

Application of Blockchain Technology in the Cultural and Creative Industries

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Abstract - Nowadays blockchain technology is a subject of continuous interest both of scientists and practitioners in order to expand its implementation in other sectors of economy and finance. Still the most popular application of blockchain technology rests bitcoins. The present paper proposes several possible applications of blockchain in the sphere of Cultural and Creative Industries based on the proven and accepted so far strengths of the technology.

Keywords— blockchain technology; cultural and creative industries

I. INTRODUCTION

According to different economists and analysts, Cultural and Creative Industries (CCIs) possesses huge potential to act as an engine for the other sectors of economy. Having in mind that on the baseline of these industries stays the talent, creativity, imagination and personal abilities and skills of the author and/or artists, the results of the competition in the field of Cultural and Creative Business are not always clear and not usually go in favor of the bigger, stronger or for this competitor who invests more financial resources in the proposed product or service. Therefore is not a big surprise that the power of CCIs is recognized by the European Commission as one of the possible ways to develop the European economy on the global scale. In this major context, the application of blockchain technology in different aspects of the CCIs could be considered as an opportunities to develop these industries in order to have not only competitive advantage, but also as a possibility to achieve products and services in better quality in a more efficient way for the companies providers and in a line of their clients. The aim of the present paper is exactly the same – to consider different aspects of implementation of blockchain in a specific field of the economic sectors within the Creative Business.

II. LITERATURE REVIEW

Even the concept of blockchain is relatively new (first decade of the 2000 year with the appearance of the founding paper of Nakamoto (Nakamoto, 2008) which is accepted as a White Paper for the blockchain technology) there are already many researchers who explore diverse aspects of this technology as well as its applicability in other sphere of economy and finance. However, still the major focus of scholar rests on the bitcoins and cryptocurrency where the blockchain technology is the most popularly used.

Some of the scholars are focused on the expanding and improvement of the blockchain technology-itself. For instance, a researchers team has admit that the existing blockchain system is limited of tracing only simple goods which are not included in the manufacturing process and

therefore they propose and develop a new system which covers all parts of manufacturing process in a way that the system “allows for the traceability of manufactured goods, including their components. Products are represented using non-fungible digital tokens that are created on a blockchain for each batch of manufactured products. To create a link between a product and the components that are needed to manufacture it, we propose “token recipes” that define the amount of tokenized goods required for minting a new token.” (Westerkamp et al., 2018). Other very vivacious discussion is formed in the light of concept of Internet of things and its possible interaction with blockchain. Wang et al present a serious research, devoted exactly on this topic. The authors admit that the future integration between Internet of things and blockchain is critical important in order to provide reliability of data in Internet of things. They claim as a conclusion: “Both the testbed and analysis reveal the blockchain capacity can be improved by accelerating the block mining rates which, however, increases stale blocks. Our analysis provides an asymptotic upper bound for the blockchain capacity” (Wang et al., 2019).

The relationship between different aspects of business and more specifically the lack of transparency and trust of some of the business activities is on the basis of the study, dedicated to the usage the specific of blockchain technology in some activities connected to providing services to clients. The authors admit that “existing Blockchain as a service deployment solutions are mostly vendor-locked: they are either bound to a cloud provider or a blockchain platform. In addition to deployment, design and implementation of blockchain-based applications is a hard task requiring deep expertise.” (Lu et al., 2019). They propose a “unified blockchain as a service platform (uBaaS) to support both design and deployment of blockchain-based applications.” (ibid).

One of the major explored topic recently in the context of the blockchain is the its usefulness in the field of agriculture and the benefits of this implementation. A collective scientific work outlines the benefits of using the blockchain technology in value chain management in agriculture. Authors claims “...blockchain technology together with advanced information and communication technology and internet of things have been adopted for the improvement of agri-food value chain management in four main aspects: traceability, information security, manufacturing and sustainable water management.” (Zhao, et al., 2019). Traceability is emerged as one of the most important specifications of the blockchain especially in terms of tracking the origin of the agriculture production. This opinion is shared by an academic team, which combines the strengths of the blockchain technology with the chimerical analysis of foods. The authors summarize their preposition as

follows: “One way of solving traceability issues and ensuring transparency is by using blockchain technology to store data from chemical analysis in chronological order so that they are impossible to manipulate afterwards.” (Galvez, Mejuto, Simal-Gandara, 2018). Baring in mind that the origins as well as the components in the food products are really sensitive question for every customer (especially in the lights of the recent big discussion on the differences between ingredients of foods for Eastern and Western part of the European Union), the proposed implementation in the field of agriculture could be considered as really significant for all sides – and for agriculture producers but also for the consumers.

