# ROLE OF MODELS IN ARCHITECTURAL DESIGN PROCESS

**ARC 6989 - Reflections on Architectural design**
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# Content

# Introduction

The essay content is based on exploring and reflecting on the architectural design process developed by making, understanding and improving design solutions using hard models. It specifically speaks about the way of evolving the design solution by visualizing it practically at a certain scale and inter-relating the spaces, materials and massing at the same time. Which the author think is difficult to do on representative 2d images of a 3d soft models. The initial part of the essay talks about architectural models, the different types of model and their general role. Then the second phase is discussed on the method of making models exploring on materials and techniques of making. The third phase of essay is on the architectural design process and types of models involved in it stage wise. The focused part in this process is the evolution of design, considering it a vital application of this method. It is explored in the final phase by using models of that stage. At the end of the paper a reflection on visit to Architect David Chipper-field's office is discussed followed by conclusion.

If Creativity and Visualisation plays important aspect in design process then why not build the space at a certain scale as an experiment to test all the expectations and derive an innovative solution. Many prefer motion films instead of photos, moreover, a 3d motion film instead of a 2d one. It helps to visualize and evaluate aesthetic and practical apsects by working on the third dimension. Today, technology makes it possible to work with this extended dimension with an interactive 2d display. However, the importance of a physically explored third dimension remains undisputed.

# Architectural model

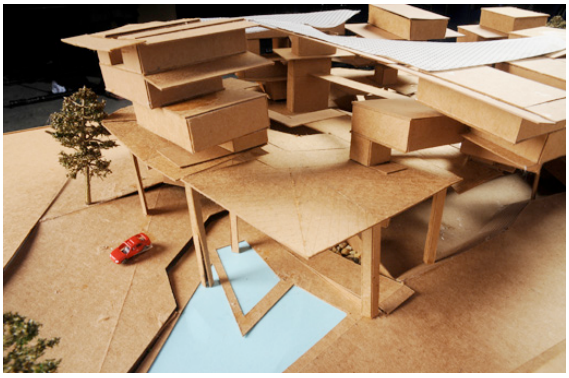

Figure 1 - Conceptual model

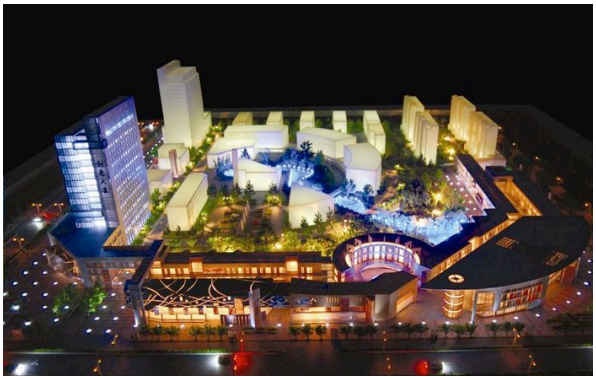

Figure 2 - Presentation model

**What is an architectural model ?**

It is an object which can be used for three basic purposes, commercial, presentation and studying. For me, as an architect the third purpose is more important and constitutes the analytical part. Architectural model is an expression of a valuable designed space for a specific project by a designer. It is a 3Dimensional feeling with Visual and physical interaction at a certain scale to deliver a thought/idea from a designer to the viewers. The thoughtful message can be varying from a designer to designer depending on their reason or client's use. A model made by an architect himself would be for his own study and can find his design issues and advices, whereas if model is made from model – maker, then he misses these opportunities to identify and rather he would know what a model maker needs, ultimately showing his personal interference less .[2]

There are different types of models depending on the types of project like planning and research model for urban scale project, aesthetic and green spaces models for landscape, aesthetic and massing models for a building, structural and stability models for construction and details, decoration models for interiors, special models, etc. These all are mostly in different materials and scales according to need exploring the different levels of design details and design aspects of a project. Even architectural models can be classified into different stages in a design process.

According to the author Rolf Janke, many of the architects under-estimate and don't recognize the importance of working with the models. He also shared thoughts of two authors Heinrich Kulth and Helmut Borcherdt regarding use of model. Heinrich wrote about a chemical plant having a cluster of pipes with different sizes, functions crossing each other and have horizontal and vertical support similar to a maze. [3] Interesting point here is that a drawing is useless to convey the proposal as it show's one face of that arrangement, also a simple isometric drawing speaks only from one angle, which is not enough to understand the proposal. This shows that a model can be the best method to process the design of a structure, with better visualisation power and confirm the proper implementations of elements structurally.

