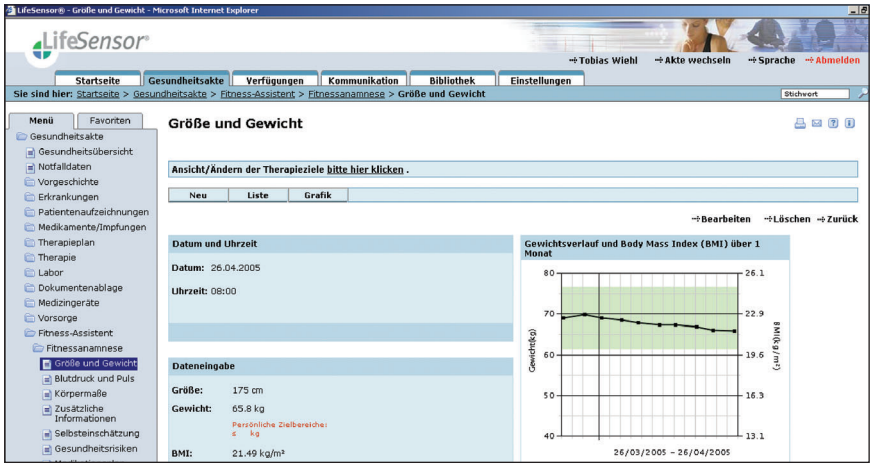
IBM Health Care
Customer Reference

Rational. software

InterComponentWare AG: Professional test automation with IBM Rational Robot.



Overview

- ***The task***
  Create an automated, secure testing environment for reliable and traceable tests
- ***The solution***
  Introduce IBM Rational Robot with ready-made test scripts
- ***The benefits***
  IBM Rational Robot tests the software fully automatically resulting in better quality for application programs and testing processes: while a tester can run approx. 170 tests per day, IBM Rational Robot returns more than 1,000 test results in four hours.

History.

InterComponentWare AG (ICW) was founded in Walldorf in 1998. The company has subsidiaries and affiliates in Berlin, San Mateo (USA), Vienna and Sofia and employs more than 250 people worldwide. ICW is a leading international service and solution provider for the e-health market. It develops and markets components to connect the players in the health care system securely and reliably. ICW's telematics solutions, including the personal health record LifeSensor (http://www.LifeSensor.com), sustainably improve process-oriented communication and data integrity in the health care system, thereby also improving medical care.

A closer look at manual tests.

The range of functions of the web-based health record LifeSensor increases with every release. For example, a fitness assistant has been integrated with which an optimum training program can be created using health data. Furthermore, the complexity of the application grows when new software components from external partners are linked up. The extended range of functions and increased complexity resulted in resource bottlenecks in the test lab. For this reason, a test automation pilot project was initiated to counteract the increasing range of functions, the complexity of the test objects and resource bottlenecks in the test lab. Up to now, test scripts have been written in colloquial English for manual tests. The non-standardized language structure meant that testers and QA engineers had some leeway in performing the tests and interpreting the results. There were no specifications on how detailed the tests and the test results should be described. Furthermore, while information on the current tests was gathered and archived, it was not centrally managed and made available to the employees responsible.

On track to a new solution.

The project focussed on creating a test reference. Test results can only be compared when the exact same sequence of test steps are repeated in a defined testing environment. The limits of automated testing tools had to be determined for high-quality results. It should also be possible to deploy appropriate testing tools at night without any operating staff. Furthermore, the impact on development processes such as requirements management, specification and design had to be examined.

ON DEMAND BUSINESS

"The importance of software quality for applications with high regulatory requirements and customer expectations with regard to the constant and reliable protection of sensitive personal data will continue to increase in the future," says Peter Reuschel, CEO of ICW in explaining the general framework conditions.

The challenge.
IBM Rational Robot Version 2003.06 was selected as the testing tool. The implementation of test scripts that can support different versions of the software to be tested posed a challenge. For this purpose, generic scripts were developed which originated through complete programming and not on the basis of records. As a result, changes to the design or the addition of new fields or links in screens of the applications to be tested no longer affected older test scripts and their results provided that newer functionalities were not involved.

Two helpful approaches.
Firstly, the use of the 'keyword-driven' and 'data-driven' test approach resulted in short but comprehensive test sequences that could be extended in IBM Rational Robot without changing the actual test scripts. This approach was also used later to preconfigure testing environments and clients before the actual test sequence. Secondly, libraries were introduced through which the tests could be assigned to three levels of abstraction that are incorporated in all the test scripts:

1) Tech-Lib: A company-wide, technically oriented library which is independent of the product lines and acts as an interface between Rational Robot and the overlying business process level. In this way, existing test scripts can be ported to new test systems with greater speed and ease.
2) A product-dependent test library as the link between 'Tech-Lib' and the actual test scripts. It provides every product line with its own business process library.
3) Test scripts that run the individual tests can support calls of all the functions from the two other levels. In this way, the level of detail can be adapted to suit the particular test case in question. This division makes it possible to split the test tasks into subprocesses while at the same time reducing the development costs for test scripts.

Conclusion.
The introduction and adaptation of an automated testing tool must be aligned towards the aims of the test: thus, it makes a difference if tests are run periodically at the site of a software producer within the context of a test reference and quality control or if tests are run once at the user's site following migration or initial operation. Test libraries and standardization help minimize maintenance costs for the tools and testing environments deployed. A holistic approach is particularly important: "highly developed testing applications can only make complete use of their advantages if the quality of the test objects is similarly improved," states Torsten Zimmermann, ICW Test Manager. Following the positive experience ICW had in the pilot project, the company now plans to gradually roll out the automated testing process across the company.

Outlook.
The development and implementation of the ICW testing concept on automated testing systems is by no means finished. Two examples of additional tasks include the idea that test lanes should support testing production in the future and that tests should also be created in a structured colloquial language such that even users without specific testing tool knowledge can write successful test scripts.

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