RepConf

White Paper

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1 Introduction

1.1 Overview

The *Report Configurator* (RepConf) is a framework for configurating and running reports in web-based applications. Among the basic design criteria for RepConf were flexibility, modularity, efficiency and reusability of both form and function, as well as a user-centric approach to creating reports.

Instead of writing a large number of almost similar reports, the application developer writes one or more general *metareports*, specifying low-level details such as SQL queries and all possible fields for sorting, searching, etc. Based on a metareport, a technically less skilled user can create one or more reports, just selecting which of the available fields should be used for filtering, sorting and grouping. The created reports can optionally require parameters that the actual end user chooses the moment the report is executed.

When running a report, the data is fetched from the database based on the configured and selected criteria and transformed into an intermediate XML-based format. The data is then rendered into one or several output formats, such as HTML, PDF, Excel or XML.

Reports can be executed on demand, or scheduled to be run automatically at specified times (especially useful for reports that take a long time to run) with the resulting output being stored in the database for later viewing. Full support for users, groups and access rights, makes sure only the right persons are able to see the relevant data and create or modify reports.

1.2 Benefits

With RepConf you effectively lower the threshold for non-technical users to specify and configure their own reports. Because the basic structure and properties of the reports are modelled in the metareport by the application developer, end users simply pick the parts that are needed and can therefore avoid the technical hardships typically involved in defining reports that give correct results.

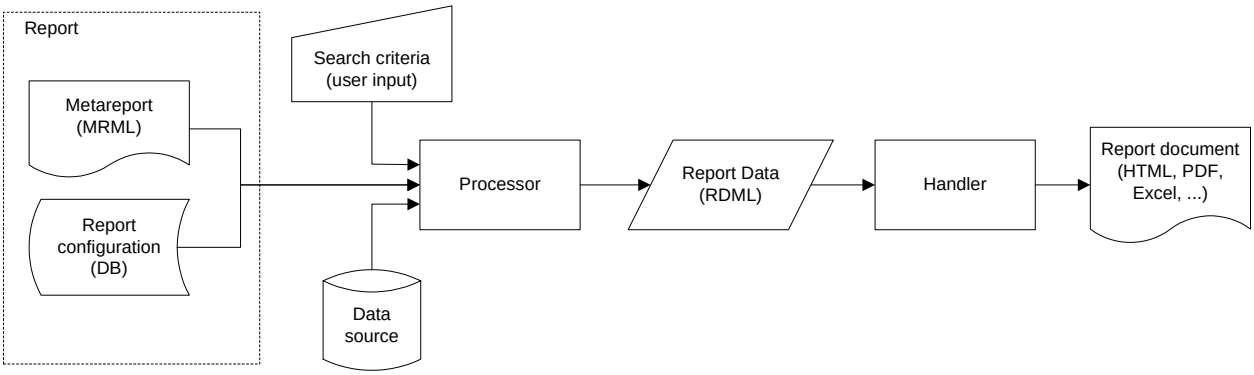
1.3 System Requirements

RepConf is implemented using **enchrome**, which is a web application environment developed by Arrak Software. RepConf thus requires an enchrome engine, which runs under the Microsoft IIS Web Server, as well as a database (e.g. Microsoft SQL Server 7.0 or newer). RepConf can be tightly integrated with any enchrome-based application, or used as a stand-alone web application.

Client machines only need Internet Explorer version 5 or higher, as well as any additional programs for viewing reports in specific formats (e.g. Acrobat Reader for viewing PDF reports). All report configuration, administration and execution is done using the browser-based user interfaces.

2 Under the Hood

2.1 Data Flow



The metareport, written in an XML-language called MRML (Meta Report Markup Language), combined with the parameters for a specific report configuration read from the database forms an actual report definition. Based on the report definition, the report processor can ask the user for additional input (e.g. search criteria) and extract the data from the data source using SQL queries. The processor generates the report data in an XML-language called RDML (Report Data Markup Language), which can be used by one or more handlers to generate the report document in specific output formats.

2.2 Metareport

The metareport is an XML document typically created by the application developer or a technically competent person. The metareport describes the common set of data sources, columns, grouping, sorting filtering critera and output handlers that can be used in one or more reports.

The metareport specifies the common building blocks that can be used in one or more reports, i.e. an arbitrary number of:

- **search criteria:** text, numbers or dates with single values, ranges, or selected from a list of valid choices
- **output handlers:** including additional parameters, e.g. for selecting portrait/landscape mode
- **report sections:** includes headings, datasources, columns, functions and groups

2.3 Report configuration

Report configuration or creation of new reports is made simple for application administrators, because they do not need to know technical stuff like SQL. Creating a new report only involves choosing a suitable metareport and selecting the desired columns with appropriate filtering, sorting, grouping and the desired output formats.

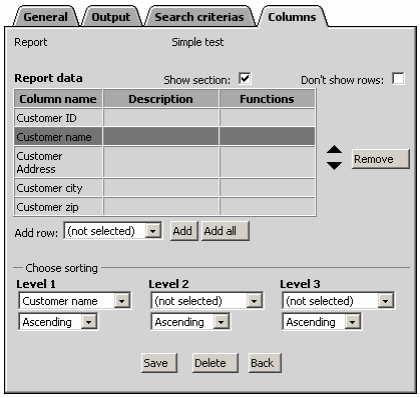


Figure 1. Example of selecting columns.

