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Architectural Briefing Data Representation and Sketch Simulation Computer Environment

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Programme Writing and Reading

Reflection about the architectural programme starts with the analysis of its writing, its "style" which bears not only the "griffe" of the programmer but as well the structure, methodology, codes of reading, etc. particular to a programming approach. The programme structure corresponds in most cases to the different levels in the text's format and the composition modes of representing data and their relations. The choice made can either facilitate or impede the reading as interpretation of the programme. The programmer's aim should be to open the text to reading towards a "synthetic schematic" summary, a sort of cognitive threshold which allows the reader to understand both the client's objectives and the designer's intentions enhanced by his experience. Articulating a designer's experience means focusing on his knowhow and memory. The designer's recollected knowledge and heuristic approaches to the solution of a basic design problem - types, his readings and spatial evaluations permanently feed the knowhow. It is important for the architect to have access to past examples, to the collective memory of his workplace, and a repertoire of readings, notes, sketches, influences and citations. It is therfore equally important that a computer environment also have a multimodal "architect's memory" or "project memory" module in which different forms of representation are classified, and made accessible as memory components. It is also necessary to have the possibility to access at any moment in an interactive manner to the recomposition, addition and adaptation of these mnemonic components. The information coming from the programme, classified as descriptive, prescriptive and quantitative types of data, must be able to be interrogated in different modes of representation : text, matrices, nets, diagrams, and so on, so that the pertinent information can be extraded at any given design process stage. Analysis of competition programmes show that often the description of an activity, for example, the Great Stadium competition in Paris, is described by several pages of text, a circulation diagram with arrows and legend, a topological proximity diagram with legend and as table activity - areas **(Figure 1)**. These different representations, which are supposed to be complementary and give the most pertinent view of the client needs, show in fact after analysis, many description problems, incoherence, and which result in a reading difficulty.

To read the programme constructively and innovatively, one must have the liberty to decompose it in a variety of ways, according to the designer's needs, which means to read it at least in three ways : quickly, comparatively and inductively (1). To do so it must be possible to treat the data in a "dynamic" way by creating interrelations, adding commentaries, personal information and keeping track of the

decomposition/recomposition of the reading process. To evaluate the design proposition in accordance with the client's needs comparative tables and matrices of programme data and resulting sketch spatial data must be easily discernible whitin the programme.

How must the structure of the programme data and its mode of representation be, in order to allow such a treatment ?

Schematically the design process approache includes the analysis - synthesis - evaluation trilogy (2). The programme is often presented as an analysis phase which takes into consideration functions, forms, economy and time. The architect's design process is presented as an analysis and synthesis phase based on the inductive logical process. Is this separation is not the direct consequence of the "MOP" [1] law on architectural competitions ? If one considers that during the design process analysis and synthesis are intimately linked in various proportions in accordance to the design process stage (3),(4), the complexity of the object and the scale of intervention, one can speak of "continuous programmation" or "permanent design" (5).

(Figure 1)

The conceptualization programme reading - project sketching which interests us most is the interaction of two research fields :
- theoretical, based on the theory of schematisation which deals with different modes of representation, their pertinence for the expression and reading data, idea and concepts ;

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[1] Since 1987, a law regulates in France the public architectural competitions. This law stipulates that an architectural public competition should be done on the vasis of an architectural programme, distributed to all competitors, and which describes the client's needs, building requirements and cost.

- experimental, on the instrumentation of these modes of representation   and their visualisation in a computer 3D image environment.

What is schematisation ?

If we look at Abraham Moles " The theory of information and aesthetic perception" (6) we see that a schema has two values :
- semantical, which is "a logic, structured, enunciable, translatable" value which prepares actions ;
- aesthetic, which is a value that determines inner states" and is untranslatable.
The first shows the utilitarian content of the message and responds to the question : what to represent ?
The second seeks the best form of organisation of the same content and the answer to the question : how to represent ?

The aesthetic value, which determines the inner states, also serves the creation process. Its aim is to give an aesthetic form to semantical values. At the same time it also transmit messages. In principle, cognitive schema and schema of communication do not have to have the same aspect. We will see that purely semantical schema or purely aesthetic ones rarely exist, and that the most common schema give free play to the purely dialectical games that occur between the semantical content and its aesthetic form.
 Schematic representations also show visual intuition as textual logic. We know that there is a difference between logic image and artistic image. Can we speak of a logic that is not purely verbal but also iconic ?