As a summarize of this quick literature overview we could conclude that the discourse of blockchain technology is really vivid on the both major field – academic and practitioners and it is abut to develop in the recent years in terms of exploring in depth the different applications and optimizations of the technology.

III. BLOCKCHAIN IN BRIEF

Some of the authors has describe blockchain technology as the greatest so far innovation of the 21st century. In order to understand better the applicability of the technology in the field of Creative Business, we have to provide closer look to the technology and have to explain its main strengths. Firstly, blockchain is absolutely decentralized system, which is based on the network connection of the computers. Something more – this system is based on the principle peer-to-peer.

There are two types of information holders – blocks and transactions. Blocks are huge number of encrypted, checked and secured transactions, which are combined at random principle. All operations are executed within the block in order to avoid big data traffic and resources for calculation as well. Each block contains information and elements of the previous block and the time marker. In fact the hash of the previous block plays the role of a link between the blocks. (fig.1). The algorithm of the Blockchain technology is based namely on the hashing process of the information which is made by the integrated computers that form network. In fact all information is shared between the members of the network.

Irrevocability of the blockchain – in case that one transaction is already done, it is impossible its further change or cancellation.

Decentralization – all nodes including in the network in fact have equal rights and a real possibility to the direct data exchange.

Reliability – the way the system operates assumes high level of security against the hackers’ attacks.

Trustworthy – the overall logic, construction and functioning of the system convert the system as trustworthy and that is the main reason that the focus both for academic and scientists is directed to the different new methods in a different sphere for applicability of the blockchain technology.

On fig. 3 are presented the three main types of blockchain – public, private and consortium. Public type of blockchain is opened to all potential participants who want to joint to the network. Private blockchain is created especially for the private organizations and is absolutely closed to the external for the organization access. The authors of the system execute the overall maintenance and control of the

system. Such private system is a subject of numerous strict organizational procedures and policy. Only customers who has certificate could be included in the network and could be work in the system. On the other hand, for the consortium as a type of blockchain we could admit that this blockchain has hybrid characteristics. Such blockchain is controlled by a number of pre-selected and defined nodes. It can be accessed by all users or by a number of limited customers which fact makes the hybrid character of the consortium as a blockchain type.

IV. POSSIBLE APPLICATION OF BLOCKCHAIN TECHNOLOGY IN THE FIELD OF CREATIVE BUSINESS

Creative Business contains a number of economic sectors, which are based on the talent, imagination, ideas and therefore vary often the result of the creative business (as a product) is copyrighted. On the fig. 4 is presented the general model of the cultural and creative industries.

As it can be seen the economic sector within the Creative Business are really diverse but their importance on the development of the overall national, European and global economy grows trough the years. Therefore every slight improvement could influence the further economy development in the creative field. This is the reason why the application of blockchain technologies in some of the sectors within the Creative Business has to be considered as a huge potential for future competitiveness.

Several proposals for the future applications of blockchain in the Creative Business are presented on the fig.5 and on fig. 6 based on different characteristics and types of organizations in this field – authorities and business organization.

In terms of the Bulgarian Ministry of Culture and its specific activities as a public authority that provides particular policy in this field, there are several possible applications for blockchain as follows:

1. Internal Procedures within the ministry – there are a lot of procedures that could be updated and improved with the help of blockchain technology in terms of transparency.

2. Funds Management – Bulgarian Ministry of Culture administrates two crucial for the artists and authors national funds: 13 Centuries Fund and National culture fund. Their management including payments for beneficiaries could be implemented through blockchain and therefore the transparency and the trust of society will increase dramatically.

3. Special Policy Management – the Ministry of culture has special policy of donating concrete a certain percentage of every ticket sold by theatres and operas in the country. This policy could be implemented very successfully namely trough blockchain with all advantages that the technology could propose so far.

4. Maintenance specific register – according to the Law, the Ministry has an obligation to maintenance a special register of Maecenas. This register could be also improved by the blockchaine.

5. Heritage – Again the Ministry has to maintain the register for all cultural heritage at the territory of Bulgaria. This register includes the category of the heritage, its type including the authorized construction activities on the objects that are culture heritage. Transparency and senility of the community could be satisfy trough usage of blockchain technology.

