Experiences from us and from others

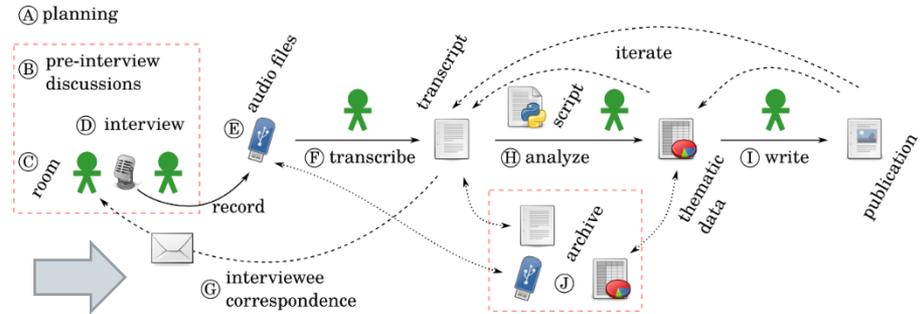
G: Interviewee Corr.



- Alice and Bob never contacted the interviewees again
 - (Except the audio file they sent to an interviewee)
- “They can read the paper once it’s out”

G: Interviewee Corr.

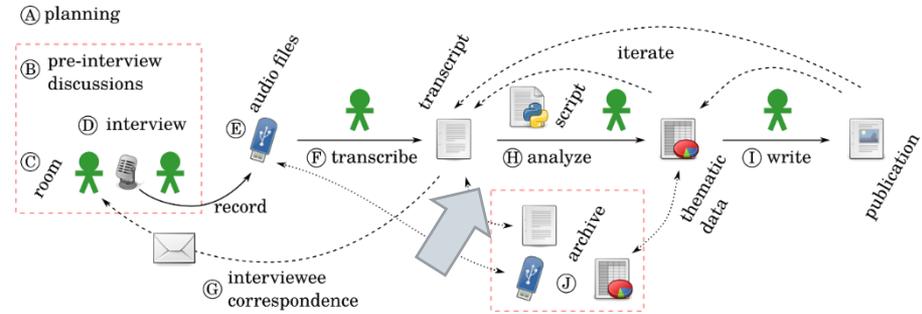
- Allow interviewees to review, correct, clarify or expand on interviews.
- Emails might
 - Break internal anonymity
 - Render transcripts undeletable
- Most of our interviewees wanted the possibility to review transcripts.
- No changes or comments were received.



▪ Check-list

21. Will interviewees review transcripts?
22. If yes to 21, how is correspondence to be conducted?
23. If yes to 21, will they be given the possibility to delete, correct, clarify and/or expand on the transcripts?

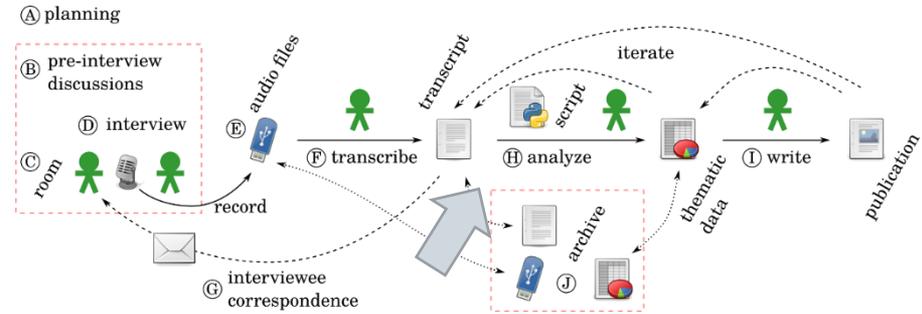
H: Analysis



- Alice and Bob got a request for withdrawal some months later
- They delete the audio files and transcripts
- They keep some hard-coded thematic data in scripts

