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# Envisioning a Future Decision Support System for Requirements Engineering: A Holistic and Human-centred Perspective

by

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Complex decision-making is a prominent aspect of requirements engineering (RE) and the need for improved decision support for RE decision-makers has been identified by a number of authors in the research literature. The fundamental viewpoint that permeates this thesis is that RE decision-making can be substantially improved by RE decision support systems (REDSS) based on the actual needs of RE decision-makers as well as the actual generic human decision-making activities that take place in the RE decision processes. Thus, a first step toward better decision support in requirements engineering is to understand complex decision situations of decision-makers. In order to gain a holistic view of the decision situation from a decision-maker's perspective, a decision situation framework has been created. The framework evolved through an analysis of decision support systems literature and decision-making theories. The decision situation of RE decision-makers has been studied at a systems engineering company and is depicted in this thesis. These situations are described in terms of, for example, RE decision matters, RE decision-making activities, and RE decision processes. Factors that affect RE decision-makers are also identified. Each factor consists of problems and difficulties. Based on the empirical findings, a number of desirable characteristics of a visionary REDSS are suggested. Examples of characteristics are to reduce the cognitive load, to support creativity and idea generation, and to support decision communication. One or more guiding principles are proposed for each characteristic and available techniques are described. The purpose of the principles and techniques is to direct further efforts concerning how to find a solution that can fulfil the characteristic. Our contributions are intended to serve as a road map that can direct the efforts of researchers addressing RE decision-making and RE decision support problems. Our intention is to widen the scope and provide new lines of thought about how decision-making in RE can be supported and improved.



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