QUALOSS, QUALity of Open Source Software

QUALOSS plans to mostly automate the quality measurement of open source software. The QUALOSS platform uses tools to analyse two types of data: (1) source code and (2) project-repository information. Thanks to the tooled-method of QUALOSS, it will be possible to assess the quality of open source projects quantitatively, objectively and rapidly. QUALOSS involves 8 partners from five countries, namely, Belgium, France, Germany, Spain and The Netherlands.

At A Glance: *QUALOSS*

QUALity of Open Source Software

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Partners: *CETIC (BE), Facultés Notre Dame de la Paix de Namur (BE), Universidad Rey Juan Carlos (ES), Fraunhofer IESE (DE), ZEA Partners (BE), MERIT (NL), AdaCore (FR), PEPITe (BE)*

Duration: *Sept., 2006 – Feb, 2009*

Project funding (EC/total): *2m€ / 3m€*

Further Information

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- **Europe's Information Society: Thematic Portal:**
  http://europa.eu.int/information_society/

QUALOSS Objectives

QUALOSS will:

- Build the QUALOSS method, an objective method to assess the robustness and evolvability of open source software.
- Develop The QUALOSS platform, a tool to automate most activities when applying the QUALOSS method.
- Validate the QUALOSS method empirically on at least 50 open source projects.

QUALOSS Timeline

A first prototype version of the QUALOSS method and platform will be available in Sept 2007.

More advanced quality analyses will be added to the method and implemented in the QUALOSS platform in later iterations. Their planned releases are for Feb. 2008 and Sept. 2008.

Motivations

Thanks to the QUALOSS method it will be possible to measure the quality of open source projects objectively, quantitatively, and quickly

In Software project, success vs. failure has the same odds as flipping a coin. In cases of failures, the financial loss often adds up millions and sometimes billions of Euros, as related in "Why software fails" in IEEE Spectrum Sept. 2005. Although failures may not solely be due to technologies and often relate to lack of communication or misunderstanding between people, it is clear that ***better software*** would relieve software projects from solving time-consuming technological problems and instead, would let stakeholders spend more time communicating.

Two important characteristics of better software are ***robustness*** and ***evolvability***. Without these two attributes, a software product cannot gain credibility and looses all chances to become a viable option.

Why Open Source

A software product rarely lives in isolation. It must often integrate to other software components. This is where Open Source becomes an attractive solution.

Indeed, by sharing its source code, a software component has a greater chance to integrate reliably with others and errors are never due to the lack or ambiguity of information as it is often the case when integrating closed source products.

Related Works

As for commercial software, not all open source projects are suitable for integration. One must therefore gauge the quality of open source components before investing time and effort. There already exits several methods for evaluating open source projects, namely, QSOS pushed by Atos Origin, OpenBRR sponsored by Intel, O'Reilly, SpikeSource and Carnegie Mellon West Center and two named Open Source Maturity Model by Cap Gemini and by Navica. These assessment models definitely show a move in the right direction however they still require an intensive manual effort where someone must explore the repository of an open source components to collect the data and manually score the open source project on different quality criteria.

QUALOSS at work

Thanks to QUALOSS, the quality assessment of an open source project will be mostly automated. Moreover, subjectivity that may still play a small role in the methods mentioned above is removed. In particular, QUALOSS plans to build its assessment method based on the Goal-Question-Metrics approach (GQM). GQM starts from the people's quality concerns and match them to mathematical formula that uses data found in open source project repositories and in source code. In the end, the mathematical formulae remove the subjectivity and GQM clearly shows the empirical link between a quality concern and the mathematical formula applied to estimate it.

QUALOSS Dissemination

Throughout the QUALOSS project, all QUALOSS partners will continuously interact with other open-source related projects. Universidad Rey Juan Carlos and MERIT both participate and even coordinate other European funded research projects, namely, Calibre, FLOSSWorld, FLOSSMetrics, and Qualipso. This will definitely help share information between QUALOSS and all these other E.C. projects.

QUALOSS will also leverage on its Industrial partners, AdaCore and ZEA partners to spread QUALOSS results to their highly interested communities and customers.

QUALOSS helps Open Source

QUALOSS will point out to open source project managers what specific raw data to collect in order to estimate accurately their project's quality. The empirical studies conducted during QUALOSS will highlight the data types that bring the most value for estimating accurately robustness and evolvability.

Moreover, QUALOSS will have the ability to study fairly young projects without automatically tagging them "risky" like it is the case when applying the other four methods afore mentioned.

European Relevance

QUALOSS and Europe are closely linked in two aspects: (1) research and (2) economical impact.

First, the expertise needed for QUALOSS is not held by a single European organisation. It is therefore crucial to form a strategic alliance to guarantee the success of QUALOSS. Fraunhofer IESE brings its world renowned Goal Question Metrics approach that QUALOSS will apply on Open Source Software. Universidad Rey Juan Carlos has built an expertise related to the analysis of open source repository. They currently have a few tools such as Carnarvon to analyse Version Control data of open source projects. CETIC masters source code analysis. PEPITe brings its expertise in data mining and machine learning. FUNDP will empirically study the validity of the model created during QUALOSS. Most importantly, our industrial partners AdaCore and ZEA partners will create the link between QUALOSS results and the Open Source world. Moreover, they will provide QUALOSS with many data to build the QUALOSS method.

Second, QUALOSS helps Europe keep its dominance in open source software development. A recent FLOSSWorld study shows that 70% of all open source software is developed in Europe. Incidentally, open source projects are themselves the largest consumers of open source software. Thanks to QUALOSS, open source projects managers will be better informed to select other high quality open source projects to collaborate with.

In this new service-oriented world, it is important to be first to market with high added value and innovative services. Europe has understood that strategy and it is paying off as multinational companies trust Europe (39%) over the rest of the world for its investment (IBM study Sept. 2006 reported in Financial Times Sept.17 2006). Undeniably, open source software has contributed to that success. In the future, based on QUALOSS results, European companies will even better leverage on the open source advantages to provide very robust and evolvable services to their customers.