SMART VALUE REPORT

Daniela RĂBOJ, Assist. PhD Eng. – Faculty of Geodesy, Technical University of Civil Engineering Bucharest , lacatusu_dani@yahoo.com
Alexandra Nadia CÎRDEI, Assist. PhD Eng. – Faculty of Geodesy, Technical University of Civil Engineering Bucharest , c.alexandranadia@gmail.com

***Abstract**: The smart value report is useful in a smart market. This phenomenon is shaping an interdisciplinary attention amongst researchers. The purpose of this article is to identify a research scheme so that in the future, researchers can make valuable contributions.*

This paper presents a lot of aspects used to describe the operating mechanism of the value report through blockchain technology. Our proposal consists in the schematic realization of a smart value report for real estate, in order to facilitate its execution, advantages and methods of implementation of this report. The smart value report aims to reduce costs and improve efficiency methods in the domain of real estate appraisal.

***Keywords:** smart value report, smart real estate market,blockchain technology*

1. Introduction

Blockchain technology is a database or registry, in which user data and operations between them can be stored on many computers, any place. [6] Therefore blockchain is made up of a succession of virtual blocks, called hashes. Information from the block along with the information from the previous block represents the components of the digital key. Thus it creates a chain based of trust, as each change can be verified, validated and impossible to compromise. The data type from the blockchain can be private, and because of that we can obtain a virtual identity, that we can fully control, in that sense we can choose what type of data to share. It is important to note that a blockchain can be accessed from anywhere, provided there is a suitable device and internet connection.

First, blockchain technology was noticed through cryptocurrencies, which allows transactions between users using e-wallets without the intervention of another entity. The attention enjoyed by blockchain technology is due to the fact that it allows the use and storage of several types of data, having the ability to influence even the real estate appraisal process. This network of chains ensures communication between different areas and domains of activity, based on the data and information available to it. Globally, the number of companies and government institutions using blockchain technology is constantly increasing, because the benefits of this technology are huge. From year to year, blockchain technology is identified by a lot of utilities in more and more domains of activity. Currently, different types of contracts can be concluded, called “smart contracts”, assets can be digitally certified, documents can be registered and verified, it also allows the use of an electronic voting system.

Fig. 1 Blockchain Technology
Source: https://www.intermodal-logistics.eu/blockchain-technologies-keeping-data-safe

In conclusion, blockchain technology has the following advantages:

- Protection and verification users’ data;
- Allows the creation of a distributed economy;
- Certain taxes are eliminated;
- Provides a high degree of trust to the companies;
- Users’ rights are protected.

2. Demand analysis in the context of using the smart value report

Our focus is to anticipate market needs so that decision makers (sellers, buyers, realtors and so forth) can take the best choices.

Smart market research requires a vast spectrum to be able to optimize existing techniques, because of the different behavior between people and their preferences regarding the market mechanism. For anticipating the needs of the real estate market, we provide users with the required tools and information in several domains of activity.

A smart value report involves three aspects: automation, efficiency and credibility. In order to be applicable in real life, the smart value report should have a platform with proper data and a viable structure for software applications. Efficiency depends on the kind of the interdisciplinary information and the increase in processing speed. The higher the volume of interdisciplinary data is, the more credible are the results provided.

Mathematical models are the basis for making smart value reports, because they can process information, receive, store and send results in different forms. Mathematical models are programs that have the ability to identify physical, economic and law characteristics and so forth.

Traditional value report vs. Smart value report

A traditional value report is not standardized, in the sense that it may be different in structure and content, it depends on the purpose and subject of the valuation. However, it is based on the following mandatory components:

- subject, purpose and valuation date;
- identification of the main parts of the valuation;
- identification of the hypotheses and the special ones;
- ilustration of relevant information (real estate data, market analysis and so forth);
- valuation methodology;
- reconciling the results and estimating the final value;
- annexes.

A value report covers several stages of preparation before validation (preparation, examination, approval and delivery to the client and / or user). When there are contradictions regarding the content of the value report, legal resources will be used to resolve them. Traditional value reports are signed manually, according to the current legislation.

Traditional value reports represent a source of inspiration for smart value reports. The design of the smart value report must take into account the participants and the content of the traditional value report, but must also include breach of contractual liability and sanction in order to eliminate as far as possible existing disadvantages.

Disadvantages of the smart value report

Obviously, there are shortcomings in the lack of specific data, which are required to realise value reports. Security issues and fraud can cause significant losses and these are a major disadvantage.

Another aspect refers to the specific needs for which the value reports are realised, being available only for a unique property.

The design of smart value reports must take into account existing law constraints. For example, the legalization of digital currencies has not been recognized in all the countries. Smart value reports must follow with law requirements, both, during and after generating those.

