International Journal of Engineering & Technology, 7 (4.8) (2018) 790-795

International Journal of Engineering & Technology

Website:www.sciencepubco.com/index.php/IJET

Research paper



The Blockchain Technology as a New Approach of Promoting Organic Products to the Market

Iryna Chychkalo-Kondratska [1]*, Lyubov Tytarenko[2], Olexandr Kalnik[3], Iryna Novytska[4]

1Poltava National Technical Yuri Kondratiuk University, Ukraine
2 Poltava National Technical Yuri Kondratiuk University, Ukraine
3 Poltava National Technical Yuri Kondratiuk University, Ukraine
4 Poltava National Technical Yuri Kondratiuk University, Ukraine
**Corresponding author E-mail: chichkalo.irina@gmail.com*

Abstract

The authors analyze the problem of promotion of organic products both to the domestic and foreign markets. The approaches to the definition of the essence of concepts "organic products" and "blockchain technology" are generalized. The brief analysis of organic products market is provided; the prospects of market development are set. The basic tools of promotion of organic products both to the domestic and international markets are determined. It is proposed to use a new blockchain technology in the logistics chain as a part of promotion of organic products to the market. The positive and negative aspects of the interaction of the blockchain technology with logistics are revealed. This technology, due to its positive characteristics, will increase the number of potential consumers of organic products, in particular through more sophisticated and transparent supply of organic products not only to the domestic, but also to the international markets.

Keywords: *blockchain technology, logistics, promotion to the market, organic products, logistics chains.*

1. Introduction

Today, the market for organic products is growing rapidly around the world. Such products comply with the approved production, processing and marketing standards. In particular, the use of synthetic fertilizers, pesticides and genetic modification is not allowed. One of the main reasons for the increased demand for organic products is that they are more environmentally friendly and more useful than traditional ones.

According to the European Union standard, the terms "ecological", "biological" and "organic" agriculture are practically synonymous. For example, IFOAM uses the term "organic farming" or "organic agriculture" in its official documents. In scientific publications, the term "ecological agriculture" is often used. In this case, organic agriculture will be a part of the ecological one, in which the conditions for conducting business, fixed in various standards (ATTRA, IFOAM, Bioland), are clearly stated.

Although the above-mentioned systems of non-traditional alternative agriculture have certain differences, they all share common features, in particular the reduction of dependence on industry and other sectors of economy, increase of self-sufficiency and self-support of farms, environmental protection, conservation of scarce resources, production of environmentally friendly healthy food, reduction of energy consumption, establishing direct relations with consumers of products [1]. In our opinion, this is a way of organizing and deploying production processes, when at a minimum cost of living and substantiated work and the minimum damage caused by nature, society reaches the maximum output of high-quality products and ensures maximum environmental protection, ecological balance. Thus, when demand from the consumer side increases, in turn, the struggle among manufacturers for their place in the market niche is increasing. The urgency of this problem is due to the presence of a significant number of problems in most enterprises supplying organic products to the market. At the same time, at many enterprises, the problem of developing and implementing the policy of commodity turnover is very acute and forms a significant part of the work of marketing specialists. Indeed, competition grows not only among the largest domestic representatives and numerous small enterprises, but also among foreign manufacturers. Almost every organic company is interested in increasing the share of its products in the market.

In order to stand out among the majority, organic producers are trying to apply new technologies in encouraging potential consumers, including the effective promotion of organic products and the use of the latest blockchain technology.

Only a part of this problem has been considered by the researchers. Thus, Fernanda Galgano considers the production and supply of organic cheese [2]. Roberta Tolve researches the market for organic products in her work; the author emphasizes the growth of the market in response to the ever-increasing demand for organic products. They are often considered to be more nutritious, healthy, and free of pesticides than conventional foods. However, the results of scientific studies do not show that organic products are more nutritious and safer than conventional foods. The author compares traditional and organic products, focuses on livestock products. The data available in the modern scientific literature are often contradictory, even if the differences are often associated with breeds adapted to organic or conventional production systems. In order to have a clear understanding of the role that the organic

Copyright © 2018 Authors. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

effect plays in products of animal origin, further research is needed [3].

