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Scientific school “Management of innovative development of socio-economic systems in the era of the knowledge economy” (“VARIORUM”)

MODEL OF MODERN SCIENCES TRANSFORMATION AND PROJECT MANAGEMENT

In modern conditions, the question of the present and future place of science in the modern life of civilization is becoming more acute. The most popular definition of science declares that it is a special type of human cognitive activity, aimed to obtain, substantiate and systematize objective knowledge about the world, people, society and cognition itself, that gives a basis to a person to transform a reality. Hence, science is the engine of progress; the “locomotive of civilizational progress”

stalls without it. Nevertheless, what happens actually? On the one hand, according to the media, humanity is living in a “golden age” of technical, medical, scientific and social progress. On the other hand, based on experts’ opinion, currently observed progress is just a decoration, gracefully arranged by the media. All the progress achievements over the past 50 years are related to the improvement and final “incorporation into life” of the discoveries of the so-called “golden quarter” (1940-60s). Nothing fundamentally new in the field of the scientific and technological cluster has been produced [1]. It is indirectly confirmed by the results of the situation analysis that has occurred in recent decades in science itself. Almost all of its directions are in a state of searching for new paradigms, ranging from the paradigms of new philosophy [2], methodology [3] to the paradigms of managing a particular enterprise [4]. To understand such a “paradigmatic starfall”, it is advisable to comprehend the idea of G. G. Kopylov, manifested in 2003, as for a need to consider science as a special organization of cognition (thought). From these perspectives, the reference points of the qualitative change in the organization of science over the past 300 years have been various meaningful units within science itself. These are new knowledge, discoveries, theories, decisive experiments, scientific programs, paradigms [5]. The latter was proposed by Thomas Kuhn as a postmodern concept: science exists in the form of paradigms, indifferent to each other. It is this concept that has been accepted by the modern community of international grantees, and is still supported, as it corresponds to modern local-project organization of science. This caused the fact that the most important output of projects (dissertations) is considered mutually agreed engineering, technological and social shifts. However, a purely scientific result, which forms the core of the project, may not exist. Its lack is due to the lack of a methodological basis for such projects and its development within each project. Namely, such a development makes it possible to harmoniously develop the active-engineering and design functions of the scientific sphere. The implementation of these functions is a source of innovations, and, first of all,

disruptive ones, which cause the humanity civilizational development, not just its habitat. One can observe the opposite nowadays.

Speaking of methodology as a doctrine of any activity organization, one must clearly understand the subject area of consideration and its boundary conditions. In science, such information is present in various classifications. Each classification has its own historical nuances. First, they are a systemic reflection of the science structure in different periods of time, which helps a deeper understanding of its processes as an integral global institution; secondly, they are tools to predict the vector of its further development. It is possible to notice this vector considering the analysis of models of the science development, based on its classifications. Nowadays, in our opinion, the most adequate model is B. Kedrov's one, which graphically reflects the evolution of sciences from the Renaissance to the 21st century. The forecast for the 21st century coincides with the assumption of Karl Marx about the merge of natural science, social sciences and humanities in future into one unified science with internal subdivisions, without their separation into completely independent, isolated scientific areas. A unified science is such a stage in its development when, within the framework of the whole (unified science), each of the individual sciences will take its place, comparable to the contribution that it will bring to the understanding of a global object - the whole world. Moreover, there has been movement already in this direction for several decades (for example, NBICS-convergence of technologies, causing the convergence of NBICS-sciences).

How can one present a unified science as an integral systemic formation, with the substratism principle and the subordinated functionality principle in a basis, that makes it possible to preserve the remnants of the previous branches of scientific knowledge in a unified science? For such a presentation, we have proposed an internal classification of sciences within the framework of a unified science by the classification criterion “the degree of the presence of a particular science knowledge (without focus on the object and research methods of this science) in other sciences”. According to this criterion, it is advisable to distinguish the following sciences:

traditional (independent, isolated, object-oriented), interdisciplinary, complex (problem-oriented), canvas sciences (“canvases” sciences), the knowledge of which is used by all sciences [6]. We used the term “canvas” in order to reflect the role of knowledge of these sciences in other sciences by analogy. As one knows, canvas is a fabric that is used as a base or a stencil when embroidering. The graphical model of the classification that we propose (“Model C”) is shown in Fig. 1.

