Project Results

ATAC
Test automation on the European agenda

The automated testing of complex and highly configurable software-intensive systems to enable European industry to maintain its leading role in the engineering of high-quality software-intensive systems was the focus of the recently completed ITEA 2 ATAC project. A consortium of 15 partners from industry and research jointly defined a set of industrial case studies in different application domains to drive the development of methods and tools geared to creating efficient and practical solutions.

IMPROVED METHODS AND TOOLS FOR TEST AUTOMATION

The development of automated testing for the effective and efficient quality assurance of complex and highly configurable systems re-used existing mature techniques and provided a systematic and tool-supported quality assurance process, with domain-specific languages (DSL) developed to support high-level modelling of test behaviour and test configurations. Other focal areas included better evaluation and improvement of existing test suites and their quality as well as testing in the context of complex systems development where components are provided by multiple parties in parallel and need to be continuously integrated. In all, twelve tools were developed, from commercial and open source to a freely available automated testing framework. The integration of the tools developed in the project into the environments and processes of the case study providers enabled the techniques and tools to be transferred into practical application. The case studies allowed these methods and tools to be continuously evaluated so that the applicability and effectiveness of the solutions in a complex, industrial environment could be ensured. Dissemination of the project results will lead to increased productivity, reduction in costs and work needed for testing and maintenance effort, and faster time-to-market with better quality of software.

TRANSFER OF INFORMATION

The results of the collection and investigation of test automation techniques and methods, best practices, tooling, modelling guidelines, domain specific languages for testing and testing patterns are available in an online repository. The publicly available and well-published content of the repository will make the adoption of test automation easier for the European software industry. Furthermore, the knowledge transfer between academia and industry throughout the project enabled the rapid and effective transfer of information, with a substantial number and quality of university Master and PhD programmes incorporating the work of the project while input from academia enabled all the industrial partners improved their level of test automation and test quality. In addition, the number of scientific publications was astoundingly high.
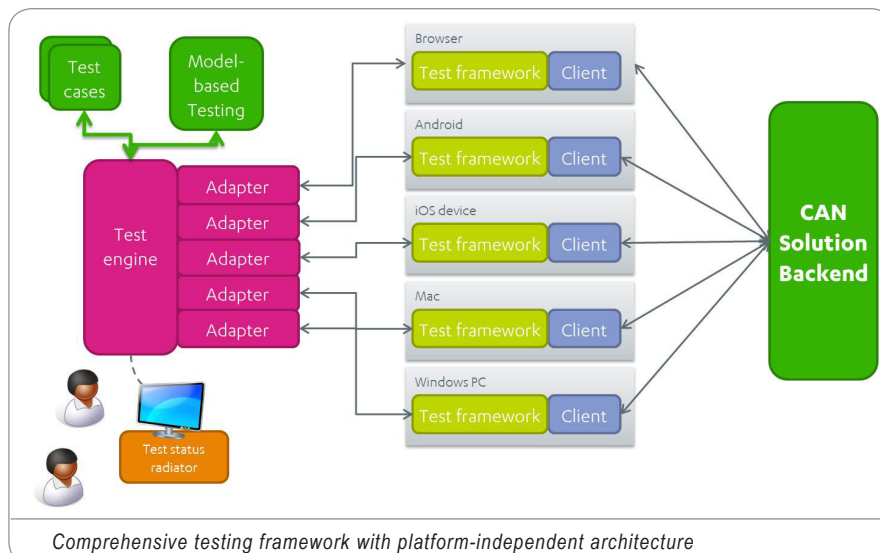
Comprehensive testing framework with platform-independent architecture

ATAC
(ITEA 2 ~ 10037)

■ Partners
Adensy
Barco N.V.
Bombardier Transportation
Elektrobit Wireless Communications Oy
Ericsson
F-Secure
Kaunas University of Technology
Mälardalen University
Maximatecc
Metso Automation
SICS
Singleton Labs UAB
Tampere University of Technology
Tekla
VTT Technical Research Centre of Finland

■ Countries involved
Belgium
Finland
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Sweden

■ Project start
October 2011
■ Project end
September 2014

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Project Results

ACHIEVEMENTS

The approach taken by this ITEA 2 project was remarkable in that it recognised the need for a heterogeneous solution given the different sizes (industry needs) required. This new and innovative type of research approach can be seen as state-of-the-art: no one single solution, but different guidelines and tools adaptable to specific needs and markets. A key objective of the ATAC project was to bridge the gap between the results of test automation achieved in the well-controlled academic environment where a lot of the day-to-day industry constraints do not apply and potential application in the industry. By going downstream to the actual problems that the partners were encountering, concrete solutions were targeted, and achieved.

The partners have benefited in a variety of ways from the results of the project. The list is extensive but a few of the examples of the concrete results achieved in this highly downstream project approach can be cited here. Barco, the project coordinator and traditionally a hardware oriented company was hampered by the cost of poor quality in its transition to a mixed hardware/software enterprise. It was able to use the results to develop a company-wide common framework that has generated a 20% reduction in software verification and validation effort. Elektrobit reduced the costs

of VoIP network functional testing by 30% and through the introduction of a production testing platform within different EB Wireless Business Areas, managed a 40% reduction of investments for production testing costs per new product. CrossControl, a developer of rugged hardware and software for mobile machinery in construction, mining, cargo, transportation and other industries, collaborated closely with Bombardier and increased the number of active licences from 30 to over 100 (>300%).

This impressive list of achievements, which includes the defining and processing of eleven use cases with requirements, gap-analysis and validation along with the preparation of the many new tools for test automation, will make a fundamental contribution to strengthening European industry and give a substantial thrust of innovation and quality assurance within the associated industries. ATAC has indeed got test automation well and truly on the agenda of European industry.

Major project outcomes

DISSEMINATION

■ Attendance to conferences and workshops on more than 45 occasions resulting in the dissemination of the ATAC project results to a wide audience raging from testing conferences with an international audience (ex: ICEE/ICIT, IEEE ICST, EESSMod) over national platforms in the participating countries (ex: Testiautomaatio in Finland) to common workshops with other projects (ex: common ATAC/MBAT workshop). This is reflected in 32 peer-reviewed conference publications.
■ 12 master dissertations and 1 PhD were conducted in the scope of the ATAC project.
■ 5 scientific publications in scientific research journals.

EXPLOITATION (SO FAR)

■ Despite the fact that the main focus of the ATAC project was geared towards the improvement of the quality of existing software-intensive systems and products, some new products and services were also realised:
- **New products:**
  > Some new test-tools were developed in the scope of the ATAC project that can be used by third parties like for example CompleteTest and Murphy.
  > Some existing test-tools were greatly extended and improved during the ATAC project so that they have grown form academic oriented tools into tools that can be used in an industrial setting. Examples are the OSMO and GUI Driver tools.
- **New services:**
  > As a result of the ATAC project, KTU does now provide software testing automation consulting services to aid companies in testing their Java based application.

STANDARDISATION

■ Participation in the "ETSI Methods For Testing and Specification" MBT and TDL standardisation working groups.

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EUREKA

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