

Second Workshop on Software Quality

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ABSTRACT

Software products are a critical and strategic asset in an organizations' business. They are becoming larger, more sophisticated and more complex. The challenge is to develop more complicated software products within the constraints of time and resources without the sacrifice of quality. Quality standards, methodologies and techniques have been continually proposed by researchers and used by software engineers in the industry. The Second Workshop on Software Quality aims to bring together academic, industrial and commercial communities interested in software quality topics to discuss the different technologies being defined and used in the software quality area.

Categories and Subject Descriptors

D.2.9 [Software Engineering]: Management – *Software Quality Assurance*

1. INTRODUCTION

One finds almost as many definitions of quality as writers on the subject. Writers have been remarkably few in number considering the obvious importance of quality concepts and the frequent appearance of the term quality in our everyday language.

Though people have been discussing software quality for decades, software quality research is still relatively immature, and it is difficult for a user to compare software quality across products. Researchers are still not clear as to what a good measure of software quality is because of the variety of interpretations of the meaning of quality, of the meanings of terms to describe its aspects, of criteria for including or excluding aspects in a model of software, and of the degree to which software development procedures should be included in the definition. A particularly important distinction is between what represents quality for the user and what represents quality for the developer of a software product.

The term "quality" is applied to virtually all products, businesses, professions and processes. Researchers in the software

engineering area have tried different ways of defining quality. They have adopted the product-based view ([1], [2], [3]), the manufacturing-based view ([4], [5], [6]), the user-based view ([7], [8], [9], [10]) and even combinations of the views ([11]). There have been many software quality studies. More recent empirical studies have addressed the rationale behind the inclusion or exclusion of a particular quality factor or criterion, describing influences on different perceptions of quality ([12], [13], [14]). In addition, several organizations are recognizing the importance of an integrated view of quality and customer satisfaction ([15], [16])

In a recent article titled 'New Years Resolution for Software Quality', ten distinguished individuals in the software quality field were asked to share the resolution they wished software organizations would make and keep in order to improve software quality [17]. The article showed that quality is complex, that there are many views of quality, and many views of what actions to take in order to improve software quality. Today, organizations in search of competitive advantages, have invested heavily in automating their business processes. Greater reliance is placed on the software products, to the point where software has assumed a critical and strategic role in organizations' business. With this level of importance and the reliance placed on software products, it has become a necessity to improve the quality of our software products. We also need to improve the efficiency and productivity of the development and maintenance processes. As such, researchers and practitioners have been paying increasing attention in understanding quality and improving the quality of the software being developed. Some studies have focused on techniques and approaches to assure the quality of software products, whilst others have focused on the software development process, how to define it, evaluate it and improve it.

2. WORKSHOP GOALS

This workshop, which is co-located with ICSE 2004, the International Conference on Software Engineering, the premier software engineering conference, intends to bring together academic, industrial and commercial communities interested in software quality in order to discuss the different technologies that have been defined and used in the software quality area.

The first goal of the workshop is to explore whether some consensus definition of "software quality" is achievable that can serve as a basis for reasoning about, measuring, and achieving software quality in sound, consistent, and useful ways. Position papers are solicited for candidate approaches to achieving such a consensus definition.

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The second goal of the workshop is to discuss how well, and under what conditions, current and emerging software quality-related standards, methodologies, and techniques enable us to improve the quality of our software projects. Here, position papers are solicited on such topics as the software quality-related aspects of:

- Software Product Evaluation and Certification
- Software Process Definition, Evaluation and Improvement
- Software Quality Education
- Introduction of Software Quality Programs
- Methods and Tools for Quality Assurance
- Quality Metrics – in-process quality and customer views of quality
- Software Quality for Web-based and Object-Oriented development
- Total Quality Management
- Building quality into software products
- Project management and software quality
- Testing, Inspections, Walkthroughs and Reviews
- Combining Quality and Rapid Development

3. WORKSHOP FORMAT

The workshop was designed to cover one day of presentations and discussions. Interested participants were invited to submit position papers describing problems and experiences in their current research in software quality.

