IN-TRA-NET, A PROJECT FOR EDUCATIONAL TRAINING

Erik Molino, David Sarriá, Antoni Mánuel
SARTI Research Group. Electronics Dept. Universitat Politècnica de Catalunya (UPC). Rambla Exposició 24, 08800, Vilanova i la Geltrú. Barcelona. Spain.+(34) 938 967 200. www.cdsarti.org

Abstract
The project IN-TRA-NET is a proposal for designing a learning environment for specific continuous updating of European professionals and SMEs workers that use electronic and control apparatus. The UPC has developed three applications as a proof of concept, concerning a didactic course, and two monitoring systems for processes and electronic instruments.

Introduction

The IN-TRA-NET (INnovation TRAnsfer NETwork) [1] is a project funded by the Eurpean Comision under the "Leonardo da Vinci: Lifelong Learning Programme", with the main purpose of creating a specific learning environment for European professionals and SME (small and medium enterprises) workers that use electronic equipments.
The learning environment is based on a Web application where professionals or SME workers can access to didactic material and specific practical courses on different electronic equipments, or for monitoring processes, with the possibility to control the real equipments remotely using any standard browser.
The Technical University of Catalonia, through the research group SARTI, participates as a partner of IN-TRA-NET contributing with research activities focused on the design of automatic applications in the area of virtual instrumentation and technologies for the marine environment. The other partners of the project are: Italy, through the University of Sannio, the Benevento Industrial Union, and the enterprise Dida Network; and Slovakia, through the Technical University of Košice.

2. Project Development

The first activity of the project was to detect user's needs: to find the specific necessities of local enterprises and workers, in order to implement explicit courses or applications to improve their working performance using electronic equipments, or for monitoring remote processes.
In the case of the UPC, a specific questionnaire was produced and sent to key enterprises in the local area of Garraf, Spain. From the survey, three specific necessities were selected for development as a proof of concept for the project:

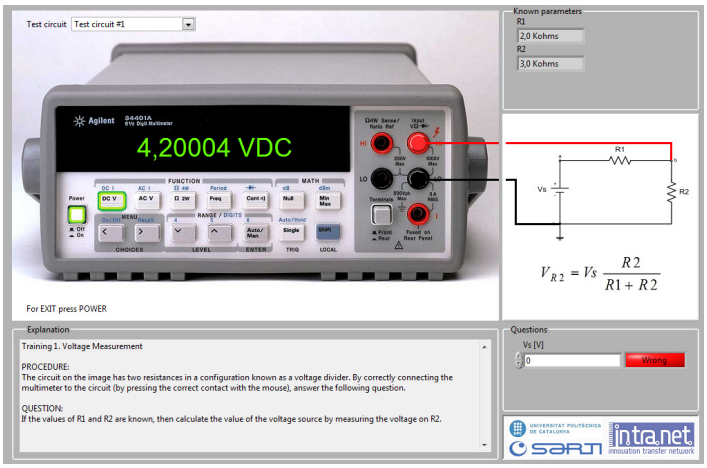


Figure 1. Digital Multimeter exercise application.

1. The design of a specific didactic course using a digital multimeter;
2. The implementation of a remote monitoring system for observing fishing trawler vessels performance;
3. The realization of an application for remote observation of marine scientific measurement equipments.

2.1 Didactic course for basic measurements with a digital multimeter.
The course consist on a web application where users can access an interface that has been divided in different areas, as shown in Figure 1. The main area shows a commercial multimeter and an "exercise" selector. At the bottom, the instructions for the exercise are shown, and finally, the values of the parameters and the answer area are located to the right. With this application, workers can learn how to use and make measurements using this kind of instruments.

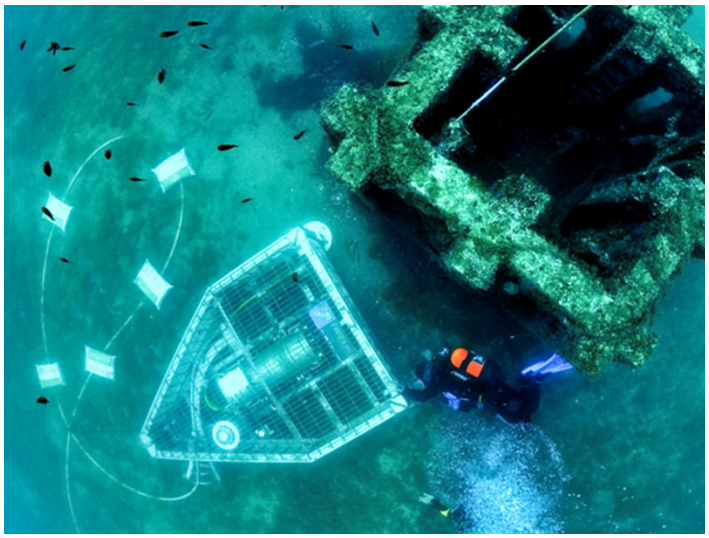
2.2 Remote monitoring of trawler vessels.
A remote monitoring system was developed in order to observe different parameters of fishing vessels [2] (speed, temperature, position, fuel consumption, wind speed and direction, etc.), Figure 2. This monitoring allows the fishing companies, and workers to test different fishing strategies and technologies, in order to improve the efficiency of fuel consumption.

