

CHRONOS SYSTEMS SOLUTIONS



CHRONOS
systems

Computer Based Testing



Chronos Systems developed an online testing (CBT) application which can be used for internal as well external purposes.

This application was developed as a **general-purpose test application**.

The application can be used for **skills certification** and **course evaluation** purposes too.

Objectives of the Project

The business objective of the project was on one hand to provide a **flexible tool**, which supports creation of different computer based tests by non-technical users and on the other hand to publish and **make these tests available for thousands of users**.

Automatic evaluation of the submitted tests was also in scope of the solution.

System architecture

The overall system architecture is based on **J2EE** standard, using JSP, JDBC and servlets technology.

Exam generation

Authorized users are allowed to **create** a new online **exam** or modify existing exams by using an online tool.

Each test step contains a **question** and number of **answers**. The author should specify the correct answer and weight (or difficulty level) of the question too.

The format of the test question is not restricted; it could contain images or a formatted text too.

WYSIWYG HTML Editor makes the formatting of the questions possible. Test Authors without HTML knowledge are able to format the content, insert tables, images, URLs into the test question. Editor converts the question into HTML and stores in a relational database.

Copy and Paste from other Applications (Word, Excel) and **Uploading documents** and attaching them to a question are also possible. Word/Excel

formatting is converted into HTML formatting.

Once the exam is considered complete, authors are able to **publish** it on the web or intranet.

User access to the published exam is controlled on group level.

You can simply **send email notifications** to the authorized users that a new exam is published.

From this point on, authorized users can access the exam.

Published exams are available until the **expiration date/time**. Once a test is expired, the author can prolong it or move to archive. Archived exams are not available on the web but can be reactivated again, and can be modified and published on the web.

Limit (minimum score or minimum percentage of correct answers) can be specified for each exam. The test is considered successful if the



tested users perform at least the minimum score or percentage.

Testing

Users can access the test after successful login and select from the list of available exams.

The status of the available exams is also displayed (completed, open, result).

Once a question is answered the next question with possible answers is displayed automatically. The user should answer every question. It is not possible to skip a question or go back.

A selected exam should be completed within a specified time period (minutes/hours). If the user is not able to finish the exam within the given time, the automatic evaluation is starting based on the submitted answers; further questions are not available.

Individual questions are not time limited, the entire exam should be completed within a given time period.

Test evaluation

Test answers are collected in a relational database. After completion of the exam, an automatic evaluation starts.

The score report is displayed immediately and the user is able

to **go through the exam again**. The selected answers of the tested user and the correct answers are marked for each question.

The specified user (author of the test) gets an automatic email notification about the completed test and can access the score report.

Email notification contains a link to the score report (detailed results) of the tested user and the summary of the test results (total score or percentage of answered questions).

Operational Environment

The project was implemented on the following platform

Operating system: **Windows 2000 Server + SP3**

Application server: **Allaire JRun 3.1**

Java Runtime: **j2sdk-1_3_1**

Database engine: **Oracle 8i**

Browser compatibility: **Internet Explorer 5.0** and above
Netscape 5.0 and above