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Interview[1] to Bernard Dousset

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1. IRIT, *Institut de Recherche en Informatique de Toulouse*, is a research unit, UMR 5505, affiliated with the *Centre National de la Recherche Scientifique (CNRS)*, the *Institut National Polytechnique de Toulouse (INPT)*, the *Université Paul Sabatier (UPS)* and the *Université des Sciences Sociales Toulouse 1 (UT1)*
IRIT, created in 1990, is now one of the strongest and most important research centers for computer sciences in France. It gathers, along with the *Université Toulouse Le Mirail* (UTM) more than 190 researchers and investigators.

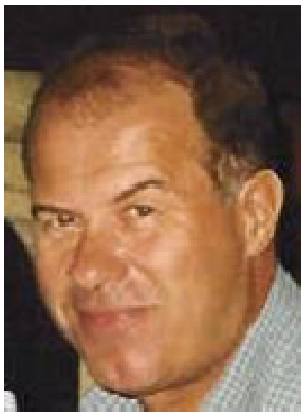

Figure 1.: Bernard Dousset

Which were the main reasons for creating the IRIT?

IRIT was founded in 1990 with the main objective of combining the different research lines that were being investigated in the University of Toulouse, that until that moment was divided in several laboratories that were dependent on different public agencies (Universities, schools, public institutions like CERFACS or INP). From 1990 on, all these laboratories joint together.

After 17 years of history, what is the current phase that IRIT is going through now? What are the main institutional goals and the challenges of today?

In recent years, IRIT has seen a significant increase in its resources, through the construction of new buildings, the hiring of more personnel, the restructuring of its research teams and the development of cross border projects. More recently, new research projects have been developed, focusing on new ambits such as life sciences, social sciences and humanities.

Which have been the main results achieved in terms of social or economic impact or repercussion?

Various platforms have emerged: PREVIO (virtual reality), RFIEC (information search and retrieval of knowledge), PRETI (research and experimentation in information processing), GRID 5000 (network of calculation).
One fifth of these new platforms are being defined in terms of mobility and disability. They all share the use and dissemination of scientific and technological culture as their goal.
Our efforts to transfer knowledge and technology to society are translated into regular meetings between the research world and the social/economic world, and other contacts with the broader public, and schools. Other initiatives

Figure 2.: IRIT

1 Esta entrevista fue realizada en Marzo de 2008 por el doctor Víctor Cavaller.

include establishing joint laboratories with industrial groups such as MIDI with EADS, and AUTODIAG with ACTIA, and at an international level we collaborate with ILINKS, a European laboratory owned by the CNRS and associated with the Italian University of Trento and the Italian *Consiglio Nazionale delle Ricerche* (CNR).

Do you consider that efficiency in Scientific, technical and technological research has been sufficient?

Our laboratory is one of the largest in Europe for research in computer sciences, most notably thanks to its projects on the man-machine interaction, gradual interaction, multimedia applied to telemedicine, natural language processing technologies and information technologies. Technology transfers can still be improved and pushed forward.
We are looking forward to further advancements in our doctoral school, EDIT (160 dissertations between 2000 and 2004, 250 theses in progress).

Figure 3.: IRIT's headquarters in the University of Toulouse

2. IRIT is organized in 25 work teams that do research in 7 general subjects:

1: Analysis and synthesis of information
2: Indexing and retrieval of information
3: Interaction, autonomy, dialogue and cooperation
4: Reasoning and decision
5: Modeling, algorithms and high performance computing
6: Architecture, systems and networks
7: Security in Software Development

This set of issues reflects the coverage of all major scientific subjects related to computer sciences that are currently being done in IRIT.

Which are the main goals of the research on relational architecture sciences of these issues?

As mentioned earlier, relations between our various research topics are mainly based on multi-disciplinary projects, work teams, deployed platforms and external collaborations.
If we take the different issues in order, these are the objectives for each of them:

1: Analysis and synthesis of information
Telecommunications, visual interaction, 3D, medical imaging, augmented reality, multimedia indexing.

2: Indexing and retrieval of information
Visualization of large volumes of data, retrieval of information that is generic solid and structured, exploration and visualization of knowledge for economic intelligence (Tetralogie and Xplor).

3: Interaction, autonomy, dialogue and cooperation
Multi-agent and agent approach for the cognitive linguistics, analysis, modeling, design, and cooperation between autonomous agents.

4: Reasoning and decision
Diagnostic of errors, manufacturing, medical dietetic attention, computer security, etc. Recent research has been focused on universes that can be ordered in hierarchies for the retrieval of information, the teaching of languages and the disambiguation.

