Facing Information Management Solutions for SAT applications:
A Tecnatom´s Perspective

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Abstract. Facing the development of Information Management Solutions for SAT applications implies to cope with different technological, methodological and services aspects. A chronological overview of the major projects in this area where Tecnatom, s.a has been involved up to present is presented. Firstly a brief explanation of Tecnatom´s Training Management (GESFORM) and Training Area Intranet applications main features is provided, to focus next in the e-learning approach which has been followed to develop Tecnatom´s Virtual Campus. Finally some R&D topics of interest in the field of SAT implementation are outlined.

1. Introduction

Three major projects are worthy to mention from a Tecnatom´s perspective when facing Information Management Solutions for SAT applications

In the early 90´s, being aware that the design of SAT based training plans required a computer application to process efficiently the important amount of associated data, an application for the overall training management (GESFORM) was developed.

In the late 90´s pursuing the objective of facilitating the daily work of the Training Area personnel and especially the instructors work, the design and development of Tecnatom´s Training Area Intranet was faced.

In year 2001 the implementation of an e-learning approach based on the emerging Information and Communication Technologies started, resulting in the availability of Tecnatom´s Virtual Campus since the beginning of year 2002

In the short medium term, the R&D interest from the point of view of SAT implementation focus in addressing issues related to the integration of e-learning, visualisation and real-time simulation technologies for improving future training and re-training of work forces.

2. Tecnatom´s Training Management Application

GESFORM is an application for the overall management of the training comprising three main modules: analysis, evaluation and training.

GESFORM allows firstly to process the data coming from the job and tasks analysis, supplying all the necessary information to facilitate the design of the training plans adapted to the job position.

Secondly it allows to manage the learning programmes either from the designed training plans or from those not based on SAT methodology, as well as their further implementation monitoring the fulfilment of them.

Finally the didactic objectives from the training units designed in the previous analysis feed the questions bank used to carry out the evaluation tests.

The analysis module links all the data from the job and tasks analysis, relating each other the job positions, tasks, knowledge, skills and attitudes, learning objectives and training units and modules.

The analysis module provides all the necessary information for a modular design of the training plans related to a specific job position.

The training module has all the methods for the training management, relating the students, course's dates and duration, associated objectives, qualifications, instructors, etc.

The training module allows to manage all the training programmes derived from the designed training plan, as well as their further implementation, being possible to include all other type of non SAT based training plans. This module allows to schedule the implementation of the training and to track its fulfilment. Information on foreseen and performed training is provided, as well individual evaluation results.

Finally the evaluation module allows to obtain the different evaluation tests from the training programmes which have been carried out. This module comprises a questions bank derived from the didactic objectives obtained during the task analysis. Each question is assigned different parameters as learning objectives, grade of difficulty, type of question and cognoscitive domain, making possible the direct creation of quizzes and assessments by the proper selection of parameters:

Figures 1, 2 and 3 are respectively displays of the analysis, training and evaluation modules
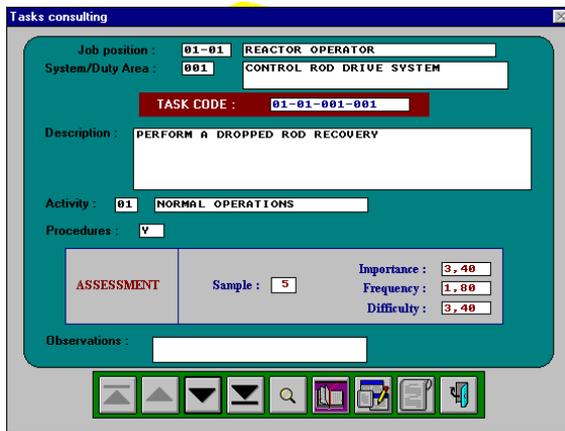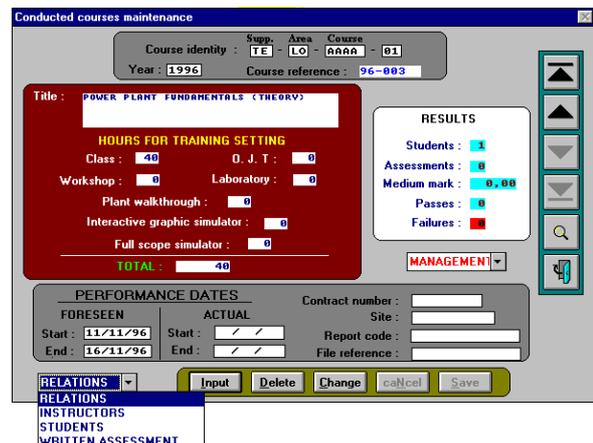

