



AVL ensures agile software development

HPE Unified Functional Testing helps shorten development cycles

Objective

High quality test bed software with short development cycles

Approach

Agile software development using the Scrum model, software quality assurance with HPE ALM and HPE Unified Functional Testing

IT Matters

- Central control over the testing and development process
- Standardised repository, open APL artefact sharing
- Predefined integration and test automation
- Risk analysis of omitted tests with HPE ALM

Business Matters

- End-to-end traceability of the development process and complete project transparency
- Fewer personnel required for software testing due to high level of automation with HPE Unified Functional Testing
- Support for the company's work across the world
- Higher quality software for customers' test beds



AVL's drive system test beds help the automotive industry to meet the challenges of shorter development times and higher quality. But the company itself faces the same challenges when developing the software for these test beds. To overcome them, it uses the HPE Application Lifecycle Management suite (ALM) for requirements management and test management, and HPE Unified Functional Testing for test automation.

Challenge

Short development cycles, high quality software

AVL is based in Graz, Austria and is the world's largest independent company in the field of development, simulation and testing technology for car, lorry and large engine drive systems. Its engine measurement technology and testing system products include all of the devices and equipment needed to test engines and vehicles. Everything from cars, commercial vehicles, agricultural vehicles and tractors, right up to motorsports are covered.

“The source code written by our developers needs to be tested. To ensure that test volumes and frequency can be handled as part of our Agile development system, software tests are becoming increasingly automated which is why HPE Unified Functional Testing is used more and more for GUI testing within the company.”

— Hubert Bruggaber, team leader, Global Software Development Tool Service, AVL

AVL helps the automotive industry to overcome the challenges of today and tomorrow with an extensive, integrated portfolio of test systems. These challenges include CO₂ reduction, the increasing complexity of new drive systems with the highest requirements for process efficiency and the fast introduction of new models. The testing systems allow the customer to achieve efficiency increases in the development processes and to bring innovative technologies for electrically powered engines to market quickly.

AVL knows exactly what its customers in the automotive sector value above all else when it comes to development: To shorten development times, save costs and still ensure a high quality product, the product development process has to become increasingly efficient.

The key element of this is front loading - a strategy that ensures that components are as defect-free as possible at an early stage in the development process. This means that the number of prototypes can be reduced. Constructive changes can be made much earlier in the process - which saves money. The later it is discovered that a component is faulty, the more costly the problem is to rectify.

Solution

HPE ALM as standard

AVL has also implemented this paradigm shift in development within its own company - when developing the software for engine and drive test beds. The company has been using HPE ALM for many years to ensure the quality of its software. An engine test bed generally includes more than 25 different software products: the automation system, calibration systems, analysis software, etc.

The solutions are often tailored to meet the needs of the specific customer. Some of the customer's own software may have to be integrated into the test beds - and AVL still has to ensure that all of the software works correctly. Many thousands of different combinations are possible, which makes software quality assurance a very complex matter.

“It is very important to AVL that we deliver high quality software. We produce high-tech solutions so that our customers can rest assured that the software for their motor and drive test beds works 100 per cent correctly, even after a number of years.”



“Test beds are often used by the customer for a considerable amount of time, sometimes up to 20 years or more. As opposed to standard software, such as programs used in offices, we do not have the opportunity to constantly provide our customers with new releases and patches. We have to ensure that our software is as error-free as possible when it is delivered. Which is why we invest so heavily in testing,” says Hubert Bruggaber, team leader, Global Software Development Tool Service at AVL.

Bruggaber’s team provides tools for software development, integration and testing to the areas of the company that need them. Their portfolio currently includes some 50 tools for the teams to choose from. “The only thing we expect is that they follow the processes and guidelines. Whichever tools the teams choose to use is down to them,” says Bruggaber.

But the company has decided that two specific solutions from HPE are to be used as standard for test management and requirements management: HPE ALM and HPE Requirements Management.

At AVL, all requirements are collated into HPE Requirements Management and test cases are then developed from these requirements.

This means that the departments always have transparency over the extent to which tests meet requirements. The links between requirements and any discrepancies and error statuses that occur during testing are also included in HPE ALM. “With the statistics we draw from HPE ALM, quality assurance always has transparency over the test coverage of our software products and what level of quality they have reached,” says Bruggaber.

Many hundreds of employees develop and test software at a number of AVL sites across the world. As well as the headquarters in Graz, there are also sites in Germany, the USA, India and Belarus. “The teams are developing around the world and around the clock,” explains Bruggaber. “We have some large teams with up to 40 or 50 employees.”

High degree of test automation with HPE Unified Functional Testing

To decrease development time, AVL relies on Agile software development based on the Scrum and Kanban development models. Individual software iterations are developed and tested in parallel in sprints of two to four weeks.

Customer at a glance

Software

- HPE Application Lifecycle Management
- HPE Requirements Management
- HPE Unified Functional Testing software

“In the future, we aim to achieve a 70 per cent degree of automation. This means that we will be able complete tests much faster, but with less manpower. Agile software development is only possible with automated testing using tools such as HPE Unified Functional Testing.”

— Hubert Bruggaber, team leader, Global Software Development Tool Service, AVL

“The source code our developers write throughout the day is tested overnight. To ensure that the volume is practical, we have a high level of automation for the software testing process. HPE Unified Functional Testing is becoming the tool of choice within the company when it comes to GUI testing,” says Bruggaber.

Benefits

Same number of tests, fewer employees

The automated regression tests are built up step by step by the software testers who often automate forthcoming tests by script and for some products, the degree of automation is already over 60 per cent.

“In the future, within the next three years, we aim to achieve a 70 to 80 per cent degree of automation,” claims Bruggaber.

“This is much better for the software testers as they do not have to test the same thing every day. We can also complete tests much faster but with less manpower. Agile software development is only possible with automated testing using HPE Unified Functional Testing. If we wanted to test a finished product, hotfixes, patches etc., manually, it would take a number of testers many weeks to test the release fully.”

Bruggaber has also found another benefit in that the tests can run overnight or over the weekend, with very little human intervention. “This supports our software development processes with teams scattered across the world.

“With HPE Unified Functional Testing, we provide our specialist teams with an excellent tool for test automation. And word gets around the company. More and more teams are starting to use the software.”

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