

VALUE CREATION AND VALUE ADDED IN BLOCKCHAIN TECHNOLOGY

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ABSTRACT

Blockchain technology has been evolved in the last years and its area of utilization has been increased, also. The purpose of this study is to analyze the relationship between organizations using the above mentioned technology and value, to identify the general and specific sources of value, respectively. The evaluation of value perceptions is a long-term research while the blockchain-based projects are very recent. Therefore, the value creation and value added concepts are very helpful for start-ups, entrepreneurs as well as stakeholders. Considering the untraditional management of such organization the paper presents the traditional approach of value- created and added and adapts them in the area of information technology through the specific instrument of these businesses- smart contract. Also, how other aspects like decentralized management or virtual coin could develop value for business are discussed. The outcome is that the paper offers some conclusions which could be helpful for investors but, more important for those who want to develop projects using this new technology.

KEYWORDS: *blockchain technology, decentralized management, smart contracts, value creation, value added,*

1. INTRODUCTION

In this part, we are going to have a brief understanding of the evolution of value perceptions in the history of economic thought, which has been evaluated by many researchers from different periods, and naturally there are many different understandings and descriptions for it. Researchers and scholars posit their opinions with different focus respectively within a certain context. As this article is about the value management in blockchain technology, the brief introduction of blockchain technology and its application is necessary and it can help us have a better understanding of the relationship between technology, information economy and value creation and added, ultimately .

Value is an important and generous concept. Because of its broad and various perceptions it is not easy for scholars or managers to have a stable and clear vision about its understanding. It is an especially challenging subject because of its subjective, intangible and emotional understanding. And with the influence from the societies and economic characters, it has to change based on all the

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influence such as those from capitalism economy, industry economy and information economy. The value has been understood to be more than just the direct and tangible financial value; there are more aspects and explanations of it, such as the relationship between sellers and buyers (Molendijk, 2017). Although at present financial and tangible value appears to be the dominant way that scholars and especially managers think value is, for a better understanding of the value concept, there is a must for approaching and perceiving value from the perspective of a wide range of stakeholders. It is obvious that value is perceived in different ways by different stakeholders. When we refer to different sectors is even more obvious. Thus, we consider important to study how value is perceived in the blockchain related projects in order to have a better idea of what value management could mean and more important, how can it be created.

2. LITERATURE REVIEW

2.1 The understanding of value, value creation and value management

Value creation is a central concept in the management and organization literature for both micro-level (individual, group) and macro-level (organization theory, strategic management) research (Lepak, Smith & Taylor, 2007). As created in different economic background, there is a multiplicity of meanings and understandings about the concept of value and little consensus over what value creation entails. Value and value management have been described as a balancing job between the satisfaction of many different needs from customers and the resources used in production of goods or delivery of services. Value in contemporary project management has shifted from ideas of 'value management' to ideas of 'understanding how stakeholders value different things' (Oliomogbe & Smith, 2013). The stakeholder theory began to show its importance and the research related to value has become more complex as more factors are considered together. The research is more difficult and complicated because value-related issues come from the subjective, complex and dynamic nature of value. Value can mean different things to different stakeholders. Complexity can be characterized as many varied and interrelated parts, including multiple levels and interdependencies between organizational elements, multiplicity of objectives, conflicting goals, multiple stakeholders and changing goals throughout the life of each project (Baccarini, 1996). So we have to understand value based on a dynamic background and with related references.

The concepts of value are always in a dynamic developing situation, in flexible environments no matter in past decades or nowadays. Thus, the evaluation of value is an ongoing process. Smith, A. (1776) mentioned in his book *The Wealth of Nations* that early theories associated value with an economic dimension, specifically value as a single entity in time and an output of labor. He explicitly stated and explored the basic dichotomy between 'value in use' and 'value in exchange'. A key point for Smith's comprehension for value is the division of labor. Smith defined the value of any commodity as 'equal to the quantity of labor which it enables the person who possesses it to purchase or command' (Pazaitis et al., 2017). But in the information economy, the dominating factor labor has been greatly influenced by its own development and more important by technology.

Ricardo, David. (1817) is critical of Adam Smith's 'adding-up theory' of value and shows his different understanding of value in his book *The Principles of Political Economy and Taxation* that value is value is indeed determined by their scarcity relative to the demand for them. He accepted the distinction between use and exchange value, but explicitly regarded the latter as the only one concerning economic analysis (Pazaitis et al., 2017).

Jevon (1871) develops the marginal utility theory which refers to the satisfaction that an individual gains from the consumption of an additional unit of a particular good in a given context (King & McLure, 2014). This theory dismisses any material embodiments of value and over-emphasizes the efficacy of free markets in coordinating any sort of meaningful action in societies, based on generalized assumptions, such as utility-maximization and equilibrium (Pazaitis et al., 2017).

