ESE
Experiment Definition

Concepts

Credits

Experimentation in Software Engineering: An Introduction

by Claes Wohlin, Per Runeson, Martin Host, Magnus C. Ohlsson, Bjorn Regnell, and Anders Wesslén

Springer-Verlag, 2005 (Formerly printed by Kluwer Academic Press, 2000).

Introduction

This phase leads to determine the foundation of the experiment that is done by:

- Defining the goal of the experiment
- Informally defining and explaining the experiment's hypotheses
- Possibly sketching on the related variables and measurements.

Goal Definition

- The GQM Template for goal definition
  - Analyze <Object(s) of study>
  - For the purpose of <Purpose>
  - With respect to <Quality focus>
  - From the point of view of the <Perspective>
  - In the context of <Context>

GQM Template

Object of study	*Purpose*	*Perspective*	*Quality focus*	*Context*
Product	Characterize	Developer	Effectiveness	Subjects +
Process	Monitor	Modifier	Efficiency	Objects +
Model	Evaluate	Maintainer	Cost	Organization +
Theory	Predict	Project Manager	Reliability	etc.
Technology	Control	Corporate manager	Maintainability	
	Change	Customer	Portability	
		User		
		Researcher		

Experiment Context Characterization: Subjects

The subjects are expected to be characterized with respect to some dimensions, including *professional* vs. *student*, *payed* vs. *not-payed*, *level of experience* and *level of expertise*, etc.

Experiment Context Characterization

Objects

The objects are expected to be characterized with respect to some dimensions, including *toy* vs. *quasi-product* vs. *product*.

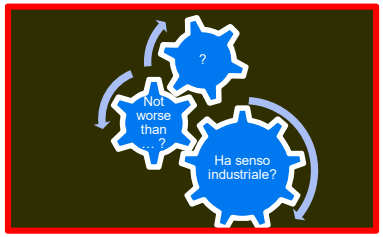
Experiment Context Characterization:
Subject vs. Objects

		# Objects	
		One	*More than one*
# Subjects per Object	*One*	**Single object study**	**Multi-object variation study**
	More than one	**Multi-test within object study**	**Blocked subject-object study**

The Experiment (Informal) Hypothesis

Example #1

In the reference software organization, the testing technique currently utilized, CTT, performs not worse than the new technique NTT for any type of defects for graphic-bound software, whatever the experience level of the involved test people might be.



The Experiment (Informal) Hypothesis

Example #2

In the reference software organization O, the new design method NDM performs significantly better than the design method currently utilized, CDM, for data mgt. software with the O's designers.

Experiment Definition

Variables & Measurements

Based on the given informal hypotheses try to define the variables involved, and the related measurements.