Uluslararası İleri Doğa Bilimleri ve Mühendislik Araştırmaları Dergisi
Sayı 7, S. 265-268, 4, 2023

Araştırma Makalesi

IJANSER
https://as-proceeding.com/index.php/ijanser
ISSN: 2980-0811

International Journal of Advanced Natural Sciences and Engineering Researches
Volume 7, pp. 265-268, 4, 2023

Research Article

Blockchain in Practice?

László Szabó*, Norbert Forman and Mihály Szilárd Avornicului

Department of Business Information Technology, Budapest Business School, Hungary

(szabo.laszlo4@uni-bge.hu) Email of the corresponding author

(Received: 22 April 2023, Accepted: 19 May 2023)

(DOI: 10.59287/ijanser.714)

(1st International Conference on Recent Academic Studies ICRAS 2023, May 2-4, 2023)

ATIF/REFERENCE: Szabó, L., Forman, N. & Avornicului, M. S. (2023). Blockchain in Practice?. *International Journal of Advanced Natural Sciences and Engineering Researches*, 7(4), 265-268.

Abstract **–**The digital future has reached a new milestone and brought major changes to industries. Blockchain technology has taken centre stage in recent years. The range of blockchain and distributed ledger technologies (DLT) has great potential to create an infrastructure for reliable, decentralised and unmediated services beyond the financial sector. In logistics, blockchain-centric solutions are being sought to perform infocommunications activities with distributed databases. Business users expect a leap in efficiency and speed in the execution of their daily processes. Blockchains can be used to take digitisation and monitoring to a higher level. However, the question is how this can be used in everyday life. How to acquire the right digital competences, how to make complex systems. We can see that ICT is also making progress in the field of education. It is important to build and develop digital competences. The European Union has also recognised the importance of this area and has launched a testing system. In this paper, we briefly describe the functioning of the blockchain. We will show that it can be used in many areas of the economy. We will also touch upon education in the ICT field with a special focus on digital education. Finally, the future expectations of the European Union are outlined.

Keywords – Blockchain, ICT, DLT Technology, Education, European Union (EU)

I. INTRODUCTION

Digitalisation started to transform industries in the early 2000s. Digital technologies triggered a new industrial revolution. As industries enter the digital world, employment opportunities change. For example, the advent of artificial intelligence (AI) is transforming business practices. With the Internet of Things (IoT), businesses can use real-time data to improve processes and reduce costs. The concept of the blockchain is also gaining attention, which is no coincidence, as this technology can solve one of the biggest problems organisations face: the secure management of information shared over networks, where NFT (non-fungible token) can play a major role. It can be seen that ICT systems are bringing major changes to different areas of industry, requiring new regulations on the one hand, and new skills on the other.

II. THE BLOCKCHAIN

Blockchain is a system of recording information in a way that makes it difficult or impossible to change, hack, or cheat the system. The blockchain is essentially a digital ledger of transactions that is replicated and distributed across the entire network

of computer systems in the blockchain. Each block in the chain contains transactions, and each time a new transaction is made on the blockchain, an entry for that transaction is added to the ledger of all participants. A decentralized database managed by several participants is called distributed ledger technology (DLT). (A blockchain is a type of DLT in which transactions are recorded with an immutable cryptographic signature, called a hash.) This means that if a block in a chain were changed, it would immediately become obvious that it had been tampered with. If hackers wanted to tamper with a blockchain system, they would have to change every block in the chain, in all distributed versions of the chain. [1]

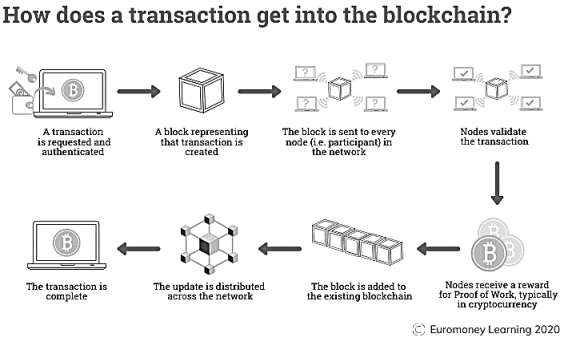

Fig. 1 How does a transaction get into the blockchain? [1]

