

## **MAKING CONSCIOUS THE PROCESS OF INDUSTRIALISED ARCHITECTURAL DESIGN**

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### **Introduction**

#### **Context**

Increasing global complexity at all levels of society seems to create a growing need for simplicity, clarity, control and reliability. At the same time a new consumer culture calls for customized goods. Due to this development the traditional architectural design process is put under pressure by a demand of exact definitions of the values and qualities produced by the architect. Contemporary architecture seem to be ruled by a mixture of different quality standards and means that do not relate to the architectural project as a whole, but is determined by a series of external conditions (product demands, value-chain definitions, technologies and desires of end-users), that are detached from the specific architectural context. Today's architect is no longer considered as the all-embracing figure of the building process, but is often reduced to the role of 'yet another consultant', who mainly deals with issues of aesthetics and 'style'. Construction management, project planning and control are often in the hands of technical consultants (engineers), in isolation from the designing architect. Thus, there are more links in the chain of communication, and questions concerning construction are further removed from the design process and the design intentions. The result we too often observe is an architecture lacking of coherence and integrity.

Architectural quality is here defined as both objective and subjective matters such as; delicate materials, proper construction solutions, the ambiance of a room, the sense of balanced proportions of a facade system etc. It includes technical aspects, aesthetics, functional schemes, economy, ecology, time, place and other values. Architectural quality forms a synthesis of these elements and can be characterized as a holistic perception of our physical environment, where every constituent part seems significant and irreplaceable within a particular setting. This means that architectural quality cannot be expressed as a single formula and that it is not possible directly to compare different levels of quality between different objects.

The project takes special interest in the architectural potentials, which lies in the use of modern industrial manufacturing processes when it comes to flexibility and customization. Due to modern computer technology and manufacturing the building industry is no longer constrained to monotonous mass production as in the past. However processes linked to industrialized manufacturing and computer technology which both involve carefully planned input and a predictable output seem to confront the concept of architectural quality as well as the iterative nature of the design process.

#### **Purpose**

These circumstances as referred above are difficult to change overnight, but greater awareness towards defining architectural quality and more consistent and conscious use of design methodology may help the architect to direct the resources and formulate explicit design strategies in order to reach certain values.

The object of this project is to contribute to this consciousness by examining the production of architectural quality within an industrial context. Questions that are studied are: How is architectural quality defined in specific architectural solutions, how intentionally is it being used among practitioners and finally which strategies and methods are being used in order to reach specific goals (architectural qualities) in the production of architecture today?

## **Progress**

Through detailed interviews with practicing architects the project examines how and to which degree design strategies are used in the attempt to attain specific architectural qualities. All the architectural offices that have been interviewed present interesting attitudes to industrialized architecture and the following analysis tries to decipher how they work in order to reach their final results. We define industrialized architecture as the overall building concept, the production process, building systems, as well as (industrial) design principles leading to particular results.

## **A theoretical model**

As part of the project we have developed a theoretical model consisting of four approaches for action, which helps to categorize and structure the different ways in which the offices try to control the design process and the end-results. The approaches are not meant as exact representations of any empirical reality, but are an attempt to collect a series of related motives for action, sorted out as clear-cut strategies. They are used as a tool in the analysis and in the discussion of the empirical results reflected in the interviews, but at the same time they are also an outcome of these interviews. In this way the model is meant more as a dynamic tool than as a rigid framework. Through the work with the analysis the model has constantly been corrected and refined. The intention is to make the model useful outside this specific research project and furthermore it is meant to create consciousness and discussion among practitioners and students about how they work.

The four approaches contained in the model are named the *pragmatic* approach, the *academic* approach, the *management* approach and the *conceptual* approach. Each of them represents different strategies along four sets of dichotomies. These are: architecture as an autonomous vs. conditional discipline, project vs. process orientation, innovative vs. evolutionary working method and intuitive vs. explicit accumulation of knowledge.

## **Autonomous vs. conditional**

An autonomous architecture is an architecture which is exclusively defined within itself and the architect is in control when it comes to decide what is relevant to include in this definition. This has to do with a conception of architecture as a true profession rather than an occupation (demarcation vs. action). On the contrary architecture's dependency places the architect as one actor among many others in the production of architecture. This is not necessarily limiting the development of architecture; the blurred borders can be seen as opportunities and inspiration rather than limitations.

## **Process vs. project**

This axis describes the focus of the architects when at work in the studio. A 'process focus' starts from the assumption, that controlling the process is the best way to control the result. Your actions influence the final outcome. This means that the working methods often have a general

character directed towards *how* you do, which is not necessarily linked to any special features of the actual project. The 'project focus' concerns – the project. This makes the process more arbitrary or improvised in the way that 'anything goes' to reach the goals set up *a priori* in a specific project. The end result can be an outcome of many different processes. The working method is thus postponed in relation to the product/project.