Fig. 1 Analysis Module
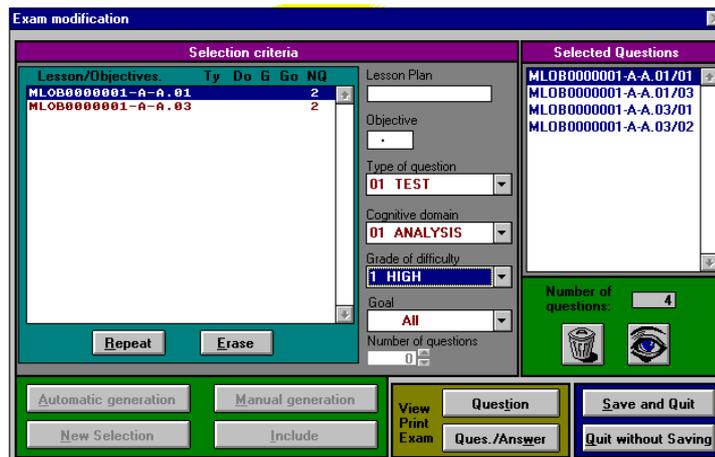

Fig. 2 Training Module

Fig. 3 Evaluation Module

GESFORM application has been used for SAT implementation in Almaraz, Cofrentes, Asco, Vandellos, Jose Cabrera and Atucha Nuclear Power Plants for an approximate total number of 40 job positions.

3. Tecnatom´s Training Area Intranet

Tecnatom Training Area Intranet is intended to centralize all the information and documentation needed for training personnel to carry out their activities:
- Information/documentation non-managed and non-developed by Training Area (NPP's supporting documentation, quality procedures, Internet links, etc.)
- Information/documentation managed and developed by Training Area (courses/training units, figures, training aids/slides, question bank, presentations, programs, time tables, etc.).

This application assist training personnel to:
- Search supporting information and documentation for their activities
- Search to official documentation developed by Training Area (courses/training units, figures, question bank)
- Access and use information and documentation prepared and developed by Training Area individuals (training aids/slides, programs, exams, evaluation certificate, time tables, summaries, questionnaires, reports, training records, conducting scripts, presentations, etc.)
- Prepare conducting scripts to provide training class
- Manage the relevant training records
- Control the modifications affecting to the official documentation
- Describe the projects developed by the Training Area

Figure 4

The application access is made by an Internet browser, Netscape or Internet Explorer.

This application, as shown in *Figure 4*, has following 7 options:
- Introducción (Introduction)
- Biblioteca Virtual (Virtual Library)
- Cursos de Adiestramiento (Training Courses)
- Aula Virtual (Virtual Classroom)
- Bases de Datos (Data Bases)
- Formación al Día (Training Up-to-date).
- Comunicaciones (Communications) -

Of particular interest for instructor´s daily work is the databases option *(Figure 5)* which provides access to different type of information/documentation, managed by Training Area.
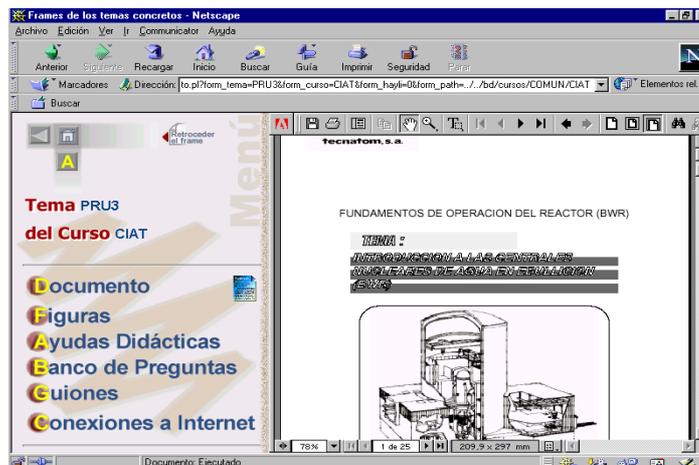

Figure 5

Functions available on this option are:
- Cursos (Courses/Training Units)
- Figuras (Figures)
- Ayudas Didáctics (Training Aids)
- Banco de Preguntas (Question Bank)
- Presentaciones (Presentations)
- Proyectos de AdiestramientoT(raining Projects)

Click on any of these options the corresponding searching form will be shown. The fields of the form will be changed depending on the option selected. *(Figure 6)*