The essence of blockchain-based data management is an encryption (cryptographic) process where each party has at least one public and one private key pair, which are digital sequences of symbols and characters. Using the public key algorithm, any user can perform a data management operation on the network, encrypting the information or data involved in the operation with his private key. The encrypted data and the public keys of the parties involved in the operation can be seen by any other user on the network, but only the parties can interpret and decrypt it using their private keys. The initiating party encrypts the information using the encryption algorithm running on the network and its own unique private key, and then assigns the public key of the receiving party to the encrypted data it has defined, thus creating an encrypted form of the original data. Only the encrypted data thus created will be visible to all users in the blockchain system. In the blockchain, the recipient assigns its own secret key to this encrypted data and decrypts the data using the algorithm. Once decrypted, the data is presented to the user as meaningful information. The block containing the data concerned is always sealed with a time stamp or a digital signature associated with the block. In the event that a user of the blockchain wishes to perform further data processing on the network, a further sequence of operations is performed in the same way as above. [2]

Blockchain technology is much more than a system for transparent and secure transactions with cryptocurrencies. In addition to finance, it can be used in areas such as healthcare, insurance, voting, social benefits, gambling and royalties. There is no doubt that the global economy is preparing for a blockchain revolution. If "revolution" sounds dramatic, consider that eight of the world's 10 largest companies make products that use blockchain. Players in any industry or other organisations could benefit from moving their financial or even operational operations to a blockchain-based platform. Blockchain technology is having a huge impact on business. The main drivers for its adoption are higher revenues, lower costs and more efficient use of time. Blockchain can also be used to create smart contracts or enforce title deeds. When used to validate, authenticate and secure evidence used in court proceedings, blockchain can improve the efficiency of the justice system. Innovation has always divided supply chains - the links between the production and distribution of goods. Today's supply chains are highly complex, spanning several continents, involving countless invoices and payments, involving multiple actors and can take months to complete. This complexity makes blockchain an attractive tool for transforming the supply chain and logistics industry. When goods are moved to a new point in the supply chain, the process can be securely and irreversibly logged, creating an unalterable, auditable flow from origin to end user. [3]

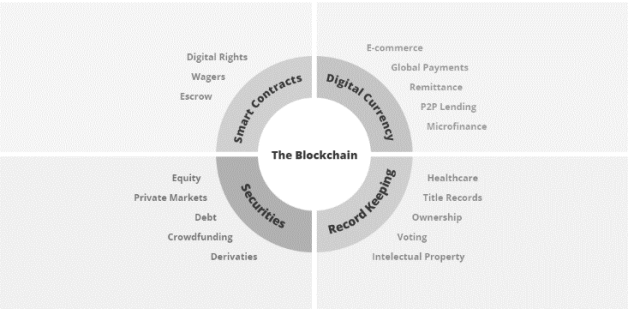

Fig. 2 How does a transaction get into the blockchain? [4]

III. EDUCATION AND DIGITALIZATION

Education 4.0 is a new educational paradigm that seeks to address the needs and opportunities of the fourth industrial revolution. It allows learners to determine their own learning model and pace. Education 4.0 is based on the concept of learning by doing, in which learners are encouraged to learn and discover in an experimental, individual way. Although the potential of Education 4.0 is capturing the imagination of more and more people, implementation and the level of support is still in its infancy, with some small-scale attempts in some parts of the world, but still largely in a test phase. [5]

It can be seen that, on the one hand, there has been a recent focus on the teaching of digital technologies, and on the other hand, digitisation has become an integral part of education. [6, 7, 8] It is clear that digitalisation has become an inevitable part of education.

The European Union has also set out its plan for digitisation in education, the main points of which are outlined below [9]:

The Digital Education Action Plan (2021-2027) is a renewed European Union (EU) policy initiative that sets out a common vision of high-quality, inclusive and accessible digital education in Europe, and aims to support the adaptation of the education and training systems of Member States to the digital age.

The actions of the Digital Education Action Plan

The Digital Education Plan sets out two strategic priorities and fourteen actions to support them:

Priority 1: Fostering the development of a high-performing digital education ecosystem

What will the European Commission do to achieve this?

Action 1: Structured Dialogue with Member States on digital education and skills

Action 2: Council Recommendation on blended learning approaches for high-quality and inclusive primary and secondary education

Action 3: European Digital Education Content Framework

Action 4: Connectivity and digital equipment for education and training

Action 5: Digital transformation plans for education and training institutions

Action 6: Ethical guidelines on the use of AI and data in teaching and learning for educators

Priority 2: Enhancing digital skills and competences for the digital transformation

What will the European Commission do to achieve this?

