UDC 33 **DOI: 10.34670/AR.2020.92.10.026**

The possibilities of using blockchain to form the institutional environment of the academic world system

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The research was carried out with the financial support of the RFBR in the framework of the scientific project No. 19-010-00844.

Abstract

The system of the academic world (SAW) is a system of socio-economic type. To analyze the state and dynamics, we use methodological studies. We pay special attention to the problem of applying technologies that ensure the effectiveness of the emerging institutions of the academic world system. For this, we use a synthesis of two research methods: systemic and institutional. In accordance with this approach, aimed at increasing the level of orderliness and organization in the system under the influence of institutional organization and increasing the level of complexity.

In this article, we consider a method for constructing a multi-level model, which involves four sequential actions: (1) the choice of a system-forming element; (2) analysis of the interaction "system-forming element – academic relations"; (3) selection of a system-forming function; (4) theoretical construction of the institutional environment of a multi-level system of the academic world.

Further, we conclude that the systemic method, supplemented by the institutional one, allows us to raise the analysis of economic phenomena within the academic world to a qualitatively new level. We also argue that the use of blockchain technology to shape the institutional environment of the academic world system helps reduce the risk of falling into institutional traps.

For citation

Bazhenov S.V., Bazhenova E.Yu., Abrosimov D.V. (2019) The possibilities of using blockchain to form the institutional environment of the academic world system. *Ekonomika: vchera, segodnya, zavtra* [Economics: Yesterday, Today and Tomorrow], 9 (10A), pp. 210-215. DOI: 10.34670/AR.2020.92.10.026

Keywords

System-institutional analysis, institutional environment, the system of the academic world, blockchain.

Introduction

The formation of the institutional environment of the academic world system (SAW) as a subsystem of socio-economic systems is studied in the framework of systemic-institutional theory. To analyze the processes of institutionalization of SAW, we supplement the institutional component of the system-institutional approach with the principles of the epigenetic theory of evolution [Glass, 1951; Levit, Hossfeld, & Olsson, 2006; Waddington, 1968]. According to this theory, the fundamental is the influence of a combination of factors affecting ontogenesis. The evolution of the general organization of the system in the process of development forms its institutional environment. Evolution, on the other hand, is the transformation of one stable development trajectory. As a result, the institutional environment develops along new paths, and new forms of institutions are created or integrated. Fixing them in the system and creating a new sustainable development path [DeAngelis & Mooij, 2005; Hubbell, 2006]. Institutional phenomena can occur spontaneously due to the spontaneous interaction of business entities. It is assumed that formal and informal rules and their changes correspond to each other according to the principle of "congruence of institutions" [Oleynik, 2005].

Main part

If the result of past events is a suboptimal state of the academic world system from which there is no instant exit, a blocking phenomenon or an institutional trap is formed [Polterovich, 2008). It blocks the behavior of the behavior of subjects in the SAW, which controls not rational considerations, but routines. If the emerging external environment blocks the action of entire institutions, that is, or the institution continues to develop within the initial trajectory, even if it is in a deadlock. The only way to overcome the blockage is the transition from the primacy of technology to the centralized formation of the institutional environment for the decentralized formation of all informally educated, but naturally established, useful institutions [Polterovich, 2008]. The use of blockchain technologies becomes necessary for this, which allows us to study the multiplicity of subjects and "subjective perception (models, theories) that allow all people to explain the world around them" [North, 1990, 41]. Such a definition of ideology implies the concept of a subjective assessment of the justice of the institutional system by the criterion of effectiveness.

According to the systemic-institutional approach to the study of the evolution of the academic world system, the transition from one historical stage of its development to another occurs through an increase in orderliness and organization under the influence of its institutional organization and an increase in the complexity of its level [Afanasyev, 1980, pp. 180–181]. Receptions and methods of using systemic and institutional principles for theoretical analysis of the institutional system of the

academic world complement each other.