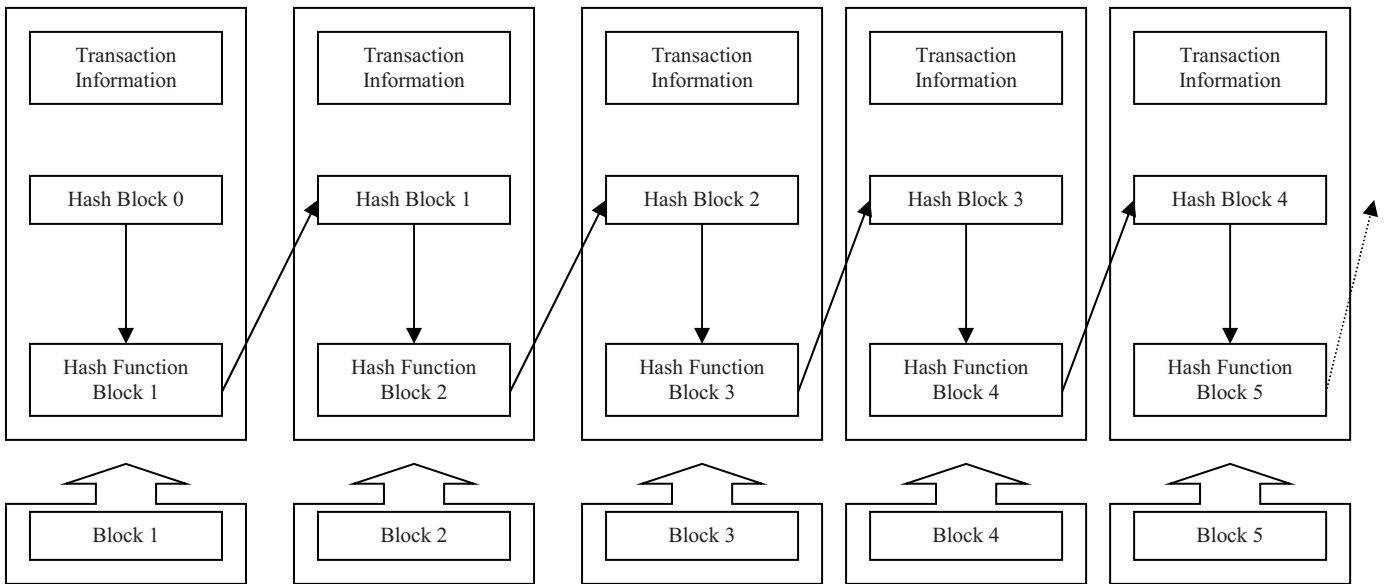


Fig.1. Model of Blockchain process

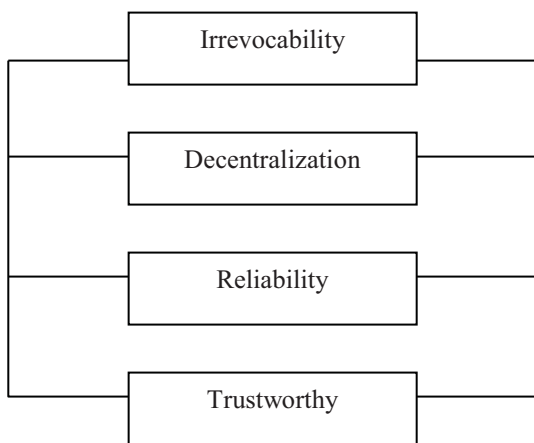


Fig. 2 Blockchain Strengths

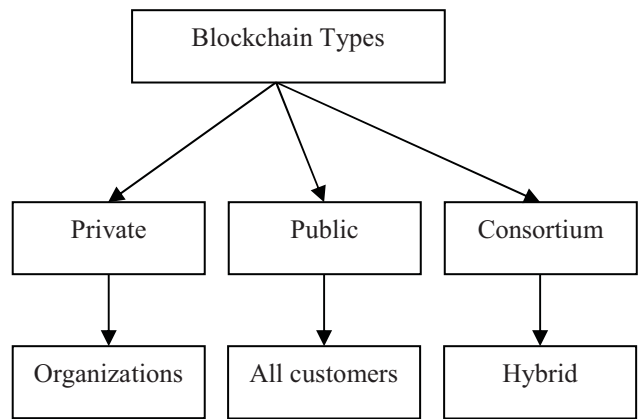


Fig. 3 Blockchain Types

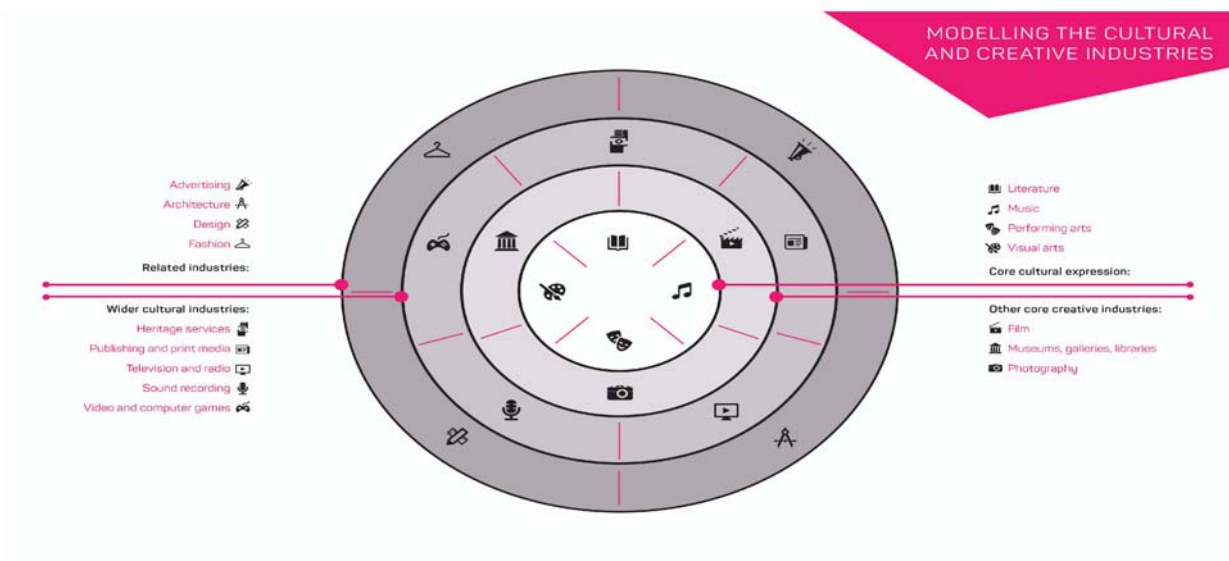


Fig. 4. Model of Cultural and Creative Industries, Source: Cultural Observatory

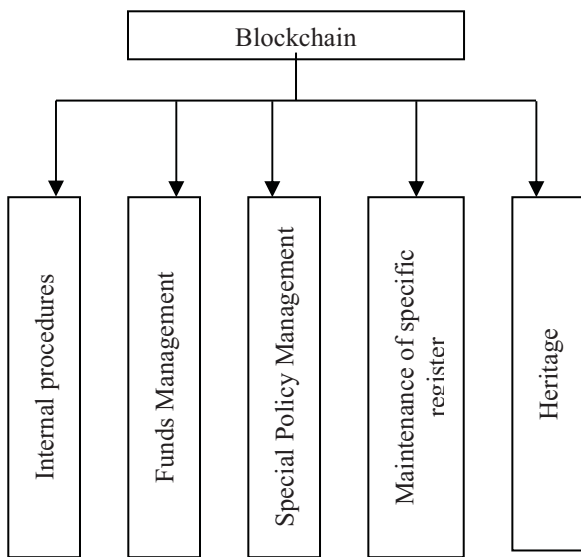


Fig. 5 Proposals for application of blockchain for authorities in the field of Creative Business

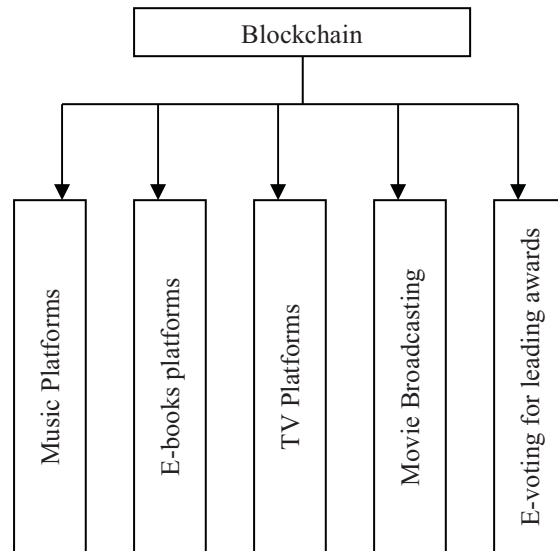


Fig. 6 Proposals for application of blockchain for organizations in the field of Creative Business

In the field of organizations, there are also several possibilities of blockchain applications namely using the hard defence of the copyrights of authors that system could provide. Therefore many platforms for music, e-books and TV and movie programmes could be act, using blockchain with the higher level of security of the authors' right. Something more – as the implementation in the agriculture – now we will be absolutely sure for the origin of the creative product (music, book, film, radio and tv programmes etc.) and there will be no more troubles and misunderstanding specially at this line.

The last proposal is connecting to the different awards (both national and international) that could change the way they form both nomination and awarded artists' trough the blockchain technology.

V. CONCLUSION

The application of blockchain technology in the field of creative business is not so well developed yet, but the results form the initial research show that there are a lot of possible future application of this technology that will developed and improved the existing activities of the organizations (both as authority and as business organizations). The benefits that blockchain offers are really clear and helpful and could provide competitive advantage in these priority for the European and national economy sectors.

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