

Need-Finding Interview Protocol

Part 0 - Obtaining Consent

“Hi! Thank you for joining me today for this interview. Before we get started, did you have an opportunity to review the consent document? If you did not get a chance or would like to review it again I can read it to you now”

[If they did not review the consent document or would like a refresher read the consent document to the participant]

“Do you wish to participate?” “Are you ok if I record the audio of this interview?”

[If they say yes continue, else end the interview and thank them for their time]

“Thank you. Now I will begin the recording and continue with the consent process”

[Start the audio recording]

“Now for the sake of the recording I'll go over some key points...

- (1) We won't use your name or any identifiable information
- (2) you can choose to stop participating at any point or ask for things to be removed from the record
- (3) Please don't share any confidential information about
Reveal any private or personally-identifiable information about yourself or others in your answers to any of the open ended questions”

“Could you please confirm that the consent information was provided to you?”

[If they say yes continue, else restart protocol from beginning]

“Do you wish to participate?”

[If they say yes continue, else end the interview and thank them for their time]

“Do you agree to be audio recorded?”

[If they say yes continue, else turn off the audio recording]

Part 1 - Background information

- Could you tell me a little about [Project X] and your role on the project?

Part 2 - Identifying characteristics of critical dependencies

2.1 [Originally Identified] Concretely abandoned dependency

“We identified [Project X] because according to our analysis it appears to be depending on [Dependency Y] which was [abandoned by maintainers who posted a notice that it would no longer be maintained on DATE] OR [was last updated on GitHub TIME SINCE UPDATE]”

Understanding whether they care/and when:

- Were you previously aware that Dependency Y was abandoned?
- Would you want to be made aware of Dependency Y's abandonment? Why or why not?
 - Probing Qs:
 - If yes: After what period of inactivity would you have wanted to be made aware?
 - If yes: Why do you want to be made aware? Do you care about receiving updates or new features from Dependency Y in the future? Is it critical to have bug fixes? Are you concerned about the package not keeping up with future environment changes? Or something else?

Understanding why/impact:

- Does the abandonment of Dependency Y impact Project X?
 - What about Project X's use of Dependency Y makes its abandonment important? (or not important)
 - If Yes: Could you give concrete examples of how Project X is impacted?

2.2 Currently abandoned dependencies

“Now I'm going to share my screen to show you a prototype tool for supporting the automated identification of abandoned dependencies and ask you some questions about it”

[Show participant dashboard for Project X, listing all direct dependencies in ascending order of most recent update/commit]

“This is a dashboard showing all the current direct dependencies for Project X and the last time they were updated. I have given you remote control access of the page so you can click around and explore. To begin, please start by browsing through the dashboard, and as you do so, please share your thoughts aloud and point out any dependencies that you would consider currently abandoned or that you are concerned about in terms of their maintenance?”

[Give participant up to five minutes to explore the dashboard. Gently prompt “what are you thinking?” if they are quiet for more than 30 seconds.]

For each of Project X's dependencies that the participant identifies as currently abandoned or concerning, ask the following questions:

Understanding whether they care/when:

- Why do you think Dependency Y is abandoned? What threshold(s) did you consider when making that decision?
- Would you want to be made aware of Dependency Y's abandonment? Why or why not?
 - If yes: Why do you want to be made aware? Do you care about receiving updates or new features from Dependency Y in the future? Is it critical to have bug fixes? Are you concerned about the package not keeping up with future environment changes? Or something else?
 - If yes: After what period of inactivity would you have wanted to be informed of [Dependency Y]'s maintenance status?

Understanding why/impact:

- Does the abandonment of Dependency Y impact Project X?
 - What about Project X's use of Dependency Y makes its abandonment important? (or not important)
 - If Yes: Could you give concrete examples of how Project X is impacted?

2.3 Hypothetically problematic dependency abandonment

- Which of your dependencies do you most care about not becoming abandoned?
- Are there any dependencies whose [hypothetical] abandonment would be particularly noteworthy and impactful to [Project X]?

