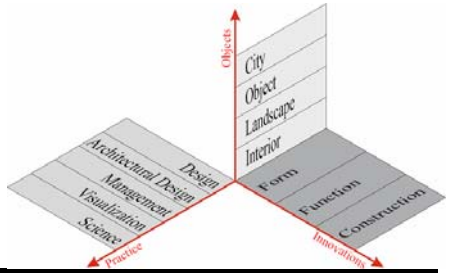

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NEW SPECIALIZATIONS IN THE PROFESSION ARCHITECT

NOWE SPECJALIZACJE W ZAWODZIE ARCHITEKTA

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ABSTRACT

The issue of expanding the field of activity of professional architects under the influence of innovative technologies is considered in the article. A model is proposed that considers new specializations in architecture as a result of the synthesis of innovative technologies, types of activity and projected objects. Methods for the analysis of innovative directions of architects' activity are proposed from the point of view of the emergence of needs for new competences and preservation of traditional knowledge. A hypothesis has been put forward on the expansion of the "core of the profession" and the allocation of new independent professional directions from it.

Key words: Core of the profession, specialization, profession, innovative technologies.

STRESZCZENIE

Artykuł rozważa zagadnienie poszerzenia zakresu działalności profesjonalnych architektów pod wpływem innowacyjnych technologii. Zaproponowano model, uwzględniający nowe specjalizacje w architekturze w wyniku syntezy innowacyjnych technologii, rodzajów działań i zaprojektowanych obiektów. Proponowane są metody analizy innowacyjnych obszarów działalności architektów pod kątem pojawiania się potrzebnych nowych kompetencji i zachowania tradycyjnej wiedzy. Przedstawiono hipotezę o rozszerzeniu "sedna profesji" i wyizolowaniu z niej nowych niezależnych trendów zawodowych.

Słowa kluczowe: rdzeń zawodu, specjalizacja, zawód, innowacyjne technologie

1. TOPICALITY

The implementation of modern architectural works is directly related to the development of new competencies previously not inherent in the specialty. It can be argued that over the past 20 years, the growth of the amount of knowledge and skills necessary to successfully fulfill the tasks assigned to architects has led to the emergence of new specializations.

Two thousand years ago, the architect was a generalist. The famous "Ten books on architecture" of Vitruvius contain knowledge that has become the basis of many scientific and technical trends of the day: building acoustics (book V), materials science (book II), military engineering (book X), water supply (book VIII), etc. [15]. At the present stage, the trend in the development of the profession leads to a quantitative increase in the narrow specializations of architects. The number and variety of new specializations prompts the research and systematization of this problem.

The development of architectural and construction innovations provoked the growth of demand for a new architecture and transformed the market of architectural services. For this study, the scientific interest is the issue of changing the profession "Architect" and the formation of new specializations associated with the advent of new technologies in architecture.

2. TERMINOLOGY

To understand the essence of the processes occurring in the specialty it is necessary to determine the terms used in the article. This is necessary to take into account the difference in the existing subject matter in European and post-Soviet architectural science.

"Core of the profession" is a professional culture that includes professional and labor ethics, professional competencies and an ideal image of a professional [8].

"Competence" is the ability to apply knowledge and skills at a certain level of independence and autonomy [9].

Classification of competencies - Katz and Kahn [5] Offered to group competencies in the following four categories:

1) technical or functional (knowledge, attitudes, skills, etc., associated with the technological or functional experience necessary to fulfill this role);

2) managerial (knowledge, attitudes, skills, etc., necessary for planning, organizing, managing and using various resources);

3) human (knowledge, attitudes and skills needed to motivate, use and develop human resources);

4) conceptual (the ability to abstract, plan and strategic thinking, evaluate long-term prospects, integrated analysis, etc.).

"Competency model" is a set of qualities necessary for a professional to successfully fulfill the obligations he is committed to.

"Professional specialization" is an in-depth study of a relatively narrow field of activity within the specialty that provides the necessary level of competence of a specialist designed to perform certain types of work [17].

