Self-reflexivity as a tool for a more relevant design-process
Mapping strategies and creative outputs by using matrices

Thierry Lagrange

Brussels, Belgium, thierry.lagrange@architectuur.sintlucas.wenk.be

Abstract: The present research project explores strategies for self-reflexivity in architectural practice. An important element in this project concerns the matrix. This paper precises certain possibilities offered by the matrix. By starting this reflection in a mathematical context it seems possible to go a step further and seek some more abstract explorations that clarify the use of the matrix as a tool in research. First the matrix transforms towards a concept sketch and afterwards towards a more elaborated framework. Finally, the emblematic work the Atlas of Gerhard Richter illustrates in a useful way a symptomatic quality of the transformation of the matrix that is the existence of an analogous space.

Key words: Matrix, framework, table, sketch, tacit knowledge, analogous space.

1. The present research project explores strategies for self-reflexivity in architectural practice. The research question that is formulated as a recurrent theme in the PhD-project is as follows: is it possible to identify and represent the purportedly “ineffable” qualities of experiential knowledge in design practice? To generate answers and strategies on this research question an appropriate research methodology is needed, which starts from a specific designerly way of thinking. Indispensable for such a method is the active exploitation of personal experiences. Therefore the concrete output of my experiences is divided in three groups: architecture, images and language. Three matrices as tools for storing are introduced to handle this material. A first matrix orders my architectural work of more than 10 years activity. Therefore 20 key works are selected. A second matrix groups a collection of images (ca. 500 0 images), mainly own photography as a result of more than 10 years of very conscious looking at the world. Finally there is a matrix with key words (ca. 16; sculpture, strategy, subversion, intensity, indistinctness, materiality, texture, image, commonplace, typology, layering, X, facts, puzzles, splinters, old masters …). They have emerged during those 10 years of designing, not always explicit, sometimes latent and implicit. They became some kind of limited language. During the research activities a series of actions are initiated by using the three matrices. By selecting elements out of these matrices, reinterpreting them, creating new photos, videos and texts, the research question is interpreted. The output of that kind of activities fits in new matrices and transformations of the matrix. Finally there is a phase of evaluation in which a public and students will get involved for a more active participation.
Figure 1. #W, matrix with key works

Figure 2. #I, matrix with collection of images

<table>
<thead>
<tr>
<th>sculpture</th>
<th>strategy</th>
<th>subversion</th>
<th>intensity</th>
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<tbody>
<tr>
<td>indistinctness</td>
<td>materiality</td>
<td>texture</td>
<td>image</td>
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<table>
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<tr>
<th>commonplace</th>
<th>typology</th>
<th>layering</th>
<th>x</th>
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| facts | puzzles | splinters | old masters |

Figure 3. #K, matrix with key words
2. The intensive use of the matrix as a structural tool for reflection in actual research projects on and through design is rather an exception than a rule and thus publications on this theme are rarely spread. This paper wants to show the relevance of the matrix and its transformations as an effective tool for that kind of reflection. The matrix is, since the beginning of this research activity, used in several ways as an element for reflection. This paper elucidates certain possibilities offered by the matrix. By situating it in a mathematical context it seems possible to go a step further and seek some more abstract explorations that clarify the use of the matrix as a tool in research.

In the mathematical theory of matrices the matrix is quantified by a number of rows and columns \((m, n)\). Depending the circumstances \(m\) and \(n\) are varying and adaptable. Several manipulations are possible to initiate alternative representations and generate solutions. One could calculate in an elementary way matrices with well chosen dimensions (count up, subtract, multiply…). It could become more complicated when a determinant has to be calculated or a canonical matrix has to be generated. There is also the possibility to represent matrices by a character and then set up actions with these characters. Matrices can be transposed etc. An interesting quality of a matrix is definitely its clear way of representing something. In a mathematical discourse it might concern a group of vectors. In an economical context it can be for instance stock data.

\[
A = \begin{bmatrix}
a_{11} & a_{12} & \cdots & a_{1n} \\
a_{21} & a_{22} & \cdots & a_{2n} \\
\vdots & \vdots & \ddots & \vdots \\
a_{m1} & a_{m2} & \cdots & a_{mn}
\end{bmatrix}
\]

Figure 4. 2 elementary examples of matrices

In the context of this research the focus is laid on the elementary properties of the matrix, in particular the possibility to represent elements in a well-ordered and clear context. These elements are not logic and rational like in a mathematical context. It concerns data that is difficult to define (such as materiality) or that has a layered structure (such as concepts) or that has a subjective connotation (such as sculptural effect) or a combination of all of them. By using this elementary formal aspect of the matrix to situate these complex thoughts it is possible to avoid the risk that they disappear in a melting pot of an enormous quantity of mental constructions.