5: Modeling, algorithms and high performance computing
Optimal Control and transfer in collaboration with CNES. Research oriented to the use of electron-ion engines.

6: Architecture, systems and networks
Sharing the management and mobilization of storage resources. REFLEX technology (patented) for the shared storing of data. The launch of StorAgency has received several awards for the promotion of innovative technologies.

7: Security in Software Development
Components in real time, computer security, secure systems, the architecture of meta-data, expertise and execution in the network, compilers of cooperation objects, verification, UML adaptive mobile agents.

What relations do you think that these subjects have outside its research ambit?

Many of these investigations have implications for the everyday life and its purpose is, ultimately, the general public: telecommunications, multimedia, indexing, 3D. Other relations involve more specific areas: medicine, space, maintenance of cars.
Other areas of research are transversal, such as economic intelligence, strategic monitoring, and treatment of the languages. These activities can be of interest for all economic activities of society.

3. One of the priorities of the laboratory is the development of transversal projects. These projects are characterized, first, for gathering various research teams with diverse scientific background and secondly, for putting these skills into action in the framework of scientific operating platforms. These platforms are open to the national and international community.

IRIT has established four transversal projects and one working group:

The "Dialogue Project" is motivated by the interest of having, in the IRIT, a platform for study of man-machine oral dialogue aiming to a more detailed exploration of the treatment of errors.

The project of degraded Interaction aims at helping to improve understanding of patterns of communication and degraded interaction. These degradations are due to shortcomings of the user or perhaps to the conditions of communication.

The SIGMA project addresses the general topic of multimedia technologies, and focuses on a set of applications related to medicine and telemedicine.

The GRID-TLSE project is about the parallel resolution of lineal empty systems of great dimension. It aims to develop of specific software and to the set up of a web site for monitoring.

The working group "Natural Language" gathers together all the teams that are studying the automatic processing of natural language, covering unique topics in the fields of semantics, extraction of knowledge and the search for information, discourse, dialogue and word processing.

What collaborations have been done in the context of the international community? In which ambits or disciplines?

The IRIT has participated in various European projects from FP5: 3 under the FP5 and 9 under the FP6. IRIT's European projects have focused on the definition of reference points for continuous learning, large firms, multi agent systems, and scientific and technical information (STI).

Do you consider that the semantic issue is perhaps the main difficulty of the related sciences?

Indeed, in an interdisciplinary working group it is very important to understand each other. I have had experience working with economists and competent people from different fields. The hardest part is understanding each other with a common vocabulary because a language is not infinitely extensive so in each field identical words are used with very different definitions, which might lead to confusion. The first step is understanding the meaning of the most common terms used in that specific field, then it is much easier to exchange ideas, and understand each other.

4. IRIT has established four platforms and a fifth one is being defined right now:

The platform of virtual reality and interaction (PREVI) is a material platform for the development of material for the works that are being carried out about virtual reality and interactions, and more generally, about science and techniques of information and communication.

The platform for research of information and knowledge extraction (RFIEC) has the objective of allocating resources and enhancing the research work carried out by IRIT on the subject of indexing, research and storage of information in texts, all in order to create a national center for research in information.

The platform of research and experimentation in information processing (PRETI) aims to regroup various features, illustrating the investigations done by the IRIT teams which work in the field of Artificial Intelligence and Information Systems.

The GRID 5000 aims to build an experimental platform for research in computer science, created from a calculation network of large dimensions.
The future "Handicap and Mobility" laboratory will have as its main goal, the design and evaluation of replacement systems and assistance for disabled people.

5. The actions of assessment and dissemination of scientific and technological culture are also important. The transfer of knowledge is reflected in the organization of regular meetings between the research world and the economic-social world and in operations addressed to the general public and students.

What has been the experience in the interaction between university and businesses?

The transfer of knowledge and technologies will be formalized with the creation of joint laboratories with the industrial world, such as EADS with MIDI, Autodiag with Actia, or Airsys with AIRBUS.

Technology transfer is not limited to the creation of joint laboratories. PhD's at the lab can create their companies to exploit the technologies developed during their work or thesis. The laboratory helps them to create their businesses, promotes technology transfer especially in intellectual property issues and ensures the transfer of scientific support for the development of these technologies after they have been transferred. PhD's also collaborate with IRIT accepting doctorates in their societies through CIFRE contracts (Contract for Information, Education and Research of Enterprise).

