Softeco Sismat

Softeco Sismat, formed in 1979, is one of the leading companies in the Information and Communications Technology market of Italy.

About Softeco

Softeco Sismat has been a leading company in the Italian Information and Communications Technology (ICT) market since 1979, providing specific application and technological competences to enable customers to exploit the potential offered by ICT, with a particular focus on business development and innovation. Ten precent of our resources and yearly turnover are invested in Research & Innovation with an experience of over 20 years of activity, proudly gained working with over 600 European partners in over 70 national and international research projects.

ZK X ARION

ZK has been adopted so far in several research projects including the GLIMS project, SmartGen project, Illuminate project and the MultiScaleHuman project. Among other projects, ZK was also successfully used in the Arion project – LIFE + Nature and Biodiversity Programme, in which Softeco collaborated with the Department of Physics (DiFi) and the Department of Biology (Now DISTAV) of the University of Genoa, the Portofino AMP (Marine Protected Area) and the local Coast Guard authority. Arion's main objective is the improvement of the conversation status of the bottlenose dolphin (Tursiops truncates), being the coastal species amongst Mediterranean cetaceans most exposed to threats due to human activity and resource exploitation.

The project specifically addresses the threat represented by boat traffic, including leisure crafts, that can lead to collisions and noise pollution in areas with high level of tourism and fishing activity. Most of the threats (collisions, entanglement in fishnets, and disturbance of feeding or breeding activity) are related to the lack of knowledge of the presence and movement of individuals in the area where the anthropic activities are carried on.

Arion provides the implementation of an interference avoidance system capable to detected and track the dolphins, to identify the threats and to prevent collisions and other risks by diffusing presence warning messages in real time to all categories involved (tourists, professional and recreational fishermen, MPA management), enforcing a protocol of conduct for reducing risks for

ZK's excellent MVVM model makes reuse of software component easy and efficient"

the species developed and agreed by involved stakeholders in cooperation with the local Coast Guard branch.

One of the tools developed to meet Arion's goals is the project web portal which is where ZK comes into the picture. The portal business logic is realized by means of ZK's MVVM model, with access to the database through plain JDBC.

Take a closer look at the application - the marine protected area is subdivided into four square quadrants. Each quadrant can be in one of three different "color" status, depending on the detection of the presence of dolphins or boats.