2.3 Remote observation of marine scientific measurement equipments.
Using the Spanish underwater observatory OBSEA [3], Figure 3, a remote control for scientific measurements instruments was implemented. The OBSEA is a cable observatory located at 4 km offshore from the coast of Vilanova i la Geltrú (Spain). Its cabled connection to land allows the use of electricity and fiber optics connection for control and data transmission.
OBSEA currently has connected a video camera with live streaming and sensors for measuring temperature, pressure, salinity, currents, etc. Different applications have been implemented for monitoring the measurements of the scientific instruments, and observing the video images of the camera [3]. These applications allows students, academic personnel and scientists to observe on real-time the measurements of the different equip-

ments located in the laboratory, giving a real feeling and experience with this sophisticate instruments.

Conclusions
The IN-TRA-NET philosophy has shown to be interesting for companies that try to improve their performance through continuous updating of their workers, using web applications for remotely control equipments or monitoring processes. It has been applied to a didactic course for learning basic measurements with a multimeter, and for remote monitoring of a trawler vessel and scientific marine instruments.

References
[1] http://www.intranetlab.eu/
[2] Sarriá, D., Sánchez, A., del Río, J., Molino, E., Mánuel, A., Valls, F. "Acquisition system for improving energy efficiency in trawler vessels," 17th Symposium IMEKO TC4, 3rd Symposium IMEKO TC 19 and 15th IWADC Workshop Instrumentation for the ICT Era, 8-10 September, Kosice, Slovakia, 2010
[3] http://www.obsea.es/



OBSEA SOFTWARE DATA STRUCTURE

Javier Cadena[1], Marc Nogueras[1], Alberto Hidalgo[1], Antoni Mànuel[1], Jordi Sorribas[2]
1-SARTI Research Group. Electronics Dept.. Universitat Politècnica de Catalunya (UPC).
2-Unidad de Tecnología Marina (CSIC) Passeig Marítim de la Barceloneta 37-49, 08003 Barcelona, Spain Phone: +(34) 932309500, Fax: +(34) 932309555

Introduction
The OBSEA observatory must provide data and services in a suitable way to users who may use different platforms and programs. The purpose of this work is to provide a service transparent to the customers and compatible with the different platforms and programs.
Nowadays, the most widely used protocol is the WWW, and a Website can reach many users. However, there are other types of customers who need specific formatted data; the reasons are the tools and programs that they may use to study and process the information. In this case, several solutions have been developed: DataTurbine, SQL, metadata, and custom formatted data.

From sensor to client
The RAW data from the OBSEA instruments is routed to the Lluna server, where the data is collected and stored by a proprietary program developed at SARTI. Before the copy is performed, the data is resent to several ports and destinations. The aim of this application is to send the incoming data to any service required and be able to change destinations and services with minimal impact. Therefore, the application is able to resend data to whatever destination and port is required. The destinations and ports are stored in a configuration file that is read by the program during its execution.

Another SARTI proprietary application in Lluna server processes the incoming data, separating the CTD, the Weather Station, and the AWAC data, in order to insert the measurements in a SQL database. This application uses also a configuration file to know the format of the RAW data and decodes the measurements required for each instrument.
In this application, also NMEA sentence has been built, with the data from instruments as well as time-stamp from instruments and server. This implementation will become in the near future a metadata to offer new services.

Data in the Website
The website presents the data from the different sensors using different methods. The data from the CTD is retrieved from a SQL database. In the other hand, the AWAC and hydrophone data is stored in a folder, so the website gets the data from this folder.

Conclusions
A modular designed system for providing information to different users has been presented. This configuration and applications allow an easy expansion of the network and the system, and it is compatible with all the platforms and Operating Systems.