

Research *in* Designing Architecture

Crisis of Facts and Impressions in Thinking Architecture

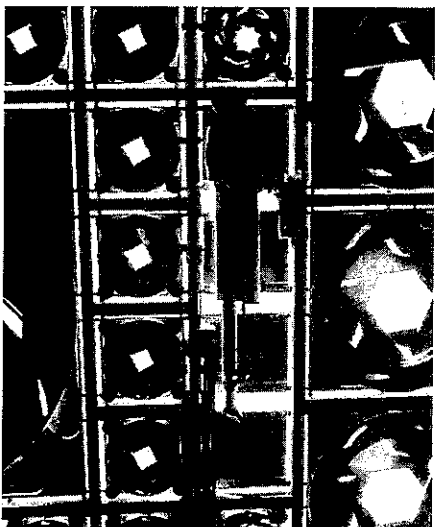
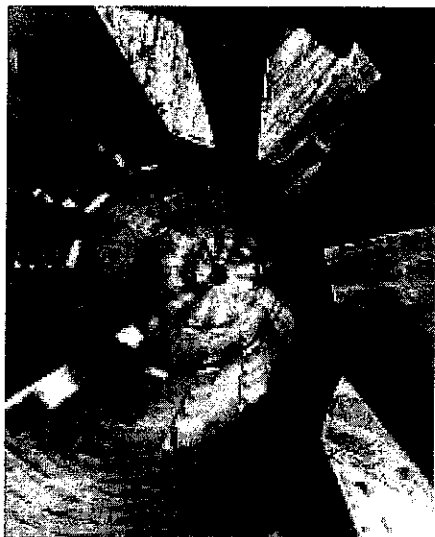
Thinking architecture

'How do architects come up with the design for a piece of architecture?' remains the question for many people including architects themselves. Perhaps the most complex object and idea man has ever made, architecture as both space and as physical object depends on knowledge and thinking in order to understand its totality (similar to the fact that a building depends on its method of construction to stand up the way it is). It is even more mysterious when the design is built and occupied by people. The question is whether the design efficiently serves architectural requirements as it was intended. How can one assess such a fact and moreover to correct and improve any problematic situations of design that might occur in space of a building?



Figure 1

The question is, therefore, how to make the design activity more sensitive and related to the actual built space. Does 'seeing' or 'using' a building answer these questions of architectural understanding? It is suggested that only through 'thinking' answers our questions about architecture regardless of whether we are architects or users and regardless of whether we are conscious of the existence of such questions or not. It is proposed that the answers to all these questions can be achieved through research. This article is the first part of a forthcoming series which focuses on research strategies in architectural thinking and designing in research environment.



The crisis in architectural thinking seems to lie in the linkage between design activity (including design decision, analysis of functions and movement, etc.) and actual built architecture. With more advanced visualising tools, facts are sometimes being pushed aside for the sake of exploring possibilities or, in the worst situation, what seems to be most pleasing for the eyes and suits current trends. In other words, visual information is becoming more and more separated from knowledge; that is, what you see is not always what you get. Architecture may be endangered by its own images which are derived from advanced visual tools such as computer. Unless we live in a totally digital environment, architecture cannot be based on the calculating procedure in computer software to arrive at its totality. In such a paradigm, impression becomes real (enough); fact becomes adaptive or bendable. This is not a paradigm shift but perhaps a split in the discipline of architecture.

For example, in Bangkok subjects *about* and *involving* architecture can be studied either as a true profession in schools of architecture or as a major in, for example, the department of education. This situation is not entirely negative but it prompts us to think of architecture as a splintered discipline which needs reengineering from within. For example, we can ask which aspects of the discipline cover the core creative aspects and which ones do not? How can we tune all these aspects of the discipline so that they maximise their potential? Is architecture a 'visualising' or a 'thinking' discipline or is it both and what proportion do the different parts maintain? To understand such a dilemma we need to investigate both of the paradigms that make architecture close to us all: building and design. Research is the best arena for such investigations.

