

TIMBRE EXPERT SYSTEM: A WEB-BASED SUPPORT TOOL FOR AN EFFECTIVE SELECTION OF APPROACHES AND TECHNOLOGIES FOR BROWNFIELD REDEVELOPMENT

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Abstract

In the last decades many EU research projects developed approaches, tools and technologies to support the redevelopment of contaminated sites and brownfields, however this variety of products still has a limited impact on brownfield revitalization success, because they are too often not used in their entire potential. This situation highlights the need to improve the access to information and to support the selection of the most suitable solutions based on stakeholders' needs.

The European project Timbre (Tailored Improvement for Brownfield Regeneration in Europe), funded by the 7th EU Framework Programme, aims at providing contaminated sites' owners, local authorities and stakeholders with a web-based and target-oriented Expert System that can be a collector and a provider of all available information related to the management of brownfields.

The first step for the development of the Expert System consisted in the definition of a shared framework for the collection of information about brownfield regeneration, where the main phases of the regeneration process correspond to "information categories" used to organize the available material. The definition of the framework started with the analysis of the frameworks developed in previous projects and led to the identification of the brownfields' rehabilitation phases. To achieve a wide acceptance of the framework, the stakeholders of Timbre case-studies have been involved through ad-hoc workshops and an on-line questionnaire has been developed to involve external stakeholders and experts from Germany, Czech Republic, Italy, Romania, Poland and Austria.

The framework constitutes the structure of the Timbre Web Database and it guides end-users in the consultation of the material included in the database (i.e., web-links to documents about brownfield regeneration) and in the upload of new information. All web-links are stored according to the aforementioned "information categories": the users can access the stored information by selecting the "information category" of interest and can upload information according to the same categories. Moreover the records are further subdivided into four classes: "Regulation", "Technical manuals", "Tools" and "Case studies".

The Web Database will be one of the main components of the Timbre Expert System to be developed in the future months. It will be a living system where external end-users can upload their own material, inputs and updates. Specific functionalities for searching the web database according to different criteria and to end-users specific needs will be provided by the Expert System. The Expert System will also offer a multi-criteria methodology for the evaluation and ranking of the collected information providing end-users with the most suitable tools according to their specific needs. Local experts, site owners, public authorities and private companies will be involved in the definition of evaluation criteria.

BACKGROUND

Brownfield regeneration issue is recognized as a problem, and even though many useful and innovative remediation technologies as well as methods to support risk assessment and decision making processes have been produced, they are only rarely applied using their full potential. This situation creates barriers to brownfield regeneration.

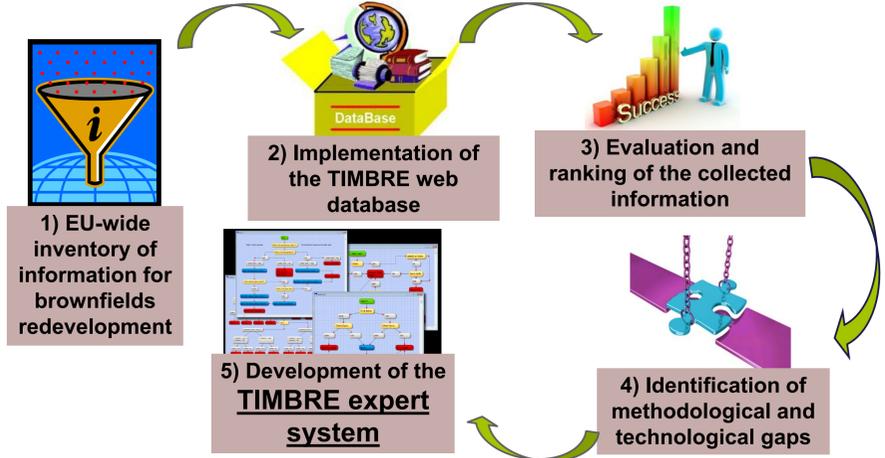
TIMBRE PROJECT

The objective of TIMBRE (Tailored Improvement of Brownfield Regeneration in Europe) is to support end-users in overcoming these barriers by developing and providing customized problem and target - oriented packages of technologies, approaches and management tools for a brownfields' reuse planning and rehabilitation.

TIMBRE WP1 OBJECTIVE

Development of an **Expert System** for the collection, analysis and classification of literature, data and further information on previous projects, programs and other initiatives focused on the regeneration of brownfields. The expert system will allow **easy access and intuitive interface to collect and provide information for partners and end-users.**

Steps to achieve WP1 objective:



Stakeholder involvement for the evaluation and improvement of the TIMBRE framework



Timbre Web Database

Stakeholders can find links to relevant documents by selecting the "information category" of interest ...

Stakeholders can insert documents using the "information categories" of the framework...

... then they can insert additional information about the document (Country, application scale, keywords, etc.)

... and the type of information between: "Regulation", "Technical manuals", "Tools" and "Case studies"

Category	Country of reference	Application scale	Type of the document	Description of the technical document	Original language	English version	Other languages
Strategic planning	Italy	National	Methodological criteria for the application of environmental risk assessment to contaminated sites (Ver. 2003)	Italian national guidelines for environmental risk assessment	Italian	English	
Risk assessment (qualitative/quantitative)	Italy	National	Methodological criteria for the application of environmental risk assessment to contaminated sites (Ver. 2003)	Italian national guidelines for environmental risk assessment	Italian	English	
Remediation strategies and options	Italy	National	Methodological criteria for the application of environmental risk assessment to contaminated sites (Ver. 2003)	Italian national guidelines for environmental risk assessment	Italian	English	
Building and infrastructure documents	Italy	National	Methodological criteria for the application of environmental risk assessment to contaminated sites (Ver. 2003)	Italian national guidelines for environmental risk assessment	Italian	English	
Waste management	Italy	National	Methodological criteria for the application of environmental risk assessment to contaminated sites (Ver. 2003)	Italian national guidelines for environmental risk assessment	Italian	English	
Requalification plan development	Italy	National	Methodological criteria for the application of environmental risk assessment to contaminated sites (Ver. 2003)	Italian national guidelines for environmental risk assessment	Italian	English	
Investigation (preliminary/detailed)	Italy	National	Methodological criteria for the application of environmental risk assessment to contaminated sites (Ver. 2003)	Italian national guidelines for environmental risk assessment	Italian	English	
Regulation	Italy	National	Methodological criteria for the application of environmental risk assessment to contaminated sites (Ver. 2003)	Italian national guidelines for environmental risk assessment	Italian	English	
Technical manuals	Italy	National	Methodological criteria for the application of environmental risk assessment to contaminated sites (Ver. 2003)	Italian national guidelines for environmental risk assessment	Italian	English	
Tools	Italy	National	Methodological criteria for the application of environmental risk assessment to contaminated sites (Ver. 2003)	Italian national guidelines for environmental risk assessment	Italian	English	
Case studies	Italy	National	Methodological criteria for the application of environmental risk assessment to contaminated sites (Ver. 2003)	Italian national guidelines for environmental risk assessment	Italian	English	

Web-based Expert System

- Information platform based on a web-based search engine;
- it will support experts and end-users to get access to all the available information concerning brownfields regeneration processes;
- specific functionalities for advanced search of documents will be implemented;
- ranking of the information based on Multi-criteria Decision Analysis (MCDA) according to specific end-users' requirements and objectives, for each step of the brownfield redevelopment process;
- it will be integrated in the TIMBRE On-line Tool Suite providing customizable information and advanced tools for brownfield regeneration for partners and end-users.

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