

Feedback Consolidation Interviews „OpenMDM User“

Four interviews/ observations have been executed on 27th October 2014 in a meeting room at the BMW central office in Munich. Three of the interviews/ observations have been recorded with an audio device in order to support documentation. All information (feedback) is anonymised. In addition the persona „Prüfstandstechniker“ (Test executive) and „Versuchingenieur“ (Test planner) are described briefly.

Persona *Prüfstandstechniker* (Test executive):

Works in an industrial building at a workbench. The test executive prepares the workbench, supported by a mechanic if needed, starts and stops tests and operates the units under test and the measuring devices.

Persona *Versuchingenieur* (Test engineer or test planner):

The test engineer works in a larger bureau with several working places. The working place is rather quiet.

Rough general description on how these personas work together:

Units of tests like seats, fairings, exteriors, wheels or gears are for example checked concerning their solidity, life span or their behaviour when exposed to solar irradiation. Tests can be performed for in-house productions as well as for external brands.

The test engineer creates under considerations of statutory provisions and based on test templates new tests and assigns them to workbenches. The layout of workbenches and test executives is planned in either of two ways:

- 1) The test engineer calls the test executive and asks when a certain test can be run on which workbench.
- 2) The test engineer defines an event in the Outlook calendar of the workbench (assuming the workbench has one). The workbench is well-staffed on workdays. The assigned test executive checks the Outlook calendar to find out which tests shall be performed.

Test executives and test engineers have special expert knowledge about which workbenches provide which equipment and therefore are predestined for certain test cases. How tests shall be executed is derived from the directives indicated in the test order. In most cases the test executives know exactly how a certain unit has to be tested.

Test results are entered into the ODS system partly by the workbench and the measurement devices themselves, partly manually by the test executive. He adds also deviations from the test specifications if there had been any.

The test engineer evaluates if a test had been executed correctly by analyzing the test results and the additions made by the test executives. Finally the test engineer can add data to the test run information.

The other roles working with the application:

Role *Fachadministrator*:

Creates test templates i.e. he defines the steps which have to be passed through as well as which mandatory information has to be provided when defining new tests. New test templates are often derived from existing ones. He is allowed to delete test data. Often also done by the persona Test engineer.

Role *Administrator*:

Defines application appearance and available function set (menus and menu items). He handles role and rights management.

Installation

The client is currently distributed as a zipped file by superiors and colleagues. In order to fulfill special business needs of certain users/ user groups the client has been extended by plugins (e.g. provided by Gigatronik Ingolstadt GmbH). Thus many different versions are now in use among the departments. It is planned to setup an automatic, unified deployment. Depending on the processing power of the computer in use the application starts within a few seconds.

Usage

Test engineers use the application permanently. But only test executives of certain departments utilize it. The application is in use significantly at more workbenches since approximately two months. In order to compensate for the shortcomings of the application (incomplete import, insufficient evaluation support) at some department external solutions (e.g. excel sheets) have been created. Some departments do not need the application's evaluation features but wanted to overcome the missing test documentation of the prior excel based solution. The XYChartView is rarely used. Important components are as follows

TemplateManager (Fachadministration)	Create test templates and maps the business model to the ASAM ODS model
Testplanner	Create and issue tests
Search with connected evaluation component	Find and evaluate test executions

Test planning

Tests change their state during their life cycle. A test is newly generated and can be saved as is without issuing a commission. Alternatively the test is saved and commissioned. IN most cases a corresponding event is added to the Outlook calendar of the workbench. The Outlook event is created and sent via email. At the defined time the test is executed and enriched with measurement data. Test execution times can be rearranged in accordance of the test planners and test executives in case some test needs precedence. The handling of finished tests differs from department to department. Whereas some keep all test data for a legal retention period of 10 to 15 years others delete test data at their own discretion.

