Effect of Domain Knowledge on Elicitation Effectiveness: An Internally Replicated Controlled Experiment

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Context: Requirements elicitation is a highly communicative activity in which human interactions play a critical role. A number of analyst characteristics or skills may influence elicitation process effectiveness, e.g., experience, academic education, cognitive capabilities, etc. One of the aspects that has been proposed to most influence an individual’s effectiveness in requirements engineering activities is the knowledge of the problem domain.

Aim: Experimentally analyse the influence of a requirements analyst’s knowledge of the problem domain on the effectiveness of the interview-mediated requirements elicitation activity.

Method: We executed a controlled experiment with post-graduate students. The experimental task was to elicit requirements using open interview and consolidate the elicited information immediately afterwards. We used four different problem domains about which students had different levels of knowledge. Two tasks were used in the experiment, whereas the other two were used in an internal replication of the experiment; that is, we repeated the experiment with the same subjects but with different domains.

Results: Effectiveness was measured as the percentage of correct domain information acquired by analysts. A joint analysis showed that problem domain knowledge has a small but statistically significant effect (7.3% improvement) on the effectiveness of the requirements elicitation activity. The interviewee has a big positive (26.7%) and significant influence, as does general training in requirements activities (20.9%) and interview experience (1.21% improvement per year).

Conclusion: During early contacts with the customer, a key factor is the interviewee; however, training in tasks related to requirements elicitation and knowledge of the problem domain helps requirements analysts to be more effective.