Because we are speaking about a prototype, it is difficult to guarantee rightness and credibility. Through rightness we mean that the value report will be transparent and will not break the fundamental ethical principles of the evaluator's profession.

Another disadvantage is accessing the application of smart value reports. When we are accessing a large number of value reports at once, there may be a risk of them stalling and causing economic problems or damaging the owner itself.

Advantages of the smart value report

Based on the information already identified, the smart value report has been following the advantages: coherent, efficient, compatible, convenient and observable. The main purpose is that the smart value report has to automatically generate reports for real-life applications and has to adapt to the special needs of the owner / user.

Coherence has two meanings which can be identified, one of them is referring to the state of the system (everything related to the assets and the execution part are in the same position), and the other one is referring to the law part (the value report must be made in accordance with standards agreed by the competent institutions and with the current legislation).

By efficiency we mean at the speed with which the smart value report is generated. The higher the processing speed, the lower the operating costs.

It is important to have a system control during the execution stage of the smart value report. This monitoring helps us to identify very quickly any errors or fraud.

The content and structure of smart value reports must be in line with traditional value reports. The implementation of smart value reports requires a series of blocks, with a clearly defined size and structure.

3. Solutions for developing smart value report

At the moment, the valuers uses the advantages of technology in carrying out their activity. We have reached at a level where technology allows us to access files, at any time of the day and from any place. (Figure 2) In a relatively short time, tools have advanced in such way that they can facilitate the work of a valuer.

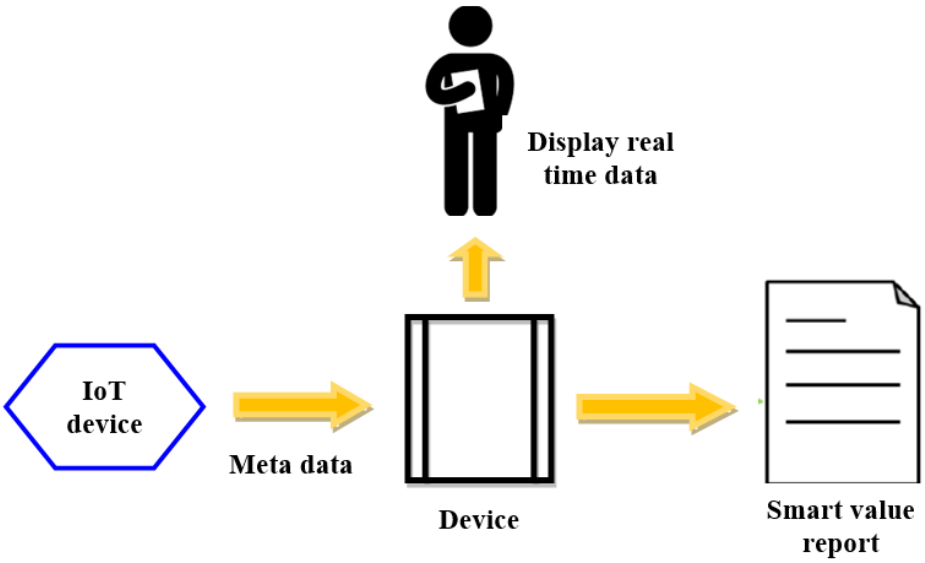

Fig. 2 Collection, processing and transmission of data

The applicability of the smart value report, on the one hand, can reduce costs and possible conflicts, and on the other hand can improve efficiency and execution rate, but also can change the original structure of value reports.

Blockchain technology is, in this context, a method of decentralized structuring and manipulation of data. The proposed model is structured in two basic elements:

- Physical-technical elements;
- Economic and legal elements.[4]

The physical, economic and legal characteristics of the property can be registered on the blockchain, which are based on the cryptology mechanism. The original files are archived on servers.

The smart value reports can be divided according to an execution model and a structure one. The execution model of smart value reports can be divided, in his turn, in four stages: signing, implementation, execution and validation.

To standardize the value report, we need to ensure that the results of the division of each value report, which performs the same function, are consistent.

Improving this process of generating a smart value report starts with the structure and quality of the information available. The lack of standardization and limited application

examples lead to a rather complex implementation of the proposed model. To make standardization possible, the application must be linked to external databases, through an application programming interface. Therefore, the data could be validated automatically without the need to validate the nodes and without being analyzed by the user. Also, network authorization rules could be much more detailed (for example, data such as assumptions or special assumptions). All of this could improve the process of generating the smart value report.