According to Karl Marx's labor theory of value, value is essentially a social, objective and historically relative category; it is social because it is determined by the overall result of the fluctuating efforts of each individual producer. It is objective because it is given, once the production of a given commodity is finished, and is thus independent from personal (or collective) valuations of customers on the market place; and it is historically relative because it changes with each important change (progress or regression) of the average productivity of labor in a given branch of output, including in agriculture and transportation (Siew, 2018). He held that in capitalist production there are two processes of labor identified: first, concrete labor, which produces use values, the qualitative element of goods, representing 'the everlasting nature-imposed condition of human existence' and second, abstract labor, which creates exchange value expressed in a quantitative relation with money. Hence, for Marx the value of commodities does not hold any connection with their material substance or usability (Pazaitis et al., 2017). The latter abstract labor gives more theoretical support for our analysis of the value creation and added in projects in information economy.

At present, as Allee (2000) put forward that value is identified as the return of a fair price or exchange by recipients for the benefits received from goods, services or knowledge that are deemed desirable or useful in both tangible and intangible forms. So we can find out that the value has attracted more attention from the tangibles such as financial and other capital-based resources in a firm to intangibles include relationships and trust, employee knowledge and competencies, group effectiveness, organizational structures and efficiencies. This is a reflection of the social development with the coming of information economy and the development of technology in challenging and creating value. Allee (2000) extends the commonly addressed perspectives of value revolving around monetary assets, alliances and relational, intellectual, human and structural capital by offering alternative views of intangible assets that were previously said to be unseen and often unappreciated. These include corporate social responsibility and environmental sustainability. Allee (2000) defines value as a tangible or intangible good or service, knowledge, or benefit that is desirable or useful to its recipients so that they are willing to return a fair price or exchange.

In projects management there are two main perspectives of value creation – value engineering (VE) and value management (VM). Linma (2012) describes that in the broadest sense, value management can be defined as a process of delivering some benefits to a client. It is a combination of planning, developing tools and methods to find the optimum balance of project benefits in relation to project costs and risks. It is the process of planning, assessing and developing the project in order to make the right decisions about the optimized balance of the benefits, risks and costs. Value management allows increasing the likelihood of producing the deliverables and creating the benefits (Siew, 2018). Venkatraman, Henderson & Oldach (1993) posit that VM is a management process used to deal with investment decisions by applying a performance management system to maximize the benefits achieved and using evaluative steps to adapt the system over time. It is said to require links between the horizontal (i.e., process to outcome) and vertical (individual to functional to business) aspects of the business. Green (1994) describes VM is based on soft systems thinking (learning paradigm) and is therefore focused on establishing a common decision framework through a dialogue

process whereby key stakeholders are involved in the early stages of planning. The dialogue itself is dynamic and tends to be unstructured. Kelly, Male and Graham (2014) view VM as a philosophy or set of principles applying a structured method of management to improve organizational decision-making and value-for-money (Siew, 2018).

The value creation and its management could also be viewed as a strategic planning process to gain competitive advantage in business. The historical conditions influenced the gradual transformation of the perception of value, so as to efficiently coordinate human sociality towards what has been generally perceived as beneficial (Pazaitis et al., 2017).

2.2 The value and high-technology

After the capitalism and industrial economy, we are in the information economy where the difference lies in the new technological conditions that result to a new form of social organization, and information generation, processing, and transmission become the fundamental sources of productivity and power (Castells, 2010). The value concept and value management are correspondingly adjusted to the new economy system more relying on high-technology. The concept 'High-Tech' is assigned with multiple meanings as it is often associated with the emergence and use of new technologies (Grønhaug & Möller, 2005), such as blockchain technology. These new technologies represent opportunities, but logically also create uncertainties. Blockchain technology as a represent in High-Tech, creates important opportunities for financial industry and other industries in a promising way. Therefore, we assist today at the impressive booming of this technology related to projects and start-ups number. Meanwhile, the uncertainties are also kept as top topics in research and practical areas, also. The decentralized autonomous management and organizations based on blockchain technology are under tests. The trust has been moved from traditional endorsement to every single personal computer which represents another big and challenging step for those people who have adapted to the traditional, safe and stable financial system in their daily life. Customers may have trouble in understanding the new technology, and they may not perceive the possible benefits, while projects managers are trying to find the most effective management ways. With a positive attitude toward information economy mainly relying on information technology, the history of internet birth and development can give us a strong support in building trust and confidence for the future of blockchain related projects.

A clear understanding of the new products and services based on new technology is an important part in value perception and value added in this information economy. Simply developing a product or a service only because of new technologies seems to be a mistake as the number one reason for failure of startups (with 42%) is that there is no demand for the product in the market. A graph of the top 20 reasons why startups fail from CB insights gives us more considerations of the value creation in IT or High-Tech industry and projects. According to the investment by CB insights in 2014, the number one failure reason is NO Market Need. Then followed by Run out of Cash, Not the right team, Outcompeted, Cost issues, and so on. For the value management in IT, without the right targeted market, it means all the other resources and work are in vain such as great technology, great data on shopping behavior, great reputation as a though leader, great expertise, great advisors (<https://www.ukessays.com/essays/project-management/the-real-success-factors-on-projects.php?vref=1>).

