



**Sosyal Bilimler
Enstitüsü**

T.C.

MARMARA ÜNİVERSİTESİ

SOSYAL BİLİMLER ENSTİTÜSÜ

İŞLETME (İNGİLİZCE) BİLİM DALI

**A NEW TYPE OF PAYMENT IN PHILANTHROPY: BLOCKCHAIN
APPLICATIONS**

Yüksek Lisans Tezi

HANİFE TESNİM ÇALIŞKAN

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Danışman: PROF. DR. AHMET FARUK AYSAN

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ÖZET

HAYIRSEVERLİKTE YENİ BİR ÖDEME YÖNTEMİ: BLOKZİNCİR UYGULAMALARI

Tarih boyunca insanlar çeşitli sebeplerden dolayı bağış ve hayırseverlik faaliyetlerinde bulunmuşlardır. Dünya üzerinde hayırseverlik faaliyetleri ve yöntemleri yıllara göre ihtiyaçlar doğrultusunda veya kültürlerin etkileşimleri ile değişmiş ve gelişmiştir. Özellikle, son otuz yılda internet teknolojisinin yaygınlaşmasıyla bu alanda da bir çok farklı uygulamalar ortaya çıkmıştır. 2010'lu yıllardan itibaren önemli bir ivme yakalayan Blokzincir teknolojisi de hayırseverlik uygulamalarında kullanılmaya başlanmıştır. Blokzincir teknolojisi sayesinde yeni bir para birimi olarak ortaya çıkan kriptoparalar günümüzde çeşitli alanlarda ödeme yöntemi olarak kullanılmaktadır. Bu çalışmada, Blokzincir teknolojisinin gelişimini ele alarak hayırseverlik alanındaki kullanım imkanları, getirdiği avantajlar, taşıdığı riskler ve zorluklar tartışılmaktadır. Dünyadaki birtakım uygulama örneklerini ele alarak analiz ve sınıflandırmalar yapılmıştır. Uygulamalar analiz edilirken platformların kurucuları, tanımlanan amaçlar, sorun tanımlamaları, önerilen değerler, destekledikleri projeler, ödeme yöntemleri parametreleri baz alınmıştır.

Anahtar Kelimeler: Blokzincir, Hayırseverlik, Bağış, Kriptopara, Hayırseverlikte Dijital Teknolojiler

ABSTRACT

A NEW TYPE OF PAYMENT IN PHILANTHROPY: BLOCKCHAIN APPLICATIONS

Throughout history, people have been involved in donation and philanthropy activities for various reasons. Philanthropy activities and methods in the world have changed and developed over the years in line with the needs or with the interaction of cultures. Especially, with the spread of internet technology in the last thirty years, many different applications have emerged in this field. Blockchain technology, which has gained significant momentum since the 2010s, has also started to be used in philanthropy applications. Cryptocurrencies, which emerged as a new currency thanks to blockchain technology, are used as a payment method in various fields today. In this study, the development of Blockchain technology, its use in the field of philanthropy, its advantages, risks and difficulties are discussed. Analysis and classifications were made by considering some application examples in the world. While analyzing the applications, the parameters of the founder(s) of the platforms, defined objectives, problem definitions, offered value, supported projects, payment methods were taken as basis.

Keywords: Blockchain, Philanthropy, Donation, Cryptocurrency, Digital Technologies in Philanthropy

“To my late father Dr. İsmail Özdiñ and my mother Dr. İnas Özdiñ ...”

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TABLE OF CONTENTS

ÖZET	i
ABSTRACT	ii
ACKNOWLEDGEMENTS	iv
TABLE OF CONTENTS	v
LIST OF TABLES	vii
LIST OF FIGURES	viii
LIST OF GRAPHS	ix
1. INTRODUCTION	1
1.1. Aim of the Research	1
1.2. Literature Review	2
1.3. Methodology	4
2. PHILANTHROPY	6
2.1. Concept of Philanthropy	6
2.1.1. Definitions of Philanthropy and Related Concepts	6
2.1.2. Motivations of Philanthropy	7
2.1.3. Institutional Form of Philanthropy: Foundations	9
2.2. History of Philanthropy	11
2.2.1. Traditional Philanthropy	11
2.2.2. Modern Philanthropy	14
2.3. Contemporary Donation Systems	17
2.3.1. Common Online Donation Tools	17
2.3.2. Donation-based Crowdfunding	19
3. BLOCKCHAIN TECHNOLOGY	22
3.1. Concept and Features of Blockchain	22
3.2. Types of Blockchains	24
3.2.1. Public Blockchain	24
3.2.2. Private Blockchain	25
3.2.3. Consortium Blockchain	25
3.3. Most Common Application Areas	26
3.3.1. Digital Identity	26
3.3.2. Smart Contracts	26
3.3.3. Financial Applications	27

3.4. Challenges in Blockchain	35
3.4.1. Trust and Transparency	35
3.4.2. Cyber-Attacks	35
3.4.3. Fork Problems	35
3.4.4. Scalability and Transaction Fee	36
3.4.5. Information Leakage.....	36
3.4.6. 51% Attacks.....	36
3.4.7. Regulation Problems	38
4. BLOCKCHAIN APPLICATIONS IN THE PHILANTHROPY.....	39
4.1. Blockchain for Social Good	39
4.2. Blockchain Solutions for Philanthropy	41
4.2.1. Limitations of Conventional Online Donations	41
4.2.2. Advantages of Blockchain for Philanthropy	42
4.2.3. Risks of Blockchain for Philanthropy.....	43
4.3. World Applications of Blockchain Technology	47
4.3.1. The Methodology	47
4.3.2. GiveTrack.....	49
4.3.3. AIDChain	51
4.3.4. The Giving Block.....	52
4.3.5. Bithope.....	53
4.3.6. Binance Charity.....	55
4.3.7. Summary of Finding	56
5. CONCLUSION.....	58
REFERENCES	63

LIST OF TABLES

Table 4.1: Summary of Findings	57
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LIST OF FIGURES

Figure 3.1: Top 10 by Preferred Cryptocurrency Exchange Platforms.....	30
Figure 3.2: Top 10 Cryptocurrencies by Market Cap.....	31
Figure 3.3: Cryptocurrency Exchange Usage Rate by Country in 2020	32
Figure 3.4: Cryptocurrency Exchanges in Turkey by the Number of Weekly User Visits.....	33
Figure 3.5: Hourly 51% Attack Cost of Cryptocurrencies Listed by Market Value.....	37

LIST OF GRAPHS

Graph 2.1: The Density of the Word Philanthropy in Written Sources on the Basis of Years, 1800 to 2019.....	7
Graph 2.2: Assets of Foundations on the Basis of Countries	11
Graph 2.3: Number of People Using Social Media Platforms, 2005 to 2019.....	18
Graph 3.1: The Density of the Word Blockchain in Written Sources on the Basis of Years, 1800 to 2019.....	22
Graph 3.2: Market Cap and Price of Bitcoin (BTC/USD), 2013 to 2020.....	28
Graph 4.1: Number of Applicants by Country for the EIC Horizon Award in Blockchain for Social Good.....	40
Graph 4.2: Price of Bitcoin (BTC/USD), July 2020 to June 2021.....	44

1. INTRODUCTION

1.1. Aim of the Research

Philanthropy and donations have been practiced by people in various ways throughout history. The concept of philanthropy has been emphasized in many religions, especially Islam, Christianity and Judaism. In addition to religions, it has been stated that aid given to the needy in the traditions and cultures of societies is an important example of social solidarity. Before the concept of money emerged, donations were made in kind, and with the widespread use of money, some aids were applied in cash. From this point of view, donations are divided into two as in-kind and cash. In-kind donation is a type of donation made with goods or services. Cash donation, on the other hand, is to meet the needs of people in need by giving money.

Due to the cultural relations between civilizations, the concept of philanthropy has developed and has undergone various changes. With the widespread use of the Internet, online donation has emerged alongside the traditional donation culture. Thanks to the internet, foundations can make their voices and activities heard to a wider audience, thanks to both social media and websites. It is seen that there has been an increase in the amount of fundraising with the activities carried out by the foundations using the power of the internet.

Blockchain, which has attracted attention recently and offers people a new payment technology, has a chain structure consisting of various blocks. Blockchain is a shared and non-modifiable system that facilitates the tracking of transactions in the business network. Blockchain is a distributed database system that provides encrypted transaction tracking. Blockchain, which has no central structure, records each transaction as a new data block. Each block is linked to the previous and next blocks, and the transactions that have been made cannot be undone. Blockchain technology is transparent and the accumulated blocks can be examined and reviewed. Transfers made with Blockchain are fast and it is an efficient technology product as it prevents institutions and individuals from losing time. Many sectors in the world use Blockchain technology for transactions such as management and storage.

With the development of technology, new payment methods have started to become widespread. Blockchain, which forms the basis of cryptocurrency technology, has an impact in many sectors. The donation sector, which is a large market, has many problems. The need for safe, fast and transparent delivery of donations has led to the use of Blockchain-based payment platforms in the field of philanthropy.

In this thesis, it is aimed to analyze and discuss the possibilities of using blockchain-related to philanthropy and the risks it contains on the basis of the platforms being used. To date, limited studies have been conducted on blockchain-based payment methods in the field of philanthropy.

In the first part of this study, the concept of philanthropy and its historical process are explained. The main reasons for the emergence of philanthropy are examined and the development of philanthropy is discussed. The past practices of traditional philanthropy and the modern philanthropy practices brought about by the opportunities provided by technology have been examined.

In the second part, information about the features, types and application areas of Blockchain technology is given. The features of cryptocurrencies as a new payment method, how it emerged, its types, advantages, reflections on the financial sector, limitations and difficulties encountered are explained with examples.

In the third part of the research, the applications of Blockchain technology in philanthropy are discussed. The advantages of blockchain in philanthropy applications, payment conveniences, risks are explained. Especially in risks, issues such as money laundering and financing of terrorism are examined. Blockchain-based platforms around the world were analyzed and the reasons for collecting donations with cryptocurrency were explained.

1.2. Literature Review

Individuals engage in philanthropic activities for various motivational reasons. The main reasons for the aid provided today are religious reasons, social traditions, the need to create social benefits, the need to feel better, the expectations of the societies from themselves, and the desire to continue their family traditions (TUSEV, 2016).

Thanks to the development of the internet along with technology, there has been a tendency towards online donation methods. More social benefits have been created by society due to the convenience of online payment. People who want to donate can donate as much as they want with fast payments. Nowadays, online donations are more than traditional donations and are more preferred by individuals. Some businesses in the financial sector do philanthropic work to attract the attention of customers and thus increase their brand value (Li, 2017).

Since transactions made with Blockchain technology are peer-to-peer transactions, no authentication is performed. The absence of any approval center increases the speed of transactions and reduces the cost. Transfers made in traditional banking transactions are approved by an intermediary institution. The cost of transactions that require an intermediary and the time required to complete the process are increasing, and time savings cannot be achieved. In blockchain technology, which consists of blocks that are

structurally interconnected and whose records are kept, transactions are permanent. Thus, the follow-up of the transactions can be easily followed. Due to the recording of time and address information, transactions can be audited and it is discussed how important blockchain technology is in terms of transparency (Zheng et al., 2018).

Jayasinghe et al. (2018) stated, the low transaction fee of donations made with cryptocurrencies provides an advantage in increasing donations directly and through platforms. While the need to use expensive transfer systems is eliminated, fraudulent intermediaries are prevented from transferring a certain amount of money to themselves. Bitcoin transactions, which are confirmed in a short time compared to money transfers of a few days, appear to be an important part of the fast donation sent to those in need.

The use of blockchain technology in philanthropy and donation activities is beneficial for non-profit organizations, foundations and donors. Nowadays, there are not many examples of philanthropy and donation activities with blockchain technology. Institutions have not yet fully deployed blockchain technology and are conducting small activities or pilots related to it. The reasons why foundations, non-profit organizations and donors do not favor blockchain technology is that they are slow to accept the risks and innovative approaches that come with blockchain technology. Technological infrastructure inadequacies and insufficient budgets are other reasons that prevent institutions from quickly switching to blockchain technology. In addition, the regulatory decisions of states that narrow the application areas of blockchain, the security vulnerability and the difficulties in explaining its use in philanthropy activities to large masses also prevent the technology from becoming widespread in this area. In order to increase the use of blockchain technology in philanthropic activities, it is necessary to have solidarity between sectors. Although it is not possible in a short time, it will be beneficial to be widespread and used in the long term. In recent years, advantages such as the increase in blockchain applications, the success in pilot applications, and the elimination of hesitant thoughts pave the way for this new financial model. In the future, there will also be an increase in the funds collected as the trust in non-profit organizations and foundations using blockchain technology increases (Galen et al., 2018)

There are not many resources in the literature on donations made with blockchain technology, but there are mostly studies on online donations. Since there are not many examples of charity organizations and donation platforms in the world about philanthropy using blockchain technology, it is not possible to analyze it with too much data. In Turkey, it is not a blockchain-based charity or donation platform, but the first and only UNICEF Turkey accepted cryptocurrency donations through Paribu, the cryptocurrency exchange. GiveTrack, AIDChain, The Giving Block, Bithope and Binance Charity are popular donation platforms based on blockchain.

1.3. Methodology

In the research within the scope of the study, the focus of work of the important actors in the establishment and management of the analyzed blockchain-based donation platforms, defined objectives, problem definitions, suggested values, projects they support and payment methods are analyzed and classified. It has been tried to find existing applications that accept donations with cryptocurrencies in the world. A limited number of platforms related to this, the most common ones, GiveTrack, AIDChain, The Giving Block, Bithope and Binance Charity were examined. While the titles were classified, information was accessed from the websites of the platforms. The information of the founding foundations or individuals was also used from the blog posts on the website. Information was also obtained from LinkedIn, which includes the focus areas of the founders, the sectors they are involved in and their work, education and professional information. If the founder of the platform writes, the information was accessed from the website and LinkedIn, if it was established by a foundation or another institution, their founder information was added. The incomes of the platforms or founding foundations that publish their financial reports by years and the number of donations collected were investigated. The platforms were compared by examining the keywords that reflect the characteristics of the blockchain and the purposes they describe themselves. Noting the limitations of other online donation applications, solution suggestions and why Blockchain-based donation platforms should be used are explained with remarkable words. In this way, it is aimed that donors will turn to the platform. The most focused values were reached in this way. By examining whether the projects or campaigns were created by individuals or institutions, the target audience and the focused work area were analyzed. Financial data such as whether the targeted donation amounts were reached in the completed campaigns and the number of funds were also examined. Although some platforms only accept donations in cryptocurrency, there are platforms that also accept fiat currency. According to these differences, transaction fees also vary. With the increase in the use of blockchain technology, the solutions it brings to the problems and allowing its use on the basis of countries, blockchain-based aid platforms are becoming widespread.

One of the difficulties encountered in the analysis phase is that there are not many articles on the newly widespread Blockchain-based and cryptocurrency donation platforms on news and blog sites. Therefore, information about the platforms was obtained from their own websites. In addition, due to the fact that not every platform publishes its financial reports, how much progress has been made since its establishment could not be included in the classification. It is expected that all data of such platforms, which emphasize the principle of transparency and traceability, will be accessible. The risks of Blockchain are also mentioned in the literature, and there is no explanation about these risks on the platforms. At the same time, there is no information such as the use of Blockchain-based platforms by

country and the countries that donate the most to the campaigns. For this reason, the rates of donations according to the use of cryptocurrencies on the basis of countries could not be compared.

2. PHILANTHROPY

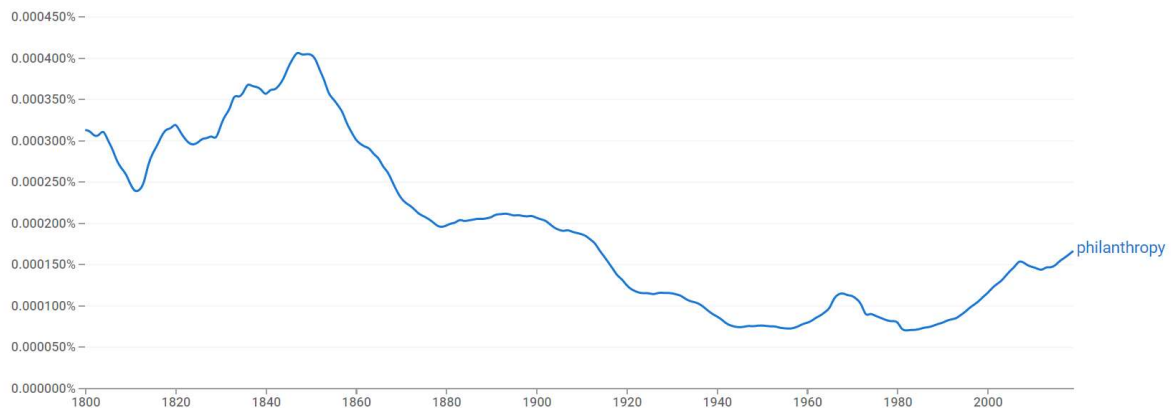
2.1. Concept of Philanthropy

2.1.1. Definitions of Philanthropy and Related Concepts

Philanthropy is a form of behavior and voluntary action aimed at improving the quality of life by creating social benefit. Raiborn et al. (2003) informed that “the term *philanthropy* comes from the Greek “*philien*,” meaning to love and “*anthropos*,” meaning mankind”. In modern definitions, philanthropy includes voluntary donations to increase the common benefit of individuals or institutions and to improve living conditions. Lynn and Wisely (2006), as the stated definitions in the concept of philanthropy, defined aid as compassionate activities aimed at fulfilling the needs of people in need, healing philanthropy as achieving targets for the development of individual human potential and solving social reforms in a fair way. Also, the definition of charity is to alleviate the poverty and personal troubles of people by making donations to the needy with the feelings of compassion, tolerance and kindness by institutions and individuals (Anheier, 2005). The common purpose of philanthropy and charity is to try to improve people's lives and focuses on the whole of the actions that take place between the donor and the recipient (Cheek et al., 2015, p. 364).

The problems explained by the human condition and nature that define the concept of human problematics constitute philanthropy, conditions requiring assistance and better quality of life are basic situations that respond to the necessity of philanthropy (Payton & Moody, 2008). With the influence of the philanthropy tradition, the understanding of helping is continued for years by raising awareness with sustainable studies to meet and develop needs. The word "philanthropy" in the Ngram Viewer, which demonstrates the proportions of concepts found in books from 1800 to 2019 on Google Books, varies based on cultural changes over the years.

Graph 2.1: The Density of the Word Philanthropy in Written Sources on the Basis of Years, 1800 to 2019



Source: The Google Books Ngram Viewer

2.1.2. Motivations of Philanthropy

Philanthropy was discussed at the beginning of the 20th century about finding temporary solutions to the plight of people and ending them permanently. However, today this concept is thought to provide public benefit by creating social benefit. Organizations that carry out actions such as elimination of poverty and health problems, increasing the level of education, improvements in the social field, protecting the environment, developing culture and arts, and resolving inequality were identified by the UK's Cabinet Office in 2002 as an organization that aims to benefit society (Anheier, 2005).