Note: If they list multiple dependencies, ask them to choose one to begin the discussion (have them choose the dependencies we discuss if possible).

For each dependency they care about, ask the following questions:

Understanding why/impact:

- How would the abandonment of Dependency Y impact Project X?
 - Could you give concrete examples of how Project X is impacted?
- Why would you want to be made aware of the abandonment of Dependency Y?
- Why is the abandonment of this dependency particularly concerning and important to the project? Why do you want to be made aware?
 - Do you care about receiving updates or new features from Dependency Y in the future? Is it critical to have bug fixes? Are you concerned about the package not keeping up with future environment changes? Or something else?

Understanding when:

- After what period of inactivity would you have wanted to be informed of Dependency Y's maintenance status?
- If the maintainers of Dependency Y posted a notice stating the project is no longer maintained, would you want to be informed immediately or after some period of inactivity?

Open-ended asking about ideas for heuristic:

- Can you imagine some sort of automated heuristic or pattern that could be used to identify the dependencies you care about becoming abandoned and would want to be made aware of?

Comparison to notification preferences for security vulnerabilities:

- Imagine you could also customize a dependency vulnerability notification tool so that it only informs you about vulnerabilities for dependencies you want to be notified about...
 - Would you want that?
 - Are the dependencies you would want to be notified about for vulnerabilities the same as those for abandonment or is there a difference?

Part 3 - Eliciting tool design requirements

3.1 Hypothetical Design and Information Presentation

“We will now ask you a series of design elicitation questions about how we might design a hypothetical tool for providing information about abandoned dependencies in a way that aligns with your existing workflow and meets your needs as a developer.”

Modality of Interaction and Notification:

- What modality should the tool be? (E.g., a bot on GitHub like Dependabot, a GitHub action, a VSCode plugin, a web dashboard, a browser extension,...)
- Is there a place in your current workflow where it would be helpful to incorporate information from this tool?
- For each dependency you care about being monitored, would you want to receive notifications outside of the tool itself about their abandonment when identified?
 - If yes:
 - Would you want the notifications to be pull or push?
 - When would you want to receive notifications? (E.g., during a continuous integration build vs in a report with some fixed cadence vs individual notifications as abandonment occurs)
 - How would you like to receive notifications? (E.g., in an email, a GitHub issue, ...)

Customizing the dependencies that are monitored for abandonment:

- Would you want the tool to monitor all your direct dependencies for abandonment (and make you aware of their abandonment somehow), or are there only certain dependencies you care about monitoring for abandonment?
 - Follow up: Lets say you only get *a small number* e.g., 5 notifications about abandoned packages a year, do you still care about only getting notifications about for important/impactful abandoned dependencies

- If they don't want to monitor all dependencies:
 - Would you be willing to configure which dependencies were monitored for abandonment? Or would you rather a tool automatically predict which dependencies should be monitored which you can modify?

Customizing definition of abandonment:

- For each dependency you care about being monitored, would you want to be able to customize the period of inactivity that qualifies as abandonment? (E.g., for package X notify me after 6 months, for dependency Y notify me if its inactive for 2 years)
- Have you configured a similar tool like Dependabot before?
 - - If yes:
 - What customizations did you make to the configuration?

Providing additional information/context:

- In a perfect world when a dependency is identified as abandoned, what information about the dependency would you want to review to help support you in dealing with the abandoned dependency?
- When a dependency is identified as abandoned, in addition to providing information about the dependency itself, what other information would be helpful when determining how to respond to the abandonment?

Part 4 - Debrief and Wrap Up

'We've reached the end of the interview. Before we wrap up, do you have any questions for me about this project or anything else?'

"As a token of appreciation and compensation for your time, we would like to offer you a \$20 Amazon gift card. If you'd like to accept please let me know what email you'd like it sent to"

- If yes: "Great! I will have the gift card sent to you shortly"

"Thank you again for your time and for sharing your perspective, it has been very helpful! I can also send you a copy of the preprint when its done in case you're interested in checking it out."