Simple Introduction to

ARCHITECTURE

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INTRODUCTION

Simple Introduction to Architecture is a textbook whose main task is to prepare students to work in an architectural branch. Architects are currently participants of the market game, with all its advantages and disadvantages. Their opportunities to design new buildings and landscapes are limited by intentions and capabilities, as well as the general situation in the design market.

The work of architects and its effects should, therefore, remain at a higher level than competition can create. For this reason, architects need to improve their design skills constantly, while at the same time gaining experience and using the knowledge of other professionals who work in the design branch.

On the other hand, taking part in a complex market game and the development of architectural projects can bring us great satisfaction, which comes from the possibility of constant observation of self-development, verification of professional qualifications, and strengthening our market position. A stronger market position is, in fact, an important factor contributing to professional success in terms of its essential context as well as income.

To undertake any design task, an architect should have a specified design aim and design thinking ability. Therefore, the first chapter of this textbook provides an introduction to a design process with a particular focus on its purpose. This chapter also includes a description of a perception of a design by representatives of the building branch who have a direct or indirect relationship with the design process: collaborators with architects, including engineers and other professionals, and clients.

It should be emphasized that architectural design is a professional service that architects provide to their customers. Apart from in extraordinary cases, an architect works for a certain client, who can be the main investor, a future building user or may play a different role. This client hires a professional to carry

out a specific design task, which (s)he cannot solve her/himself. Thus, for this reason (s)he hires the architect.

The second chapter presents the most important design principles based on a concept of subject, scale, and scope of design. Knowledge of these three elements allows the designer to consciously adhere to the rules of a design process. It is important to note that decisions taken at the preliminary design stage affect to a large extent the final shape of a project. This chapter also describes types of buildings and nonbuilding structures, as well as landscapes that may remain objects of an architect's design work.

Due to architects' need for appropriate instruments for specific requirements of certain work methods at various stages of design use, the third chapter presents the most important and common drawing tools. This chapter includes a description of sketches and technical drawing types, as well as ways of working and possible effects of their use. This part of the textbook presents both traditional and modern, widely used electronic drawing tools with extended databases and wide access to information – via computers with their external devices.

In the fourth chapter, basic sources of information about architectural design knowledge have been provided. As the most important, the following are featured: design experience, knowledge acquired in the process of architecture education, which is the basis for further professional development, and national and international literature. In this chapter building codes are generally described in a way that enables their role in a design process to be understood. Thus, students may gain general knowledge about technical and legal sources of information, while at the same time being aware of their usefulness in different design situations. Due to the large amount of architectural documentation available, in this chapter its possible sources are also presented, as well as its applicability for certain design tasks.

Ways of design thinking and techniques for performing specific design tasks are presented in the fifth chapter. Implementation of a particular way of design thinking allows young architects to make conscious and correct design decisions, thanks to which it is possible to participate in a design process and, over time, to lead it. Designing is featured that takes into consideration different techniques of so-called "thinking on paper," and thus a creative approach to design problem solving.

The sixth chapter includes issues connected with design process rules led by an architect. Optimal ways of preparing data for commencing any design process are described in this chapter. Afterwards, the most important princi-

ples of a whole investment process leading to a particular design consideration are presented. The purpose of this way of presenting an architect's and his/her collaborators' work is to explain the place of architectural design in the whole investment process. This chapter also describes the relations between an architect and his/her collaborators during the design part of an investment process. An important element of the sixth chapter is the explanation of architects', engineers', and their clients' tasks and responsibilities throughout the mentioned investment process in the light of contemporary market requirements. This chapter also provides information about selected issues that are typical of a design process, and methods of design problem solving.

The seventh chapter describes the collaboration between an architect and his/her client, together with its simple characteristics. This collaboration takes place in various ways, and depends on mutual expectations and opportunities, which are not always clear for all participants at the beginning of a design process. For this reason, in the seventh chapter basic principles of communication between participants of a design process, as well as presented causes of potential misunderstanding, are explained. As the textbook should serve as guidance for market-oriented students, it presents a client's idea about cooperation with the architect. Special attention is paid to the client's expectations of the architect and the principles of their collaboration, which should be appropriate for both sides of a design process and, at the same time, the designed space.

