

# Probabilistic Thinking to Support Early Evaluation of System Quality Through Requirement Analysis

Mohammad Rajabalinejad <sup>1</sup> and Maarten G. Bonnema

**Abstract.** This paper focuses on coping with system quality in the early phases of design where there is lack of knowledge about a system, its functions or its architect. The paper encourages knowledge based evaluation of system quality and promotes probabilistic thinking. It states that probabilistic thinking facilitates communication between a system designer and other design stakeholders or specialists. It accommodates tolerance and flexibility in sharing opinions and embraces uncertain information. This uncertain information, however, is to be processed and combined. This study offers a basic framework to collect, process and combine uncertain information based on the probability theory. Our purpose is to offer a graphical tool used by a system designer, systems engineer or system architect for collecting information under uncertainty. An example shows the application of this method through a case study.

**Keywords:** system; quality; uncertainty; design; evaluation

---

<sup>1</sup> Corresponding author: Mohammad Rajabalinejad Faculty of Engineering Technology, University of Twente 2522 LW Enschede, Netherlands - M.Rajabalinejad@utwente.nl