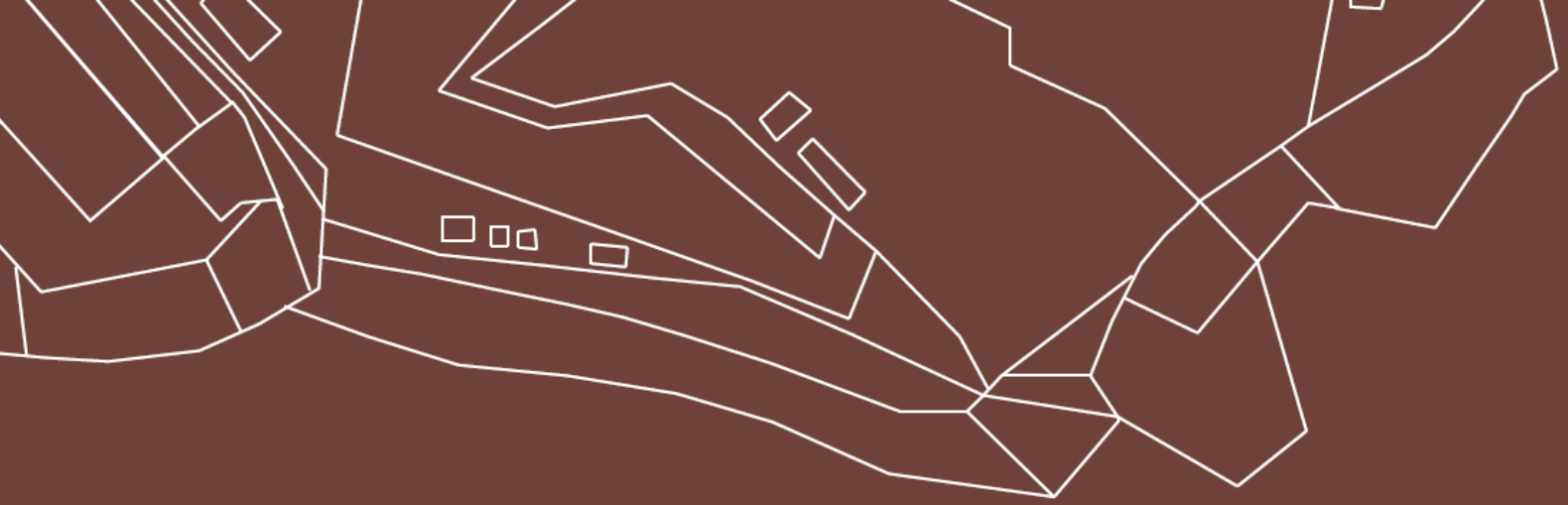

TIMBRE
Information System for Brownfield Regeneration

The research leading to these results was elaborated by the Ca' Foscari University Venice within the framework of the European collaborative project TIMBRE.

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More information on TIMBRE is available on http://www.timbre-project.eu.

CONTENT

1. BROWNFIELD SITES

Brownfields are commonly defined as “sites that have been affected by former uses of the site or surrounding land, are derelict or underused, are mainly in fully or partly developed urban areas, require intervention to bring them back to beneficial use and may have real or perceived contamination problems” (CABERNET, 2006).

The presence of brownfields is recognised to be a global challenge, because, since the second half of the 19th century, industrialization has produced many contaminated brownfield areas all over the world. Sustainable approaches for brownfields regeneration still need to be promoted.

2. THE TIMBRE INFORMATION SYSTEM FOR BROWNFIELD REGENERATION

Brownfield regeneration in the European context has too often proven to be unsuccessful due to several problems, delays and failure factors.

One of these problems concerns the non-visibility of available methodologies and tools, which hampers stakeholders in accessing the most useful and customised information. This situation brings to an unsuccessful regeneration of the brownfield sites, which is recognized as a problem.

In order to overcome this problem, the **TIMBRE Information System for Brownfield Regeneration** (Information System) was developed, which **collects all available information on brownfield regeneration and makes them more visible and tailored according to stakeholders' needs.**

The Information System is a web based software which supports stakeholders in sharing, accessing and selecting the most suitable information for the different phases of the brownfield management process, taking into account stakeholders' specific requirements and using feedbacks provided by previous users.

The tool is composed of the TIMBRE web database, where the web links to relevant information on brownfield regeneration are stored, and by a ranking methodology that allows to classify those web links according to users' characteristics and information needs. These two components are effectively integrated into the tool and users can benefit from their features through user friendly functionalities and interfaces.

