Self-Admitted Technical Debt in the Embedded Systems Industry: An Exploratory Case Study

Case study instrument

This section contains the interview instrument.

Phase 1 – Introduction			
Duration:	3 min.	**Goal:**	Introduce the interviewee to the study, and inform them about confidentiality
RQ Link:	None		
Step:	**Description:**		**Note for the interviewer**
1.1	The interviewer introduces himself and informs the interviewee about confidentiality. Then asks their permission to record the interview. **Questions:** None		The first minutes of the interview is very important to determine the type of environment; try to be friendly to make the interviewee feel at ease.
Step:	**Description:**		**Note for the interviewer**
1.2	The interviewer briefly introduces the goal of the study and explains what is going to happen. He reminds the interviewee about the confidentiality agreement. **Questions:** None		It is important to disclose as little information as possible but is also important to be clear and concise. We are bound by a confidentiality agreement between [interviewed company] and RUG, and thus nothing discussed during the interview can be revealed without the explicit consent of [interviewed company].

Phase 2 – Collect interviewee general data			
Duration:	3 min.	**Goal:**	Gather demographic characteristics of the interviewee
RQ Link:	None		
Step:	**Description:**		**Timer check:**
2.1	Discuss the interviewee's work situation.		3 min.

	Questions:	Notes for the interviewer
	Q1: Tell us about your work ● Role in your current project ● Years of experience	

Step:	Description:	
2.2	Assessing the interviewees' technical background	
	Questions:	**Notes for the interviewer**
	Q2: What is your understanding of TD and SATD? **Q3:** Can you give us some examples?	

Phase 3 – Main interview			
Duration:	22 min.	**Goal:**	Ask the interviewee to answer questions related to RQs.

Step:	Description:	Timer check:
3.1	Assessing the practitioners' attitude towards identified SATD and statistics	5 min.
	Questions:	**Notes for the interviewer**
	Show the identified SATD items: **Q4:** Do you acknowledge identified SATD items from different sources? **Q5:** Do you consider identified SATD items to be important? **Q6:** What do you think of different types of SATD? Show the two bar charts for the average time of closing and number of open issues: **Q7:** What do you think about the average time to close different types of SATD issues and non-SATD issues? **Q8:** Do these SATD items and statistics give you new information or insights about this project? ● Know the amount of SATD? ● Know the proportion of different types of SATD?	If practitioners do not agree with the identified SATD, ask them the reasons and what needs to be improved.

	● Know the proportion of SATD in different sources? ● Know the trend of SATD? ● Know the distribution of SATD in the project?	
Step:	**Description:**	**Timer check:**
3.2	Investigating the when and how is SATD documented in different sources	8 - 10 min.
	Questions:	**Notes for the interviewer**
	Q9: Do you record TD in your project? **Q10:** Which TD items do you usually record and which not? **Q11:** Where do you typically record TD? **Q12:** Do you have any constraints on recording TD? **Q13:** Which types of TD do you usually record?	
Step:	**Description:**	**Timer check:**
3.3	Investigating the differences and relations between SATD in different sources	12 - 14 min.
	Questions:	**Notes for the interviewer**
	Q14: What do you think are the differences between TD documented in different sources? **Q15:** What do you think are the relations between TD documented in different sources?	
Step:	**Description:**	**Timer check:**
3.4	Investigating when and how is documented SATD resolved	16 - 18 min.
	Questions:	**Notes for the interviewer**
	Q16: How do you decide on resolving one of the recorded TD items?	
Step:	**Description:**	**Timer check:**
3.5	Investigating the practices to support SATD management	20 - 22 min.

RQ Link:	Questions:	Notes for the interviewer
RQ7	**Q17:** How do you manage the recorded TD items in practice? **Q18:** How do you prioritize documented TD items in practice? • Put some words, such as 'urgent', and 'important', before SATD comments to show the importance? **Q19:** What strategies do you follow to pay back documented TD?	

Step:	Description:	Timer check:
3.6	Explore how to build a tool to help software engineers to manage SATD	22 - 24 min.
	Questions:	**Notes for the interviewer**
	Q20: What features would you like to have from an ideal tool to manage SATD? (Follow-up) What information would be useful to you for managing SATD? • SATD indexes? • Number of SATD? • Percentage of SATD? • Types of SATD? • SATD heatmap? • List of unpaid SATD items? (Follow-up) Which artifacts can be analyzed in order to derive this information? • Source code comments? • Commit messages? • Issue tracking systems? (Follow-up) How should tools present and visualize the aforementioned information? • Dashboard? • IDE integration? • Email? • SMS alert? •	
Step:	**Description:**	**Timer check:**

3.7	Studying the SATD management challenges	24 - 26 min
	Questions:	**Notes for the interviewer**
	Q21: What challenges do you encounter when you manage recorded TD? ● Lack of SATD automatic identification tool? ● Lack of SATD automatic prioritization tool? ● Do not know when to pay back SATD? ● Hard to monitor SATD? ● Hard to know the effort to repay SATD? (Follow-up) How do these challenges influence your work? ● Forget to repay SATD? ● Accumulate too much SATD?	Ask interviewees to give some examples of challenges.

Phase 4 – End of the interview			
Duration:	2 min.	**Goal:**	Inform the interviewee of the next steps
Step:	**Description:**		**Timer:**
4.1	Informs the interviewee of the next steps and gives them an idea of what to expect.		28 min.
	Information:		**Notes for the interviewer**
	The next steps are: ● We will analyze the results and publish a paper based on them. We will send it to the interviewees as a means of feedback. ● Ask if he has any questions or comments. ● Thank the interviewees for participating in the interview.		
TOTAL DURATION	30 min.		