As another perspective, the effect is to be interpreted with philanthropy motivation. Philanthropy is stated as the motivational impact philanthropy models, the form of public goods motivated by the donors' activities, and the consumption form felt by the donor's sense of help (Duncan, 2004). Effective philanthropy develops by supporting organizations that work to strengthen civil society and develop a favorable environment. In line with this goal, the knowledge and experience gained is shared and infrastructure institutions operating in the society are strengthened.

The culture of philanthropy has developed over time, and cultural evolution often takes more than a few years. If there is a settled tendency to philanthropy, it will be easier to create and expand the culture of philanthropy in these societies. To create a community with philanthropy culture, people of the same frequency are first brought together. People with common points are brought together before the mission, vision and values are determined very clearly for the community. Each member of the community embraces what it aims for, how it moves to get there, and values that will always be preserved.

The active love towards the “anthropos”, and especially towards those in need, is the essential element of philanthropy. Philanthropy is an inevitable task of humanity and is a part of religions and cultures they believe in (Christou et al., 2019). Given the situation Christou et al. (2019) describes that philanthropy is one of the most important common features of cultures and religions within them. According to the Individual Giving and Philanthropy in Turkey 2016 Report published by TUSEV (Third Sector Foundation of Turkey), performing religious duties ranks first among individuals' motivation to donate and help with 32.5%. The concepts of *zakat* and *sadaqah* are at the top of philanthropy in Islam. *Zakat* is one of the five basic conditions of Islam and it refers to a certain amount of people who have some religious wealth should give to certain people. Also, *sadaqah* is the financial aid that Muslims voluntarily provide to those in need. In Islam, the word *sadaqah* is used in a sense that expresses all kinds of goodness, especially financial sacrifices. Promoting Muslims to such activities has developed a strong spirit of solidarity. The understanding of aid proposed by Islam was supported with *waqf* (Islamic charitable foundation) that served these purposes throughout the history of Islam. Also, Ottoman foundations (*waqf*) were accepted as an important part of the social order by building hospitals, caravanserais, educational institutions, roads. With the institutionalization of philanthropy as a foundation, it was ensured that the donor and the recipient did not face directly. According to the Orthodox theology, philanthropy refers to the love of God towards people, who are called upon to imitate this by loving others as themselves. The other way to show this admiration is through the help and activities of the poor and vulnerable (Vantsos & Kiroudi, 2007).

The understanding of doing kindness is based on the basis that the human conscience is related to the process of empathy. Payton and Moody (2008) states that the benefits provided to themselves, the privileges provided by the government for the needy, mutual assistance and the aids made without waiting for a return are necessary applications to meet the needs of the society. Philanthropic activities are organized, which are voluntary action in situations where self-help, mutual aid or government aid required in times of crisis fails. It becomes necessary to carry out organizational activities with the support of the philanthropists and the government in regions considered as dangerous (Payton & Moody, 2008).

Damage to the natural system due to the effects of natural disasters and deliberate economic or environmental factors causing losses makes life difficult, and this situation reveals the highest level of philanthropy activities with the sacrifice and empathy reactions of societies (Payton & Moody, 2008). Acting out of anxiety due to human nature, philanthropy is performed in order to intervene to alleviate the suffering of the needy, to feel good in conscience or to improve human well-being. In case of catastrophic events such as natural disasters, the state should make long-term investments such as tax

incentives, infrastructure works for businesses and residences so that the society can move from the relaxation phase to the recovery phase (Payton & Moody, 2008).

2.1.3. Institutional Form of Philanthropy: Foundations

The economic meaning of the foundation is the sharing of the earnings of individuals or institutions as a result of their work with the needy. Foundations are institutions that show an example of cooperation and solidarity aiming at the happiness of people in need. The need to establish and develop foundations has emerged in order to ensure social security in societies (Akyıldız & Abay, 2017). Foundations with a very long history date back to ancient ages. Artifacts such as fountains, wells, shelters and places of worship are examples of foundation culture dating back to old time. The first examples of modern foundation understanding emerged in the USA at the beginning of the 20th century, and it started to be seen in Europe after the Second World War (Anheier, 2005).

The understanding of foundation is interpreted differently in societies. In the Western geography, the people who give aid are ahead of the donations, and in the Eastern culture, the type and quality of the donation is more important than the donor. It is not possible to donate a property in societies without the concept of private property. As an example of this, in the Hittites, there were practices of foundations because of the concept of private property, and philanthropy could not be done because this definition was not available in Sumerians (Akyıldız & Abay, 2017). Foundations are divided into three main types of activities as grant-making, operating and mixed foundations.

According to the type of founders, it carries out its activities as individual, corporate, public and community foundations (Anheier, 2005). Individual foundations are charitable established by a person, group or family. There are no public resources in its activities and financial support is provided by individuals or families. This charity provides tax relief to donors for their contributions. Examples of individual foundations are The Bill and Melinda Gates Foundation, The Rockefeller Foundation, The Walton Family Foundation, and Sabri Ulker Foundation, which operate in education, health, social support and environmental issues. Corporate foundations, whose main purpose is to promote philanthropy, is a non-profit legal entity managed by the board of directors, contribution committee members and staff (Anheier, 2005). There is a difference in operational processes between corporate foundations and companies' donation practices, which have the same regulations as private foundations. The company ensures that corporate philanthropy is sustainable by donating a certain percentage of its annual profit to the foundation. In addition to this, corporate companies also contribute by donating products produced by themselves, buildings or land within their own structure, apart from cash assistance. Foundations established by the state or with the support of the government were established according to the public statute. The main purpose of public charities is to contribute to the development

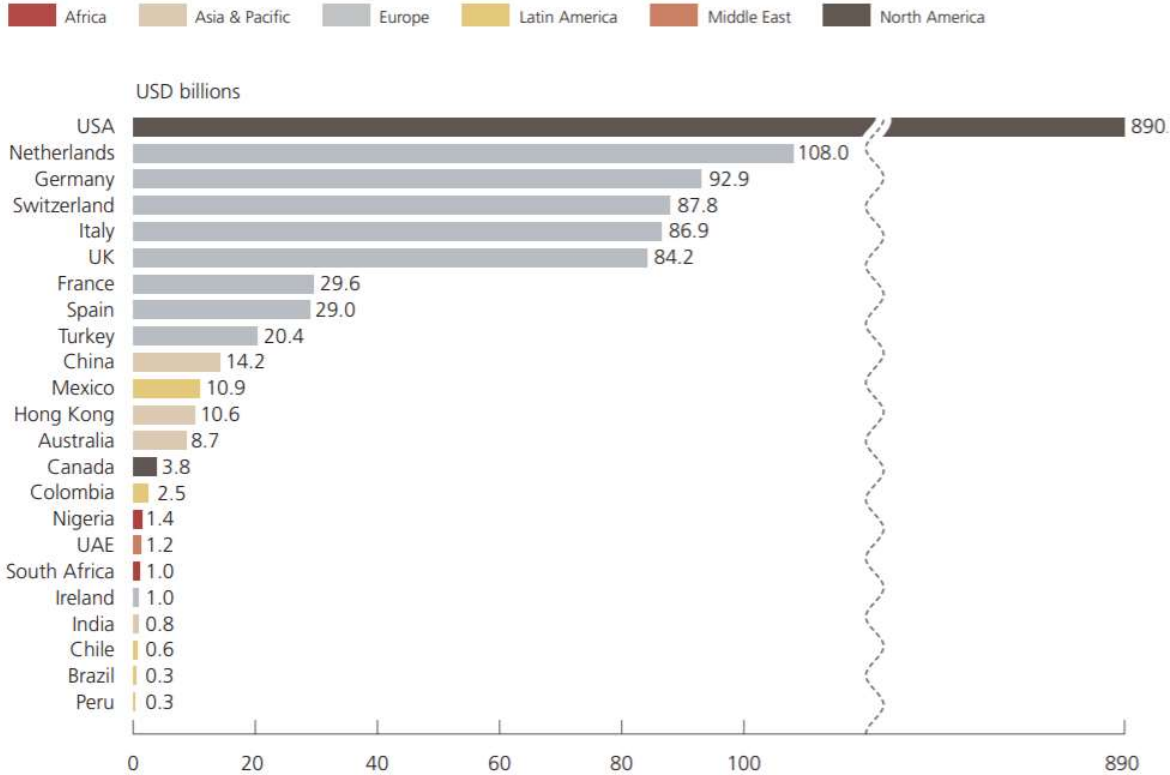
of their country. The main goal of community foundations is to tackle the issues of their communities and find solutions to them, and they focus on issues such as youth programs or women's issues (Salamon, 2014). Examples of these foundations in Turkey are the Darüŝŝafaka Society in the field of education, the Green Crescent in the field of immunity, and the TEMA foundation in order to create environmental awareness.

While establishing charitable organizations, it is aimed to serve a purpose. With donations made by donors and organizations, charitable organizations both support the needy and become motivated for those who donate and receive aid (Anheier, 2005). The biggest factor in this is the people who founded the foundation, the institutions or the tendencies of their managers. In addition to their founders, the tendencies of foundations are determined by the geography and governments in which they are established. In some countries, the state argues that foundations should work more narrowly. Because, it is thought that the government manages the state and that the government should be involved in these activities, and foundations should help (Johnson, 2018). However, in some countries, the state offers foundations a more comprehensive working area.

Foundations around the world work on very different and varied subjects, but their common fields of activity generally overlap with each other. According to the Global Philanthropy Report, the five basic solidarity issues focused on by foundations around the world are education (35.1%), social welfare (21.2%), health (20.4%), arts and culture (17.7%) and poverty alleviation (16.3%) (Johnson, 2018). The reasons why education is universally chosen as the first priority all over the world are the equality of opportunity in education, the main factor in success and the economic development of countries.

The most important reasons why it is difficult to collect information about the financial assets and expenditures of foundations on philanthropy is that foundations want to hide their financial information and for security reasons. Foundations receive assistance from individuals, companies and government agencies as they build their financial assets. 156,894 charities located in 22 countries and Hong Kong have approximately 1.5 trillion USD in assets (Johnson, 2018).

Graph 2.2: Assets of Foundations on the Basis of Countries



Source: Global Philanthropy Report

The total income of foundations in the North American region is more than the total income of foundations around the world. North America region ranks first in terms of foundation assets, followed by Europe, Asia, Pacific, Latin America, Africa and the Middle East. The main reason determining the financial assets of the regions is the number of foundations in the region and the economic power of the country.

According to the Charities Aid Foundation World Donation Index Report, the USA is the country with the highest donation with a score of 58%, while China is the lowest country with 16% (CAF, 2019).

2.2. History of Philanthropy

2.2.1. Traditional Philanthropy

There are various methods to meet the needs of people who can survive with financial or moral support from outside in every period of history. The act of giving people arises from traditions, religion's orientation to philanthropy or sense of responsibility (Gary & Kohner, 2002). Traditional philanthropy is all methods for finding solutions to the problems of the society and supports the institutions for these.

One of the ways to support foundations is to donate real estate and lands owned by the society. The foundation activities continued with the rents collected from the real estates. In addition, activities were carried out by selling the products obtained by cultivating the lands owned by them or by giving these products to those in need. Foundation officials had difficulties in collecting rent, also earthquakes and fires were damaging the properties owned by the foundation (Çizakça, 2006). In addition, difficulties in cultivating the soil and possible fire threats caused difficulties in the activities of the foundations.

Thanks to the control mechanisms of cultures, rules are adopted as learned behavior over time and differentiate within the framework of the instructions required by cultures in the processing of philanthropy (Ilchman et al., 1998). The financial situation of people, their characteristics, the suitability of the purposes, the types and amounts of donations are determined depending on the variables.

The understanding of foundation culture has caused interactions between societies in history. In the Roman-Byzantine period, it is understood from the expenditures made for the belief in God and the places of worship that the understanding of foundation predates Islam. The transition of the understanding of foundation from individual to corporate in the Roman period started after Christianity was accepted as the official religion. Before Christianity, the charity works that individuals did in order to gain glory, honor, fame and social status in Greece prevented the development of the understanding of foundation (Akyıldız & Abay, 2017). Charities developed with the establishment of churches and monasteries with the adoption of Christianity.

Although there were no foundations in the early years of Islam, charitable activities were common and the foundation culture began to be adopted. The religion of Islam explains that the problems of people in need of help should be solved. In the Islamic geography, foundations were established by states or wealthy individuals to gain the approval of Allah. Philanthropy in Islam was carried out through legal and culturally accepted activities through the waqf (Ilchman et al., 1998). It is mentioned in the Quran that poor and needy people should be helped. At the same time, some of the properties acquired at the end of wars in the first years of Islam were donated to people in need (Okuyan, 2018).

The Roman-Byzantine Empire, which was before Islam, influenced the Islamic geography in terms of foundation culture. Later, with the conversion of the Turkish society to Islam, the Islamic understanding of foundation culture was adopted. While the Ottomans influenced the West in the field of philanthropy, in the 18th and 19th centuries the West affected the philanthropic system in the Ottoman Empire. Thus, the characteristics of Roman-Byzantine, Islamic principles, and Western geography can be seen in the foundation culture in Turkey (Çizakça, 2006).

In the Ottoman Empire, the effects of Islamic culture are encountered both in state administration and in philanthropic activities. Before the adoption of Islam, examples of benevolence and social solidarity

are seen in Turkish society, and philanthropic actions are effective in increasing social welfare. As an example, during the economic crisis in the Chou Hun period, it was aimed to provide social welfare by distributing the grains and fish caught belonging to the rich people to the elderly and in need of help (Baykuzu, 2003, as cited in Çanak, 2019). This method, which has been applied, shows the social assistance in the country and the commitment to the state. There was also cooperation between the Turkish states in Central Asia. The states that were at war or the states that were experiencing economic difficulties were being helped by other Turkish states. The expressions about cooperation in the Orkhon Inscriptions, which are an important cultural heritage in history, show the importance of social cooperation in the period of Kokturks (Çanak, 2019). In the Uyghur Period, there were almost no poor people in the country and there was no death at a young age due to hunger, thanks to the social assistance that the state and the rich people realized jointly (Ögel, 1948, as cited in Çanak, 2019). However, with various examples of social cooperation in Turkish customs and traditions, it is supported by Turkish proverbs such as "even in the smallest of matters one neighbor can help another".

Although the geographical conditions differ in mutual assistance between societies, the main purpose is to support the population that is deprived of meeting their needs with aid. With the "suspended coffee" practice, which is a very old Italian tradition, a person who orders coffee pays for two coffees by considering other people in need besides the coffee he drinks, and another person without financial means drinks the other coffee. The follow-up of these coffees is noted on a board in the shop, and it is understood by a person who does not have coffee by looking at the board. The person who orders the coffee does not know who ordered the coffee, and the person who drinks the coffee does not know who ordered the coffee. With this method, the person who does not have the condition will not be offended. A similar philanthropic activity, the practice of "suspended bread", which has started to be implemented in Turkey, is an example of traditional assistance received by an individual with a good economic status, who comes to the baker to buy bread, for the needy. The total number of donated breads in the bakery are noted in a way that passersby can see and the needy buys the bread from there. The hadith of the Prophet Muhammad "Let the left hand not see what the right hand gives" summarizes the way this practice was implemented. That is to say, the needy does not know from whom the help came, and the helper does not know who he has helped (Çetin, 2014).

The payment of customers who have debt to grocery stores, an Ottoman tradition, by someone else is also an example of traditional solidarity. This application is paid by the person who wants to help the people who have a debt to the grocery store in Ramadan (Çetin, 2014). Thanks to this example of philanthropy, which is still being practiced, the aid made reaches its true purpose because the owner of the grocery store knows the economic situation of the people living in the neighborhood well. As in the "suspended coffee" and "suspended bread" applications, anonymous giving is also available here.

In the Ottoman Period, many different methods were applied as well as foundations to help people in need. Charity Stones were also made in order not to leave people in a difficult situation, not to leave them needy and not to offend people (Özönder, 2000, as cited in Çetin, 2014). In order not to harm people's dignity, begging was not considered appropriate both in the religion of Islam and in the Ottoman Empire. In order not to offend people's dignity, Charity Stones were widely applied until the Tanzimat Period (Bayhan, 2010).

In addition, it was built in a way that people can see near aid institutions, mosques and cemeteries. The reason why it was built at a height beyond the reach of children was to benefit people who really needed it. The needy people took only the amount they needed from the coins left, and other needy people were also considered (Özönder, 2000, as cited in Çetin, 2014).

Mosques, madrasahs, hospitals, inns, Turkish baths, soup kitchens, bridges, fountains, caravanserais are concrete examples of social assistance and meet the needs of people for the development of the country's economy. The caravan owners who were doing business with the established caravanserais were accommodated in these facilities and the safety of their caravans was ensured. Confidence in commercial activities in the country was also increasing with the preserved caravans. The Ottoman Empire attached importance to the caravan routes and built small lodges called "Zaviye" on these roads, where merchants and passengers could stay for three days free of charge. Students could benefit from the madrasahs built free of charge, have a profession and contribute to the development of the country. Places known as Darüşşifa, which have survived to the present day, provided free health services to people in the Ottoman period without discrimination. Resting places are places where poor people or foreigners stay and feel safe. With the changes that took place after the Tanzimat Edict, the modernization process began in cooperation.

2.2.2. Modern Philanthropy

Systematic studies to support the requirements of social change and increase living standards are a definition of philanthropy in the modern world. With technology, philanthropy has developed in digital environment and it has become easier to reach people in need. Collecting donation funds, allocating resources, informing and educating members about activities are among the requirements of creating a charity environment. Eikenberry (2008) stated three different formations to which these features are applied as small groups, formal organizations and loose networks. Funding processes in small groups are organized rapidly and organized systematically. The second group, loose networks carry out planning, routing, organization and coordination processes. Also, formal organizations consist of experienced and professional members and people who make grant decisions. Decision making processes of grant incentives are carried out by teams and committees in the official organization and

have a bureaucratic structure (Eikenberry, 2008). Non-profit organizations make great use of these professional groups in terms of consultancy.

The activities of modern philanthropy are found in Non-Governmental Organizations (NGOs). Non-Governmental Organizations around the world were established in India to defend the rights of the people against the government, and in Europe after the 1st World War with the aim of helping (Gündüz & Kaya, 2014). In addition to organizations doing professional work, associations operating on a small scale are non-governmental organizations. Non-governmental organizations are non-profit, non-governmental, tax-exempt, independent charitable organizations (Özdemir et al., 2009). NGOs whose membership is accepted on a voluntary basis without any pressure are independent organizations. Although it is not related to the state, it can operate closely with the state under necessary conditions.

The financial sector also contributes to the activities of NGOs and charities supported by the state or companies, as well as from various sectors. For instance, Charity Bank lends funds collected from individual and corporate customers to charities. It is the first charity institution established in the UK to obtain a banking license. From 2002 to April 2021, the Bank has lent 357 million pounds to charities in total and has supported activities such as arts, education, environment, religion, health, social housing and sports (Charity Bank, 2021).

