Chapter 18
Integrating Blockchain Platforms With Big Data Solutions for Regional Innovation Development

Leyla Ayvarovna Gamidullaeva
https://orcid.org/0000-0003-3042-7550
Penza State University, Russia

Vardan Mkrttchian
https://orcid.org/0000-0003-4871-5956
HHH University, Australia

Alexey Finogeev
https://orcid.org/0000-0002-4777-3364
Penza State University, Russia

ABSTRACT

The chapter discusses the creation of a mechanism for ensuring reliable and secure interaction among participants in regional innovation systems based on the establishment of smart contracts in the blockchain. The technology allows to reduce the possibility of fraud by dishonest participants, as well as to exclude the need for a third party by transferring its functions to a smart contract. This is important for ensuring confidential and transparent relations between participants in innovative projects, as well as with interested subjects of social and economic activities in the regions. The Ethereum blockchain platform was chosen to create smart contracts. On its basis, there were developed components to perform transactions in contracting, creating, and implementing innovations, transferring intellectual property rights, using rights and licenses for innovation, etc. The main component of the system is a distributed transaction register with digital copies of innovation objects.

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INTRODUCTION

Today we can observe the strengthening of global communication accessibility that promotes the emergence of new economic relations on the principles of collaborative behavior.

The authors in previous research identified that the main barrier impeding efficient interaction of innovation actors in Russian Federation (RF) is high level of transaction costs. As a rule, there are growing instability and uncertainty of existing links and relationships at innovation activity stages, which, in particular, stimulate the growth of transaction costs. This determines high costs of development and implementation of innovations. Such costs are not of transformational nature associated with transformations and changes of initial resources, but of transactional one that is determined by a necessity of collaborations and mutually beneficial contacts.

The strengthening of interactions between interested participants in a regional system appears to be an important mechanism of innovation activity development from the emergence of an idea to the commercialization of innovation.

It is reasonable to use digital technologies to organize and support an innovation system that simplify and promote interactions between innovation activity participants by performing a situational analysis of large volumes of structured and unstructured data on innovation activity subjects in the regions.

The cyber-social innovation system may be considered as an intelligent information system focused on lowering the barriers to implementation of innovations by engaging a larger amount of participants in the innovation process and ensuring their intensive interaction. Its synthesis requires a mechanism that will enable different agents of innovation interaction having common development goals to create new knowledge and exchange it in a safe intelligent network.

The Internet of Things (IoT), Big Data and blockchain are three main trends that could combine to create an entirely new methods and tools for managing regional innovation system and provide their economic development. Blockchain technology provides the ability to redistribute costs across all of the participants of the peer-to-peer network, and give each peer an economic motivation to provide their (small) part of the infrastructure needed to enable the greater good. This reduces the burden on any individual peer, while allowing them to leverage the resources of all (Sun, et al., 2015).

The aim of the present chapter is to substantiate the essence, peculiarities and features of integrating blockchain platforms with Big Data intelligent analytics for regional innovation development. The study was carried out based on materials describing the development of this concept both in the whole world and its spread in the Russian economy.

BACKGROUND

The world experience in transition to the digital economy is disclosed in the works by Tapscott D. (1996), Brynjolfsson E. & Kahin B. (Eds.) (2003), Wetherbe J.C., Turban E., Leidner D.E. & McLean E.R. (2008).

Digital economy operates at three levels - markets and industries, platforms and technologies, environment (Bershadsky, et al, 2017). At the first level, suppliers and consumers interact, at the second level; competencies are formed for the development of markets and sectors of the economy. The third level is the environment that creates conditions for the development of platforms and technologies. Technological tools and management models are necessary for its successful operation and development. They will