

STRATEGIC DECISION MAKING IN CONTEXT OF PEER TO PEER CONCEPT AND BLOCKCHAIN TECHNOLOGY IN THE CONDITIONS OF SLOVAK ENTERPRISES

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Abstract

The paper focuses on the analysis of the current state of the use of peer to peer technology in the management of the Slovak enterprises with a focus on blockchain technology. Paper illuminates the materials and methods used for analysis, followed by the results of the analysed dataset. After spotlighting the status quo, we conclude the assumptions of the paper with discussion.

Keywords:

Blockchain, Peer-to-Peer, Strategic technology

1 Introduction

Current management in industrial enterprises is competing on rapidly changing challenges in terms of technological development, which represents tool for efficiency in the field of mass production. We can see massive potential for improvement and replacing the current centralised ecosystem which relies on fragile centralised solutions. Blockchain appears to be the right solution for this issue. However, according to Trend.sk (2019), it appears that it is not easy to understand how blockchain technology works for everyone. The most well-known example of a blockchain system is the cryptocurrency Bitcoin. The reason why blockchain was implemented in the form of currency, like Bitcoin, is quite clear. The reason for this is its inherent property - the authenticity of the information. The system is trustworthy without any central authority authorizing it. Blockchain solves not only the problem of deliberate action, but also the mistakes that have been made unwittingly.

In keeping with Colombus (2018) the manufacturing sector is a major contributor to global GDP. US producers accounted for USD 2.33 trillion in the first quarter of 2018 alone, corresponding to 11.7% of the country's economic performance and with 12.75 million jobs being an important sector for maintaining employment and national economy.

2 Data Protection in the Context of Strategy

Conforming to the material presented in Material, Handling and Logistics (2018) blockchain brings an environmental aspect to the production process, which also ensures that falsifying environmental recordings will not be an easy task. The potential applications of this technology in business are huge. According to the Accenture Technology Vision Global Report, 60% of directors rank this technology among the key technologies of the near future (mhlnews.com 2017).

Deloitte conducted a survey which highlights the high rate of fraud in the supply chain, despite the constant increase in the number of companies that use different analytical tools to reduce fraudulent practices (Sit 2017). Therefore, manufacturers are increasingly focusing on new technologies, including blockchain, in order to reduce the number of different supply chain frauds. By 2020, it is estimated that 60% of the major manufacturers will be dependent on digital platforms and up to one third of all production supply chains will use analysis-based cognitive capabilities to increase cost efficiency by up to 10% and service performance by up to 5% (mhlnews.com 2017). By 2021, a number of new technologies will be integrated into the

manufacturing sector, with 20% of the top manufacturers using AI, IoT, cognitive systems and blockchain (Sit 2017). According to Columbus (2018) company Capgemini has researched 731 organizations in its worldwide blockchain integration research, focusing on existing or planned use of Blockchain technology. Research has shown that up to 447 organizations are currently experimenting with blockchain or directly implementing this technology. The results of the survey show interesting solutions to various problems in managing the production process and eliminating current deficiencies (Columbus 2018). In keeping with Columbus (2018) problems with traditional supply chains are:

- lack of traceability,
- risks linked to multiple stakeholders,
- manual processing,
- compliance,
- reconciliation load.

According to Columbus (2017) blockchain would solve these problems because of (Columbus, 2017):

- audit trail for all transactions,
- is safe against unwanted changes,
- is near real-time,
- is digitized, therefore faster,
- the tamper-resistant data is easily verifiable,
- the only common source of truth.

The main reasons why companies have decided to invest in blockchain technology (Columbus, 2017):

- cost reduction (89%),
- increased traceability (81%),
- increased transparency (79%),
- revenue increase (57%),
- risk reduction (50%),
- creating new business opportunities (44%),
- increasing customer numbers (38%).

Our goal, in this paper, is to map and analyse the status quo of industrial field of business in Slovak Republic in terms of the application of the blockchain technology.

2.1 Blockchain Strategical Applications

The area with the greatest potential for using Blockchain technology is the manufacturing area. The combination of blockchain and IoT technology will revolutionize product safety, transparency, risk management, maintenance, repair and lead to new business models based on the use of smart and connected products.

According to Newman (2017) Blockchain is one of the innovative open-source ways to increase its competitiveness towards larger businesses. According to surveys, 58% of manufacturing companies used blockchain technology in 2017, which focuses on supply chain value added, order tracking, maintenance, and other strategic processes that are essential to maintain competitiveness with large manufacturing enterprises (Newman 2017).