Tests can end ahead of schedule either with a positive result (just less time than presumed was needed) or a negative result (defect on the unit under test made further test steps impossible). Currently there is no reporting back to the workbench layout so that workbenches remain unused. The same applies when tests need more time than expected. The use of a resource planning tool is a long-term objective. This tool should

- ensure a balanced workload for workbenches and personnel
- help avoiding workbench over-occupation

- reveal available workbenches along with their equipment as well as available staff
- point out the test types so that similar tests (with similar equipment needs) can be bundled thus shorten preparation time for workbenches

Furthermore changes in the test schedule (shifted time slots, tests moved to other workbench) are not confirmed by the test executive staff. Therefore the test planner cannot be sure that the test executives have noticed the adaptations without calling them.

Navigator

The navigator (tree) is a central component of the application and is used among all working steps.

Data

The test engineer plans 10 to 20 tests on average per day. But it is not seldom that he plans all tests for the whole week already on Monday morning. There is no archive functionality for old tests. Thus they are displayed in the navigator tree impeding finding of relevant tests.

Evaluation

Very useful for the work with the Fachadministration is the so called NameHelper. It allows to tag input fields with special codes while defining test templates. These codes are then evaluated during test creation so that input fields can be filled automatically with e.g. login data of the current logged in user.

The email notification system for workbenches used to commission tests is highly appreciated.

One of the major point of criticism is that after a test has been defined, no changes can be applied to it. Typos cannot be corrected even though the test has not been published yet.

The composition of a test template, based on an existing template is inconvenient. Even if only a detail has to be adapted, all subtemplates (unit under test (Prüfling), measurement data (Betriebsgrößen), test setup) must as well be copied and added manually to the new template.

It is not transparent/ obvious which changes have which impact on the test template i.e. on the workflow defined by the test template. A preview before committing changes on the templates would be appreciated.

Just by scanning the navigator tree it is not transparent, which templates are composed of which subtemplates (unit under test, measurement data, test setup).

Adding of measurement results is complicated. As the test order specification cannot be altered, the predefined input fields cannot be edited. Instead an addendum has to be created, mirroring the exact same input fields.

Potential differences between test description (test engineer) and measurement description (test executive) is unapparent.

Wishes

As long as a test is not commissioned the owning test planner should be allowed to edit the test definition.

It is desired to compare results of multiple tests and whole test series.

Often it is not obvious what a test template is used for. Help texts informing about its purpose can be added but are not as visible as they should be.

A filter feature for the navigator shall facilitate the search for tests of interest. Commonly used criteria are test id (Versuchsnummer (V-Nummer)), name of the test executive and project id. Equally interesting are failed and successful tests, particularly recent ones (yesterday, today) and those that are owned by the logged in user. It would be nice if search criteria could be saved and reloaded.

User input is only partly validated. The user does not know which input is allowed.

The application might have a more appealing design. In some cases input fields are small even though much empty space is available.

It would help a lot, if the notification mails would provide a link back into the OpenMDM system such that the test executive does not have to search for the test definition with the sparse information included in the mail.

The test planner should be notified when the test executive uploads measurement results.

In order to be able to evaluate if a test has been executed correctly acceptable upper and lower limits of measurement data should be made visible.

Conclusion

In contrast to the test planning module there is no user guidance in the module Fachadministration. The user has to find out by himself what it needs to create a valuable test template. The composition of subtemplates (unit under test, measurement data, test setup) should be optimized. This would require a new workshop.

The test executives know (expert knowledge, test directives) which type of results have to be added to the test definitions. It is not obvious from the application itself.

The search feature should be simplified. Maybe a faceted search approach could help.

Measurement data evaluation/reporting: The requirements vary from department to department. All plan tests but only some need (simple) evaluation features (e.g. to find today's failing tests). External tools e.g. Concerto are often oversized for this kind of quick analysis. Some wish to get a summary of successful and failed tests (and have a special extension, which unfortunately not works as expected). Generally a quick and lean integration into external reporting tool is preferred to have general analysis reports off the data (like the X/Y chart, which nobody uses), as these tools can do this much better.