Namely, when nothing is detected by the audio sensors on the beacons the status of the corresponding area is set to "green" (as illustrated below).
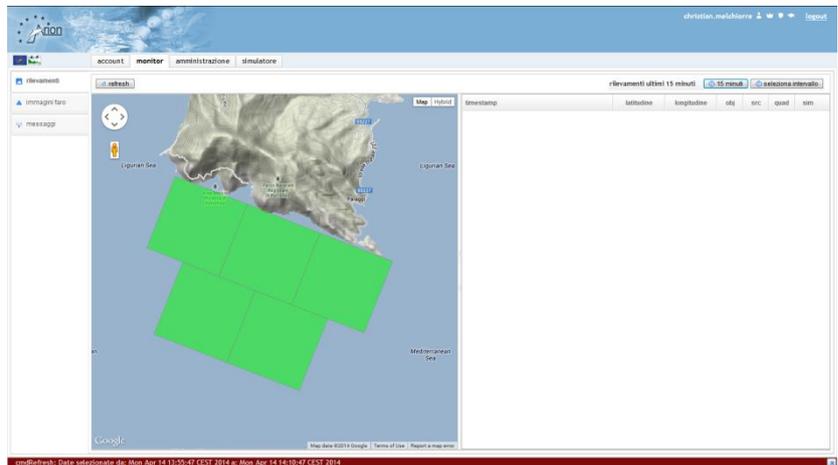
When the software on the beacons recognizes one or more dolphins in the area (by analizing the underwater audio tracks and detecting dolphin whistles), the status of the quadrant is set to "yellow" (as illustrated below).
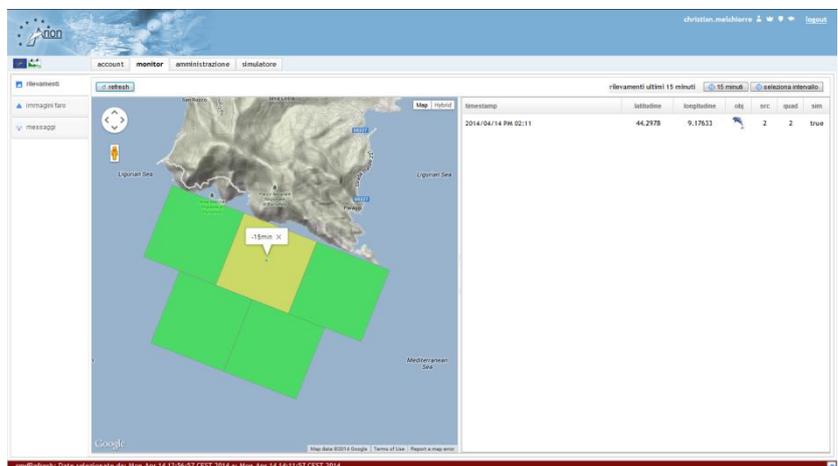
When both the presence of dolphins and boats are detected, the quadrant status is set to "red" (as illustrated below).
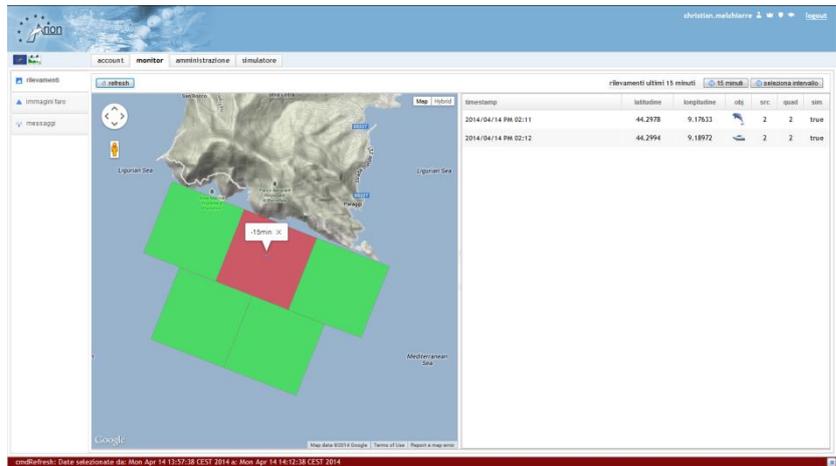
These "yellow" and "red" status correspond to different alarms raised by the area's maritime authorities, lasting 15 minutes since the last detection, and are notified to the public through several channels (the project's public web site, screen monitors available in public touristic areas and, in future, through a specific mobile application) to inform them of the necessity to behave according to a specific protocol of conduct when transiting in the area.
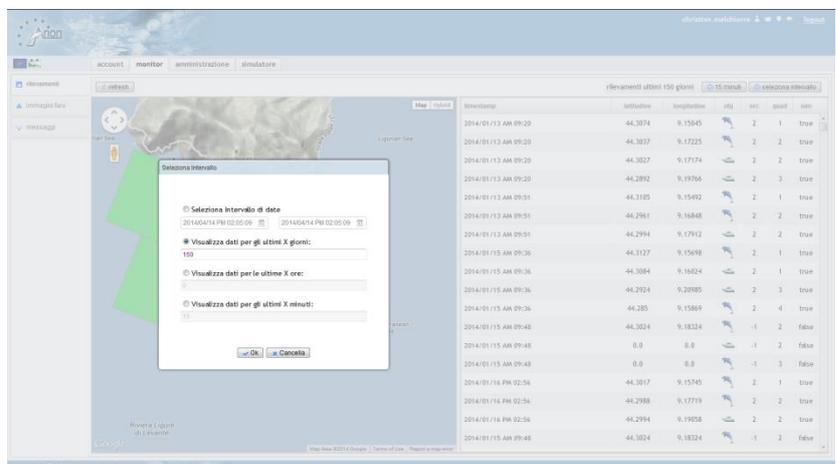
Figure: The monitor area of the Arion portal shows the status of presence detection of dolphins and boat in the Protected Marine Area of Portofino. The operator can choose a custom time interval for which data about dolphin and boat detection in the area are shown. The default value corresponds to the last 15 minutes. The example screenshot shows the choice of a longer period of 150 days, in order to show more data.