The main purpose of NGOs, which have very different ideals from each other, is to progress in line with the vision they have determined in their organizations. NGOs that deal with social problems and work to solve them work in partnership with the state when necessary. Efforts are made to find solutions to the problems encountered in state administration by organizing. Thanks to NGOs, the people in every part of their society participate in the management for the solution of problems. According to the World Sustainable Development Business Council, corporate social responsibility defends the economic development of the country and the business ethics of companies should be done by considering social benefit (Anheier, 2005). In addition to their own profitability, companies should aim at the economic development of their country in terms of price policy and employment of their products. Otherwise, exorbitant prices, which are unethical, cause economic damage to the country and society. Companies should determine the prices of the products they produce according to the price policy determined by the state. In this way, companies dealing with corporate social responsibility act in accordance with business ethics in addition to their donations to increase brand value.

The concept of corporate social responsibility, which is one of the areas where modern philanthropy is applied, is increasingly taking place on the agenda of companies. With the impact of the concept of corporate social responsibility (CSR) to start the modern era in this field in the 1950s, descriptive

contributions such as corporate social performance, which defines the activities and projects required to meet social needs, became widespread in the 1970s (Caroll, 1999).

The reason for the success of the companies in the business world reflects the principles of volunteering and sensitivity as well as doing profit-oriented business. Companies adopt goals, principles and actions that support community development. In this respect, corporate social responsibility becomes a consciousness towards the society for institutions and contributes to the improvement of social life with a sense of responsibility. Wang and Qian (2011) argue that a company has a significant financial impact in embracing corporate philanthropy and dealing with relevant activities, and supports the elimination of stakeholder concerns. There are many factors affecting business results such as increased sales for companies with social responsibility activities, improved risk management and ensuring sustainability. However, organizations that monitor social problems launch new products to develop solutions, and the products produced attract the attention of the society. In this way, while people are informed about the manufacturers of the products they use, their impact on the brand image has a positive effect.

When company employees define corporate philanthropy as having a moral value, they adopt the company more and contribute to the development of their performance (Wang & Qian, 2011). Social responsibility awareness helps to overcome these problems as the decrease in internal motivation and the inability of work life to respond to human emotions and expectations lead to problems. Projects carried out with this motivation become effective and successful works in the long term. However, when companies cooperate with non-profit organizations, participating in philanthropic activities due to the lack of time for company employees is no longer an obstacle and social benefit is provided.

It has an important place in the development of society with its corporate social responsibility (CSR) in line with the EU 2020 strategy, which includes the goals of sustainable growth and employment, and against the negative effects of the economy (EC, 2021). Factors such as ensuring brand value and trust, increasing employment and employee work motivation, meeting customer demands ensure value harmony between the company and the society. These concordant values, which are caught by corporate social responsibility, increase the power of the company against its competitors and gain competitive advantage. Although social responsibility projects cause additional financial needs for the company in the short term, profitability increases with the brand in the long term. In this way, investors trust in companies that achieve sustainability and they prefer to invest in companies with increasing brand reputation. Modern corporate social responsibility approach is to improve the quality of life as well as making profit for the sustainability of companies.

Since the methods of philanthropy made by these means are analyzed through analysis, efforts are made to find solutions to all difficulties. Gary and Kohner (2002) defines this method, whose effects are

analyzed through analysis, as progressive philanthropy and argues that it supports social change. It involves the transformation of the values and many elements that can be monitored in the structure of the society and within a process.

2.3. Contemporary Donation Systems

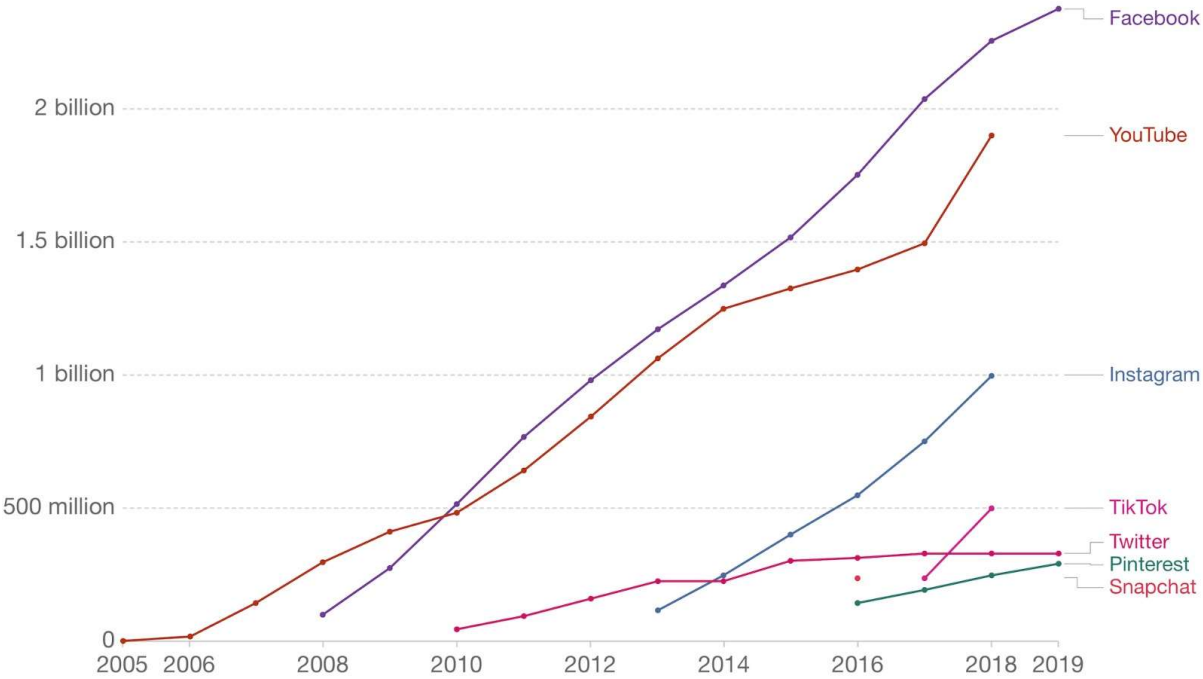
2.3.1. Common Online Donation Tools

The concept of philanthropy has gained a more comprehensive meaning as people have begun to become more integrated with digital in all areas of their lives, with increased access to the Internet. With the spread of online payment methods since of the late 1990s, online donation payments increased. With online donations, individuals contribute to the development of society by enabling increased social benefits with small donations. Donors deliver their aid to those in need, directly or through non-profit organizations. Unlike these methods of donating money, donations can be collected through platforms where foundations or institutions can continue their campaigns.

In recent years, support has been provided on the use of internet and social media, as well as on the implementation of strategies on social issues. Just as for-profit organizations have benefited from the power of social networks, charities have also increased the number of online donations through promotional campaigns and projects. It has been observed that, through social media, philanthropy has been affected positively by its peers, especially because of its effects and pressures on people (Lacetera et al., 2016). Also, increased incentives for people to donate by being influenced by the posts of celebrities sharing support on the social network. Thanks to social media, charities operating on a small scale and people who want to announce their needs are supported by reaching more people. Individuals consider providing inexpensive support on social media as a personal benefit or looking good (Lacetera et al., 2016).

With the increase in the use of the internet, aid organizations aim to make their voices heard more through the accounts they have opened on various social media platforms by establishing their own websites. By introducing themselves to the national world better with their social media accounts, they reach more donors by showing their aid activities with photos and videos. Statista and TNW (The Next Web) show that the use of social media, which has increased over the years, shows that the decision taken by charities is correct (Roser et al., 2015).

Graph 2.3: Number of People Using Social Media Platforms, 2005 to 2019



Source: Our World in Data

Nonprofit organizations direct individuals to their websites to convey their activities and projects to the community, to keep people informed about the institution, and to make donations online. Donating online saves time and money for donors and charities. The person who wants to donate with traditional methods has to go to the branch of the foundation or a bank to donate. Online donation is a more cost-effective method than traditional donation in terms of the time and expenses that the donor will spend on the road. Foundations, on the other hand, used to spend time tracking the traditional donation and sending an information letter by mail. Thanks to the online donation, the money is easily tracked and information is provided by e-mail. The collected funds can be viewed instantly and the analysis is carried out in a much shorter time. The relationships between foundations and donors are increasing more thanks to online donations, and foundations are raising more funds. In the traditional donation method, various documents are filled in manually, affecting the donor's motivation to donate. Because of online donation, the donor does not have to deal with procedures such as signing and filling out documents. Thus, since donating becomes easier than traditional methods, the frequency of donations by donors increases. While becoming a member of the websites of the foundations, the contact information of the donor is recorded in the system, and by sending congratulatory messages or e-mails on special days, religious and official holidays, bilateral relations are increased. Therefore, donors' loyalty to the charity is formed

and the frequency and amount of sending donations increases. Also, through platforms that provide donation-based crowdfunding, access to campaigns of charities and individuals is provided.

2.3.2. Donation-based Crowdfunding

Donations are collected through crowdfunding for activities or projects in many fields such as medical, emergency, charity, education, animals, as well as the most donated areas such as teaching students, giving scholarships and helping the poor. The crowdfunding model, which creates a financial resource for projects or initiatives, is also used in the field of philanthropy.

Crowdfunding is a financial service that is a fund-raising model through a technology-supported open call that began in the early 2000s. While crowdsourcing is the inclusion of a particular crowd in innovation and efficiency processes for a goal, crowdfunding is the system by which projects or initiatives are financed by the public (Landström et al., 2019). The tendency towards alternative financial support methods is increasing due to the application of high amounts of bank loans or the inability to provide the loan. In addition, geographic boundaries are eliminated in order to reach people who will provide fund support for ideas or campaigns for social purposes in geographies where there is economic insufficiency, and time efficiency is achieved.

The three main crowdfunding activities are donation-based, reward-based and investment-based crowdfunding. More profitability is created in the transactions made by crowdfunding for entrepreneurs and the society, and it is easier to reach the uncertainty of demand (Cason & Zubrickas, 2019). Campaigns can be financed with fund providers in internet based crowdfunding platforms (Belleflamme et al., 2015). Crowdfunding platforms are an updated version of the traditional fundraising process with the contribution of the Internet, similar to how non-profit organizations collect aid to make a social project. Unlike charities that collect donations online, crowdfunding focuses on project-based campaigns, and factors such as the target amount required for the campaign, donation status, place of use and purpose of use can be monitored. According to the research of the crowdfunding platform Fundly, on average, the amount donated to a campaign is \$ 99, the successful funding campaign is prepared in about 11 days, the duration of the campaign takes an average of 9 weeks, achieving 30% of the target amount in the first week increases the success rate, and the campaign is about 42% of the amount of funds collected at the beginning and in the last three days (Fundly, 2020). Also, it applies fee a certain percentage of successful projects.

Donation-based crowdfunding platforms show their impact to reach the wider community. Scataglini and Ventresca (2019) define donation-based crowdfunding as fund support that occurs when participants contribute by not demanding a financial return. In the donation-based crowdfunding model, investors

aim to support by investing in an enterprise, project or idea, without waiting for any material or moral response. If the targeted investment amount is not reached, the collected investments are returned to the investors. Donation-based crowdfunding investment model, which has a different motivation compared to other investment models, includes motivations to add power to a project that is desired to be realized, to be one of the first supporters of a promising initiative or to support an idea that will add value to the society. While other types of crowdfunding may have an upper and lower limit of investment, there is usually no lower or upper limit in the donation-based crowdfunding model. Campaigns are created by individual or non-profit organizations. There are two models for beneficiaries who receive donation support, the all-or-nothing model indicates that if the goal is not reached, the amounts can be returned to the donors, or the keep-what-you-raise model is applied, the donated amount is used for the specified need, regardless of the amount (Jenik et al., 2017).

In donation based crowdfunding campaigns, the creators define the fundraising goals to start the campaign. Also, those who launch the campaign share their needs by telling stories by text or video. The financing success of projects or campaigns is directly proportional to the media types conveying information about the campaign in detail (Koch & Siering, 2015). In the second step, after the project is accepted by the platform, it is necessary to declare the amount of fund required for the project to be realized and to set a time to collect the targeted amount. The beneficiary creates the financing target for campaign and shares information about the project in the online platform. Throughout the campaign, project owners update information about the progress of the process to inform donors on the online platform. Crowdfunding platforms differ in their knowledge needs according to the areas they specialize in and need (Belleflamme et al., 2015). To instance, one of the donation-based fundraising crowdfunding platforms is GoFundMe, it is basically a funding platform for medical, emergency, education, non-profit organizations and business issues. Funding campaigns for Covid-19, which is one of the biggest virus outbreaks of recent times, emerging in Wuhan, China in late 2019, have begun on the GoFundMe platform. Thus, donations are collected for medical supplies, quality health services and basic needs. GoFundMe allows individuals to create campaigns to raise money for their needs. There is no time limit for campaigns, organizers can close their campaigns whenever they want. This platform allows the creation of campaigns in 19 countries, and campaign owners can withdraw their funds only from that country.

According to Scataglini and Ventresca (2019), donation-based platforms are not subject to licensing unless they require regulation like payment services. GoFundMe platform fee is free to US dollars, Canadian dollars, British pounds, some European countries, and there is a 2.9% plus \$0.30 fee for credit and debit cards. Since 2010, GoFundMe has raised money more than \$5 billion for campaigns (GoFundMe, 2020).

Another donation-based CFP is FundRazr, includes fundraising categories on business, school, sports team, nonprofit and personal causes. The projects of the campaign owners are shared on social media or via e-mail. Donation-based crowdfunding platforms allow shared campaigns to be shared on social media. In the campaign shared on social media, awareness and targeted funds increase rapidly. Considering the number of active users in 2017, Facebook launched the “Fundraisers” campaign based on the prevalence of the use of fundraising platforms for non-profit organizations (Xu, 2018). Therefore, donation-based crowdfunding platforms are intermediaries for collecting donations to individuals and organizations.

The main challenges faced are the risks of fraudulent campaigns, which are shown as foundations with no public registration or created individually, and the fees and exchange rate risks demanded by the platforms where the campaign is created for the beneficiaries (Jenik et al., 2017). Since the platforms implement the necessary regulations to anti-fraud, the legalization of the campaigns creates credibility and the effect of the funders on the project goals increases.

3. BLOCKCHAIN TECHNOLOGY

3.1. Concept and Features of Blockchain

With the development of the technology, instead of saving the data to the central systems, copying and distributing the necessary datasets can be defined as the first step to enter the Blockchain technology. The blockchain consists of digital ledgers that operate in a distributed area and cannot be changed, and the emergence of this technology occurred in 1991 when the data chain was created to prevent digital signature (Ghosh et al., 2020). The Ngram Viewer, which shows the rate of use of words in the books uploaded to Google Books and published between 1800 and 2019, indicates that the "blockchain" concept has a certain percentage in 1992 and the frequency of the word has gradually increased with the use of Bitcoin in 2009.

Graph 3.1: The Density of the Word Blockchain in Written Sources on the Basis of Years, 1800 to 2019



Source: The Google Books Ngram Viewer

The data is recorded not only by one center or a group of centers, but also by everyone in the system. Therefore, control is provided from many points and consistency is ensured. In a peer-to-peer network, decentralized and distributed network, the participant's nodes are not connected to a central server. Since it is not connected to a centralized system, there is a reduction in operating costs and a greater increase in performance compared to systems with a central server (Zheng et al., 2018). Unlike central systems, functions continue in the blockchain even if certain nodes due to problems caused by a number of reasons are broken (Nofer et al., 2017).

Digital signatures are used together with the cryptographic mechanism to verify the transactions on the blockchain. Pilkington (2017) stated that the public key and secure encryption method is applied for the double spending problem, thereby creating a private key for each user and a sharing public key with everyone. The private key and public key create a different digital signature for each node. A digital signature is a cryptographic mechanism used to validate the accuracy and integrity of digital data, and a digital signature can be defined as a code attached to a message or document. The working principle of digital signatures is possible by understanding the hash functions and the basics of public key cryptography. The hashing process involves turning any size of data into an output, and hash functions are done using a mathematical algorithm. When combined with cryptography, hash functions are used to create a hash value that acts as a digital fingerprint, and any change in input data creates a completely different output (hash value). Thus, cryptographic hash functions are used to verify the authenticity of digital data. Since the unique and related hash value will change with the change of any block, fraud is prevented with this method (Nofer et al., 2017). In blockchain technology, digital signatures are used and coins are transferred to sign and confirm cryptocurrency transactions (Pilkington, 2017).

All nodes are independent and directly linked to perform transactions. The blocks are cryptographically added to each other to create a chain of records in the blockchain network (Andoni et al., 2019). As transactions take place between parties, the distributed digital copies of the ledger are instantly and simultaneously updated, and the record of each transaction is indelibly recorded through advanced computational algorithms and cryptographic locks. The system's lack of potential to decide by which miner the blocks will be added is an indication that the network is not connected to a central location (Ghosh et al., 2020). In order for the blockchain to be sustainable, security is provided by the mining system and the transfer transactions are made by the miners. The cryptographic calculations required for block creation and verification are performed with the proof of work algorithm in the Bitcoin protocol (Pilkington, 2017). In proof of work (PoW), with the rule that a miner has less than half of the processing power, in a possible attack, the transaction is rejected because other miners have more than 50% transaction potential (Khan et al., 2019). In this way, it becomes difficult to make changes in blockchain.

The network is not based on permission, block creation is publicly accessible, and the person can be involved in the block creation process, and if it creates a valid block, it is entitled to a reward. If the user attempts to cheat, the rest of the network will notice this, and the user will lose money, which the protocols require compromising. These mechanisms are called consensus algorithms because they enable network participants to agree on the next block to be added. Since the system is a distributed network, consensus algorithms are used to ensure that transactions are safe (Zheng et al., 2018). With

the features of blockchain technology, it is possible to have information about the speed of the number of users and the ideas of the society (Risius & Spohrer, 2017).

3.2. Types of Blockchains

3.2.1. Public Blockchain

Public blockchain is a completely decentralized type of blockchain where every person can be involved in all transactions and the consensus process (Buterin, 2015). The fact that transaction information is distributed to each node supports the idea of immutability and decentralization (Zheng et al., 2018). Thus, cyber-attacks on the blockchain network become difficult thanks to the information distributed to each node. Public blockchain does not reveal information about the user, only transaction information is provided to everyone. All users have a consensus mechanism called the permissionless ledger in the public blockchain network, and each user can participate in the approval process (Andoni et al., 2019). Consensus algorithms are used to ensure that the rules of the protocol are followed and that transactions proceed safely. While the protocol is defined as the rules of a blockchain, the consensus algorithm is defined as the mechanism by which these rules are applied. The operation of the network is built over the protocol, and users follow the protocol rules. Since public blockchains are decentralized, consensus should be established on distributed nodes regarding the validity of transactions. According to Zheng et al. (2018), this requirement is achieved by applying a consensus algorithm, since trust must be established in the consistency of all nodes.

One of the most common consensus algorithms that Proof-of-Work is used especially in cryptocurrencies in public blockchain. Proof-of-Work (PoW) complicates the nodes that cause the attack in terms of cost, while ensuring reliability in the public blockchain area (Lai & Chuen, 2018). It has been successful and used by Bitcoin to verify a new transaction block provided by the Proof-of-Work algorithm and add it to the network (Lai & Chuen, 2018). Systems using the PoW algorithm reward users who decode cryptographic processes to affirm transactions and add new blocks to the system (Andoni et al., 2019). In this way, the number of participants who get paid for their work and who are entitled to produce new blocks increases. On the other hand, Li et al. (2017) exemplified the uncontrollable process verification in the network as an example of the constraints of the consensus mechanism, the reduced efficiency resulting from energy loss as a block generation and calculation, which is far from compliance with business rules.

