Abstract

We at a new step of software where the development of applications is done not using instructions, but composing applications. The software object oriented which allows the integration between applications is the solution for the designer to produce the own software.

It is possible to use integrated applications with a limited knowledge of algorithms and programming languages. That allows the not specialized users to use specialized multimedia tools. The consequences of this opportunity can result very important not only for the designer but above all the actors involved in the decision making process. It is hard to evaluate the social weight of hypertexts and hypermedia in the field of social participation to the decision making. However their efficiency in the communication problem it is clear, we can preview that in the next future the use of hypermedia will be more extensive in the field of decision making, which involve public interests.

Some hypertexts developed in the CAAD Laboratory of the Third University are briefly described.

The Telecommunications revolution: social and politics influences

"The global economy is growing at an unheralded rate, but large organizations in business and government level are faltering. The dream of a "United Europe" is rapidly fading, while dozens od nations are establishing their own identities.

Multinational corporations are transforming themselves into looser confederation of small, agile operating units. (...) And small and medium sized firms are coming increasingly to dominate the marketplace. These events combined suggest a fascinating paradox that is becoming more and more apparent: as the global economy gets larger, the individual units – people, countries and small companies – are becoming more powerful.

An interconnecting world in which not only is small successful, but small is powerful” (Naisbitt 1994).

It is easy to compare this situation with parallel movement in the computer world happened in these last ten years: networked personal computers took the place of mainframes.

Amongst the many key trends which Naisbitt reveals are:

- the world will contain nearly ten times more countries than today;
- a move towards political independence on the one hand, the formation of economic alliance on the other;
- the concept of 'Think Globally, Act Locally' will be replaced by 'Think Locally, Act Globally';
● electronics will become both a universal currency and language;
● entrepreneurs will become the most important players in the next century. Business
● conglomerates will have to break themselves into smaller autonomous units if they are to survive;
● the crisis of the idea that central government – one huge mainframe – is the most important part of governance.

*The power will pass from the state to the individual. From the upright to the horizontal. From the hierarchy to the net. The power will drive in all the directions, not foreseeable, a few chaotic, surely confused, not businesslike.*

Politically the world will pass from right hand – left hand to local – global, universal – tribal dichotomy. Naisbitt observes: "if the present rate of growth of Internet users continues, there will be 300 million by 1999, 750 million by 2000, and 1,5 billion by 2001". On the wave of telecommunications revolution the opportunities offered to individuals and corporations never happen before.
The global network will give to individuals the chance to communicate with each other in real time, changing their way to work and their way to relate.
The number of people who will use personal computers to receive messages, data and other kind of information will increase.
The telecomputing will increase the individual custom and will continue to put in crisis structures centralized at economic and government level. According to Bill Gates in the 2000 the televisions will have the abilities of a personal computer. Many industries of computer like IBM and Digital are been grant with society of telecommunication for collected plans.

**How hypertext can improve the social participation**

It is hard to evaluate the social weight of hypertexts and hypermedia in the field of social participation to the decision making.
However their efficiency in the communication problem it is clear. We can preview that in the next future the use of hypermedia will be more extensive in the field of decision making, which involve public interests.
This chance of technology give an answer to the needs of participation, which is recently confirmed in Italy by the last referendum.

Hypertext, a name created in the sixties (*Velson 1990*), is referred to a non sequential form of text, which allow the user to choose and interact in his reading (his navigation path). The hypertext is made by several nodes, a text branch, connected with links by which the user can follow different path.
The name ipermedia simply extend this idea of non-sequential text including information like pictures, sounds, movies and other kinds of data.
In hypertext systems are fundamental concepts like multi-linearity, nodes, links and web (*Landow 1993*).
The hypertext for environmental topics needs flexible and rich multi-media technology, which is be able to manage a wide range of tools for raster and vectorial images, computer modelling animation, sounds.
The introduction of optic memories and terminals of excellent quality increased the introduction of graphic interface, expanding the use of multi-media systems in which standing pictures or animation, the audio, the iconic communication are interconnected.
Using graphic interfaces to work with computers means to work with objects which can be manipulated out of the domain of computers.
With computers the opportunity of analysis and quality of work can grow very much with controlled costs.
That is true if it is possible to integrate different software applications.
The multimedia applications need a quantity of elements to realise significative applications. To construct a prototype already ready applications can be used to reduce the development of new software.
"That corresponds to a new step of software where the development of applications is done not using instructions, but composing applications. (...) The software object oriented which allows the integration between applications is the solution for the designer to produce the own soAware without to use languages of fourth generation" (*Degli Antoni 1989*).
It is possible to use integrated applications with a limited knowledge of algorithms and programming languages. It is possible to use a 3D computer graphics program without to know the modelling algorithms: it is sufficient have a base knowledge as the program works and about the results expected.
That allows the not specialized users to use specialized multimedia tools.
The consequences of this opportunity can result very important not only for the designer but above all the involved actors.
The experiences in the CAAD Laboratory in Rome

