ON DIGITAL ARCHITECTURE

Rosalba Belibani, Anna Gadola
Università di Roma "La Sapienza"-
Dipartimento di Progettazione Architettonica e Urbana - Via Gramsci, 53 -00197 Roma
tel. 0039 6 49919147 / 221 - fax 0039 6 3217094
e-mail: rbelibani@axrma.uniroma1.it - agadola@axrma.uniroma1.it

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One of the main aims of this research was to highlight the influence of computer as a designing tool. Their wide acceptance as drawing tools might occult the importance of their role in architectural design. We will try to apprehend, with the help of synthetic images, that computers mark a historic step forward in drawing and representation, as well as a major progress in the understanding of creative processes.

Together these features offer a broader horizon to architectural design. New source of inspiration can be found in virtual reality that makes visible what does not really exist, permitting design to suggest itself with its primordial image. We mean a kind of architectural imprint, where the first three-dimensional lines suggest in some way the designer with their shape, and encourage the definition process.

Through the visualisation of some images, it is possible to show the modifications of language and style, to examine the transformation modalities of the design process and to propose an essay of the new methods to communicate architecture.

The use of computer marks a historic step forward in drawing, representation and communication, due to the need for a more accurate definition of methods and procedures.

The shape auto-feeds itself to a new dimension of the space, futuristic but not foreseeable, autoreferencing. The representation of the project, in continuous evolution, is also involved in this metamorphosis, and even if it needs a deep discussion, it cannot be neglected. Above all, the communication of the project has substantially changed, after several centuries wherein the public communication of project followed traditional rules and consolidated styles, from Bernini to Shinkel. The transformation happened thanks also to the growing use of computers which have led to new and consolidated communication codes, that draw from TV and all media.

The present time is a sort of far-west of the communication: the risk is that stylistically unacceptable communications appear correct, since the period of acceptance of transformations has been canceled.

fig.1 - Index of the hypertext

Among all the new ways of classifiable digitalized communications of the project, the hypertextual communication is the one that presents multimedia properties and that promises further enhancements for its own interactivity. The hypertext utilises digital images as a new language in order to understand what debt they have, as an intellectual action, to the formal language of architecture.

The present research completed an hypertext structured in four parts: the architecture, the image, the technics and the virtual.

For what concerns the ARCHITECTURE we have considered some formal aspects, flowing from the creative process, that characterize the different phases of the project, from the automatic drawing of the shape to the representation and the communication.

The creation.

Whether the project is source of reflection, the computer is the place where the reflection finds new phases of feedback and new suggestions to the creative imaginary. There are several different ways to create architecture with the computer.

The shape.

The automatic instruments for drawing give the illusion of a sort of formal freedom, of an unlimited control of the entire space and they lead to the born of new shapes. These strange volumes, whether constrained in a display, seem to reply only to aesthetic meditations supported by the use of the computer.

In fact, they are formal expressions of new heuristic needs, of a projectual loneliness which rules on new forms of spatial and environmental relations.

The structure.

The computer simplifies the drawing and enhances the visualisation in special case for the structures: the beams, the ribs, the details, once reconstructed are easily readable and recognisable. The recent large production of reticular structures is certainly partially due to the use of CAD: it simplifies the definition of the elements and allows the 3D vision for a better verification.

fig.2 - The Structure (Studio Valle, Capolei, Cavalli: International Port Terminal, Yokohama, 1994)

The representation.

The language of representation is richer of new shapes and contents. The digital representation is the most crucial aspect for the interaction with the computer since this one increases the representation techniques, simplifying the methodologies and allowing easy advertising solutions. The digital representation compares to manual representation to which the communication of architecture has always been entrusted. The techniques and the modalities of representation, from sketch to drawing, appear to be various, but at the moment they seem often to refer to a known linguistic code. Nevertheless we can begin to see the research of more autonomous references.

The multimedia in architecture.

The architecture, as an object of multimedia communication, becomes itself a multimedia instrument of communication. Its moving from object to subject comes through a kinetic scenic representation of projected

images, of mechanical movements, yielding the light a changing scenography, of dynamics of users and of itself, of words and sounds.

