Reference:	**Model Quality Assurance**
Topic:	**Supporting Controlled Experiments in Crowd-based Model Quality Assurance**
LVA-Type:	Praktikum, Bakk-/Diplomarbeit
Start:	Ab sofort
End:	Nach Vereinbarung
Contact:	Marta Sabou (marta.sabou@ifs.tuwien.ac.at)
	Dietmar Winkler (dietmar.winkler@tuwien.ac.at)
	Stefan Biffl (Stefan.Biffl@tuwien.ac.at)

Background

During the design of software systems, a variety of models are created in the process of transforming the requirements and/or specification of the desired system into the corresponding software. These models include Extended Entity Relationship (EER) diagrams or UML model variants for designing databases and software system structures and behavior. The tasks of creating such models from software specifications and their subsequent verification to ensure their quality, i.e., through software model inspection [1], are cognitively intense tasks, that require significant time and effort investment from software engineers.
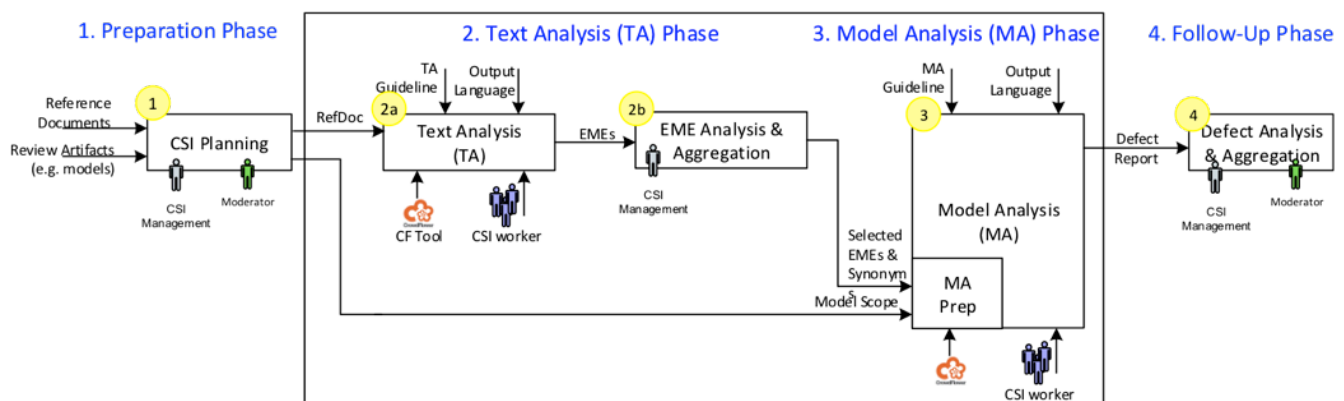

Figure 1: Crowdsourcing-based Software Inspection (CSI) process

To address this issue, we defined and introduced a novel Crowdsourcing-based Software Inspection (CSI) process [1,2,3] (see Figure 1). CSI includes the following two main phases. During a *Text Analysis* phase (2), inspector crowds identify Expected Model Elements (EMEs) in the system requirements specification (2a). In the *Model Analysis phase* (3), inspector crowds verify the model itself (e.g., an EER diagram), or a subset thereof, while being guided by EMEs.

The CSI process (and its variations) was and is being tested with large groups of students at TUWien as part of controlled experiments. To support the experiment process, a platform has been implemented and is continuously extended with new functionalities which help the researchers running the experiments to more easily prepare, run and evaluate the experiments. This platform also allows providing

feedback to students on their inspection performance and therefore contributes to the Software Engineering education at TUWien.

Tasks

The goal of this thesis will be to extend the available platform with new functionalities needed to support the experiment process. These functionalities can support the creation of experimental data, the evaluation of the collected data or the feedback stage to students. The implemented functionalities will be tested as part of the large scale controlled experiments executed at TU Wien.

Experience and skills needed

The following preconditions are recommended, but could also be learned during the thesis itself.

- Java programming
- Databases
- Software engineering
- Defect detection in software engineering models
- (optional) Crowdsourcing (CrowdFlower, CML)

References

[1] Winkler D., Sabou M., Petrovic S., Carneiro G., Kalinowski M., Biffl S.: Investigating Model Quality Assurance with a Distributed and Scalable Review Process, In: Proceedings of the 20th Ibero-American Conference on Software Engineering, Experimental Software Engineering (ESELAW) Track, Springer, Buenos Aires, Argentina, 2017.

[2] Winkler D., Sabou M., Petrovic S., Biffl S., Kalinowski M., Carneiro G.: Improving Model Inspection with Crowdsourcing, In: Proceedings of the 4th International Workshop on Crowdsourcing in Software Engineering, ACM/IEEE International Conference on Software Engineering (ICSE), Buenos Aires, Argentina, 2017.

[3] Winkler D., Sabou M., Petrovic S., Biffl S., Kalinowski M., Carneiro G.: Improving Model Inspection Processes with Crowdsourcing: Findings from a Controlled Experiment. In: Proceedings of the 24th European System, Software and Service Process Improvement and Innovation (EuroSPI), 2017