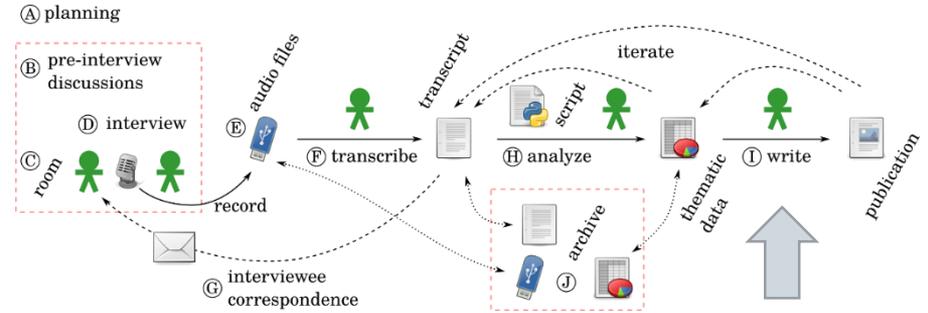
H: Analysis

- Thematic analysis, grounded theory, content analysis, qualitative coding, ... all involve “tagging” of text
- Separate data and scripts
- Analyze only anonymous data
 - Read end-user agreements
 - If you use google docs, then remember that google will “collect” your data in order “to make Google services more useful”



- Check-list
 24. Will data analysis (and the potential use of third party tools) be done on anonymized data only?
 25. Has the end user license agreements for tools been read?
 26. Is there an inventory of the data (with locations of audio files, transcripts, and processed data)?

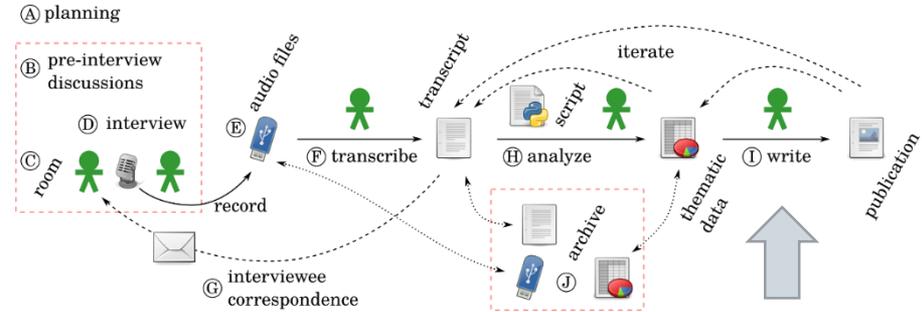
I: Write Paper/Report



- Alice and Bob anonymize the company as “a Nordic manufacturer of manned helicopters with about 1500 employees”

I: Write Paper/Report

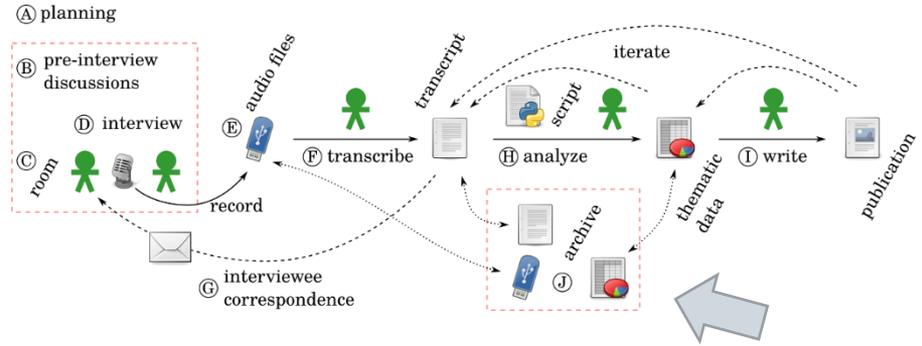
- Anonymization destroys context
 - Context is important
 - Anonymization is more important
 - Report context in aggregated format
- How do companies want feedback?
 - Academic papers?
 - Presentations?
 - Reports?
 - YouTube videos?
- (Read guidelines on how to write academic papers)



▪ Check-list

27. How will details on the organizations, and other context data, be reported?
28. Will reports in different forms, for different audiences, be prepared?
29. How will feedback for the participating interviewees and organizations be made?

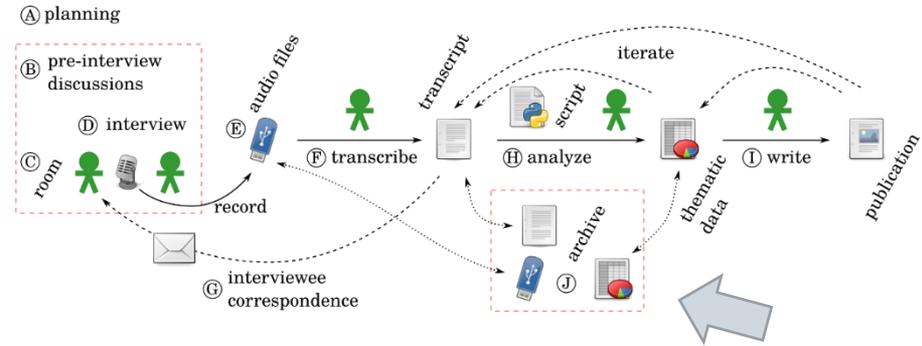
J: Archive



- Professor Carol
 - New position as “full professor” at another University
 - New research group on agile practices in embedded
- To kick-start the new group she brings the transcripts from the Helicopter-study to the new group

