Context

Today, empirical studies confirm that companies use so-called “Hybrid Methods” to develop their software systems. A hybrid method is characterized by a combination of comprehensive process frameworks and various smaller practices. A typical combination is the so-called “Water-Scrum-Fall”, i.e., a hybrid method, which includes the classic Waterfall model, Scrum, and number of practices like User Stories, Code Reviews or Test-driven development.

So far, studies provide a holistic picture only. That is, the general tendency regarding the process use is analyzed regardless of industry sector (e.g., information systems, automotive software, space and avionics) or system criticality (e.g., reputation, environmental harm, impact to health or loss of life).

Task

This project aims at analyzing the HELENA dataset to investigate hybrid methods as used in the different industry sectors and for software systems tagged with specific criticality attributes.

Goal:

The goal of this project is to answer the following questions: (1) Do the hybrid methods applied in practice differ among the industry sectors? (2) Do the hybrid methods applied in practice differ in relation to criticality attributes? (3) Are there process patterns observable across industry sectors and criticality attributes?

Task Description: The project consists of the following main tasks:

- Detailed analysis of the HELENA-2 dataset
- Descriptive analysis of the data points for the criteria “Industry Sector” and “Criticality” (including the complementing variables for company size, distribution, project size, etc.)
- Construction of hybrid methods as reported by the study’s participants for the relevant attributes
- Statistical analysis of the process patterns to lay the foundation for formulating a theory
- Complementing tasks: literature survey to compare the project’s findings with scientific state of the art and a small confirming interview with practitioners to back up the findings from analyzing the dataset

Organization

Supervision: The supervision also includes members of the HELENA team as sparring partners. Contact will be established. These researchers will help with data analysis, data interpretation and quality assurance.

Reference Literature: Before you apply for this topic, you should read the following reference papers as they provide you with an overview of the overall context of the topic:


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Die Arbeit kann wahlweise in englischer oder deutscher Sprache verfasst werden.