



# Benchmarking Server Technical Description

## 1 Scope

This document should give answers to the following Questions:

- ❓ **What is the „Benchmarking Server“ about?**
- ❓ **How does it work?**
- ❓ **Which structure does it have?**
- ❓ **Which technologies are used?**
- ❓ **Which security model is realized?**

## 2 Basics

The Benchmarking Server is a web based application (Internet or Intranet), which permits analyzing, benchmarking and reporting (*Benchmarking Report*) of data generated by a *Self-Assessment-Tool* (e.g. SynQuest).

Users are able to upload *Assessments* over the Internet and compare them with the *Assessments* stored on the Benchmarking Server. This is not a superficial comparison but many thousand different comparisons (e.g. comparing different countries, different company sizes, etc) can be generated.

An User of the Benchmarking Server can generate a *Report* on the fly or can make him send such *Reports* in defined intervalls (like a subscription) per email.

The whole functionality of the Benchmarking Server is generically adjusted to the structure of all *Assessment Tools* of the „Quest-Family“ (SynQuest, Spice121, ÖkoQuest, ControllingQuest etc).

This means that within a few hours a new tool which is generated by SynEdit can be set up on the Benchmarking Server with all its features.



### 3 Structure

#### 3.1 Users

The Benchmarking Server can only be used by registered Users. Basically there are three different groups of Users and the Administrator ("Expert User") can change, add or delete Users and User's rights.

##### 3.1.1 Restricted User

The Restricted User is only allowed to upload one *Assessment* at a time, preview charts and generate *Reports* which are released for all Users.

##### 3.1.2 Registered User

The Registered User is allowed to upload and manage more than one *Assessment*. He can group these *Assessments* to one or more groups to compare them against themselves or against the Benchmarking Data on the Server. This can be done in a *Report* or in single Charts in the Chart Preview Section.

##### 3.1.3 Expert User

The Expert User has the right to do anything within the Benchmarking Server. He is allowed to either add new Users or delete them and add, change or delete *Chart Layouts*, *Selection Groups*, *Selection Criteria*, *Data Definitions*, *Report Sections* and *Reports*.

But he has not the right to view or manipulate the Benchmarking Data on the Server.

#### 3.2 The Principle

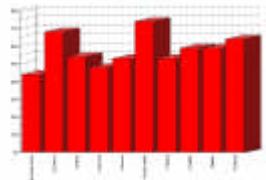
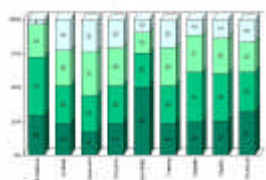
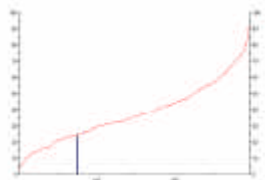

The Benchmarking Server generates Charts with the help of three components:

- a) *Chart Layout*
- b) *Selection Criteria Group*
- c) *Data Definition*

##### 3.2.1 Chart Layout

This component designs the charts to be generated. There can be created as many *Chart Layouts* as you like, because e.g. Scoring Charts have an appearance different from e.g. Rating Charts.

Basically there are four different types of Chart:

1) Scoring Charts	2) Rating Charts	3) Ranking Charts	4) Capability Charts
			

You are able to define, among others, the type of the Chart (e.g. Bar Charts), the font of the labels (X-Axes, Y-Axes, header, etc) and the background color.

### 3.2.2 Selection Criteria Group

You are able to define exactly which of the uploaded *Assessments* of the Benchmarking Server you want to be shown in the Charts or the *Report Section* (see below).

You can do this by defining a *Selection Criteria Group* which is a collection of one or more *Selection Criteria*.

#### 3.2.2.1 Selection Criteria

A *Selection Criteria* defines, the *Assessments* to be used.

Each *Assessment* that is stored in the database of the Benchmarking Server can be divided into many different categories.

Some examples:

- The size of a company
- The country where the company has its headquarters
- Its line of business
- ...

These criteria differ according to the tool out of the „Quest“-family being used.

With the help of the *Selection Criteria* you can decide which *Assessments* you want to use.

One Example is only to use *Assessments* from Austrian companies.

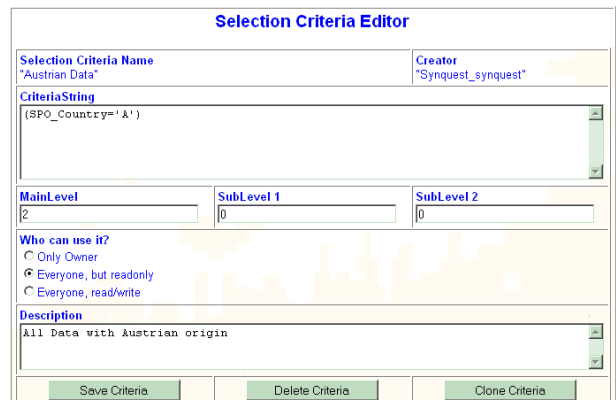
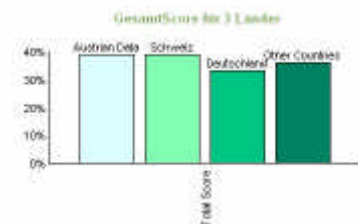
If you decide to unite several *Selection Criteria* into a *Criteria Group* you are, for example, able to show *Assessment Data* out of four countries side by side.