Once the search is defined and made the result will be shown in a page:
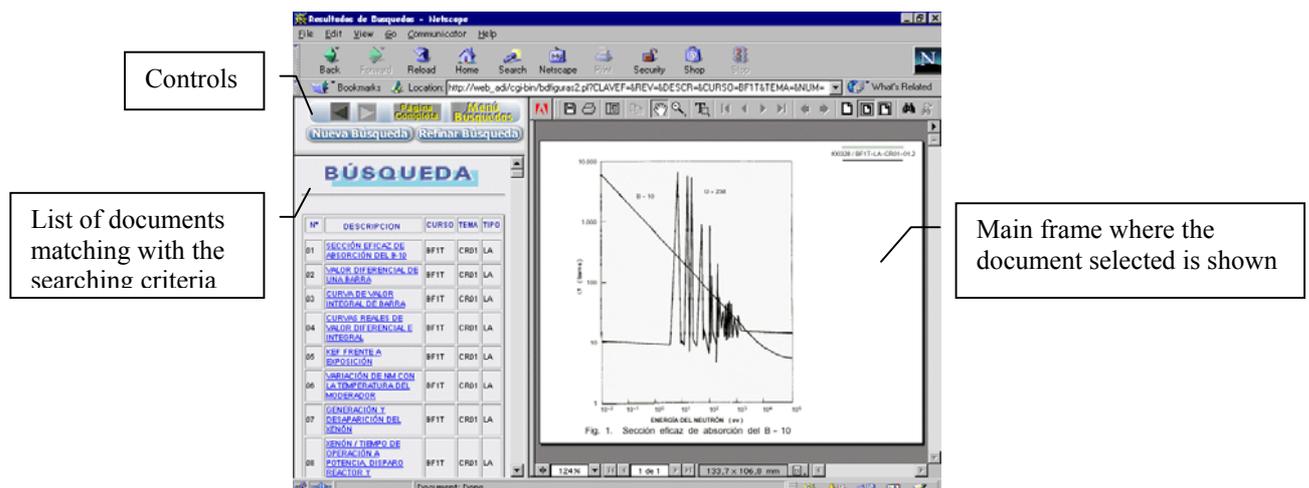

Figure 6

4. Implementing the e-learning approach

The implementation of the e-learning approach has pursued a global technical positioning oriented to:
- Promoting a cultural change in the training area
- Coping with the technological, methodological and services aspects associated to the e-learning environments based on the emerging Information and Communication Technologies

- Using e-learning state of the art tools and platforms
- Supporting the development of new training environments integrating e-learning, simulation and advanced MMI technologies.

The implementation of the e-learning approach has been focused in the design and development of a Virtual Campus.

Tecnatom´s Virtual Campus Project

The First Phase of the project (2001) tackled following objectives:
- E-learning platforms and tools market analysis
- Development of Tecnatom´s Virtual Campus (www.tcampusvirtual.com)
- Development of a didactical methodology for conversion of presential contents into non-presential ones
- Development of e-learning courses prototypes
- Getting an early feedback on key aspects and associated efforts

During a second phase(2002-2003) different Plans and Courses for In-house and Electrical Utilities Corporate training are being implemented in the Campus. Expansion of available offer will be made by -on demand- re-engineering of existing portfolio of courses or elaboration of new e-learning oriented ones are being tackled.

Main Features of Tecnatom Virtual Campus *(Figure 7)* are:
- Easy to use. Configurable for different users
- Different roles and profiles in the Campus
- Users management and information recording
- Learning scheduling and organization functions
- On-line tutoring system
- Debate Forums and Knowledge data base management
- Self-evaluations and exams
- Virtual Community communication tools
- Academic records management
- Learning process auditing functions
- etc

Figure 7

Tecnatom´s Virtual Campus groups all the course material and provides an easy access to it. Some of its capabilities are:

- It allows to navigate from a development need, down to a course through the use of a hierarchical tree.
- It allows to offer course-packages. A package could be for a certain target audience, or could be
- assembled by the individual student.
- It allows to search through all available course material.
- It provides a news-flash, about what is happening on the Campus.
- It allows its users to ask questions or give feedback .
- It provides an eye-opening statement about learning in the e-world.
- It provides a help function to navigate the Campus as well as the Course material.
- Etc

Different training courses are available at present in the following areas: power plants (hydraulic, fossil, nuclear, combined cycle), non-destructive essays, and software engineering

5. Some innovation areas of interest for SAT implementation

Different proposals and expressions of interest have been presented in the framework of Fifth and Sixth European IST Programmes.

Addressing issues related to the integration of distance learning, visualisation and real-time simulation technologies for improving future training and re-training of work forces, mainly aimed at:

- Providing innovative distance learning models supported by web based realistic simulation scenarios
- Developing the necessary layers of the distributed simulation environment and optimising real-time execution for appropriate network connectivity and information exchange rate
- Using advanced MMI to achieve an immersion of the learner in the core of the system being studied
- Applying virtual assistant agents for debriefing, personal tutoring and evaluation
- Establishing a methodology for e-learning contents development, taking into account pedagogical and adult self-study criteria
- Creating both a framework and specific tools for building adaptive net-based learning environments to enhance on-line learning outcomes of adult learners within the context of corporate training

Global objective of the above mentioned proposals and expressions of interest is to empower individuals who work or intend to work in the European Energy Sector to define, procure and manage their learning for work in response to the rapid organisation changes occurring within the electrical market, the business and employment needs.

This global objective will be met through the creation of an advanced learning environment for individuals of the Energy Sector comprising a professional career development system, as well as a new generation e-learning platform for a flexible and personalised access to, and delivery of lifelong learning solutions.