Figure 2, 3, 4, 5 : 'Is this for you and me or is it just for everybody to see?'

Research *in* designing architecture is different from research *about* architecture which often deals with either personal impressions and interpretation (e.g. aesthetic, behavioural, psychological, historical) or plain numerical facts and data (e.g. geometrical analysis, people observation, construction). On the other hand, research *in* designing architecture covers the core and unique parts in architecture; that is the thinking and design process. The discussion will focus on theoretical and conceptual aspects of research. Examples will be taken from well-known research projects as well as the author's own ongoing research (Suvanajata, 2001). The discussion will suggest possible directions for researching *in* designing architecture with the aim of encouraging more architects to do research and to participate more in this aspect of architecture. It is proposed that architecture will be simultaneously better understood from both architects' and user's point of view through carrying out research. Such research would make it necessary for 'thinking architecture' to be more clearly seen and understood by more people. This approach will help a piece of architecture to relate more closely to its users and to be more than just 'what' the eyes can see.

It is important to be aware that the nature of research *in* designing architecture can be unique since dealing with different conceptual approaches may require different strategies. And because the goal is not to find the definition of architecture but the better and efficient way to 'think' and 'design' architecture. It would not be beneficial if research is too alienated from the way the profession thinks and works. It is proposed that the true results and benefits should 'emerge' through the process of research as architecture is achieved from process of design (see an example of relationship between writing and designing in Zumthor, 2000). Similarly to research in many disciplines, research *in* designing architecture needs to be first of all 'analytical'. To understand, analysis is required. Only through analysis (and not following only facts and figures) do we know which direction should be taken to obtain the particular quality in question and only analysis will allow us to reach the core of our search (and not being carried away by impression). Secondly, research in designing architecture should be 'systematic' but not 'systematised'. Finally, like design, it should be flexible and aimed at 'problem-solving' quality.

As mentioned before, there are many ways to go about research *in* designing architecture. In order to be certain that the research design is not misleading or forcing the data, it must have a logical explanation about its process and procedure. Furthermore, the design must withstand systematic assessments. By doing so, design is in fact knowledge in research environment. Joroff and Morse interestingly relate design to research:

'To be used as a research tool, designing must be done self-consciously and must produce generalizable results. Both these criteria suggest that the design process requires more attention than it has yet received. It must be externalized and modeled, thus helping to highlight the assumptions being made, raising questions about their validity and how this might be assessed. ...To use design in research requires instead the ability to clearly articulate values, to be able to design on the basis of different sets of values, and to generate many possible solutions to a problem in a dispassionate, systematic manner.' (1984 : 22)



Figure 6 : 'I think this is a better way because...'

A systematic approach has been attempted in most design-oriented research in architecture (e.g. Alexander, 1977 ; Eisenman, 1984 ; Mitchell, 1990). The following examples will show that researchers often employ linguistic ideas which are highly semantic and syntactic to find a general structure of architectural knowledge. Most research that has involved language of grammar of architectural elements were conducted in order to find a tool that can be used to explain various architectural phenomena. However, it must be clear that the ultimate 'idea' searched for using this approach must

be 'knowledge' not 'artefact' in architecture. Research must be used as a 'framework' for extensive tests and must focus on the 'structure' of the fact under investigation not merely the 'content' of the proposed topics. For example, studying period buildings can reveal more than styles or historical dates; that is, it could be the search for the logic of design in that typical socio-cultural setting. Conducting research in such paradigm would yield a more systematic procedure which is crucial for creating new found 'knowledge'. With knowledge, we can use the data not just collect it.

Architecture is a field that requires skill and thinking that is both quantitative and qualitative. Traditionally and instinctively, what architects have been familiar with in solving architectural problems is their intuition. Either by nature or education, architects are good at being intuitive and this makes the profession what it is and gives it its problem solving quality. The intuitive quality of architects is vital and makes them unique. But we cannot keep relying on our intuition. We cannot rely on what has already been done and is currently understood about architecture in order to advance our quantitative and qualitative understanding of architecture. Architecture is made of creativity not adaptation.