Action 7: Common guidelines for teachers and educators to foster digital literacy and tackle disinformation through education and training

Action 8: Updating the European Digital Competence Framework to include AI and data-related skills

Action 9: European Digital Skills Certificate (EDSC)

Action 10: Proposal for a Council recommendation on improving the provision of digital skills in education and training

Action 11: Cross-national collection of data and an EU-level target on student digital skills

Action 12: Digital Opportunity Traineeships

Action 13: Women's participation in STEM

European Digital Education Hub

IV. BLOCKCHAIN AND EU

The European Commission wants to ensure that businesses can make the most of digitalisation. At the same time, it must help businesses to meet the challenges of the digital shift. These challenges include increasing global competition, changing skills needs in the workforce and differences in the speed of digitisation of European sectors, businesses and regions. The Commission has identified four areas to focus on to fully exploit the potential of the new industrial revolution: digital innovation for all (digital innovation hubs), strengthening leadership through partnerships and industry platforms, the regulatory framework for the digital age, and preparing Europeans for the digital future. [10]

The EU strongly supports EU-wide rules on blockchain to avoid legal and regulatory fragmentation. The Commission has adopted a comprehensive package of legislative proposals to regulate crypto-assets to increase investment and protect consumers and investors. The package updates certain financial market rules for cryptoassets and creates a legal framework for EU financial supervisors regulators on the use of blockchains in securities trading and post-trading of securities. [10]

In February 2023, the European Blockchain Regulatory Sandbox was launched, aiming to help the technology spread by reducing legal uncertainty around blockchain and distributed technology

solutions. The Sandbox is expected to be operational until the end of 2026 and is expected to receive 20 projects per year. The Sandbox is open to public institutions and private companies in the EU, Norway and Liechtenstein. The Sandbox accepts projects that have already passed the PoC (Proof of Concept) phase, are about to enter the market or are in the early stages of operation/commissioning and use distributed ledger technology (DLT). Here we should mention the regulatory sandbox in the context of EU regulation. A regulatory sandbox is a controlled (test) environment where companies can test their products and services in cooperation with and under the supervision of the regulator. The regulatory sandbox provides legal certainty for the development and operation of decentralised technology solutions, including blockchain, by enabling project promoters to identify legal and regulatory barriers to deployment with the regulator's experts. In addition, the regulator will provide advice, experience and guidance to support deployments in a secure, supervised environment. This should explore the significance of the results of the work, not repeat them. The results should be drawn together, compared with prior work and/or theory and interpreted to present a clear step forward in scientific understanding. Combined Results and Discussion sections comprising a list of results and individual interpretations in isolation are particularly discouraged. [11]

V. CONCLUSION

Once a curiosity, blockchain technology is now an increasingly widespread process, found in all areas of the economy. Organizations around the world are taking advantage of blockchain technology in their own domains. However, there are problems that are slowing down the rapid spread of blockchain. These include regulatory complications [12], an area where, in part, European Union regulation could go a long way. However, it is certain that in the near future, the use of blockchain technologies will continue to grow in many areas because of the benefits they offer. Integrating the teaching of blockchain technologies into the teaching of digital technologies will be an important step towards this.

REFERENCES

[1] (2022) The euromoney website. [Online]. Available: www.euromoney.com

[2] D. Eszteri, “A blokklánc mint személyes adatkezelési technológia GDPR-megfelelőségéről műanyagok újrahasznosítása” *Állam - és Jogtudomány*, 2020 LXI. évf. 4. szám pp. 24-51

[3] (2022) iPon website [Online]. Available: www.ipon.hu.

[4] (2021) MLSDev website [Online]. Available: www.mlsdev.com

[5] J. Udvaros and N. Forman. (2023) Artificial Intelligence and Education 4.0, INTED2023 Proceedings, pp. 6309-6317. https://doi.org/10.21125/inted.2023.1670

[6] O. Takáč and L. Végh. (2021) Creation of 3D models of real objects in the teaching of computer science, ICERI2021 Proceedings, pp. 5723-5727.

[7] N. Annuš, M. Csóka and D. Paksi. (2023) Learning Management Systems and Their Possibilities in Education - Case of Slovakia. 17th International Technology, Education and Development Conference, 6981-6986 p. ISBN 978-84-09-49026-4. DOI 10.21125/inted.2023.1896

[8] J. Udvaros and L. Végh. (2020) New teaching methods by using microcontrollers in teaching programming. eLearning and Software for Education 2020. Bukarest 1 pp. 630-637. Paper: 82, 8 p. http://doi.org/10.12753/2066-026X-20-119

[9] (2021) European Education Area [Online]. Available: www.education.ec.europa.eu

[10] (2023) Shaping Europe’s digital future [Online]. Available: www.education.ec.europa.eu

[11] (2023) fintechzone [Online]. Available: www.fintechzone.hu

[12] (2020). computerworld.com, [Online]. Available: www.computerworld.hu