Teresa Scarpa, Marisa Carmela Caruso consider organic production standardization methods, including the Oxitest method, which was recognized by the International Standard AOCS procedure due to the efforts of VELP Scientifica to develop a tool and method in collaboration with universities and research centers. The new method is found in AOCS Official Methods and Recommended Practices [4].

In their work, Rock B., Puhalenthi K. and Vishnupriya S. consider high population growth and life expectancy in recent years, which has increased the demand for food products in India. In their view, in order to supply the demand, the green revolution has become the cornerstone of agricultural achievements. Excessive exploitation of natural and non-renewable resources has disturbed the ecological balance and endangered the health of consumers; therefore it is impossible not to resort to organic food. The purpose of the study was to assess the awareness of organic food among consumers in the area of Trichy, Tamil Nadu [5].

David Pearson and Joanna Henriks research in their work the marketing of organic products. The authors highlight the problems that permeate the national, organizational and individual differences of the global organic industry. These ideas are interpreted through the marketing mix of products, prices, promotion and distribution. It follows that a significant part of the clients who spread throughout the community buy organic products, most of which only periodically. The most important attributes of organic products are health, quality and the environment. The advancement of these benefits has the potential to demonstrate that even at a higher price they still offer a price for money [6].

Kilbourne W. and Beckmann S. also criticized the object of research of environmental marketing. In their view, organic marketing requires a revision of the main assumptions of the school of marketing, and management perspectives are more likely to call the stability of the system into question. This means that the emphasis in research should shift from micro to macro level, where dominated social paradigms, the system of values, and general view on environmental issues are studied [7].

The peculiarity of organic products marketing is determined primarily by its object. The organic product differs in that it cannot be considered in isolation from production. V. Kilborn and C. Beckmann are working on the analysis of the organic products market, but none of them raised the issue of promotion of organic products.

The problem of blockchain technology in economics is researched by some scholars. Srdjan Atanasijevic notes that the main benefits of blockchain are trust based on the transparency of the self-copying of all transactions, secure data sharing through a reliable network of publicly available systems used in many industries, finance, medicine, education, logistics, etc. He predicts a good future for the use of blockchain technology [8].

Kay Smarsly also emphasizes the popularity of this technology. IOTA, as one of the platforms for creating Internet connections, offers some advantages over blockchain when using links rather than blocks (or chains) such as increasing the scalability and efficiency of operations. In the scientist's opinion, in the future IoT connections and IOTA can be a base for various applications, for example, for machine communications or micro-payments [9].

Hamit Can is inclined to use a decentralized model (blockchain) as a solution for IoT, focusing on security and privacy; but at the moment it's not possible to find a unique solution to this problem [10].

In addition, N.G. Yatskiv and S.V. Yatskiv consider the prospects of using blockchain technology in the Internet of things. [11].Viktor Diordiiev emphasizes that the blockchain technology becomes one of the main driving forces of innovation in the global economy. Its implementation will have a huge impact on the way businesses and governments operate, and the way people organize their daily lives. The financial services industry is currently experiencing the greatest impact of the blockchain revolution, and financial institutions are among the first users of the technology. He considers the possibilities of implementing blockchain in the field of maritime transport, where this technology is able to change the industry significantly [12].

2. Statement of the main material

Our analysis of existing scientific works has shown that the researches do not cover all possible areas of application of blockchain technology. In this article we determine the prospects for the development of blockchain technology and evaluate the feasibility of its implementation in the construction of logistic chains of organic products.

According to the IFOAM (International Federation of Organic Agriculture Movements) [13], organic agriculture includes all agricultural systems that promote environmentally, socially and economically directed food and dietary fiber production. Reuse of nutrients and enhancement of natural processes help to maintain soil fertility and ensure successful production. By supporting the natural abilities of plants, animals and landscapes, this action is aimed at optimizing quality in all aspects of agriculture and the environment. Organic agriculture dramatically reduces the external contribution through natural methods and substances, increasing agricultural productivity and resistance to disease. IFOAM pays great attention and supports the development of self-functioning systems at local and regional levels [14].

