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(Photo: Münch, GMD)

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User Interface and Multimedia 7

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This issue is about Multimedia. Rather than talking about GMD and the restructuring that takes place here it is more interesting to discuss Multimedia. Scientific issues should be more interesting to the readers than managerial issues.

What is Multimedia? Most computer scientists define it as "data, text, voice, pictures and ... sometime soon we will deal with video". A better definition coming from a real media person is "anything with more than seven cables". The reason that the latter definition is better is that it emphasises the real problems. The real problems are not about how to attach voice or picture frames to text or data. They are about all the difficult interface and synchronisation problems that come when video and computer technology meet. In undiplomatic terms "if you can't handle video then you are not dealing with the important problems".

Why is Multimedia important? There are many answers, intellectual, scientific, economic, etc. Intellectually, Multimedia is important because it brings closer computer science to real creative persons, i.e., artists. Scientifically, it is important because it is a melting pot of ideas coming from the logic oriented world of Computer Science and the imagination oriented world of video and film making. Economically, it is important because it is an economic sector in-between two different economic sectors: Information Technology and Media. Usually the in-between economic sectors expand faster than any one of the constituents.

What can we do in Multimedia? First, we need to be honest. We don't know very much about media. There is a whole world out there who are experts. We need to have a close cooperation with them to understand what they need. The end-users are not only clerks or engineers but artists and kids. In addition, most people watch television and films every day with spectacular side effects. It is difficult to do much better or much different. We should concentrate on what we can do best, i.e., tools. As amateur video artists we cannot be very successful. As tool makers for video artists we can do better. We should not also forget that cost and ease of use are as important for tools as functionality.

How do we start in Multimedia? It used to be the case that you needed many millions $ to put together a media lab. It is still the case if you need top quality. Many ideas, however, can be tried out on lower quality but adequate equipment. You can start up a small media lab with $ 100,00 – $ 200,000 which is a reasonable budget for most Information Technology Research Labs. The equipment is heterogeneous and there are many interface problems but it can be done. At the end please count the cables. You will understand the proposed definition of Multimedia. What kind of research is meaningful? This is the hardest question. It is indispensable to have a lab and it helps to have an application in mind. Then we need much imagination. The motto should be "you see what you imagine". So close your eyes and start imagining.

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Implementing a User-friendly Conceptual Access to CNR Research Project Descriptions

by Paola Venerosi

The CNR Special project "Trasferimento delle tecnologie dei Progetti Finalizzati" was set up in 1988 with the aim of diffusing information on CNR research activities and promoting cooperation and synergetic enterprises within the R&D community. In 1991, the Project supported about 53 working groups throughout Italy. At IEI, a working group has the task of designing and implementing a user-friendly interface which interacts with a conceptual representation of CNR research projects in the computer science area.

The first step was to analyse the use of an indexing language to represent the contents of a research project. Our aim was to develop an interface module providing a variety of hierarchical index "views" in which the nodes represent concepts and the links represent the relationships between the concepts. This easily understood structure permits the user to browse comfortably.

Organizing the unstructured free-term terminology employed in the project documents in order to define a search strategy was difficult; it appeared far more profitable to organise the free-terms into a controlled, structured and well-known classification scheme. The top two levels of the ACM Computing Reviews Scheme met our purpose and were adopted to constitute the frame with which the free terms could be associated. The conceptual subdivision of computer science topic areas was thus efficiently expressed and the hierarchical organisation inside the subdivision maintained, allowing general and specific queries from the controlled language to the free-term level. Data suitable for semantic retrieval were considered separately, thus enlarging the document description elements.

In 1990-1991, an end-user interface was designed to allow interaction with the project data. A menu-driven interface allows the user to operate on homogeneous data either by information content or by functions to be performed using different information retrieval techniques. The system, called PROGEST, runs under DOS on dBASEIII plus. Deterministic retrieval is executed by relational DBMS functionalities while two complementary search methods, i.e. full-text retrieval and indexing language searching, have been developed for semantic retrieval. A browsing strategy has been implemented to allow users to search through the graph of index associations. An extended indexing implementation, increasing the expressive RDBS power, was essential to support the non-traditional application.

A revised version of PROGEST was then developed in a hypertext environment. Our scope was to increase the graphical expressivity of the interface, maintaining most of the above functionalities. The system is developed in Hypercard Apple using the Hypertalk language. The prototype has a two level structure. At the first level, we have a hypertext document base composed of all research project documents. At the second level, two linked hypertext objects enabling IR functions are implemented: the first contains a controlled and structured indexing language representing the content of the research projects, and the second contains a set of structured images representing the geographic location of the CNR research centres. Both operate on the document base by means of a navigational technique. A switching system is provided linking the different levels and introducing the user into the hypertext environment to access information and view documents.

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User Interface and Multimedia at INESC

by Nuno Guimarães

User Interfaces and Multimedia is a growing area at INESC. One reason for this growth is the evolution of current computing systems with respect to improved interactive capabilities. New technologies raise new questions and justify new answers. A second reason is the pervasiveness of high quality user interfaces, and multimedia facilities, in current computing systems. We believe that high quality user interfaces and multimedia have a qualitative impact in the role of future organisational systems and critical information systems.

INESC has its own attempts to answer the questions related with the User Interface and Multimedia technologies. Some examples are described below. INGRID (Interactive Graphical Interface Designer) is a tool that supports interactive creation of user interfaces. It adopts the object oriented paradigm and stresses the need for openness. The kernel components of INGRID are a C++ runtime support system (ICE) and a user interface toolkit (4D) designed to encapsulate external tools.

The H4D is an extension of the 4D toolkit to support the development of Hypermedia applications. The main features of the toolkit are the strong encapsulation of the storage systems like indexed Unix files or object oriented distributed platforms (COMANDOS), a high degree of transparency to representation systems, and the compatibility with the INGRID architecture. Continuous media and synchronisation is also a concern. The development of a toolkit for manipulating continuous media is under way. Special attention is given to standards like HyTime.