

Research Question:	RQ3.2 Can TD effects be organized to broadly represent the main points of pain caused by the presence of debt?
Goal:	Organize the identified effects into categories of effects.
Expected Result:	<ul style="list-style-type: none"> - List of categories of effects; - Mind map representing the effects of TD and their respective categories.
Necessary Files:	<ul style="list-style-type: none"> - RQ3.2_Analysis_COUNTRY-NAME_Execution_Categories of Effects.xlsx - List of effects and their categories identified in InsighTD BR.docx

Analysis Procedure

This analysis considers the answers for the questions Q20 and Q21 of the questionnaire.

When we are analyzing the identified set of effects, we need to observe that many of them are related to each other and can be organized into more generic categories. For example, effects such as “low quality”, “low performance”, “bad code”, and “design problems” could be grouped into a category like “Quality Issues”. In the first execution of InsighTD in Brazil, we have identified 66 effects, what configures a broad space of possible effects that the presence of TD brings to the software project. We think that this type of grouping would allow a more comprehensive view about the main sources of pain of TD for development teams. To identify the categories of effects:

1. One researcher needs to analyze each effect comparing it with the others, considering as criterion of comparison the meaning of each effect. When the researcher identify a relation between the compared effects, he/she groups both effects in a category;
2. Then the researcher needs to define a name for each category that best encompasses the grouped effects;
 - a. At the end of this process, it is necessary to compare the list of the identified categories with the categories identified in the **InsighTD BR**. The names of the final list of categories should be based on the names of the InsighTD BR list of categories. If there is a new category, this should be added to the end of the BR list.
3. This process needs to be reviewed by a second researcher;
4. Finally, we can build the mind map to represent the categories and their related effects (see Figure 1);
 - a. We suggest the use of the tool MindMaster (<https://www.edrawsoft.com/mindmaster/>).

Figure 1 exemplifies the mind map that we elaborated to represent the categories and their related effects based on InsighTD BR results. We put “Effects of Technical Debt” as the central topic. Then, we have the categories of effects associated with their respective effects.



Figure 1. Mind map representing the effects of TD and their respective categories.