The new French regulation of the financing of public research changes the nature of the synergies between public and private sectors. The obtaining of recurrent credits has become very difficult. Obtaining financing is made through collaborations between businesses and public laboratories, in response to the projects proposed by agencies like the National Research Council, for example.

What applications have been developed jointly by IRIT and the business world? In which areas?

IRIT is involved in systems for the car industry and aeronautics. The laboratory has also developed innovative procedures in the area of indexing of multimedia content of interest for big conglomerates such as QUAERO (European Search Engine of audiovisual content). IRIT has an important research center of information and contributes with its results with search engines such as EXALEAD. It also develops systems for real-time translation of sentences in sign language. These systems will be installed in public places like subway stations (RATP, SNCF). The laboratory is involved in several disciplines and synergies between industry and IRIT are numerous.

Which have been cases of technology transfer? Give examples

IRIT has sold a patent of storage virtualization to a private company. This company currently has over 20 employees and exports its R & D to the United States keeping its head office in Toulouse.

At an international level, IRIT has created ILIKS (Interdisciplinary Laboratory on Interacting Knowledge Systems), a European laboratory associated with the CNRS, with the University of Trento and with the National Center for Scientific Research (CNR) of Italy.

What are the main activities of this lab?

The interaction between knowledge systems is the new paradigm for building the future of the society of intelligent agents. People, machines and organizations have to interact more among themselves by means of modern information technologies and information and communication technologies (ICTs). The social nature of interaction and communication processes has to be recognized and treated as such, if we want this technology to be effective in order to create benefits for society.

The "Interdisciplinary Laboratory on Interacting Knowledge Systems" (ILIKS) is a "common European laboratory" (Associated European Laboratory or LEA), an initiative of the French National Center for Scientific Research (CNRS), which will examine the theoretical foundations of interaction in the context of an interdisciplinary approach to develop rigorous models based on cognitive science, linguistics, philosophy, economics, logic sciences and computer sciences. Although this approach is theoretical in nature, it will have a deep impact on ICT applications, precisely because of its generality, and the need for this generality comes from the implementation of the projects that our partners and colleagues have done.

6. Regarding the teaching of computer sciences, IRIT plays an important role in the different institutions of Toulouse (UPS, INPT, UT1, UTM), helping to create a strong linkage between teaching and research. IRIT participates in various research Masters in Computer Science and Telecommunications and in the EDICTO Doctoral School. From January 2000 to December 2004, 160 theses and ratings have been sustained. There are currently 250 ongoing theses.

Which are the main lines of research currently being done by PhD in their theses?

This is the list of the titles of recent theses and ratings on issue 2:

- **Dynamic Optimization of instances: about centralized on decentralized.**
- **Gestural and haptic adaptations and interactions, addressed at increasing usability and accessibility for users**
- **A model of research of information based on possibility networks.**
- **Accessibility in Electronic Documents: personalization of the presentation and interaction with the information.**
- **Domain ontologies for modeling contexts in search of information.**
- **A model of implementation based on mobile agents for the dynamic optimization of fast instances scattered on a large scale.**
- **Ontology-driven conceptual indexing for searching information.**

- **Distributed multimedia indexing services.**
- **Comparison of audiovisual materials with the similarity matrix.**
- **Flexible model for finding information on bodies of semi-structured documents.**
- **Generic modelling of multimedia documents for meta-data: mechanisms for annotation and query.**
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To which academic pathways are these lines of research associated with?

Doctors at IRIT generally find their way either in the academic world or as researchers in scientific institutions or universities affiliated with the CNRS. They may also be recruited by the companies that are currently or were working with IRIT in the past.

7. Let us talk about you now: What has been your main activity recently here at the IRIT?

Figure 4.: Bernard Dousset and his team

I have been focusing mainly in four activities:

- **In my PhD's and the development of new methods for data Mining (Great Scale graphics, morphing of graphics, semantic treatments, online reporting, etc**
- **Organizing the VSST 5-day congress that has had its editions in October 2004 in Toulouse, in October 2007 in Marrakech and the seminar of 2 days in January 2006 in Lille.**
- **Implementation of various strategic studies and training on issues of strategic watch (courses).**
- **The responsibility of several research contracts with public agencies.**

Which are the main lines of the scientific production? Cite 3 to 4 relevant articles you find important.