A well-targeted market for blockchain technology now seems a quite easy objective but very hard topic. As the market seems to be quite clear in fact the steps to develop the market are challenging.

At present, the most active blockchain projects are oriented to financial markets, the second stage at present as Swan (2015) mentions that the Blockchain 2.0 is about the overwhelming application in business and financial areas. The following Blockchain 3.0 is the vast application of this High-tech tool in more industries and areas such as education, public health, and logistics and so on. When the new start-ups will develop market strategies in those areas, the market needs should be put on the first and priority position. Before attempting to sell a product or service, the entrepreneurs should run a competitive analysis of the industry, and realistically determine the company's offerings, which are related to the constructive, objective criticism from potential customers.

Besides the importance of targeted market, the combination of engagement with customers and other stakeholders in value management is critical to value added (Molendijk, 2017), especially when refer to intangible services. Customer is the key and central point but other stakeholders should be considered, also. The ability to communicate the benefits of the product to the customers is indicated as being at the heart of high-tech marketing. Companies should contact potential customers in an early stage, think about potential solutions and then test these solutions (Molendijk, 2017). The value creation and value management for blockchain technology projects is a combination of the existing theories on value and high-tech marketing. Successful value management for blockchain projects when trying to enter new or existing markets is seen as a struggle for a lot of startups dealing with the new challenges.

2.3 Value and Stakeholder theory

In stakeholder theory, value perception adjusts to different situations according to the stakeholder importance degree. In information economy, the technology like blockchain influences its distribution or focus.

Freeman (2004) describes the stakeholder theory like being a socially-oriented perspective and considers that managers articulate the shared sense of the value they create and derives from how core stakeholders are connected. Freeman and McVea (2001) posit the purpose of stakeholder management was to devise methods to manage the myriad groups and relationships that resulted in a strategic fashion. It addresses the diversity of stakeholders and their underlying objectives and finds a way to balance the different expectations in an effective way. Donaldson & Preston (1995) believe that strategy theory includes the legitimate interests of individuals, groups and communities who are affected or impacted by the activities of the organization, particularly stakeholders who could have an impact on the performance of the organization, strategic value generation and long-term success. Jones & Wicks (1999) point out that an organization should be managed in the best interest of all its stakeholders, including external and internal stakeholders from micro to macro level. Stakeholder theory therefore attempts to address the question of which groups of stakeholders deserve or require management's attention (Freeman, 2004). In essence, unless stakeholders are clearly defined and identified, it is be almost impossible for managers to deliver the value intended.

Stakeholders have differing and often conflicting viewpoints of value and competing goals (Hillman & Keim, 2001). It is obvious that some stakeholders are more important than others in different projects, even in different stages of a project. So if managers cannot develop the relationships of stakeholders in projects in a good way, they may result in tensions, misaligned interests.

Thiry (2001) suggests that managing value among multiple stakeholders involves sense-making as an interpretive activity grounded in the social process of projects; people make sense of and build a collective understanding of a situation to then develop a shared inter-subjective desired outcome. The

managing value in multi-stakeholder environments is easy to be trapped in the focusing too much on tangible deliverables. He advocates the adoption of value perception in complex, ambiguous and multileveled situations where multiple stakeholders are involved. Research indicates the importance of a well created value proposition for startups and the process of developing value propositions and the role of some stakeholders in value proposition development in general (Siew, 2018).

When we have clear positions of value in a project with various stakeholders, value creation and added seems easier to be approached. Frow & Payne, (2011) put forward that value propositions concept has a key role in value creation between stakeholders. Baldassarre et al., (2017) describes the process to develop a user-driven value proposition and a superior problem-solution fit should be adopted in a dynamic and iterative way. A three-step approach is proposed: (1) talking to users, customers and stakeholders; (2) thinking about potential solutions; and (3) testing these solutions early on moving towards problem-solution fit.

We believe these steps can be practiced in blockchain projects, also.

3. BLOCKCHAIN TECHNOLOGY, SMART CONTRACTS AND VALUE ADDED

3.1 Blockchain technology

There is no doubt that the blockchain technology is one of the most significant information technologies in last decade, and it has been listed as the four most potential information technologies of the future, together with artificial intelligence (AI), cloud computing, data science.

According to Frommany descriptions and definitions of blockchain, we can find that it is about a decentralized and trustless ledger which is working possibly in any computers in the world with Proof of Work (PoW). It has the characteristics of decentralization, trustless, being destructive, transparency, consensus mechanism, and cannot be manipulated and so on. All of these points are very beneficial for financial management and other industries.

Thanks to the creative and powerful properties of blockchain technology, the financial and even economic world has been processing a fantastic changing. Let's take a look what are those characteristics of blockchain and how they influence the world.