In different countries, different terms are used to refer to agricultural practices that are consistent with the principles of organic agriculture:

- organic agriculture - England, the USA, Ukraine;
- biological agriculture - Austria, Germany, Georgia, Switzerland, Italy, France;
- natural agriculture - Finland;
- ecological agriculture - Sweden, Norway, Denmark, Spain;
- environmentally friendly agriculture - Estonia [15].

Organic production varies from small farms to large-scale high-tech enterprises. The latest study, conducted in 2014, included data from 172 countries worldwide for certified organic agriculture. Australia, Argentina and the USA had the largest area of land used for organic agriculture [16]. The average share of organic agricultural land in the countries included in the survey was 1%; however, organic farming in 11 countries was more than 10%.

Retail trade and international trade data were available on approximately one-third of the countries included in the 2016 report and showed that the countries with the highest retail selling price of organic products in 2014 were:

- the US - 27.1 billion euros, which is 2.8 billion euro more than in the previous year;
- Germany - 7.9 billion euros, growth compared to 2013 amounted to 0.3 billion euros;
- France - 4.8 billion euros, which is 0.4 billion euro more than in the previous year;
- Canada - 2.7 billion euros;
- the UK - 2.3 billion euros [16].

In 2013, the official figures for the organic market were first published by China (2.4 billion euros), marking it the fourth largest country in the world organic produce market. And in 2014, retail sales of organic products amounted to 3.7 billion euros.

The largest expenditures on organic products per capita are observed in Switzerland (210 euros) and Denmark (163 euros) [17].

The number of farms is growing, and therefore, the supply of organic products is increasing, as evidenced by indicators of organic production in Europe (Table 1).

Table 1: Indicators of organic production in Europe [16]

Country	Number of farms	Area, thousand hectares
Germany	25 078	1 088 838
Turkey	69 967	486 069
Switzerland	6 244	137 234
Latvia	3 634	231 608
Ireland	1 709	73 037
Ukraine	390	410 550

The study by Grand View Research has shown that the organic food and beverage market will grow annually by an average of 15.5% over the 2018-2020 period. The projected total market for organic products will be about $ 212 billion.

It is expected that by 2020, the Asia-Pacific region will be the leader in organic farming. Organic food is produced without food additives, dyes, GMOs, synthetic agro-chemicals, growth hormones, antibiotics. According to IFOAM, organic farming today is practiced in 172 countries, 82 of which have their own laws in this area. 16 countries are in the process of developing and adopting a regulatory framework for organic farming.

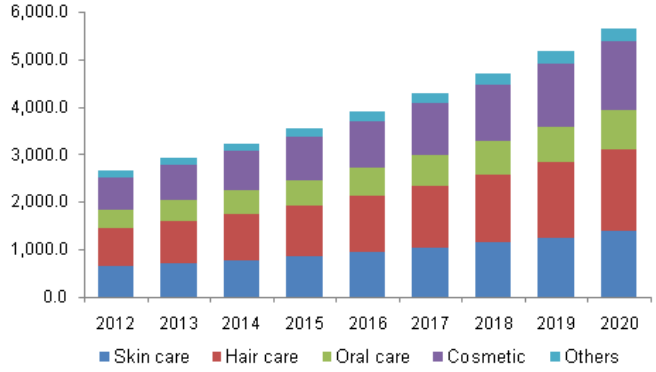


Fig. 1. Growth of the organic products market in the USA in 2012 - 2020 [17]

Today, producers of major European countries are making a lot of efforts to raise interest and increase confidence in organic products. This conditioned the growth of the role of the system of promotion of products in connection with the increased competition for the consumer, increased risks associated with the creation of new products and increasing requirements for the quality standards of the product. In these circumstances, the success of an enterprise largely depends on how much it is able to manage a complex functional system of marketing communications. Promotion of products is an important part of the marketing activity of any organic enterprise and needs an appropriate organization and planning. In general, the instruments for promotion of organic products on the market can be divided into six main groups:

1. Holding of specialized exhibitions of organic products on a regular basis.

The most famous and largest of such events is BioFach exhibition held annually in Nuremberg under the leadership of the International Federation of Organic Farming (IFOAM). The Ukrainian national pavilion was presented at BioFach 2018 for the 5th time. The pavilion has increased almost twice from about 70 sq.m. in 2014 to 130 sq.m. in 2018, and the number of exhibiting companies increased from 8 to 20. The Ukrainian forum, which has already become traditional, was organized on the basis of BioFach and attracted 90 participants from 15 countries such as Ukraine, Switzerland, the UK, Italy, the USA, Canada, Argentina, the Netherlands, Turkey, Germany, Austria, Lithuania and others.

