Application of Fuzzy Inference Rules to Early Semi-automatic Estimation of Activity Duration in Software Project Management

Expert judgment is widely used for activity duration estimation in software project management. While there are both advantages and disadvantages of expert judgment-based estimation, we propose the use of fuzzy inference rules for semi-automatic estimation to reduce the potential negative aspects of the expert judgment-based estimation. Fourteen fuzzy inference rules are introduced to elicit and adjust expert tacit knowledge, and expert judgment-based estimation results are complemented by fuzzy inference rules. The results from expert judgment and fuzzy inference rules are compared with the expert judgment-based approach using surveys and one-on-one interviews with project managers from different disciplines through analyses with data from past software projects. The use of fuzzy inference rules improves the estimation accuracy of the expert judgment-based approach by 39.35%. The proposed approach facilitates the experts to derive a more realistic and reliable activity duration estimation in software project management.