


Chapter 11

Integrating Blockchain Platforms With Big Data Solutions for Regional Innovation Development


Leyla 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.

DOI: 10.4018/978-1-7998-1104-6.ch011

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.

10 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/integrating-blockchain-platforms-with-big-data-solutions-for-regional-innovation-development/237726

Related Content

Co-Creating a Sustainable Tomorrow, Today

Luzia Arantes (2025). *Empowering Value Co-Creation in the Digital Era* (pp. 1-28). www.irma-international.org/chapter/co-creating-a-sustainable-tomorrow-today/376563

The Omnipresence of Metaverse With the Cultural Conventions: An Era of Changes in the Global Context

Madhurima Chowdhury and Malika Banerjee (2023). *Dynamics of Dialogue, Cultural Development, and Peace in the Metaverse* (pp. 64-77). www.irma-international.org/chapter/the-omnipresence-of-metaverse-with-the-cultural-conventions/314989

Brand Management in the Digital Era

David Wiestner and Ralf Spiller (2025). *Digital Transformation Initiatives for Agile Marketing* (pp. 403-434). www.irma-international.org/chapter/brand-management-in-the-digital-era/359384

Harmony Wave: Exploring Smart Music Therapy Through IoT, AI, and Fuzzy Logic

T. Sudha, P. Raja and V. Bharathi (2025). *AI for Large Scale Communication Networks* (pp. 197-220). www.irma-international.org/chapter/harmony-wave/360613

Empowering Digital Education: The Future of Value-Based Learning in the Digital Era

R. Vettriselvan (2025). *Empowering Value Co-Creation in the Digital Era* (pp. 199-228). www.irma-international.org/chapter/empowering-digital-education/376571