According to “Organic Ukraine” Association, in 2019, 30 companies are planning to participate in the exhibition, which is 50% more than this year [17]. This testifies to the rapid growth of certified organic enterprises in Ukraine and the possibility of finding new markets. Similar exhibitions are held in different countries and regions of the world. Within the framework of such exhibition events, the main organic food and raw materials are displayed.

Simultaneously with these events, workshops on the promotion of organic products to local markets are conducted using the marketing tools and PR-company "Organic food as a healthy way of life".

The target audience for such events is, above all, representatives of retail and wholesale companies, food companies involved in the organic products sector, as well as end-users of this product.

2. Holding of international contests of organic products in cooperation with the media.

The most famous competition is the competition for the International Organic Wine Prize, held in Germany under the leadership of the International Organization of Vine and Wine (OIV). To hold this competition, the representatives of the press, a large number of wine-growers and, of course, end consumers of products are invited. Traditionally more than two thousand samples of products take part in the competition.

3. Extension of physical promotion (distribution) of products through retail network.

In most developed countries, the retail distribution chain prevails among organic food distribution channels, including such forms of sales as discounters (chains of stores that sell goods at reduced prices). Also, the number of specialized stores is increasing. They provide delivery of organic products from the manufacturer to corporate clients. For VIP-clients, personal delivery of products to the doors of the houses is provided. A similar way of working with VIP clients is also applied in Ukraine (for example, LLC Global Organic-Group) [14]. In addition, the retail organizations very often carry out an active advertising company of organic products under their own logo.

4. The EU constantly supports the producers of organic products, in particular through the work of the International Federation of Organic Agriculture.

As a part of the European Commission's projects, organic farming is subsidized, as it cannot compete with traditional farming because of its high expenses. In addition, in most EU countries, programs for financing the development of the use of tools for promotion of organic products to consumer markets are actively being implemented.

5. Measures to expand the target audience of consumers.

Organizing of events to promote healthy lifestyle, aimed at parents and children themselves, adolescents as future active consumers. For example, in order to encourage children and adolescents to consume environmentally friendly products, organic products are used for cooking school lunches in Italy; the "organic school" program is under way in the Czech Republic [15]; in Germany, the program for the payment of awards for the promotion of a healthy lifestyle is being implemented on an ongoing basis, and cooking courses for schoolchildren are organized [16].

6. Organization of the system of support for the delivery of organic products to the end-consumer without intermediaries.

This measure is aimed at supporting farms producing organic products in terms of delivering grown products to the end-consumer. This activity is relevant for the reason that most owners of organic farms cannot afford to open their own store and maintain it.

Having analyzed the main tools for promotion of organic products, we propose to consider the system of marketing logistics as a means of promoting organic products to the end-consumer.

Thus, today, marketing logistics is a system of planning and action that guarantees timely delivery of ordered goods using the right vehicles, in the fastest and, if possible, the cheapest way [19]. The structure of marketing logistics combines the marketing tools and the implementation of the distribution and delivery of goods to the point of contact with the consumer. The decisions taken in the distribution zone, in the first place, must meet the goal of the created product. The manufacturers face the question of the channels of product promotion, which is connected not only with the way of delivery of the products to stores, but also the choice of

the type of store, its location, forms of sales, affecting the way of products transfer to consumers. The correct choice of product type, its structure and characteristics allows to reduce problems while promoting the product.

