



# Software Process Improvement Case Study



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## *MOCAVEET – Managing of Configuration and Versions Enabling Effective Testing*

### Overview

Since 1995, the company BOOM software GmbH has been producing software in the data warehouse, industrial software and individual software sectors. The projects finalised by BOOM can be envisaged in any scale, from small programmes to projects lasting several man years. The focus of activity, however, is always quality and the readiness to develop a component library for clients. For this reason there is a particular need for quality management.

BOOM was able to gather experience in the application of reviews, version management and test execution within the framework of the SPIRE project. These experiences will be applied in the company as a whole down the line. In this regard, care is being taken to keep operations formal so as to ensure that processes can later be duplicated

### The Organisation and its Environment

BOOM Software GmbH is an independent software producer based in Leibnitz/Austria. Since its establishment, the company has developed into a regional leader in the software sector. Centred around its target groups, the company is divided into three sectors:

#### 1. Data Warehouse Solutions

This section offers solutions in the new area of multi-dimensional databases. Projects are OLAP (Online Analytical Processing) solutions. Generally, the aim is a Management Information System or a “Decision Support System”. The tools deployed are widely dispersed. A relational database is standard, as are a multi-dimensional front or back end, and various programming languages.

#### 2. Industrial Software and Visualisation

This involves supporting the broad field of process control and visualisation. Typical clients include water and power plants. Standard software for the visual programming of SPS hardware is also being developed.

#### 3. Individual Software

This concept encompasses just about any type of software within a defined environment. Clients dealt with generally come from the financial services sector and the pharmaceutical industry.

In addition, BOOM Software GmbH offers individual clients services in the following sectors: **consultancy, analysis, design and implementation** (in respect of various platforms and programming languages); **Internet** (HTML, Client/Server scripts), **Datawarehouse** (or Management Information Systems in relational and multi-dimensional technologies) and **training** (in respect of technologies and software solutions).

### The Starting Point

Evaluation of the questionnaire (synquest assessment) filled out by BOOM Software GmbH employees in the context of the SPIRE Project showed that there are weaknesses in the quality management, metrics, tests and integration sectors.

*“Our guiding company principle means that a lot of attention is paid to quality and responsibility; however, the size of our company means that we ignored professional quality management up to now” -*

**Joachim Schnedlitz (Manager)**

This defect is to be remedied using the so-called MOCAVEET Project (“Management of Configuration and Versions Enabling Effective Testing”), which has been developed by the management in co-operation with the Seibersdorf Research Centre.

The project basically consists of a three-point plan. This is generally termed “workpackages”, as in the SPIRE jargon.

- **Introduction of reviews for specific milestones within projects**
- **Configuration management to cover all baseline projects**
- **Introduction of test procedures in order to test effectively and regressively**

The introduction of automated test procedures was the main aim of the project. In terms of software production, these serve to avoid recurring errors and, especially, side-effects of alterations.

The first pre-condition for this was the introduction of reviews in order to detect test requirements at an early stage. The second pre-condition was smoothly functioning configuration and version management. These two processes then facilitate the third step: the introduction of specific test methods which are to be supported by adapted techniques and tools.

## **The Improvement Project**

The project pre-supposes the first two sectors in order to execute the third sector. After all, test planning is to be integrated into the reviews. The test scripts required for text execution are, in turn, administered by the version control sector.

### **1. Reviews**

In the context of a review, an element or operation is assessed in order to detect any inadequacies. If there is a written template for the element or operation, a check is made as to whether this is being adhered to. The review itself either results in confirmation that the

available result is correct, or in precisely detailed instructions for improvement.

These reviews should become more formal – less informal – and should be organised in the form of checklists. All reviews (and decisions) can then be administered using a simple tool, in order to create the basis for more precise analysis. In addition, depending on their use, the reviews should be classified and integrated into existing project plans.

For this purpose we developed written templates which are to be used by the employees. These will then be incorporated into the documentation in respect of the relevant projects. Reviews have the advantage that operations can be duplicated very quickly and simply, resulting in a control mechanism which is linked to a direct feedback.

### **2. Configuration Management**

Parts of the existing configuration and version control tools are to be extended and established as the company standard for both large and small projects. In addition, the version control system is to be brought up to date in order to also facilitate the synchronisation of source files.

Following a test phase, the product MS Visual SourceSafe 5.0 was installed on a single workstation in the company. It was chosen due to its simple integration into the Microsoft development environments. This tool is now being increasingly employed and has already significantly shortened the development time within the team.

