

PROJECT DESIGN IS RESEARCH

There are countless reasons that demonstrate why an architectural project is a work of research.

Architectural practice, which we architects call project design, from the initial idea to the basic project, throughout the construction or working project and followed by the site management, is, or should be, a real work of research. And by the same token, its transmission, the teaching of project design, is also, and must be, a real work of research.

In this text, Project Design is Research, it is my intention to show how design in architecture is research. Because, while this may be difficult for those who are not architects to understand, project design IS research. Any architectural project is, or should be, a real work of research.

What is Project design?

To design a project is to think, to reflect and to decide, to respond, to conceive; to thoroughly analyze all the existing data and then diagnose a problem in order to finally solve it. In architecture, project design is something more serious and more scientific than most people believe.

An architectural project is the development of an idea that is the result of a long process. An idea that is capable of being built and, as with every research process, one that always has a purpose and a concrete result.

An architectural project is not simply drawing sketches of the first thing that occurs to the architect. It is never a mere whim, the product of an ingenious mind.

To design is to give a unified response to a multitude of questions. To design is to give a simple answer to a complex question. It is to adopt a decision from diverse possibilities. To design is to generate an idea that when materialized, when formalized, is capable of solving all the questions raised.

In order to design one needs to know the problem well, to recognize it, and to know how it has been resolved throughout history, so as not to reinvent the wheel. It involves knowing the place well, being cognizant of the conditions and the requirements, the existing conditions and the wishes of the person commissioning the assignment, being familiar with the new technologies that make it possible to find new solutions.

Designing requires research. How could it be anything else? Searching, testing, exploring, finding. In short, studying the problems thoroughly to come up with the best solution. With all the time and dedication needed to reach the best possible result, at the slow, deliberate pace characteristic of all research projects.

And to carry out this project research, you do not need a microscope. There are those who think that to be a researcher you have to be looking through a microscope, just like Pasteur himself. They and much of our present-day society might accept that architects are researchers, if they were to see us working on our project designs under a microscope. For to these wise men of Zion, as a Spanish painter once replied when asked what he was painting: if it ends up with a beard then it will be Saint Anthony, and if not, the Immaculate Conception! How wise such sayings can be sometimes! And how ignorant our present-day society!

Project design: what is it not?

Design projects are everything except the more formalization of bright ideas, or the result of chance.

In the well-known fable by the Spanish writer Tomás de Iriarte, an ass plays the flute quite by chance.

Passing my abode,
Some fields adjoining me
A big ass on his road
Came accidentally.

And laid upon the spot,
A flute he chanced to see,
Some shepherd had forgot
There accidentally.

The animal in front
To scan it nigh came he,
And snuffing loud as wont,
Blew accidentally.

The air it chanced around
The pipe went passing free
And thus the flute a sound
Gave accidentally.

“O then,” exclaimed the ass,
“I know to play it fine;
And who for bad shall class
This music asinine?”

Without the rules of art,
Even asses, we agree,
May once succeed in part,
Thus accidentally.

I think this fable summarizes extremely well much of what I want to say here. For indeed, what turns the ass into a flautist is not the fact of playing music or designing. Many an architect is capable of playing the flute that makes a sound by chance. In the same way that composing or performing music is something wonderful but complex, designing and building architecture is perhaps still more complex and wonderful.

You have to listen carefully to your clients to know what they want. If their wishes are reasonable, as they usually are, you have to try to translate them into the best possible design. And if what they want goes against nature, you have to convince him that this doesn't make sense. Because the client is not always right, at least as far as architecture is concerned.

It's like the patient who, on receiving his doctor's diagnosis, questions its merits or failings and puts forward his own bright ideas to his doctor, “because, you know, doctor, I know myself better than anyone.” I, personally, try to do everything that my doctor tells me. And I'm doing very well.

Some think that project design is a democratic act. And they are wrong. An architect should listen carefully, very carefully, to what the patient has to say, but after that it's the architect's job to diagnose. It's not the client's job to design.

Nor is design what some architects do, putting down on paper the first thing that occurs to them. As they think they know, they put down the first solution that comes to mind. And that's how it turns out. That is not project design, much less research.

Other architects think that to design well you have to follow the latest trends. And after soaking up all the most fashionable magazines, they try to do something similar. And that's how things turn out the way they do. Perhaps if they all were to read E.H. Gombrich's beautiful book, *The Preference for the Primitive*, it might clarify many of their ideas.

What constitutes research?

To carry out research is synonymous with analyzing, investigating or examining. Research is carried out because something is unknown and a solution needs to be found. The concept of research is applicable to different fields, especially scientific or historical.

It would appear however that research is something reserved for the usually bearded 'eminence grise', standing behind their microscopes, probing into matters that our society considers scientific. As if architecture did not quite reach that high level!

