

Improving Software Inspections by Using Reading Techniques

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Abstract

Reading techniques are step-by-step procedures that guide individual inspectors while they uncover defects in a software artifact. Reading techniques provide a systematic and well-defined way of inspecting a document, allowing feedback and improvement. This tutorial introduces Perspective-Based Reading (PBR), a specific reading technique used to review software requirements. PBR verifies the quality of requirements specifications by requiring each reviewer to take the perspective of a specific stakeholder of the document (such as designer, tester, and user).

This tutorial aims at industry practitioners, managers and developers alike, who want to learn more about ways to improve their software inspections with systematic reading techniques. Attending this tutorial will enable the participants to be more effective and more focused in looking for potential defects in software documents. Since the focus of the tutorial is on systematic reading techniques for defect detection, it is beneficial for participants to have some basic understanding about software inspections.

1. Learning Objectives and Scope

Reading techniques are step-by-step procedures that guide individual inspectors while they uncover defects in a software artifact. Reading techniques provide a systematic and well-defined way of inspecting a document, allowing feedback and improvement. At the same time they can be tailored for use in a particular organization, because they can be adapted to the development process used by the organization and to the experience level of the inspectors.

This tutorial introduces Perspective-Based Reading (PBR), a specific reading technique used to review software requirements documents. Unlike other

approaches, PBR verifies the quality of requirements specifications by requiring each reviewer to take the perspective of a specific stakeholder of the document (such as designer, tester, and user). Thus a PBR inspection helps make certain that requirements documents are of sufficient quality to support all of the necessary later stages of software development. PBR also assists reviewers by providing a more structured approach than either ad hoc or checklist inspections. PBR has been the subject of a series of empirical studies that have shown it represents an improvement over current state-of-the-practice techniques.

The primary goal of this tutorial is to provide awareness, training, and skill development in the use of reading techniques embedded in inspections. Specific emphasis will be placed on the reading of requirements using PBR as a concrete example of the reading technique approach.

More specifically, this tutorial provides:

- An overview of inspections.
- Some ideas as to how participants can assess inspections in their own environments: different approaches to assessments, metrics for evaluating effectiveness, how to perform the evaluation.
- The ideas behind reading techniques for improving inspections.
- A set of techniques that can increase the effectiveness of software inspections, by providing individual inspectors with systematic techniques to read a software artifact and recognize defects. A specific set of reading techniques, PBR, for defect detection in requirements documents, will be explained in detail.
- Ideas on tailoring and improving the approach for participants' own environments.
- A classification of defect types in requirements documents.

This tutorial takes an interactive approach, to provide ideas and examples for tailoring and improving the

reading techniques to participants' own environments. Participants are also provided with the opportunity to apply PBR while being able to ask questions or ask for assistance from the instructors.

2. Target Audience

This tutorial aims at industry practitioners, managers and developers alike, who want to learn more about ways to improve their software inspections with systematic reading techniques. Attending this tutorial will enable the participants to be more effective and more focused in looking for potential defects in software documents.

3. Required Background

Since the focus of the tutorial is on systematic reading techniques for defect detection, it is beneficial for participants to have some basic understanding about software inspections. The software inspection method itself, that is, the various roles and activities beyond defect detection, will only be succinctly described during this tutorial.

4. Brief History

Parts of this tutorial have evolved from tutorials that were previously presented to several companies and consortia, including NASA (USA), the Maryland Software Industry Consortium (USA), Allianz Life Insurance (Germany), and Bosch Telecom (Germany). These tutorials were often part of an introduction effort of software inspections with a particular emphasis on systematic reading techniques. The tutorial for ICSE therefore presents the essence of previous tutorials in condensed form and makes the material accessible to a broader industrial audience. In doing so, it elaborates upon the topic of reading techniques for defect detection including the experiences of previous efforts. The result is a tutorial that provides a fresh and at the same time experience-based view on how to improve software inspections with systematic reading techniques.