"Area of the nearest development of a specialist" - "... defines functions that are not ripe yet, but are in the process of maturation, which will mature tomorrow, which are still in their infancy ...". The term model is taken from child psychology - this is a theoretical construct proposed by Lev Vygotsky [16], Characterizing the relationship between learning and the child's mental development. In the context of the study, the term so closely

describes the concept of the prospects of a specialist's competent development that it was decided to leave it unchanged. Thus, the term "Area of the nearest development of a specialist" should be understood as a set of competencies that an expert can acquire in the short term (up to six months).

3. TYPES OF PROFESSIONAL ACTIVITY OF ARCHITECTS

To identify existing architectural specialties, a study of the European labor market was conducted. The obtained results are conditionally classified according to five main types of the architect's activity (Table 1).

Table 1. Classification of types of activity of architects.

№	Type of activity	Specialization
1	Design	Architectural designer
		Building Designer
		Chief architect
		Interior designer
		Urban designer
2	Atchitectural Design	Architectural Draftsman
		Architect restorer
		Architectural technologist
		BIM-modeler
		Commercial Architect
		Constructing architect
		Industrial Architect
		Landscape architect
		Residential Architect
		State architect
		Green Design Architects
3	Management	Construction Supervisor
		Government architect
		Project manager
		Senior Partner
		Town planner/ Urban planer
4	Visualization	Design visualizator
		Architect-illustrator
		Architect animator
5	The science	Project consultant
		Architect scientist
		Architect lecturer

Each of the specialties has a clearly defined list of competencies that an architect must possess for successful fulfillment of his obligations.

The study examines the concept of three structural levels of specializations:

1. Basic (the core of the profession) -competencies, which form the basis of the specialty, without mastering which the specialist can not be considered a professional architect;

2. Specialty core competencies - this level is a superstructure above the base level and adds competences corresponding to the type of activity chosen by the architect (urban planning, design, etc.);

3. Competences that form the basis of specialization - expanding the list of competences that make up the core of the specialty to the level necessary for performing highly specialized types of work (Fig. 1).

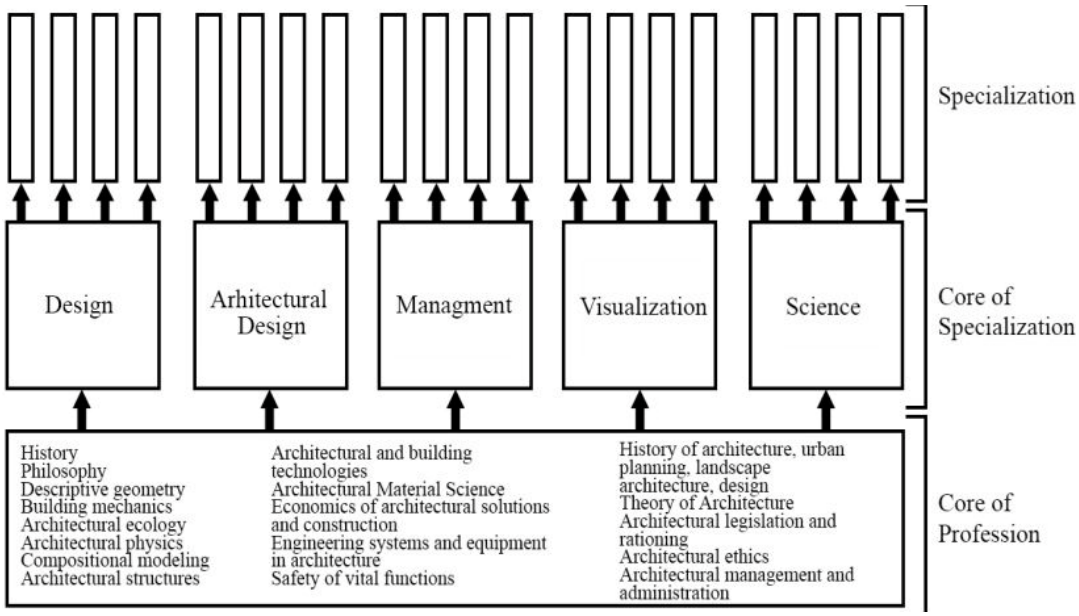

Fig. 1. Structural levels of specialization
Ryc. 1. Struktura szczebli specjalizacji. Źródło: autor

Representation of specialization in the form of step-by-step superstructures over the basic model of competences (the core of the profession) in the future research will make it possible to form an idea of the "Zone of the nearest development of a specialist".