1. Decentralization is the most significant characteristic for blockchain technology; it makes blockchain outstanding and special. Decentralization makes the ledger in destructive recording, store and renew. As the destructive storage and counting, all the blocks in blockchain network have the responsibility to maintain and protect the data. Cryptography ensures the latter while all the rules are clear and easy to obey without any third-party as the credit endorsement.

2. Time stamp is very meaningful to the inquiry, verification and protection of information. In actual society, the information is consisted of massive data and data basis, which can be divided into sharing information, private information and secret information. The key point for sharing information is the authenticity, so we must make sure it's authentic. The key point for private information is the intellectual property while for secret information is the safety. Although the internet provides information share and transfer without cost, it is hard to protect the authenticity of sharing information, intellectual property of private information and safety of secret information. Thanks to time stamp, all the blocks can inquire the source and verified it. All the information stored in blockchain cannot be manipulated. As every participant makes a time stamp in their information, the intellectual property can be protected.

3. Asymmetric cryptography is the technology used in blockchain for safety of information.

Blockchain technology also uses transparent mathematical algorithm to store and deal with information in the trustless situation autonomously and safely. All the data has been stored after checking and cannot be manipulated theoretically. Once the data has been verified and added to the blockchain, no one have right to manipulate it. The only possibility to manipulate the data on blockchain is to control more than 50% of all the data on whole blockchain, the manipulation of a single block is meaningless. This possibility has a very low probability. The following diagram can show us how the asymmetric cryptography keeps the safety.

4. Transparency is a highpoint for financial industry. Any people can find the information stored in blockchain networks and exploit new application of blockchain technology. All the data and the renew data in blockchain are accessible for blocks in network. Therefore, users can check the source of data. According to Swan (2015), for organization and convenience, the different kinds of existing and potential activities in the blockchain revolution are broken into three categories: blockchain 1.0, blockchain 2.0, and blockchain 3.0.

Blockchain 1.0 is currency, the development of cryptocurrencies in applications related to cash, such as currency transfer and digital payment system. Blockchain 2.0 is the contract, the entire slate of economic, market, and financial applications using the blockchain that are more extensive than simple cash transactions: stocks, bonds, futures, loans, mortgages, titles, smart property, and smart contracts. Now the applications of blockchian technology are focused on this stage and the related projects are in this area. Blockchain 3.0 is blockchain applications beyond currency, finance, and markets—particularly in the areas of government, health, science, literacy, culture and art. More and more researchers from different industries are doing tests of the blockchain applications. Blockchain can be implemented within individual educational institutions, groups of educational institutions, and both national and international educational bodies. In fact anyone wanting to securely store badges, credits, and qualifications – and make educational data that matters available to others – could consider using blockchain technology.

3.2 The application of blockchain and value added

3.2.1 Smart Contract

Smart contracts are an important factor for blockchain and a new contributing factor in value management. Hofmann (2018) mentioned that smart contracts allow the automation of contractual relations and change the state of assets on a distributed ledger. According to Buterin (u.d.), a smart contract is a mechanism which involves digital assets with two or more parties involved, in which some or all of the parties put assets in and those assets are automatically redistributed among all parties according to a formula based on certain data which is not known at the time when the contract is initiated. Hedging contracts and escrow contracts are includes in smart contracts, also. Smart contracts are coded and available to anyone involved in the contract. Jentzsch (2017) posits that smart contract is very important for blockchain and also helps DAOs to develop new projects inside the virtual chain e.g. building new products, developing hardware or writing code. Sharples and Domingue (2016) give the idea that smart contracts are segments of computer code which enact blockchain transactions when certain conditions have been met. These enable business and legal agreements to be stored and executed online, for example automate invoicing. These smart contracts could also establish cooperations, organizations, even national constitutions — anything you can code. The contracts would enforce themselves in a pre-determined way, including by automatically

removing funds from a party's account.

From above descriptions, the concept of smart contract is that it is a comprehensive pre-determined autonomous procedure which can help people to solve many individual or organizational issues and work in legal, financial, distribution environment and so on with development, maintains of the spirit of contract and the relationships in contracts. The spirit of contract is related to market economy foundation and has become more important in an information economy; it plays an important role in maintaining the healthy development of market society. In traditional market economy, the spirit of contract is protected by laws and regulations, as well as different custom taxes or regulations. Those traditional customs taxes and laws can be broken in some cases. The smart contract can help to make up the possibility of default. Although, smart contract is not an artificial intelligence tool which can work by itself to some extent, it is only a more comprehensive procedure which enables a better way of working. When a condition is achieved, the following procedures are automatically processed without the interruption from labors.

Smart contract is a production based approach on the blockchain technology which records all the data on blocks without possibility of manipulation. Blockchain technology provides safety to smart contracts while smart contracts make the application of blockchain more mature. At the same time, value creation and value added evolve gradually. The labor in smart contract cannot be measured only by time as the value produced is related to intangible services. Value added seems to have more growth potential with the application of smart contracts in various aspects.