3.2.2. Private Blockchain

Reading permissions are permitted to anyone or in a restricted way, while writing permissions are centralized by an institution (Buterin, 2015). Lai and Chuen (2018) define the private blockchain as belonging to a reliable and controlled membership. Since it is controlled by a single institution or group in the private blockchain, efficiency increases due to the decrease in delay time (Zheng et al., 2018). Thus, companies can benefit from blockchain by establishing a closed network of employees only, due to the private blockchain. In this private blockchain application for a company, the writing process is limited to a central organization and the reading process may or may not be limited to a certain extent (Ghosh, 2020). The system provides the necessary permissions and restrictions to provide companies with full control over the network. Different permission units may need to be authorized to prepare different access levels for each role of use, such as joining consensus, making smart contract, reading a transaction (Lai & Chuen, 2018). Although the users get to know each other in the network, the transaction details are kept secret. Only allowed computers can join the private blockchain, and transactions are completed faster, as opposed to Bitcoin (Pongnumkul et al., 2017).

3.2.3. Consortium Blockchain

The consortium blockchain contains features from public and private blockchains. Unlike the control of everyone and a single place, it is verified by a group of partially central nodes. Only a selected set of nodes is responsible for verifying the block, partly due to centralization (Zheng et al., 2018). Furthermore, Buterin (2015) defines consortium blockchain as "partially decentralized". In this way, this network can be used for collaboration for more than one institution to operate transactions within information sharing. According to Zheng et al. (2018), while the change to the public blockchain is almost impossible, the consortium blockchain can be tampered with and the productivity can be greater with less confirming participants. Li et al. (2017) advocates the feasibility of the consortium blockchain network for money laundering and other difficult financial problems. As an example of the consortium blockchain applications, banks will require authentication and information sharing to be verified, so the consensus mechanism used in the public blockchain will not be sufficient, so it is implemented with Proof-of-Vote (Li et al., 2017). In this mechanism, the production of blocks and all transactions that require verification takes place within the rules by voting. According to the experimental results of Li et al. (2017), the first way of the proposed consensus mechanism is to verify the commission members by controlling the selected producers and the block generation processes by voting, which is partially centralized, and the second way is to increase security by involving some of the commission members in the transaction processes.

3.3. Most Common Application Areas

3.3.1. Digital Identity

Organizations offer opportunities for authentication and management services on the road to digitalization and allow users to apply verification processes using information from trusted parties (Wolfond, 2017). Instead of spending a large amount of money that companies allocate to verify customers' information, in the system provided by the integration of digital identity and public keys, the identity information can be verified once and the cost can be reduced by ensuring that it is valid for all other transactions (Niforos, 2017). Platforms that provide financial services between countries using digital identity aim to reduce the transfer cost. According to Ramachandran and Rehermann (2017), the BitPesa platform established in Kenya offers blockchain-based digital payment opportunity and local fiat money from African countries is transferred and converted into local currency of the recipient's country.

However, Rivera et al. (2017) emphasizes the importance of using the blockchain network in digital identity to identify any person to ensure security and data integrity. According to research conducted in Canada, it has been effective in preventing authentication and fraud in government services, and has provided significant benefits in traceability of patients and elderly people in healthcare (Wolfond, 2017). The need for digital identity integrated with blockchain technology to decrease the risks of digital transactions against cyber-attacks and increase the security of users.

3.3.2. Smart Contracts

Smart contracts provide mediation between mediated transactions and their partners, without requiring trust to the other side (Risius & Spohrer, 2017). Thus, it requires lower costs with this method, which is based on software codes and does not require third parties in approval mechanisms (Salmon & Myers, 2019). Meanwhile, the contract rules do not require a different verification tool because the code is contained in the content and savings are made. Since the rules are predetermined and the records are encrypted, there is no lack of trust due to information change, and the use of distributed ledger technology strengthens security against hacking. Transfers of digital asset transactions are applied automatically through smart contracts. According to Chiristidis and Devetsikiotis (2016), the absence of intermediaries leads to faster progress and compromise of transactions, and also indicates the applicability of distributed and automated flows with smart contracts. Smart contracts are easy to archive as well as fast data transfer in terms of reliability. Introducing the smart contract concept, Nick Szabo has specified the contract items as a reliable tool by adapting them to the software and applying them with codes (Chiristidis & Devetsikiotis, 2016). The implementation mechanism of smart contracts is

provided by adding blocks to the blockchain and can be controlled without requiring a third party (Koepl & Kronick, 2017). In this context, the reliability of the system increases due to the fact that many records are kept and the control mechanism is decentralized. According to Crosby et al. (2016), the invention of programmed and automatically executed smart contracts was not used until payment applications related to cryptocurrencies. It is used as the application of a secure mechanism in financial transactions with blockchain technology.

3.3.3. Financial Applications

3.3.3.1. Cryptocurrencies

Transactions with cryptocurrencies that do not have a central authority are considered to be used by users as an electronic accounting system (Kumar & Smith, 2017). In this system, privacy is required and encryption is made with algorithms in order to perform transactions. Encryption method is used in order not to make any changes while sending transactions and against inconvenient situations. It is also used to protect identities and make transaction records unchangeable. The security of the blockchain is carried out with encryption called cryptography, and the users or networks that ensure the verification of transactions are called miners and thus the miner who records the transaction is rewarded with cryptocurrency (Vyas & Lunagaria, 2014). Records of transactions approved by miners are kept in block. The block reward, which is defined as a fee for the transactions made by the miners, is given as bitcoin and the verified block transactions are added to the chain (Easley et al., 2019). Cryptography protects account addresses, and thus transactions for cryptocurrencies are recorded in these financial ledgers and peer-to-peer transactions are seen by everyone (Kumar & Smith, 2017). Public key encryption provides a secure message that can be verified by all users. According to the algorithm, the time each block is added to the blockchain is ten minutes and if the time decreases depending on the speed, the balance will be disrupted, so an adjustment is made at a certain time or transaction limit (Easley et al., 2019).

The emergence of Bitcoin took place in 2008, when an article was published by Satoshi Nakamoto, who is unknown. Thus, the first cryptocurrency, Bitcoin, started to be used based on the technical document and alternatively many different cryptocurrencies were produced. All cryptocurrencies used with blockchain technology are also sent peer-to-peer without intermediaries. Unlike common digital currencies, Bitcoin shares a distributed and transparent ledger containing all transactions related to digital currency in a network defined as a peer-to-peer (Li et al., 2017). Therefore, Bitcoin transactions are made directly to the other party with the peer-to-peer network without the need for a third party. With Bitcoin transactions, consumption was increased by directly transferring money without a single

user authorization (Ghosh et al., 2020). Bitcoin does not have a payment system or any center to which it is connected, and there is no single power that can determine its value as desired. Bitcoin price is determined by supply and demand conditions. As in normal economic conditions, demand and price change in direct proportion. There is a certain supply limit and the total supply for Bitcoin is 21 million. However, the circulating supply, which shows the number of Bitcoin owned by the market and users, approaches the total supply. Since cryptocurrency is not managed by governments, it shows value depending on the use of society and the industries used.

After a market growth in the Bitcoin price in 2018, there was another rise in 2020. According to the data obtained from Coinmarketcap, Bitcoin, which was approximately \$7200 and market value of 130 billion dollar at the beginning of 2020, reached about \$27717 on the 27th of December and has a market value of 515 billion dollar (2020). Accordingly, there was an approximately 385% increase in the Bitcoin price and a 396% increase in the market cap. This is because in 2020, with the impact of COVID-19, Bitcoin increased just like precious metals due to market uncertainty.

Graph 3.2: Market Cap and Price of Bitcoin (BTC/USD), 2013 to 2020



Source: coinmarketcap.com, Retrieved December 27, 2020

Bitcoin production is the process of performing the operation with the calculation authority by mining, synchronizing every user in the system and protecting the system network safely. In order for the cryptocurrency to be created, either data mining is done or the money is converted into cryptocurrency according to the exchange rate. For Bitcoin application users, a wallet and a node in the network are created and access to the blockchain that past activities (Böhme et al., 2015). The wallet includes bitcoin addresses, cryptographic private and public keys, and the account balance where all transactions are kept (Kumar & Smith, 2017). Because of each cryptocurrency protocols and algorithms are different, each cryptocurrency has a separate wallet and not all cryptocurrencies can be controlled with a single

wallet. The Bitcoin address, which consists of a chain of digital signatures of the users, is associated with the public and private key, and a message generated by the private key is confirmed by the participants through this public key (Vyas & Lunagaria, 2014). Thus, ensuring security is created with keys made of numbers and letters. The user sending the Bitcoin encryption method authenticates the instructions to transfer money to the other user using a private key (Böhme et al., 2015). Only someone who knows a public key can only track and see the balance of that key account. Each private key allows you to spend money sent to the public key generated from that key.

Vyas and Lunagaria (2014) argue that a part of the Bitcoin protocol should be changed against attacks caused by vulnerabilities in the mining process and storage of cryptocurrencies that threaten Bitcoin security. According to this idea, with the technology that continues to be developed, limitations in the protocol lead to attacks. Miners verify the existence of the amount that the user who wants to spend cryptocurrency wants to send against the risk of double spending (Kumar & Smith, 2017). In this way, an entry is prevented from being sent to different accounts. For purchases made with an input, taking measures against many transactions against double-spending attacks depends on the approval mechanism. Transactions are stored in “mempool”, which means a pool of memory where they are collected before being confirmed by the miners (Kumar & Smith, 2017). Due to the time stamp change, stored transactions belonging to attackers are only considered the first transaction in the mechanism approved by the miners, and the second transaction remains outside the network. (Vyas & Lunagaria, 2014).

There is a certain limit on the processing times due to the programming protocol in the mining process (Kumar & Smith, 2017). Also, with the growth of transaction volume, the number of transactions to be confirmed by miners is increasing. Transaction fees increase due to these restrictions affecting transaction speeds. Accordingly, the priorities in transaction verification and the transaction fees to be charged by miners will be directly affected. Easley et al. (2019) assert that the increase in waiting time due to the accumulation of transactions in “mempool” affects the bitcoin blockchain balance when miners do not profit from transaction fees. The process of executing transaction fees between users and miners on the network depends on this balance. Mining requires costs such as a computer and the energy required, and the protocol includes a bitcoin award for the incentive to add blocks (Koepl & Kronick, 2017). Hence, transaction fees allow miners to perform transactions for this process against the cost and effort spent.

Various exchange platforms have been established in order to increase the interest in cryptocurrencies in the world and for individuals to invest and follow cryptocurrency exchanges. Individuals can follow the cryptocurrency exchange free of charge, apart from being able to easily buy and sell with these platforms. The reasons for preference of users who want to invest on stock exchange platforms vary.

These can be listed as reliability, support, globality, commissions, ease of money transfer, variety of virtual currencies, accepted currency type, user experiences, local stock market preference, and the decisions taken by their governments.

Figure 3.1: Top 10 by Preferred Cryptocurrency Exchange Platforms

Name	Exchange Score	Volume(24h)	Avg. Liquidity	Weekly Visits	# Markets	# Coins	Fiat Supported	Volume Graph (7d)
Binance	9.9	\$30,355,288,176 ↑ 6.93%	729	38,475,284	1250	359	AED, ARS, AUD and +43 more	
ZG.com	2.6	\$12,423,458,840 ↓ 10.09%	89	25,306	47	42	--	
IDCM	--	\$12,159,708,979 ↑ 43.52%	--	3,944	25	21	--	
Upbit	5.9	\$8,907,816,317 ↑ 56.41%	300	4,585,222	268	169	KRW	
Huobi Global	8.9	\$7,943,717,186 ↑ 0.5%	675	1,470,777	974	333	ALL, AUD, BRL and +47 more	
OKEx	7.2	\$6,461,479,384 ↑ 10.18%	487	1,489,254	720	264	--	
Hotcoin Global	4.3	\$6,010,710,073 ↑ 16.88%	229	31,173	86	69	--	
TOKENCAN	--	\$4,780,032,210 ↓ 3.94%	--	1,162	51	42	--	
BitForex	3.7	\$4,483,183,486 ↑ 928.04%	204	448,674	174	116	--	
Venus	--	\$3,772,236,730 ↓ 5.94%	--	172,375	19	37	--	

Source: coinmarketcap.com, Retrieved June 3, 2021

The chart shows that Binance is the most traded cryptocurrency exchange platform, with a weekly visitor count of around 38 million and trading in 1250 different markets. In addition, 359 different virtual currencies can be invested and it supports trading with 46 different currencies. The Binance exchange platform also has its own virtual currency called BNB (Binance Coin). According to the trading volumes of the Binance exchange platform, ZG.com, IDCM, Upbit, Huobi Global, OKEx, Hotcoin Global, TOKENCAN, BitForex, Venus follow. According to the report of CoinMarketCap, the reasons why the Binance exchange platform has the highest trading volume can be considered as having a high market network, providing a wide range of virtual currency investment services, and supporting various country currencies.

Apart from the most well-known Bitcoin (BTC), Ethereum (ETH), Dogecoin (DOGE), Ripple (XRP) virtual currencies, there are more than 5500 types of cryptocurrencies around the world. In the table

below on CoinMarketCap, Bitcoin (BTC) ranks first in the world in terms of market value according to the USD currency. Market value is calculated by multiplying the current price by the circulating supply. For this reason, Bitcoin is the first virtual currency that comes to mind when it comes to cryptocurrencies. Tether (USDT) ranks first in the trading volume for one-day USD currency as of June 3, 2021. Cryptocurrencies following Bitcoin (BTC) by market cap Ethereum (ETH), Binance Coin (BNB), Tether (USDT), Cardano (ADA), Dogecoin (DOGE), Ripple (XRP), Polkadot (DOT), USD Coin (USDC) as Uniswap (UNI) is presented in CoinMarketCap's report.

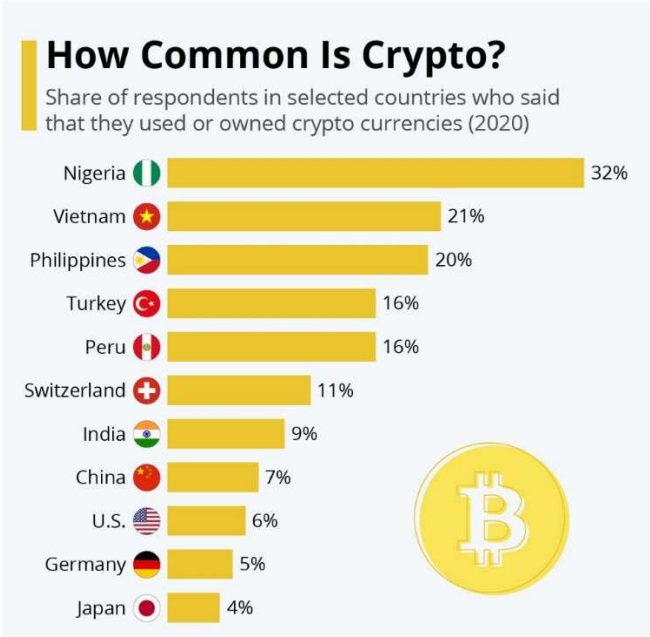
Figure 3.2: Top 10 Cryptocurrencies by Market Cap

#	Name	Price	24h %	7d %	Market Cap	Volume(24h)	Circulating Supply	Last 7 Days
1	Bitcoin BTC Buy	\$39,059.18	-5.46%	-1.52%	\$732,399,075,622	\$36,398,063,281 930,603 BTC	18,725,518 BTC	
2	Ethereum ETH Buy	\$2,840.22	+6.20%	+1.18%	\$330,986,544,464	\$30,601,646,549 10,737,654 ETH	116,138,167 ETH	
3	Binance Coin BNB Buy	\$422.91	-10.94%	-12.52%	\$65,075,016,372	\$5,149,853,434 12,142,247 BNB	153,432,897 BNB	
4	Tether USDT Buy	\$1.00	-0.04%	-0.07%	\$61,722,945,565	\$83,575,963,367 83,505,544,143 USDT	61,670,939,202 USDT	
5	Cardano ADA Buy	\$1.85	-5.69%	+5.94%	\$59,404,710,708	\$3,468,805,432 1,865,550,190 ADA	31,948,309,441 ADA	
6	Dogecoin DOGE	\$0.4085	-7.44%	+18.71%	\$53,381,831,908	\$8,949,561,213 21,772,636,260 DOGE	129,868,178,051 DOGE	
7	XRP XRP Buy	\$1.05	+4.19%	+2.67%	\$48,558,783,850	\$3,850,272,542 3,659,358,108 XRP	46,151,013,329 XRP	
8	Polkadot DOT Buy	\$27.77	+15.71%	+15.66%	\$26,375,973,563	\$3,266,472,271 116,954,397 DOT	944,378,470 DOT	
9	USD Coin USDC	\$1.00	-0.05%	+0.02%	\$22,775,665,104	\$2,074,968,338 2,073,600,631 USDC	22,760,652,620 USDC	
10	Uniswap UNI	\$28.77	+4.35%	-0.86%	\$16,382,315,591	\$575,711,556 19,881,322 UNI	565,738,335 UNI	

Source: coinmarketcap.com, Retrieved June 3, 2021

According to Statista, Nigeria ranks first among the countries that trade on the crypto currency exchange in proportion to the population of the countries in the world. In addition, Turkey ranks 4th in the world and first in Europe in this ranking.









Figure 3.3: Cryptocurrency Exchange Usage Rate by Country in 2020



Source: Statista

The domestic stock exchange platforms that are used most actively in Turkey according to the number of weekly user logins are Paribu, BtcTurk, Bitci and Paritex, respectively. In the chart, it is seen that the weekly total user login in Turkey is more than 3.5 million, and the total trading volume made on these 4 stock exchange platforms for one day is close to 1 million dollars according to this date. Paribu, the most actively used stock market platform, was launched in February 2017. This stock exchange platform, which has a total paid-in capital of 12 million Turkish Liras, has 3.5 million registered users. As of March 2021, there is an average daily trading volume of 1.5 billion dollars. It is a platform that ranked 16th in terms of trading volume on CoinMarketCap's list in December 2017. In addition, on May 4, 2020, it became the 2nd Exchange platform in the world with a total trading volume of \$ 1.4 million Chiliz Coin (CHZ). It also became the first Stock Exchange platform in the world with its Waves Coin (WAVES) trading volume on April 1, 2020, and Holo Coin (HOLO) on May 4, 2020 (Paribu, 2021).