For the successful realization of a design process we need a welleducated architect who has a broad knowledge, based on a solid foundation. Therefore, the education of young architects should be, from the beginning of their studies, carried out in a carefully planned manner. An important element of a student's education is the conscious management of the teaching process, which enables realization of what is most important in this profession, and an understanding that, in reality, essentially the studies are quite simple and pleasant.

This architectural design textbook is a didactical publication in the field of architecture, which enables students and other people interested in this subject to understand the basic principles of the profession in a simple – according to the author's intention – way. The other purpose of the textbook is to introduce students to a market-oriented way of thinking, a standard approach for the architecture profession.

The addressees of *Simple Introduction to Architecture* are both early-years students from architectural faculties and people who have not previously been close to the work of architects but want to learn more about at least some aspects

of this interesting profession. I would like to emphasize that the source of the tips and comments in this textbook is the knowledge and design experience of the author. This means that the recipients of information included in this book are not obliged to accept uncritically all my opinions and guidance. My idea is that this textbook should only be an aid to finding one's own professional way in the broadly understood field of architecture.

Chapter 1

WHAT IS DESIGN?

1.1. INTRODUCTION TO DESIGN

Everything that does not occur by accident begins from an idea. A concept comes to our mind, and we want to realize it. At first, we don't know how to do it. Before we do anything, we guess, more or less, why we want to do it. And, in the end, achieving the main aim is the prize for our effort.

The first idea determines the general aim of the activity, for example: "I will build a house, in which I am going to live" or "I will build a factory." In fact, it is not even a way of thinking. It is only a verbal formulation of our dreams. After this verbal formulation we take the next step, which is specifying and detailing the main aim of our actions.

And at this point we stop and reflect: "Yes, I am going to build a house or factory, but how am I going to make it?" Each of us deals, to a greater or lesser extent, with creating a new reality in its various aspects. However, only some of us learn how to create a space in a professional way, because for this action both proper knowledge and a developed consciousness of creation are necessary. That's why the space is created by professional designers, including architects (Fig. 1.1.), and the **whole creative process of making decisions aimed at satisfying human needs we call "design." Simply, design is the art of making decisions** and their logic is defended by the use of proper arguments.

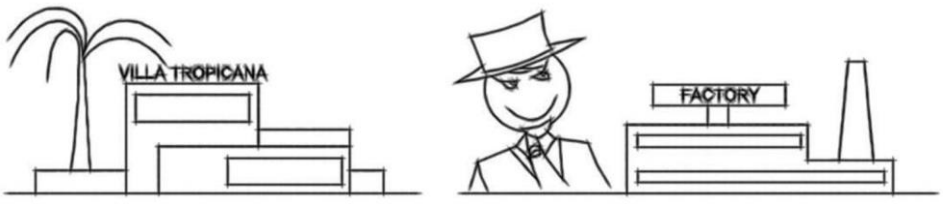


Fig. 1.1. The idea of constructing any object is always the first step towards meeting with a designer/architect.

We architects may design not only houses but also landscapes, apartments, clothes, cars, planes, machines and tools, graphics, promotional campaigns, and even law. Thanks to design we know how to build a plane that doesn't crash during its first flight, a house that doesn't collapse, and an apartment in which we may live, how to design a poster that attracts people, how to plant trees that don't obstruct the view, and how to create an aesthetic space.

Above all, we are especially interested in spatial design, e.g. houses and their interiors (corridors, halls, apartments, etc.), other buildings and nonbuilding structures (bridges, advertisement pillars, and so on), and landscapes including monuments, benches, trees, and other plants. Designing a space, in contrast to clothes, cars, planes, machines and tools, graphics, promotional campaigns and law, we call **architectural design**. For example, urban planning involves the design of larger areas' and, therefore, remains on another, more general level of spatial precision in comparison to architecture.