4. MODEL OF STRUCTURAL ANALYSIS OF WORKS PERFORMED BY ARCHITECTS USING INNOVATIVE TECHNOLOGIES.

From the definition of "Professional specialization" it is obvious that for its formation, the types of professionally performed jobs are of basic importance. This thesis became the basis for the development of a model for analyzing the work performed by architects

using innovative technologies. The model is represented as a three-dimensional coordinate system (Fig.2) where:

- on the abscissa axis are types of activities of the architect: A) Design; B) Designing; B) Management; D) Visualization and D) Science. The presented types of the architect's activity are chosen on the basis of the conducted analysis of the competences, characteristic for the existing major specialties in architecture today;

- On the ordinate axis, innovations are displayed that allow modern architects to work more effectively with the classical triad of Gottfried Semper - form, function, design Gottfried Semper - form, structure and function [13], as a combination of functional, technical and architectural and artistic requirements for architectural structures.

- along the axis of the applicator there are blocks with the main groups united by the objects of designing: city, architectural object, landscape, interior.

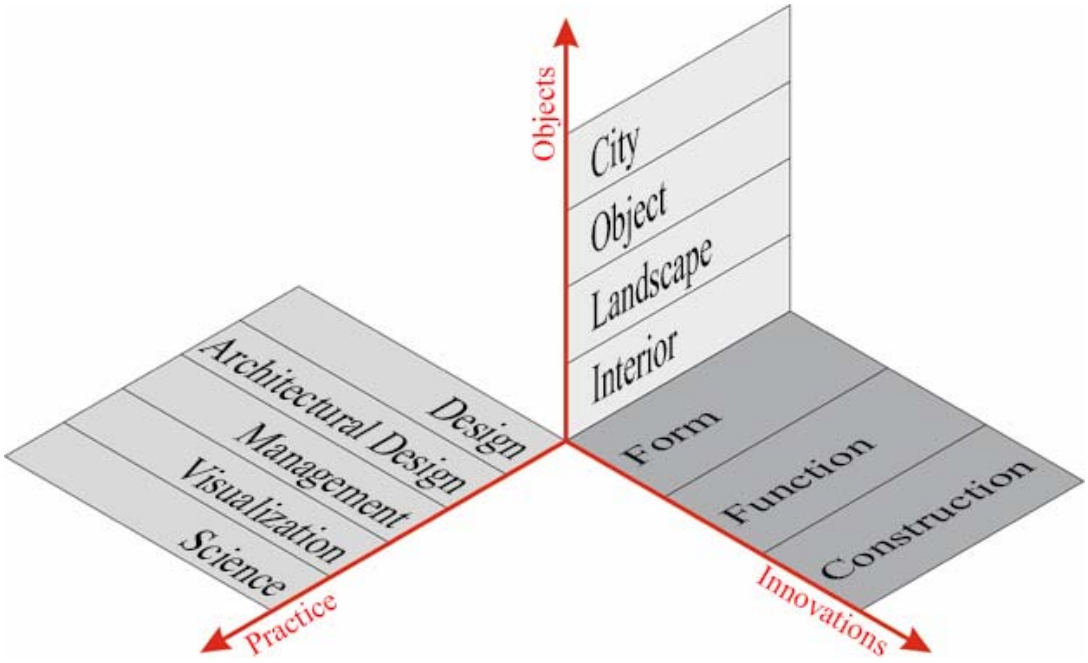

Fig. 2. Model of structural analysis of works performed by architects using innovative technologies

Ryc. 2. Model analizy strukturalnej pracy wykonanej przez architektów z wykorzystaniem innowacyjnych technologii. Źródło: autor

Potentially, each of the elements of this model is an area of a set of design developments that require a certain number of professionals for their participation - holders of certain architectural specializations.