The Author also mentions about cost expenses for working with models in a project can be higher, but then he concludes that it can be used as a tool to avoid the justifications and mistakes while designing process, and also helps to analyse structural, acoustic and lighting issues. Helmut concludes about his experience with models for TWA building project as design resolved with elevations and plans can differ from that resolved with help of a model, as it can be expressed better in that form alone.

**What are the methods for making ?**

Basic techniques of making models are by hand, machine cut or both, which with materials decide the cost factor of the model. By hand it is a self exploring and inventive process which cannot be compared to any other process. By machine it is little less exploring while making and the model is precise with perfection. Architectural models are been made from very long time carrying a great importance, they were used for as symbols and presenting the structures or sculptures to their community. The models were mostly made of mud, stone or wood, which were hand carved in one piece and were required obviously less tools.

The methods of making a model depends on the material, available tools suitable to work on those materials, scale, space, and purpose. This is possible with some basic similarities in the method like requiring proper drawing, tools appropriate for working on materials and type of finishing at the end. Even the arrangement for making model are important like place of making should be clean and big enough, proper place to segregate and store model pieces, free of dirt and mess.


Figure 3 - Laser cut model

Figure 4 - Handmade model

Progress in making methods has evolved from generation to generation and there is always new technique invented world wide. Hand made models are most effective in terms of understanding the problems related to construction of the design which could be faced during actual construction and visualizing the aesthetics to the maker. Now a days there are laser cutters and 3d cutters which reduces tremendous efforts to make a model and they are referred because of their perfection. The role of making model in design process in its initial stages is for models to explore and improve the design aspects. These models can be known as concept models or working models used to stimulate design. These models are usually made by using light weight materials (like card board, foam, paper, plastic, etc.) and basic tools (like cutter, scale, glue, cutting pad, etc.) as it tends to speed up the model building and reduces cost at the same time. Although one model in the design process won't be sufficient to analyse the design, making models in different stages with drawings can be a proper process. While making the whole model manually, the brain works for each and every step while drawing, cutting, pasting for piece by piece

and tries to interrelate the current piece with previous one enabling the maker to visualise drawbacks like the construction technique and structural stability of actual scale structure if any. Whereas machine cut require drawings at a time and gives all the cutting at a time, so only pasting remains. The benefit in the manual method is that the components of model can be replace on the spot.

**How important are materials while making a model?**

While making model choosing the correct materials is one of the most important and critical choice. To select materials the important aspects are colour, texture, pattern, stability of the material and quality. Sometimes the raw material for model like cardboard itself could be a representative of actual material applied on it. Materials are the most important aspect in design, improper selection spoils the beauty and expectation of the project making it unsuccessful. It is normally preferred to use the similar identical materials that are used in the actual project for a model, because look of model can speak about the deepness of design, aesthetics, composition, form, comparisons within itself or with its surroundings. It also help to balance the design if other aspects of design are improper which may have some restrictions, ultimately making the whole design look good and balanced. Materials not only show but can be used for testing design functionality like Sustainability or economic approach using wood on a certain scale.

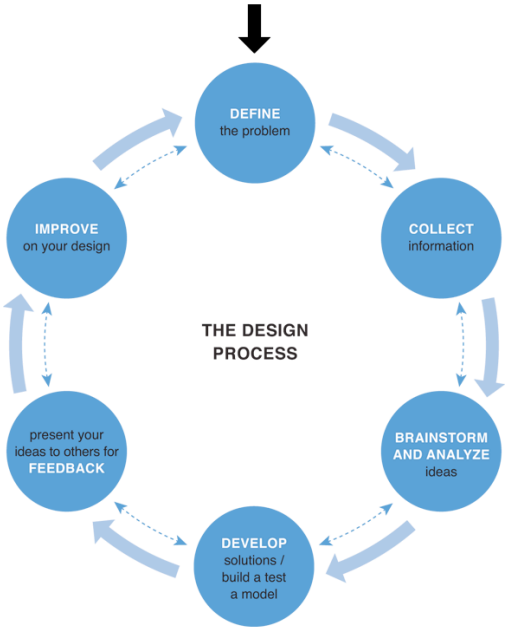


Figure 5 - Typical design process

**What is an architectural design process?**

In simple words it is the process in which the design is simplified in stages of thoughts and ideas, other inputs and existing conditions which are fixed, ultimately to make the project successful and fully functional. There are various levels of models depending on the stage of design process, it can start from a conceptual block model, model showing priority details, working models, model showing specific details, part model exploring design in more detail and the final model.

