Chapter 7
Testing

7.1 INTRODUCTION

Software testing is the process that controls the quality of software (Myers, 1979). Software testing is comprised in any development process and every method of development applies practices for software testing (Burnstein, 2003; Kaner et al., 2002). Traditional methods of development, like the waterfall approach, allocate software testing in a given phase of the overall development process – e.g., toward the end of the software lifecycle. In modern methods, practices of software testing rather permeate the whole development process in an iterative and increasing way (Black, 2002; Spillner et al., 2007) – e.g., in XP.

The goal of this chapter is to understand to what extent testing is embraced and applied in the OS projects. In particular, we discuss whether OSD adopts testing practices coming from AMs. In practice, we analyze OS repositories looking for information revealing the adoption of some testing practice. In other words, we analyze the existence, the date of creation, and the changes of test classes and their related code classes in the public version control systems available in the OS repositories.

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7.2 TESTING IN THE OPEN SOURCE DEVELOPMENT

The majority of OS projects combines the feedback from the community and an internal strategy of testing to release competitive and stable software products.

The most common practices of internal testing in the open source projects are the use of the nightly builds and the frequent releases. The frequent releases guarantees a fast and iterative reporting from all the community. The majority of the projects use Bugzilla or a modification of it to collect - from the internal teams or from the volunteers - reports on failures, request of modification, or enhancements. The same tool is used to divulgate solutions, patches, or occurrences of defects. Many of OS projects declare to use automated tools or agile practices for testing, like Test Driven Development (TDD). As we shall see, the reality is different: in many cases test classes are totally missing or appear in a very low percentage. In what follows we discuss the existence of test classes in projects stored in the following on-line repositories:

1. Tigris.org (http://www.tigris.org/)
3. Mozilla Foundation (http://www.mozilla.org/)
4. OpenBSD (http://www.openbsd.org/)
5. XFree86 (http://www.xfree86.org/)
6. JBoss (http://www.jboss.org)
7. PostgreSQL (http://www.postgresql.org/)
8. KDE (http://www.kde.org/)

In Table 1 we report the number of classes (files), the programming language dominant in the project, the number of test classes (tests) and the percentage of test with respect to the files.

Among the 68 projects considered, 13 have no tests at all, or such tests are not stored in the version control system together with the source code. 32 have more than 10% of the files dedicated to test cases (Figure 1).

However, nearly all the projects that started in the last few years include a higher percentage of tests. This behavior could be caused by several reasons. However, it is interesting that the diffusion of the AMs started at the same time (2000 ca.). It is likely that the basic ideas of the AMs have affected the development of the projects that started from 2000 onwards.
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