Figure 3.4: Cryptocurrency Exchanges in Turkey by the Number of Weekly User Visits

Name	Exchange Score	Volume(24h)	Avg. Liquidity	Weekly Visits	# Markets	# Coins	Fiat Supported	Volume Graph (7d)
 Paribu	5.2	\$435,721,655 ▼ 20.93%	202	2,366,983	49	41	TRY	
 BtcTurk Pro	5.1	\$243,810,819 ▲ 0.11%	273	822,194	79	29	TRY	
 Bitci	3.7	\$13,060,137 ▼ 15.89%	52	489,546	71	25	TRY	
 Paritex	4.7	\$131,217,065 ▲ 1.48%	173	5,959	14	8	TRY	

Source: coinmarketcap.com, Retrieved June 4, 2021

3.3.3.2. Initial Coin Offering (ICO)

ICO is a tool that entrepreneurs obtain the financial resources they need to generate capital by selling tokens to investors (Fisch, 2018). Instead of opening the company's shares to investors in the stock exchange and applying to the initial public offering (IPO) method, tokens created by making ICOs on blockchain-based platforms are offered for sale and the earnings obtained are used in projects. (Conley, 2017). However, companies that have been operating for a long time use the IPO, and startups use the ICO, using the risky but profitable method. A whitepaper, which is a technical document that does not require specific rules, is prepared for the introduction of projects to investors. The whitepaper contains information on pricing, code sets and protocols (Adhami et al., 2018). The procedures required to obtain funding support take less time than the preparation for IPO. Conley (2017) states that it is not a profitable practice for small companies as the cost of public offering traditionally applied to increase company profits is expensive. In this way, small investments and access to international projects are supported. An example of an organization that uses it as initial funding is a Decentralized Autonomous Organization (DAO) that creates smart contracts by coding the approval mechanisms and is not linked to a management. In addition, according to Howell et al. (2019), the support of funds for the development of the blockchain, the adoption of the token purchased for use on the same platform in the future, and the liquidity tendency to increase because the token can be converted to any currency are the advantages of ICO usage.

The factors affecting the utility value of ICO tokens are rewarding the network creators with tokens before the control processes, providing funds with research and evaluation for the development of the platform and ensuring the gain, and the use of commitment for the access of the product to be formed (Howell et al., 2019). The mentioned methods can be applied because they are related to the value of the blockchain platform. Thanks to the code sets that are available and accessible for the projects, it becomes a visible feature in terms of technology for funders (Adhami et al., 2018). However, return on

investment is correlated with the current value of the tokens purchased. Howell et al. (2019) explains the high rate of ICO usage with Ethereum blockchain based on the result that 73% of smart contracts called ERC20 are used for the control and distribution of applied tokens.

In order for a project to be demanded in the collection of funds with the ICO, it is provided by making sense of the project with the token, determining the target audience and finding solutions to the requests of the people who will provide fund support. On the other hand, token sales are limited in most projects, causing blockchain slowdown in high demand and price increases in transaction fees (Howell et al., 2019). Demand increased as it gained confidence in security and transparency relative to other financial instruments, and there was growth in the ICO market in 2017 and 2018 (Howell et al., 2019). As one of the ICO projects created as venture capital and the decentralized system, 150 million dollars of funds were provided (Adhami et al., 2018). Especially for small businesses or startups, financial institutions will be less likely to lend, so companies can try to raise funds to create capital. This method can also use the ICO mechanism to create project funds in large enterprises and increase the use of cryptocurrencies. Howell et al. (2019) suggest that the average time it takes for the mechanism to create campaigns is 40 days.

According to Fisch (2018), the first ICO, the digital currency called Mastercoin, built on the blockchain of Bitcoin, was made by collecting Bitcoin from 500 investors. Even at first, considering the number of those involved in ICO, it has managed to be of interest to many investors. For countries, the impact of the demands depends on whether the projects carried out with the ICO campaign are legal or not. While ICO is banned in South Korea and China because it is an irregular and risky investment, it may also cause fraud, Germany and the U.S. Securities and Exchange Commission issued a warning letter to investors (Fisch, 2018). With the help of blockchain technology, new areas are opened for the fundraising tool, and curiosity towards cryptocurrencies increases, but failures occur due to fraud and risky transactions. Whether or not to obey the investor protection laws varies by country, U.S. Securities and Exchange Commission (SEC) argues that fraudulent organizations using ICOs and not trading according to protection laws lead to manipulation risks (Salmon & Myers, 2019). By introducing more regulations, forward-looking entrepreneurs such as the demand for ICOs may be interesting for the entrepreneurs.

In addition, the purpose of organizations using ICOs is to find investors for their campaigns and to gain users who use the tokens they create for their services. On the other hand, it is advocated that the regulations are uncertain due to the difficulties that may arise when the token-selling institution does not have a service, the investors do not want to take advantage of the services provided, and the organization that creates the campaign sells more tokens that will not be used (Salmon & Myers, 2019).

3.4. Challenges in Blockchain

3.4.1. Trust and Transparency

Although using the solutions brought by blockchain technology provides many advantages, adaptation to the new with budget constraints and complex processes brings difficulties. Maintaining network security, the balance of scalability with the growth of transaction volume, high costs, and concerns about ensuring privacy are among the main challenges faced in blockchain (Niforos, 2017). In order for Blockchain solutions to be sustainable, cooperation and communication with different business areas cannot be provided too much, and there may be problems between companies regarding trust and transparency (Galen et al., 2018). Furthermore, the attack on Distributed Autonomous Organizations (DAO) in 2016 due to an error detected in the smart contract on the network indicates that this blockchain technology needs to be further developed (Niforos, 2017). In the attack on the DAO, as approximately \$50 million was transferred to a different contract under the attacker's control, the tampering of the smart contract indicates that new rules must be added (Salmon & Myers, 2019).

3.4.2. Cyber-Attacks

However, attackers exploiting network vulnerabilities carry out cyber-attacks. With attacks on data entry, access to wallets is targeted, wrong information is accessed by users and payments can be sent to the account of the attacker (Salmon & Myers, 2019). Also, a distributed denial-of-service (DDoS) attack, in which access is blocked by concentrating nodes, is an example of a cyber-attack (Salmon & Myers, 2019).

3.4.3. Fork Problems

The fork problem, which is one of the factors affecting the reliability of the system, occurs when the consensus of the nodes in the distributed network cannot be achieved by upgrading the software. The rules created with the updated version are implemented by the new nodes, and there are old nodes that are not updated due to lack of consensus. Lin and Liao (2017) states that new nodes have more than 50% processing power as the feature that distinguishes them from old nodes. Two different problems arise, namely a soft fork and a hard fork, because the block operations of old nodes and new nodes cannot match. As the nodes that are not updated process the blocks, until the version update is complete, a soft fork is formed and the problem becomes temporary as all nodes use a single chain (Khan et al., 2019). While the old nodes that are not updated continue the block verification process in the same way, the new nodes continue to operate on the other chain, transacting on two different chains and a hard fork occurs (Lin & Liao, 2017). As one of the most important examples of the hard fork, the cryptocurrency

Bitcoin Cash (BCH) was created in the new blockchain by software developers who wanted to increase the Bitcoin block size from 1 MB to 8 MB in 2017.

3.4.4. Scalability and Transaction Fee

As with any emerging technology, issues such as scalability and budget constraints are challenging the development of Blockchain's mass assumptions. According to Zheng et al. (2018), since the increase in transactions will cause the storage area to become heavy in blockchain and when block producers choose the processes with transaction fees, scalability problem is encountered as a result of the problem of delay in other transactions. For instance, PayFast, which provides payment method services for businesses, individuals and non-profit organizations in South Africa, ended paying with Bitcoin on the platform as of July 20, 2019 due to delayed approval times and variability in transaction fees because of the increase in transaction volume (PayFast, 2019).

Since the issue of increasing the block size will lead to a decrease in the speed of propagation in the distributed network, ensuring storage optimization thanks to the database containing the records of the addresses and the micro blocks created for the storage of transactions are among the solutions to the scalability problem (Zheng et al., 2018). Also, while it is difficult to update all nodes as the network size expands, hard forks can occur (Kaur & Gandhi, 2020). The scalability problem can lead to a decrease in the value of cryptocurrencies and the number of users by extending the duration of transactions on the network.

3.4.5. Information Leakage

Blockchain users can overlook the information leakage since they operate with addresses created specifically for them, so that all transactions can be monitored by anyone (Zheng et al., 2018). As cryptocurrencies become harder to track with increasing transactions over time, criminals can take any action on crypto exchanges in order to perform tax evasion, fake id and passport sales, and other illegal activities (Vogel et al., 2019). Due to the diversity of data and participants in the blockchain, privacy regulations will improve by limiting users to upload each data to the blockchain for privacy risks (Salmon & Myers, 2019).

3.4.6. 51% Attacks

One of the attacks that threatens the security of the majority attack is that the miner has the ability to change data, stop mining or verification processes with 51% processing power (Lin & Liao, 2017). With 51% power ownership, double-spending attacks become possible as a result of changing data or stopping transactions on the network (Khan et al., 2019). Besides, miners who perform the block verification

process receive rewards for adding the block to the chain. In selfish mining, the miner who wants to cheat keeps the blocks that need to be added to the chain and continues the transactions in the second chain, and gains all the rewards from the new chain and can access 51% processing power (Zheng et al., 2018). Although the past transactions cannot be changed, the transactions to be made in the approval mechanism will be taken under control. For cryptocurrencies with lower transaction volumes, 51% attacks are more possible. As an example of the 51% attack, according to the report published by the Gate.io crypto exchange on January 8, 2019, the Ethereum Classic (ETC) blockchain network was attacked in a 4-hour period on January 7, 2019, and approximately 40,000 ETC was lost (Huillet, 2019). However, adequate hardware is required for a 51% attack on high transaction volume cryptocurrency, and therefore it is expensive. On the other hand, attacks on small cryptocurrencies are carried out with less costs and there are hash power leasing platforms for this. It is stated on the crypto51.app website that cost calculation and estimation are made to take precautions against the attack risk of these small cryptocurrencies. The Crypto51 site calculates the one-hour attack cost for attacks due to 51% processing power, and the required data is used on coinmarketcap.com for coin fees, whattomine.com for hash rates and nicehash.com for rental prices. Attack cost estimation is made by calculating the cryptocurrencies listed according to market value with the obtained data.

Figure 3.5: Hourly 51% Attack Cost of Cryptocurrencies Listed by Market Value

Name	Symbol	Market Cap	Algorithm	Hash Rate	1h Attack Cost	NiceHash-able
Bitcoin	BTC	\$355.17 B	SHA-256	114,915 PH/s	\$716,072	0%
Ethereum	ETH	\$67.76 B	Ethash	253 TH/s	\$418,438	3%
Litecoin	LTC	\$5.81 B	Scrypt	227 TH/s	\$29,287	6%
BitcoinCashABC	BCH	\$5.44 B	SHA-256	1,374 PH/s	\$8,560	33%
BitcoinSV	BSV	\$3.17 B	SHA-256	1,109 PH/s	\$6,912	40%
Dash	DASH	\$1.04 B	X11	7 PH/s	\$3,246	2%
Zcash	ZEC	\$802.85 M	Equihash	8 GH/s	\$8,710	3%
BitcoinGold	BTG	\$157.32 M	Zhash	869 KH/s	\$329	60%
Verge-Lyra2REv2	XVG	\$116.07 M	Lyra2REv2	13 TH/s	\$47	39%
Ravencoin	RVN	\$107.44 M	KawPow	2 TH/s	\$4,098	42%

Source: crypto51.app, Retrieved December 2, 2020

The NiceHash-able percentage is the rate that corresponds to the hash power of the NiceHash rental capacity required to attack cryptocurrencies for one hour. This rate is 0% for Bitcoin and 3% for Ethereum. The hash power rented is not sufficient for cryptocurrencies with a large transaction volume.

3.4.7. Regulation Problems

There is a need for legal regulations required for the expansion of the transaction volume in blockchain applications (Feng et al., 2020). Due to the establishment and non-adoption of legal regulations that will adversely affect blockchain applications and the use of cryptocurrency, it is difficult for society and decentralized technology to adapt (Niforos, 2017). In the survey conducted by the Cambridge Alternative Center in 2017 regarding the regulations and legal validity of the system, which was conducted with companies related to payment services in Europe, Asia-Pacific and Latin America, 40% of companies advocate the necessity of legal regulations with certain standards (Niforos, 2017).

4. BLOCKCHAIN APPLICATIONS IN THE PHILANTHROPY

4.1. Blockchain for Social Good

Financial platforms have been used for social purposes for different reasons in recent years. Data sources such as financial platforms, social networks or websites where projects are created provide ideas about the feasibility of blockchain for social good (Bartoletti et al., 2018). According to the analysis of projects that provide blockchain-based social good by Bartoletti et al. (2018), philanthropy category is the area that has the most projects of social benefit among the criteria, which are basically the compatibility of any of the UN Sustainable Development Goals and the project's target for the sector. Thus, high applicability projects, realization with a participatory approach, and having sustainable and measurable concrete results contribute to the creation of different projects in the same area. The project is started by setting a social goal that is compatible with social perception, and the success of the process is related to the announcement rate of the project as well as the determination of the criteria. Galen et al. (2018) emphasize that 2.5 trillion dollars of investment will be required by non-profit organizations, the private sector and the government for issues in Sustainable Development Goals, and it may be possible to do this with blockchain technology, which has an important place in the financial area.

Galen et al. (2018) stated that governments, private sector institutions and especially banks may lose up to 10% of funds for international money transfer due to transaction fees and slow money transfers. Projects that manage cryptocurrencies and fiat (traditional) currencies together are generally projects aimed at people who do not have a bank in their region to make transfer transactions easily (Bartoletti et al., 2018). Non-profit organizations invest more in these blockchain-based projects in order to make quick donations between countries and to be traceable. More than half of the initiatives for social good are invested using blockchain technology, the vast majority of them are foundations and the region is invested in western countries (Galen et al., 2018).

The European Innovation Council (EIC), which is still in the pilot phase, has been launched by the European Commission to take advantage of innovative ideas and effective innovations that are constantly evolving with technology and that will shape the future and to accelerate the growth of effective innovations. The pilot phase of the council is planned to be completed and implemented with 2021 Horizon Europe. R&D initiatives and artificial intelligence research in EU countries are moved to the USA to take advantage of the necessary resources, and the work intensity lags behind in the EU compared to South Korea and the USA (EIC, 2019). For this reason, the European Commission conducts reward-based studies to support new ideas and products based on science and technology. Prize on Blockchains for Social Good, one of these studies, was launched in 2019 to select the best project.

Blockchain award is given by the EU to successful projects to support social innovation in order to implement sustainability to a large extent and to increase applications in socially beneficial areas. The prize is awarded €1 million for each project, and it has been announced that five project owners will benefit from this award. Therefore, incentives for blockchain solution social innovation projects have been increased. The applicants for the EIC Horizon Prize are mostly from EU member states and the Netherlands is the top applicant country.

Graph 4.1: Number of Applicants by Country for the EIC Horizon Award in Blockchain for Social Good



Source: European Commission

Applications have been made in many areas according to the categories, and the most applied category is blockchain-based platforms and circular economy. Applications were made according to the main categories, which are “democratic participation”, “traceability and fair trade”, “financial inclusion”, “management of public records”, “public transparency” and “decentralized platforms/circular economy”. Also, philanthropy and health areas are among the newly added areas. As one of the application rules, people who have previously received EU awards in the same fields cannot apply to this program again. Public enterprises and individuals are among the participant groups while mostly small businesses participate in the project. In the studies, there are expectations such as beneficial change in social structure, solutions to problems related to sustainability, projects where transparency and confidentiality can be carried out together.

According to Galen et al. (2018), Alice which is one of the platforms that succeed with the transparent and traceability of projects with smart contracts, supports the project owners more when the determined

fee is reached. This further encourages people who want to donate via blockchain by directing them to the platform.

4.2. Blockchain Solutions for Philanthropy

4.2.1. Limitations of Conventional Online Donations

When the donor wants to help a different country, an intermediary nonprofit organization is needed. If this organization is abroad, the amount is transferred via bank and there is a transaction interruption. However, it takes time for the assistance to reach the person in need, and no feedback is received from the NPO. In the donation scenario created with blockchain technology, the donation reaches quickly with a very small transfer fee with the cryptocurrency. If the donation is sent directly to the needy, it is followed up about what it is used for and whether the donation has reached.

Due to restrictions on opening accounts for immigrants, banks are obliged to pay high transaction fees in order to transfer money to their relatives living in their country through the institutions that carry out the transactions (Ramachandran & Rehermann, 2017). Furthermore, there are difficulties in receiving donations through bank account due to limitations. Immigrants who apply to companies that carry out money transfer transactions across borders and people who have economic difficulties in their countries have financial access problems due to the lack of bank accounts.

According to Niforos (2018), due to the presence of 70% of the population without bank accounts in the Sub-Saharan Africa region and the fact that there is less resistance and more adoption in the face of cultural changes, the applicability of technology and blockchain is efficient. Due to the availability of blockchain-based applications in Africa, the necessary ground exists for the creation of donation campaigns to be provided with cryptocurrency. However, there are 1.7 billion adults without bank accounts in the world and approximately half of the adult population in Nigeria, Ethiopia, Indonesia and Colombia have no accounts (Demirgüç-Kunt et al., 2018). Thus, it is not possible to send donations to the poor through banks.

Refugees who flee to different countries to protect their lives due to problems such as economic crisis, civil war, foreign power, hunger and drought have problems receiving online donations. Data obtained in mid-2020 shows that there are 26.3 million refugees in the world, with the most refugees being 6.6 million Syrians, 3.7 million Venezuelans, 2.7 million Afghans, 2.3 million South Sudanese and 1 million Myanmar refugees (UNHCR, 2020). Therefore, refugees receive donations anonymously for different reasons. The reason for anonymous donation is that the identity of the donor is kept secret, either voluntarily or for religious reasons.

4.2.2. Advantages of Blockchain for Philanthropy

According to the Charities Aid Foundation 2019 Report, trust in nonprofits was 51% in 2016, while it has now dropped to 48%. Therefore, the fact that non-profit organizations have difficulties in fast and instant communication with donors is an indication that they are not working with professional teams. Another reason for the problem of trust is that the donor cannot follow the donations made and does not receive feedback from the institution. Donors' trust in non-governmental organizations has decreased due to the difficulties in communication, transparency and traceability. Blockchain-based donation platforms are used to make donations without intermediaries in terms of traceability and transparency.

Jayasinghe et al. (2018) identified four main advantages according to the study they analyzed: donation transparency, reducing transaction costs, donation speed, donation provisioning.

- Donations are transferred to users' Bitcoin addresses. Since the transferred addresses are registered, it is easy to control as it is clear where the donation goes.
- Payments made with blockchain technology are less costly than traditional transfer transactions.
- In current banking transactions, money transfers can take several days. Transfer transactions made with Blockchain technology take place in as little as 50 minutes.
- The presence of certain sanctions in the banking systems of countries can be prevented from being transferred to those in need in war zones. However, in Bitcoin transactions, large amounts are easily sent to desired destinations without the need for charities to carry cash.

Accordingly, donors may choose to send bitcoins to make even a small amount of donation, rather than waiting for banks to make international money transfers. The increase in nonprofits accepting cryptocurrency donations supports this idea. For example, cryptocurrency donations are accepted and distributed through CryptoFund, which is part of UNICEF's Innovation Fund (UNICEF Innovation Fund, 2021). In this way, blockchain technology is used to be visible between donor and needy.

