



Software Quality Exercise 3

Defining and Achieving Quality

1 Information

1.1 Dates

- Release: 28.03.2011 12.15pm
- Deadline: 04.04.2011 12.15pm
- Discussion: 18.04.2011

1.2 Formalities

Please submit your solution as a *pdf* and submit it via email to jeanneret@ifi.uzh.ch. The subject of the email must begin with *[FS 11 SWQ]*. Exercises can be solved and handed in in groups of three. Every member of a group must be able to answer questions about the group's solution. The document must include the names of group members. Finally, assignments are written in English, but feel free to write your answers in German (or in French) if you like to do so.

1.3 Context

A new iteration of the development of ImageJ is about to begin. It has been decided that the quality of ImageJ has to be systematically improved for the next milestone. Your task is to find out, using Quality Function Deployment (QFD) and the standard ISO / IEC 9126-1, which characteristics of ImageJ should be improved first.

2 Defining Quality

Your initial task is to further define, using the standard ISO / IEC 9126-1, what is meant by quality in the context of software dedicated to the editing of digital photographs. More information about this standard can be found in the Chapter 10 of the lecture's slides. Furthermore, a printed copy of the standard is available for consultation in the assistant's office (BIN 2.B.17).

- a) In the standard ISO / IEC 9126-1, a distinction is made between *internal quality*, *external quality* and *quality in use*. What are the differences between these qualities and how are they related?
- b) Define typical user needs when processing or editing digital photos. Write at least one requirement per characteristic of the ISO / IEC 9216-1 *Quality model for quality in use* model.
- c) Are these requirements verifiable? If yes, how can you actually verify that ImageJ fulfills these requirements? If not, how could you concretely make them verifiable?
- d) Have a look at typical features offered by actual programs specialized in the editing of photographs (such as Adobe Photoshop, Corel PaintShop Pro or Gimp). Identify features that support these user needs (at least 3 features for each requirement) and classify them according to the ISO / IEC 9216-1 *Quality model for external and internal quality* model.

3 Achieving Quality

3.1 Quality Function Deployment (QFD)

In the previous part of this assignment, you have identified some requirements and some features of programs specialized in the editing of digital photographs. You are now ready to assess the quality of ImageJ and its competitor and to plan the next development iteration of ImageJ.

For this part of the exercise, your task is to build a House of Quality (HoQ thereafter), as presented in the Chapter 6 of the lecture's slides. For this purpose, you can use the Excel template available on the exercise's website and include it in your PDF document.

- a) Report the requirements identified in 2.b) in your HoQ. Assign an importance to each of these requirements according to the following scale: 1 - low, 3 - medium and 5 - high.
- b) Report in the HoQ the product features identified in 2.d).
- c) Investigate the correlations among product features: which features support (+) or impede (-) another one?
- d) Evaluate the extent to which a feature helps to fulfill a given requirement using the following scale: empty - no relationship, 1 - weak, 3 - moderate and 9 - strong.
- e) Choose two competitors of ImageJ. Estimate, with respect to each requirement, the users' satisfaction given by ImageJ and these 2 competitors. For this purpose, use the following scale: 1 - dissatisfied, 3 - neither dissatisfied nor satisfied and 5 - satisfied.
- f) Conduct a technical benchmark for ImageJ and its two competitors. Which features do they offer or to what extent do they present a given (internal or external) product quality?

Based on your HoQ, which requirements should be better fulfilled by ImageJ? Why? How could this improvement be achieved?

3.2 Beyond QFD

Assess the use of QFD to develop a product strategy. What are the strengths of QFD? What are its weaknesses and the risks related to its use? How could QFD be improved?

Give an alternative strategy or method to evaluate the quality of a product from a client perspective. Describe it briefly and highlight its differences with QFD.