Maria Moliner's dictionary provides us with a long list of synonyms in Spanish for the verb 'to research', which translate as: to analyze, to investigate, to examine, to seek, to inquire, to trace, to search, to browse, to interfere, to scrutinize, to rummage, to dig out, to probe, to sound out, to explore, to stir up, to study. And the synonyms for research as a noun are: analysis, inquiry, examination, search, exploration, inquisition, inquest, study.

Poets do their research when striving to come up with the precise word to translate the idea they want to express and in accordance with the metrics of the poem, placing a word with the greatest precision in the exact right place. And they are well aware that a word that in one line says little or nothing is capable in another line, in another position, of producing the sound of a thousand Handelian trumpets and stirring our hearts. They spend as much time researching, seeking out and finding the word, as in placing it in the precise place.

Musicians do their research when, knowing the ethereal nature of music, they forage between the lines of sheet music to devise a way of placing the notes to achieve the intended result. Their research involves both seeking and finding the notes, and placing them in the right place.

Painters do their research when, knowing what they want to paint, draw a sketch on the canvas that reflects the theme that is later covered over with the painting, resulting in a successful outcome astonishing their very authors and capable of transcending them.

Creators, all creators, do their research when they work tirelessly on their creations every day, every single day, with the conviction that their creation will one day transcend them, as indicated so well by my friend Stefan Zweig.

But neither the poet nor the musician nor the painter, nor almost any other creators have to fight against the laws of gravity as architects do. Neither the works of poets, musicians or painters can fall down. Nor, like architects, do they create for reasons of necessity.

Architects carry out research when, after analyzing all the conditions and the requirements of a new project, they gradually unveil an idea capable of responding to them all. Their research into seeking out and finding the idea is just as painstaking as the development and the construction of that idea. It involves investigating and exploring the place, the locus, in its physical and its historical aspects. It involves examining and analyzing the function to be developed and the construction itself, as well as the aspects related to aesthetics and beauty.

And in this vast and complex research that is architectural practice, architects must attend to many different questions: what they want to achieve in relation to the function; how they want to do it in relation to the construction; when they want to do it in relation to the technology of their time; for whom it is being done in relation to the finances and the idiosyncrasy of the client; where it is going to be done in terms of the place, the locus; and why it is being done, which is open to many and very diverse answers. It would seem that we have closely followed the seven questions of the Quintilian Hexameter: quis, quid, ubi, quibus auxiliis, cur, quomodo, quando. (quis = who; quid = what; ubi = where; quibus auxiliis = by what means; cur = why; quomodo = how; quando = when.)

Quintilian's questions are similar to the famous Ws often quoted in journalism: What? How? When? Who? Where? Why? The six Ws, also known as the five Ws and one H, is a concept used in writing and news stories, but also constitutes a basic formula in information gathering, problem solving and scientific research.

Perhaps the simple achievement of Utilitas, Firmitas and Venustas proposed by Vitruvius, may constitute a more appropriate response to these questions, not forgetting that Gravity builds Space and Light builds Time.

The Idea resulting from the first stage of research

Just like a medical analysis, an architect should carefully study the symptoms of the project in order to be aware of all the circumstances involved so as to come up with the most accurate diagnosis, which is what we understand as the project concept. We have already explained this sufficiently.

The idea is like a distillation that needs time, like a good wine. Time for research. As the classics would say, if the idea is clear and distinct, everything will go smoothly.

Research on the Locus

When studying the site on which to build, whether in a natural or historic city setting, the architect carries out a great deal of research on the locus. The locus includes everything from topography to landscape, from climate to history.

On my desk at the moment I have the project of a house perched high on a rocky ridge facing the Atlantic Ocean. I can assure you that, in addition to the obligatory on-site visits to this beautiful spot, we have not only drawn but already produced several topography models at different scales, in order to better understand the site. Investigating, looking for the vestiges of the layout that the site indicates to us.

Analyzing the surrounding landscape, to know where and how the house will be facing, focusing it, underlining it and framing it.

Studying the climate of the place to decide on the type of architecture that best responds to the prevailing conditions.

Knowing the history of that place. Knowing what others have done before us to avoid replicating what has been done before.

All of this is a research exercise to inform ourselves thoroughly and become fully acquainted with the site to produce a diagnosis based on the greatest wisdom that we are able to summon up. It has never been easy for non-architects to understand the huge importance of the placement of architecture on a site. It truly is so important.

Research on function, Utilitas

Following an in-depth analysis of the program, when a first idea begins to emerge of what orders the spaces so that the requested functions are well ordered and articulated, the arrangement of functions and circulation flows are not as obvious as it might seem.