The new architecture appears as multimedia form of communication of its own formal content, it is not a simple effect of an evolutionary process but the cause of it.
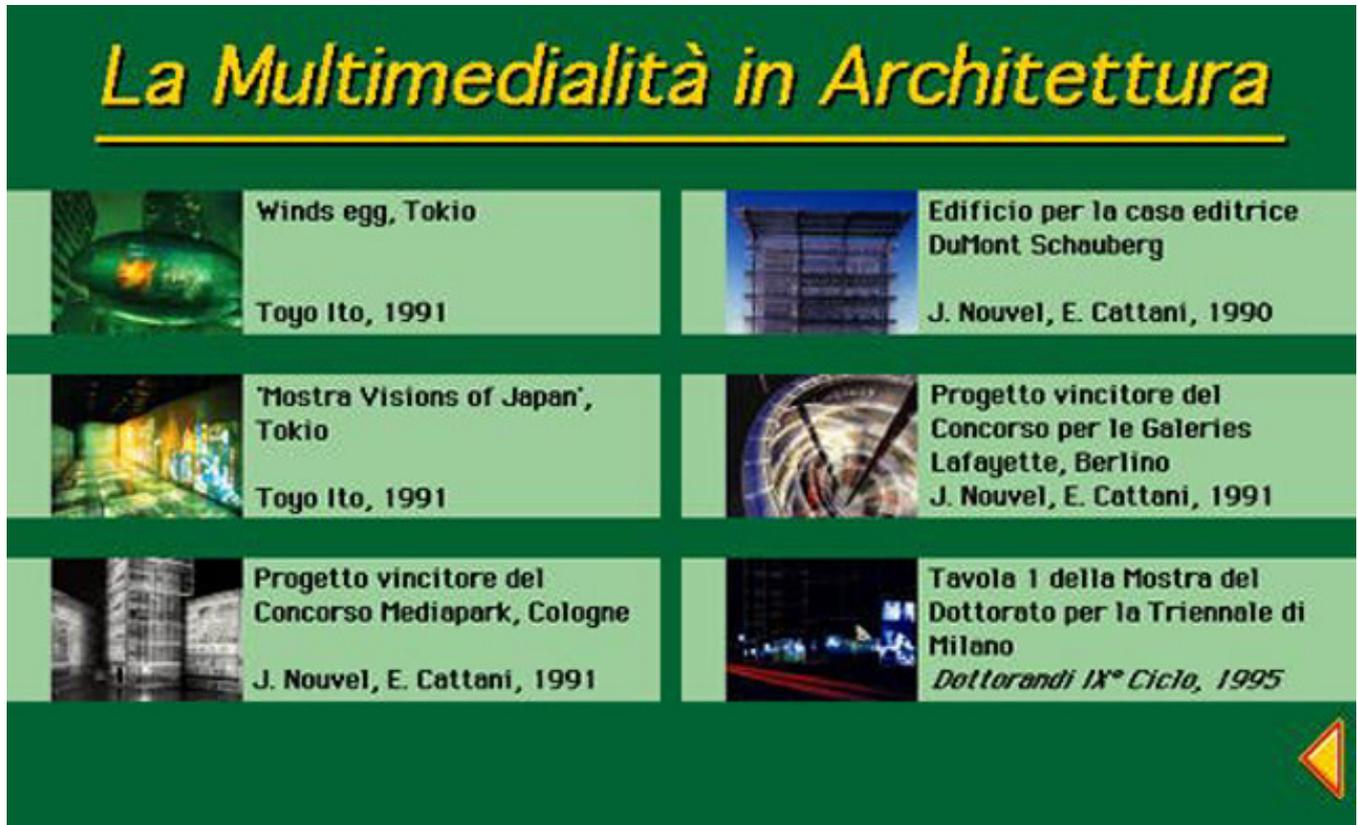

fig.3 - Index of the section Multimedia in Architecture

The model and the reality.

The virtual model of architecture compares with the build reality proposing a possible model. The vision of the digital prototype of architecture is an image of the entire visualisation of the building. The artificial vision adapts itself to the traditional rules of vision of a static model. From the real wooden prototype, big, heavy, and material, we move to an artificial prototype which shows its own interior and exterior complexities and turns around the user as in a sort of Copernican revolution. The digital prototype may be a reliable forecast of the future reality, an instrument for control, or a suggestion of how it could be. The digital prototype substitutes the classical prototype, simulating or creating new formal and aesthetic references.

The digital reconstruction.

The reconstruction of existing or destroyed buildings allows an exportation of the model and the test of virtual space.

Architectural projects never built or destroyed buildings can be visited through a model: it's a new spatial and emotional discover.