One Example:

One *Criteria Group* is made up of the four following *Selection Criteria*:

- 1) Austria
- 2) Germany
- 3) Switzerland
- 4) Others

Now you can generate a Chart which shows one bar for each of these four categories. The result of this Chart is shown in the picture on the right. It shows a nice comparison between Austrian, German, Swiss and other companies.

### 3.2.3 Data Definition

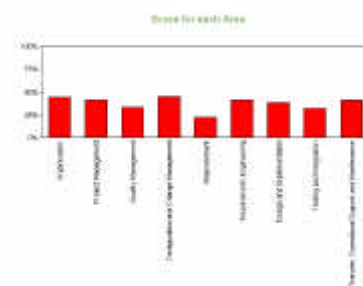
In contrast to *Selection Criteria* resp. *Criteria Groups* the *Data Definitions* define the contents of a chart and not the number of *Assessments* to be used.

Basically there are three differences:

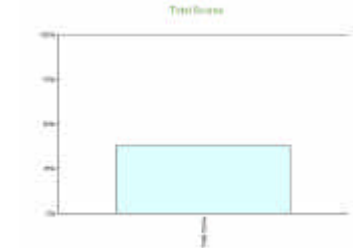
1) Questions resp. Processes



2) Areas resp. Categories



3) Total



In the first case you can see each Question (resp. their per cent values) being compared to each other. You are also able to show the *Attributes* of each Question (resp. their per cent values).

That means that in the *Data Definitions* you are able to define which part of the *Assessments* is evaluated.

With the Benchmarking Server you can basically do each Evaluation you have generated with the help of the Quest-Tools, but you have much more opportunities to do that.

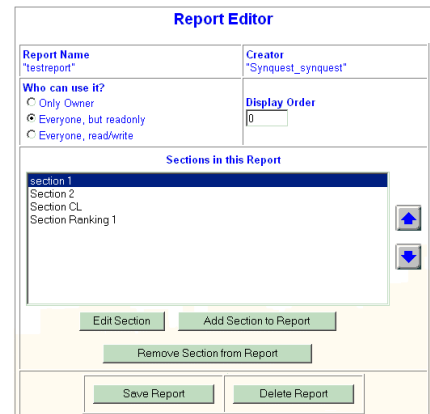
### 3.3 The Reports

Beside the generation of Charts, you are able to generate *Reports* on the basis of the *Assessment Data* stored in the Database.

On the one hand you can generate *Reports* on the fly (with the actual Data) and view them in the Browser or download them in the Adobe Acrobat File Format ("PDF") onto your local harddisk.

On the other hand you can define your own *Report*.

One *Report* is made up of one or more *Report Sections*. Of course you are also able to change the order of appearance.



#### 3.3.1 Report Sections

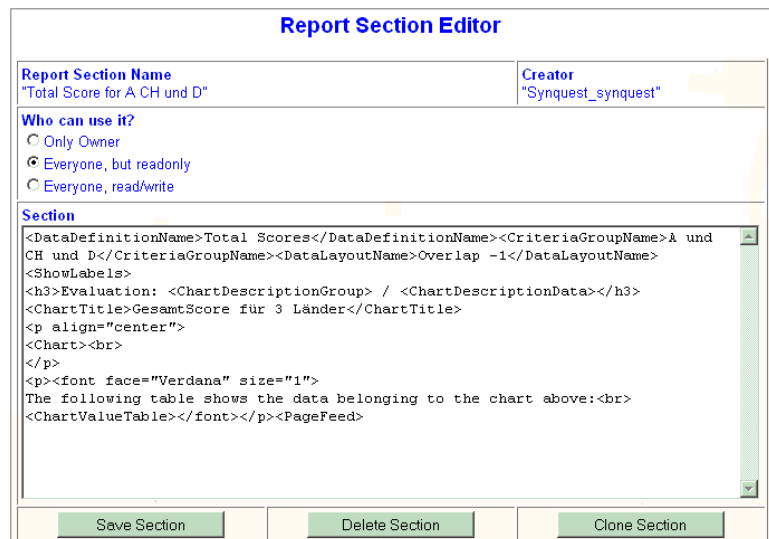
The *Report Sections* are the components of the *Reports*.

On one side they contain real HTML-Code which defines the layout in one *Section*.

On the other side there are built-in tags which define the place where one chart is shown (in the *Section*) and which contents this chart has.

##### 3.3.1.1 HTML-Code in Report Sections

With the help of HTML you are able to define the layout of each *Section*.



