5 Modeling Quality

Additional Questions and Exercises

5.8.1 Questions

5.8 ****: Which developer role (software architect, component developer, domain expert, system deployer) would need to specify the performance-relevant contents of a database within a Palladio model? Which modeling construct(s) would need to be used?

9 Software Engineering Processes

Additional Questions and Exercises

9.4.1 Questions

9.4 ***: If we want to use architecture modeling in an iterative process such as the Unified Process (Figure 9.4), which architecture modeling and simulation activities and artifacts from the workflows depicted in Figures 9.1 and 9.2 might earlier iterations of the project be focused on, and which are more likely to be central in later iterations? What are examples for differences between earlier and later iterations when developing the Media Store example introduced in Section 2.1?

9.5 ****: Consider the different phases of an iterative and incremental process as depicted in Figure 9.3. What are examples for challenges and effects of using an architectural model continuously and incrementally during the development process as depicted in Figure 9.3? What are possible ways of dealing with these problems?

9.4.2 Exercises

9.2 ****: Section 9.2.4 states various influence factors and guidelines for designing interfaces in the Subsections "Interface Specification" and "Best Practices for Interface Specification".

a) Apply the statement "reusability does not necessarily imply usability for a specific context" to the fictional `IMediaManager` interface provided in Figure 9.5. In which sense could the level of abstraction of the interface reduce its usability in the specific context of the Media Store?

b) Similar to the example in Listing 9.1, give an example for changes in the interface that make it more suitable for each of the following separate goals:

   i) Reusability – in different kinds of systems that handle remote file system management.

   ii) Distribution – for the case that the user is connected to the Media Manager with a reliable connection that has a very high latency.

```
public interface IMediaManager {
  public long getFirstAudioFileId();
  public long getNextAudioFileId(long currentAudioFileId);

  public long getChunkCount(long requestedAudioId, long chunkSize);
  public byte[] downloadChunk(long requestedAudioId, long chunkNumber,
      long chunkSize);

  public long createNewAudioFile(String fileName);
  public long prepareUpload(long newAudioId, long uploadSize,
      long chunkSize);
  public long uploadChunk(long uploadedAudioId, long chunkNumber,
      byte[] chunk);
}
```

Figure 9.5: Code for the IMediaManager interface referenced in Exercise 9.2.

9.3 ***: Give reasons, why the Media Store introduced in Section 2.1 is a system, for whose development Model-Driven Quality Prediction is worthwhile or not worthwhile and examples of circumstances in the project context (e.g. market pressure) that influence the cost-benefit consideration.

10 Relation to Requirements Engineering

Additional Questions and Exercises

10.4.2 Exercises

10.2 ****: Give a concrete example (quantitative, operationalized, or qualitative) for each type of quality requirement shown in Figure 10.1 for the Media Store example introduced in Section 2.1. For each requirement, describe an aspect of the architecture or the project, or a design decision which influences this requirement.

10.3 ***: Consider the following requirement concerning the usability: "Every action by the user can be reverted ('undone') for at least one week." Which qualities besides usability might be influenced by introducing this functionality and how do they depend on the architecture of the system?