



Public

German Federal Waterways Engineering and Research Institute

Better product quality through systematic control

Background

The Federal Waterways Engineering and Research Institute (BAW) is a higher authority operating at national level in Germany. It supports the Federal Ministry of Transport, Building and Urban Affairs (BMVBW) and the Federal German Waterways and Shipping Administration (WSV) in building, expanding, operating and maintaining national waterways. The BAW's responsibilities cover structural engineering, geotechnical engineering and hydraulic engineering in inland and coastal areas. The Information Technology Centre in Ilmenau is the institute's central point of contact in all matters relating to IT. The BAW currently employs 450 people and has been allocated an annual budget of some 40 million euros, with which it carries out about 1,000 individual projects per year.

The Challenge

WaGIS, the Waterways Geoinformation System, was created by the Federal German Waterways and Shipping Administration (WSV) and provides a network that integrates the many IT systems at the WSV as well as external data sources. For the first time, users are able to view and evaluate data from various sources in one system. They also have new functions at their disposal for displaying and analysing the geodata. WaGIS is designed as a central information platform for the

WSV, which has locations spread all across Germany. The system allows WSV departments and staff to communicate faster and in better quality, as well as improving the implementation of projects (e.g. in waterway construction).

The greatest challenge in bringing WaGIS to fruition lay in integrating the separate systems that were already in existence. The BAW had to deal with a multiplicity of different IT processes, ranging from CAD to straight worksheet procedures. On top of that there were different user authorisations, applications, platforms and much more besides. To round it off, WaGIS was supposed to be able to be used as standard in more than 140 WSV offices across the country, as well as by external users.

Because of the complexity of the tasks, the BAW also had to bring various suppliers on board and get them all to follow the same line – from the general contractor right through to the database supplier. This made project management and communication between the partners all the more demanding.



The Solution

The complexity of the WaGIS solution induced the BAW to break new ground in project organisation and execution. Among other things the institute invested in systematic software quality management and in additional quality assurance measures (testing). Two points emerged as the most important factors in success: firstly the involvement of external appraisers as independent mediators between the BAW as the client on the one hand and the suppliers on the other, and secondly planning and carrying out tests at an early stage, before actual implementation. Both of these tasks were undertaken by SQS Software Quality Systems.

On the back of this experience, SQS was brought in on a whole series of projects, dealing with a range of specific tasks:

- Assuming an appraiser role at individual stages of a project; in consultation with the client and the suppliers, SQS checked whether the results met the requirements
- Within that framework, acting as a link in communication between the client and contractors
- Systematisation of test case specification (definition of test objects)
- Performing test planning (prioritisation of test cases, resource distribution, cost-benefit analyses, test coverage analyses)
- Running the individual tests in cooperation with WSV experts
- Testing individual documents (primarily source code analysis)
- Formalisation and standardisation of the test process as a whole

The Benefits

- The BAW obtained about 95 per cent of the commissioned WaGIS functions error-free (compared with an estimated 65 to 70 per cent without systematic quality management).
- Product quality has clearly benefited. The BAW can put WaGIS to use for its purposes without restriction: faster internal and external communication together with higher quality of services in construction and maintenance projects.
- Budget targets were easier to keep to.
- The quality of the system means it copes with additional loading, especially when the system is further expanded. Upcoming maintenance costs were confined within limits.
- The investment has already proved worthwhile, with development procedures now flowing more freely to add to the comprehensive achievement of the BAW's objectives for WaGIS.

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