The range of works performed by modern architects is very wide. Its borders are constantly expanding, penetrating into the field of knowledge not peculiar to the profession in past centuries. On the one hand - it's programming and higher mathematics, the competence without which it is impossible to work in Grasshopper, an application to the program

Revit. On the other hand, the basics of biology and medicine are necessary for the design of park lanes with prescribed therapeutic effects. At present, the author, based on the developed model (Fig. 2), performed a typological analysis of the works performed by architects using innovative technologies. For this purpose, a matrix has been developed that is in the form of a table, the structural fragment of which is presented below (Table 2).

Table 2. The matrix of typological analysis of works performed by architects using innovative technologies

Objects	Practice	Innovations	Examples	Skill	Code
1	2	3	4	5	6
City	Design	Form		I	CDFo_I
				II	CDFo_II
				III	CDFo_III
				IV	CDFo_IV
		Function		I	CDFu_I
				II	CDFu_II
				III	CDFu_III
				IV	CDFu_IV
		Structure		I	CDS_I
				II	CDS_II
				III	CDS_III
				IV	CDS_IV

Examples of architectural works collected in Table 2 enable us to structure the competencies necessary for their implementation. Table 1 lists the identified specializations, each of which, in turn, has clearly defined requirements for a set of competencies of the specialist architect. Comparative analysis of the competencies required to perform architectural works and competences of various specializations allows:
- identify new competencies that have appeared in the specialty "Architecture";
- identify trends in the emergence of new architectural specializations;
- identify trends in the development of existing architectural specializations;
- clarify the boundaries of the "Core of the profession";
- determine the optimal "zone of proximate development" of the specialist;
- determine the optimal "zone of proximal development" for architectural faculties;

In the study, Table 2 is the prototype of a matrix that allows you to assign a unique code for each identified competence. The encoding is performed according to the location of the competence in the table and its relation to the corresponding columns. An important point of the analysis is the binding to the code of the description of the competence parameters. This action is necessary to correlate the competencies required to carry out certain types of work and competences that make up the profile of the specialist.

The approach to the analysis of competencies developed in the study allows for their clustering and grouping according to the criteria of belonging to a particular specialization. In each cluster competencies are divided into three groups related to: "Core of the profession", "Core of the specialty" and "Specialization". Given the relatively slow changes in the "Core of the profession" in relation to "Specialization", it is accepted as a constant. Thus, we obtain clusters describing specializations, consisting of two groups of competences - mutable and unchanged in the analyzed period of time. "Core of the profession" allows you to create an information competence base to which the informa-

tion blocks describing the competencies of the specialty are linked. The next logical step is to link the blocks of specialties to the blocks of competencies necessary for successful professional activity in the specialization.

This approach allows us to begin work on the creation of a computer program aimed at identifying the "Zone of the nearest development of a specialist".

6. PRINCIPLES FOR IDENTIFYING THE "ZONE OF THE NEAREST DEVELOPMENT OF A SPECIALIST"

"Competences", "Competence models", "Specialization" are concepts with a high degree of subjectivity of their description, as indicated by many researchers: McClelland [7], Klemp [6], Boyatzis [1], Jacobs [10], Spencer and Spencer [14], Page and Wilson [11], Gilbert [4], Dubois [2], Evarts [3]. Each author gives his own interpretation of these terms, sometimes markedly different from the others. Attempts to formalize the problem of the development of new competencies in architecture under the influence of architectural and construction innovations at the first stages of the study were greatly hampered precisely because of the significant differences in terminology. In addition, it should be borne in mind that the scientific interest of the author, as an architect, boils down to the main question: what skills, knowledge and aptitudes should a specialist acquire in order to carry out work that he likes and is interested in. Also of interest is the optimization of this process.