At this point it should be underlined that decisions in architectural design, understood exactly as a decision-making process aimed at complete architectural project preparation, on the basis of which we may build a certain object, refer to in particular:

- the selection of people to perform specific creative activities and organization of work,
- the choice of specific design methods,
- the choice of preparation and presentation technique for an architectural design (including drawing tools and the material on which this design will be presented),
- determination of the place of work,

- agreement with a client on rules of cooperation, and a price for the architectural design,
- finally, methods of finding solutions to certain design problems.

Typically we make all architectural design decisions in fluctuating conditions of uncertainty about their correctness and after taking into consideration possible, sometimes difficult-to-predict, consequences.

Architectural design stands out from other kinds of design because of a few important features. Firstly, it applies to a relatively large space, usually much bigger than in the case of any means of transport such as planes or cars. At the same time, an architect becomes responsible for the space that (s)he has created; of course, this responsibility also concerns her/his client.

Secondly, the realized effect of design work, e.g. a building, park etc., usually cannot move, or even be moved from one place to another.

Thirdly, such a realization serves people for a relatively long time, much longer than the above-mentioned means of transport.

Fourthly and finally, to prepare an architectural design it is necessary to possess knowledge from a few branches beyond pure designing; for example, it is not possible to design a sports hall without knowledge of football, basketball or volleyball rules. It would also be difficult to design a garden without any knowledge about the needs of the trees and flowers we want to plant there. Similar problems would occur in any attempt to design a temple without knowledge of any of the rituals of that particular religion.

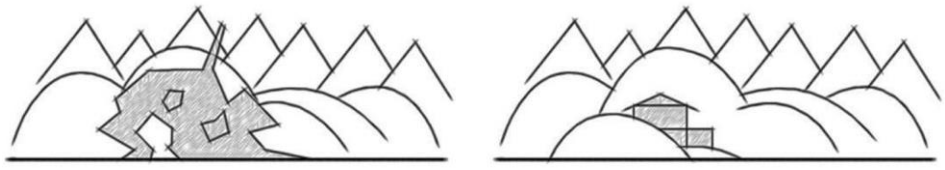
It should be emphasized that **architectural design is a paid service for which we take proper payment**. Architectural practice is a professional service that we, as architects, provide to our clients. Apart from in extraordinary situations, when we prepare an architectural design for ourselves – in this case we are both service providers and customers – we work for a specific client(s). A client may hire us to solve some design tasks that cannot be solved by herself/himself/ because of a lack of proper knowledge. That is why this client hires a professional architect.

The result of this relationship between an architect and her/his client is an obligation to realize the will, and sometimes whims, of our customers.
However, we should be aware of our responsibility for the effects of our design activity. This means that implementation of the architectural design on behalf of our client shouldn't lead to any aesthetic or functional disorder or

compromise of the safety of the space designed by us. Moreover, our architectural design cannot disturb the society or, generally, the public interest, and all proper regulations in force must be respected. Therefore, it is important to explain to clients how some of their ideas might affect the space, either negatively or positively. This is an obligation and privilege for all architects.

By the term "clients" we understand not only individuals but also institutions, local authorities of a municipality or parish, or even the state. For example, a client who wants to build a playing field may remain a member of the local authority of the municipality. In some cases, we may deal with institutional clients or firms, which may be represented by individuals. These people, officially authorized to represent their institutions, firms or local authorities, will pass us information about our clients' needs that is necessary to perform all the design works.

Fig. 1.2. In particular, we architects are responsible for the space created by us.



In conclusion, we can state that architectural design is the preparation of a plan for changing a space that is not our property. At the same time, we should remember that when starting work on any spatial change, we take responsibility for the result of our work (Fig. 1.2.). This responsibility we take both to our client and the society, because the profession of architect is an occupation that requires public trust.