The active involvement of TIMBRE partners and stakeholders, during the Information System development, has been of crucial importance to guarantee that the scientific process would have produced a useful and shared result.

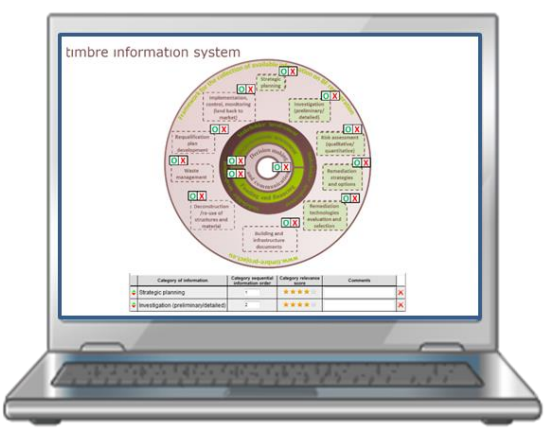

Figure. 1 The Information System

3. GOALS AND TARGET GROUPS

The Information System aims at providing users with the most tailored and sustainable solutions they are looking for, among a wide collection of information and tools.

For the ranking of the search results, the Information System considers stakeholders' specific needs and environmental and socio-economic aspects which are crucial when dealing with brownfield management.

The tools is addressed to experts in the sustainable brownfield management field including **scientific community and researchers**, **national/regional/local authorities**, and **consultants**.

4. INFORMATION SYSTEM STRUCTURE AND ACCESS

The Information System is composed of two main modules (see Fig. 3):

1. the TIMBRE web database, where the web links to information on brownfield regeneration (in the form of Regulations, Technical manuals, Tools and Case studies) are stored and organised according to the following brownfield management phases:
    - strategic planning;
    - investigation;
    - risk assessment;
    - remediation strategies and options;
    - remediation technologies evaluation and selection;
    - waste management;
    - deconstruction/re-use of structures materials;
    - building and infrastructure documents;
    - requalification plan development;
    - implementation, control, monitoring (land back to market);
    - socio-economic assessment;
    - funding and financing;
    - decision-making and communication;
2. the ranking methodology that allows to classify those web links according to users' characteristics, specifications, requirements and information needs.

Users can access the tool from the web page: http://www.timbre-project.eu/informationsystem.html (Fig. 2).

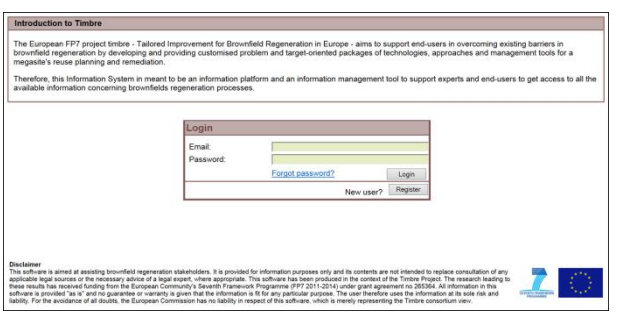

Figure 2. Log in and registration web page

Once users access the tool, they can download the **"User Manual"** clicking on the button "Help". The "User manual" provides in-deep explanations of all functionalities and interfaces of the Information System.

