Browser-based test data evaluation in quality assurance

NI DIAdem is the first choice when it comes to analyzing technical data and generating reports from it. Its range of functions and powerful interfaces enable fully automatic, fully interactive and combined solutions. However, if DIAdem cannot be installed due to technical or organizational restrictions, special approaches are needed to make DIAdem's functionality available to users nevertheless. müller+krahmer GmbH developed such a solution for a major pneumatics manufacturer, based on an Oracle database and an HTML application (HTA) running in Internet Explorer.

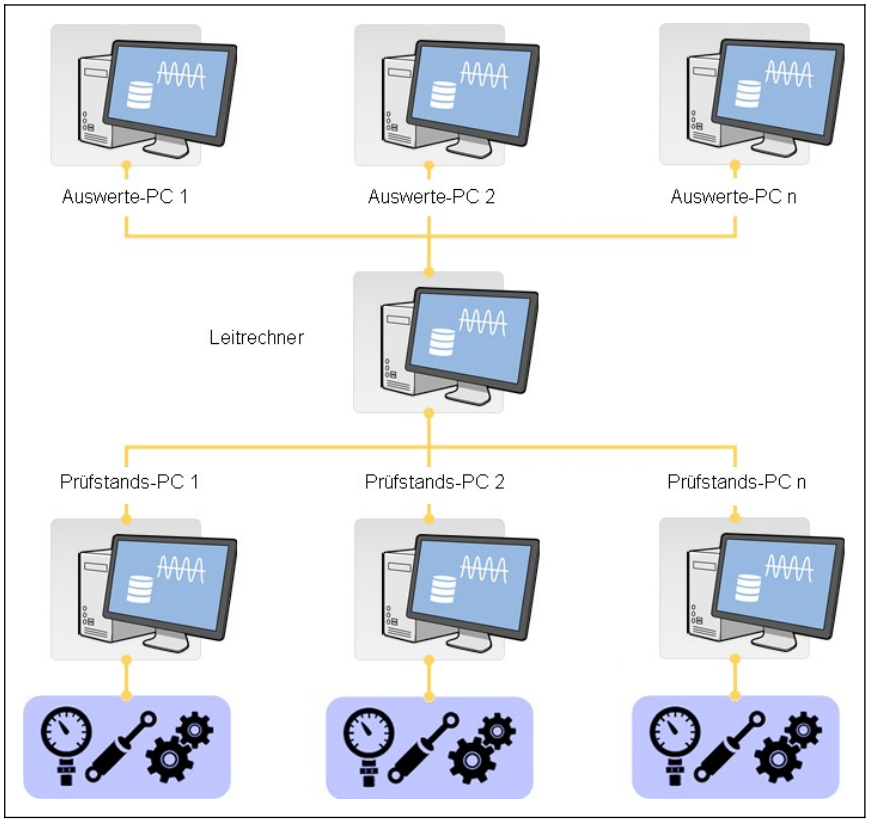


Figure 1: Schematic representation of the system structure with central host computer and any number of data sources (test benches) and data sinks (evaluation PCs)

In the present case, the task was to give numerous employees of the customer from production, quality assurance and customer service access to the data produced around the clock by about a dozen end-of-line test benches. This data comprises metadata such as order and customer information, identification features such as serial numbers of the device under test and its components, as well as the actual test data. This information was to be available both individually and combined in a test report in PDF format. Since only a few of these employees have access to a DIAdem installation, a local DIAdem application and the associated access to DataFinder technology were ruled out. The user interface was to be a component available on all user computers. After examining various approaches, the decision was made in favor of Internet Explorer and an HTML application (HTA) running in it. This approach offers several advantages: the DIAdem scripting language Visual Basic Script (VBS) is also one of the programming languages of HTA. Functions already implemented in DIAdem can therefore be reused with little adaptation effort. VBS also offers extensive system access under Windows. In addition, HTA allows input and output via HTML forms as well as dynamic adaptation of the HTML page. The VBS code in HTA is not compiled but interpreted, resulting in relatively small files with extensive functionality and visible source code.

