

Research Question:	RQ2.2 Can TD causes be organized to broadly represent the main sources of factors that lead to the occurrence of TD?
Goal:	Organize the identified causes into categories of causes.
Expected Result:	<ul style="list-style-type: none"> - List of categories of causes; - Mind map representing the causes of TD and their respective categories.
Necessary Files:	<ul style="list-style-type: none"> - RQ2.2_Analysis_COUNTRY-NAME_Execution_Categories of Causes.xlsx - List of causes identified by InsighTD BR.docx

Analysis Procedure

This analysis considers the answers for the questions Q16 to Q19 of the questionnaire.

When we are analyzing the identified set of causes, we need to observe that many of them are related to each other and can be organized into more generic categories. For example, causes such as "effort," "deadline," and "project manager pressure" can be grouped into a category like "Planning and management", because they are related to project management issues. In the first execution of InsighTD in Brazil, we have identified 76 causes, what configures a broad space of possible reasons that could lead development teams to incur in debt. We think that this type of grouping is useful to allow a more comprehensive view about the main clusters of issues that contribute to the occurrence of debt. To identify the categories of causes:

1. One researcher needs to analyze each cause comparing it with the others, considering as criterion of comparison the meaning of each cause. When the researcher identify a relation between the compared causes, he/she groups both causes in a category;
2. Then the researcher needs to define a name for each category that best encompasses the grouped causes;
 - 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 causes (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 causes based on InsighTD BR results. We put "Causes of Technical Debt" as the central topic. Then, we have the categories of causes associated with their respective causes.



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