In this aspect of the problem, child psychology was of great assistance. From this paradigm the concept of "Zone of the nearest development" and the thesis was taken: "... the transition to a new type of activity is impossible without mastering the previous types of activity ..." [12]

Thus, the correlation analysis of the representations taken from child psychology and human resources management allowed us to arrive at the following vision of the problem:

- each specialist has a level of competence that can potentially be measured;

- each type of architectural work requires a certain number of competencies that can be described;

- the difference between the model of competencies required to perform the task and the competency model of the specialist is "the zone of the desired development of a specialist";

- "Zone of desirable development of a specialist" defines the set of competencies that an expert must find for the successful performance of a certain type of work;

- "Area of the nearest development of a specialist" determines the potential for the specialist to obtain the necessary set of knowledge, skills and aptitudes from a given set of competencies for a certain period of time (usually from 3 to 6 months);

- in case if the "Area of the nearest development of a specialist" is less than the "Zone of desirable development", the latter is divided into several consecutive stages, each of which becomes a regular zone for the development of a specialist;

- "Zone of proximal development" determines the potential for a specialist to reach the level of competence sufficient for independent fulfillment of the tasks assigned to him.

From the above theses, it can be concluded that a well-formed test system will allow to determine how the current level of competence of a specialist, and possible prospects for its development. Taking into account the number of possible variants of "Competence models", and, hence, "Zones of the nearest development" the program algorithm developed by the author is actual.

6. SUPPLY AND DEMAND, AS A MANIFESTATION OF THE DUAL NATURE OF ARCHITECTURAL COMPETENCES

In this aspect of consideration of the problem, competence is represented in the form of two main aspects: the demand for the achievement of a new professional level by the specialist and the supply of means for achieving it.

Demand.

Here we should consider two main factors of developmental motivation:

- The personal aspect of mastering new competencies by an architect is the personal interest of a specialist in mastering new types of activities;

- Corporate aspect - the interest of organizations in improving the useful productivity of t-heir employees. In this case, we mean the productivity and competitiveness of organizations in the market of goods and services.

Supply.

Here, the aspect of acquiring new competencies by a specialist is considered as a commodity - at present there are many organizations working in the field of information and educational services, whose activities are directly related to the development of new competencies by specialists. These include universities, advanced training courses, specialized training courses, courses on mastering various software products, etc.

Considering the competence from these points of view, the main question arises - the urgency of efforts to acquire new professional skills by the architect. From here we can draw the following conclusions:

- The need to develop a tool to assess the relevance of the types of architectural works performed, at the level of the city and the country. The author, based on the created "Model of the structural analysis of works" (Fig. 2.), suggests the introduction of a coefficient that determines the value of the type of work for each item of the developed model. The coefficient is derived from the ratio of the total number of architectural works performed over a certain period of time in a certain region to the amount of the type of work being considered. The construction of a graph of the base rate of growth of the type of work and its comparison with similar graphs constructed for the model will allow us to assess the pace and prospects for the development of this direction in architecture;

- The developed model allows to consider similarly the new competences that have emerged as a result of the introduction of architectural and construction innovations in the specialty.

- For each "Competency Model" you can get a total coefficient of competences, which will help you evaluate the prospects for the development of new specializations in comparison with classical specialties.

The coefficient of employment is derived from the ratio - employed in the specialization / total number of specialists.

The basic rate of growth in the employment ratio is the development of specialization.

Higher education institutions, local government and the ministry can compare indicators and determine the profiles of specializations.

7. CONCLUSIONS

The developed algorithm for drawing up a program for assessing the competencies and types of work performed in modern architecture makes it possible to optimize the processes of increasing the level of competence among architects. the level in the specialty after which the number of possible combinations of professional competencies has be-

come extremely high has been reached. On the one hand, this situation allows almost every person who dreams of working in architecture and being able to get a higher education, to realize his dream. On the other hand, there is a threat of the appearance of some illusions by specialists, encouraging them to master popular innovative directions having extremely narrow areas of application and indistinct prospects.

For architectural faculties, this study will help to formulate the areas of development more clearly and identify the items that have the greatest prospects for their development and improvement.

For business, the program being developed will allow us to more adequately assess our own actions to improve the level of personnel. However, it should be specially noted that the author agrees with those researchers who argue that even the most thorough tests and programs are not able to, for example, estimate the level of creativity of the architect with 100% accuracy.

In the personal development of the architect, this approach will help to address the problem of career and evaluation of personal development prospects in the specialty more adequately.

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