Of all the stages of theoretical knowledge of the phenomenon of institutionalization of the SAW, the most difficult is the stage of creating its conceptual multi-level model, within which a system-institutional analysis of the formed institutional environment should be carried out. The procedure for constructing a multi-level model involves the following sequence of actions:

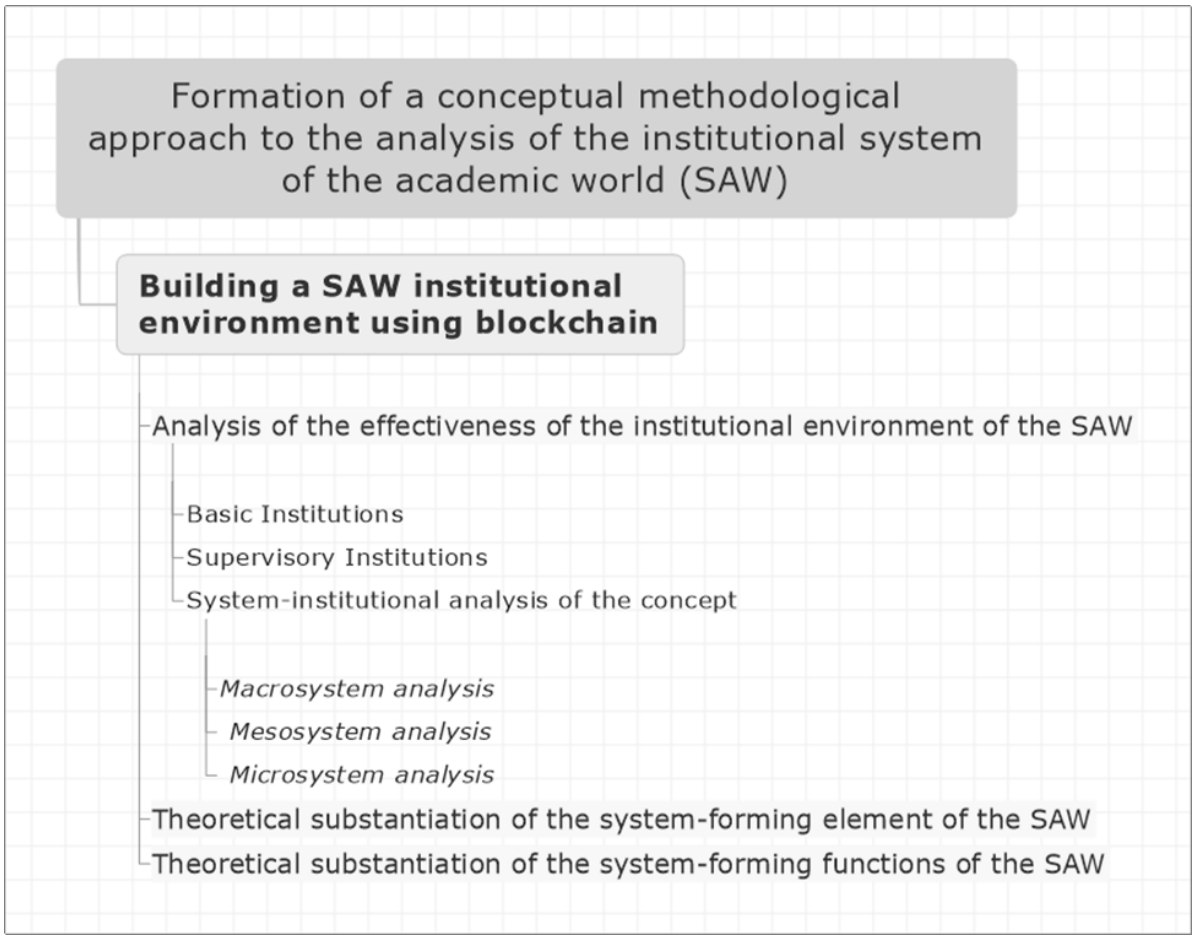
1. The theoretical rationale for the selection of the backbone element, the starting point of the system;

2. The analysis of the interaction "system-forming element - academic relations" and the theoretical justification of the institutional-evolutionary modifications of the system-forming element;

3. The theoretical justification of the backbone function that defines the "nature" of the multilevel system and its analytical boundaries;

4. Theoretical design of the institutional environment of a multi-level system of the academic world. We consider: (1) the activity of the backbone element in the generation or import of informal institutions; (2) verifying them from other entities through the use of blockchain technology; and (3) completing mining by formalizing the ultimate institution.

The general model of the system-institutional approach proposed by the authors for the research of SAW is presented in Figure 1.



