The article underlines the problem of introducing computer techniques into the education process in master degree studies in architecture. Following the consumer society, developing technologies, changing social values architecture education changed its continuous principle into two-level system. The system well known from other fields of education results in diversified level of knowledge between admitted students on master studies. This fact in together with large exercise groups and a relatively short time allocated with the project requires methodical approach in relationship between a student and a teacher. The article focuses on complexity of a design process within different stages. Special attention is placed to an early design phase of shaping an architecture form because it demands different ways of presentation including freehand sketching, physical modelling and digital modelling. These tools correspond to the subsequent three phases of the design process, starting with exploration of the idea and context, functional decisions and determining the aesthetics. In authors opinion, the first phase of teaching process held without the use of computer techniques led to a higher originality of the architecture concept and increased efficiency in design process.

Keywords: sketch, computer , architect’s vision, shaping the architecture

INTRODUCTION
Shaping the built environment is the basic subject of architecture where an idea and materiality play a crucial role. According to Vitruvius, an idea or the thought is a basic feature of architecture, although it is not yet architecture itself (Niemojewski, 1947). An architectural design in the form of a drawing or model is still a thought - an important element in the process of transforming the thought into the material shape of the building (see Figure 1). Various techniques and technologies significantly affect the shape, beauty and usability of the forthcoming object. Although different methods at different times, the change of technology significantly affects the development of architectural thought.

The architect sees his idea in a nearly real way, he can move in the building he has presented. There is a gulf between a thing built and a planned thing, similar to that between the idea in the mind and the idea already drawn. Construction of the work - choice...
of structure, selecting materials, colours - is created through a project, a drawing or a model, whose task is to change the thought into reality. An important task of the work is to make the user's mind create impressions similar to those that were the inspiration for an architect.

Gothic cathedrals, or earlier buildings of antiquity, well known from perfect proportions of medieval or Renaissance urban squares, illusory palaces and gardens of the Baroque, as well as subsequent magnificent buildings or restored places destroyed, or forgotten, to name only a few among many... All these the buildings make the reality of architectural space allow us to feel our humanity entirely. The expression of these places in the development of culture and thought means more than the increasing perfection of technology solutions, it also means that the changing forms of human existence influence changes in the scope of social needs.

GOALS
The preliminary goal of the article is to show a multi-layered nature of the architecture design process. The process has two basic fields of interest: functional and cultural aspects, both are also the subject of physical solutions in architecture. Functional aspect means that the urban building / or an urban complex meets pragmatic requirements of technique and technology (quality and user related comfort) or meet ideological (social, psychological) and other assumptions that existed at the beginning of a design process. Cultural aspects concern the building form and aesthetics or in a broader context con-
cerns fitting an urban environment.

The secondary goal of the article is to indicate important aspects in the design process. Architecture, like art, can be considered in two categories: high or universal. We usually talk about ‘universal art’ on the occasion of discussions about our everyday life. The second category, like in art, creates an original architecture, innovative in the sense of an idea, architectural geometry and material solutions. Creation of such an architecture can be compared to the dialogue between the problem and the solution. The dialogue concerns three components of high importance - project idea, the knowledge and imagination of a designer and an ability to use a digital software. The article underlines the problem of the design process that can be expressed in three abovementioned aspects, which are also the three most important terms on evaluation of the architecture project during the students semester.

The article is based on authors experience in architectural design education collected on design courses at the master’s degree studies, diploma supervisions and students workshops at the Institute of Architecture and Urban Planning, Lodz University of Technology and the Faculty of Architecture, Silesian University of Technology, Poland. Most courses concern service, public and commercial buildings, like university buildings, office complexes, shopping malls, etc.

IDEA, CONCEPT, PROJECT
Architectural design is a process of transformation or creation of the new reality. Methodically speaking there are two formulas functioning one next to another: - thinking of a project which leads from the detail (functional or technical solution) to an overall layout concept and a geometrical form; the second approach leads the designer differently; the first step is a thought - an overall picture; detailed solutions are the second step.

In each case there are three stages of action: analysis - synthesis - evaluation (see Figure 2) and synthesis - analysis - evaluation. Both models are consistent and form symmetrically different approaches to the design process. But they split architects, of which almost 90% is on the first side and 10% on the second side; this situation is somewhat the effect of inborn abilities and somewhat the effect of the teaching methodology. The ideal model is to be able to conduct detailed analysis at the beginning of the design task and to create an overall shape of the object as a summary, as well as to be able to visualize the whole object in the first other place and in time, to lead to solutions related to function, structure, and technology. An important aspect of the learning process is to teach both skills.

If one deal with ideal designers who can equally success in beginning the concept design with details and ending up with a whole, or the other way round - beginning with an overall idea of the building form which leads to the details. From the didactic point of view it is essential to teach the students both skills. At the level of teaching as well as during the professional work, each practicing architect and each student should start the design process with underlining their conceptual path according to the following rule: idea - solution alternatives - architectural concept - project. The mentioned stages should refer to the method of visualizing - presenting the developing thought:- an idea, one need an idea to be able to hypothesize; an idea helps to form criteria and provides a framework of evaluation possibilities in the architectural creation,- solution alternatives, alternating teaches how to move freely around the two formulas of the teaching process: ‘from the general to the particular’ and ‘from the particular to the general’, which is particularly important in the phase of concept creation,- an architectural concept; the search for solution alternatives should lead to clarifying one concept picturing the new architectural object and/or the new urban plan (see Figure 3).
The designing course conducted by the authors pursues the first two phases to be performed as a free-hand drawing. In the next phase a draw is also required, but in a form of model. The last phase of the design in architectural teaching is the time of generating a digital project - creating the visualization and technical documentation.