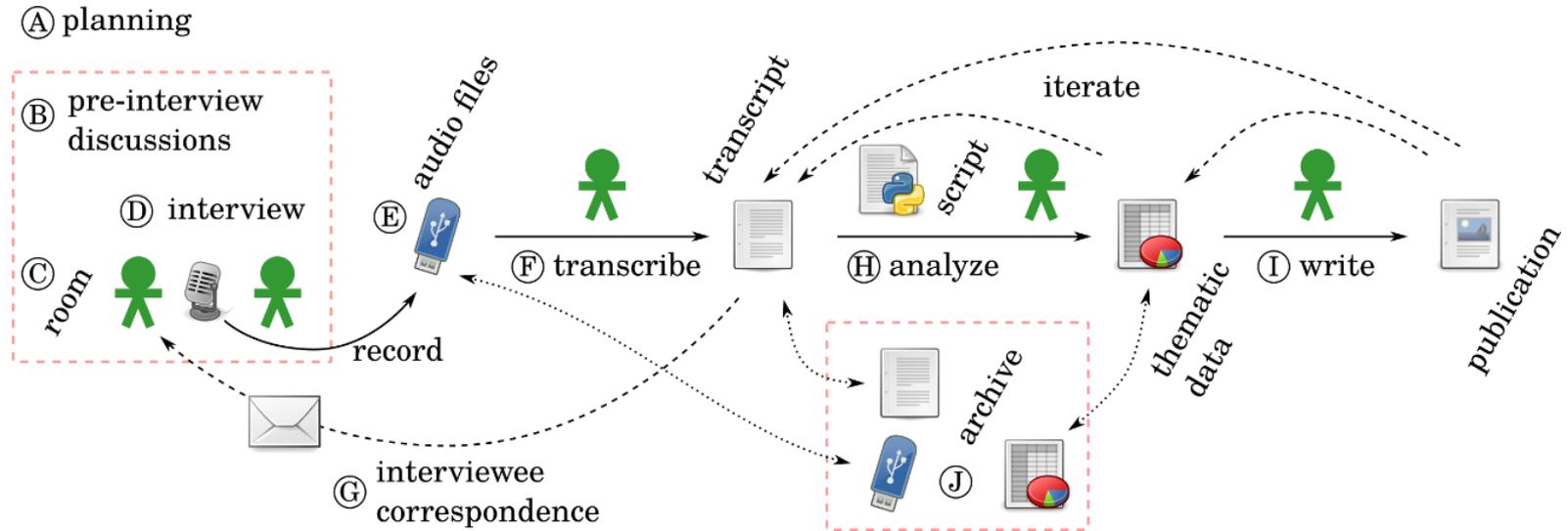
J: Archive

- Research data is not private property
 - Gillberg v. Sweden: Professor destroyed data and lost in the European Court on Human Rights
- There may be legal reasons to:
 - Make data available in archives
 - Delete data as soon as possible
- If data is in archives
 - De-anonymization might be trivial
 - “New” types of data might have no ethical guidelines



- Check-list
 - 30. If any data is to be publicly archived, how will the implications with respect to de-anonymization and withdrawal from the study be explained to the interviewees?
 - 31. What is the data deletion plan? When, how and by whom will the data be deleted? Is it coordinated with the data storage plan (item 15)?

A-J: Main Interview Elements



4. Discussion



Limitations and Future Work

- Guidelines from other fields? (Psychology, ...)
 - Checklists may be incomplete
- Combinations
 - GDPR + Helsinki declaration + National Laws + Wishes from sponsors
 - Impossible? Compare Gillberg v. Sweden
- Knowledge and competence of researchers?
- Institutional review board: How to get started?
- Balance: Ethics vs. Research Progress?

Summary

- Gap: handling interview artifacts in existing guidelines
- Contributions
 - Checklists for ethical interviews in software engineering
 - How to anonymize interview data
 - Experiences from us and from others

(Paper and presentation available online [1](#) [2](#) [3](#))

5. Acknowledgments



Acknowledgments

- Westermo Network Technologies AB
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 - Tom Ostrand
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