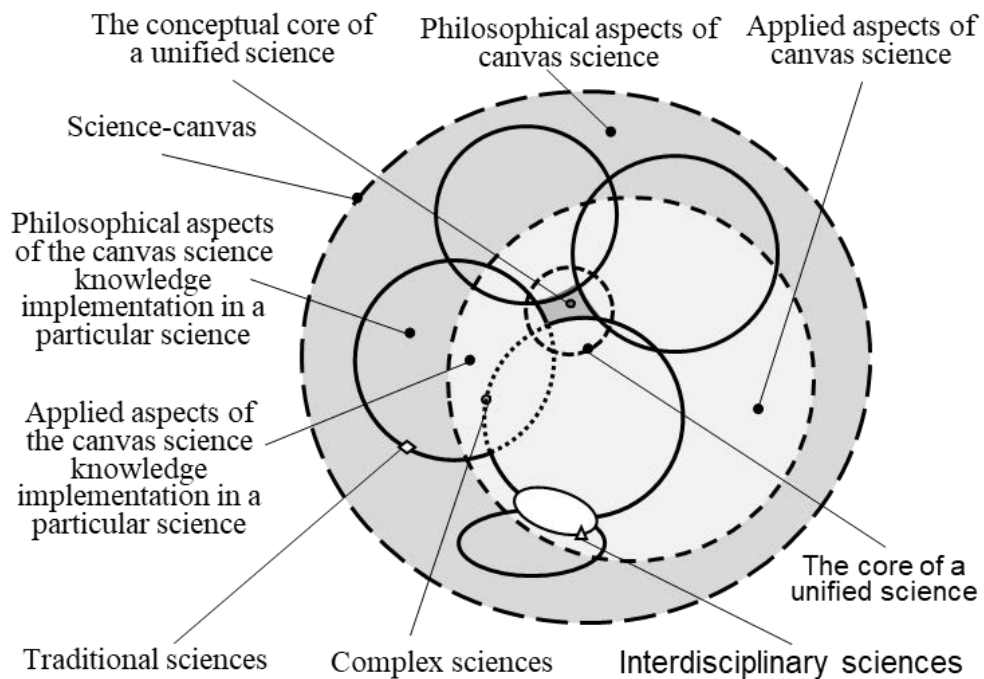


Figure 1 - Model of sciences classification based on “the degree of presence of scientific knowledge of a particular science in other sciences” (“Model C”)

“Model C” has a three-dimensional layered construction. Therefore, traditional, complex and interdisciplinary sciences are located above the layer of canvas-science, and the core of a unified science permeates all layers. At the same time, it has a core that reveals the philosophical essence of a unified science.

Using the “Model C” as a base, it is advisable to present the classification of sciences, proposed by B. Kedrov, in the form shown in Fig. 2.