**COMPLEXITY, INTERDISCIPLINARY, CREATING VARIANTS**

Architecture, however, still perceived as an art. Whose task is the symbolic expression in the role of object in the space, and sometimes even the ability to create a ‘decoration’ for construction and installation solution, is seen as an activity at the interface of theory, applied sciences and practical knowledge (Juzwa, Ujma-Wąsowicz, 2011). The reasons lie probably in the directions of modern architecture: traditional design based on the realization of human/user’s needs, design creating environmentally friendly architecture- design in which computer are widely used.

Lately, these trends have been actively pursued in the form of parametric design, in which a prominent role, next to the architect, is played by the computer with modern software and technology associated with the implementation of the undertaking at hand and is usually a matter of students interest. The technique, which increasingly enters various aspects of life in large, complex projects often results in shifting the role of an architect in the direction of interdisciplinary activities, combining theoretical knowledge with experience and practical engineering knowledge. Similar observations can be made in current pro-ecological trend and in so-called ‘zero energy architecture’.

The most striking feature of architectural design, is its complexity and interdisciplinary. The easiest explanation of it is that each project is a response to a given functional program in a material form (drawings, visualization) and offering a uniform architectural vision. Three methods could be mentioned: architectural concepts, using a ‘simple’ idea merge knowledge coming from different areas of expertise (ergonomics, ecology, social conditions etc.) - architecture is associated with signs and symbols, and therefore with emotions developed on many levels, its ‘language’ is the form of the objects, which inspires to pose existential questions but its function descends into the background in this design phase- design that uses knowledge about modern technologies implements solutions simple in form and functional organization, while developing complex construction and technical systems.

The issues of the economics of solutions, closely connected with technology and technique, enter the centre of design and teaching architecture (Turner, 1986). Material creation of the object: choice of structure, construction technology, selection of materials, etc. are created by the means of a drawing or a model. Their task is to change the thought into a new material reality, which in the mind of the future user will also create new feelings - similar to those that were inspiration for the architect’s designer. In the diversity of architectural ideas, the effects of creator beliefs about the role that architecture should play in society are the most clear. If we notice that thanks to the access to computer technology, the architect ‘maybe more’ also means that often the user
must also learn to read the new space.

**COMPUTER AIDED DESIGN**

The project created in the form of computer-developed solutions has become a standard in the field of architecture. The computer over three decades proved that it is an irreplaceable tool in creating an unique architecture. Nowadays, only a few designers imagine designing without changeable drawings, a three-dimensional model, or photorealistic visualizations. The computer supports design process making it faster, easier and more precise. Thanks to a computer software it became possible to coordinate a complicated design actions, especially in the case of large scale objects. Computerization also includes the production of building components and is increasingly supporting the creation of new construction techniques and technologies.

On the other hand, the digitization of architecture has made it possible to cross the limits of impossibility. Thanks to computerization, previously unmanageable forms, construction techniques and details were possible to be built. Digitization among the new generation of architects has become a tool for the implementation of architectural fantasies. It freed the creative imagination, making the architect limited only by his creativity and the strength of his own mind. Of course, there are still unreal dreams but as Harbison writes (Harbison, 2001) the collection of unmanageable building elements has significantly narrowed. Moreover, due to many architecture critics computer-generated parametric architecture has become one of the newest architectural styles of the 21st century considering its remarkable and recognizable aesthetics.

Despite many advantages, a computer equipped with the latest software is still not an automatic tool. It does not replace the work of an architect or student. Still, the role of the designer in the creation process is undeniable. Even though, the increasing impact of optimization of architecture, without specifying the parameters or managing the scripts, the computer software is useless. It is only through the use of the architect’s skills and introducing basic concepts that the dialogue between designer, computer and idea is possible.

The dialog is especially difficult in the early design phase when the idea is still under modification. Concept improvement needs solution alternatives which are difficult to manage in digital production and easy to handle manually. Furthermore, the ability of operating computer software is extremely problematic for unexperienced students or young architects. Therefore, the early design process accomplished manually in contrast to digital work is more effective and brings more original effects.

**SUMMARY**

The design process can be otherwise presented as a dialogue between the problem and its solution.
In this process a special role is played by:- an idea-designer’s knowledge and imagination.- architecture drawings collected by computer technologies

With appreciation and importance for computer technologies in shaping the contemporary architecture, the authors of the article would like to express their focus on the idea and architect’s knowledge and imagination.

Idea is the guideline of the project expressed most often in the form of a sketch that allows a synthetic record of the project. At the same time the idea allows a broad reflection on detailed solutions in the further phase of the design process. The close relationship between the idea and the material shape of the architecture work is closely related on the time and place where the object is built.

The architect, his professional knowledge, but also his imagination and his dreams affect the form, aesthetic and technical solutions of the designed object. Regardless of the pragmatics of creation or avant-garde aspirations - the world in which the object is created imprints the form and aesthetics of the object. This happens through the realization of the architect’s thought.

An architect, in the act of creating an object, just like an artist struggles with materiality and also with ideas. Like the manager of a large company, he must react as quickly and as accurately as possible to the needs, possibilities and dreams of modern times. It is because human dreams change at the beginning of the thought just as quickly as the change of materials in architecture. Architect plays an important role throughout the entire design process. Especially a designer who can use knowledge derived from professional experience, theoretical knowledge, creative reflection, the ability to compare and use the experience of others. These skill are known as Knowing-in-Action and Reflection-in-Action, knowledge specific to architecture, but also for related fields. The effectiveness of such a process lies in a particular ability or even creative passion given to some of us ‘from time to time’, while others learn from it, fighting their own imperfections.

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