The digital reconstruction of an existing building through the transfer of its artificial model to Internet, allows the experience of the space to other people, even located very far away.

The analysis.

The digital elaboration allows a stratified-temporal and a structural-formal reading of architecture.

So as the construction of a model that is realised through the rational use of layers or completed parts, the analysis of formal and structural components occurs through a geometric deconstruction of logical or functional parts described by homogeneous attributes.

The second part of the hypertext is about the numeric, electronic image, that is both source of inspiration and result.

The images handled with the conputer acquire the digital quality of numeric information, that can, be modified and duplicated without limits.

Pictorial effects

The manipulation of images establish a new style on a repertory that flows from the transformation of traditional techniques to digital subtraction. It explain the image, so as the image translate the feeling, extending its expressive possibilities, with tools suitable to its dynamic and eclectic feature. Images show chameleontic qualities that have to be decodified and registrered in the codes of a new style that is not yet explained and classified.

fig.4 - A pictorial effect obtained by digital manipulation

Manual and digital

Man submit the computer to his own thought. Often very particular images are created, but sometimes they are similar to those hand-made. This is due to a reassuring will of refering to the known or to an intentional linguistic matter.

It is sometimes difficult to differentiate the manual from the digital result, on account of a clear will to mix them up.

The advantage of digital over manual modelling is the possibility of duplicate itself with an always different stylistic results.

The electronic photomontage

The techniques of photomontage, already in use by photography, find an efficacious help in the use of computer. The word "photomontage" has to lose the prefix "photo" because the technique itself takes on new qualities in the computer and renews its function.

Reality is placed upon digital drawing, or they complete one another for new stylistic compositions. Even the digital superimposes to itself in a continous modification of the scene.

Digital volumes

Architectural model is material or pictorial and it overthrows the reality of a traditional model in an experienceable tridimensional space. It allows an easier translation of the identifying features.

Digital volume is a plastic model that simulates the space and creates new formal aestetic references.

Computer art

The "scientific game" incites the creativity of the artist that manipulates the immaterial, extending his imaginary by creating those casual shapes that will satisfy and stimulate his desire of plastic innovation.

While he utilises a computer instead of traditional tools, as a superior one that contains all he needs, the artist are able to refuse the limits of possible, producing an infinity of shapes and colours.

The digital rendering also communicates the TECHNICS of a project.

The matter.

The matter covers the shape distinguishing itself from the function. In the computer it is allowed to visualize the final model with the rendering of materials as similar as possible to reality. This allows to verify and control the dimensions, the colour, the texture and the reflexivity of materials.

The light.

Digital light simulates reality in the reproduction of the space as one of the most powerful tools for visualisation and building of the model.

The simulated light that gives life to the architecture, may be as real, natural or artificial, daily or nightly. The light together with the movement may bring remarkable inventiveness.

fig.5 - The section about the light (Toyo Ito: Winds tower, Yokohama, 1986)

The sign.

The sign generates and decodes the image, it is fragment and icon. As a structural element of drawing, it creates a distinctive matrix, almost immediately obtainable with the computer through a decomposition.

The sign decomposition, as a pictorial and structural fact, is the result of an algorithm and of an interpretation.

The movement.

The reading is no more sequential but dynamical, becoming a space-time continuum. The movement as a perceptive dynamical fact offers the possibility to explore deeply the object of architecture. The dynamism allowed by the machine originates new ideas in the communication and the creation of the architectural object, because it is describable in its own dynamism.

The trasformation.

The dynamic evolution may be freezed in static images. With the use of the computer it is possible to capture several hidden aspects of formulation and communication. The possibility to make visible the transformation in its dynamical aspects is one of them.

Through a dynamic cycle of transformation it is possible to describe a moving from a state to another, and to capture this transformation in an whole of single significant and representative frames.