Almost all the tags of HTML may be used in a *Report Section*. Some examples are: „<table>“, „<p>“, „<br>“, „<font>“.

You can see you are very flexible to layout one *Report Section*.

Only multimedia elements such as music, movies and so on are not allowed.

For example you can generate a HTML page with the help of a tool (e.g. HotMetal), copy the HTML sources between the two body-tags („<body>“ and „</body>“) into the clipboard and paste them in the *Report Section*. Now you have created a new *Report Section*. If you want to have some charts in it, you only have to add the specific tags (see below).

##### 3.3.1.2 Built in Tags

The Benchmarking Server provides certain tags (e.g. „<Chart>“, „<ValueTable>“, „<PageFeed>“, etc). With these tags you are able to define the known triple of *Data Definition*, *Criteria Group* and *Chart Layout* to generate a Chart and to show this Chart in a *Section*. This Chart is generated on the fly with the help of the Data of the Database actually at the time you generate the *Report*.

Furthermore, you are even able to put each actual Value of the Chart into the text or a table of the *Report Section*. For example, if you want the value of the first bar to be shown in your *Section*, just write the Tag „<Value(1/1)>“ into the text of the *Section* and the Application will replace this tag by the actual value of the Bar.

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## 3.4 The Databases

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The Benchmarking Server uses four databases:

- 1) User
- 2) Profiles
- 3) Benchmarking
- 4) Evaluation

### 3.4.1 The User-Database

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Every Information about each User is stored in this database. These are the rights, the password, his adress and much more. Only the Expert User has access to these entries.

### 3.4.2 The Profiles-Database

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All necessary entries for the generation of the charts are stored in this database.

These are:

- ChartLayouts
- CriteriaGroups
- SelectionCriteria
- Criterias2CriteriaGroups (Link between *Selection Criteria* and *Criteria Groups*)
- DataDefinitions
- Reports
- ReportSections
- Report2Sections (Link between *Report Sections* and *Reports*)

Only the Expert Users have access to these entries. They are able to add, change or delete everything they would like to.

### 3.4.3 The Benchmarking-Database

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All the data from the *Assessments* which are used for an evaluation are stored in this database.

During the upload of an *Assessment* into the Benchmarking Database, many different values will be calculated, to optimize the speed of the Benchmarking Server.

These are the values for each Question resp. Process, the accumulated values for each Area resp. category (each Question resp. Process in one Area resp. Category will be accumulated to one value) and the accumulated values for the whole *Assessment* ("Total Score").

In addition, all General Questions are stored there.

The tables in this database are:

- Questions
- Areas
- Total
- GenQuestions (*General Questions*)

No User has direct access to these data!

To manage these data there has to be a tool (e.g. „Query Analyzer“ for MS SQL Server) and you must have a direct connection between the Computer and the Database Server.

### 3.4.4 The Evaluation-Database

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In this database are stored the data of all *Assessments* which are uploaded by the Users. This data will be used to benchmark itself with the basic data of the Benchmarking Database.

It has the same structure as the Benchmarking Database.

The „Restricted User“ is only allowed to store uploaded data (only one *Assessment*) temporarily for one session. The data will be deleted after the session.

The „Registered User“ is allowed to upload more than one *Assessment* und store them on the server. He can put them into groups for evaluation and can also delete his own ones.

The „Expert User“ is additionally allowed to delete *Assessments* other than his own.

## 4 Hard- and Software Requirements

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The Benchmarking Server has to be installed on an IBM-compatible PC (INTEL Pentium III > 350 MHZ or equivalent).

The following Software has to be installed correctly:

- Microsoft Windows NT Server 4.0 (SP 4or higher) with IIS (InternetInformationServer) and ASP (ActiveServerPage)-extension or Windows 2000 Server
- Microsoft SQL Server (6.5 or higher) or MSDE
- Adobe Acrobat, if the *Reports* should be made available in PDF-Format

## 5 Security

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Basically, the Benchmarking Server is protected by Username and Password against foreign access.

But the security goes even further.

Each User has his own login on the Database Server. So he has no chance to manipulate more data than he can do over the Internet, even if he has direct access to the Database Server.

Only the libraries which are installed together with the Benchmarking Server (dlls) have access on the sensitive data (Evaluation- and Benchmarking-Database). Each function provided by the libraries has its own algorithm to verify whether the User is allowed to do an operation or not.

These libraries use the registry to read the Username and the Password of the Server Administrator Account (or another account which has enough rights) and connect to the Database Server.

That means that a User who unlawfully wants to manipulate data either has to know the Username and the Password of an „Expert User“. But then he „only“ is able to manipulate the Users-Database (change Passwords, Usernames, etc) and the Profiles-Database (change *Data Definitions*, *Selection Criteria*, etc).

Or he has direct access to the Computer where the Benchmarking Server is running and knows the Username and the Password of an Administrator to read the entries in the registry.