Verbal concepts do not yet have a precise and particular pictorial and spatial signification. They have the potential to be multiple concrete compositional organisations. In the process of forming a graphic schema we see the beginning of the formation of a particular representation. A schema, while still containing words, begins to become an iconic model and is no longer purely verbal. The reverse process can be demonstrated : a concept can arise from an image, and be schematised through the conceptualisation of a spatial or pictorial composition. The opposition between a verbal representation and an iconic one should not exist, as both refer to the same thought process but at different levels. Both can be complementary, and elucidate one another. There can be approaches more or less poetic or logical for both the verbal description (metaphorical description) and the iconic description (diagram, nets, etc.). As there is no opposition, no iconic representation can be the only possible translation   from words into image. If this was so it would be possible to ask the computer to execute schematic works, by describing the constitutive elements of a verbal message and the relations between these elements in formal language. Programming computers with information about a direct and faithful transcription of the image would be possible. But this fidelity would have some drawbacks, because   in a computer image, both iconic and verbal systems of representation   are in direct communication and the problems of figuration, deviant and parasitic usage, together with the problem of "impossible situations", do not exist for the computer.

The necessity to construct models before creating images presupposes a global prealable view of the mechanism of all the effects to be achieved, involving a systematical approach, and a logical process, where no point of the composition takes place by chance or intuition and the work progresses towards its solution with the precision and the logic of a mathematic problem. In general artists define their creative process like Fellini :
" I do not wish to create a type of mystic on my work, I would say that my system is not to have a system ; I go to a story to know what it has to tell me". The act of creating an image at the stage of concept visualisation   is not in general an automatic act. Pictorial composition and plastic research are done through the image. But is it possible that design schematisation demands a more rigorous approach ?

The spatial 3D computer image modelisation is closely linked to the necessity to decompose elements of the concept which do not yet exist, but that one wants to create. The difficulty is finding the means to make a transformable virtual model which could be enriched at any stage of the design process and which would allow through different filters of the iconicity scale of representation access to all the design forms. But there are as many possible decompositions as there are creators. On the, one hand, each type of representation presupposes a decomposition from the point of view of its own pertinence. On the other, it is difficult to know all the components of this decomposition before the construction of the representation is done. The extreme variety of possible decomposition and their importance for the design process force the designer to find a method which accepts partial imprecision from the outset. This method of decomposition must allow for the production of modifications and enhancements during the design process.

The creation of an artistic schema demonstrates a particular process of schematisation. It is not, as it is for Moles, the reduction of acomplexity into those constitute elements essential to its comprehension, but, rather, to make an inventory of these elements and then reduce it successively until only one element remains. Nothing must stop the designer at any design stage from representating on a both a pictorial and a spatial way, or from comparing these verbal and iconic representations.
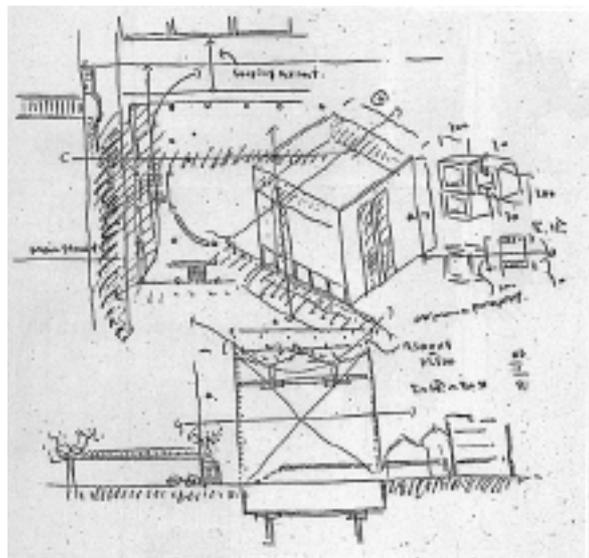
(Figure 2)   Ando Festival of Naha

Toward hybrid dynamic modes of representation

The analysis of the decreasing scale of iconicity of Abraham Moles (7) and the elaboration of a scale of increasing iconicity in architecture (8) serves as a starting point for the elaboration of a typology of different modes of representation of an architectural object. Concurrent to this analysis, a more acute study of what a decomposition environment programme appeals to the notion of "hybrid dynamic representation" which permits to include different modes de representation of different levels in an interactive way. In opposition to a hybrid passive representation which is only a mechanic juxtaposition of different modes of representations without interaction between them. Well illustrated by a commonly used architectural sketch, where graphic is accompanied with a text and a detail axonometry **(Figure 2)**.

This sort of representation can be easily implemented by collage in any of the computer standards worlds. The dynamic hybrid representation is the same in appearance but the juxtaposition between these different modes is interactive in both ways.

In conclusion, here are some questions which illustrate our research works.
How can we arrive at a computer spatiallity scaled model from a data table ?
How can we move from this 3D model, which is unique and necessarily simplistic in the beginning of the design process, to different modes of representation without having to re-enter all the data ?

How can we allow the resulting 3D computer model to evolve from a simple to more complex form, while following a design process which goes from general to specific detail or vice versa, in a circular process through successive interactions ? And finally, how can we create a junction between reading and sketching in a dynamic way, which would allow us to sketch in a *permanent design* environment ?

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