1.2. AIMS OF ARCHITECTURAL DESIGN

The main objective of architectural design is to realize an idea of aesthetic and functional alteration of a certain space. This idea, in accordance with its high

degree of complexity, cannot be realized without a prepared plan. Architectural design consists precisely in preparing such a plan. To execute this plan, we need adequate knowledge of architecture, and at least basic knowledge of disciplines related to architecture, above all engineering, and branches about which knowledge is required in certain cases, for example the sports industry, trade, gastronomy and catering, private or public transport, etc. These branches are also represented by their own specialists. In particular, architects cooperate with specialists from various engineering branches.

In other words, the aim of the above-mentioned process is to prepare an architectural design, i.e. a "plan of activity," with the use of adequate design methodology. The result of this process is the architectural design, while the result of the whole investment process is a new building, the renovation of a building, or the development of a landscape. The more design methods we know, the greater our range of possibilities for creating the "plan of activity" will be, and thus the better the architectural designs we are able to prepare. Preparation of the architectural design is finished when the result of our work – the completed design – is already the basis for the commencement of a new building construction, its interior, or landscape.

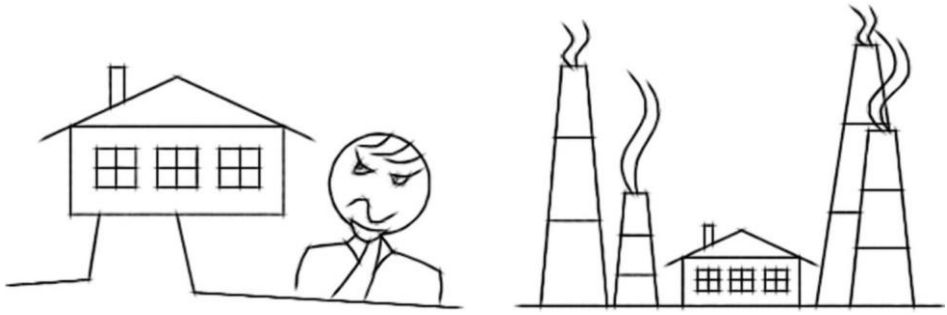
I would like to mention that starting to construct any new house doesn't mean the completion of the architect's work in the investment process. (S)he also supervises the realization of the architectural design throughout the construction process. During construction it is possible – or sometimes necessary – to make some changes in the design, including detailing of architectural and technical arrangements of chosen elements of the building.

Visible and generally recognized as symbolic completion of a design process is the end of preparation of the whole design documentation including architectural design, all engineering designs, necessary opinions and legal arrangements – known as "building permit design." Therefore, architectural design is a part of a **building permit design**. According to the national building code, executive drawings, interior design or landscape design are usually not a part of building permit design. Sometimes, as the final point of a design process, getting an official legal acceptance of our design, which is called a "building permit," is also recognized. It is important to establish before any design work what the real starting and final points of the design process are.

We have to remember to present the rules establishing the starting and final points of the design process to our client. By passing on this information, we

avoid any ambiguity that may lead to misunderstanding. Thus, we shouldn't regret the time we spend on the above-mentioned explanations.

One of the aims of architectural design may also be research if we are able to locate a new building(s) on a certain plot of land – we call this architectural activity "analysis of the land capacity." Evaluation of the proper functioning of a building(s) on a plot in relation to its surroundings, on the other hand, we call "functional site analysis" (Fig. 1.3.). An example of functional site analysis may be verification of whether, on a plot of land, in some district and with certain surroundings, it is reasonable to build a new building(s). This research is limited to a level of preliminary conceptual drawings and calculation of the number of people who may live in this area, the number of apartments, parking lots and green areas, as well as an interdisciplinary recognition of relations with surroundings in the field of technical and transport supply. The result of this research is usually presented in written form with the necessary research drawings. Other reasons for the aforementioned analysis preparation are



connected with checking whether it is reasonable to buy a plot of land, to search for it in another place, or to leave any idea of this type of investment in the analyzed place.

