IN – TECH – TRANSFER BASED NETWORK. CASE STUDY

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Rețeaua informatică dezvoltată în cadrul proiectului IN – TECH – TRANSFER vine în sprijinul exploatării oportunităților existente pe piață în ceea ce priveşte inovarea şi transferul tehnologic. Pentru ca transferul tehnologic să fie încununat de succes trebuie să aibă ca țintă nevoia de satisfacere a pieței cu produse, tehnologii şi servicii. În sprijinul acestei idei a fost creat un sistem informatic care să poată fi accesat cu uşurință de potențialii utilizatori ai rezultatelor cercetării – dezvoltării.

The information network developed through the IN-TECH-TRANSFER project is aimed to support the best exploitation of existing market opportunities, as far as innovation and technological transfer are concerned. For a successful technological transfer, the final goal should be market supply of products, technologies and services. To support this idea, an information system easily accessible to potential users of R&D results was created.

Keywords: IN-TECH-TRANSFER

1. Introduction

Implementing a software tool to support analysis and exploitation of research results in an economic environment is a worldwide current issue. In this direction, in the academic environment, efforts have been made at different levels of development of complex research projects, such as: system modeling to obtain a complex which can be integrated into Web applications [1], fabrication process modeling [2], quality [3], performance analysis of systems [4].

A great importance is given to the development of such software tools for analyzing quality projects based on predefined criteria at the strategic level [5], value analysis of R&D projects results which leading to decisions on next actions for the promotion, implementation and use [6]. The decision making is a decisive step of the technology transfer in achieving any degree of success of R&D activities [7].

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This paper presents an analysis and implementation of the database system which is the project backbone - TECH - TRANSFER which will be integrated in a collaborative network and adjusting it to specific requirements [8]. This type of project is common in the IT industry [10] but some modules which permits the implementation of the modules dedicated to value analysis of the projects are integrated.

In the hereinafter, we will focus on collaborative aspects of the network constructed following the logic and specifications and after we will present the database structure and, finally, some aspects of the Web product.

Between different types of ICT networks, collaborative networks have a special relevance. A collaborative network (CN) is comprised of various entities (organizations and people), mostly autonomous, with a certain geographical distribution and heterogeneous with respect to: operational environment, culture, capital and objectives. These entities collaborate to better achieve the common goals which otherwise could not be achieved, with minimal costs. All these interactions are supported by a network of computers designed for this purpose. A wide variety of collaborative networks have emerged over the past years as a result of changes in the business and scientific world [10]. In recent years different structures or variations of RC appeared, including for example [9]:

- Virtual Enterprise (VE) – is a temporary alliance of enterprises participating together to make joint competencies or core skills and their resources to better respond to business opportunities. This cooperation is supported by computer networks.
- Virtual Organization (VO) – a concept similar to VE. It includes a set of independent organizations that share their resources and skills to meet mission / goal achievement. This is not limited to an alliance to obtain profit by participating organizations. Thus we can say that a VE is a case of VO.
- Dynamic Virtual Organization (DVO) – generally refers to a VO created and organized in a relatively short time to respond to competitive market opportunities. It has a short life cycle and it is dissolved when the short-term purpose of VO has been achieved.
- Expanded Virtual Enterprise (EVE) – typical concept of an organization in which a dominant enterprise extends its activities both downstream and upstream (on the market, or on some of the suppliers). A virtual extended enterprise can be regarded as a particular case of VE.
- The virtual organization for environment development – association (also known as cluster) or a group of organizations and their supported organizations with both the potential and

willingness to cooperate. It has an interoperable infrastructure based on long-term understanding and cooperation. When a business opportunity is identified by a member, who acts as broker, a division of that organization can be selected and will form a VE or VO.

- Professional Virtual Community (PVC) – combination of the concepts of virtual community and professional community. PVC provides the environment for professionals to share knowledge, similar cultures, professional work, perception issues, techniques for solving, professional and behavioral values. PVC systems are defined as social networks of individuals who use technologies related to computers that mediate their relations.
- E-Science - refers to global collaboration in key areas of science, and is the next generation of ICT infrastructure. It allows resources sharing, a flexible and secure coordination between individuals, institutions and resources, all in a dynamic state.
- Collaborative virtual laboratory (VL) - is a relatively heterogeneous and distributed environment that enables a group of researchers who are in different geographic locations to work together, sharing resources (equipment, instruments, data and information related experiments). VL may be seen as part of E-Science.

