

SQO-OSS

Scope

Metric-based evaluation has been at the heart of software quality assessment for some time and the topic has subsequently reached maturity within the research context. The Sqo-oss project aims to leverage and expand upon what is known in order to automate software quality assessment. In particular, the project aims to assess open source software and publish a league table of open source quality. Through these means the project aims to raise awareness of automated software quality assessment practices and the quality of open source products whilst concurrently aiding software procurers in their selection of products.

Advances

New metrics for software quality assessment

There are many accepted metrics for software quality assessment. As the field has matured, so too has the list of recognised metrics grown. Concurrently, interest in the open source development phenomenon has grown. Sqo-oss represents the desire to bring these fields together.

As part of the project's remit researchers have been investigating novel metrics that can be applied specifically to open source software. In particular, the project has aimed to assess metrics utilising the forms of data that can *only be found within open source development*. With this in mind, Sqo-oss has developed and published three novel metrics: Mean Developer Engagement, the Productivity Metric and the Cross Language Metric Tool.

Mean Developer Engagement: This metric evaluates how capable an open source project is at making use of its available human resources, over time.

The Productivity Metric: This metric evaluates the activity of a particular developer over time by combining activity data from the source code repository, the mailing lists and the bug management database.

Cross Language Metric Tool: This metric evaluates the structural quality of source code by converting the source code of various languages to an intermediate XML format and running metrics as queries to the XML code.

The Sqo-oss quality model: This metric aggregates the results of other metrics (both product and process) and applies threshold-based profiles to the aggregations, depending on a predefined set of user classes.

These metrics are particularly important as they open up a new direction for quality assessment. Whereas previous software quality assessment had been focused on code, these approaches encourage the evaluation of the capability of the team writing the software. As with all metrics, these are universally applicable where

the pertinent data is available. Where the research community may utilise these new approaches as part of continuation of Sqo-oss work, industry stands to gain most by applying these new approaches within its own quality assessment practises.

Alitheia Core – The Quality Assessment Platform

At the heart of the Sqo-oss project is Alitheia Core (named from the Greek for “truth”) a system for the automated evaluation of software quality. Over the past few years many tools for assessment of software quality have emerged: Coverity and Ohloh being strong examples. The Alitheia Core software advances the state of the art by integrating various data sources under a single API and allowing organisations to tie up the quality assessment process to the development process by applying continuous quality monitoring.

Within the project Alitheia Core shall serve two primary purposes:

Compilation of the Open Source Quality League Table: The Alitheia Core shall be employed, using the Sqo-oss project's novel metrics, to evaluate the quality of popular open source software projects. The major output from this shall be a publicly available database of open source quality-related data. Visitors to the Sqo-oss project website will be able to query the tool in order to gather quality data for themselves.

Freely Available Alitheia Core: The Alitheia Core has been developed and made available under the BSD license. As a piece of Free Software anyone is able to obtain the software source code for themselves and run the system. Users of the system are able to run the system for themselves, evaluate any product of their choice (utilising readily available and custom developed metrics). Under the terms of the BSD license, users are also able to modify the system to behave in different ways according to their own needs.

Positioning in global context

The Sqo-oss project continues to publish results relating to novel metrics for software quality assessment. In partnership, with the EC-funded QualOSS and FLOSSMetrics projects, we are part of an emerging community dedicated to this particular field.

The Sqo-oss platform shall receive its public release in early June. At this point, we will offer the first publicly accessible source of software quality data, in formats that can be consumed by both researchers (raw data) and end users (website). As the system gathers attention and feedback we predict it shall reach comparative maturity very quickly.

Contribution to standardization and interoperability issues

Use of ISO 9126: ISO 9126 is an internationally recognised standard for the evaluation of software quality. In developing the Sqo-oss project's own quality model, this standard was used as the basis for which model interoperability could be ensured. At this stage no contributions from Sqo-oss towards the maintenance of this standard are perceived.

Target users / sectors in business and society

(Open Source) Software Developers, IT Consultants, Software Quality Researchers, Software procurers.

Overall benefits for business and society

The primary benefit from the Sqo-oss project is the provision of new technology for the enhancement of the software quality assessment process. Organisations will be able to setup continuous software quality assessment infrastructures which will enable them to monitor, among others, the maturity of their projects and the productivity of their developers.

The secondary benefit is the raising of public awareness of quality issues with regards to open source software. Although intangible, this benefit holds potentially significant ramifications for the way in which open source software is perceived with software procurement exercises, both public and private sector.

Achievements

Novel metrics: Mean Developer Engagement, the Productivity Metric, Cross Language Metric Tool, Sqo-oss quality model.

Publications: Results published at the International Conference on Software Engineering, International Workshop on Mining Software Repositories, International Conference on Open Source Systems, International Journal of Open Source Software and Processes, International Workshop on Software Quality and Maintainability and others.

Software: Development of the Alitheia Core, various metric plugins, publicly accessible league of quality assessed software.



title

Software quality observatory for open source software

contract number

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type of project

Specific Targeted Research Project

contact point

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project website and partner list

<http://www.sqo-oss.eu/>

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