Since there is a risk of carrying cash over vulnerable people who need help for reasons such as war, natural disaster or conflicts within the country, blockchain-based donations are made to prevent this and to shop safely. To instance, United Nations World Food Programme launched a pilot fundraising project called Blockchain-based Building Blocks for Syrian refugees in Jordan in 2017. Since the transaction fees for the World Food Programme, which is an example of international transfers, are 98% less costly, a lot of savings will be achieved if this pilot application is made for such organizations in different areas (Galen et al., 2018). With this project, cash transfers are provided by controlling the risks. Thus, there are restrictions for refugees to have an account at the bank, and donations are sent without the need for the bank. Payment is made with biometric authentication and transactions are recorded. This saves financial transaction fees and provides security for refugees.

4.2.3. Risks of Blockchain for Philanthropy

Due to the fact that blockchain is new in the philanthropy sector as in all sectors, it is mentioned about the risks as well as the advantages. As the storage requirements will increase with the increase of the blockchain volume, transaction fees can increase in forward donation platforms. The growth of the blockchain network due to the more transactions being made creates more storage requirements. With the emergence of technical needs, transaction fees may increase accordingly. For donors who donate with cryptocurrency by taking advantage of the low transaction fee, the increase in the fee depending on the transaction volume poses a risk.

4.2.3.1. Economic Risks

Especially with the effect of COVID-19, interest in crypto money exchanges has increased. The most important reason for this is that people in the business sectors want to make money after the closure. The financial literacy rate of people who trade on cryptocurrency exchanges may be low. The transactions are made by the events taking place in the world agenda, the statements made by the businessmen in the business world or the statements made by the states. In addition to their financial literacy, traders also trade with the recommendations of others. Due to the explanations made, the pricing of cryptocurrencies changes very quickly. Bitcoin, which was at the level of 10,000 USD in October 2020, reached a historical record in mid-April 2021 and reached 62,000 USD. At the beginning of 2021, Bitcoin, which was at the level of 30,000 USD, entered an increasing trend with the announcement of Tesla's CEO, Elon Musk, to sell vehicles with Bitcoin. However, Elon Musk later stopped buying vehicles with Bitcoin due to the energy damage caused by cryptocurrency mining. Restrictions brought in Turkey, restrictions brought by China to cryptocurrency mining and negative statements made by other states about crypto money caused Bitcoin to drop to the level of 35,000 USD within a month. Bitcoin, which increased by 600% in a short period of seven months, lost 40% of its value in a month. Because of high volatility with this type of news, it involves high risks for investors. The high decreases that occurred on a daily basis caused losses to those who entered only for profit, without market knowledge.

Graph 4.2: Price of Bitcoin (BTC/USD), July 2020 to June 2021



Source: coinmarketcap.com, Retrieved June 3, 2021

Despite the fact that money is an intermediary for social value and the expectation of value creation by economic change and technologies are adopted, states have regulatory powers for the means of change. According to Dimitropoulos (2019), security and fraud problems arising from the fact that cryptocurrencies are not subject to regulatory control create difficulties for regulators and raise the need for a legal system in blockchain applications. However, although the obligations of smart contracts are fulfilled automatically with security and immutability features thanks to the codes, the legal criteria of the countries or the party anonymity implementation processes affect. Blockchain applications used to make cross-border donations easily and eliminate fees paid to many intermediaries pose a legal challenge due to the lack of a central party responsible.

4.2.3.2. Terrorism Financing

Due to the anonymity feature of blockchain technology, there is the possibility of illegal activities to be carried out with cryptocurrencies. Terrorism is the whole of the activities carried out to try to make people adopt their own thoughts by making them give up their own thoughts by pressure and tyranny. Terrorist activities carried out as a group in a systematic and planned way for a political purpose are called terrorism (Bozdemir, 1982, as cited in Yücebaşı, 2010). That is to say, terrorism is the attempt to destroy the existing government through various means of violence by engaging in activities against the people and the state as a group of ideas they have adopted. In addition to the emergence of terrorist

organizations with the union of individuals who have anti-government thoughts, they are also created by foreign states to harm the existing country. There is no target in terrorist activities and all kinds of terrorist activities that can have a great impact in the country can be carried out.

The terrorist organization needs financing in order to carry out and continue terrorist activities in the current country. Financial resources are required for terrorist organizations that have needs such as recruiting new people to the organization, weapons, shelter, clothing, food needs and transportation. Terrorist organizations meet their financing needs through illegal means, by pretending to be legal and with support from foreign countries (Aykın and Sözmen, 2008, as cited in Yücebaşı, 2010). Based on this statement, activities such as smuggling, counterfeiting, extortion, drug trafficking, theft, bank transactions and fraud are illegal financing activities. Countries, on the other hand, finance terrorist organizations between states that do not have good bilateral relations with the aim of destroying another state economically or disturbing the peace by causing turmoil within the country.

Illegal organizations carry out their fund transfer activities through banks, non-bank institutions and physical transfer. Terrorist financing has been actively carried out through banks from past to present, since banks can transfer funds quickly and easily (Göktaş, 2019). In addition to banks, organizations that are increasing in number and performing money transfer are also used for financing terrorism. Due to the great measures taken to finance terrorism in the banking system, terrorist organizations also perform fund transfers as cash transfers. Today, with the development of technology, cryptocurrencies have emerged and attracted the attention of people. Terrorist organizations also use cryptocurrencies in fund transfer transactions and fulfilling their financing needs (Yardımcıoğlu & Şerbetçi, 2018).

Cryptocurrencies have different features than fiat currencies. Customers need to open an account in order to make transactions in banks and the money in this account is expressed as a debt to the bank. Cryptocurrencies, on the other hand, do not represent any debt and are just values. States control the transactions of banks through various institutions and try to prevent the financing of terrorism. However, there is no state control and tracking of cryptocurrencies created with the encryption method. Transactions and transfers made on the Exchange cannot be prevented. States can make various interventions to control the financial structure of the country. For example, the state cannot intervene in cryptocurrencies, while performing various interventions or restrictions on fiat currencies related to the money supply. Cryptocurrency buy-sell or transfer transactions are made through various platforms, and individuals' information is not requested in detail when entering these platforms. Transactions are carried out with the nicknames determined by the customers among the digital addresses of the customers. The fact that these institutions and platforms do not ask for detailed information about their users facilitates the financing of terrorism. However, banks and institutions that are supervised by states request detailed information from their customers and share them with the state. Customers do not need

to get permission from any institution when trading cryptocurrencies. Therefore, it cannot be understood that the customer who is a member will be on the black list and will finance terrorism. The fact that there is no geographical barrier in cryptocurrency transfers and that it is in the international arena facilitates the financing of terrorism (Çarkacıoğlu, 2016). Despite the fact that the biggest problems of the cryptocurrency market are that the information belonging to individuals is not known and it is open to illegal financing, it will benefit the world if supervision activities are organized (Troeller, 2016, as cited in Yardımcıoğlu & Şerbetçi, 2018).

4.2.3.3. Money Laundering

Money laundering is the entry of money earned by individuals into the economy as a result of certain activities that are not appropriate by the state (Ergül, 2008). There is an attempt to show money earned from illegal activities such as terrorism and drug trafficking as legitimate (Troeller, 2016, as cited in Yardımcıoğlu & Şerbetçi, 2018). The moral definition is money laundering, which is money that has not been earned virtuously, regardless of whether it is clearly stated by law, has a legal penalty, and proof. Money earned in legal frameworks may also be obtained as a result of money laundering (MASAK, 2006, as cited in Berber, 2019).

It is tried to launder money by various methods by making money through illegal activities. The first source of money is tried to be hidden by avoiding the pursuit of state institutions and security. In order to launder cash earned as a result of illegal activities, different ways are applied to find places where this money will be placed. The earned money is deposited in different banks under different names so that it does not attract attention. The aim is the possibility of large amounts to be caught under the supervision of banks. The reason why it is put in different names, not in a single name, is not to arouse any suspicion. A transfer or conversion of money deposited in a bank that does not attract any attention is required. The determination that cannot be made in the first stage becomes difficult to do in the second stage. Here, the money to be laundered is transferred to different banks and individuals. The reason for transferring to different banks and individuals here is to increase the transfer volume and try to lose the main source of money. Thus, the regulatory departments of banks have difficulty in finding the origin of money. The transferred funds are transferred to different countries and institutions within the tax haven. The next final stage, the investment stage, is the most difficult stage to determine whether the transaction is illegal (Paoli et al, 2017).

Nowadays, large investments are made in cyber technologies due to money laundering activities, especially with virtual currencies. Developing and increasing virtual currency exchanges and criminal organizations carry out their money laundering activities on these platforms. Money earned after various criminal activities is invested in these exchanges. After the money deposited here is converted into

virtual money, their transfer takes place (Carlisle, 2017). Criminal organizations use virtual money platforms to launder money, as cryptocurrency transfers are fast and there is no approval or control. The low cost of money transfers, the availability of anonymous accounts and the fact that individuals perform these transactions with digital identities provide advantages for criminal organizations (Brill and Keene, 2014).

Inspection of the intermediary between the buyer and seller in the money laundering activities and transfer transactions in the markets, and identifying the identity prevents money laundering. However, due to the nature of Bitcoin, the absence of any intermediary between the buyer and the seller and the absence of a centralized structure make money laundering transactions easier. Due to the lack of interpersonal contact in Bitcoin buy-sell and transfer transactions, identification becomes difficult. Although each transaction made with bitcoin, which is based on the blockchain, can be stored and tracked on the chain, it has no connection with the person who made the transaction. The fact that individuals have more than one electronic wallet also complicates the investigation of money laundering activities. The fact that transfer transactions through crypto money exchanges are faster than interbank money transfers and that they are global facilitate money laundering activities. The fact that fiat currency is paper and coin does not allow physical transportation of money between countries. In addition, it brings difficulties and limitations in carrying the volume-weight of high amounts of money. However, it is possible to go to other countries by storing millions of virtual money with USB devices or hard disks (Baath and Zellhorn, 2016).

Money laundering causes serious damage to the country's economy. Since the money transferred from abroad in foreign currency causes the currency of the country to appreciate, it increases the price of the goods produced in the country. The price increase in these goods reduces the competition with other countries. The money transferred as illegal and domestic currency causes inflation as it increases the amount of money in the country. Therefore, the state's budget is adversely affected and reduces tax revenues. These large amounts of money entering the country affect the markets in the country and cause speculative movements in exchange rates. It causes a change in the income distribution in the country. Since criminal organizations use banks for money laundering activities, it harms the asset-liability management of banks and causes banks to go bankrupt (Mavral, 2001, as cited in Aydınşakir, 2008).

4.3. World Applications of Blockchain Technology

4.3.1. The Methodology

In this study, the multiple case study method, which is one of the qualitative research methods, was used. According to Chmiliar, case study is a methodological approach that allows the systematic

collection of information about the functioning of the system to be examined by multiple data collection method (2010). Whereas multiple case analysis is the name given to studies in which more than one case is examined. I supplemented the multiple case study with a comparative analysis of platforms.

The method was followed in the data collection process: First, in order to find application related to the research the words “Blockchain” and “Philanthropy” were searched together from the internet search engines. Applications that use blockchain or cryptocurrency technology as a tool in philanthropy have been tried to be determined by analyzing the content of the sites accessed with different combinations. In this data collection process, 6 parameters for each case were determined as analysis parameters. These are (1) the founder(s), (2) objectives, (3) problem statements, (4) offered value, (5) projects -presented for getting donations- and (6) payment methods. For the founder parameter, the website of the relevant applications was not sufficient, and the background of the founders was tried to be understood by using the LinkedIn platform (one of the career oriented social network/media platforms). Data on other parameters were taken from their own websites, blog posts and whitepapers within the websites. Information of platforms was obtained from givetrack.org, aidchain.co and AIDCoin Whitepaper, thegivingblock.com, bithope.org, binance.charity websites.

The following can be considered as data analysis section. Based on the statements such as risks and advantages already mentioned in the literature, I tried to determine how the applications’ discourses have similarities with them. I have also highlighted common themes and differing aspects for each parameter by juxtaposing the parameters in a table.

Since blockchain technology is a new technology and its use in the field of philanthropy is a very new subject, it has limited our study. I had a hard time finding applications because there were very few examples of this. The lack of research on existing platforms has also led to the use of limited parameters. Although there is no study that collectively reveals these findings, I have tried to find solutions by examining the case studies.

The methodological contribution of my work has formed the basis for the work of blockchain in the field of philanthropy. There is no study that evaluates many applications together as a starting point for future studies. Blockchain studies in the other philanthropy field include more theoretical research. No study has been found that brings these practical applications together. This study can also be analyzed for how it has changed over time, using the findings here for future studies. I hope this study contributes to guide future studies.

4.3.2. GiveTrack

Founder(s)

BitGive Foundation, the first donation platform based on blockchain and using Bitcoin, was established in 2013 and is an intermediary for non-profit organizations and to support projects for the benefit of the society. Connie Gallippi, the founder of the foundation, is the first female founder among foundations established in the cryptocurrency field, and has previously held various positions in non-profit foundations for fifteen years. In order to implement transparency and scalability, it launched the donation platform “GiveTrack and Bitcoin Charity 2.0 Initiative” to users in 2015. The organization has tax exemption status and in California that supports fundraising for nonprofits and focuses on public health, environment, education, poverty, protecting animals, children and human rights. BitGive created its first campaign with the Save the Children for children affected by the strong storm that caused the destruction of houses in the Philippines and the death of people. Subsequently, the foundation carried out joint activities with The Water Project for water well drilling operations as the second project. In 2014, the Foundation is the first official Bitcoin non-profit organization in the world and continues its studies in the field of technology.

Save the Children, The Code Inspire and The Water Project are among the collaboration partners of non-profit organizations. The Code Inspire institution was established in Afghanistan in 2015 for women to develop themselves in technology, learn to write code, create mobile applications and learn programming languages. Save the Children was founded in 1919 for war-affected children and now operates in 117 countries for children exposed to poverty, disease and violence. Also, The Water Project is a NPO that has been running water projects since 2006 for places affected by access to clean water enough to cause disease in Africa.

Blockchain-based donation projects and fundraising system are carried out through the GiveTrack platform. According to the results observed in the foundation's five-year report, the annual fundraising amount started with \$50,000 in the first year of its establishment and the total revenue increased to \$2,726,443 between 2017 and 2018 with GiveTrack, a blockchain-based donation platform established in 2015. As funds can be collected with other currencies besides cryptocurrencies, the tendency of users to donate through the platform has increased. Many magazines and media tools such as EconoTimes, Forbes, The NonProfit Times, US News, Chronicle of Philanthropy, Wall Street Journal, Entrepreneur, Bitcoin Magazine have been featured and attracted attention.

Objectives

It emphasizes financial transparency, global influence and revolution in its slogans. There are opinions that the concept of philanthropy will turn into real-time tracking in the future.

Problem Statements and Offered Value

By using blockchain technology, solutions were created for problems such as slow transaction times in charities, misuse of funds, not following all the funds processes and high cost transactions. Advantages such as providing access from anywhere without space limitation, creating security with transparency and encryption method, transfer with free or low transaction fee, and rapid progress of processes with the approval of transactions are provided.

Projects

Classification of projects by the platform according to their subjects and situations increases the accessibility of donors. The processes of 2 protecting animals, 6 children, 3 environment, 3 education, 4 health and 1 human rights project can be displayed according to their subjects. The last fundraising project was created for Covid-19, a pandemic crisis that affects the world, especially for risky group medical workers and those in need, and the targeted fund amount is \$20,000. Covid-19 Emergency Relief Fund, which is one of the projects created, is the only project in the stage of fund raising initiated by them. Thus, the foundation also finances the projects they create.

In addition, a total of 19 projects are available on the platform, of which 7 are implemented and 11 are completed among the campaigns of different organizations. There are 2 projects that have reached their targets and more funds have been provided. 9 Projects are over \$10,000 and its ratio to all projects is 48%. Among the targeted projects, the lowest is \$4,200 and the highest is \$50,000.

Payment Method

Payments are made via Bitcoin or financial service support platform to Uphold by registering a certain transaction fee and donation payments are made with fiat currency or other cryptocurrencies. For cryptocurrencies other than Bitcoin, there are 20-30 minutes of waiting time and up to 24 hours for debit/credit card and PayPal. The largest funding amount announced on the platform was provided by Pineapple Fund and private donor, which is 1 million dollars. It has been stated that the funding campaigns requested by individuals are not supported only by the organizations' campaigns and projects. Since the platform is open to the public, data such as project start time and targeted fund amount are visible to everyone. By sharing the results of the project with donors, the desired targets are achieved in terms of accountability.

4.3.3. AIDChain

Founder(s)

AIDChain was designed by CharityStars in 2018, which carries out its projects in collaboration with charities, famous donors and large companies. Charitystars has offices in Milan, Los Angeles and London, and no information is available on where the AIDChain platform was created.

Objectives

The platform using Ethereum blockchain provides services for transactions between nonprofits and cryptocurrency donors, focusing on the traceability and transparency of donations. The interface on the AIDChain platform converts many cryptocurrencies into Aidcoin to store and donate them in wallets created by users. Services are provided with the tools developed for donation transactions between donors and charities.

Problem Statements and Offered Value

It is stated that societies advocate the idea that NPOs should have the effectiveness of donation management, transparency in transactions and lower costs. Therefore, the focus is on efficiency, transparency, low cost and tax deduction in donation transactions.

Since transactions are not deleted on the blockchain, the flows of cryptocurrencies can be monitored. Thus, it is recommended that NPOs use this ecosystem to manage resources efficiently.

Transparency is provided by making the necessity of protocols for the approval and verification of certain rules through smart contracts in the blockchain. With this method, security is provided and donations are conveyed to the necessary recipients accurately and easily. The management of funds in the philanthropy sector with smart contracts allows donations to reach the right recipients and if the necessary conditions are approved. According to AIDChain, if half of the targeted amount for the project is not collected, donations are returned to donors and independent validators can hold the collected cryptocurrencies until the delivery of the project, as an example of the requirements in smart contracts.

Projects

The platform, which has collected funds for a total of 12 charities, has so far raised about \$156,739 for 77 donation projects and there are 309 donors registered on the platform. Among the existing charities, there are organizations that work in the fields of education, health and environment. The most funds were collected for the Japan Relief institution and are working to meet the needs of the provinces affected by the precipitation in Japan. In addition, the World Wildlife Fund Italy works to protect

biodiversity and Alice for Children works to support children in Kenya in the fields of education and health.

Payment Method

AIDChain, a donation platform that produces its own cryptocurrencies which is AidCoin, collects funds for donors from donors through the payment system they have developed. Payment is made in 23 different cryptocurrencies through AIDPay, the payment system they have developed. The aids made from the websites of NPOs registered on the platform are converted to AidCoin through the AIDPay system, and institutions easily manage the funds collected. In order to create a campaign on the platform, it is registered as a company in any industry. It is stated on the website that the registration process can be realized by receiving an invitation from the company or NPO that is being worked out for individual registration in the near future. While registering, they are asked to work or their own company information to enable them to easily communicate with people. In particular, fraud can be prevented by requesting this information and reports the progress of the charitable foundations in detail.