3.2.2 Blockchain technology and smart contract

Smart contract is a tool which can be applied in many industries; because of multiple benefits we expect a high potential for adding value to projects and to increase management value, also. We consider the example of token system to identify some benefits of smart contract.

The token system based on smart contract is easier to work and therefore, to utilize. The development of token system is related to value transfer who means the value of currency or other capitals transfers from one unit to the other. When an account transfers money to another, the value in original account should decrease while for the other account the value increases; the transaction is unique and safe. Traditionally, the transaction relies on the technology and credit endorsement from international banks and national financial organizations. We know that internet can share and spread data thank to the Hyper Text Transfer Protocol (HTTP) while internet cannot share and process value transfer because it is stricter and complicated. Although the information transfer is ok for both parts to keep the same information, it is not okay for both accounts to keep value. Value transfer should have its uniqueness. The record of value transfer and settlement are two hard points to process in case of computer science without bank and government work. This problem is possible to be solved within smart contracts and blockchain technology. The procedures of value transfer are that:

1. Part A removes data X to part B.
2. Part A should have data X and gets permission to remove it.
3. Once part A removes data X to part B, it has no data X anymore, only B has the unique X in the world.
4. Data X can only exist in part B, nowhere else.

Figure 1. Procedure for value transfer within smart contracts and blockchain technology

Source: Authors' own presentation

In this situation, capitals, shares and securities and so on can be managed using smart contracts based on blockchain technology. The nature of value transfer is how data is recorded. In the smart contract case is more effective and smarter than traditional contract management. Different from tangible value, such as house, car or valuable metal, value in currency is more intangible as digital information is. We need a reliable organization or an entity which to communicate various items and issues when needed. We refer to the function of endorsement in financial industry. The international banks and government financial departments are playing such a role when we consider the traditional manner of transfer. Nowadays, blockchain technology redirects that role to the powerful technology and to computers all around the world, all the people in this world with computers can become the endorsement to prove and record the value of currency. Thus, blockchain technology makes the value transaction more efficient while value transaction gives to blockchain its main significance of existing. Dermody (2015) explains that blockchain was primarily designed to be transfers of value in digital currencies, and their transaction logic implements a token system. As Swan (2015) mentions in her book, the financial foundation is the transaction of value.

At present, besides banks, some other companies are founded as the third-party payment tools, such as Alipay and Paypal. The most popular agency used to transfer value is Society for Worldwide Interbank Financial Telecommunication (SWIFT). All these payment instruments use the centralized proposal with government or big companies as the credit endorsement, all the transferred values are collected in a central service, which means we have to trust the centralized organization. Although the centralization is a good system to solve many problems in financial industry, the limitation of credit endorsement is obvious. With smart contract approach people all around the world rather than just some countries establishing the credit represent the core of solving the problem of vast value transaction. According to history, people are the most untreatable from confidence perspective and the conflicts are from the lack of trust between human being; in those circumstances centralization is the least welcomed. The development 21st century society is the process which replace people with technology and replace centralized organization with decentralized ones. Thus, for the value transfer at a bigger and safer scale, we need a system to replace the third party agency with characteristics like decentralization and trustless.

Swan (2015) gives the idea that blockchain technology can not only transfer merely money, more important is that it can transfer information and the effective allocation of resources that money has enabled in human and corporate-scale economy. The most recent paradigm—blockchain technology brings the pervasive expectation of value exchange functionality. It can strengthen the connection between every unit, including physical world, multi-device computing layer. This technology is significant for the future basic payments, token earnings and spending, digital asset invocation and transfer, and smart contracts issuance and execution.

3.3 Blockchain technology in the financial industry

Although the financial industry comes back to life after the financial crisis in 2008, there still are many problems, which have existed long time ago and before 2008 moment. According to Tapscott & Tapscott (2017), 45% of financial intermediaries, such as payment networks, stock exchanges, and money transfer services, suffer from economic crime every year; the level is 37% for the entire economy, and only 20% and 27% for the professional services and technology sectors, respectively. It's no small wonder that regulatory costs continue to climb and remain a top concern for bankers. Now let's refer to the payment section in finance when we use blockchain technology. In the previous

part, we have discussed the value transfer. Usually, when a customer makes a transfer accounts through a banking system, online service or smart phone app, the information is transferred to the database center, which supports and facilitates to finish the records and transfer. All the information, such as the transfer date, money amount, and personal information, is recorded in the bank center. This is a typical centralized management model and the service in headquarter is the center block. When a customer transfers money to another bank, the process is from bank A to the center bank then to bank B. In this case, the center bank is the center of this transfer. This transfer model is the most basic and popular model in financial area.