Architecture can advance only through creation. Research is the system that ensures creative findings. It is the nature of research that it is scientific and that it exists not as it is but as the representation of the progression in the discipline based on all the knowledge in past works of others. Therefore, research would help to prepare the ground for further research that would allow us to reach the deeper core of architecture and, consequently, better practices. To carry out research in designing architecture, we will have to start from the theoretical basis of thinking architecture. It would affect 'knowledge' and not only 'precedent'. Therefore, real effective and creative changes and developments can be achieved.

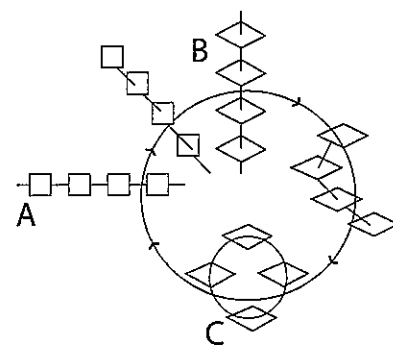
'Architecturing' the Ideas

When carrying out research in designing architecture, it is very important that the researcher understands creativity in both research and design terms. This quality of being both researcher and designer helps direct the research into a valid research structure and results in practical outcomes that have design-related application. This article focuses on how to conceive ideas in the area of architectural research. The structure of ideas will be the main point of discussion.

The aim of the discussion is also to show how key ideas in architectural research are pursued and tested. Examples of research discussed here are greatly influenced by late 19th and 20th century philosophical foundations such as works of Kant, Cassirer, Russell and Piaget. The ideas are basically 'scientific' and 'structural' in which architectural ideas, after the industrial revolution, are compatible. The analysis below tries to show how theoretical enterprise shapes the direction of a research *in* designing architecture.

The analysis is discussed in relation to my theory 'Relational Syntax' (referred to as 'the research' in the excerpts) in order to show how ideas in these research projects developed in relation to one another and to Relational Syntax theory. Relational Syntax is a theory which proposes clearer connections between design activity and architecture through syntactic procedure. Architectural space is seen as having multi-dimensional qualities all of which are related to one another. Thus changes in one will affect the others. In this way, we will be able to detect, assess, improve and verify 'activities' in one dimension with full sensitivity towards other dimensions and thus a piece of architecture as a whole (Suvanajata, 2001)

The idea of 'pattern' suggests systematic methodologies in research. Alexander obtains knowledge from a systematic analytical process and observation before putting the data into categories which he calls 'pattern'. *'...because he relates its concept with the idea of repeated events associated with both space and objects. ...Alexander gives many examples of what he considers to be the generators of the patterns that happen in*



A:reading → B:conception → C:reality

Figure 7: 'From abstraction to reality'

a building. They are for example, walls, rooms, ceilings, doorhandles, terraces etc. These items definitely have effects on the space they are in, but the research proposes that these effects are conceived by people in different senses and are thus reacted to differently on different occasions. This is a vital point for consideration, as one relates to space either as a designer or a user, ultimately it is people's action and movement that verifies everything. As far as the research's concept is concerned, we need to be very clear about different dimensions in space. For example, the structural dimension has to be considered in its own terms; that is according to its topological properties, while the experiential dimension must be considered in terms of its actual mechanism in space with people's actions and movements. ...' (Suvanajata, 2001:43)