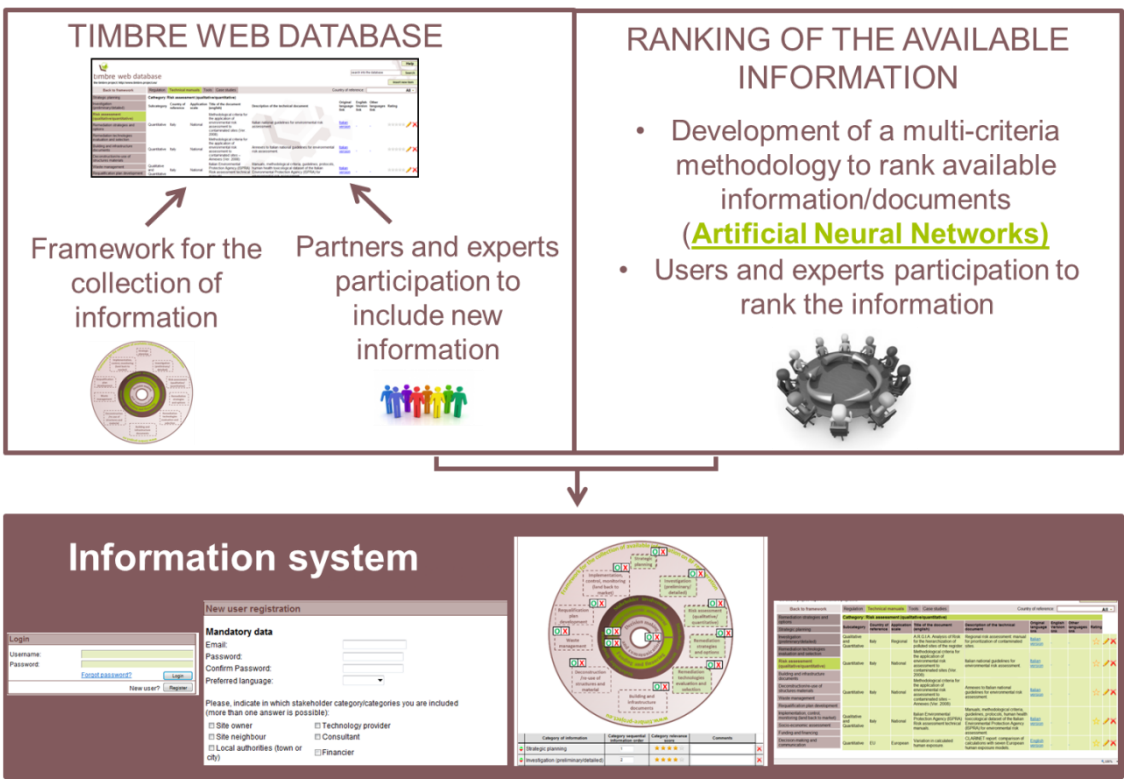

Figure. 3 Information System structure

3. BASIC PRINCIPLES OF THE RANKING METHODOLOGY

The methodology implemented in the Information System is based on the idea of developing a system with the ability to continuously learn from past search sessions in order to improve the provided results. For this purpose Artificial Neural Networks (ANNs) are used.

An ANN consists of a mathematical model inspired by biological neural networks, with an interconnected group of artificial neurons.

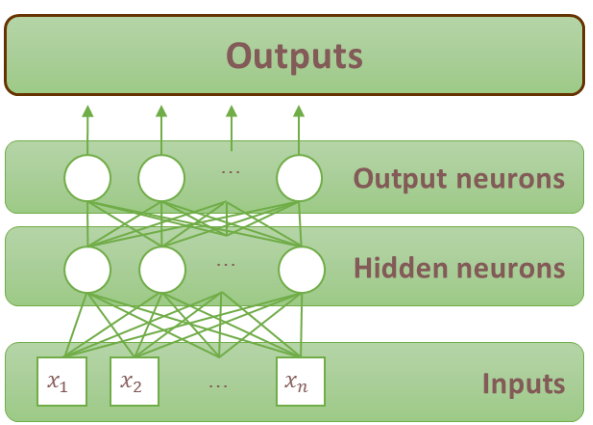

Figure 4. Graphic representation of a generic ANN

A graphic representation of a generic ANN is reported in Fig. 4, where the circles are the neurons and the lines are the connections. The neurons that provide the outputs of the network, are called output neurons, the other neurons, which perform intermediate computations, are termed hidden neurons.

This methodology makes use of information collected from users and in particular: *User related inputs* provided by users during the registration to the tool, *Session related inputs* that are provided by the user during each search session, *Scores inputs* resulting from the evaluation of the web links contents, and *Statistics* (e.g., number of clicks received by a web link from users belonging to the same stakeholder category).

4. PARTNERS AND STAKEHOLDER INVOLVEMENT

In order to guarantee the development of a useful and shared product, the active involvement of stakeholders has constantly been promoted during the different stages of the Information System development.

In particular, as described in Fig. 5, stakeholders have been involved during the development of a framework used to structure the information collected within the web database, to upload and update information within the tool, and during three testing activities aimed at improving the functionalities of the tool and at collecting evaluations and feedbacks on the information stored within the tool.