Different from the traditional transfer model, the blockchain technology is a typical decentralized model. Every PC is an equal block; all the blocks in the blockchain can share and record all the information gathered without the existence of a center block. Any transfer information between two blocks is shared and recorded by all the other computers with encryption and all the computers can store encrypted information. As Tapscott & Tapscott (2017) mentioned, blockchain is a vast, globally distributed ledger running on millions of devices, it is capable of recording anything of value. Money, equities, bonds, titles, deeds, contracts, and virtually all other kinds of assets can be moved and stored securely, privately, and from peer to peer, because trust is established not by powerful intermediaries like banks and governments, but by network consensus, cryptography, collaboration, and clever code. In the conventional understanding of the economy driven by rational action in pursuit of utility maximization, but the practice of sharing, which means a perennial element found in human relations with varied significance and meaning concerning tangible goods and service, is leading a revolution in traditional economic process with the Information and Communication Technology (ICT) (Pazaitis et al., 2017) and blockchain technology. Pazaitis et al., (2017) also describe that this technology can make a difference of the present economic environment. Blockchain technology can help people and organizations in social sharing to create commons, to enact their own systems of value, through an inclusive, consensus-based approach, and promote and sustain the communications in different markets in countries and places. The information economy is a new ecosystem composed by a variety of value systems that fuel the circulation of commons in a sharing economy where value would become perceptible in a way that it shifts away from the traditional logic of utility maximization, towards the general benefit for the society.

4. Different industries and value added with blockchain technology

According to the research from FUTURETHINK in 2017, blockchain technology is already creating value in different industries; even we have today few examples in a certain industry. We design a table with the already identified cases which disrupt the traditional businesses in some representative areas (Table 1)

The innovation of Bitcoin disrupted the global financial system, by featuring a decentralized digital currency and payment system that is governed by no government or financial institution (Pazaitis et al., 2017). Following this tendency, more tokens based on blockchain technology are created and become popular, such as Ether. And more decentralized APPs used for payment and market are designed and processed, such as Localetherum, AirSwap, and IDEX, which are used for token exchange.

Table 1. Different industries and value added with blockchain technology

Industry	Positive aspects which add improvements/ value	Companies
Banking and other financial services	Direct transaction between A and B High speed and information accuracy IBM states that 15% of US banking sector uses SC and blockchain technology at the end of 2017	ABRA, BARCLAYS
Supply Chain Management	Better data management, decentralized system saving time, costs, labor or a better accuracy for waste or product location	PROVENANCE, SKU CHAIN
Forecasting	A global decentralized system for prediction of markets in various area	AUGUR
Networking and IOT (Internet of things)	Update software, manage bugs or monitor energy consumption	SAMSUNG AND IBM
Insurance	A better way to manage trust, keep safety of identity, real data recorded	AE TERNITY
Private transportation	Managing the sharing system with direct connection between supplier and beneficiary	ARCADE CITY
Cloud storage	Avoid of data loss or hacking	STORJ
Charity	Direct connection which help donation and make it transparent, safer and more rapid No third party involved, more warranties for user to benefit	BIGGIVE
Voting system	Safer, more transparent, less chances for someone else to control or influence Accurate information for person identity, avoid double voting or identity replacement	DEMOCRACY EARTH
Retail industry	Disrupt the traditional store and market place, a direct buyer-seller connection, no additional fees	OPEN BAZAAR AND OBI ONE
Online music	Musicians get paid directly by the fans or listener, no other parts involved, better access and low prices, a better solving for licensing issues	MY CELIA AND UJO MUSIC
Energy management	From centralization to decentralization, direct contact, more rapid transfer, lower bureaucracy	TRANSACTIVE GRID
Real estate	Safety of information, of ownership, a direct connection buyer-seller, no additional fees, simplicity of documents, speed and transparent property transfer	UBIQUITY

Source: Authors' own presentation, based on information available from FUTURETHINK (2017)

The banking and payments industry is the first and most important area for blockchain technology to change the traditional value management and make value added. The invention and vast application of cryptographic tokens is a revolution for financial system and stock market. Blockchain technology will do to banking what the internet did to media as the internet makes media much more popular. Now anyone with a phone can watch video anywhere and anytime. The tokens and decentralized APPs designed with blockchain technology allows more people have access to financial services around the world, including those in third world countries who don't have access to traditional banking, and this is a good approach to add value for more small companies and entrepreneurs. Now, not only the start-ups from different industries focus on the application of blockchain to make value added, there are many big companies and banks like Barclays are also working on adopting blockchain technology to make their business operations faster, more efficient and secure. Banks are also increasingly investing in blockchain startups and projects. IBM predicts that 15% of banks will be using the blockchain by the end of 2017. More blockchain technology based projects are developed to bring value to various industries including Metamask for browser, Ujo for music, Balanc 3 for accounting, and so on.

With advanced cryptography in blockchain technology, cyber security can be guaranteed as all the data recorded on blockchain is verified and encrypted. As a decentralized ledger, all the computers and laptops are possible to record data, and the possibility to manipulate the data is to manipulate more than half data of all the recorded data all around the world. This is the highlight of blockchain to make value added not only for cyber security but also for new decentralized projects in different industries.