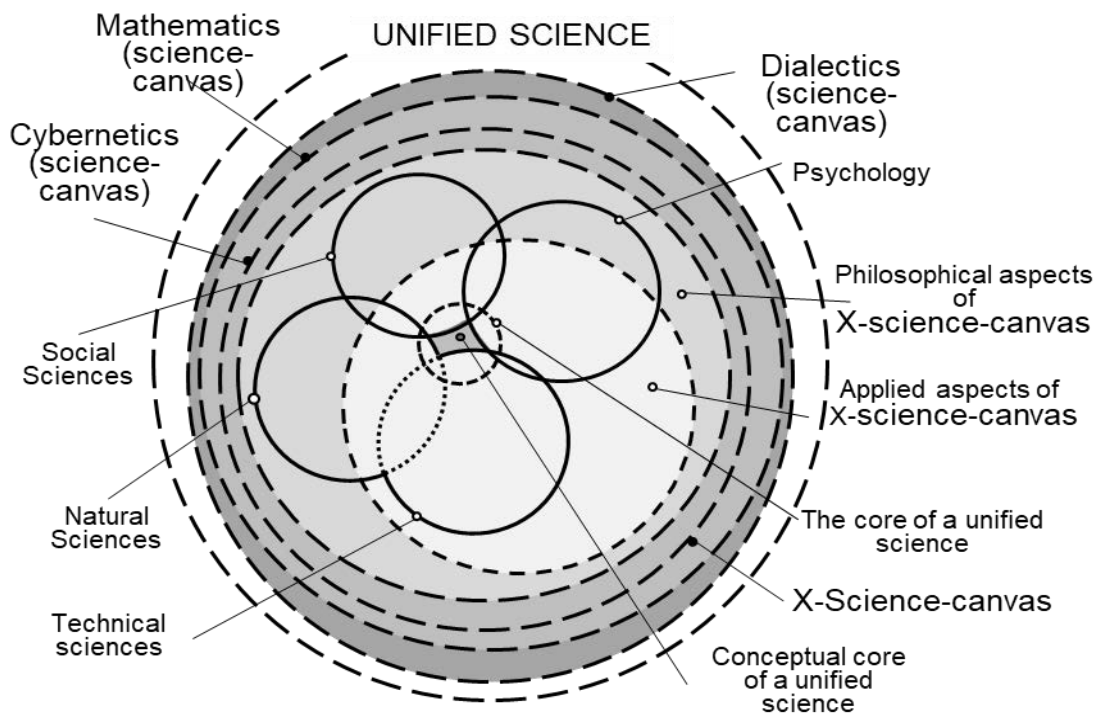


Figure 2 – B. Kedrov's sciences classification in the “Model C” format

As a contender for the X-Science-canvas, the science of inneralogy is considered nowadays [6], which studies the categories of the phenomenon “data-information-knowledge-wisdom” based on the provisions of dianomics - formalized meaningful logic [7].

Let us determine the place of project management as a science in the proposed classification based on the previously derived tendencies of its “movement” from the zone of the strong version sciences (end of the 20th century) to the zone of the weak version sciences (first decade of the 21st century) (Fig. 3). Analysis of the currently discussed project of PMBoK 7th edition prove that project management today has completely moved to the area of the humanities (soft skills), which are massively faced with a crisis of reproducibility and scale. Based on this, the science of project management is on the verge of new challenges related to testing its sustainability.

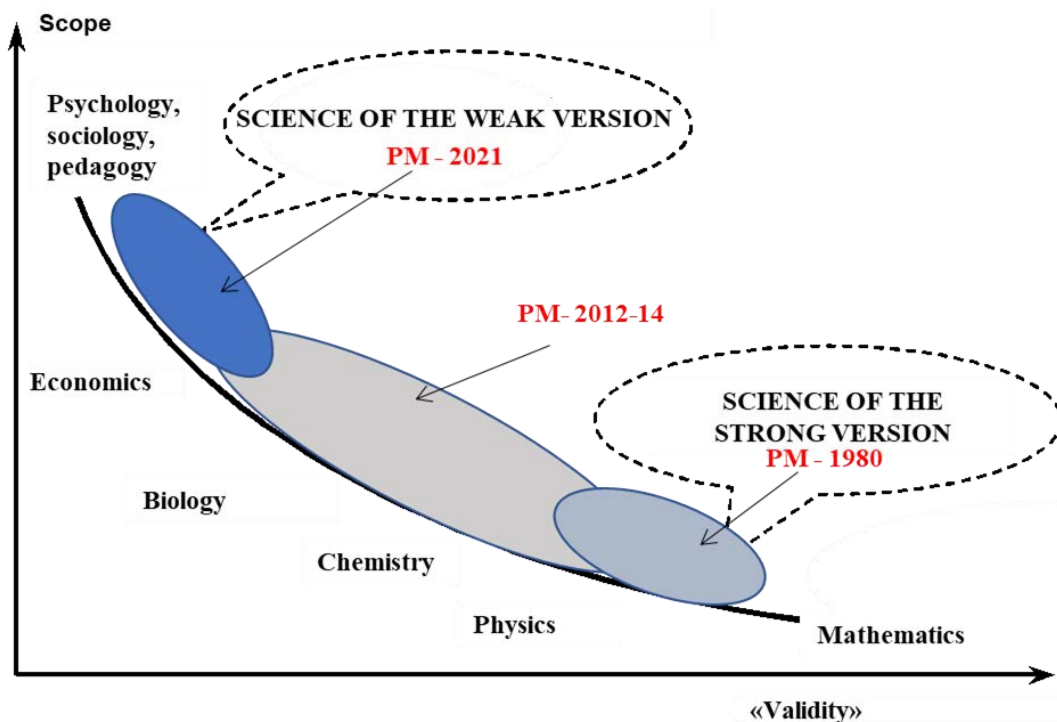


Figure 3 - Trends in changes in the position of the “Project Management” science in the coordinate system “validity” – “scope” [8]

This has reflected in the trends of practical field of project management. Over the past 30-40 years in the real economy, the share of project and project-oriented activities has exceeded the share of serial production. Moreover, the number of projects has increased significantly, while their duration in majority does not exceed several months. Most of them do not correspond to the classic distinctive features of oneness, uniqueness (innovativeness), which are decisive for development projects. Most of modern projects are functional support and growth projects. Therefore, the competence of project management has become basic for all sectors of the real economy, and the discipline “Project Management” is a part of the scope of the majority of educational programs.

We do not reject the hypothesis that project management will meet the fate of those sciences that have merged with others (for example, the scientific discipline “Resistance of Materials and Structural Mechanics” became part of “Mechanics of Deformed Rigid Body”).

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