Fig. 1.3. Analysis of land capacity and functional site analysis allow any risk connected with unpredictable situations that may arise during the investment process to be avoided or at least reduced.

Another objective of architectural design is to perform a preliminary cost estimation of the construction or renovation of a building(s), and also that of modernization or adaptation to other functions of an existing object(s). In the above-mentioned cases we have to make preliminary conceptual drawings of

the investment object. It is important that, on the basis of the preliminary conceptual drawings, general costing can be developed, so it is possible to check the price of the investment. Thanks to this general costing, the client, with the help of the architect, is able to make a decision about starting the architectural design process or, on the other hand, discontinuing it.

1.3. DESIGN THINKING IN ARCHITECTURE

The real foundation of our design activity is thinking, so we take into consideration how to lead thinking processes in a conscious way. The starting point of our thinking about a certain design usually occurs when we get clear information from a client that we may start with the design process. This means that the client has already made a decision about commencing the whole long and complex investment process in which our architectural design plays the main role.

Sometimes architects who commence design processes in certain architectural tasks have in their minds some solutions that they found earlier. Regardless of their earlier realization, these solutions are useful for work on new architectural designs. Of course, it should be emphasized that the more experienced an architect is, the more possible solutions to architectural problems she/he will know.

Our design thinking in architecture usually starts from generally imagining what a new building or garden wanted by the client could look like, and whether realization her/his expectations is possible at all? Sometimes our clients want things that are not realizable yet. That's why it is important at the beginning of the design process to aim for an assessment with the client of which of her/his ideas may be realized, and which (s)he can discard. At the same time, we should remember to keep our emotional distance from our first image of the space created by us; ultimately, we are not owners of the land, and the largest investment risk is taken by our client. Beneficiaries of well-designed space are, on the other hand, not only our clients and ourselves, but also other people using or even looking at this space. It should be underlined that the first image of the space we create is very important from a psychological point of view. It allows the architect to get accustomed to the building, garden or other design object. Thus, we may start to design without fear of the real possibility of incorrect development of this fragment of space.

The approach to design thinking presented above is not mandatory nor the only one. One of the main, if not *the* most important advantages of the architecture profession is independence. Independence means not only a considerable range of choices in our work and responsibility for a design space but also the need to make reasonable decisions.

The creative thinking processes of different architects – and even of the same architects but in various design situations – most often run in somewhat different ways. Therefore, we shouldn't deny our achievements in the field of design thinking even if they are different from the standard that we know. I would like to emphasize that any of the above-described ways of design thinking may be popular, but not only one; each architect has the right to develop her/his own, independent way of design thinking, as well as improve or change it.

Our perception of designed space throughout the whole design process is usually subjected to large changes of an evolutionary character. When considering the development of a design space, for example with the use of a multistory building, after the initial satisfaction arising from "domestication" of the space, the architect has to tackle a whole spectrum of factors influencing the preparation of an architectural design. These factors are usually recognized and known by the architect to varying degrees, depending on her/his experience and the level of analysis of a particular design task.

The most well-known and commonly analyzed groups of factors that have an impact on our architectural design are:

- the needs of clients (eventually it will be their building),
- climatic factors (it would be hard to survive winter without any roof),
- technical and technological factors (the building has to remain somehow, and water supply is necessary for daily life),
- economic factors (someone has to pay for the investment),
- social factors (someone may evaluate our building, for example while passing by),
- legal and administrative factors (there are requirements drawn up by, above all, architects to increase the level of safety and make their work easier at the same time),
- environmental factors (our architectural design, or rather building as its realization, is influenced by a natural environment, its level of pollution

and potential threats; the building will also have an impact on its surroundings, often in a negative way: through the use of energy, exhaust fumes from the chimney, toxic materials, etc.; Fig. 1.4.).