An organic product has its own peculiarities that influence the choice of marketing tools, the location of a network of shops and sales forms. There are also links between the distribution of organic products and the activation of sales. They exist primarily between the type of distribution channel and the intensity of sales intensification. For example, a manufacturing company can conclude that it is more profitable to sell the product directly to retailers or even to consumers, because the wholesale intermediary does not support the sale of the manufacturer's products, even if this method is more expensive. If indirect sales of organic products use longer distribution channels, more attention should be paid to the problem of the interests of potential consumers to the manufacturer using intensive and direct commercials.

One of the functions of marketing logistics is to find out who your customer is and how to get a product or service for the client. Each customer may have individual needs, so the provided logistics services may vary depending on the specific needs of the client. But regardless of these differences, customers expect 100 percent compliance and guaranteed reliability at any given moment in each transaction. Therefore, marketing logistics includes order filling, timely delivery, accurate invoicing and zero loss [18].

The enterprise makes decisions on prices taking into account both internal and external factors. Marketing logistics should recognize the price drivers. The customer profile, product, and order type are the factors that shape the price. These changes are not usually controlled by marketing logistics. However, marketing logistics should respond to these factors and understand how they affect customer decisions. Discounts, depending on the quantity of goods and the associated structure of material and technical costs, can affect the price the customer will ultimately pay for the product [19].

Promotion is another important aspect of the marketing logistics process of the organization. When the product is released to the market, the organization must coordinate the logistics of various marketing structures. For example, the art department can design work for aesthetic product packaging, and an external supplier can create packaging with a cover. Marketing logistics can help to ensure the co-operation of all these organizations and marketing structures and departments necessary for product sales [7].

The function of the place in the marketing logistics allows the organization to simplify the transaction between the supplier and the client. An enterprise should use logistics in such a way that the client does not experience the difficulties associated with the logistics process. For the client, the result is always more important than the process. In addition, the location of the plant, warehouse and customer can significantly affect the process of marketing logistics by increasing or reducing costs. For example, the placement of a factory in Mexico could reduce labor costs associated with the product. To achieve this goal, we propose the commodity producers of organic products to consider the possibility of using a new technology to promote the product as part of the logistics chain.

While the Internet can help firms export more, the transportation of goods is mandatory for domestic and cross-border e-commerce. Efficient functioning of the infrastructure of road transport, ports, postal delivery services, and customs assistance facilitate the timely execution of orders. Inefficiencies in the logistics system (including freight, warehousing, customs clearance and internal delivery of mail) increase the trading costs of e-commerce firms, and especially small and medium-sized enterprises.

Lack of logistics remains an obstacle to the growth of e-commerce of physical goods in many developing countries. The main problems can be related to the following factors:

- logistics and transport infrastructure, for example, increased congestion in city centers, bottlenecks in ports and on roads, poor transport infrastructure outside city centers;
- access to quality services in a competitive environment, in particular the lack of courier delivery services, which can ensure fast and reliable delivery of parcels; possible partnership between the private postal sector and local post offices;
- efficiency of customs clearance procedures and trade barriers - complication of customs procedures, administrative formalities and increasing requirements to documents, problems with tax refunds.

E-commerce and the digital revolution have triggered the emergence of new business models that affect the supply chain configuration. These models combine additional inter-firm and internal functions (related to physical, financial and information flows) and widely use technological solutions for improving retail experience. In this regard, improving the infrastructure of transport services and distribution networks can be important elements in the development of transport systems that promote the spread of e-commerce in developing countries.

The efficiency of postal services and the operation of air transport is very important in the context of e-commerce and, in particular, parcel transportation. In addition, maximizing the contribution of transport and logistics to e-commerce can also include increasing chain efficiency, for example: improving transport logistics in cities, linking urban and rural areas, as well as between warehousing centers and consumption centers. Improving multimodal connections and transit modes to improve the efficiency of corridors can also help reduce shipping costs in the supply chain and expedite delivery.

E-commerce platforms use network technologies to support the acquisition of materials, warehousing and transportation. E-commerce transport systems seek to improve communication, increase transparency in the supply chain, increase customer satisfaction, optimize distribution and logistics, reduce costs, and ensure timely delivery. The development of such network technologies creates new opportunities for improving the organization and tracking of supplies, the search for freight alternatives, and so on.