### **Innovation vs. evolution**

The third dichotomy spanning from innovation to evolution is related to the *use* of knowledge in the generation of new ideas. Innovation has to do with the ability or the intention to throw away what you already know and take in completely new information without prejudice. This knowledge can be both consistent knowledge generated in external environments<sup>1</sup> and more *ad-hoc* based knowledge generated by a specific combination of conditions linked to the specific case. Evolution means that the actor (the architect) holds the main part of the knowledge or information employed in a project already at the beginning of the project. Compared to nature itself evolution is based on *mutation* where minor corrections and refinements make an organism (or object or process) more apt in a certain environment, context or situation<sup>2</sup>.

### **Explicit knowledge accumulation/intuitive non-explicit use of knowledge**

The last dichotomy deals with the nature of the knowledge used or could also be illustrated as the *media and code* used for information storage and exchange. Explicit knowledge accumulation mainly uses external media and universal codes<sup>3</sup> e.g. paper/pen (media) and letters/English (code). This type of knowledge accumulation facilitates communication and exchange by making it more independent of the actors involved in this communication. By intuitive non-explicit use of knowledge is meant that the media is the actors themselves and codes are personal or at least limited by personal access<sup>4</sup>. This knowledge can be conscious but are more likely to be part of the subconscious.<sup>5</sup>

The four approaches of the theoretical model can briefly be described in the following way:

### **The pragmatic approach**

This approach starts from the belief that you deal with the present conditions - good or bad. The role of the architect is not to change the world, but her mission is to present qualified proposals and improve the general standards. Knowledge is collected through a kind of apprenticeship based on routines and tradition and it is developed through working with specific projects. Knowledge is produced and held by the involved employees in each project. There is no

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<sup>1</sup> Knowledge collected from other related or non-related fields

<sup>2</sup> Again reality will always be somewhere in between. You cannot start completely from scratch even if you wanted to. There will always be reuse of some basic knowledge e.g. how to use a pen or the dimensions of the human body (in architecture). On the opposite total reuse will not generate new ideas (and will not even be evolution).

<sup>3</sup> Universal codes do not exist. In this context universal should be understood as 'shared by a large number of individuals'. Even shared codes will contain an interpretative element.

<sup>4</sup> An extreme way of attempting to surpass this personal access could be the use of torture.

<sup>5</sup> The actual knowledge accumulation will always be a combination of the two extremes. This has to do with the interpretative act, which will always be involved in the translation of any form of information independent of media and code into useable real-time knowledge. It is not without importance *who* is reading a text or looking at a drawing.

systematic cross-project evaluation and transmission and you deal with what is possible within the given frames and conditions. Objectives concerning architectural quality are defined during the programming and the sketching process. Summing up the pragmatic approach is to see architecture as a conditional discipline. The approach is primarily 'project oriented', based on tradition (evolution) with an intuitive non-explicit use of knowledge. A caricature: the craftsman.

### **The academic approach**

Behind this approach you will find an understanding of architecture stressing the ordering of information. Only the architect can fully get a hold of this complex, which nevertheless is created through interaction between various parties each one contributing with specialised knowledge. The role of the architect is to interpret and synthesise the many different inputs. New knowledge is systematically gained and critically held up against present knowledge. A strategy is to use well-known solutions (typologies) that are repeated while continuously adjusted and refined. The different tasks are specified so that responsibility easily can be distributed. Objectives concerning architectural quality transcend the project level as e.g. sustainability, lower costs or daylight qualities. Through a fixed method one tries to reach specific qualities. Summing up the academic approach claims architecture's autonomy. It is primarily process oriented, based on tradition (evolution) and has a high level of explicit knowledge accumulation. A caricature: the scientist.

### **The management approach**

This approach consider architecture to be formed by the building industry and the architect has no special status within this context. Efficient coaching and management, rational thinking and good business are essentials to attain good results. Knowledge is based on theoretical models and internal systematically collected experience. The business administration controls the total amount of knowledge as a platform for decision-making. Keywords are: business organisation, specialisation of each employee and controlling or directing each one's effort. This assures an optimal use of all qualifications within the company held by its employees. By possessing sufficient economical resources in each project as well as in the company as a whole, room for innovation and new ideas to emerge is made. Summing up the management approach claims architecture's conditionality. It is primarily process oriented, innovative and has a high degree of explicit knowledge accumulation. A caricature: the manager.

