

“Farmers Rangers” in Lunigiana: a wearIT@work take-up action



The problem

Climate changes and summer arson are turning rural areas of Mediterranean Europe (included its many islands) into a fire-prone ecosystem. In the past 25 years, occasional droughts, coupled with large-scale criminal attacks to forests, have led to countless, systematic (small- to mega-) fire events, that have burnt millions of hectares. ***The economic loss, social disruption and environmental damage run into billions of euros.***

In the sole Italy, the yearly number of fires skyrocketed from 6,000 in the Sixties, 12,000 in the Eighties up to 15,000 now, being 42 per day, almost 2 per hour.

In spite of some pilot initiatives, also making use of GIS and satellite infrastructure, Government agencies, local police and fire brigades lack of the necessary resources to perform a systematic control of the whole territory. Therefore, a strategic alliance with civic communities and private enterprises has been repeatedly called for, and several trials of collaboration have been put in force, with fairly good results.

The solution

In 2005, a working agreement was signed between Coldiretti (the leading Italian association of agricultural producers), Legambiente (one of the most active Italian not-for-profit entities in the environmental protection) and Federparchi, the Italian federation of natural parks and protected areas. By this agreement, specific territorial protocols were furthered between local stakeholders to implement the provisions of Legislative Decree No. 228 of 2001, allowing farmers to contribute “to the safeguard of rural and forest landscape”, also through an increased use of agricultural machinery. This seminal agreement has been nicknamed as ***the “Farmers-Rangers” protocol.***

In 2006, a second agreement was signed between Coldiretti and Corpo Forestale dello Stato (the State non-military Environmental Police), to identify a list of tourist locations, forests and rural sites that would be actively controlled by some 1,400 “Farmers-Rangers” for fire prevention purposes during the summer period.

Aim of the take-up action

To create a “Living Lab” environment for testing innovation in mobile technologies and wearable computing in the context of fire prevention, monitoring and control in rural and mountain locations. The Living Lab is composed of a number of selected agricultural producers from Coldiretti Massa-Carrara and public officials from the Lunigiana Mountain Community (Tuscany, Italy). The former group will play the role of “Farmers-Rangers”, dispersed over a territory of about 964 sq.km., while the latter will animate a central “situation room”, in direct contact with local fire brigades, as shown in the following picture.

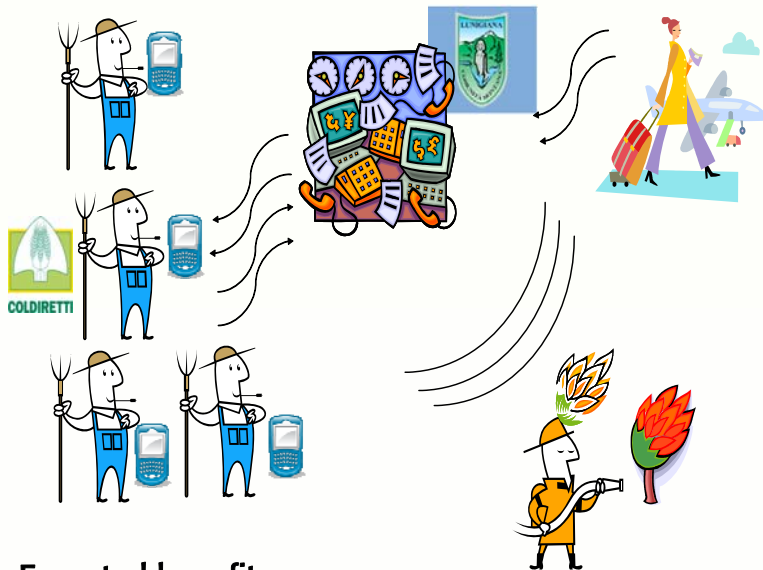
wearIT@work was set up by the European Commission as an Integrated Project to investigate “Wearable Computing” as a technology dealing with computer systems integrated in clothing.

The project has 42 partners with a project volume of about 23.7 million € and a funding of about 14.6 million €

It is the largest project world-wide in wearable computing.

<http://www.wearitatwork.com>





In this real-life scenario, an original combination of wearable and mobile devices for territorial monitoring has been identified, and is now being developed and tested. This will be able to:

- ensure physical localisation of the person ("Farmer-Ranger") wearing the system;
- stay connected to the central "situation room" that will be continuously monitoring weather and fire risk parameters in the area of interest;
- receive and send updates of local working and fire risk conditions by means of mobile (GPRS, UMTS etc.) communication networks;
- supply generic GPS-GIS functionalities to the system holder;
- send GPS-GIS data to the central "Situation Room" to keep it up to date about Farmer-Rangers' position;
- provide additional ambient intelligence capabilities like sensor data processing, visualisation etc.

Expected benefits

Information timeliness - Wearable technology will greatly enhance the provision of the right information at the right moment. One of the main benefits of the envisaged solution is that the "Farmers Rangers" can continue with their primary activities while providing the Situation Room with more timely and updated information. Additionally, by integrating geographical location into the system, the central Situation Room will be provided with continuous updates of the real situation on site.

Information quality - The use of wearables will support the acquisition of quality and continuously updated information on fire alarms. More specifically, it will make more risk evaluation parameters better available through context-aware combination and presentation on wearable output devices. This improvement of information can either be a dedicated activity or a side-effect of other activities of the ³Farmers Rangers².

Localisation features - Traditionally, emergency interventions are controlled centrally. One reason for this is that individual members of the fire brigade only have a limited perception of the incident situation. Therefore, information is collected at the command centre and then used to take informed decisions on what tasks to perform. Different technologies and methods exist to locate people and objects indoors and outdoors. Localisation is important to be able to provide people with the specific information they need in their current situation. For example, as is well known from GPS-based automobile navigation systems, localisation can be used for very useful navigational support. Wearable computing will enhance fire brigade members perception of the shared situation during an intervention. Therefore, the team will have an improved knowledge to take more decisions locally. Generally speaking, wearables will enhance self-organization of situated activities.

Context-awareness of information - This is one of the central characteristics of effective wearable computing support. Context-awareness will be enabled by information about the users environment gained from sensors or other wearable sources. It will consist of providing services and information to the user that specifically adapt to his/her current environment.

Personalization of information - Complementary to context-awareness, personalization will be enabled by information about the users themselves, gained from sensors or other wearable sources. It will then consist of providing services and information to the user that specifically fit into his or her needs, such as available cognitive resources, preferences for output modalities etc.



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