At the present stage, in order to achieve the effective promotion of organic products, it is necessary to link it with new technologies, information, money and numerous documents. To achieve these or other tasks, it is necessary to involve numerous intermediaries, whose cooperation involves dozens of different operations.

We propose to use the blockchain technology to promote organic products. The task of the technology is to address the problems associated with significant material (paid intermediary services) and temporary costs (paper and other delays in the documentation process). Let's consider the main features of this technology. In its structure, blockchain is a chain of blocks that contain certain information. In this case, all the blocks of the chain are connected with each other. The block is filled with a group of records, and new blocks are always added to the end of the chain and duplicate the information contained in the previously created structural units of the system, adding to it new one. Building a chain of blockchain takes place on the basis of three main principles - distribution, openness and protection. System users form a computer network. At the same time in each of the personal computers a copy of each of the blocks is stored. This principle makes the system almost invulnerable. The only variant of the system failure is a possible breakdown of all computers simultaneously, which, given the total number of scattered unevenly across the entire surface of the planet's computing nodes, is impossible. All data in the system are protected. The blockchain chains are securely encrypted, which opens the way for getting reliable and open information, and it is very important for consumers. The system users use a special key to log in and identify themselves.

While earlier blockchain has been associated with cryptography, today we propose to apply it to a new level. Investors and entrepreneurs in the field of production of organic products are paying close attention to the development of smart contracts. These are digital contracts, which are controlled by algorithms

rather than people. In practice, this ensures transparency (the history of all actions with each object is visible) and security (all records are encrypted).
This technology is cheaper in terms of:
- financial transactions;
- registration and verification of documents authenticity;
- identification of users;
- protection of intellectual property;
- storage of information;
- maintenance of various registers;
- management of enterprises;
- supply chains;
- contract conclusion and execution.

According to experts, mass consumption of blockchain will begin after 2020 [17]. By saving on paperwork and other business processes, most products and services will become cheaper for end users. And since organic products today are too expensive, this will solve the issue of cheapening them. The market will not need different intermediaries: notaries, bank payments, forwarders, firms involved in the storage, processing and protection of information, etc. This will cause significant changes in market infrastructure.
In our opinion, the main positive aspects of implementing the blockchain technology are: cost-effectiveness; transparency; security; protection against corruption; the possibility to create sectorial alliances by connecting suppliers, partners and even competitors to them.
Among the shortcomings of the functioning of the blockchain technology the following should be noted: its performance is lower than the high-capacity systems; insufficient number of developers; large investments in IT infrastructure; system support requires the formation of a staff of specialists.
Let us consider the effect of using the blockchain system taking the three logistics streams as an example and determine its benefits in the implementation of international cargo transportation.
When servicing the material flow, the blockchain system reduces:
- the term of the order execution due to the reduction of the number of intermediaries in the chain;
- delivery time (3% on each forwarder);
- significantly increases the real amount of earnings for the carrier.

The blockchain system optimizes information flows, creating the preconditions for:
1) the formation of a single information space;
2) the appearance of all documents on transportation in open access;
3) reducing the processing time of documents;
4) reduction of inspection time by the tax inspectorate;
5) insurance of loads in one click;
6) submission to the customs authorities of documents from the head office;
7) minimizing the accompanying flow of information [10].

Support for the financial flow by the blockchain technology forms a system of interaction with the following characteristics:
1) the complete lack of intermediaries;
2) intermediary banks are unnecessary;
3) the commission is collected once;
4) reduction of expenses related to the cost of cargo transportation;
5) reduction of processing time;
6) risks are minimized;
7) optimization of the flow of financial resources at each stage allows to save up to 3% per annum [18].

