

GUIDE FOR SEMI-STRUCTURED INTERVIEWS ON THE USE OF USER FEEDBACK FROM A CROWD IN REQUIREMENTS MANAGEMENT IN SOFTWARE ECOSYSTEMS

This study investigates the use of user feedback from a crowd in requirements management in software ecosystems. The main research question in this field study is: **Is user feedback from a crowd considered in requirements management in software ecosystems?**

PROCEDURES FOR PREPARING INTERVIEWS

DEFINITION OF THE TARGET PUBLIC FOR THE INTERVIEWS:

- Professionals who carry out activities related to requirements management in software ecosystems (i.e., platform manager, product manager, product owner, project manager, developer, requirements manager, requirements engineer).

DEFINITION OF THE DURATION OF THE INTERVIEWS:

- 40 minutes.

DEFINITION OF INTERVIEW FORMAT:

- Online por meio da ferramenta Google Meet.

SENDING INVITATION AND INTERVIEW SCHEDULE:

- We will search for potential participants in our contact networks and academic networks on digital platforms. In addition, we will ask for nominations of new participants for the professionals interviewed.
- We will invite potential participants by email and inform them that, if they accept the invitation, they must inform us of the day and time availability. We will send a link with the days and times available for the interviews in the invitation email.

DEFINITION PROFILE OF PARTICIPANTS:

- After scheduling the interview, we will send you a new email with: (i) a link to the Google Meet room for the interview; (ii) a link with a consent term for the acceptance of the participant; and (iii) a link to a form with five questions for the characterization of participants. We will send the following characterization questions to participants:

1. Have you ever been (or are you) involved with a software platform/marketplace* in collaboration with other actors (companies, third-party developers, open source software communities, software vendors, etc.)?

- Closed question (Yes, No, or I don't know)

***NOTE:** *The software platform/marketplace and all the actors collaborating around it (your company and/or you) will be called the software ecosystem. A software ecosystem is “a set of actors functioning as a unit and interacting with a shared*

market of software and services, along with the relationships between them” (JANSEN et al., 2009).

2. Have you ever participated in any project that considered the user feedback from a crowd* in requirements management activities?

- Closed question (Yes, No, or I don't know)

***NOTE:** *User feedback from a crowd in requirements engineering is called crowd-based requirements engineering (CrowdRE). CrowdRE is a generic term for automated or semi-automated approaches to collecting and analyzing information from a crowd to derive validated user requirements (GROEN et al., 2015). A crowd is a large group of current or potential software product users who interact with each other or with software company representatives (GROEN et al., 2017). CrowdRE benefits users because user feedback from a crowd results in a more functional and reliable product (GROEN et al., 2017).*

3. What is your major educational background?

- Closed question (PhD, Master's degree, Specialization, Bachelor's degree, Technical course/High school degree)

4. What are the main activities related to requirements management* that you have already performed?

- Open question

***NOTE:** *Requirements management encompasses “the set of procedures that support requirements development, including planning, traceability, impact analysis, change management, and other related activities” (HOOD et al., 2007). For example, activities related to (i) requirements change identification; (ii) version control or requirements traceability; (iii) requirements prioritization, negotiation, or communication.*

5. How many years of experience do you have working with activities related to requirements management?

- Open question (in years)

PROCEDURES FOR CARRYING OUT INTERVIEWS

PART 1 – CHARACTERIZATION OF THE PARTICIPANTS

COMPLETION OF THE CONSENT FORM AND CHARACTERIZATION OF THE PARTICIPANTS VIA A FORM.

PART 2 – PRESENTATION OF THE CONCEPTS OF REQUIREMENT MANAGEMENT, SOFTWARE ECOSYSTEMS, AND CROWD FEEDBACK

DEFINITION OF REQUIREMENTS MANAGEMENT

- Requirements management encompasses procedures supporting requirements development, including planning, traceability, impact analysis, change management, and other related activities. In addition, it represents the integration between requirements development and all other systems engineering disciplines, such as configuration management and project management (HOOD et al., 2007). Requirements management is an organized process of identifying, documenting, maintaining, communicating, tracking, and tracing requirements throughout the life cycle of a system, product, or service. Requirements management evolves from elicitation to requirements change management (ISO-IEC-IEEE-29148/2018).

DEFINITION OF SOFTWARE ECOSYSTEM

- A software ecosystem is a set of actors functioning as a unit and interacting with a shared software and services marketplace and the relationships between them. (JANSEN et al., 2009). In addition, a software ecosystem can also be analyzed from the perspective of projects as groups of projects that are developed and co-evolved in the same environment (LUNGU et al. 2010).

DEFINITION OF USER FEEDBACK FROM A CROWD AND CROWD-BASED REQUIREMENTS ENGINEERING

- User feedback is an important means of validating and discovering new requirements in continuous software evolution \citep{Dzvonyar2016}. *The use of user feedback from a crowd in the context of requirements engineering is called crowd-based requirements engineering (CrowdRE). CrowdRE is a generic term for automated or semi-automated approaches to collecting and analyzing information from a crowd to derive validated user requirements (GROEN et al., 2015). A crowd is a large group of current or potential software product users who interact with each other or with software company representatives (GROEN et al., 2017).*

PART 3 – INVESTIGATING THE USE OF CROWD FEEDBACK TO SUPPORT REQUIREMENTS MANAGEMENT IN SOFTWARE ECOSYSTEMS

1. Have you considered user feedback from a crowd in requirements management activities (*requirements change identification, requirements prioritization, or requirements negotiation*) in software ecosystems?
2. What mechanisms (i.e., means to achieve their reach a crowd, including the media for communication or sources used to reach out to a crowd, the incentives to motivate a crowd to participate in RE activities) did you use to reach user feedback from a crowd in requirements management activities in software ecosystems?
3. What approaches (i.e., methods, techniques, tools, and web-based platforms) did you use to analyze user feedback from a crowd in requirements management activities in software ecosystems?
4. Do you consider that user feedback from a crowd benefits requirements management in software ecosystems? Why?

REFERENCES

- Groen, E. C., Doerr, J., & Adam, S. (2015). Towards crowd-based requirements engineering a research preview. In *Requirements Engineering: Foundation for Software Quality: 21st International Working Conference, REFSQ 2015, Essen, Germany, March 23-26, 2015. Proceedings 21* (pp. 247-253). Springer International Publishing.
- Groen, E. C., Seyff, N., Ali, R., Dalpiaz, F., Doerr, J., Guzman, E., ... & Stade, M. (2017). The crowd in requirements engineering: The landscape and challenges. *IEEE software*, 34(2), 44-52.
- Hood, C., Wiedemann, S., Fichtinger, S., & Pautz, U. (2007). *Requirements management: The interface between requirements development and all other systems engineering processes*. Springer Science & Business Media.
- ISO/IEC/IEEE29148: ISO/IEC/IEEE International Standard - Systems and Software Engineering – Life Cycle Processes – Requirements Engineering. ISO/IEC/IEEE 29148:2018(E) pp. 1–104 (2018). <https://doi.org/10.1109/IEEESTD.2018.8559686>
- Jansen, S., Finkelstein, A., & Brinkkemper, S. (2009). A sense of community: A research agenda for software ecosystems. In *2009 31st International Conference on Software Engineering-Companion Volume* pp. 187-190.
- Lungu, M., Lanza, M., Gîrba, T., & Robbes, R. (2010). The small project observatory: Visualizing software ecosystems. *Science of Computer Programming*, 75(4), 264-275.
- Pagano, D. & Maalej, W. (2013). User feedback in the appstore: An empirical study. In *Requirements Engineering Conference*, pages 125–134, 2013.