These are the most significant of my recent production:

- **Ilhème Ghalamallah, Aziz Grimeh, Bernard Dousset. "Processing data stream by relational analysis". MODULAD n°36, July 2007.**
- **Josiane Mothe, Claude Chrisment, Taoufiq Dkaki, Bernard Dousset, Saïd Karouach. "Combining mining and visualization tools to discover the geographic structure of a domain". Computer, Environment and Urban Systems, Elsevier, special number Geographic Information Retrieval, V (hors-série) N°4, p. 460-484, July 2006.**
- **Brigitte Gay, Bernard Dousset. "Cartographie de réseaux d'alliances et analyse stratégique". Revue des sciences et technologies de l'information, série ingénierie des systèmes d'information (ISI), systèmes d'information stratégique, Hermes-Lavoisier, vol. 11, n° 2/2006, p. 37-51.**
- **Brigitte Gay, Bernard Dousset. "Innovation and network structural dynamics : Study of the alliance network of a major sector of the biotechnology industry". Research policy, vol. 34, 2005, p. 1457-1474.**

What are the latest lines of research that you are currently working on and where are they heading in the future?

I am currently moving towards online help processes for strategic analysis, to allow web users to navigate through updated data, dealing with current issues with an on-demand report of it. This

implies: semantic, lexical and syntax processing of texts (in order to standardize the format and vocabulary), an export to a web database of worked articles, the possibility of focusing on a certain interest point, and finally having resources such as numeric indicators or graphs, all to evaluate the contents. We believe that the crossing of information provides a more synthetic and strategic type of knowledge. The endogenous (implicit) information retrieved with these methods can have a noticeable impact in the decision making process: the key is to present this information well. We are also interested in the classification methods, and we are considering some projects on graphs splitting, classifications of evolution and pyramid classification.

8. In October, professionals and technology watch experts met in Marrakech for the VSST congress:

How has this congress evolved throughout its latest editions?

The colloquium in 2007 represents a sharp decline compared with the previous conferences (135 persons in 1995, 160 in 1998, 185 in 2001 in Barcelona, 280 in 2004 in Toulouse and only 120 this year in Marrakech). The cost and distance are the main reasons for this decline, but several other congresses suffer these same problems, because there are too many events on economic intelligence.

What are the questions and issues that professionals from the field are more concerned with lately?

In 2007, various problems have emerged: territorial intelligence, risk management, detection of weak signals, social networks, visualization techniques and especially the mapping of knowledge.

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1. Logo

2. Current Keywords:
Methods of analysis of needs, spatial intelligence, morphing graphics, Interactive Reporting, Analysis of semantics.

3. Guidance for the coming years:
Analyze the need for territorial intelligence, Analysis of the evolution of the relational, Cover of reporting for economic intelligence.

4. Names of the major search engines Economic Intelligence:
Bernard DOUSSET (P), Maryse SALLES (MC), Josiane MOTHE (P), Eloïse LOUBIER (3°C), Aziz GRIMEH (3°C)

5. Contract research: DGA, INRA, CNRS

6. International relations
- Universities: Barcelona, Mexico City, Bogota, Louvain la Neuve.
- Service Companies: IALE Tecnología (Spain, Chile), Synergiums, GFI (Luxembourg).
- Industry: Nestlé (Switzerland), Leia (Esagne) Carmeuse (Belgium), Idelux (Luxembourg), IMP (Mexico)

7. Journals which publish with us:
Research policy, Journal of the American Society for Information Science and Technologiy, Production Planning and Control Journal, Journal of ISDM , Computer Physics Communications, Revue Droit et Société, Revue d'Intelligence Economique, Revue des sciences et technologies de l'information, Ingéniérie des Systèmes d'Information, Editions Economica - Collection IE
http://www.irit.fr/publications.php3?theme=2&equipe=SIG

8. Scientific colloquiums in which we participate:
VSST, EGC, SFBA, CIGIR, COLLNET, ROADEF, RIAO, ECIR, HCI, INFORSID, CEIE, IERA, SMESME, IAMOT, IDMME, NORDNET, meetings of the French Classification Society (SFC), Workshop on Geographic Information Retrieval

9. Websites of interest: http://atlas.irit.fr, http://ieut1.irit.fr, http://www.irit.fr

B / Your opinion:
The idea that the environment is the central object for the economic intelligence (Information gathering on the environment, its representations, anticipation of the up and coming changes, etc.) is being progressively abandoned in favor of the new idea of considering the strategic decision as a general concept. Therefore, Economic Intelligence considers related ambits that are outside its main competence. We must refocus the issue in its essence: Strategic information of the environment of companies and its integration in the global process of knowledge management are outside the central competence of economic intelligence, that is a much broader concept. That is why, since 1995 our congress is called VSST: *Veille Stratégique Scientifique & Technologique*, a more precise term.