The proposed structure of the Workshop will include four sessions plus a coda, as follows:

1. Defining "Software Quality"
2. Achieving Software Quality I
3. Achieving Software Quality II
4. Achieving Software Quality III
5. Defining "Software Quality" Revisited

Discussion points will be recorded considering:

- a set of current research efforts in the topic;
- a set of topics requiring further investigation;
- a list of research groups who have agreed to collaborate in their research topic; and,
- a set of possible future trends in the specific topic.

Finally, the results of the discussions will be presented in a closing plenary session.

4. PROGRAM COMMITTEE

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5. REFERENCES

- [1] Boehm, B., Brown, J. & Lipow, M: Quantitative Evaluation of Software Quality, Proceedings of the Second International Conference on Software Engineering, 1976, pp592-605.
- [2] McCall, J., Richards, P. & Walters, G.: Factors in Software Quality, Vol 1,2, & 3, November 1977.
- [3] Kitchenham, B. & Walker, J.: The Meaning of Quality, *Software Engineering 86: Proceedings of BCS-IEE Software Engineering 86 Conference*, Southampton England September 1986.
- [4] Humphrey, W.: Characterizing the Software Process: A Maturity Framework, *IEEE Software*, **5(2)**, March 1988, pp73-79.
- [5] Paulk, M., Curtis, W., Chrissis, M.: *Capability Maturity Model for Software*, Report CMU/SEI-91-TR-24. SEI, Carnegie Mellon University, 1991.
- [6] Dowson, M.: Software Process Themes and Issues, *2nd International Conference on the Software Process: Continuous Software Process Improvement*, 1993, pp54-60.
- [7] Kitchenham, B.: Towards a constructive quality model Part 1: Software quality modeling, measurement and prediction, *Software Engineering Journal*, July 1987.
- [8] Kitchenham, B. & Pickard, L.: Towards a constructive quality model Part 2: Statistical techniques for modeling software quality in the ESPRIT REQUEST project, *Software Engineering Journal*, July 1987.
- [9] Virdgen, R., Wood, J. & Wood-Harper, A.: Customer satisfaction: the need for multiple perspectives of information system quality, *Software Quality Management II Vol I*, Computaional Mechanics Publications, 1994.
- [10] Virdgen: A multiple perspective approach to information systems quality, *University of Salford*, 1996.
- [11] Kitchenham, B., Lonkman, S., Pasquini, A. & Nanni, V.: "The SQUID approach to defining a quality model", *Software Quality Journal* **6**, (1997) pp.211-233
- [12] Wong, B. & Jeffery, R.: Cognitive Structures of Software Evaluation: A Means-End Chain Analysis of Quality, *Proceedings of the Third International Conference, PROFES 2001*, 2001, pp 6-26.
- [13] Wong, B. & Jeffery, R.: Quality Metrics: ISO9126 and Stakeholder Perceptions, *Proceedings of the Second Australian Conference on Software Metrics*, 1995, pp.54-65.
- [14] Wong, B. & Jeffery, R.: A Pilot Study of Stakeholder Perceptions of Quality, *Technical Report*, CSIRO, 1996.
- [15] Chulani, S., Santhanam P., Moore D., Leszkowicz B., Davidson G., "Deriving a Software Quality View from Customer Satisfaction and Service Data", *European Software Conference on Metrics and Measurement*, Mar 2001.
- [16] Chulani, S, Ray, B., Santhanam, P. & Leszkowicz, R.: "Metrics for Managing Customer View of Quality", *IEEE Metrics conference*, Sep. 2003
- [17] Eickelmann, N. & Hayes, J., New Year's Resolutions for Software Quality, *IEEE Software*, pp.12-13, Jan./Feb. 2004.