The test benches, which have been in use for around two decades with DIAdem-based application software, generated DIAdem DAT test files until a fundamental modernization a few years ago, and

| mueller+krahmer GmbH | Koenitzer Str. 14, 07338 Kaulsdorf, Germany | Phone: +49 36733 / 23286 | E-Mail: email@mueller-krahmer.de | Web: www.mueller-krahmer.de |
| Headquarters: Kaulsdorf | Commercial Register: Jena Local Court, HRB 514035 | VAT ID: DE315104478 | Managing Directors: Dipl.-Ing. Holger Müller, Dipl.-Ing. (FH) Marco Krahmer |

TDMS files since then. Both formats were to be available for evaluation. An Oracle 10 database already in use at the customer was specified as the central component for data storage and search.

Since reimplementing DIAdem's functions for handling DAT and TDMS files and for report generation in VBS would have required excessive effort, these functions still had to be provided by DIAdem – even though the software itself was not available on the users' PCs. The solution is a central DIAdem instance on the so-called host computer, a central computer with access both to the data servers holding the test data and to the Oracle database. The central DIAdem instance thus performs the two tasks that require DIAdem functionality: transferring the parameters from the test files to the database and generating the report from the test files – because, in order to limit the amount of data in the database (the volume of the test files amounts to several dozen gigabytes), only individual parameters, but not time histories of measurement data, were to be stored in the database. Moving the parameter transfer to the database from the test bench computers to the host computer also relieves the former and thus shortens valuable test time.

The DIAdem application for test data storage is permanently active on the host computer. While the application is running, the configured source directories are searched for test files, their parameters are entered into the test database and the files are moved to the likewise configured target directories. Test report generation is embedded in the test data storage and carried out in parallel with it. Thanks to DIAdem worker technology, up to 10 report generation jobs can be processed simultaneously – if more arrive, they are collected in the job stack in the database and processed as soon as a worker instance becomes available.

