

Structure + Architecture

In this class we examine:

- the role of structure in architecture;
- the role of architecture in structure;
- cases where good structure and good architecture merge;
- cases where there is conflict between architecture and structure.

For the projects examined we look at the structural principles used, and the architectural implications.

Firstly, answer these questions:

If a building is to be 'successful', what is the relative importance of structure and architecture?

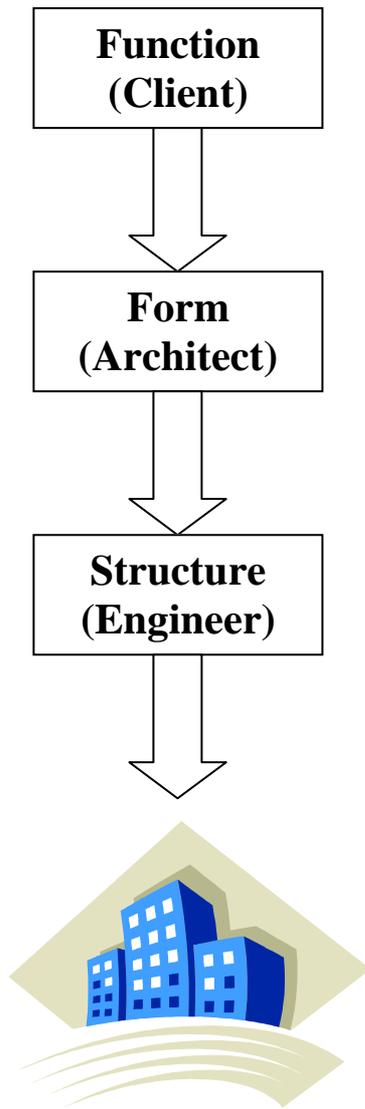
Can good architecture exist without good structure?

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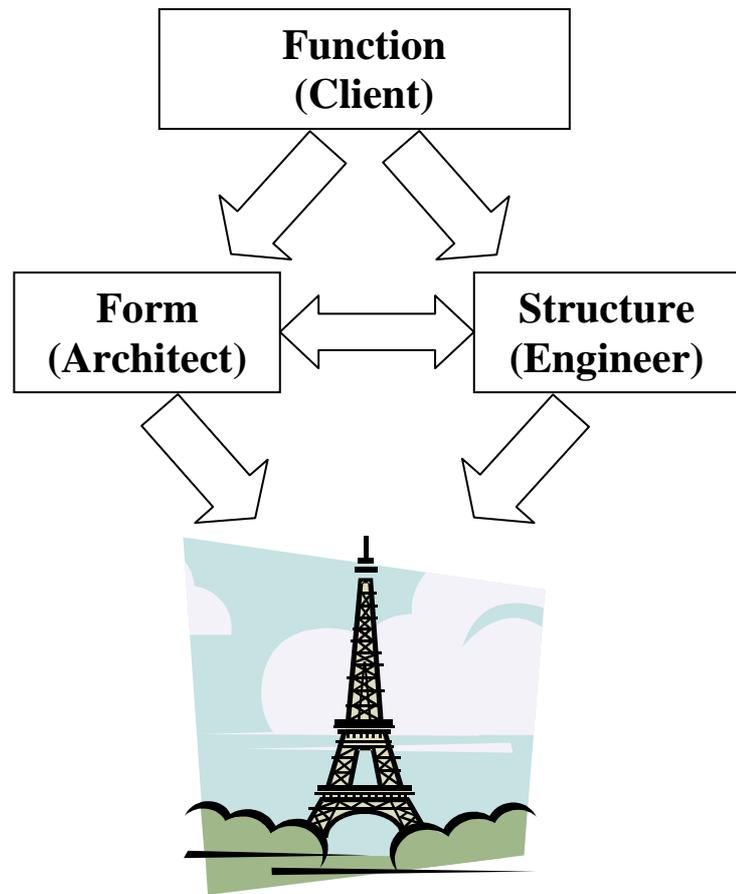
In these contexts, what is good structure?

And what is good architecture (humour yourselves!)?

The Design Process



**Traditional
Approach**



Ideal Approach?

What do well-known Architects and Engineers have to say?

Louis Kahn

Kahn's engineer Komendant explains:

"I was always an insider from the beginning of each project to the finished building...we worked together like brothers"

Eero Saarinen to Kahn, (teasingly):

"Do you consider this building [Medical Research Lab, Pennsylvania] an architectural or a structural success?"

Kahn replies, (irritated):

"Your question is a valid one. The elements and their shapes, like the structure they form, evolve so logically from the architectural requirements that structure and building cannot be separated, the one evolves the other!"

(Margolius 2002)

Pier Luigi Nervi

"A good structural organism worked out passionately in detail and in general appearance is essential to good architecture"

"A structure that does not follow the simplest and most efficient schemes...will only with great difficulty achieve good aesthetic expression."

(Nervi, 1966)

Ove Arup

"The Modern Movement... discovered that the work of bygone engineers was in fact architecture. It is now accepted that bridges and factories...in fact everything built is architecture"

(Arup, 1970)

Le Corbusier

“The Engineer’s aesthetic, and Architecture, are two things that march together and follow one from the other...”

(Le Corbusier, 1923)

Eladio Dieste

"The resistant virtues of the structures that we seek depend on their form; it is through their form that they are stable, not because of awkward accumulation of material. There is nothing more noble and elegant from an intellectual viewpoint than this: to resist through form."

(Dieste, 1987)

Heinz Isler

“One does not actually create the form; one lets it become, as it has to according to its own law.”

Frei Otto

Q: “Should an engineer be an equal partner at the design stage?”

A: “Yes, if he’s capable of that. But there are very few engineers of that kind. In part, that has to do with one’s nature or disposition. People who enter the engineering profession today mostly have mathematical gifts and understand something about physics...People who ...become architects...are those who can draw well...In other words, two quite different ways of thinking are involved.”

(Detail Vol 1, 2006)

Summary Questions

Can good architecture exist without good structure?

Can good structure exist without good architecture?

Are architects and engineers equal design partners:

- (a) on all projects;*
- (b) on some projects?*

Does the engineering of a building have an effect on the form of the building?

Which of the Design Processes is most conducive to good results?

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