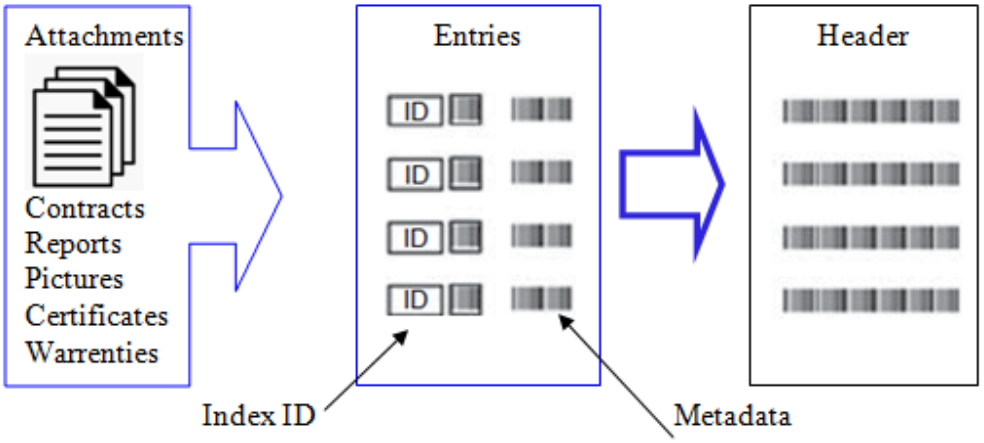

Fig. 3 Blockchain type infrastructure [4]

The usefulness of smart values reports is a hotly debated theme, ilustrating a difficult process due the lack of qualitative data.

The proposed blockchain infrastructure improves this process of obtaining smart value reports. The benefits consist of:

- reliability (network information is validated and answer to requirements);
- transparency;
- efficiency.

In addition to the benefits mentioned above, there are also social benefits, which refers in sense that if the reliability and transparency of information is improved, real estate fraud can be reduced.

4. Value estimation through the smart technology

The potential of technologies such as artificial intelligence, big data and blockchains have the role to distribute, to commercialize the real estate markets, but also to create other markets [4]. The real estate market is unique, complex and represents the largest asset class in the world. History shows that real estate plays an important role in global economies [4]. Globally, governments are trying to create value using smart technologies and also new strategies. There are public institutions that have set out to implement smart technologies in the public sector management.

At this moment, the real estate market became the largest asset class in the global stock market, in addition to stocks and bonds. This is further supported by the fundamental characteristics of real estate markets (heterogeneity and immobility).

According to studies of the other researchers, which analyzed the theoretical applicability of blockchain technology in real estate management and the real estate transaction process, they indicated that blockchain technology could lead to improvements in efficiency, transparency and trust. Although recent studies have examined the possibilities of applying blockchain technology in real estate, the specifications and applications present uncertainties in the implementation of smart technologies.

5. Conclusions

This article approaches the role of smart technologies in creating smart value reports.

In this paper, we emphasized the advantages and disadvantages of using smart value reports through blockchain technology, as well as future research directions. This article presents a point of view of the shortcomings in traditional value reports and smart value reports, and presents solutions for these shortcomings.

Based on the research done, the requirement to use value reports was analyzed in relation to issues related to the structure and quality of existing data worldwide. The structure and quality of the data are the main elements in the real estate valuation and essential for the process to be improved. As the need for smart value reports increases, its structure can be improved.

In this research paper the legislative part was excluded. The European Union, made some legislative changes on personal data protection called"General Data Protection Regulation". Estimation of the costs of creating and implementing a blockchain database were also excluded.

To ensure a proper functioning of smart value report, formal validation is required before implementation, as it can greatly reduce the probability of errors, and also can reduce the losses caused by errors. To benefit from the widespread use of smart value reports, we need an efficient mechanism.

As with all new technologies, and with blockchain technology, most research focuses more on applicability, and less on developing an application. This research is based on technical and legal assumptions about how blockchain technology should be implemented. Therefore, further research is needed to move beyond the assumption stage.

6. References

1. *Colectiv Facultatea de Geodezie de la U.T.C.B. – Planificarea spațială și GIS pentru dezvoltare durabilă Vol.I Sinteze/Cap.13 Analiza statistică pentru mediul urban, Matrix Rom, București, ISBN 978-606-25-0378-9,978-606-25-0379-6, 2017*
2. *Journal Valoarea Oriunde este ea, no. 26, ed. ANEVAR, 2018*
3. *Definition source: https://site2.anevar.ro/sites/default/files/revista-asociatiei/valoarea_26_2.pdf*
4. *Wouda H. P., Opdenakker R. – Blockchain technology in commercial real estate transactions: Emerald Insight Journal, pg. 570 - 579, 2019*
5. *Tianyu F., Xiao Y., Yueting C., Yi L. – Smart contract model for complex reality transcation: Technologies, application domains and challenges forhe cities of the future, Emerald Insight Journal, pg. 184-197, 2019*
6. *https://admiralmarkets.com/ro/education/articles/cryptocurrencies/tehnologia-blockchain*
7. *https://www.intermodal-logistics.eu/blockchain-technologies-keeping-data-safe*