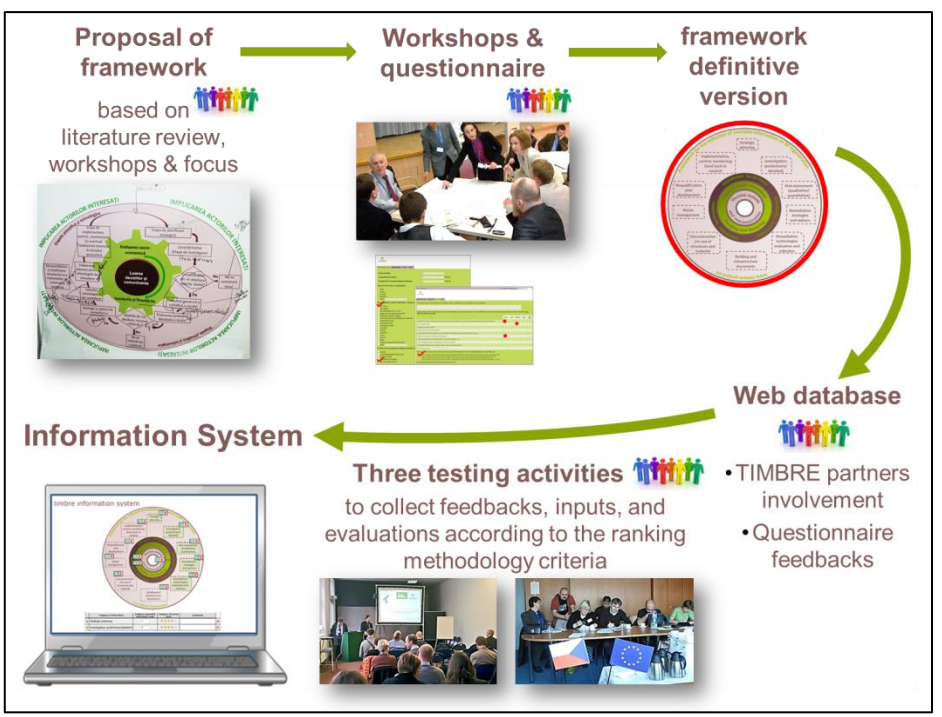

Figure 5. The role of partners and stakeholders during the development of the Information System

5. INFORMATION SYSTEM OUTPUTS

The Information System provides each user with a customised and tailored list of the web links as outputs of his/her search session (See Fig. 6). The web links are ranked according to the user's requirements, to statistics from previous users with the same characteristics, to the user specific search goal, and other technical indications.

After clicking on the wanted information category (Fig. 6 on the left), the list of available information are ranked according to the user's characteristics and visualised, as reported in Fig. 6 (on the right).

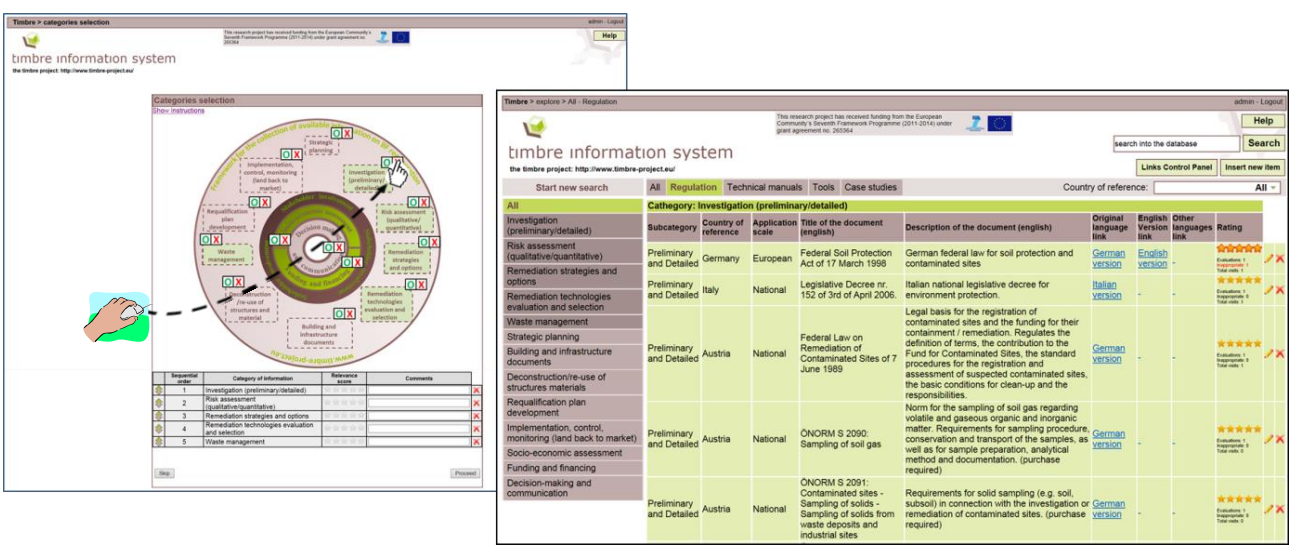

Figure 6. Information System outputs

6. SUMMARY

The Information System represents an innovative tool for increasing and improving the access to available information on sustainable brownfield redevelopment. The tool is an attempt to overcome the barriers which actually hamper the optimal and effective use of available approaches, technologies and tools across different European Countries.