The task of the urban-planner involved in the participation process is to be conscious of actual situation, to stimulate the interest of the people about the new shape of the territory coherent with the needs of the community, to involve the people in the management process founded on decentralization. This way of conceive the role of the urban-planner needs new tools of planning and communication. In the decision making process about environmental problems multimedia tools can assume a very important role. These tools result effective in the analytical and cognitive phases and can became powerful tools for the communication and diffusion in the phases of collective implication.

In the research activity of the CAAD Laboratory in the Department of Design and Science of Architecture (called DipSA, Third University) were developed some hypertexts which aimed at:

- analysis of the context and design strategies for the Third University of Rome in the area of Valco-San Paolo/Ostienese;
- analysis of archaeological heritage and the prospective of restoration and appropriate use of resources in the Archaeological Park of Appia Antica (a collaboration project "Il Parco Archeologico di Roma, Fori - Appia Antica") (*).

The hypertext on "The green side in the sustainable town: the Tevere-Sud Park"

This hypertext was used as an instrument of communication between planners and other experts, who gave their contribution to the planning installations studies done by the DipSA in the academic year 1994-95. The hypertext was also used to show the planning results and the relations with the local authority plan, during the occasion of the signature of the agreement between the Assessorato alle Politiche del Territorio (Council of Politics of the Territory) and the Third University, which took place in the Town Hall last February (fig. 1-2). The hypertext on Green side in the sustainable city: the Tevere Sud Park (fig. 3-4) is a deepening of the first hypertext above mentioned and it is divided in two hypercard stacks:

- the first stack is about the problematic aspects of the Tevere Sud Park, in which the retrieval of the archaeological rests of Pietra Papa is deepened in distinctive. The archeological rests and all the historic patrimony of the area are very important elements, careless from the recent process of urbanization, on which to grow the sense of the place of the inhabitants.
- the second stack is about the moderation of the circulation with distinctive reference to the residential streets. The cards relative to the norms and the examples (in Italy and Europe) could be a legitimate tool for the inhabitants which want to adopt the idea of residential streets.

The proposals developed by the students of the CAAD course (**), which live, for the more, in the area in examination, could become a base of discussion for the inhabitants.

The Hypertext developed with the help of the students and of young researchers could become a good reference for the "Self-sustainable Laboratory for the Marconi-Ostienese District" (**), where inhabitants can try new techniques of interactive planning and methods of social production of planning.

An hypertext system for Rome's heritage, "The Archaeologic Park of Rome, Central area - Fori - Ancient Appia"

It is an experimental prototype of an hypertextual system which could become an effective support in the activities of Scientific Committee of Appia Antica Regional Park. The hypertext topic is the Archaeologic Park, which start in the deep heart of Rome (in Via dei Fori Imperiali) and continue outside the roman walls, on south-east, along the ancient Via Appia (fig. 5-6). The aim of this hypermedia is to manage not only information about natural and historical heritage, but also the urban planning development, the transformation process and future strategies in the Archaeologic Park. If this instrument will be used it can effectively promote the social participation of park users because of the hypertextual chance.

The first step of this project was to implement a prototype which had to be showed during the celebration of the anniversary of the foundation of Rome (called Natale di Roma, in the 21 of April) in a multi-media kiosk located in Via dei Fori Imperiali; a step forward will be the implementation of the final hypertext system (increasing of data input and more system implementation) for the location in the new park centre.

Technical remarks

The promise of hypertext lies in its ability to produce complex, richly connected and cross-referenced bodies
of information. However, it can also become a complex system of tangled webs, confusing both authors and readers.

The comprehension and navigation of a hypertext document depends on the reader’s ability to construct a coherent mental representation. It is the author’s responsibility to ensure the construction of the hypertext document as a coherent entity. The construction of a coherent hypertext document can be considered to be a design problem. (Balasubramanian, 1993).