4.3.4. The Giving Block

Founder(s)

It was founded by Alex Wilson and Pat Duffy in 2018 for donors to send Bitcoin and other cryptocurrencies to nonprofits. Pat Duffy has been involved in consultancy and collaboration with non-profit organizations, and Alex Wilson has worked in the management consultancy field, which carries out strategy stealing of technologies such as cryptocurrency, IoT (Internet of Things), and blockchain. Since cryptocurrencies have tax incentives for donations to charities, a platform was created by producing a solution for the acceptance of cryptocurrency donation.

Objectives

With establishing partnerships between crypto companies and NPOs, companies are supported to rise in terms of brand and reputation and NPOs to create more resources.

Problem Statements and Offered Value

It contributes to the formation of partnerships between companies and non-profit organizations, as crypto donation provides tax reduction advantage.

The platform allows nonprofits to open a trusted crypto exchange account, create an integrated widget on site to make quick donations in exchange for a receipt, and run their own campaigns for more donors to be effective. It offers donors the marketing tools needed to find nonprofits. In addition, necessary resources are created for institutions to reach donors.

According to The Giving Block, donating cryptocurrency for corporations creates social benefit by demonstrating corporate social responsibility. As the number of charities accepting cryptocurrencies increases, more will be adopted. Thus, the purpose of the platform is to act as an intermediary between NPOs and donors that accept cryptocurrency, as well as to promote crypto.

Projects

The Giving Block platform has partnerships with 49 technology companies. It has been working with a total of 104 nonprofit organizations to donate the crypto money of donors. Thanks to these partnerships, they facilitate donations to NPOs as well as their own campaigns. The platform, which has four campaigns in total, takes part in campaigns to support the cryptocurrency donations of nonprofit organizations that have projects for the same purpose. One of these campaigns is "CryptoCOVID19" of NPO that create projects for people affected by Covid-19. Thus, partnerships were made with 33 nonprofit organizations that work on the epidemic and accept cryptocurrency. Secondly, the "Crypto for Black Lives" campaign is carried out with 6 partner nonprofit organizations. The "Bitcoin for Beirut" campaign was created on The Giving Block platform for the explosion of Beirut, which was delivered by the International Medical Corps, which provides healthcare services to people affected by diseases, disasters and conflicts and communities with insufficient health services. As the last campaign, "Bitcoin Tuesday", created for the adoption of cryptocurrency donations, was created to celebrate the cryptocurrency charitable day. There is a goal of donating \$1 million worth of cryptocurrencies to charities for this campaign. It is a movement similar to the Giving Tuesday campaign, which is celebrated to increase the number of donors and raise awareness for more donations to charities.

Payment Method

Through the platform, the donations of Bitcoin, Ethereum, Bitcoin Cash, Litecoin, Amp, Basic Attention Token, ChainLink, Dai, Gemini Dollar, Storj, Zcash and 0x cryptocurrencies are mediated to charities. It is also stated that when donations are made, a tax receipt is automatically given.

4.3.5. Bithope

Founder(s)

The Bithope Foundation was established in Bulgaria and aims to encourage the use of cryptocurrency in its country. Vladislav Dramaliev, who founded the Bithope Foundation in 2014, working in the field of blockchain, cryptocurrency and marketing, is one of the founders of the first bitcoin website exchange in his country. Bithope.org, a bitcoin crowdfunding platform, was introduced to bitcoin donors in 2015.

Objectives

The goal of foundation is to promote nonprofits and encourage donors to provide cryptocurrency funds to charities. In addition, it directs businesses that work on bitcoin to corporate social responsibility activities and ensures that cryptocurrency is adopted by the society. The BitHope Foundation provides additional funding at the international level to support funding campaigns using the cryptocurrency to support established NPOs that are difficult to access or less known, and businesses that develop projects in the area of social responsibility using cryptocurrency. It is aimed to encourage international donations, to develop images for decentralized technologies and public interest, and to create campaigns that support communities and businesses that develop projects in the field of social responsibility. In addition, the foundation discloses its money laundering policy, which is an illegal activity and is registered in the "Central Registry of Nonprofit Legal Entities".

Problem Statements and Offered Value

The fact that the blockchain is open source software makes it possible to track the operation. Since the approval of a central place such as a bank is not required for transactions, there are no restrictions on access and transparency is ensured. As in central systems, it has a neutral feature since personal information such as financial status required for access is not questioned. Since the network is always available without interruption, transfers are carried out quickly. It is also protected against counterfeiting due to the limited number of bitcoins being created and not renewable.

Bithope Foundation, which works for the public good, ensures that the public reputation is developed, donations are made at international level and donors reach the needy. In addition, the rules are regulated and implemented by the foundation to prevent money laundering, and the foundation implements the obligations required by the Personal Data Protection Commission.

In order to promote NPOs at the international level and support bitcoin donation campaigns, Bithope Foundation requests 5% of all funds sent from the NPO for administrative expenses. In addition, a certificate is issued by the foundation for donors who are EU citizens to benefit from reducing their taxes.

Projects

The status of the annual campaigns and the amount of donations collected are reported on the website. In donation campaigns conducted jointly with charities, the donations made to the projects on health, nature and development of the foundation are also categorized.

Donations are accepted to campaigns created on the site or to the BTC address of the foundation. Donations sent to the address of the foundation are distributed to the campaigns. It is available on

bithope.org where 36 campaigns have been completed. The amount of donations collected for a total of ten campaigns created in 2017 was announced on the website as \$15,500. It was stated that the fundraising of approximately \$6,123 for six campaigns carried out by the foundation in 2018 was concluded despite the depreciation of the cryptocurrency market. According to the report for the year 2019, approximately \$35,670 was donated for five campaigns. However, the breast cancer screening project, which is the donation campaign that the foundation has collected the most bitcoins to date, was supported by 3.6 BTC in total sent by donors.

Payment Method

Since the purpose of the platform is to increase the use of bitcoin, it has a BTC address. However, donors who want to donate a different cryptocurrency other than Bitcoin can use the ShapeShift button to convert the cryptocurrency they send to bitcoin. The ShapeShift platform allows more than fifty cryptocurrencies to be converted. There is no need to create an account for the cryptocurrency exchange transaction made through the Bithope platform, and miners are paid instead of a service or exchange fee.

It has also been stated that using the IndieSquare wallet, bitcoin can be donated through the Counterparty platform, which is a blockchain solution. Counterparty, a public and free platform, uses the bitcoin network and users can create tokens. On this financial platform, the Bithope Foundation has created a token called Hopecoin, and donors are given 50 Hopecoins in exchange for the donation of \$1 in bitcoin. It is stated on the site that these coins can be exchanged for the services of future projects.

4.3.6. Binance Charity

Founder(s)

It was founded by Changpeng Zhao, the founder and CEO of Binance cryptocurrency exchange. This donation platform is also effective in increasing the number of donations made with cryptocurrency, as it attracts the attention of cryptocurrency users all over the world due to the size of its transaction volume. The founder previously worked at Bloomberg and is also a software developer.

Objectives

Blockchain Charity Foundation is a NPO that uses blockchain technology for global sustainability and development worldwide. Blockchain Charity Foundation aims to be sustainable globally by increasing transparency in charitable activities using cryptocurrencies and grow to radically change the lives of communities in need through various social projects. It is desired to show that donations made with Blockchain technology create a visible change in the world, not only by helping donors, but also by

providing them with a new donation experience. It goals to enable blockchain technology to end inequality and poverty in the world and be sustainable.

Problem Statements and Offered Value

It creates a transparent, accountable and efficient blockchain-based donation system for every transaction made. Blockchain Charity Foundation is constantly working on innovative solutions and increasing social impact, testing to fix problems. It also seeks to increase global awareness of the social power of Blockchain. At international events, blockchain facilitates the accessibility of youth and vulnerable communities through dialogues.

Projects

People and companies from all over the world can donate at very low costs, and no share is taken from the donations collected. Binance Charity Foundation transfers donations to crypto wallets of those in need after authentication. A total of 2,984 BTC (approximately USD 120 Million) donations have been collected from 2,271 different people to date. The donations collected were delivered to 106,000 people living in many different countries around the world. Binance Charity Foundation often organizes projects for the education of children in Africa, in school building projects and to provide healthy food. In addition, there are various projects such as combating COVID-19, health, facilitating the lives of mothers, helping places damaged by various natural disasters.

Payment Method

Binance Charity Foundation does not charge any transaction fees from donations made with bitcoin and other cryptocurrencies. Generally, donations are made with BNB (Binance Coin), BTC (Bitcoin), ETH (Ethereum), XRP (Ripple) virtual currencies, but donations are made with all virtual currencies.

4.3.7. Summary of Finding

When the platforms that are instrumental in making cryptocurrency donations are examined, the findings that emerge according to the classification made are shown in the table below. It is generally useful to prepare a table in such studies.

Table 4.1: Summary of Findings

Donation Platform	Founder(s)	Objectives	Problem Statements	Offered Value	Project Domains	Payment Methods
GiveTrack	-Founded by a NPO -Sector: Use of bitcoin and blockchain in philanthropy	-Financial transparency -Global influence -Revolution of philanthropy	-Misuse of funds	-Creating security with transparency and encryption method	-Protecting animals -Children -Environment -Education -Health -Civil rights	-Bank Transfer (5-7 days) -Debit Card (up to 24 hours) -Credit Card (up to 24 hours) -Cryptocurrencies (20-30 min.) *Bitcoin, Litecoin, Ethereum and other 11 cryptocurrencies
			-High cost	-Free or low transaction fee with cryptocurrency		
			-Slow transaction	-Rapid progress of process with approval mechanism		
AIDChain	-Founded by a company -Sector: Charity fundraising	-Transparency -Traceability	-Inefficiency	-Distributed ledger technology	-Education -Health -Environment -Animals	-AIDPay (23 cryptocurrencies) *Converted to AIDCoin
			-Nontransparent	-Smart contracts		
			-High cost	-Without using debit/credit cards		
			-Tax problem	-Using virtual currencies as noncash assets		
The Giving Block	-Founded by individuals -Sector: Consultancy of emergent technology as cryptocurrency, IoT, blockchain and NPO	-Partnerships between crypto companies and NPOs	-Slow transaction	-Create an integrated widget on the platform	-Health -Disasters -Civil rights -Education -Animals -Children -Religion -Arts	-Bitcoin, Litecoin, Ethereum and other most common cryptocurrencies
			-Tax problem	-Crypto donation provides tax reduction		
			-Need for more donors	-Marketing tools and campaigns		
Bithope	-Founded by an individual -Sector: Cryptocurrency exchange, blockchain, marketing	-Encourage cryptocurrency donations -Community adoption of cryptocurrencies	-Nontransparent	-Open source software	-Health -Environment -Children -Education -Sport -Science	-Bitcoin *Other cryptocurrencies converted to Bitcoin by ShapeShift trade platform
			-Access problem	-Decentralized		
			-Slow transaction	-Accessible network		
			-Tax problem	-Payment certificate for tax deduction to donors		
			-Counterfeiting	-Prevent money laundering by rules		
Binance Charity	-Founded by a company -Sector: Cryptocurrency exchange	-Global sustainability -Transparency -New donation experience	-Access problem	-Decentralized	-Health -Children -Education -Disasters -Civil rights	-Debit Card -Credit Card -Paypal -Bitcoin and other cryptocurrencies
			-High cost	-Zero transaction fees		
			-Tax problem	-Minimize tax payments by donate crypto		

5. CONCLUSION

Philanthropy is a behavior done to increase the quality of life of people in need of help in order to create social benefit. Foundations, which have an important place in philanthropic activities, are institutions that aim to meet the needs of people in need. Although modern foundations emerged in the early 20th century, the history of foundations dates back to ancient times. At the present time, there are individual, institutional, public and community foundations according to the type of foundation. The fields of activity of foundation organizations are tended by the people who established the foundations or the people who are in the management. Although there are orientations to different fields of activity, the main points of focus overlap with each other. The most focal areas of activity of foundations are education, health, fighting against poverty, art and increasing social welfare.

Religion and traditions are among the main reasons that urge people to do philanthropy. The donations made in traditional philanthropy were mostly in kind. Individuals were trying to support the foundations by giving them land, real estate and agricultural products. In history, the culture of philanthropy and the functioning of foundation activities developed with the interaction of civilizations. After the Industrial Revolution, charitable activities started to be carried out in cash due to the difficulties experienced by the foundations in collecting rent or in providing in-kind aid.

The concept of modern philanthropy is systematic work carried out to meet the needs of those in need and to increase their living standards in accordance with social changes. With technology, philanthropic activities have begun to spread in digital environments, thus reaching wider audiences. In the modern sense, philanthropic activities are carried out by non-governmental organizations, non-profit organizations and foundations. Although these organizations act independently from the state, they work in partnership with the state when necessary.

With the emergence of the internet, people have started to spend time on the internet because of their work or in different areas. With the increase in the use of the internet, foundations started to carry out their activities on the internet. Due to the ease of internet use, people have started to make their donations online. The amount of online donations made today is higher than the amount of donations made by other means. Making use of the power of social media, foundations spread their projects to people much more easily. With this method, more people can be reached and more funds are collected. Thanks to online donation, donors and foundations save time and money. Foundations can monitor donations instantly and minimize the risk of errors in operational transactions. In addition, thanks to online donations, foundations can store donors' information more easily and communication between each other becomes stronger.

Crowdfunding is a financial system that aims to collect donations via open call with the development of technology. Crowdfunding, which is a common fundraising method, collects donations for health, education, animals, helping the poor and many more. Crowdfunding is done for three main reasons: donation, award-based and investment-based. Thanks to this method, large audiences can be reached regardless of location and it is aimed to make the project successful. In crowdfunding, donors can view the purpose of the project, the target amount and the remaining amount. Investors do not have any material or moral expectations in donation-based crowdfunding. In case the target amount is not reached, the funds collected can be returned to the investors. These campaigns are executed by non-profit organizations or individuals. The people who started the campaign explain the project and their needs with various videos or articles. With these applications shared via social media, support for crowdfunding is increasing. The biggest risk in crowdfunding is the possibility that the campaign to be donated is fake. The platforms that share the projects should make the necessary arrangements to prevent fraud and audit the projects.

With the development of technology, Blockchain, which is used in many sectors today, has emerged. In Blockchain technology, data sets are copied and distributed instead of being recorded in central systems. Data is recorded not only by a center or group but by all users in the system. Because it is not connected to a central system, it is both less costly and higher performance than systems with central servers. In order for the blockchain to be sustainable, security and transfer operations are provided by the mining system.

Basically, it is divided into three groups as public, private and consortium blockchains. The public blockchain includes immutability and decentralization, where anyone can participate in the transaction process. Also, the public blockchain, which does not provide information about users, only provides information about transactions. Consensus algorithms are used because it is necessary to make transactions more reliable and to ensure the consistency of all nodes. Today, blockchain-based cryptocurrencies are generally included in the public blockchain group. In private blockchain, read permissions are given to everyone in a limited way and only one party makes write permissions. Efficiency is high as delays are reduced in a private blockchain whose control center is provided only by a group or an institution. The partially decentralized consortium blockchain includes features of public and private. Within the scope of information sharing, more than one institution can make transactions in this way. Consortium blockchain is used to authenticate banks and verify information sharing. It includes solutions to money laundering and other financial problems.

Organizations take advantage of digitalization in their authentication and management activities. Companies pay high costs to verify the information of customers. However, the cost is reduced as the information that is verified once with the digital identity will be valid in other transactions as well. It is

important to use the blockchain network in digital identities to ensure security and data integrity. In addition, many frauds can be prevented with digital identity verification. Smart contracts are very advantageous in terms of reliability, fast transfer of data and ease of archiving. With blockchain technology, smart contracts are used as a secure mechanism application in financial transactions.

Cryptocurrencies created with blockchain technology do not have a central structure and their security is provided by cryptography. With Cryptography, account addresses and transactions are recorded in financial books. Peer-to-peer transactions can be viewed by everyone. After the emergence of the first cryptocurrency Bitcoin in 2008, many different cryptocurrencies have been produced today. Cryptocurrencies do not have a center and their price is determined by supply and demand in the market. With the increasing interest in cryptocurrencies around the world, various exchange platforms have been established. The main reasons that affect the preference of investors for these exchanges can be listed as reliability, support, globality, transaction commissions, ease of money transfer, diversity of virtual currencies, user experiences and decisions taken by governments.

Although the use of blockchain technology is very advantageous, it is an extra cost to prepare and adapt the necessary infrastructure for the use of a new system. Ensuring network security is one of the main problems encountered in blockchain technology. Attackers who gain access to wallets with attacks due to network security vulnerabilities can send payments to their own accounts.

Furthermore, scalability imbalance with the increase in transaction volume, fork problem, increase in transaction fees due to storage space, information leakage and illegal activities are the disadvantages of blockchain technology. In addition, the attacker, who has access to 51% processing power in mining, can take the operations under his own control by cheating such as changing data. These problems threaten the future of the system.

Blockchain technologies have also begun to be used for social good today. One of the purposes of financial platforms established on the basis of blockchain or collecting social aid with cryptocurrencies is to provide assistance to those in need who cannot access or use existing banks in their countries. Blockchain applications in philanthropy provide solutions to these problems due to the international money transfer ban that governments have taken or the high commissions taken by banks and intermediary institutions in their transfers.

There is a need for intermediary non-profit organizations in international donation activities. It takes a long time for the relevant charity to transfer the collected donations to another country via a bank, and the commissions received by the banks reduce the effectiveness of the donation. It is also very difficult to monitor whether the funds sent to reach their real owners. Refugees living in other countries may be

prohibited from opening bank accounts in line with the decisions taken by the governments. In such cases, donations do not reach those in need directly.

There are blockchain-based donation platforms that eliminate problems such as donating and non-transparency with applications that require intermediaries. Thanks to these platforms, the problems experienced in banks have been eliminated and donations reach those in need directly. In addition, since it would be risky for people living in war countries to have cash on them, blockchain-based donations also provide solutions to these situations. No intermediary bank is used with these donations, which are sent with digital identity verification, and donations are transferred quickly without any deduction fees.

Although blockchain technology is advantageous, it has disadvantages as it is a very new technology. There are economic risks involved in these virtual currencies that are not managed by governments. Due to its still developing financial infrastructure, it is affected by news flows very quickly and acts with high volatility. Rapid appreciation or depreciation experienced during the day is a major risk factor economically. Due to the anonymity feature and the lack of adequate controls by the states, there is a possibility of illegal activities with cryptocurrencies. Financing terrorist organizations or money laundering activities are among the most illegal activities. In transfers made through banks, the state can easily access the information of the recipient and sender. However, it is very difficult to determine identities in blockchain technology, where state audits cannot be done.

In the philanthropy sector, when intermediary institutions are also involved in the process of sending donations, there may be some events that lose the trust of the society. For example, there are risks such as careless mistakes in fund calculations by charities or intermediaries engaged in illegal activities. In systems that are centralized and cannot be followed up, it is possible to abuse the donation. There are applications built on Blockchain in many sectors, and this new technology is also used in the collection and sending of donations. Platforms in which cryptocurrencies play a role in the payment method have become widespread, with a system that can be monitored and audited, which achieves large goals from small amounts such as crowdfunding.

