Master's Thesis Proposal
in the Requirements Engineering Research Group

Topic
Evaluation of pragmatic mechanisms to improve value and acceptance of software procured in public tenders.

Content
Government procurement is an important economic factor. The countries that signed the agreement on Government Procurement (GPA) from 1994 have agreed to apply principles of transparency and non-discrimination for the procurement of goods such as software and services such as software development of a given minimal size by government entities and utilities [World Trade Organization 2009]. Switzerland is one of these countries.

The procurement of software is not only challenging from fairness and transparency perspectives, but also from the perspectives of system value and acceptance. System value concerns the degree of innovation in a system in terms of how well supplier capabilities are utilized for matching the interests of the procuring organization. System acceptance concerns the degree of fitness of the procured system with respect to the expectations of the system stakeholders. Anecdotal reports regarding inadequate quality and lacking acceptance of systems procured in WTO-regulated tendering indicate that these concerns are central to the success of software tendering, but are not well understood and mastered yet. Systematic consideration of solution acceptance and value may also positively affect non-discrimination of suppliers who not only are evaluated on the basis of price and feature lists but also by considering the impact of the procured system.

To optimize system value and acceptance, we have proposed and evaluated pragmatic principles for requirements communication for software product development [Fricker 2009]. Pragmatic requirements communication involves feed-forward and feedback. Feed-forward allows a customer to suggest solutions that are assumed to lead to the satisfaction of requirements. Feedback allows a supplier to describe how his intended solutions address customer interests. Feed-forward and feedback-based communication leads to aligned customer and supplier interests through emerging win-win negotiations. It has been shown that the use of these principles was feasible, triggered early requirement changes to account for technological capabilities, and led to predictable development projects [Fricker et al 2010].

The goal of this Master’s thesis is to investigate the role and potential of pragmatic principles for requirements communication in a public tender context. The study evaluates whether and how pragmatic requirements communication principles may be implemented in a tendering process performed according to WTO regulations. The thesis further characterizes today’s practices employed for software procurement by the Swiss government, rate the quality of procured systems in terms of acceptance by key stakeholders and in terms of alternatives considered during the procurement process, and identify the factors such as employed feed-forward or feedback that influenced the rating. This investigation shall allow judging a possible relationship between pragmatic requirements communication principles and system value and acceptance.

The research proposed in this thesis will be performed in collaboration with practitioners from industry and government. The student will be given access to real-world cases of performed ten-
ders and will receive possibilities to interview stakeholders at the Swiss government related to these cases and to the tendering process.

The results of the study are expected to provide an understanding of the importance and potential of pragmatic requirements communication in a public tendering context and how the underlying principles may be operationalized. The study results are an input to deciding whether pragmatic requirements communication principles should be proposed as a practice for WTO-regulated public tenders and whether research should be launched to study the achievement of system value and acceptance in tender projects. The study results may further be used as an input to the process group that guides the definition of the procurement processes by the Swiss government.

References

Deliverables
- Analysis of feasibility of pragmatic requirements communication within WTO regulations, in terms of non-discrimination of suppliers and transparency of supplier selection, and recommendations of how to implement feed-forward and feedback in public tendering.
- Analysis of the effect of pragmatic requirements communication practices, or the lack thereof, on solution value and acceptance in past public tendering projects.
- Recommendation regarding adoption or non-adoption of pragmatic requirements communication for public tendering.

Prerequisites
✓ good general knowledge and interest in requirements engineering
✓ interest in empirical research
✓ analytical skills

How to proceed
- Study literature related to requirements communication (20%)
- Study WTO GPA regulations and tendering processes from the Swiss government (20%)
- Analyze feasibility of pragmatic requirements communication for public tendering (20%)
- Evaluate current requirements communication practices at the Swiss government (20%)
- Write Thesis (20%).

Workload 6 months, 30 ECTS
Advisor Dr. Samuel Fricker, http://www.ifi.uzh.ch/erg/people/fricker/
Examiner Prof. Dr. Martin Glinz, http://www.ifi.uzh.ch/erg/people/glinz/