

Enhancing risk analysis using a conjoint method: FRAM - interpretive structural method - MICMAC

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The Functional Resonance Analysis Method - FRAM is a method that helps understanding complex sociotechnical systems, and is used both for prospective and retrospective analysis (Risk analysis or Accident investigation). The FRAM method is a bridge to enhance the system's resilience.

Interpretative Structural Method - ISM was developed by Warfield in 1974, and is a method that seeks the interrelationships among the various elements (or functions in FRAM's context) considered and endows with a hierarchical and multilevel structure. The method helps managers, researchers, and safety specialists by converting the intricate web of factors (or functions) into an understandable, readable and well-defined model (structure). The implementation of ISM consist of nine steps: 1) Define Objective; 2) Explore attributes that may be useful, 3) Determine relationship among attributes, 4) Develop structural self-interaction matrix (SSIM), 5) Convert SSIM into initial reachability matrix (IRM), 6) Obtain final reachability matrix (FRM) and partition reachability matrix (RM), 7) Develop canonical matrix (CM), 8) Develop pictorial representation and 9) Analyse ISM obtained searching for sensemaking. *Matrice d'Impacts Croises-multiplication Appliqué à un Classement* - MICMAC is a method that analyzes the driving power (influential) of factors (functions) and dependence power (influenced), and is a step further from the ISM method. The result is a classification of functions in four segments: autonomous, linkage, dependent and independent. This paper looks to enhance FRAM's analysis by incorporating MICMAC classification of functions that will enable better sensemaking of the complex system, and enable analysts to select instantiations of FRAM's model which represents the most influential power and the hierarchical structure of influences of those functions. The results showed that FRAM's analysis is enhanced by ISM/MICMAC conjoint analysis, and it represents a step further into sensemaking and understandability of complex socio-technical systems in order to better resilience.

KEY-WORDS: FRAM, INTERPRETATIVE STRUCTURAL METHOD - ISM, MICMAC.