With reference to O'Brien (2017), the cumulative global cost of cyber-attacks and fraud in the manufacturing industry is \$ 3.7 trillion (€ 194,000 per plant). This number will most likely have a growing trend line in the future, as cyber-attacks are more sophisticated and efficient.

Possible issues that blockchain can help eliminate are (O'Brien 2017):

- corruption,
- invoicing fraud,

- fraud in manufacturing and shipping,
- the public database of certified parts,
- and all the innovative measures that are aimed at eliminating problems with the supply chain.

The goal of integrating Blockchain is to help manufacturers build more credibility in the eyes of consumers than reliable ethical suppliers of goods and services and to give consumers more quality (Ibm.com 2018).

Reported by Verizon (2017), the Internet of Things affects most industries, and production is not an exception. This is evidenced by the fact that, between 2016 and 2017, IoT's network connections increased by 84% in production, while the second growth sector, energy, recorded only a 41% increase. IDC predicts that by the end of 2019, up to 75% of large manufacturers will update their IoT operations to mitigate risk and speed up time to market products (Verizon.com 2017).

According to Aberdeen Research (2018), 82% of manufacturing companies have experienced some form of unplanned downtime over the past three years, with up to \$ 260,000 an hour. Unplanned downtime, which is a specific category often attributed to equipment failure, is even more expensive than expected (Immerman 2018).

Blockchain, therefore, enables the supply chain to securely and transparently consult and record production data to all stakeholders in order to perform real-time data updates and gather important data that can be used for predictive analysis to identify a problem before it occurs (fortune.com, 2017).

For the 12-month period, up to 87% of manufacturing enterprises were affected by some type of fraud (engineerlive.com, 2013). According to Kroll, who conducted the study, she mentions an example, the falsification of professional sports jerseys in China that were falsified so well that the fake product was indistinguishable from the real. This fraud case is one example of the prevailing trend that is detrimental to producer confidence (Kroll, 2018).

In the following chapter we will combine two issues - CSR and peer to peer in business management, to deliver the status quo in conditions of Slovak industrial management, consisting of answers predominantly from PR managers as a spokespersons, followed by CEOs.

3 Materials and Methods for the Analysis

We present outputs of the questionnaire made in December 2018. The questions were formulated in conforming to the surveys CSR 1-8, the results of which are frequently published by the under the leadership of prof. Sakál at UPIM MTF STU since 2001. The questionnaire has closed and open-ended questions. Questionnaire was conducted in Google Forms, distributed via email and social networks. The link on questionnaire responses is presented on <https://bit.ly/2Zm7bp4>. We provide answers only from the closed questions. Outcome of this survey is an overview of understanding the technology of general application of blockchain in Slovak enterprises.

We analyse 96 returned questionnaires which are composed of 54% of industrial companies. The first set of questions consists of basic identification questions for the companies that participated in the survey. The second set of questions consists of research questions and supplementary questions on the use and discernibility of the Peer to Peer. Concept Blockchain in order to increase business efficiency. Peer to Peer is a distributed application architecture that partitions tasks or workloads between peers. Size of the database for the purpose of the questionnaire survey was based on the size of the core set. According to the Statistical Office of the Slovak Republic as of 31st December 2017, we considered **17,526** industrial enterprises as the basic set. The sample was a sample of 768 enterprises, representing **4.38%** of the base sample. Questionnaire. **95 respondents** responded, until 31st January 2019. Rate of return of the questionnaire was **12.37%**.

Before the questionnaire was designed, the assumptions have been coined:

A1. Less than 50% of industrial enterprises in Slovakia has experienced some Blockchain management system.

A2. At least 10% of industrial enterprises in Slovakia use or would be able to use various modifications of the Blockchain technology in company management in the management of the company.

A3. More than 50% of industrial enterprises in Slovakia consider the main obstacle in the integration of Blockchain technology to the time and cost of development or the ignorance of the technology in question.