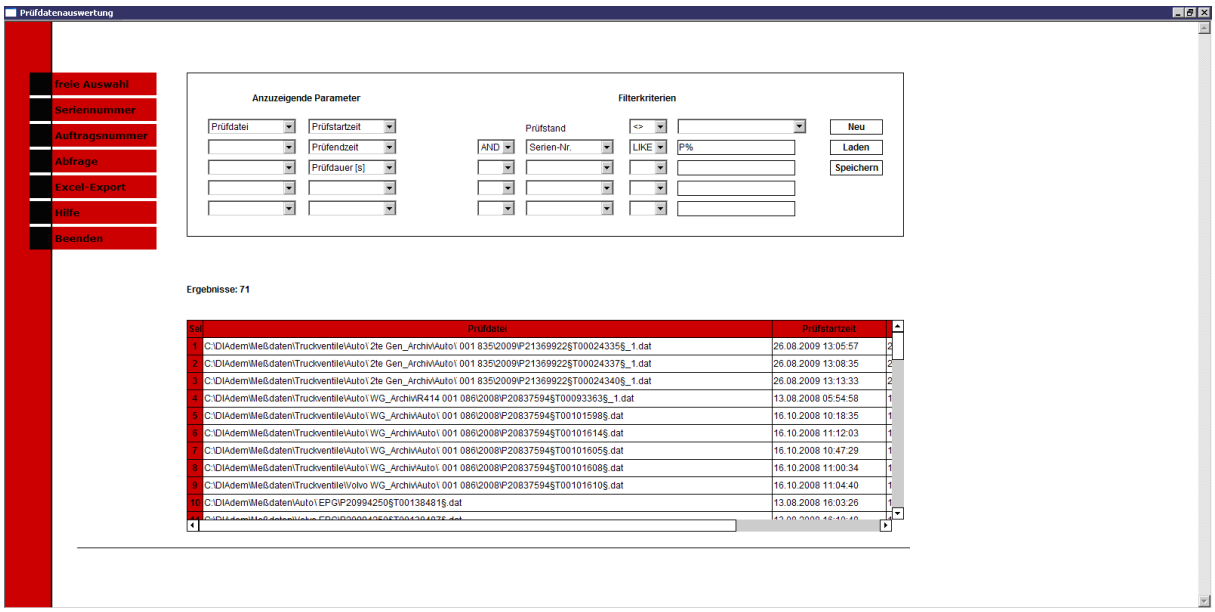


Figure 2: User interface of the HTA application for data search in the variant for free selection of query criteria

When the HTA application is started on the evaluation PCs, all program files are first updated and then the actual application is launched. It provides two basic variants of user interfaces for entering query parameters – one for free selection of search criteria and display parameters, and one for predefined queries based on serial and order numbers. The free selection of query criteria allows up to 10 parameters to be displayed and up to five filter criteria linked by AND or OR to be defined. Comparison parameters and comparison operations are selected from lists, comparison values are entered in input fields.

The queries based on serial or order number each provide a number of input fields for comparison parameters and a selection list for an additional criterion regarding the test result.

The results of the database query are displayed in a table with a maximum of 100 rows. Buttons allow paging through the results and jumping to the first or last result record. In addition, the query results can be sorted in ascending or descending order by the individual parameters. For statistical evaluations with special tools, the query results can be exported to an Excel file.

| mueller+krahmer GmbH | Koenitzer Str. 14, 07338 Kaulsdorf, Germany | Phone: +49 36733 / 23286 | E-Mail: email@mueller-krahmer.de | Web: www.mueller-krahmer.de |
| Headquarters: Kaulsdorf | Commercial Register: Jena Local Court, HRB 514035 | VAT ID: DE315104478 | Managing Directors: Dipl.-Ing. Holger Müller, Dipl.-Ing. (FH) Marco Krahmer |

Clicking on the row headers of the results table starts the creation of a test report in PDF format for the selected test file via the DIAdem installation on the host computer. Parameters are exchanged via the Oracle database. Static test parameters are shown in the test report as tables, dynamic parameters as curves:

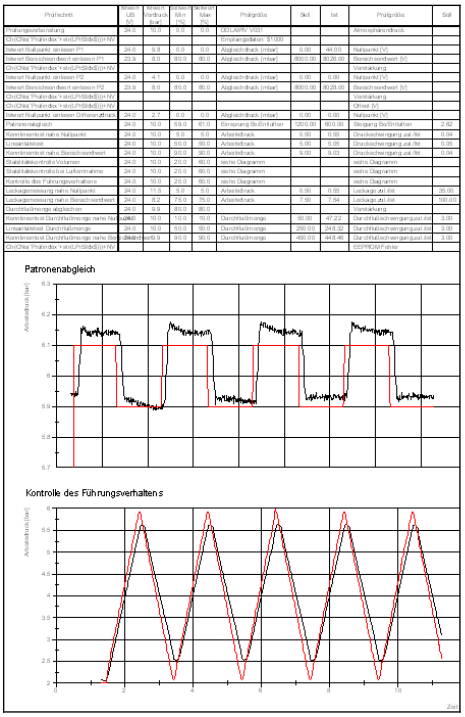


Figure 3: Test report in PDF format

| mueller+krahmer GmbH | Koenitzer Str. 14, 07338 Kaulsdorf, Germany | Phone: +49 36733 / 23286 | E-Mail: email@mueller-krahmer.de | Web: www.mueller-krahmer.de |
| Headquarters: Kaulsdorf | Commercial Register: Jena Local Court, HRB 514035 | VAT ID: DE315104478 | Managing Directors: Dipl.-Ing. Holger Müller, Dipl.-Ing. (FH) Marco Krahmer |