SELECTION OF INSTANTIATIONS THROUGH RISK ANALYSIS IN FRAM MODELS: A METHOD PROPOSAL

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Abstract

Complex Sociotechnical systems are characterized by a large number of interactions between functions, making it difficult to be modeled. However, tools such as the Functional Resonance Analysis Method (FRAM) have been developed for the purpose of analyzing such systems and its complexity. FRAM models allow variability analysis of the systems functions, as well as its influences in other functions (resonance) by means of daily critical activity modeling (work-as-Done). However, such analyzes depend on the elaboration of instantiations of the analyzed activity and literature does not yet present a consensus regarding identification of critical functions for analyzing variability. Thus, this article proposes a structured method to analyze the criticality of a model by means of risk analysis of functions, allowing the identification of instantiations. Four models of critical multidisciplinary operations were developed related to the drilling of oil wells and the production of oil and gas. During the validation phase of the models, interviewees were asked about probability and severity of occurrences related to each function, as well as history of adverse situations. Data was tabulated allowing the identification of most critical functions (greater risk) and the histories related to these functions were instantiated. For each operation, three instantiations were elaborated, representing a situation of disarm, of recovery and of adaptation. The main contribution of this paper is a structured method for risk analysis in FRAM models as a way of selecting critical events for the development of instantiations.

Keywords: FRAM models, risk matrix analysis