The Information System is the result of the active involvement of stakeholders and is expected to become a “living system” which relies on direct end-users inputs, updates and evaluations.

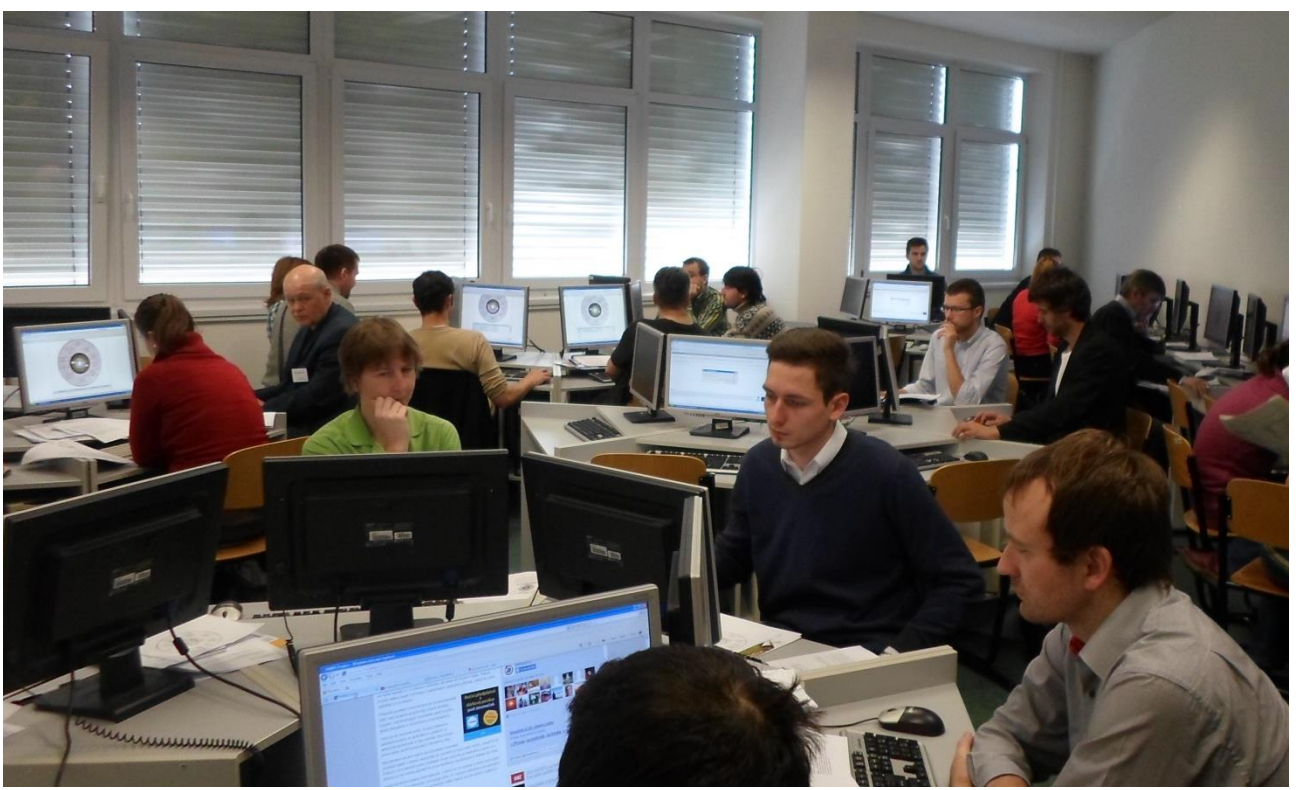

Figure 7. Brno testing activity with local stakeholders

7. RECOMMENDED LITERATURE

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Image references

P. 2, 3: Marilena (cat.marilyn) and Lenny, iFocus photographers. **P. 5:** Photo http://www.e-architect.co.uk/, and http://susettabozzi.photoshelter.com

DISCLAIMER

This document is aimed at assisting brownfield regeneration stakeholders. It is provided for information purposes only and its contents are not intended to replace consultation of any applicable legal sources or the necessary advice of a legal expert, where appropriate.

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