2.4 User Input

When executing a report, some user input is often needed. E.g. the user might need to restrict the report to a specific date interval, or to only include data for a a given customer or project. When a report configuration is created, the administrator selects which of the search criteria available in the metareport should be active in the report. When an end-user runs a report, the selected search critera are presented to the user, who then "fills in the blanks" before the report is executed.

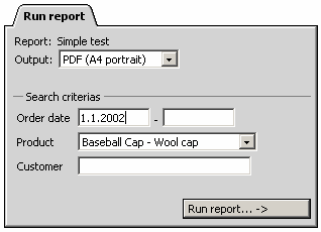


Figure 2. Example of user input

2.5 Handlers

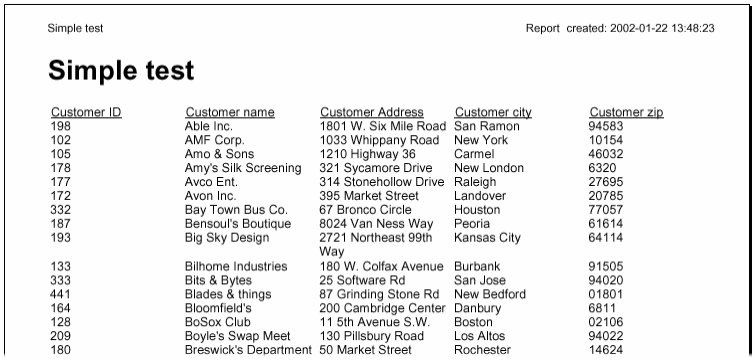
A handler is a special component for transforming the XML-based data of the report into a specific output format. A handler can have parameters for specifying paper size and orientation, and the parameters can be given values from the metaraport or from user input.

One or more handlers can be run on the same generated report data, resulting in, e.g., an HTML rendering for quick on-screen previewing as well as a PDF version for archiving.

RepConf currently includes handlers for the following output formats:

- XML
- HTML
- Microsoft Excel
- PDF

Other output formats can rather easily be added by implementing its own handler (using enchrome) that reads the report XML-data and generates the desired output.



Simple test Report created: 2002-01-22 13:48:23

Simple test

Customer ID	Customer name	Customer Address	Customer city	Customer zip
198	Able Inc.	1801 W. Six Mile Road	San Ramon	94583
102	AMF Corp.	1033 Whippany Road	New York	10154
105	Amo & Sons	1210 Highway 36	Carmel	46032
178	Amy's Silk Screening	321 Sycamore Drive	New London	6320
177	Avco Ent.	314 Stonehollow Drive	Raleigh	27695
172	Avon Inc.	395 Market Street	Landover	20785
332	Bay Town Bus Co.	67 Bronco Circle	Houston	77057
187	Bensoul's Boutique	8024 Van Ness Way	Peoria	61614
193	Big Sky Design	2721 Northeast 99th Way	Kansas City	64114
133	Bilhome Industries	180 W. Colfax Avenue	Burbank	91505
333	Bits & Bytes	25 Software Rd	San Jose	94020
441	Blades & things	87 Grinding Stone Rd	New Bedford	01801
164	Bloomfield's	200 Cambridge Center	Danbury	6811
128	BoSox Club	11 5th Avenue S.W.	Boston	02106
209	Boyle's Swap Meet	130 Pillsbury Road	Los Altos	94022
180	Breswick's Department	50 Market Street	Rochester	14624

Figure 3. Example of PDF output

3 Advanced Features

3.1 Scheduling

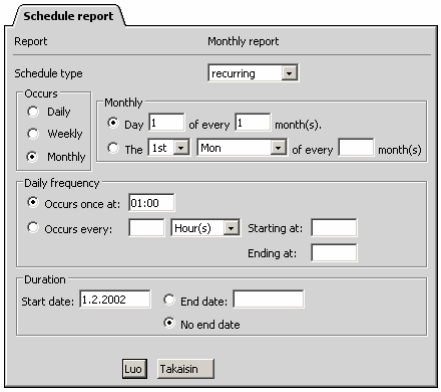


Figure 4. Example of scheduling a monthly report

For reports that take a long time to generate, having to wait for the report to be generated interactively can be quite unexciting. Therefore report generation can be scheduled to run in the background. Either simply queued for execution when the server load is low enough, or at a specific time or at repeating intervals.

Scheduled reports are executed using either the default report parameters, or with the parameters explicitly selected by the user at the time the report was scheduled. When the report has been executed by the RepConf scheduler, the resulting XML-data and generated output formats are stored for later viewing. It is also possible to have the system send the reports by email, or to send a notification when the finished reports are available.

3.2 Enchrome features

Since RepConf is built with enchrome technology, it automatically benefits from all the integrated features of enchrome. Some of the more important features are:

- web-based user interface
- user authentication with group-level access restrictions
- tamper-proof server installations
- language translations for different users