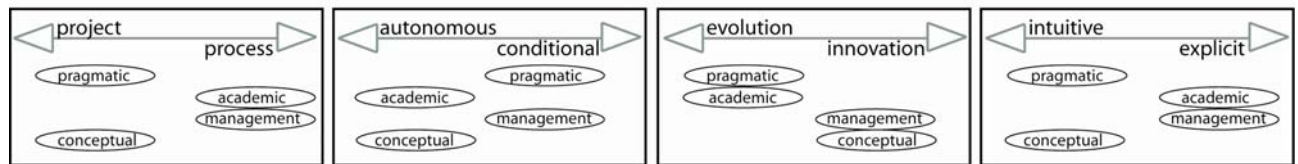
### **The conceptual approach**

Architecture is conceived as an art in this approach. Every building must be a unique statement, which claims more than just to be the physical framework for human activity. Every project starts as *tabula rasa* where a particular concept sets up the framework for possible action. This concept might originate or be inspired by part of reality but generates its own logic. The quality is embedded in the value of the concept, the degree of innovation or the special characteristics as well as in the clarity and consistency of the final result, which also should be able to solve technical and functional requirements. Summing up the conceptual approach claims architecture's autonomy. It is primarily project oriented and innovative and has an intuitive non-explicit use of knowledge. A caricature: the artist.

The four approaches should be understood as neutral based on the assumption that *all* approaches can result in architecture of high quality. The approaches are the result of refining a group of

related characteristics. Real practice will always be more ambivalent and thus hold different approaches simultaneously forming a complex of strategies.

figure a



## Implementation and perspectives

The model of action has been presented in various contexts thus trying to agitate for a more conscious strategic approach among architects. There is a difference between not being conscious and *choosing* not to be and our argument is that given the new and industrialised context as described above there is definitely a need for this conscious choice. This not only seen as a means to empower the architect as a professional person as well as the profession, but rather to emphasize what is more important: the *architectural quality*. As presented in the introduction the traditional design process is under pressure and in this context it is our opinion that new measures must be taken to insure that design is not reduced to cost control, industrial just-in-time production or building code. These might be important issues but should be submitted and measured against a more wide-ranging approach including all the other important aspects of a *holistic* architectural design process.

## An example

A preliminary attempt to use the model outside the research project was made in March 2005 with a group of architectural students in a half-day workshop. The students were working with a general theme about project design and group processes. First they were presented for the model of action and a couple of examples from the analysis. Then the students had some time to think about and write down their own personal approach using the model and the four theoretical approaches as point of departure. Subsequently each of the students presented their approach. The idea was on a general level to discuss how the personal approaches related to the theoretical ones and on a more specific level to see if the results could point towards different roles among the students in their current group project.

The presentations and the following discussion showed that the students placed themselves in quite similar ways. Most of them identified themselves mainly with the conceptual approach with some resemblances to the pragmatic approach. This implied that even though they as students were in a process of learning they did not claim to use any systematic or explicit form of knowledge accumulation, but rather improvised (intuition) or did 'as they used to do' when they had to start up a project. However many of the students also claimed that a more systematic knowledge accumulation as characterised by both the management and the academic approach would be desirable, but that they had no tools to reach such an end.

One conclusion was that the education at the School of Architecture in Copenhagen is characterised by its historical affiliation with the Royal Academy of Fine Arts and that this affiliation today still has an important impact on the self-image of the architects graduating from here. This does not necessarily correspond to the actual needed or desirable qualifications in a

modern industrialised context, but the pattern is reproduced through the practice or at least through the culture and the architectural ontology found in many architectural offices in Denmark and it is therefore hard to change.

### **Further implementation**

An article was published in *Arkitekten* 6/05 in May 2005 presenting the model for a wider target group of architects in Denmark<sup>6</sup>. The direct impact was that one of the biggest offices in Denmark asked for permission to use the article and the theoretical model as a basis for an internal meeting on business strategy. Currently (July 2005) we are working on an article meant for the *Nordic Journal of Architectural Research* focusing on the research methodology applied in the project. A two-week seminar on project design and design strategy is under development to be carried out in November 2005. Finally a project paper has been accepted at the CIB W096 conference in November 2005 focusing on issues of architectural value in this project. In this way we try to make the project more than a final report to be placed in the bookshelves of other researchers. It is our hope that the model can and will be used by more offices in discussions about strategy and that it can contribute to make more conscious the ways we – as architects or designers – define and try to reach goals concerning architectural quality.

One could ask if industrialisation really calls for a special terminology or design process. Is industrialised architecture really something new or different? We do not think so, but the circumstances under which it is produced – and especially the number of actors involved in the process – have changed considerably making building a complicated affair. The world changes rapidly and the architects and the building sector must develop as well in order to provide modern buildings to modern people who live with a new global complexity that call for clearly defined values. The purpose of this research is not to reject the traditional role of the architect, but to challenge it by making the architect more conscious of her own choices and the architectural consequences of these choices.

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<sup>6</sup> The article can be downloaded (in Danish) from [www.cinark.dk](http://www.cinark.dk) (Centre of Industrialised Architecture)

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