

RExplorer : a tool for requirement analysis in software domainsD A I P Fernando^{1*} and A S Karunananda²^{1,2}Department of Mathematics and Computer Science, Open university, Nawala

Domain modeling explores the possibility of generating a target system, given the user requirements, by tailoring a domain, which has been analyzed with regard to the similarities and differences of various systems (software product lines). While fully endorsing this concept, we have proposed an approach based on theories derived from biological systems, where functional requirements can be organized as a hierarchy. However, preparation of user requirements according to the proposed approach is cumbersome without tool support.

Biological systems implicate a hierarchy of functional requirements corresponding to its hierarchical structure of components. Also, in their realm, biological systems of same families (as software system domains) their requirements are *generic*, but become more specific towards each species, and each living being (as in a target system). Accordingly, in order to design RExplorer, we exploited two concepts. Firstly, within a domain of software systems, there exist generic functional user requirements. Secondly, such specific functional user requirements can be organized as a hierarchy, where combinations of its child requirements form parent requirements. A generic functional requirement is formulated as a template by generalizing a set of specific functional requirements, which share some commonalities. Such templates need to be developed for various software system domains and requirement analysis should be based on such templates.

RExplorer assists in developing repositories of these templates, deriving functional requirements using these templates and preparing requirements as a hierarchy. Further, it generates a coded specification of user requirements, which can be parsed by an application generator CASE tool such as *SoftGene*.

Since the knowledge of functional requirements in software system domains is embodied in templates, it will ease the process of requirement analysis. Also, the approach of organizing requirements as a hierarchy, it is more methodical and gives insight of possible hierarchical system architecture. Paving the way to code generation through a method of customization of program codes according to the specific nature of each requirement is the main advantage of this approach.

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