

Appendix B. First iteration: Feature concept definition

The CDR method presented in the paper is the result of a second design cycle that we applied after a first iteration where we applied a preliminary version of the method to the notion of *feature*. Here, we report on the lessons learned; a full description of the case can be found in previous work (the RCIS 2022 paper “Defining Key Concepts in Information Science Research: The Adoption of the Definition of Feature”). Note that the first iteration of the CDR method consisted of six steps.

1. *Purpose of the concept definition review.* The case that was used to develop the method addressed the definitions of the term *feature* in SE. We chose this term because many definitions have been formulated over the last thirty years. Instead of listing them all, our aim was to establish which definitions are best suited for specific contexts and perspectives. Specifically, we studied definitions in the scope of requirements engineering software architecture.

2. *Searching for papers containing definitions.* During the first iteration, defining and executing the search were combined into one step. The search results were matched to their query and method of origin, although this was not required according to the first version of the method. To improve replicability and to allow for preliminary feedback, separating the two activities is desirable (L2.1). Furthermore, selection criteria were only included later in the process, while they can be of use during the search, for instance, to exclude old works or publications that are not in English (L2.2). Finally, while conducting the search, the saturation point was unclear, which might make it more difficult to replicate the study (L2.3). Searching for definitions of the concept *feature* was more a journey of discovery than following a strict protocol, as the latter was iteratively defined while being executed (L2.4). The origins of the results were clearly documented (L2.6), such as the method used to find it, but may be more difficult to replicate, since no record of excluded results was kept (L2.5). The purpose of the review ensured for selections to not deviate too much from the original plan, but could have been made clear beforehand.

3. *Relevancy screen and quality appraisal.* As stated before, no records of when or how results were excluded were kept (L3.1). Candidate definitions were only screened for one criterion: “*must present a unique definition of the concept of ‘feature’*”, since the other criteria were used as restrictions during the search (“*must be written in English*” and “*must be scientific literature*”). We did find that, since some criteria could be assessed during the search, splitting search selection criteria and screening selection criteria would make the structure of the method less confusing and improve replicability (L3.3).

4. *Data extraction.* Based on the objective and the research question, some characteristics were determined beforehand. However, during analyses, a need for additional or different data may arise. In this study, the research questions asked how features were defined, so there was a need to analyze the different types of definitions in the context of the research domains. More specifically, the analysis asked for categorization of the definitions based on the level of abstraction and viewpoint (L4.3). Since these characteristics were not explicitly mentioned in the definitions or their sources, these were determined by multiple actors to ensure objectivity (L4.1).

5. *Synthesis of studies.* The analyses were determined prior to data extraction; however, multiple iterations of data extraction and analysis were required to answer the research question. To save time and avoid rework, the research questions should preferably be formulated such that one analysis addresses (at least) one question (L5.1).

Table B.16: Lessons learned from the first method iteration for the term 'feature'.

1. Purpose of the concept definition review	
<i>L1.1</i>	Research questions should be explicitly included in the purpose.
<i>L1.2</i>	A visualization helps to relate research questions to objectives.
<i>L1.3</i>	Research questions should guide the data analysis.
2. Searching for papers containing definitions	
<i>L2.1</i>	The definition of the search protocol should be a separate activity from executing it.
<i>L2.2</i>	Selection criteria should be defined in the search protocol.
<i>L2.3</i>	The saturation point should be determined beforehand.
<i>L2.4</i>	The search protocol should be tested prior to fully committing to it.
<i>L2.5</i>	Included and excluded results should be recorded (along with motivation).
<i>L2.6</i>	The origin of search results should be documented, especially when combining search methods and/or queries.
3. Relevancy screen and quality appraisal	
<i>L3.1</i>	Records should be kept of why and when preliminary results were excluded.
<i>L3.2</i>	A PRISMA flow diagram would be a beneficial visualization of the screening activity.
<i>L3.3</i>	Search selection criteria and screening selection criteria should be separated.
4. Data extraction	
<i>L4.1</i>	Subjective or implicit definition characteristics should be extracted by multiple, independent analysts.
<i>L4.2</i>	Conflicts between analysts should be reported and resolved.
<i>L4.3</i>	It may be necessary to gather additional characteristics during analysis.
5. Synthesis of studies	
<i>L5.1</i>	All analyses should address at least one research question.
<i>L5.2</i>	Analysis strategy should be determined beforehand, to check whether it properly addresses the research questions.
<i>L5.3</i>	Research findings should be presented figures or tables whenever possible.
6. Documenting the concept guidelines	
<i>L6.1</i>	The conclusion of the study should answer the research question(s).
<i>L6.2</i>	The conclusion of the study should address the objective(s).
<i>L6.3</i>	If no definitive answer is available, recommendations should be provided.

6. Documenting the concept guidelines. The conclusion of this study implicitly followed the purpose and context template that was made explicit in the paper, by answering the research question and addressing the objective. In accordance with the objective, multiple recommendations for various purposes were provided as well as some guidelines for selecting definitions.