According to Conklin, disorientation and cognitive overhead are the two most challenging problems related to hypertext. He feels that these two problems "may ultimately limit the usefulness of hypertext" (Conklin, 1987). The problem of disorientation or "getting lost in space" arises from the need to know where one is in the network, where one came from, and how to get to another place in the network. In traditional text, it is not easy to get lost.

There is the table of contents of topics with page numbers, the index with keywords and page numbers, and also bookmarks. However, in a complex hypertext network, with thousands of nodes and links, it is more than likely that the reader will get lost.

Cognitive overhead is the additional mental overhead on authors to create name, and keep track of nodes and links. For readers, it is the overhead due to making decisions as to which links to follow and which to abandon, given a large number of choices. The process of pausing (either to jot down required information or to decide which way to go) can be very distracting. It can become a serious problem if there are a large number of nodes and links (Balasubramanian, 1993).

In most current hypertext systems, readers have a problem trying to understand the material presented because they view it in the wrong order or they simply cannot comprehend easily.

Carroll and Thomas have established that people develop new cognitive structures by metaphorically extending old ones (Carroll and Thomas, 1982). Users of a new computer system can master it if they can metaphorically extend it to some real world objects or entities. A good metaphor not only helps the user, but also provides a rigid framework within which the hypertext author or designer must work to maintain consistency. Choosing an appropriate metaphor would also reduce both functional opacity (mismatch between the framework and the metaphor) and system opacity (mismatch between the metaphor and the implementation model) (Rao and Turoff 1990). Hypertext has been compared to electronic encyclopaedia, notecards, journeys, browsing, windows, paths, guided tours, travel holiday, and survey-type maps (Edwards and Hardman, 1989), (Hammond and Allinson, 1987), (McAleese, 1989). The travel metaphor serves as an extremely powerful aid to hypertext navigation (Baird and Percival, 1989). At the same time, metaphors should not become too restrictive. Hammond and Allinson say that "the system should improve upon the metaphor, not be bounded by it" (Hammond and Allinson, 1987).

Our intention was to consider the interface not just a nice dress for an application but a central problem because it affect not only the productivity and ease of use of the system but the quality of the interface must provide to the user inspiration of new uses (historically the evolution of the information technology brought not a quantitative but a qualitative progress). To do this the interface must not be a casual collection of pre-programmed tools to use some data, but must present to the user the image of a rational conceptual structure that is useful for the mental processes of the user, helping as much as possible the user to process data at a higher level.

So even if some hypertext guru refuse any kind of structure and even any kind of orientation in the hypertext to leave the user navigate absolutely free in the "sea" of information, we think that, at least for now, this approach is very unfriendly for most users and that conceptual structure and the knowledge of "where" you are, are powerful thinking tools and base for further qualitative developments.

Frank Halasz had originally identified seven issues for next generation hypermedia systems (Halasz, 1988). Other researchers have come up with a few more over the past few years (Lange, 1993), (Fountain et al., 1990).

We tried to meet most of them:

- **openness and distribution**: most current hypertext systems use proprietary data formats for storage, they are closed systems – material created in one system cannot be transferred or integrated with material created in another system because of proprietary document formats and storage mechanisms. Conversion programs are difficult to write since the formats are not disclosed by organizations (Fountain et al., 1990).

- **dynamism**: most current generation hypertext systems implement a static and explicit model of hypertext – nodes, links, and link markers must be declared explicitly and be fully enumerated during creation time as opposed to being declared dynamically and generated upon demand (Bieber, 1993).
**composites:** with increasing use of hypermedia for sophisticated applications it becomes necessary to deal with groups of nodes and links. This will require making a composite node as a primitive construct in the basic hypermedia model. Inclusion (or part-of) relations have to be supported in addition to standard, referential links.

**multimedia support:** the database layer should be able to efficiently store and retrieve multiple media. It should also provide transparent access to different storage media.

**extensibility and tailorability:** extensibility involves the ability to handle extensions to the existing data model (schema evolution) in a flexible and safe manner. The database layer should not only be able to handle the structural part of the hypertext data model but also the semantic part to ensure data abstraction and encapsulation of the evolving data model.

Lucarella has written that whereas conventional IR techniques focus on "what to where" (we know what we want, but we wish to find out where in the database it is), hypertext browsers focus on "where to what" (we know where we are, but we want to know what is there) (Lucarella, 1990). IR in a hypertext system can combine these two techniques to greatly enhance the process of finding relevant information. Query facilities can supplement hypertext browsing by providing the user with a set of relevant nodes for browsing.