4 Results of the Analysis

Industrial production had the largest share of responses 54 (56.8%). Followed by 24 (25.3%) of companies operating in sectors such as IT 7 (7.4%), construction, wholesale, retail, financial intermediation, electronics are minority has 1 response. Industrial production (orange) accounts for the majority of question: *“In what industry does your business operate?”*

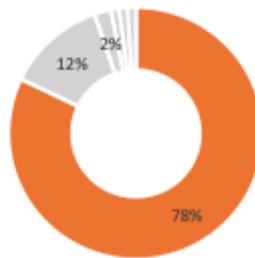


Figure 1 Graphical representation of answers – question 1 (own processing)

For question *“In what business sector does your business operate?”* Industrial production is the most common answer to the question: *“What is the number of your employees?”*: Large enterprise (over 250 employees) and Medium enterprise (50-249 employees) appear most often.

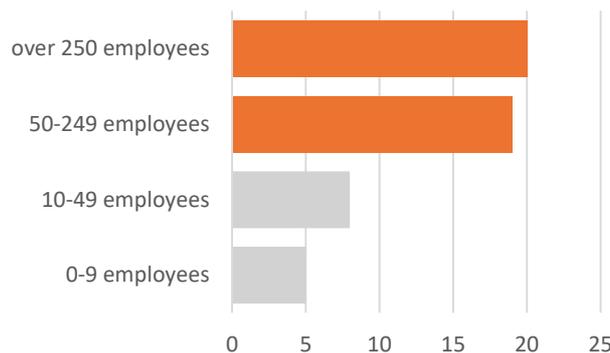


Figure 2 Graphical representation of answers – question 2 (own processing)

For the question: *“In which region do you operate?”* is Trnava region (28 respondents) and Bratislava region (24 respondents) are the most common answers.



Figure 3 Graphical representation of answers – question 3 (own processing)

For question: “Have you ever used any form of service or product based on Blockchain technology to manage your business?” is No (orange) the most appearing answer (81.1%), Yes (13%), I don’t know (2%), Lack of information (2%), Absolutely not (1%), On the plan (1%).

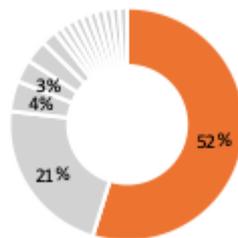


Figure 4 Graphical representation of answers – question 4 (own processing)

Assumption A1 "Less than 50% of industrial enterprises in Slovakia have no practical experience in their Blockchain management system." Therefore, the assumption was proven.

For the question: “What are the activities, which could be supported by Blockchain?”, the answers show that up to 38 respondents (40%) said they could use blockchain in connection with finance. 26 (27.4%) respondents reported communication. In addition, 25 respondents (26.3%) reported human resources and 25 respondents (26.3%) said they could not imagine blockchain technology in any business. 24 respondents (25.3%) decided for marketing. 16 respondents chose education (16.8%) and the remaining respondents said they could not assess the issue.

For question: “What reasons prevent you to take advantage of the Blockchain technology in your company?” Lack of knowledge of options appears most often. The answer suggests that up to 66 respondents (69.5%) said that the biggest obstacle to using technology is the technology ignorance. In addition, 22 respondents (23.2%) reported reluctance to innovate and 13 respondents (13.7%) reported high development costs. 10 respondents (10.5%) identified the unnecessary concept and 6 respondents (6.3%) reported negative experiences. The rest of the respondents said they were unable to assess the issue.

Assumption A3 “More than 50% of industrial enterprises in the Slovak Republic consider the main obstacle to the integration of Blockchain technology to the time and cost of development or ignorance of the technology in question” is confirmed.

Discussion

If an enterprise wants to be competitive and innovative, it must constantly develop new opportunities, methods and solutions. Therefore, the management of the company will be faced with challenging issues that will need to be resolved. One of the many questions will be the implementation of various technological solutions, such as Blockchain. Therefore, the work is focused on the current innovative possibilities of implementing this solution in industrial enterprises and describing its positive impact on the industry. This innovative digital feature provides the ability to set aside intermediaries, streamline processes and improve overall security as well as simplify data management. The main goal of implementing this innovation is market security and integrity, system stability in terms of data protection, combating various types of fraud and eliminating other existing negative impacts.

Therefore, the assumption A2 “*At least 10% of industrial enterprises in Slovakia use or could use various modifications of Blockchain technology in company management*” is proven.

In today's systematically evolving digital era, we consider it very important to keep abreast of the current trends and be on the "pulse of the day". These solutions ultimately bring us a new paradigm for the functioning of the company and have the potential to redefine the functioning of the company as we have not known it before. The definition of a new company based on the new principles of more sophisticated Peer to Peer system solutions builds the pace of systemic changes that will bring a more efficient, fairer, decentralized and ultimately more human society.

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