Having analyzed the experience of the Republic of Belarus, we note that the implementation and creation of the blockchain system for increasing the efficiency of transport logistics, as well as the introduction of technology in all enterprises and transport and logistics companies can be provided by a coordination organization established on the basis of the Association of international carriers "BAMAP" and the Association of International Freight Forwarders and logistics "BAME".
Thus, the advantages of the blockchain technology are as follows: information is always open for everyone; ease of its verification and tracking; complete decentralization and independence, no authority can ban transactions or block access to blockchain.
Among the international IT companies, IBM has already offered some large companies from different fields to test their designs based on the blockchain principle. The International Blockchain Consortium Hyperladger was launched by the Linux Foundation in 2015 and currently brings together over 115 companies from across the board, including finance, automotive, healthcare, IT technology and aviation. The main goal of the consortium is to create a single open source blockchain platform that enables organizations around the world to implement blockchain technology in their business processes [9].
Another example is WalMart retailer, one of the first to believe in the expediency of blockchain using. It is currently testing a new IBM technology for supplying mangoes to the United States and pork to China. According to the company, the introduction of this technology will increase the efficiency of inventory management and ensure the safety of food supply, which is especially important after the outbreak of salmonella in 2006. At that time, with the use of paper document circulation, the company spent about two weeks for the identification of the source of infection. Blockchain will allow to get full information about any batch of goods entered in the database in seconds, due to the peculiarities of the technology.
The end users will benefit from transparency of the supply chain, as they will be able to be sure of the safety of products, their freshness, the absence of GMOs and unwanted additives. One can also know for sure that, for example, purchased tuna is caught not in a poaching way: blockchain began to use the British Provenance startup just to protect itself from this kind of accusations. The company, using blockchain technology, monitors the movement of tuna by controlling its catch and delivery [13]. EverLadger company uses blockchain in the supply chain to confirm the source in diamond trade.The Assetcha.in startup enhances the security of the storage of valuable things with blockchain. Midasium, with the help of blockchain, operates rental agreements on the real estate market [19].

3. Conclusions

Thus, the potential of using blockchain technology, its protection against unauthorized access and full transparency make it an ideal tool for a revolutionary way of managing supply chains today.
Supply of physical goods usually involves the integration of information flow, transportation, warehousing and often security. Logistics chains often cover numerous stages and hundreds of geographic locations. It is clear that it is difficult to keep track of events throughout the chain, to check how goods are transported, and to react quickly to unforeseen circumstances. This is also relevant for the transportation of organic products, especially to the external market.
Blockchain has the potential to address all of the above issues. Being a transparent public register, it will provide clients and auditors with simple and effective tools to track the entire route. One of the important features of blockchain is that it can provide its benefits only if all members of the logistics chain have access to the network. In addition to addressing industry-specific problems, blockchain provides a number of instant benefits. It not only eliminates intermediaries and significantly reduces the amount of workflow, but also offers reliable protection, error reduction, preventing the mis-labeling of illegal goods and other fraud attempts. Besides, the new paradigm promises enormous potential benefits of cost savings for the industry.
This technology, with its positive characteristics, will allow producers of organic products to increase the number of potential consumers, as blockchain will provide the opportunity to perfectly

and transparently supply organic products not only to the domestic market, but also to the international market, to reduce their price.

References

[1] Orhanik v Ukrayini / Federatsiya orhanichnoho rukhu Ukrayiny [Elektronnyy resurs]. – Rezhym dostupu: http://organic.com.ua/uk/homepage/2010-01-26-13-42-29

[2] F. Galgano, G. Suzzi, F. Favati, M. Caruso, M., Martuscelli Biogenic amines during ripening in 'Semicotto Caprino'cheese: role of enterococci // F Galgano, G Suzzi, F Favati, M Caruso, M Martuscelli. - International journal of food science & technology, 2001

[3] F. Galgano, R. Tolve, M. Colangelo, T. Scarpa, Conventional and organic foods: A comparison focused on animal products - Cogent Food & Agriculture, 2016: http://dx.doi.org/10.18203/2394-6040.ijcmph20175319

[4] Conventional and organic foods: A comparison focused on animal products. Fernanda Galgano ,Roberta Tolve ,Maria Antonietta Colangelo ,Teresa Scarpa &Marisa Carmela Caruso | Fatih Yildiz (Reviewing Editor) Article: 1142818 | Received 17 Dec 2015, Accepted 12 Jan 2016, Accepted author version posted online: 19 Jan 2016, Published online: 12 Feb 2016 Download citation https://doi.org/10.1080/23311932.2016.1142818

