Application of an integrated, modular, metric based test concept for object oriented software systems

Fact Sheet

Project Information

ATOS

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Project closed

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Funded under
Software Best Practice initiative within the framework of the specific research and technological development programme in the field of Information Technologies, 1994-1998

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€ 432 000,00

EU contribution
€ 432 000,00

Coordinated by
Deutsche Forschungsanstalt Für Luft und Raumfahrt (Dlr)
Germany

Objective

The prime contractor, the Deutsche Forschungsanstalt für Luft- und Raumfahrt e.V. (DLR), develops high technology software systems for aerospace applications, for ground support systems and for different research areas. This development is increasingly been made using object oriented techniques. While support for the early

phases of the projects is adequate, the area of testing and integrating object oriented systems is not enough developed. Thus the main interest of the partners is to extend its software engineering approach by introducing a systematic test concept for object oriented systems. This project aims at developing and putting into practice an efficient, state-of-the-art, well founded, and cost-effective test approach for object oriented systems that covers all test phases (unit, integration, system and acceptance test phases). The test approach must be scalable to projects of different sizes and with different reliability, availability, maintainability and safety requirements. It must be a pragmatic approach to be applied on real-world projects right away. This concept is to extend the software engineering approach from the partners (DLR and ConSol) and is a further step towards the ISO 9001 certification. The installation of this defined test process will enable the improvement of the software quality produced by the partners. Therefore, a higher customer satisfaction will be reached and the consortium will achieve a quicker reaction to new requirements imposed by the market. This will enable us to reach a better position in the market, to increase the efficiency and effectiveness and therefore to reduce costs. Selected results and experiences gained within the experiment will be available to all companies interested in a systematic test approach for object oriented systems. Additionally, companies aiming at the ISO 9001 certification will be able to have an inside in the costs, efforts and experiences made by the ATOS consortium and analyse the possibility of including this test approach in their own companies.

THE EXPERIMENT

Within the framework of the entire development life cycle, the focus of this experiment is the definition and application of a systematic test approach for object oriented systems and the enrichment of the knowledge on testing object oriented systems of the baseline projects team members and their management. The test approach generated and applied in this application experiment shall fulfil the following main requirements:

- the test approach shall be based on a modular test concept and on a supporting test environment
- the concepts and the environment shall consider the interfaces to the different life cycle phases
- it shall cover all test phases starting from the module test over the integration and system test phase onto the acceptance test phase
- the integration of quality assurance activities shall enforce the correct application of the test methods, procedures and tools defined within this approach and result in an ongoing improvement of these concepts and environments
- CASE tools should be used to support the different test activities.

The main activities to be performed within this application experiment are:

- an assessment in the baseline projects to identify the existing test practices and to determine the knowledge on methods and techniques for testing object oriented systems is available in the project teams.

- tailor a training program for the project team members
- select the methods and tools to be used in the different test phases will be selected
- define and apply concepts for the unit, integration, system and acceptance test phases
- evaluate and disseminate the results

EXPECTED IMPACT AND EXPERIENCE

The impact and anticipated benefits can be summarised as follows:
- extend the DLR and ConSol company software engineering standard by incorporating a systematic and well founded test approach for object oriented systems
- reach higher customer satisfaction and improve the position in the market through better product quality of the software developed in-house or by subcontractors making it mandatory the use of this systematic test concept
- further step towards the ISO 9001 certification of the entire software development process
- introduce a well defined, integrated, modular test concept and environment for object oriented systems supported by the necessary process and project management and quality assurance activities
- increase the knowledge and qualification of the test engineers and project managers in well founded test approaches for each test phase and gain hands-on experience with state-of-the-art test practices, i. e. methods, procedures and tools supported by external training and consulting

Fields of science (EuroSciVoc)

natural sciences > computer and information sciences > software > software applications > **system software**

natural sciences > computer and information sciences > software > **software development**

Programme(s)

FP4-ESSI 2 - Software Best Practice initiative within the framework of the specific research and technological development programme in the field of Information Technologies, 1994-1998

Topic(s)

1.28 - Process Improvement Experiments

Call for proposal

Data not available

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ACM - Preparatory, accompanying and support measures

Coordinator

Deutsche Forschungsanstalt Für Luft und Raumfahrt (Dlr)

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