International Workshop on

Evolution of Large-scale Industrial Software Applications (ELISA)

Tuesday, 23 September 2003
Royal Netherlands Academy of Arts and Sciences, Amsterdam, The Netherlands
Co-located with the IEEE International Conference on Software Maintenance (ICSM 2003)

Sponsored by FWO Scientific Research Network Foundations of Software Evolution and
ESF Research Network Research Links to Explore and Advance Software Evolution (RELEASE).

MOTIVATION

A characteristic of software that addresses real-world applications is the inevitable need to be changed and enhanced -- that is, evolved -- if it is to remain satisfactory to its stakeholders. However, implementing such evolution reliably and predictably over the long life span of a software system poses many organisational, process-related, and technical challenges. These include the tendency of complexity to increase as changes accumulate, the feedback-system nature of the software evolution process, and the difficulty to predict the need for, and estimate the full impact of, software change.

Within the research community, the term *software evolution* is increasingly being used to describe the phenomena of software change, maintenance, and evolution. Such changes to software systems tend to be progressive and incremental; they are driven, in part, by a learning process in which feedback from users and other stakeholders plays a vital role. Surveys suggest that in practice, and over the lifetime of a system, incremental change of software artefacts driven by continual changes of requirements consumes more resources than the development of their first operational release. Software evolution is and will continue to be of major economic and social importance.

Issues of largeness compound the challenges to achieve disciplined software evolution, however largeness is defined. Large-scale industrial systems generally consists of numerous software artefacts that need to be evolved in a harmonious fashion, a change request flow that surpasses the implementation rate, and the involvement of several teams implementing the evolution. Typical examples of large-scale systems include air traffic control systems, popular PC operating systems, and telephone switch software. The challenges posed by the continual evolution of these and similar systems clearly surpass the current state-of-the-art.

The problems of evolving software are further compounded by the growing use and integration of mobile, distributed, and embedded systems, some of them built from off-the-shelf or open source components that also are subject to evolution pressures. The dependence of organisations and society on evolving software makes the search for solutions to the fundamental problems of software evolution more urgent than ever.

Presentations and discussions in this workshop are expected to contribute to the establishment of a research agenda in the field that combines processes, methods, tools and techniques for the implementation of evolution (the *how*) with the results of empirical studies of the phenomenon (the *what* and the *why*).

OBJECTIVES

The goal of this workshop is to achieve a deeper and wider insight into the problems posed by the evolution of large-scale industrial software systems and the possible technological and managerial solutions, from both an academic and an industrial point of view. Participation will be based on a submitted paper. All groups and individual practitioners and researchers with an interest in software evolution are invited to submit either a position paper or a full paper.

Contributions that address one or several of the following topics are particularly encouraged:

- Innovative solutions to the issues of largeness, complexity, scalability and configuration control in software including agile, extreme, distributed, collaborative and non-standard evolution processes
- Benchmarks for evaluation of software evolution methods, processes and tools
- Empirical studies of evolving software, including: metrics and metrics-based models of software evolution; estimation techniques for evolving software; the economics of software evolution
- Evolution of open source and COTS software: processes, tools and techniques
- Taxonomies and classification of software, processes and software evolution activities

Two kinds of submissions are invited:

- **Research papers** that focus on techniques, formalisms, methods and tools that aim to measure, analyse, plan, manage, control, or support the evolution of large-scale industrial software systems.
- **Experience papers** that report on industrial experience with the evolution of large-scale software systems. This includes good practice, lessons learned, analysis of failures and successes.

All types of software and software applications will be of relevance for the discussion in the workshop. Issues related to the evolution of all kinds of software artefacts are relevant to the workshop, including requirement specifications, architecture and design, models, and - of course - source and executable code.

WORKSHOP

PARTICIPATION

Participants will be invited on the basis of either an **position paper** of maximum 6 pages, or a **full paper** of maximum 12 pages in A4-format. The paper should be sent by **e-mail** in PDF or PostScript format to **Tom Mens** (tommens (a) vub.ac.be). The body of the e-mail should clearly include the *authors' names, addresses, affiliations*, the *kind of submission* (position or full paper; research or experience paper), and the *paper's title*. All submissions will be subject to an independent peer-review process, and feedback will be given to the authors. Authors of accepted submissions will be invited to participate in the workshop. All accepted position papers will be made available from the workshop's website. Participants are strongly encouraged to read these papers before the workshop.

FORMAT

The workshop will start with an invited presentation by Susan Elliott Sim about the use of benchmarks for software evolution. From all submitted papers, a limited number will be selected for oral presentation during a plenary session. The selection will be made based on those contributions that have the highest potential for generating issues that can stimulate the discussions. After a discussion on the issues raised during the presentations, participants will divide into groups to discuss a number of important questions. By the end of the day, each group will report its findings to the other participants during a final plenary session. Based on these results, a workshop report will be distilled and made available on the organisers' website.

PUBLICATION

Workshop pre-prints containing all the accepted workshop papers will be distributed to all participants during the workshop. These pre-prints will also be made available from the workshop's website. Additionally, a summary of the workshop will be distilled and be made available as a technical report. After the workshop, all full papers will undergo a selection process for inclusion in a journal special issue. The best papers will be independently re-reviewed and considered for publication in a **special issue of the Journal of Software Maintenance and Evolution**. Therefore, the authors of these selected papers will be asked to revise and extend their papers, based on the comments received from the reviewers, as well as the comments received during the workshop. After an independent round of peer-reviewing, a camera-ready copy of the accepted papers has to be prepared for publication in the Journal special issue.

IMPORTANT DEADLINES

May 30, 2003: Submission of workshop papers. **EXTENDED DEADLINE!**
June 28, 2003: Notification of workshop acceptance

September 23, 2003: Date of the workshop

October 31, 2003: Notification of selected papers for journal special issue
January 5, 2004: Submission of extended selected papers
February 16, 2004: Notification of acceptance/minor or major revisions of selected papers
March 15, 2004: Submission of camera-ready paper

ORGANIZERS

- **Tom Mens**, Programming Technology Lab, Departement Informatica, Vrije Universiteit Brussel, Brussels, Belgium
- **Michael Godfrey**, School of Computer Science, University of Waterloo, Canada
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PROGRAMME COMMITTEE

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- Kim Mens, Université catholique de Louvain, Belgium
- Vaclav Rajlich, Wayne State University, Detroit, USA
- Harvey Siy, Lucent Technologies, Illinois, USA
- Arie Van Deursen, CWI, The Netherlands

INVITED SPEAKER

Susan Elliott Sim, University of Toronto, Canada. *Benchmarking: The Way Forward for Software Evolution*.

SPONSORS

As an official activity of the Scientific Research Network on Foundations of Software Evolution and of the ESF Research Network on Research Links to Explore and Advance Software Evolution (RELEASE) this workshop is jointly sponsored by the Fund for Scientific Research - Flanders (Belgium) and by the European Science Foundation.