[5] Rock B., Puhalenthi K., Vishnupriya S., Pavithra R., Supriya A. S., Gayathri K. A study on awareness of organic food products in Trichy district. International Journal of Community Medicine and Public Health | December 2017 | Vol 4 | Issue 12 Page 4490 Available from: https://www.researchgate.net/publication/321261712_A_study_on_awareness_of_organic_food_products_in_Trichy_district

[6] Marketing Organic Products: Exploring Some of the Pervasive Issues David Pearson & Joanna Henryks Pages 95-108 | Published online: 08 Sep 2008 Journal of Food Products Marketing, 11: 63–76. https://doi.org/10.1080/10454440801986421

[7] Kilbourne, WE, Beckmann, SC, & Thelen, E. (2002). Rol domynyruiushchei sotsyalnoi paradyhmy v ekolohycheskykh otnoshenyiakh: mnohonatsyonalnaia ekspertyza. *Journal of Business Research* , *55* (3), 193-204. DOI: 10.1016 / S0148-2963 (00) 00141-7

[8] Srdjan Atanasijevic [Elektronnij resurs]. – Rezhim dostupu: https://www.linkedin.com/in/srdjanatanasijevic

[9] Kay Smarsly International Workshop "Coupled Numerical and Experimental Models in Structural Engineering" https://www.researchgate.net/project/GRK-1462-International-Workshop-Coupled-Numerical-and-Experimental-Models-in-Structural-Engineering

[10] Can, Hamit and Paskaleva, Mariya, Macroeconomic Determinants of CDS: The Case of Europe (October 1, 2017). New knowledge Journal of science, Vol. 6, No. 3, 2017. Available at SSRN: https://ssrn.com/abstract=3157461.

[11] N.G. Yatskiv, S.V. Yatskiv, Perspective of the technology of blocking the Internet. DOI https://doi.org/10.15421/40260857

[12] Viktor Diordiiev The technology of blocking and iï vplyv on finansovi sgigi ta sgigi morskih perevezen DOI https://doi.org/10.31520/2616-7107/2018.2.1-5

[13] Marketing Organic Products: Exploring Some of the Pervasive Issues David Pearson & Joanna Henryks Pages 95-108 | Published online: 08 Sep 2008 Journal of Food Products Marketing, 11: 63–76. doi:10.1300/J038v11n04_05. Canberra, Australia: Department of Agriculture, Fisheries, and Forestry. Download citation https://doi.org/10.1080/10454440801986421

[14] Food crises, food regimes and food movements: rumblings of reform or tides of transformation? Eric Holt Giménez & Annie Shattuck Pages 109-144 | Published online: 13 Jan 2011. Download citation https://doi.org/10.1080/03066150.2010.538578

[15] Consumer behaviour towards organic food in porto alegre: an application of the theory of planned behaviour. *Cogent Food &* Agriculture Rev. Econ. Sociol. Rural vol.51 no.1 Brasília Jan./Mar. 2013 http://dx.doi.org/10.1590/S0103-20032013000100004

[16] How does organic agriculture contribute to food security of small land holders?: A case study in the North of Thailand. *Journal Cogent Food &* Agriculture. Published: 19 January 2018 https://doi.org/10.1080/23311932.2018.1429698

[17] The World of Organic Agriculture – Statistics and Emerging Trends 2017 / Organic Farming and Market Development in Europe and the European Union // [Elektronnyi resurs]. – Rezhym dostupu: http://orgprints.org/31187/1/willer-etal-2017-europe.pdf.

[18] Organichna polityka u 2017 roci 5 vektoriv rozvytku [Elektronnij resurs]. – Rezhim dostupu: https://agropolit.com/spetsproekty/236-organichna-politika-u-2017-rotsi-5-vektoriv-rozvitku .

[19] Luisa Rodriguez The role of transport and logistics in promoting e-commerce in developing countries. Article No. 17 [UNCTAD Transport and Trade Facilitation Newsletter N°77 - First Quarter 2018] http://unctad.org/en/pages/newsdetails.aspx?OriginalVersionID=1705 last visit: 19.09.2018