582678 Software Measurement and Quality Modeling (Fall 2011)

Exercises 2

22nd September

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1. Abstraction sheets

Consider the abstraction sheet found in appendix A. What would change if the viewpoint would be that of a manager and the quality focus would be efficiency?

2. Variation factors

Consider the scenario and the variation factors depicted in the figure found in appendix A.

   a) Define allowed values for the six mentioned variation factors.
   b) How many different contexts could be covered overall by assigning values to the variation factors?
   c) How could you reduce the amount of variations?

3. Baseline Hypotheses

In GQM abstraction sheets, what kind of methods can be used to build baseline hypotheses? What challenges are there related to constructing such hypotheses and their subsequent application later on? Use the baseline hypotheses described in the figure of appendix A for illustration.

4. GQM Abstraction Sheet for Performance

Analyze a distributed software system with respect to its performance. Select a typical measurement purpose and viewpoint from a software development organization. Prepare a GQM abstraction sheet including your criteria for performance and the variation parameters that influence it.

5. GQM$^+$ Strategies

Assume that a company involved in software development has a high level goal of recruiting the best possible employees for their company. They want to have the most talented people working for them and they are also considering junior developers. Develop a GQM$^+$ Strategies grid for this goal.
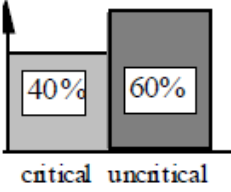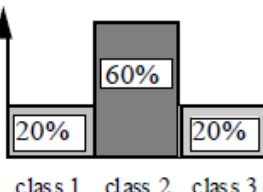
6. Fixed measures

Frameworks such as CoBIT provide a set of already defined fixed goals on different levels and also provide measures. An example can be found in the slides of Chapter 2. Discuss advantages and disadvantages of providing fixed goals and measures. What are the prerequisites and limitations of using predefined business and IT goals and associated measures?

Exercises 2 - Appendix A

GQM Abstraction Sheet (Source: Briand et al., *Practical Guidelines for Measurement-Based Process Improvement*, 1996, page 16)

Figure 1: Example of a GQM abstraction sheet

Object of Study	Purpose	Quality Focus	Viewpoint	Context
unit test	prediction	effectiveness	tester	organization A

Quality Focus

1. Number of detected failures
2. Proportion of critical/uncritical failures
3. Number of detected faults
4. Distribution of faults across fault classes

   .

   .

   .

Variation Factors

1. Quality of test cases
2. Test method used
3. Test method conformance
4. Experience of testers with tools
5. Understandability of the requirements
6. Understandability of the source code

   .

   .

   .

Baseline Hypotheses

1. 30
2.

critical   uncritical

3 40
4.

class 1   class 2   class 3

Variation Hypotheses

1. The higher the quality of the test cases, the more failures detected
2. Different testing methods detect different numbers of failures
3. The better the method conformance, the more failures detected
4. The higher the experience with the testing tool, the more failures detected
5. The better the understandability of the requirements, the more failures detected
6. The better the understandability of the source code, the more faults detected