Many a times model is made after completion of design, for representing it in polished manner and not necessarily conveying the process that went behind the final outcome. This technique is not much useful as a designing tool. The part of design process I am exploring on and relating it to use of models is the design evolution, which comes after concept finalisation but before freezing the design. Working drawings and calculations come in the later part. The first idea on concept of a design is a zero level platform from where the evolution of design starts and after several refinements the design reaches to it's freezing stage, where model is the most practical and precious tool for critical analysis on the design. In the evolution stage an architect needs to think from basic aspects like massing, basic function, light, ventilation and spatial arrangement. Then usually, he goes on exploring the aspects in detail either by changing and modifying or using permutations and combinations of ideas to create third one. This helps to produce options and one suitable option having all the positive points of other options can be picked. While exploring these aspects the inputs from colleagues and clients are very important, overlapping all the comments and self-thoughts the design can be reached to its maximum potential. For these discussions a model would be a self-explanatory and better representative of the project.

## Model as a design evolution tool

This method of designing enables shaping of third dimension, effective height of the space. I agree to what author Rolf Janke states, a drawing of modular or proportional design contains volumes that are spatial creation and considering that space in three-dimensions rarely exists. Making block models of modular or proportional structure is simpler and easy to visualize. There are few Architects who dedicate their daily routine in working with models for trial and error of their design which is the key part of analyzing design and evolution according to me.[2] Sir David Alan Chipperfield, is one of the best examples for me, who works with models and I have also explored his working method at the end of the paper as a study. For an architect a model should be like a 3d tool which he can touch, feel and change, thus acquiring the required architectural form and solutions for spatial problems. The preliminary and experimental stage of design can be classified into more stages as per the size and criticality of the project. They can be more like a working block model and basic materials can be used as they are only for self understanding.

# Living example - Sir David Chipperfield

I remember the visit to his office in berlin, Germany when I was on my filed trip for studio work. His office was huge well categorised into floor with different sections, one was looking after competition projects, other current projects, graphics works and approval work having overall 100 people staff. The most interesting thing other than his projects or structure of staff was his approach and presentation for design using model and dedication of whole basement for making models and storing them. The most important part of his work is that he always wants to explore his design materials and spaces using the models, instead of rendering them in the computer. The models played with lighting, scale, shadows and ventilation which helped him to keep the design overall balance. He also stored sample materials for showing them to clients. I think these materials can also be used while deciding the materials for design models, as the look and feel of model with representative real materials is just like a actual one. He also had a section of photography where highly professional photos were taken and recorded of the model into a book of that project.

Typically in his office after making and analysing a model other model with modified components is made. This keeps on going till it reaches its freezing stage and although the models are stored, photos are taken on every stage for record and can be used to compare at the end. His office was having displays of models which gave feeling of an architects office and this is important for me to impress the clients or new visitor.

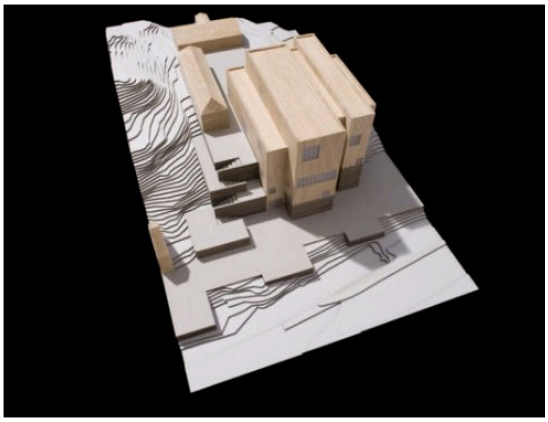

Figure 6 - Cultural centre by David Chipperfield

Figure 7 - James simon gallery by David Chipperfield

# Conclusion

I think working with these models is like seeking inside a computer screen and working with three dimensional block from all sides in a single look and enabling to inter-relate the spatial spaces and think in other dimensions like height, feel, look, etc. If an architect is involved in the making process intensely enough, he can make quick decisions. If an architect is busy and making from a model maker than the model maker knows the difficulties but he cannot express them in architectural terms. I don't agree here, sparing a bit of time should be manageable because it is a key part of design process which need equal attention after and while making the model or the possible solution can be making it with help of colleagues. And colleagues can give him report on positive and negative aspects of the design. The most important factor an architect can gain from this method is the imagination power for all aspects and form of the structure. Same way even for my studio project I am trying to make model and record it, because at the end when I compare the records I can see the evolution of design and the way they are shaping and honing my design proposals.

Apart from being a useful tool for understanding and developing architectural designs, model making may also be seen as a mirror that reflects a designer's growth as an individual who gains an understanding of their professional journey.

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