2. THE IN – TECH – TRANSFER Information System

For efficiency reasons, the information system is designed with three-level architecture (database, application server and access level). All information is stored in a database able to collect and storage large quantities of data. The system can securely access any application, using communication encrypting methods using internationally recognized security certificates. The system uses the same database for all component modules to simplify the administration operations such as backup, restore or space allocation, but also functional operations such as search function to retrieve specific information. The information stored in the IN – TECH – TRANSFER database consists mainly of data from RELANSIN Program projects. Project structuring is based on AMCSIT criteria as previously presented. The database design followed specific Program guidelines and objectives, aiming to provide future management advantages for technological transfer, with all the economic and technological implications.

The generic approach of the database structure made good use of AMCSIT practices and experience, implemented both the organization, classification and

evaluation system of RELANSIN projects, but also the new tendencies in R&D management. The IN – TECH – TRANSFER project aimed at:

- portal web page design;
- developing a portal administration area;
- database optimization for speedy information access.

Global database use revolves around technological transfer projects. Thus, each project is identified by current number (index) existing in AMCSIT documentation. This number is marked symbolically *project_id*. The database loading is simplified, can be easily traceable and verified. All projects are complied in a single table named **Projects**. The table structure is presented Table 1.

Table 1

Projects

index				
project_id	crit2_id	crit5_val	crit7_id	crit10_val
class_id	crit3_val	crit5_id	crit8_val	crit10_id
crit1_val	crit3_id	crit6_val	crit8_id	comb_val
crit1_id	crit4_val	crit6_id	crit9_val	name
crit2_val	crit4_id	crit7_val	crit9_id	creation_data

AMCSIT distributed the projects in *subprograms*. For example, subprogram 1 is *SMEs*, subprogram 5 is *Life Quality*, etc. These subprograms define as many *classes* in the database. Each class has an identifier marked as *class_id* and each class has an alphanumeric description of maximum 50 characters. If necessary, this description can be extended. All classes information is presented in **Class** Table, structured as seen in Table 2.

Table 2

Project class

index		
class_id	criterion_name	creation_data

All RELANSIN projects were evaluated in accordance with ten criteria. Each evaluation criterion creates restrictive metrics:

- each criterion score belongs to {0, 1, 2, 3, 4};
- the maximum score, value 4, is given to patentable or patented products, or to special use products;
- the minimum score, value 0, is used when project results meets no evaluation criterion;
- the intermediary scores, values 2 and 3, are for modernized products, technologies or services;

- the maximum score assigned to criteria C8 (interdisciplinary researches) and C9 (establishing a partnership between at least two research units and two firms, others than research units production departments).

These criteria are presented in Table 3, **Criteria**.

Table 3

Project criteria

index		
criterion_id	criterion_name	creation_data

The use of this particular database in a collaborative application aiming at technological transfer leads to a specific users management. The users can be registered or not (those only seeking for information on the application potential). Information on registered application users are presented in Table 4, **Users**.

Table 4

Users

Index			
user_id	last name	first name	organisation
e_mail_address	password	no._entries	creation_data

The projects accessed by each registered user are recorded in a separate table, to see which projects finalize the technological transfer. This particularity helps estimate each project raised interest. The mechanism is implemented by Table **Project Users**, presented in Table 5

Table 5

Project user

index			
user_id	project_id	valorization_id	creation_data

The project valorization method is presented in Table 6, **Valorization**. This table was designed for application flexibility reasons, allowing new valorization methods to be introduced, the moment they are identified.

Table 6

Project valorization

index		
valorization_id	valorization	creation_data

The database tables are interconnected by primary keys mechanisms, as shown below. The Web application structure using the IN – TECH – TRANSFER database is presented in two mock-ups with the main operational elements, the index page and the selected information presentation page.

Fig. 1. Example of implementation of IN - TECH - TRANSFER database application. First page

