Experiment Scoping

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Experiment Scoping

- In the scoping phase, the foundations of the experiment are determined
- Its purpose is to define the goals of the experiment
  - The Goal-Question-Metric (GQM) method can be used

Defining the Goals

- A template can be used do define the goals of the experiment
- The basic template consists of five elements
  - Object of study (what is studied?)
  - Purpose (what is the intention?)
  - Quality focus (which effect is studied?)
  - Perspective (whose view)
  - Context (where is the study conducted?)

GQM Template for Scoping

Analyze <*object of study*>

from the purpose of <*purpose*>

with respect to <*quality focus*>

from the point of view of <*perspective*>

in the context of <*context*>

Object of Study

- The object of study is the entity that is studied in the experiment
- It can be product, processes, resources, models, metrics, or theories
  - Example: the final product, inspection processes, software metrics, etc.

Purpose and Quality Focus

- The purpose defines what the intention of the experiment is
  - It may be to evaluate the impact of two different techniques, tools, methods…
- The quality focus is the primary effect under study
  - It may be effectiveness, cost, reliability, etc.

Perspective and Context

- The perspective tells the viewpoint from which the results are interpreted
  - Examples: developer, project manager, costumer, researcher, etc.
- The context is the environment in which the experiment runs
  - It defines subjects and objects

Number of Subjects / Objects

- Types of experiments with respect to the number of subjects and number of objects
  - In a quasi-experiment, either objects or subjects are not randomized

	One Object	**More than one**
One Subject	Single object study	Multi-object variation study
More than one	Multi-test within object study	Blocked subject-object study

Examples for the Template

Object of Study	Product, Process, Model, Metric, Theory
Purpose	Characterize, Monitor, Evaluate, Predict, Control, Change
Quality Focus	Effectiveness, Cost, Reliability, Maintainability, Portability
Perspective	Developer, Modifier, Maintainer, Project Manager, Corporate Manager, Customer, User, Researcher
Context	Information about subjects and objects

Example of Use (Book)

Analyze the PBR and checklist techniques

from the purpose of evaluation

with respect to effectiveness and efficiency

from the point of view of the researcher

in the context of MSc and PhD students reading requirements documents

Another Example

Analyze software metrics

from the purpose of evaluate

with respect to their accuracy

from the point of view of the developers

in the context of students detecting bad smells in a software project.

Bibliography

- C. Wohlin et al. **Experimentation in Software Engineering**, Springer. 2012.
  - Chapter 7 – Scoping