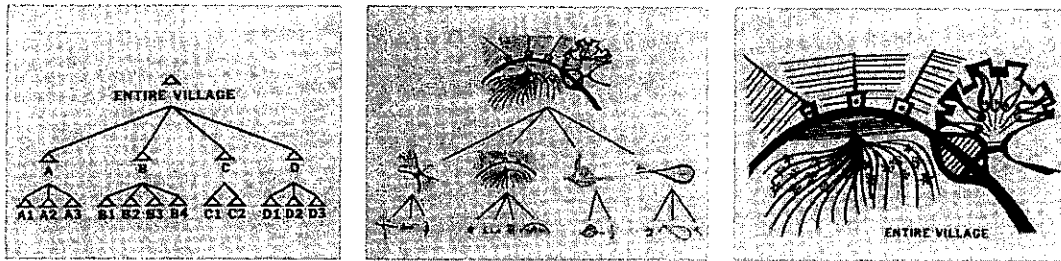


Figure 8 : 'Alexander's Hierarchical Systems'

Alexander's idea is derived from actual observations in real buildings. In this way, the research has a high applicational value which is one of the most important qualities in architectural research. Alexander's works are among the first in the field of research in architecture to employ an analytical procedure on qualitative data in a systematic way. His PhD work published in 1967 is a good example in terms of both his new approach and its pitfalls (see the analysis concerning this in Hillier, 1996). Around the same time as when 'The Pattern Language' was published, there were works that are highly mathematical focusing on geometrical qualities (e.g. March and Steadman, 1971). These two approaches touch on architecture from totally different angles. Alexander looked into the 'software' or the use, function, perception in architecture while March and Steadman examined the 'hardware' or the totality of geometry and its structural system.

In 1963, the first article of Peter Eisenman was published. The idea in this research has become Eisenman's theory on which he has based his practice in architecture. Eisenman researches into what he calls the 'self-referential' quality in architectural space and elements. He takes socio-cultural aspects and geometrical properties of architecture in order to rethink the approach towards architecture. Together with Chomsky's theory, Eisenman analyses his data in syntactical way. In this way, Eisenman's work stands half way between those of Alexander's and March and Steadman.

‘... In his ‘Towards an understanding of form in architecture’ essay (1963), Eisenman is concerned with the relation of the transitional parts and the establishment of the whole, to which end he used the word ‘future pattern’ as the means to indicate the intelligibility of form. The issue of generic and specific form was raised using the concept of a temple.

temple = gathering-place-for-large-groups-of-people
 |
 |
 a large space with a roof over it

This is said to describe only a generic form because of its lack of symbolic function while:

temple = focal-point-of-the-worship-of-the-community
 |
 |
 (a specific form)

A specific form then is first considered as the attachment of symbolic function, but there again, if we consider its working function, a specific form could be imagined with a range of architectural elements that contribute to its conceptual whole. Self reference/ Self-existing is the interaction between ‘message’ and ‘meaning’. The idea of becoming independent from messages that already mean something and acquire the immediate meaning as-is, would characterise the intelligibility of an architectural element in the sense that it becomes a ‘being’ and detaches itself from the functional dimension. In this research, a room is detached from what it serves and becomes one of the devices that is used, together with other elements, to achieve pure architectural effects. However, design strategies, are not expected to be independent but relational and sensitive to all independent dimensions of architectural space and may even have a fixed syntax for the effects they want.

It is usually not enough to only understand the structure in order to appreciate the rest of the meaning of something like architecture. For Eisenman, forms or architectural elements are for the purpose of indication not poetic content (1984 a, 1990). The process of recognition and intelligibility deals with decidability and it may be said that this is one version of intuition. Architecture becomes more like a text in the sense that it can be understood through the system of self-referential signs in architectural elements. Then, the question is not about looking good or bad, colour or touch; an object and space are independent from their traditional properties. ...’ (Suvanajata, 2001:64-66)

We can see that Eisenman attacked the core concept of architecture in his research. Eisenman's House X (1982) is a good example of research *in* architecture; it takes intuition into a systematic arrangement of forms. In this way, design and form seem to be self-referential as they become