Situating elements in such a formal construction introduces a new kind of space, which can be imagined by the reader of the matrix. This can be illustrated with an example. By positioning for instance a group of photographs of textures (texture is one of the key words) in a matrix an imaginary space is constructed; an analogous space. All these textures are positioned in a surveyable way. It creates in its static situation a seeming tranquility. However the content is not the regular data we are used to see in a mathematical context. In the example the series of textures is multi-interpretable and covers a number of stories. The same will happen for each selection made with the material stocked in the three matrices (key works, photography and key words) of the research.
project. By situating these elements in such a formal construction, they become visual and ready for manipulation. The so-called tranquility was only a perfidious impression.

Moreover, creating a matrix provokes another attitude. Although the intention when someone is using a matrix to arrange concrete data in a mathematical context is the same as what happens above; both want to compose a more understandable constellation. The way the matrix is interpreted, is completely different for both users. Understanding all data might be the goal in a mathematical or economical context. The aim for me, as a designer, is to evoke new insights that help clarifying design processes and that can generate interesting architectural answers and insights on certain problems. Finding coincidences, seeking opportunities, being confronted with sudden insights, all these daily events in a design process, are situated and stimulated by this tool.

Positioning alternative data in a matrix must be seen as a fundamental property, which leads to mental platforms wherein a designer can move, see and act. This last aspect is the parallel phenomenon for the logic procedures in a mathematical realm.

3.

Taking into account the latter, a first element that is worthwhile to reflect on is the idea of transformation. The matrix is probably one of the most elementary formats to order data. There are no lines, there is only the data positioned in columns and rows, gathered together by two brackets. This format is, because of its elementary organization, a point of reference. For this reason it might function as a starting point for a series of interpretations and transformations. One of these is formal. The matrix can, filled with research data, become transformed into a framework, or a table with content, or even a master plan. In the present research project this action has been done several times in varying circumstances and conditions. So it became an explicit mechanism that ended in two types; a series of concept sketches and some elaborated frameworks. Both types of transformations differ significantly.

The sketches introduce an abstraction. The research data is represented by symbols and small drawings. In the theory of matrices, a matrix can also be symbolized by a character (A, B …). The content of a matrix can even become a group of matrices. The sketch generates a variant for these mathematical possibilities. This creates a whole series of alternative ways of representing research data and possible manipulations of it. These sketches become useful as a think tool. They help clarifying the lines of thought present during a reflection period in a design process. Bringing together the matrix format and the skills of the sketcher generates a synergy that leads to a surprising evolution of the basic form of a matrix. The main reason lays in the qualities of the sketch. The sketch is a precious. Every sketch is different and not reproducible. It suggests always the existence of other opportunities, possibilities. The qualities of a sketch are the direct result of a motor action of a body. Thus it represents besides elements of the research content all the state of mind of the author (nervous, relaxed, uncertain …). Line after line, fragment after fragment, the whole results in a chain of images and has a filmic nature. The sketch is an unconscious stilled film. So the transformation of the matrix must be seen as a representation of the personal quest of the author.
In the more elaborated frameworks the directness and spontaneity fades away and a more complex layering of several elements is appearing. An orthogonal framework drawn with thin lines, matrices with a content, text fragments, schemes, all these components are situated in a global, more complex constellation. During a research period it is appropriate to create from time to time an overview, even when it might be speculative. In particular for difficult research question, it can be fruitful to organize a more elaborated framework. This framework is drawn as an architectural plan, line by line. Like the drawing of a house, a school, an interior, this drawing represents a mental framework with the goal to position several elements of an intellectual process, in particular elements of a design process. This differs fundamentally with the sketch, built up with rough lines one next to the other, impulsive and emotional.

It is more structured than a mind map, more materialized than a scheme and more complex than a matrix. In a way it refers to certain drawings of theorists of the 16th century like Filarete, Francesco di Giorgio Martini and
Scamozzi. They too were looking for an alternative way to communicate more complex thoughts. They found a possibility in their way of *drawing* a theory. It opened a gate to an analogous space.

There is, while looking at these images, what could be called indistinctness. It is an indistinctness framed in a well known structure, the structure of an architectural theory. Moreover, the indistinctness appears in images that are very well designed, balanced, made and constructed by architectural minds. And thus the indistinctness is situated in a imaginable mental framework. The indistinctness functions as a lack, an emptiness that can be filled with thoughts or as a place to escape from the controlled way of functioning and communicating.¹ Th is

¹ In one of the interviews published in *Pourparlers*, Deleuze mentions the link between language and a controlled society … *Vous demandez*
Indistinctness is of vital importance letting the engravings function as stimulators and generators of new insight.

In the present research project an analogue way of communication is created, for a personal insight and for the outer world. It is the strength of the typical properties of a plan that makes this possible. If somebody wants to explain only by using words how a house is organized will be very difficult and unclear. If he uses a plan, it becomes much easier. The communication is more understandable, more transparent. That is what is happening in a more elaborated framework; it might be read and seen as plans of an analogous space. It situates a state of mind that might be relevant seen in a personal or public perspective.

