Pattern-based Guideline to Empirically Analyse Software Development Processes

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Setting: Continuous (Software) Process Improvement

- Analyse
- Conceptualise
- Integrate
- Realise
Software Process Improvement Today

Process analysis as it should be ...

These are our project-specific needs. What conclusions can we draw?
Software Process Improvement Today

Process analysis as it should be ...

These are our project-specific needs. What conclusions can we draw?

These are some best practices. How can we justify and implement them?

... and as it often is ...

D. Méndez
Research Objective & Context

Research Objective

- Investigation of how to qualitatively analyse software processes while differentiating case-specific aspects

Contribution

- Pattern-based Guideline to qualitatively analyse processes

Long-Term Goals

- **Systematisation**: Consolidate & evaluate
- **(Re-)Focus**: Requirements Engineering in context of dev. processes
- **Integrate** into software process improvement lifecycle
Procedure

1. Clustering of 9 academic research projects according to commonalities in research designs
   - Purpose & research methodology (Objectives, research questions/purpose, etc.)
   - Types of cases
   - Data collection & analysis methods
2. Inference of research methodology patterns
3. Integration into guideline (abstraction from processes)
Example Project

Context & Research Objectives

- Capgemini TS
- Explorative analysis of demands in Requirements Engineering (projects)

Research Questions:
1. Which RE artefacts are created to which extent?
2. Which project parameters have an influence?
3. ...
Research Methodology Patterns

Pattern

<table>
<thead>
<tr>
<th>Purpose</th>
<th># Cases</th>
<th>Research Methodology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exploratory</td>
<td>2..*</td>
<td>Field Study</td>
</tr>
<tr>
<td>Exploratory</td>
<td>1</td>
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<tr>
<td>Exploratory</td>
<td>2..*</td>
<td>Survey</td>
</tr>
<tr>
<td>Improving</td>
<td></td>
<td>Action Research</td>
</tr>
</tbody>
</table>

Types of Cases

- Project monitoring, reference process documentation
- Document and model analysis
- (Manual) Reviews
- Interviews, Workshops
- Questionnaires

Methods

- Project monitoring, reference process documentation, tools
- Interviews, Workshops
- Questionnaires
- (Manual) Reviews
Resulting Guideline

Responsibility

Company Members

- Goal Elaboration
- Contracting
- Study Planning
- Study Proposal

Researchers

- Research Objective
- Study Proposal

Responsibility

Study Initiation

Study Elaboration

Kick-Off

- Data Collection
- Data Collection Workshop
- Data Analysis
- Research Question 1

Study Completion

- Feedback Protocol
- Presentation Workshop
- Completion
- Approval and Evaluation

Differentiation (Pattern)
Resulting Guideline

Threats to validity (selected)

- Data samples/projects do not reflect investments and soft facts
- Projects conducted in academic environment (lowers "confidentiality"-barriers)

→ Generalisation difficult

D. Méndez
Future Work & Call for Action

- Operationalise & make it publicly accessible
  - Eclipse process framework implementation
  - Wiki (for EPF export and joint collaboration)
- Joint work…
  - Consolidation & extension
  - Evaluation in further contexts
  - Publish
Future Work & Call for Action

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  - Publish

You are cordially invited to participate!

(Join or the puppy gets it 😊)

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Thank you.