That task of sizing, organizing and connecting each of the requested functions is also research.

Research on the structure and the construction, Firmitas

When working on a structure, the skeleton of the building, we must always understand that the structure establishes the order of space; it builds the space.

The architectural translation of the space involves the absolute control of the structure through its precise calculation to guarantee the stability of the work, to guarantee the security of its resistance. For this the architect uses calculation tables which are put to good use. And knowing that there is not just one possible structure for each work, the architect pursues a real work of research here.

Norman Foster, when designing the Hearst Tower at Columbus Circle in New York, did his research and decided to build a facade structure of overwhelming logic. Piano and Rogers carried out their research when they constructed the Pompidou Center in Paris, where the structure is the main protagonist.

Here I'd like to allude to a personal example. In the context of the project for the Pavilion Sports Center for the Francisco de Vitoria University we studied a variety of structural alternatives, researching, seeking to find the simplest solution: the most logical and the most economical. After numerous work sessions with Andres Rubio, the architect with whom I calculate the structures of my works, and with Ignacio Aguirre, my main collaborator on that project, we finally came up with the solution of the simple trusses that were later built and placed there.

And when we work with materials we are also involved in research; investigating materials: stone, concrete, wood, steel and glass, but also graphene or EFTE and structural silicone.

Research on Beauty, Venustas

But, oh, Venustas! Oh Beauty, how to reach her?

I know it is not easy to understand how one can actually carry out research into something that seems so ethereal -but is not- as beauty. All the creators in the world have employed research in the pursuit of seeking and finding beauty.

We pointed out earlier how everything in architecture is form, that inescapable form. And it is that form that shapes the load-bearing suspension in the air and establishes the order of space that one way or another leads us towards beauty.

Mies Van der Rohe did his research into form when he introduced the solution of acute angles in his Friedrichstrasse building, on account of the visible perspective transparency and for similar reasons in his beautiful unbuilt Glass Tower.

In this context it is appropriate to speak of how in my Cala house, which we call Raumplan house, because of its spatial conformation, the reason for this arrangement of spaces, is a pure exercise of project research. The simple concatenation of double-height spaces in a simple ascending helical movement produces spatial effects that are enormously effective. To achieve this we did substantial research work involving countless drawings, plans and models.

Research on Light and Time

If there is one central material in architecture it is light: light that builds time. When people speak of me as the architect of light, as has happened on numerous occasions, I have always answered that neither I nor anyone else can take ownership of that prerogative. Light is a theme of architecture itself. As a friend of mine said: *architectura sine luce nulla architectura est*.

In an attempt to explain how that control of light, far from being something intuitive, is a question that requires great precision, I invented the existence of light tables, tables for calculating light just like the structural calculation tables that we all use. Because working with light is a true work of research, perhaps the most specific research work in architecture.

Light that builds physical time, but also builds that other time, the *distentio animis*, which leads us to the capacity of light to make time stand still, to suspend it in an architectural space.

Teaching as a research project. Information, knowledge and wisdom.

And so we finally come to the transmission of project design, to the teaching of architectural design in Schools of Architecture, which is also, and should be, a work of research. Those of us who teach know that we learn more than we teach.

Teaching project design in Architecture on account of its root cause also becomes a real work of research.

A professor in charge of project design who carries out research on a daily basis in his own work, in his architectural practice, can only operate in the same spirit when he teaches. Teaching is not a mere transmission of the results of the designing activity, but is in itself an activity of research.

Many of the questions raised by educators in their daily lives as teachers in a school are resolved in their studios when they are designing. And vice versa: some of the questions that architects pose in their studios are resolved in their everyday teaching work.

That is why I always advise my best students to stay on in teaching when they graduate. Being a teacher provides a privileged position for producing the best possible architecture, for developing the role of researcher. Designing and teaching, teaching and designing become inseparable actions that mutually benefit one another. They are the two sides of the coin in the context of project research.

It is acknowledged that good architects -the top ones- if they take up teaching, cannot fail to be involved in research in their projects and their teaching. I have always stoutly defended that desirable balance for an architect between teaching and constructing.

Back in 1986, when presenting a Research Project for my candidature for the Chair of Design at the School of Architecture in Madrid, I submitted a real project, that of the Orihuela Library, which was under construction at the time. And in that thick document, I already put forward quite an outspoken defense of the architectural project as a research project.

Conclusion

I have endeavored to demonstrate through the countless reasons outlined here, that project design in architecture, what we call architectural practice, and its transmission through teaching, constitute a real work of research requiring an investigative spirit so well described in the words of St. Augustine: "Let us seek as those seek who have not yet found, and find as those find who are yet to seek."

And so it is, truly, that an architectural project is a labor of research.