The possibility of recording the transformation process origines new techniques and structural yields and linguistic
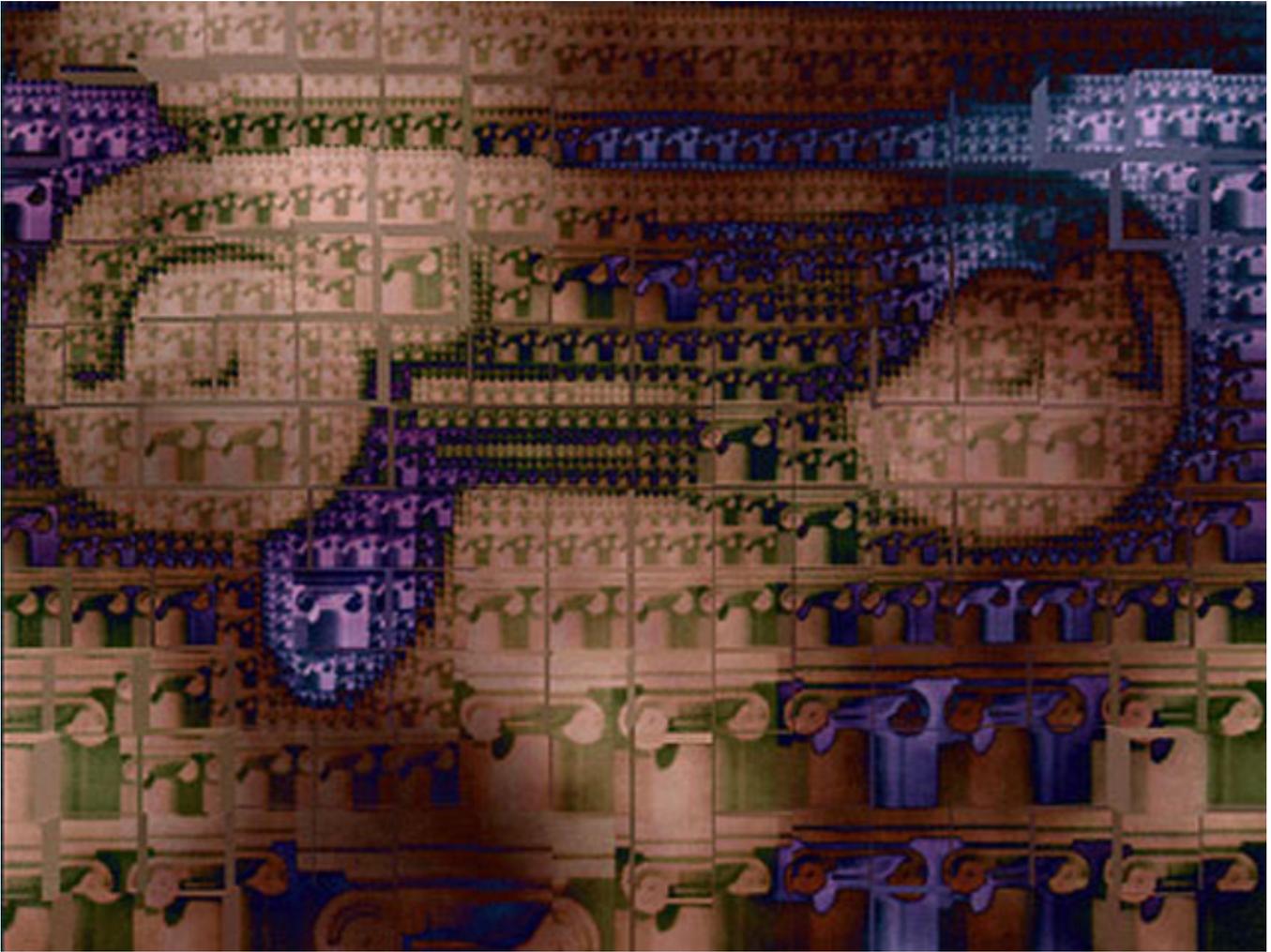
metamorphosys.

fig.6 - A step of the trasformation of a static image

In the theme of VIRTUAL we take into account the transformation obtained by the computer on the way to live and to communicate the reality, an atopical and immaterial way, and on the way to experiment what is constructed with virtual material.

The fiction.

Limits between real and possible are filled up, because the computer, besides the simulation of reality, takes part in it by modifying it. The digital reality is a new axiom. The relationship between reality and fiction in our culture is always more based on the emotion of images and also the concept of history, as a transcription, is modified. Often the perception does not distinguish the true from the false and we live in a new no dimensional space.

The artificial reality.

The simulation is so perfect that it becomes difficult to distinguish between fiction and reality. The syntetic images simulate the reality as the only possible model. The mathematical algorithm may be so sofisticated to allow an elaboration of the fantastic and a clonation of the real. The images of very high quality are characterized by a brilliant luminosity, typical of syntetic product. This attribute allows a sensible separation from the reality itself as a representation dependant on further manipulations.