Navigation or browsing is effective only for small hypertext systems. For large hypertext databases, information retrieval (IR) through queries becomes crucial. Conklin had suggested that search and query mechanisms can present information at a manageable level of complexity and detail (Conklin, 1987). Halasz’s view was that "navigational access itself is not sufficient. Effective access to information stored in a hypermedia network requires query-based access to complement navigation .... search and query needs to be elevated to a primary access mechanism on par with navigation.” (Halasz, 1988).

In addition to navigational access to information, hypermedia systems should provide efficient search and query mechanisms. This would partly solve the "lost in space" (disorientation) problem experienced by users during navigation. There can be two kinds of queries - a structure query to retrieve a part of the network and a content query to retrieve a specific node.

Other problems we tried to solve are:

- **flexibility:** the system must be flexible enough to adapt to the user needs and not to constrain the user to adapt to the system. This is a big problem when you want the system to be useful for a wide range of users that have completely different needs (maybe very personal, even unpredictable);

- **efficiency:** the system must allow unlimited adding, updating and editing of the material and allow to do it without any additional work. The data must be available for any other use, also in the future, without any additional work;

- **longevity:** a problem, that becomes very big with the fast growing new technology is the early obsolescence that can make unusable a data file even before it is completed (this is a big problem with archives that are too big to convert).

To solve the problems above (make the structure flexible and possible to personalize, use the data for all the purposes that can be related, allow the data survive the hardware and software they are implemented etc.) the main way is to make data independent from the structure (of course it means also from the program used) and, as much as possible, from the environment they are implemented (that seems to be also the future of computing generally)

So, actually, our application is only a structure realized to allow the personal use of a big amount of external data. To meet those needs and to be highly coherent with the structure and the metaphor, we never used direct linking (link to...) and tried to avoid the use of arbitrary "buttons", and the linking managed automatically by a simple macro-language with this syntax - keyword: filename – by adding semantic value to the structure links:

- **conceptual links:** in each card there is a simple explaining text, containing conceptually related topics to which the user can link simply by clicking on them;

- **automatic structured links:** when you add, delete cards or change the order of them, you don’t need to create any link, because the program will automatically link to the correct card (if it exists) at the upper and lower level;

- **automatic search for reference links:** clicking on any word in the text will cause the program to search if there are specific information without any action required by the compiler (this in the default Navigation Mode because clicking on a word in the Writing Mode lets you add or modify text);
• **automatic external data links**: you can see one or more external images at once, and to do it you don’t need to create any link but just clicking on a drawing name and the program will automatically link to the picture file in the archive folder (if it exists). The same for other kind of data (video, text, animation, etc.);

• **automatic index of contents creation**: when you add, delete cards or change the order of them, the indexes will automatically update.

**Notes**

(*) The hypertext is born from an idea of Annalisa Cipriani and has been realized by the CAAD Lab of the Third University in Rome in collaboration with the Soprintendenza per i Beni Archeologici di Roma and with the Comune d’Roma (X Circoscrizione).

(**) The theme of the Competition for Inhabitants and students about the Tevere Sud ParK, proposed from the Third University of Rome (dead line 31/8/95), has been chosen as argument of the CAAD course of the Faculty of Architecture.

(***) The DiPSA (Dip. of Design and Architecture Science) and the Comune di Roma recently signed an accord about the production of multimedia tools with the task to create occasions of interactive planning and social production of planning in the Laboratori di Quartiere (Local Laboratory), managed by Comune di Roma with the collaboration of the University.
MODERAZIONE DELLA CIRCOLAZIONE

Le strade con velocità moderata consentono di usufruire dello spazio esterno anche ai soggetti più deboli: anziani e bambini.

Moderazione della circolazione non significa eliminare l'automobile ma consentirne un uso più appropriato, adatto alle esigenze dell'uomo che deve poter vivere liberamente anche nella strada.

PRINCIPI  
NORMATIVA  
ESEMPI  
PROGETTI  

INDICE
Modello di strada residenziale
Strade residenziali a Berlino
Ristrutturazione viaria a Zurigo
Strada residenziale a Stoccarda
IL PARCO ARCHEOLOGICO DENTRO LE MURA
DALLA CAMPIDOGLIO AL CIRCO MASSIMO
References


**Publications of E. Mortola about Multimedia**


Giangrande A., Mortola E. 1992 "An Evaluation Module for An Interface for Designing" (AID) in *CAAD futures ’91*, Wiesbaden ; Vieweg