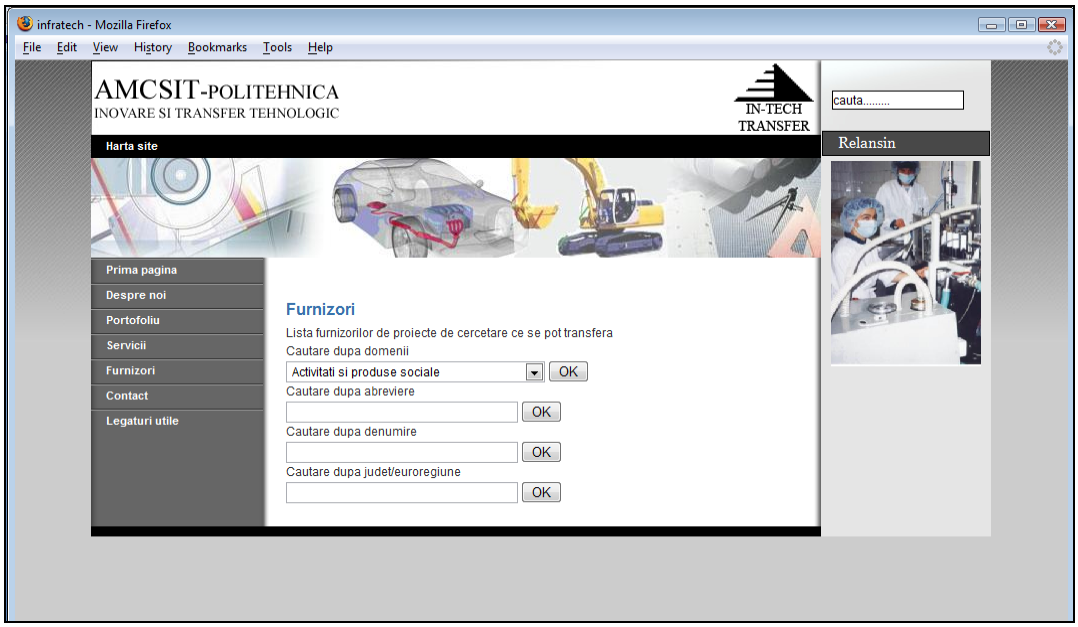

Fig. 2. Example of implementation of IN - TECH - TRANSFER database application. Database page

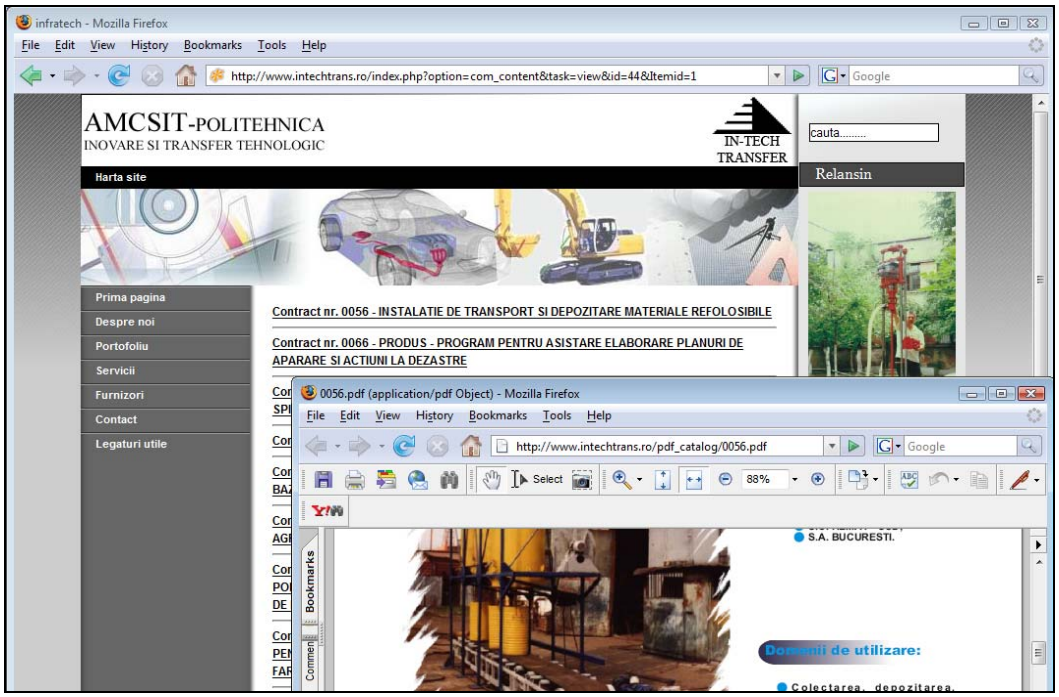

Fig. 3. Example of implementation of IN - TECH - TRANSFER database application. Reports page

The database tables are interconnected by primary keys mechanisms, as shown below. The Web application structure using the IN – TECH – TRANSFER database is presented in two mock-ups with the main operational elements, the index page and the selected information presentation page.

5. Conclusions

From all the ICT networks, the collaborative networks (CN) are particularly relevant. Over the last decades, changes in both the business and scientific environment lead to a large variety of collaborative networks with different structures: virtual enterprise, virtual organization, dynamic virtual organization, extended virtual enterprise, environmental development virtual organization, virtual professional community, e-Science, virtual collaborative laboratory, etc.

For efficiency reasons, the information system is based on three-level architecture (database, application server and access level). The system can securely access any application using communication encryption methods internationally certified. The information stored in the IN-TECH-TRANSFER

database mainly consists in data from the RELANSIN Program. The database was designed following guidelines and objectives specific for the technological transfer management, with all economic, financial and technological particularities.

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