Like in the historical examples it should be a well balanced graphic design, drawn and designed in a precise way, wherein all elements, important at a certain moment, are positioned at the right place. It does not always avoid a naive use of certain properties of a plan. This might happen when someone thinks that a plan is a formal and visual confirmation of a thought or a theoretical statement. A plan is only a plan, just like a plan in architecture is more or less only a drawn concept and not a confirmation of an architectural theory. On the contrary the drawn plan opens a perspective on a suggestive space directed by indistinctness.

Figure 10. Elaborated matrix, first example

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4.

What happens when an architect or artist wants to structure his data, data that is crucial in a design or a creative process? It is not always clear why and how certain elements play a role in a creative development. Symptomatic is the indistinctness that plays in this structuring process. The link between the indistinctness and the previously emphasized properties of the matrix might lead to some intriguing insights.

The Atlas of Gerhard Richter is a grateful emblematic example that merits a closer look in this context. Gerhard Richter, the German painter, collected an impressive amount of images during his life. These images are compiled in the Atlas. Th is is a pr essive c ollection of mo re than 5000 sketches, photographs, press-cuttings, studies, ... were all ordered in a meticulous way, sheet after sheet, in rows and columns. At this very moment Richter is still enlarging his collection. For Richter this must be one large playfield of thoughts generating an impressive series of creative moments. This corpus filled with data functions as an enormous complex series of matrices. In his introduction to the publication of the Atlas, Helmut Friedel compares the book already with a reference work. He continues as follows.

Accordingly, horizontal as well as vertical directions of reading open up. Combinations of different adjacent sheets result from the viewing and correspondingly different connections among the contents of the images. From the outset, Gerhard Richter did not collect the visual motifs of the Atlas in a rigid sequence, but repeatedly conceded priority to issues of content, but above all formal criteria which cannot always be easily followed in the various publications on the Atlas, but can be seen by studying the views of his exhibitions. The extant installation plans, sketches and room models allow detailed conclusions to be drawn about each selection and the ordering of the sheets. They allow it to be clearly seen that in the blocks which he forms from the sheets, he is especially concerned, beyond all questions of content, with clear forms defining the wall and space. Each block
of sheets stands in a certain formal relation to the wall and to the room, but also to the character of the whole exhibition, and represents in addition usually a unity with respect to motif and theme. The individual blocks consisting of different numbers of sheets develop in each case their own visual quality of great clarity.

There is an intriguing tension between the book form of the Atlas and the way it is shown in a series of exhibitions. The book form results in an extreme long series of well ordered images. As if they were situated in matrices with varying rows and columns. This is a chain of compositions and juxtapositions of images, one after the other. An overview does not exist. A reader can only enter punctually in the world of Richter. A close ‘reading’ of the images leads to certain insights in the work of the artist. Though what remains is an incomplete view. This changes when the Atlas is presented in an exhibition (for instance at the Documenta X, 1997, Kassel, Germany). The spatial constellation results in another relationship between visitor and work. This situation suggests, like Friedel describes, some kind of an overview. It stays peridious at the one hand and to think that the whole complex is understandable because one can see it in total. But it is without any doubt a nice opportunity to experience another space, a space structured and constructed with patterns of images. Moreover visiting the exhibition means entering an analogical space. This clarity, only experienced in fragments in the book form and intensely developed in the context of an exhibition is based on the principle of ordering images like in an elaborated matrix. In both cases, the groups of images are situated in spatial conditions. Richter arranged the groups meticulously, with a well known effect on the visitor. The lines of the framework are in the exhibition materialized by the walls of the space.

This almost schizophrenic situation, where the visitor balances between the one hand a fragmented but detailed view (in the book or in a frame of the exhibition) and at the other hand a liberating peridious look on the whole (in the exhibition), results in that stimulating and inspiring tension. Friedel calls the Atlas an ‘organism’ that ‘develops further and changes’. This continuous swaying out makes the Atlas as a whole elusive.

Figure 11. typical page, Atlas
5.

The matrix as a tool is omnipresent in the research project. Like it has been said in the introduction, the basic data, used in the research, is situated in a series of matrices. This leads to transformations of the matrix; the sketch and the elaborated framework. When someone starts a close reading of these two types of constructions, he enters an analogous space. This way a tension comparable with the one traced in the ambiguous position of the Atlas of Richter is introduced. These constructions seek at the same time a certain clarity and an overview. It is indeed important in a design process not to lose contact with all aspects in detail and their relation to one another.

A fundamental difference in approach sits in the professional attitude. Richter constructs his exhibition as a painter. Like no-one else he is constantly exploring the space, her proportions, the possible perceptions of a work in the space, etc. The numerous perspectives and studies of situating paintings on walls that are part of the Atlas make this clear and generate an absorbing visual palimpsest. These groups of images function as spaces in the constructed space. A same tension has been searched by introducing these analogous spaces in the research project; however the attitude is purely architectural, almost technical and not pictorial. By selecting and manipulating data like formulating a program for a design project, surfaces are filled and divided with lines like spaces are organized with walls. The rigor of a good organization is more important than the proportion of a matrix or a piece of data in that surface. Still, it is the same kind of tension that is revealed, one between indistinctness and clarity.

6. Citations