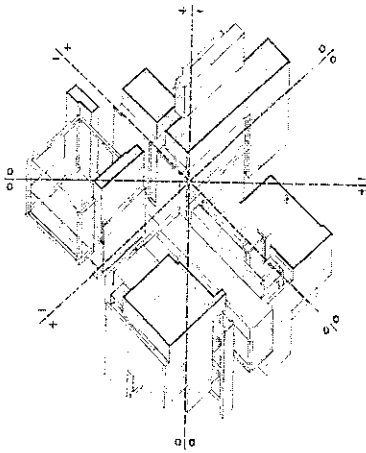


Figure 9 : House X

constraints of each other and yet can clearly be seen as independent factors. The development of the house in this work is both the development of the research and the design. The research is also composed of two interactive sources of argument which Eisenman called 'Voice' and 'Architect'. This methodology was used to both cross check the idea and to promote the environment of design activity which is also an interactive process.

Eisenman's research has the advantage of being turned into reality more often and on a larger scale than that of Alexander. However, House X was never realised but the search found outlets in some of Eisenman's later works. Eisenman's research, similar to Alexander's, deals with the topic of design and intuition in architecture. This makes it easier for the idea to connect to architects and design problems in the built world.

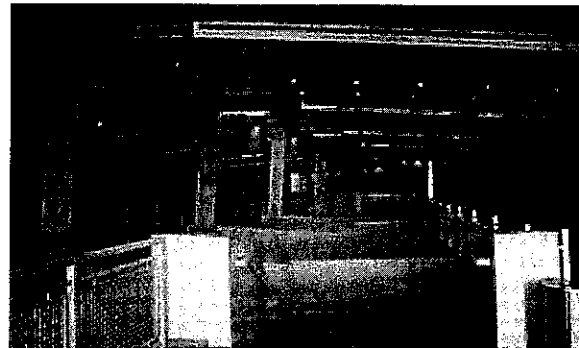


Figure 10, 11 : '30 years later...Eisenman continues with his 60's ongoing research'

A unique quality of research *in* designing architecture is its capacity to employ intuition as a precise assessment tool. This is due to the nature of architecture itself; it is always a matter of personal 'decision' when architecture is built or designed. If architects were to be more involved in research then there could be no more efficient tool for discovering new knowledge in architecture than their intuition. However, intuition may be used in different mechanisms from those which architects have become familiar with. One of the responsibilities of research *in* designing architecture, which comes from the luxury of being able to trust intuition, is to give a logic and origin for those decisions in a consistent and systematic way. It must prove that such strategies are compatible with research problems if they were to yield problem-solving outcomes. Any methodology for research *in* designing architecture should be aware of, but not determined by, architectural reality.

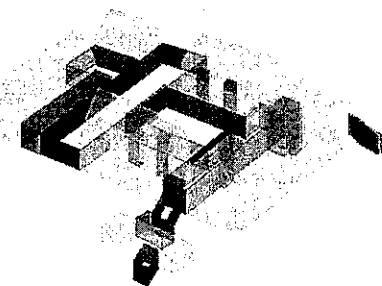


Figure 12 : 'Relational analysis of Ruenton'

William J. Mitchell has proposed the idea of a design world, a real world and a construction world when he discusses the grammar of architectural elements (1990). He calls the system that can be used to put together architectural elements 'the logic of architecture'. Mitchell uses 'grammar' that makes sense for intended architectural meanings as assessment tool and also the framework for possible variations. His research introduces the concept of 'type' and 'vocabulary' to design activities. By 'type', Mitchell means '...a building instantiates various recognizable types of architectural elements (columns, beams, walls, etc.)...' (1990:86). In Relational Syntax, architectural recognition of type also has other dimensions qualities built in. Therefore, each architectural element is the outcome of certain arrangement of relations of other dimensions (see notes for descriptions of dimensions).