Actually, the industries influenced by blockchain technology and achieve value added are more related to data management. Transactions of data can be documented in a permanent decentralized record, and monitored securely and transparently. This can greatly reduce time delays and human mistakes. It can also be used to monitor costs, labor, and even waste and emissions at every point of the supply chain. This has serious implications for understanding and controlling the real environmental impact of products. The distributed ledger can also be used to verify the authenticity or fair trade status of products by tracking them from their origin. Now there are start-ups in supply chain management including Provenance, Fluent, SKUChain, and Blockverify (<https://futurethinkers.org/industries-blockchain-disrupt/>).

In networking and the Internet of Things (IoT), Samsung and IBM are using blockchain technology for a new concept called ADEPT, which will create a decentralized network of internet of thing (IoT) devices. It is operating like a public ledger for a large number of devices and would eliminate the need for a central location to handle communications between them. The devices would be able to communicate to each other directly to update software, manage bugs, and monitor energy usage.

The global insurance market is based on trust management, and trust is the crucial topic in financial industry as many problems caused by trust between people. The blockchain technology achieves value added with verifying many types of data in insurance contracts in an efficient way, such as the insured personal identity, items and conditions in contract and so on.

The most serious problem in government is corruption and government systems are often slow, opaque, and prone to corruption. Implementing blockchain-based systems can significantly reduce bureaucracy and increase security, efficiency, and transparency of government operations. Dubai, for example, is aiming to put all its government documents on the blockchain by 2020 (<https://futurethinkers.org/industries-blockchain-disrupt/>).

Energy management has been a highly centralized industry for a long time and it is the time to bring some changes to its traditional management and improve its value management. Usually energy producers and users cannot buy it directly from each other and have to go through the public grid or a trusted private intermediary. Blockchain technology and smart contract ensure the trades in energy market like the value transfer in financial industry, allow customers to buy and sell energy from each other in a peer-to-peer way safely. It is more convenient for customers and profitable for producers. According to above examples of applications of blockchain technology and smart contract in different industries, it shows the potential of it in value added in many areas. It brings changes to traditional value concept and makes the work more efficiently. The two main problems that are security and trust existing in every data related industries make managers spend lots of time and cost. The achievement of value added in this information economy is mainly based on high-techs and blockchain is such a technology promoting the evaluation of value management and create new profit. Proper utilization of technology in value management and value added is crucial to promote productivity and services and reduce the investment in labors.

5. PRESENT AND PERSPECTIVES

Nowadays, the blockchain technology and smart contracts implicitly has changed the traditional financial industry and many others little by little, which is very similar to the situation as the internet did in 1990s. This paper tries to bring into analysis the main characteristics of above mention technology which contribute to value creation and value added. There are two aspects about value perception and blockchain technology. One is that the value perception has generally been influenced by new technologies, in our case by blockchain one and the other aspect lead us to the two concepts value added and value management, respectively. First, we create and add value to the product or to the service itself but to the management process, also- decentralization, transparency, safety, trust all are values for the organization itself. As discussed above, the meaning of value is all the time in a dynamic situation as different social and political situations. Researchers and scholars put forward their understanding of value and some are kept even developed until now. With the blockchain, the economic environment is changing silently; value itself has also a dynamic trend.

Value added is in a new stage with lot of opportunities and challenges. After the development of blockchain technology for approximate 9 years, there are many online communities that cooperate in a decentralized manner, such as free and Open-source software, Wikipedia, Open street maps, Couch surfing or Wiki house. Such communities aggregate larger contributions from a large number of people cooperating for the achievement of a common goal (Pazaitis et al., 2017). But the majority of such communities operate on a very small scale, often on a local territory or in a niche area. These communities usually comprise a small handful of highly motivated contributors, and a slightly larger number of people who contribute on an ad hoc basis. Because they do not have a proper incentive system inherent into their governance structure, these communities are often having a hard time attracting new contributors beyond the highly intrinsically motivated individuals (Arvidsson et al., 2016). So at this point, as we discussed, the targeted stakeholders analysis and market analysis are compulsory for start-ups in high-tech industry when refer to value perception and value added. Besides the clear targeted market, an attractive incentive system can promise a sustainable development for the new projects and reduce cost. So in this case, Blockchain technology based projects should be designed to support a dynamic governance structure that does not focus on a set of

predefined roles and tasks, but rather on an open and meritocratic model, where everyone is free to contribute to a particular community in the way they see most fit. In turn they are rewarded with reputation that reflects their influence in the governance of the community. Also, participants receive an economic compensation in the form of digital tokens, which can be used to benefit from the services offered by the community, but also represent an actual (equity) share in the organization (Pazaitis et al., 2017). Only when all the contributors in blockchain based projects are attracted by common and meaningful value at the beginning the projects have possibility to continue. Blockchain projects enable a type of governance that reflects the decentralized approach as well as a reward system based on the perceived value of every contribution (Pazaitis et al., 2017)

The term "sharing economy" refers to something more than simply sharing becoming an economically relevant practice, in terms of becoming rational within a certain economic system. It portrays a new system of value in which sharing is the common sense that guides human behavior towards what is perceived as the greater (Pazaitis et al., 2017). Blockchain technology promises some significant opportunities for the sharing economy and its potential for societies to efficiently allocate resources in a more fair and sustainable utilization. We assist to an effective distribution of social and natural resources, and thus more people can enjoy the social resources. A potential application of the blockchain technology is for more open and meritocratic governance. Whereas 'open', with reference to the open-source mindset, is understood as enabling people's capacity to participate on equal footing; and 'meritocratic' is related to a fair distribution of power, based on merit as perceived in the sense of the greater good (Pazaitis et al., 2017).