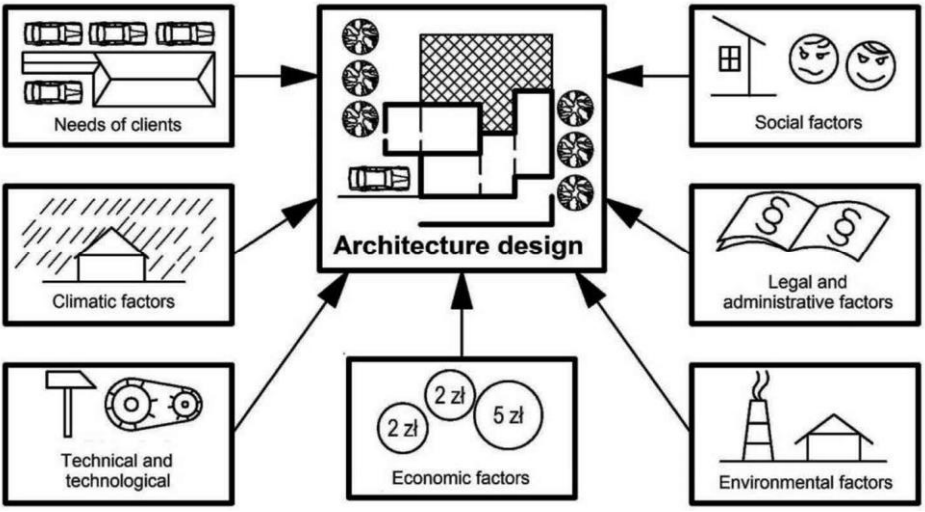


Fig. 1.4. Factors influencing an architectural design.

In design thinking, for issues connected with aesthetics and the function of a building, other object or garden, we take into consideration all the abovementioned groups of factors.

Starting with the designing of a building, which means adjustment of our imagination to the reality on the basis of factors described above, we begin the main phase of the investment process from the architect's viewpoint – the design phase. The design phase is characterized by significant time consumption, because during this stage we analyze, literally, all architectural aspects of our design task – from the size of the object, to its function and structure – while at the same time consulting on all architectural solutions with our client. In the case of a sports hall or office building, we also carry out a survey on the acceptance of our architectural solutions among potential users.

Design thinking also consists in finding detailed architectural solutions. It concerns various design corrections – at each stage of the design, and even in the

investment process, we may find better solutions to any design problem – and preparation of architectural detail as well as more suitable solutions for our client's needs.

I would like to mention that sometimes during the construction process we have to solve new, not previously predicted problems and, especially in the case of any renovation works, new problems related to the level of complexity of our architectural task. Therefore, for all architects, design thinking is relevant until the end of the construction process, and sometimes even longer. During the last phase of the investment process, the effects of design thinking do not necessarily have to be drawn on paper.

1.4. ARCHITECT'S AND ENGINEER'S VIEWPOINTS OF PROFESSION

Just as any person in any profession, an architect also has some notion of how her/his work is connected with its financial value, in other words the price of an architectural design, its purpose, the principles of the design preparation, social responsibility, and general positioning in a society. As the work of an architect consists primarily in designing, the above-mentioned notion is mostly connected with this activity.

Architectural design – which, as we know, is the basis of an architect's work – constitutes a very interesting profession requiring a large amount of creativity. After all, the most important task of an architect is to develop a fragment of space by placing there a new object(s), characterized by a certain aesthetic, function and structure.

These objects may be built thanks to, at least, basic construction knowledge. Thus, architects should be familiar with branches allowing them to use not only aesthetic or functional, but also technical and technological knowledge. This approach to architecture gives design a deep artistic meaning, and at the same time construction knowledge brings to this art some frames thanks to which designed objects preserve their utility values.

Of course, this reasoning extends the range of architects' obligations and possibilities, which is why a lot of representatives of this profession have a lot of additional qualifications. We may include in these an extensive knowledge of

sociological and psychological issues, as well as economic ones. The more diverse the issues understood by architects, the better the quality of the work that is possible.