

Exercises 1

15th September

1. Measurement Goals

Context and viewpoint play an important role defining measurement goals. What might happen if the context or the viewpoint is not considered when defining measures?

2. Measurement Scales

Measures come in many shapes. The scale of the measure defines the applicable operations for analyzing the gathered data. Not all operations are sensible for all types of measures.

(a) Consider the following measures: program execution time, code coverage, user satisfaction, coupling between program modules, programming skill, user role, and program compilation time. Assign a scale for each of the measures.

(b) If you calculate an average over a set of course grades, would this be an allowed operation?

3. Measurement Purposes

Measurement can be used for purposes such as characterization, understanding, evaluation, prediction, motivation and improvement. Suppose that an organization wants to improve the reliability of its software products, but it currently knows nothing about the reliability of its products or the processes used to increase reliability.

Define a structured measurement goal for one of the mentioned measurement purposes that this organization might use to guide its investigation into product reliability. Use the guidelines for product-oriented GQM plans from the lecture and derive appropriate questions and measures.

4. Goal Refinement

Assume the following measurement goal:

Analyze **development teams**
with respect to their **productivity**
for the purpose of **evaluation**
from the viewpoint of the **management of a business unit**
responsible for software development
in the context of a **telecommunication company that**
applies agile practices in a collocated manner.

Assume that productivity is understood as the ratio between units of output divided by units of input.

- a. What could be appropriate units for input and output?
- b. Use the guidelines presented in the lecture for process-oriented GQM plans and derive questions and measures for this goal.

- c. What problems and challenges did you discover when refining the measurement goal into questions and measures? Why?
- d. What could be potential variation factors that influence software development productivity and why?

5. Context change

How would the GQM plan from exercise 4a) change if you have

- a. high reuse rates
- b. globally distributed teams

6. Deployment of measurement programs

What problems and challenges would you expect when asking for productivity data from the teams?