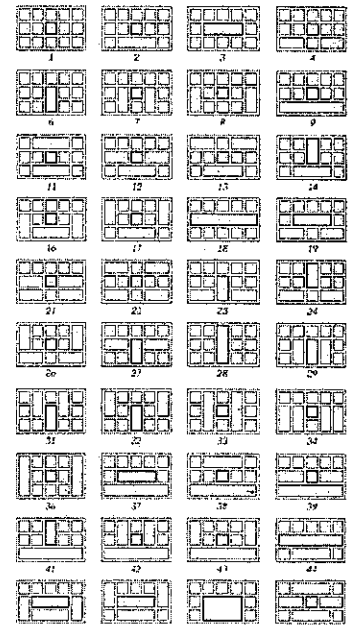


Figure 13 : 'Mitchell's variations and grammars'

'... In 'The Logic of Architecture' Mitchell (1990) emphasises how different strategies using parts can contribute to a different concept of the whole. For Mitchell, the structural dimension of architectural space is made of relations under different rules and only those that make architectural sense. He classifies architecture as having different qualities in different paradigms : design world, real world and construction world, though they are all related to one another. The logic of columns, which are below beams, must support beams and so on, are put into relation using the structure of language. It serves the purpose of what Mitchell calls, 'depiction relation' of the intuition system in architecture (1990:64). However, it is the representative but not the representation of the structural dimension in architecture. The idea has, once again, fused abstract properties with concrete properties of architecture. Mitchell's attempt to understand architecture from its design process to the construction world shares the research's theoretical goal. His idea of using types to clarify relations is also useful and practical for conducting an analysis.' (Suvanajata, 2001:42)

Unlike Eisenman, Mitchell seems to put more emphasis on the variations and transformations of existing grammar rather than the possibilities for new ones. Most of the research in and about architecture has focused on the perceivable elements of architecture, e.g. architectural elements, geometry of forms, decorative treatments, symbolic figures, historical significance and styles. However, Bill Hillier and Julienne Hanson have focused their research on 'space' of architecture (1984). Their research project is not about 'form' but about 'spatial configuration' in which ideas of socio-cultural factors play a central role. They associate the idea with works of Durkheim and Levi Strauss as they see architecture as a network of social space. At University College London, they have established 'Space Syntax' unit named after the software which is used in their research (Hillier, Hanson and Graham, 1987).

Their works do not cover form or geometry of architecture only space and the structure of spatial connections. Space Syntax theory is highly applicable on an urban scale which could involve aspects such as crime, pollution, wayfinding. Based on structural concept in Space Syntax

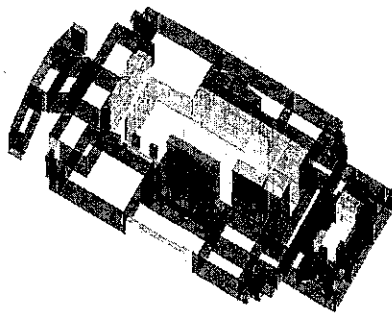


Figure 14 : 'Relational analysis of Wat Hualumpung

theory, Relational syntax further emphasises multi-dimension design strategies and effects in architectural space. It is the framework in which different dimensions of architectural space can be understood as relative and independent qualities at the same time.

'... The word 'structure' refers to the idea of system and the specific idea and methodology used to analyse space that is known as 'Space Syntax' introduced in 'The Social Logic of Space' (Hillier and Hanson, 1984). The idea of structure defined by Hillier and Hanson is essentially the idea of a configuration that creates intelligibility in space through a relational, not combinatorial process (Hillier, 1996).

Space Syntax theory describes each space in relation to its social structure that in turn makes any spatial configuration of built environment possible. Here the idea of intelligibility of space is achieved from the relation of parts and whole. The idea of convex spaces represents the idea of constitutive parts that make up the whole, spatial configuration (Hillier and Hanson, 1984). At a macro scale, the context of this system is social relations in which any other relations, in a micro

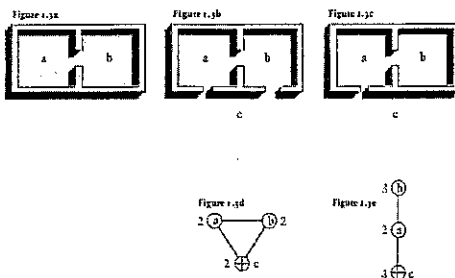


Figure 15 : 'Basic idea of Space Syntax' Connecting spaces...from?...to?...how?'