Challenge

The Arion portal must provide an almost real-time access to the flow of data coming from the sensors installed on the beacons in the marine protected area, including mainly data about presence detection of dolphins and boats, plus meteorological data, such as

information on temperature, winds, etc.

The application must provide an efficient and dynamic visualization of this flow of information, in order to enable the users to take timely measures (e.g., raising an alarm).

Why ZK

ZK was successfully used in Softeco in several other research projects, which gave us the opportunity to verify its flexibility and ease of use in very different contents, and give back the ZK community our know how. Demos apart, one of the truly distinguishing features of ZK was the excellent documentation, well-articulated in several flavors (from quick start to fully fledged technical docs) and continuously updated. The possibility to arrange components in any possible way was really powerful and useful – with ZK it was really easy to set up working mock-ups for customers and get a valuable feedback in minutes. For Arion's purposes, MVVM support and the excellent <gmap> component really represented a distinguishing value added.

ZK's rich component library is a truly differentiating feature to develop desktop-like web application in a dramatically reduced time"
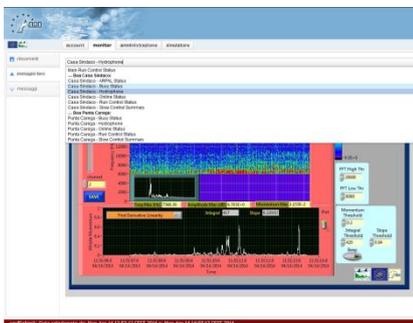
The best of ZK

As previously mentioned, ZK allows a very rapid design and development cycle, primarily for what concerns the development of the applications' user interface layer, without sacrificing aspects such as power and flexibility. Specifically concerning the Arion portal, we were able to develop a Web Application whose user interaction was comparable to those of native desktop applications. The MVVM model also allowed a very powerful modularization of the code, allowing us to increase the reuse of code.

The Result

Arion now provides the implementation of a real time interference avoidance system capable to detected and track dolphins, to identify the threats and to prevent collisions and other risks by diffusing presence warning messages.

Upon reception of the warning messages the ships and boats present in the area will be invited to follow the protocol of conduct and the Coast Guard will supervise its application. This approach will ensure the species protection improvement, the sustainable coexistence of dolphins and anthropic activities and will promote responsible usage of the sea.

The area selected for system demonstration (Portofino Marine Protected Area) can be considered as "Case Study" because there is a resident population of bottlenose dolphins which is an important fraction of the northwestern Mediterranean population, and most of the anthropic activities mentioned above are present in the area.

The project intends now to demonstrate the effectiveness of the proposed tool for reducing threats and improving preservation, as well as the possibility of easily reproducing and conducting it in other Mediterranean areas.
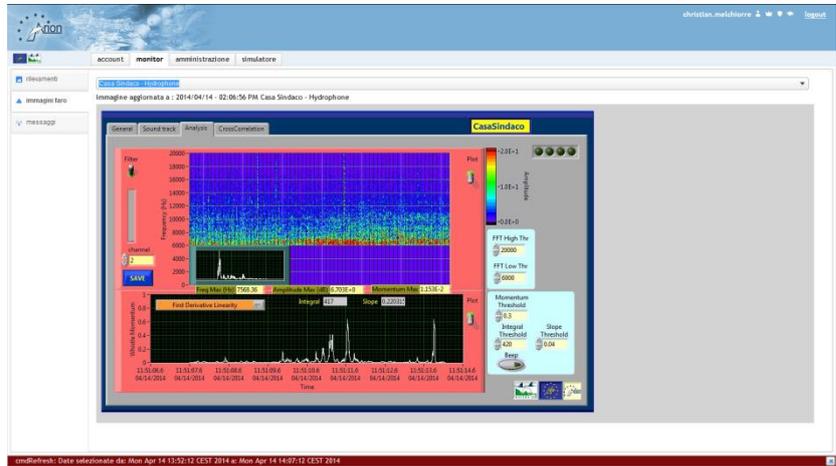
About ZK

ZK is the leading enterprise Java Web framework with more than 1,500,000 downloads. ZK is deployed by a large number of Fortune Global 500 companies, including Barclays, Allianz, Swiss RE, Roche, Deutsche Bank, Sony, Sun Microsystems, and Toyota, providing them with the ability to rapidly create rich Ajax enterprise level applications.

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