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PERSPECTIVES OF THE USE OF BLOCKCHAIN IN LAND MANAGEMENT

Abstract:

In land management, as in many other areas, it became necessary to understand many factors during the transition to digital transformation. Intelligent management of data dissemination is the basis for a fundamental rethinking of digital transformation. The success of advanced analytics, artificial intelligence, and any digital transformation requires two critical elements: data reliability and comprehension, which will be possible through effective data quality and governance initiatives. Although fragmented examples of spatial thinking in land management have existed for a long time, it has become necessary to rethink spatial perspectives in current technological progressive environment.

The article discusses role of blockchain-technologies in land management, which have developed as a result f digital transformation.

Keywords: Blockchain; Land Management; Transaction; Geospatial Data.

Introduction

The speed of changes in technological progressive environment is evident in all areas. Perception and comprehension of these variabilities are quite difficult. The situation is complicated by unfiltered information, by its multilayered nature. Mutually exclusive and intertwined information causes the loss of fundamental values in many cases. Establishing a cause-and-effect relationship requires a great deal of effort and readiness for the current achievements, such as digital technologies, artificial intelligence, etc.

The article discusses the challenges of land management in the current environment. The purpose of this article is to discuss capabilities of blockchain technology perspectives used in land management systems.

Analysis and synthesis methods were used during the research. The paper basically represents the literature review. Recommendations based on the findings will assist policy makers and researchers interested in the issue.

Discussion

Digital transformation has created the means that caused improvement of management system. An example of this is blockchain, which is essentially a digital database distributed across a computers network where systematic computation and verification take place. The advantage of blockchain technology over traditional servers is its decentralization. The possible utilization of blockchain technology in the field of land management is a tool for developing countries to be transparent and fight against corruption.

Blockchain is a new promising technology that can ensure trustworthiness, immutability and transparency in any organizational systems. Data form a continuous chain in the form of blocks in blockchain technology, each block contains information about transactions. It is unable to delete, modify and copy records in the database. Every new ledger transaction is a new block and all blocks construct the blockchain [1]. The first proof-of concept using blockchain technology was cryptocurrency. This was later developed and implemented for public blockchains such as Ethereum and Bitcoin [2]. The most well-known program of blockchain technology is in the financial field, however, using the potential of such technology in land management is already an established practice and developed countries are interested in launching pilot projects to test their utilization in land management for reasons such as speeding up real estate operations and reducing costs in safer environment [3].

Rapid technological advances changes management structures in all areas, including land management. Cadastral models must be perfect in accordance with conservation and renewal process, in line with current and future realities, with sufficient flexibility and accuracy to adapt to changes.

Land management information systems are represented by numerical and geospatial data as well. Geographic Information System (GIS) technology, which is location-based technology itself, and combination of these technologies will help us to answer the question of where the blockchain transaction took place. The combination, and integration, of blockchain with GIS

underlie the concept of GeoBlockchain. This new tool can be used to support the analysis of spatial temporal trends of blockchain transactions via a geospatially-enabled blockchain [4].

With the help of GIS technology, varieties of data combinations are possible in all industrial areas, including land management. Cadastral systems manage and control land ownership through diagrams, plans, maps and schemes [5]. This information are the base attributes of GIS-based Cadaster Land Information Systems [6]. Blockchain is a trustworthy data network where an unchanged record will be distributed. Multiple records, information transparency and accuracy will be one of the important benefits in the distributed network. Land or property transfer details, systems of legal, tax or government bodies may be used directly in business transactions.

Several countries have launched pilot projects in terms of land management, among them are: Brazil [7], Dubai/UAE [8], Georgia [9], India [10], Kenya [11], Ghana [12], Ukraine [13], Sweden [14] and etc. According to researchers, the main motivation for developing blockchain in real estate transactions in developed countries is the increase of transaction speed, reduction of costs and possible errors, while developing countries utilize it to improve the transparency of property transactions and fight against corruption [3].

Besides, Müller and Seifert studied a blockchain-based land registry that could motivate the use of blockchain in land management [15].

Other researchers note that quality assurance framework based on blockchain technology provides more transparent real property market [16].

Although most studies are focused on land registry, which contains the legal alphanumeric number of property, property rights, and right of ownership, some researchers focus on geospatial data. Sets of geospatial data in land information systems are produced through research and are stored in GIS database. A location layer that is placed in the database provides information about certain cadastral parcel or the results of a specific survey regarding building boundary. In this way it will be possible to track changes in a timely manner and solve the problem of inaccurate and up-to-date cadastral spatial data. Farnaghi and Mansourian suggest that public participatory GIS should be developed as decentralized applications (DApp) based on Ethereum blockchain to have a fully transparent and reliable environment for public participation. The authors suggest that public blockchains are an appropriate solution for participatory mapping [17].

Findings

Blockchain technologies are developing and the prospects for its future utilization are high. Based on a literature review, it can be assumed that certain components of blockchain systems in land management have already been used successfully in some countries, although its full utilization depends on many factors. Critical elements such as data reliability and transparency,

which are essential for the success of advanced analytics, artificial intelligence, and any digital transformation, will be preserved in the context of similar technological developments.

The advantages of using blockchain systems in land management are as follows: the creation of reliable large geospatial databases; faster recording of transactions in the land register; automatic notifications of changes in the land registry; ensuring transparency and security of transactions; creating digital databases of contracts and other documents, etc. The use of blockchain technologies in land management saves a great deal of time and money, enables global vision of information and correspondingly effective management tools.

It is true that many approaches to modern solutions of blockchain systems are theoretical, but, undoubtably, the role of blockchain technology in ensuring transactions and transparency in land information systems will incredibly improve and assist policy makers, participants of relevant transaction and researchers interested in the issue.

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УПРОВАДЖЕННЯ КОНЦЕПЦІЇ «WELLBEING» У КОРПОРАТИВНУ КУЛЬТУРУ ОРГАНІЗАЦІЇ

Ключові слова: wellbeing, добробут, Інститут Геллапа, корпоративна культура.

Анотація. *Проаналізовано поняття «wellbeing» (добробут). Представлено результати дослідження Інституту Геллапа, у результаті якого встановлено, що добробут складається з 5 елементів: здоров'я, професії, фінансів, соціальних зв'язків та громадської залученості. Наведено приклади комплексних програм компаній з упровадження концепції wellbeing.*