scale, take place among at least three convex spaces. As the idea of spatial configuration is confined to human knowledge, the structural dimension of space has to be confined to the logic of intuition and intelligibility. Moreover, architectural space eventually has to make symbolic and functional sense for people when they use and move in a building. This fact automatically disqualifies many abstract configurations that do not fit into our intuition of being in architecture.' (Suvanajata, 2001 : 41-42)

Research in designing architecture relies in some parts on intuition to arrive at its hypothesis because in architecture it is often the case that the phenomena in question are beyond mere perception. Therefore the intuitive skill architects use when designing architecture can help to structure the direction for research; research, like design, is the problem solving tool. *'...For such research to be effective, the physical complexity variable must be controlled at the level at which real design decisions are made. ...On the basis of this common language, it is argued, it should be possible to build a domain theory of built environments as structural and functional entities in themselves, and this will lend greater precision to studies of its*

interactions with other domains'. (Hillier, 2002:1) To this concern, Relational Syntax is the method that relates all major dimensions necessity to realisation of architectural space. The theory further investigates the interactions among these dimensions: structure-experience-function-architectural element.

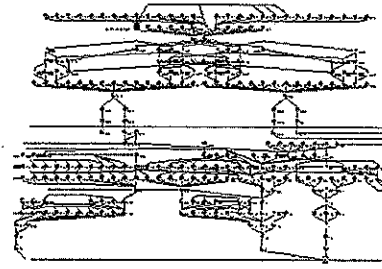


Figure 16 : 'Structural-experiential analysis of Wat Phrachetupon'

The discussion has shown what could possibly be the ideas, methodologies, findings and applications in this young architectural research discipline, especially in the area of research *in* design. In conclusion, research *in* designing architecture should focus on achieving a good balance between facts and impressions. In this way, research must be able to extract facts from architectural phenomena and it should also discover precise impressions that can be used to describe such facts. Therefore, research *in* designing architecture should focus more on:

1. Knowledge that relates to design activity
2. Knowledge that leads to analytical tools for design
3. Knowledge that can be used in design process
4. Knowledge that can link design activity to real buildings

By focusing on the above considerations, research *in* designing architecture will be closer to reality even though it is theoretical work. There will be two major benefits from such research:

- 1.) better design and practice in architecture and
- 2.) better and thorough understanding of architectural knowledge and architecture between architects and users.

The next article, designing a research methodology, will move on to consider a detailed analysis of how research projects can be designed for the above objectives. Details of how to use Relational Syntax technique to discover both generic and specific design characters in architecture will also be explained in full in the forthcoming article.

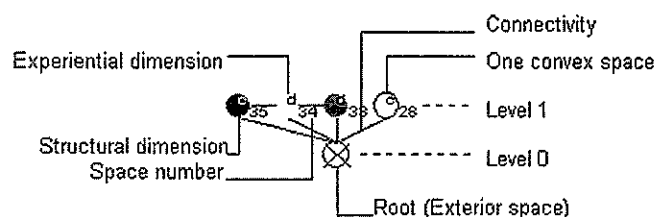


Figure 17 : 'Elements in justified graph of structural-experiential analysis'

Notes on Relational Syntax (Suvanajata, 2001) :

Relational Syntax is the linkage between:

Architects —→ structure-experience-function-architectural element ←— Users

It is the design tool in which the four dimensions are parts of one whole operation.

Relational Syntax consists of:

The Structural Dimension is the way spaces are connected through body movement.

The Experiential Dimension is how spaces are moved through in body movement (Suvanajata, 1993).

The Functional Dimension is how spaces are assigned with meanings of use in relation to body movement.

The Architectural-element Dimension is how spaces are finally given envelopes to accommodate body movement.

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