*“We used to have major problems keeping our common source codes uniform. Alterations always got lost. This has now significantly improved through SourceSafe.” –*

**Bora Man** (developer – industry)

Furthermore, some tools are available which also offer Source Safe support for Office products; thus the new functionality is of benefit not only to the employed developer.

### **3. Test Execution**

Based on the configuration and version management, the personnel is to be trained in the following areas:

- Test planning combined with milestone or review activities
- Preparing test execution and the necessary documentation
- Test execution with a repeat capability due to parallel test recording
- Evaluation of the test results within the project (further project management) and within the company (error metrics).

Of course, the test execution and documentation should also be supported by the relevant tools; these still had to be selected at the time.

Following an internal evaluation of various different test tools (and, especially, test tools of different types), we finally decided on the SQA Team Test product produced by Rational. We were impressed by its ease of application and the GUI support. This tool is now to be deployed in a major planned project.

## **The Results**

Using the means which we received in the context of the SPIRE project, the first improvement have already become visible. The software development process is now documented and can thus be structured and checked in individual studies.

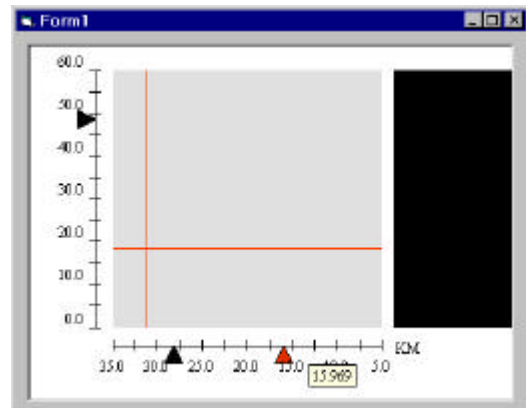
*“Due to the new means, there has been a visible time saving; in addition, we are supplying our customers with products which are significantly easier to maintain.” –*

**Joachim Schnedlitz** (Manager)

Team work is being decisively improved through the use of the Visual SourceSafe version administration, since this makes the joint use of source files and, in particular, teams’ joint work on projects easier. The version control, which makes the source files available in a central database (accessible to all), now enables everyone to harmonise alterations to source files with the project as a whole.

Automated test procedures are to be increasingly used further down the line, in order to both detect and avoid errors. An example of a detected error:

An ActiveX-Control, indicating a diagram, was tested. Markers can be placed on the axes and moved using the drag’n’drop function. In this regard the marker on which one has just clicked is highlighted in red.



Following a functionality extension (a moveable crosshair was inserted), the marker remained red on being moved, even after the left mouse button was released, since an internal flag was no longer correctly set.

*Problems like this are common in development. However, detecting such errors is very laborious, since functions are involved which have already been treated as functional*

– **Michael Roth** (Profit Centre Head – Industry)

The SQA robot, which carries out regression tests, was used for testing. That means that the user’s operating steps are recorded sequentially by a programme. During this, test cases are incorporated which, one after the other, can record attributes such as values, texts, contents of list boxes and the like, in order to later compare them with the new contents.

A test was set up for the programme which executes the insertion of markers, and then tests the window’s content in the form of a graphic.

On repeating the test, the marker was no longer shown as black, which caused the test to miscarry and thus enabled the detection of the error – an initial success for BOOM’s newly gained development tools.

## **Insights**

The improvements brought about by the SPIRE project mean that BOOM employees increasingly recognise the importance of written documentation and the checking of work operations (formally realised by the review).

Motivation in this respect is quite hard to come by, since the value of such records does not become clear at the time



of execution, but only following a longer application period.

The same applies to the long-term planning of the development process in combination with the development and planning of test procedures. While this manner of proceeding shortens the development time as a whole, the extra labour involved at the beginning appears rather to lengthen the development time. However, the benefit to be anticipated in the medium and long-term can be seen.

Motivating employees to use version management proved the simplest. Its functionality becomes obvious once the first files have been added. You can see at once where its advantages lie and how it will improve the development process. In addition, the application demands relatively little effort.

### **Future Plans**

We have achieved the goals which we set ourselves within the SPIRE project. But the introduction of new methods is actually just starting for BOOM Software GmbH.

The procedures for deploying the new means review, version management and automatic testing are now being deployed and expanded, in order to be able to adapt them to company requirements. At the same time, it is intended that the procedures will become a matter of course for all BOOM employees. However, that will probably only become possible after a longer introductory period.

For example, due to the size of the company it does not make sense at the moment to execute, and electronically process, reviews for all activities.

*We will certainly continue expanding our experience and means in respect of quality management, since this represents a decisive basis for the further growth of the company BOOM Software GmbH."*

– Joachim Schnedlitz (Manager)

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