What makes value added highly efficient are "Decentralized autonomous organization" (DAO) and "Decentralized autonomous Cooperation" (DOC). They encapsulate any type of structure that allows autonomous agents to collaborate and achieve a common goal, by making spontaneous contributions with no central coordination or ruling authority (Pazaitis et al., 2017). Based on trustless mechanism, more time and money can be used in value added in products and services rather than personal relationships and the solutions for conflicts between individuals and cooperation.

According to Fernandes (2011), the Gross Value Added (GVA) in a firm can be computed as the sum of the value added by the use of the three basic resources: the values added by the direct use of knowledge (labor), by the use of technology and by the use of capital. In blockchain projects, the value added is more relied on the use of technology as labor value or we can name it the knowledge of blockchain technology or other knowledge is a part different from blockchain technology processing in work.

Although the blockchain is very powerful in value added, it cannot alone resolve issues concerning power relations, excessive influence or greed. A technological infrastructure cannot simply avoid the problems that are inherent in human relations. It also cannot profoundly determine the governance model that will eventually be enacted in an organization. While the applicability of the technology seems relevant to many aspects of human interaction, its implementation at scale is yet to be seen. The technology is indeed pervasive and resilient; nevertheless it still cannot operate outside the sphere of computation. Whether tokens or monetary units, the logic is, to a large extend, still one of quantification. Just as double-entry bookkeeping developed related to the abstracted, rationalized and impersonal logic of the capitalist spirit, both in practice and in economic scholarship, the blockchain could as well be associated with a machine like responsiveness and predictability overwhelming the economic affairs (Pazaitis et al., 2017).

6. CONCLUSION

The main motivation of this paper is to explore the ongoing transformation of the value perception in information economy with blockchain technology related industries. The objective of study is the value added in blockchain related industries and the main research question is how the changes of value added in different industries and are happening. With the brief understanding of the changes and rules, we can have more confidence in new technology and more efficient strategies when dealing with future blockchain technology applications.

Theoretical understanding of value perception begins with historical concepts of value in the economic thought. The concepts for value have been evaluated since its birth and the corresponding value management is developing. The focus of value perception in different period reflects the economy situation. Stakeholder theory is a result of the dynamic value management, and targeted market and customers are most important factors for blockchain projects and startups. In an information economy, a new way of resource allocation and manage exchange in societies is utilization of blockchain technology especially in financial industries- already tested and more potential other industries. Basically, we consider that any industry where decentralization, transparency or data safety could bring a better efficiency, effectiveness and performance is an appropriate one. Examples presented in Table 1 are relevant and supportive with our statement.

Based on that table we conclude that value added has two different approaches, respectively:

- a. the financial perspective- by using the blockchain technology and smart contracts opportunities related to *cost savings*, price reduction, low costs with labor, higher efficiency, fast delivery, better quality
- b. the management perspective, which could add significant value to the business itself through the principles guiding DAOs- decentralization, safety, transparency or trustless

Blockchain technology as a new and compelling topic has attracted more attention from people in various industries with its incredible features—decentralization, trustless, safety and automation, which is leading the development of financial industry in a new direction. Startups utilizing blockchain technology in different industries are doing their best to create more value and improve value management. At the same time, the value transfer which is the foundation of financial industry is experiencing a change from traditional and costly processing to an efficient way.

Blockchain technology as a recording medium could effectively determine the value of contributions to commons- based peer production where a genuine sharing economy could function. The smart contract based on blockchain technology can be applied in more and more industries. Although it cannot work as an artificial intelligence, it reduces cost in labor and determines less complicated related works and ensures more people access to various industries. The resources in information economy and the opportunities created by this technology are moving to the people in less developed areas, also. Also, more areas are welcoming the utilization of the new and interesting technology in order to determine value maximization and a more rational and efficient way for distributed resources. However, any blockchain technology related projects and startups pose certain challenges to the internal relations in productive communities, related to trust, reciprocity and intrinsic motives (Pazaitis et al., 2017). The technology is still at an early stage and more empirical data are necessary to support its practical application for further evolution. At the same time, as the technology yet has to reach a dominant and mature design, it is too early to predict how it would operate on large scale. Positively, the appearance and development of blockchain technology in financial industry and other

fields presents an interesting scenario for the temporary economy and the possibility of the future.

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