Source: Compiled by the authors

Figure 1 - General model of a system-institutional approach to the study of the institutionalization of the academic world system

In this model, the theoretical design of the system, within the framework of which a multi-level analysis of the SAW is to be conducted, is fundamentally new, both from the point of view of posing the problem and the position of the methodology for solving it.

Conclusions

1. A system analysis of any complex object should be based on such a fundamental methodological method as the "rule for measuring complex systems", which states that the quality of a system's functioning can only be judged from the point of view of a system of a higher order than itself. It follows from this that the system of the academic world as an object of systemic research should be described and studied at least at three levels.

Firstly, at the macro level, as a subsystem of a broader (socio-economic) system, undergoing institutionalization. Secondly, at the mesoscale, as an integral system, combining the properties of both the macro- and intra-system level. Thirdly, at the micro level, as the evolution of SAW from the perspective of identifying and revealing the evolution of the relationships and dependencies behind simple elements of the system.

2. In the presented concept of a systemic-institutional approach to cognition of SAW, the system method, in contrast to the subject (formal), is focused on the study of the integrity and individuality of the studied SAW. In this case, the institutional method is focused on studying the laws of influence and effectiveness of the formed institutional environment of the SAW and its elements.

3. Expanding the range of tasks that can be solved with the help of the methodology of the system-institutional approach requires the addition of the well-known principles of consistency to the principles of institutionalism, including evolutionary ones, which make it possible to more fully and more deeply reveal the internal properties of the system, to discover the evolutionary modification of its "nature".

4. The systematic method, supplemented by the institutional one, allows one to raise the analysis of economic phenomena to a qualitatively new level, prepares the transition from one-dimensional cognition based on the properties of an element to multidimensional, scientifically explaining the effect on the heredity of the institutions of the academic world system of its external (epigenetic) environment, perceived as a combination of factors affecting the ontogenesis of SAW in the process of its institutionalization. The efficiency of transformation under the disturbing influence of the environment and the avoidance of institutional traps can be achieved using blockchain technology in the formation of the institutional environment of the SAW.

5. In the presented model, the most complex and responsible is the work on the theoretical construction of the institutionalization of a multi-level system, in the framework of which an analysis of the state of the SAW and the effectiveness of the formed economic relations as a system-forming element in all the diversity of their forms should be carried out. The starting point of the theoretical construction of a multi-level SAW is the scientific justification of the backbone element, performing the role of a kind of "gene" of the system that defines the structure and dynamics of development of its components at each of the desired system levels and the logical design of the system as a whole and the institutional (epigenetic) system as a combination of factors, affecting the ontogenesis of SAW.

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Возможности применения блокчейн для формирования институциональной среды системы академического мира

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Аннотация

Система академического мира (САМ) является сложной системой социально-экономического типа. Для анализа её состояния и динамики мы применяем институционально-системный метод исследования. Особое внимание мы уделяем проблеме применения технологии блокчейн для выявления эффективности формирующихся

институтов системы академического мира. Для этого мы используем синтез двух методов исследования: системного и институционального. Согласно этому подходу, переход от одной исторической ступени её развития к другой происходит через рост упорядоченности и организованности в системе под воздействием её институциональной организации и повышение сложности её уровня.

В статье мы рассматриваем процедуру конструирования многоуровневой модели, предполагающей четыре последовательных действия: (1) выбор системообразующего элемента; (2) анализ взаимодействия «системообразующий элемент – академические отношения»; (3) выбор системообразующей функции; (4) теоретическое конструирование институциональной среды многоуровневой системы академического мира и её верификация путём применения блокчейн.

Далее мы делаем вывод, что системный метод, дополненный институциональным, позволяет поднять анализ экономических явлений в рамках академического мира на качественно новый уровень. Также мы утверждаем, что применение технологии блокчейн для формирования институциональной среды системы академического мира помогает снизить риск попадания в институциональные ловушки.

Для цитирования в научных исследованиях

Баженов С.В., Баженова Е.Ю., Абросимов Д.В. The possibilities of using blockchain to form the institutional environment of the academic world system // Экономика: вчера, сегодня, завтра. 2019. Том 9. № 10А. С. 210-215. DOI: 10.34670/AR.2020.92.10.026

Ключевые слова

Системно-институциональный анализ, институциональная среда, система академического мира, блокчейн.

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