In this study; GiveTrack, AIDChain, The Giving Block, Bithope and Binance Charity platforms, which allow cryptocurrency donations, are analyzed. The main areas of work for the people who build or manage the platforms are the NPOs, blockchain, IoT and cryptocurrency sectors. When the applications are examined, three of the five platforms were established by institutions and their founders are from different organizations. The other two platforms were founded by individuals. That is to say, the platforms in this field, which are generally established, are established as subsidiaries of certain organizations. It is seen that the founders have previously done both commercial and non-governmental activities related to blockchain and cryptocurrencies. The founders of The Giving Block

and Bithope platforms work in the fields of blockchain. The Giving Block aims to expand the work of companies and foundations working in the field of crypto by collaborating together.

The most emphasized features are transparency and promoting the proliferation of cryptocurrency donations. Then, creating a global impact, realizing sustainable projects and ensuring the traceability of donation transactions are among the defined goals. Transparency, traceability, security, zero or low transaction fees and tax reduction features are among the most mentioned advantages of Blockchain in the literature. Thus, the purpose of the emergence of Blockchain and the expressions in the literature coincide with the values that the platforms focus on.

On the other hand, four of the five platforms explained taxation among the problems encountered and stated that donations with cryptocurrencies are minimized in taxation. Next, three of the five platforms explain the high transaction fees for other online donation payments and the much slower sending of donations to the recipient via brokerage firms or banks. The third problem is the lack of transparency since the transactions made by traditional and other methods cannot be followed, the difficulty of reaching the donations to the needy and the abuse of the funds provided. Due to the need to reach more donors and the fees paid to intermediaries, the inefficient use of funds is among the least explained problem.

It is clearly seen that the areas where charities and individuals donate the most in all societies are the areas in education, health, environment and every subject related to children. It is understood that in all of the analyzed platforms, campaigns related to these areas have been created or cooperation has been made with foundations that are active. Three-fifths of them supported human rights and animal protection projects. The areas with the least campaigns were religion, art, sports and science.

While Binance Charity and GiveTrack accept all payment methods, AIDChain, The Giving Block and Bithope have announced on their websites that they only make donations with cryptocurrencies. In addition, accepted cryptocurrencies are converted into its own cryptocurrency, AIDCoin, by the AIDChain platform. Due to the widespread use of cryptocurrencies, all platforms focused on Blockchain solutions do not only receive donations with cryptocurrencies.

In conclusion, donations have taken different forms with the change of technology and civilization throughout history. On the other hand, blockchain technology is also developing in the world and has shaped the formation of cryptocurrencies. In this study, the advantages and risks that blockchain technology brings to the philanthropy sector are explained. Widely used platforms that are blockchain-based or accept cryptocurrency donations are analyzed. Overall, the possibilities of blockchain and the spread of non-profit institutions or donation platforms will benefit the processes in philanthropy activities.

REFERENCES

- Adhami, S., Giudici, G., Martinazzi, S. (2018), “Why do businesses go crypto? An empirical analysis of initial coin offerings”, *Journal of Economics and Business*.
- doi: 10.1016/j.jeconbus.2018.04.001
- AidChain (2021, February, 5), Retrieved from <https://www.aidchain.co/>
- AidCoin (2021, February, 7), “AidCoin Whitepaper”.
- Retrieved from <https://www.aidcoin.com/assets/documents/whitepaper.pdf?v=1.2.0>
- Akyıldız, Y., Abay, A. R. (2017), “Vakıf Müessesesinin Gelişimi ve Mahiyeti Tarihsel Bir Değerlendirme”, *Yalova Sosyal Bilimler Dergisi*, 7/15: 141-157.
- Andoni, M., Robu, V., Flynn, D., Abram, S., Geach, D., Jenkins, D., Peacock, A. (2019), “Blockchain technology in the energy sector: A systematic review of challenges and opportunities”, *Renewable and Sustainable Energy Reviews*, 100: 143–174. doi: 10.1016/j.rser.2018.10.014
- Anheier, H. K. (2005), *A dictionary of civil society, philanthropy and the third sector*, Routledge.
- Aydınşakir, E. (2008), *Kara Para Aklamayla Mücadele*, MA Thesis, Aydın, Adnan Menderes University, Institute of Social Sciences.
- Baath, D., Zellhorn, F. (2016), “How to combat money laundering in Bitcoin? An institutional and game theoretic approach to anti-money laundering prevention measures aimed at Bitcoin”.
- Bartoletti, M., Cimoli, T., Pompianu, L., Serusi, S. (2018), “Blockchain for social good: a quantitative analysis”, *In Proceedings of the 4th EAI international conference on smart objects and technologies for social good*, 37-42.
- Bayhan, A. (2002), “Türk Kültüründeki Sadaka Taşlarına Çankırı’ dan Bir Örnek: Çivitçioğlu Medresesi Sadaka Taşı”, *Çankırı Araştırmaları*, 5-6: 25-30.
- Belleflamme, P., Omrani, N., Peitz, M. (2015), “The economics of crowdfunding platforms”, *Information Economics and Policy*, 33: 11–28. doi: 10.1016/j.infoecopol.2015.08.003
- Berber, B. (2019), *Kara Para Aklama İşlemleri ve Finansal Sisteme Etkileri*, MA Thesis, İstanbul, Marmara University, Institute of Banking and Insurance.
- Binance Charity (2021, April 3), Retrieved from <https://www.binance.charity/>
- Bithope (2021, March 13), Retrieved from <https://bithope.org/>

- Böhme, R., Christin, N., Edelman, B., Moore, T. (2015), “Bitcoin: Economics, technology, and governance”, *Journal of economic Perspectives*, 29/2: 213-38.
- Brill, A., Keene, L. (2014), “Cryptocurrencies: The next generation of terrorist financing?”, *Defence against terrorism review*, 6/1: 7-30.
- Buterin, V. (2020, October 21), “On Public and Private Blockchains”, Retrieved from <https://blog.ethereum.org/2015/08/07/on-public-and-private-blockchains/>
- Carlisle, D. (2017), “Virtual Currencies and Financial Crime Challenges and Opportunities”, *Royal United Services Institute for Defence and Security Studies*. https://rusi.org/sites/default/files/rusi_op_virtual_currencies_and_financial_crime.pdf
- Carroll, A. B. (1999), “Corporate social responsibility: Evolution of a definitional construct”, *Business & society*, 38/3: 268-295.
- Cason, T. N., Zubrickas, R. (2019). “Donation-based crowdfunding with refund bonuses”, *European Economic Review*, 119: 452–471. doi: 10.1016/j.euroecorev.2019.08.003
- Charities Aid Foundation (2019), *CAF World Giving Index 10th Edition*, CAF: London.
- Charity Bank (2021, May 25), Retrieved from <https://charitybank.org/ethical-bank>.
- Cheek, D. W., Kramarek, M., Rooney, P. (2015), “Charity and Philanthropy: Overview”, *International Encyclopedia of the Social & Behavioral Sciences*, 364–370.
doi: 10.1016/b978-0-08-097086-8.28001-x
- Chmiliar, L. (2010), “Multiple-case designs”. Mills”, A. J., Durepos, G., Wiebe E. (Eds.), *Encyclopedia of case study research*, 582-583, SAGE Publications: USA.
- Christidis, K., Devetsikiotis, M. (2016), “Blockchains and Smart Contracts for the Internet of Things”, *IEEE Access*, 4: 2292–2303. doi: 10.1109/access.2016.2566339
- Christou, P., Hadjielias, E., Farmaki, A. (2019), “Reconnaissance of philanthropy”, *Annals of Tourism Research*, 78, 102749. doi: 10.1016/j.annals.2019.102749
- Coinmarketcap (2020, December 27), Retrieved from <https://coinmarketcap.com/currencies/bitcoin/>
- Coinmarketcap (2021, June 3), Retrieved from <https://coinmarketcap.com/rankings/exchanges/>
- Coinmarketcap (2021, June 3), Retrieved from <https://coinmarketcap.com/>
- Conley, J. P. (2017), “Blockchain and the economics of crypto-tokens and initial coin offerings”, *Vanderbilt University Department of economics working papers*, VUECON-17-00008.

- Crosby, M., Pattanayak, P., Verma, S., Kalyanaraman, V. (2016), "Blockchain technology: Beyond bitcoin", *Applied Innovation*, 2/6-10: 71.
- Crypto51 (2020, December 2), "PoW 51% Attack Cost". Retrieved from <https://www.crypto51.app/> (Accessed: 2021, January 9).
- Çanak, Ö. (2019), İslam Öncesi Türk Kültüründe İnsani Değerler, MA Thesis, İstanbul, İstanbul University, Institute of Social Sciences.
- Çarkacıoğlu, A. (2016), "Kripto-Para Bitcoin", *Sermaye Piyasası Kurulu Araştırma Dairesi Araştırma Raporu*. <https://www.ekovizyon.com.tr/wp-content/uploads/2017/01/SPK-Bitcoin-Raporu.pdf>
- Çarkoğlu, A., Aytaç, S. E. (2016), "Türkiye’de bireysel bağışçılık ve hayırseverlik", İstanbul: TÜSEV Yayınları.
https://www.tusev.org.tr/usrfiles/files/Turkiye'de_Bireysel_Bagiscilik_ve_Hayirseverlik.pdf
- Çetin, E. (2014), "Bir Sosyal Yardımlaşma Pratiği Olarak Askıda Kahve Ve Sadaka Taşı", *Akademik Bakış Uluslararası Hakemli Sosyal Bilimler Dergisi*, 41.
- Çizakça, M. (2006), "Osmanlı dönemi vakıflarının tarihsel ve ekonomik boyutları", *Türkiye’de Hayırseverlik: Vatandaşlar, Vakıflar ve Sosyal Adalet Araştırması*, İstanbul: TÜSEV Yayınları.
- Demirgüç-Kunt, A., Klapper, L., Singer, D., Ansar, S., Hess, J. (2018), "The Global Findex Database 2017: Measuring financial inclusion and the fintech revolution", The World Bank. https://globalfindex.worldbank.org/sites/globalfindex/files/2018-04/2017%20Findex%20full%20report_0.pdf
- Dimitropoulos, G. (2019), "Global Currencies and Domestic Regulation: Embedding through Enabling?".
- Duncan, B. (2004), "A theory of impact philanthropy", *Journal of Public Economics*, 88/9-10: 2159–2180. doi: 10.1016/s0047-2727(03)00037-9
- Easley, D., O’Hara, M., Basu, S. (2019), "From mining to markets: The evolution of bitcoin transaction fees", *Journal of Financial Economics*. doi: 10.1016/j.jfineco.2019.03.004
- Eikenberry, A. M. (2008), "Fundraising in the new philanthropy environment: The benefits and challenges of working with giving circles", *Nonprofit management and leadership*, 19/2: 141-152.
- Ergül, E. (2018), *Kara Ekonomi ve Aklama Suçu*, Ankara: Adalet Yayınevi.

- European Commission (2021), “Corporate social responsibility & Responsible business conduct”. Retrieved from https://ec.europa.eu/growth/industry/sustainability/corporate-social-responsibility_en
- European Innovation Council (2019), “EIC Horizon Prize for 'Blockchains for Social Good’”, Retrieved From https://ec.europa.eu/research/eic/pdf/prizes/ec_rtd_eic-prize-blockchain-stats_2019.pdf
- Feng, H., Wang, X., Duan, Y., Zhang, J., Zhang, X. (2020), “Applying blockchain technology to improve agri-food traceability: A review of development methods, benefits and challenges”, *Journal of Cleaner Production*, 121031. doi: 10.1016/j.jclepro.2020.121031
- Fisch, C. (2019), “Initial coin offerings (ICOs) to finance new ventures”, *Journal of Business Venturing*, 34/1: 1-22. doi: 10.1016/j.jbusvent.2018.09.007
- Fundly (2020, December 28), Retrieved from <https://fundly.com/>
- Galen, D., Brand, N., Boucherle, L., Davis, R., Do, N., El-Baz, B., Lee, J. (2018), “Blockchain for social impact: Moving beyond the hype”, *Center for Social Innovation, RippleWorks*. <https://www.gsb.stanford.edu/sites/gsb/files/publication-pdf/study-blockchain-impact-moving-beyond-hype.pdf>
- Gary, T., Kohner, M. (2002), *Inspired Philanthropy: Your Step-by-Step Guide to Creating a Giving Plan* (2th Edition), San Francisco: Jossey-Bass.
- Ghosh, A., Gupta, S., Dua, A., Kumar, N. (2020), “Security of Cryptocurrencies in blockchain technology: State-of-art, challenges and future prospects”, *Journal of Network and Computer Applications*, 102635. doi: 10.1016/j.jnca.2020.102635
- GiveTrack (2021, January 10), Retrieved from <https://www.givettrack.org/>
- Göktaş, E. (2019), Terörün Finansmanı Bağlamında Türkiye’de Kara Paranın Aklanmasının Engellenmesinde Bankacılık Sektöründe Rolü, MA Thesis, İstanbul, İstanbul Gelişim University, Institute of Social Sciences.
- Gündüz, A. Y., Kaya, M. (2014), “Küresel Dünyada Sivil Toplum Kuruluşlarının Ekonomik Kalkınmadaki Rollerini Üzerine Bir Değerlendirme”, *Akademik Araştırmalar ve Çalışmalar Dergisi (AKAD)*, 6/10: 130-169.
- Howell, S., Niessner, M., Yermack, D. (2019), “Initial Coin Offerings: Financing Growth with Cryptocurrency Token Sales”, *The Review of Financial Studies*. doi: 10.1093/rfs/hhz131

- Huillet M. (2019, January 9), “Crypto Exchange Gate.io Confirms 51% Attack on Ethereum Classic, Promises Refunds”. Retrieved from <https://cointelegraph.com/news/crypto-exchange-gateio-confirms-51-attack-on-ethereum-classic-promises-refunds>
- Ilchman, W. F., Katz, S. N., Queen, E. L. (Ed.) (1998), *Philanthropy in the World's Traditions*, Indiana University Press.
- Jayasinghe, D., Cobourne, S., Markantonakis, K., Akram, R. N., Mayes, K. (2018), “Philanthropy on the Blockchain”, *Lecture Notes in Computer Science*, 25–38. doi: 10.1007/978-3-319-93524-9_2
- Jenik, I., Lyman, T., Nava, A. (2017), “Crowdfunding and financial inclusion”, *CGAP (Consultative Group to Assist the Poor) working paper*. <https://www.cgap.org/sites/default/files/Working-Paper-Crowdfunding-and-Financial-Inclusion-Mar-2017.pdf>
- Johnson, P. D. (2018), “Global philanthropy report: Perspectives on the global foundation sector”, Harvard Kennedy School, the Hauser Institute for Civil Society at the Center for Public Leadership.
https://cpl.hks.harvard.edu/files/cpl/files/global_philanthropy_report_final_april_2018.pdf
- Kaur, G., Gandhi, C. (2020), “Scalability in Blockchain: Challenges and Solutions”, *Handbook of Research on Blockchain Technology*, 373–406. doi: 10.1016/b978-0-12-819816-2.00015-0
- Khan, F. A., Asif, M., Ahmad, A., Alharbi, M., Aljuaid, H. (2020), “Blockchain Technology, Improvement Suggestions, Security Challenges on Smart Grid and Its Application in Healthcare for Sustainable Development”, *Sustainable Cities and Society*, 102018.
doi: 10.1016/j.scs.2020.102018
- Koch, J. A., Siering, M. (2015), “Crowdfunding success factors: The characteristics of successfully funded projects on crowdfunding platforms”, *Twenty-Third European Conference on Information Systems (ECIS)*.
- Koepl, T. V., Kronick, J. (2017), “Blockchain Technology—What's in Store for Canada's Economy and Financial Markets?”. *CD Howe Institute Commentary*, 468.
- Kumar, A., Smith, C. (2017), “Crypto-currencies—An introduction to not-so-funny moneys”, *Reserve Bank of New Zealand*.
- Lacetera, N., Macis, M., Mele, A. (2016), “Viral Altruism? Charitable Giving and Social Contagion in Online Networks”, *Sociological Science*, 3: 202-238. doi: 10.15195/v3.a11

- Lai, R., Chuen, D. L. K. (2018), *Blockchain – From Public to Private, Handbook of Blockchain, Digital Finance, and Inclusion*, 2: 145–177. doi:10.1016/b978-0-12-812282-2.00007-3
- Landström, H., Parhankangas, A., Mason, C. (Ed.) (2019), *Handbook of Research on Crowdfunding*, Edward Elgar Publishing.
- Li, K., Li, H., Hou, H., Li, K., Chen, Y. (2017), “Proof of Vote: A High-Performance Consensus Protocol Based on Vote Mechanism & Consortium Blockchain”.
- doi: 10.1109/hpcc-smartcity-dss.2017.61
- Li, Q. (2017), “Research on impact factors for online donation behavior of bank customer”, *The Journal of Finance and Data Science*, 3/1-4: 13–19. doi: 10.1016/j.jfds.2017.09.001
- Lin, I. C., Liao, T. C. (2017), “A survey of blockchain security issues and challenges”, *IJ Network Security*, 19/5: 653-659. doi: 10.6633/IJNS.201709.19(5).01
- Lynn, E., Wisely, S. (2006), “Four traditions of philanthropy”, *The civically engaged reader: A diverse collection of short provocative readings on civic activity*, 210-217.
- Niforos, M. (2017), “Blockchain in Financial Services in Emerging Markets Part I: Current Trends”, <https://openknowledge.worldbank.org/bitstream/handle/10986/30369/120261-BRI-PUBLIC-EMCompass-Note-43-FINAL-8-21.pdf?sequence=1>
- Nofer, M., Gomber, P., Hinz, O., Schiereck, D. (2017), “Blockchain”, *Business & Information Systems Engineering*, 59/3: 183–187. doi:10.1007/s12599-017-0467-3
- Okuyan, A. (2018), “Türk-İslam Medeniyetinde Vakıf Müessesesi: Bayburt Örneği”, *Ondokuz Mayıs Üniversitesi İlahiyat Fakültesi Dergisi*, 45: 115-149.
- Özdemir, S., Başel, H., Şenocak, H. (2009), “Sivil Toplum Kuruluşları (STK)’nın Artan Önemi ve Üsküdar’da Faaliyet Gösteren Bazı STK’lar Üzerine Bir Araştırma”, *Sosyal Siyaset Konferansları Dergisi*. 56: 151-234.
- Paoli, G. P., Aldridge, J., Nathan, R., Warnes, R. (2017), “Behind the curtain: The illicit trade of firearms, explosives and ammunition on the dark web”.
- https://www.research.manchester.ac.uk/portal/files/57841517/RAND_Behind_the_curtain.pdf
- Paribu (2021, June 4), “Paribu ve Kripto Paralar Hakkında”. Retrieved from <https://destek.paribu.com/hc/tr/articles/115005841469-Paribu-Nedir->
- PayFast (2019, Jul 12), “PayFast is ending support for Bitcoin”. Retrieved from <https://www.payfast.co.za/blog/ending-support-for-bitcoin/> (Accessed: 2021, January 9).

- Payton, R. L., Moody, M. P. (2008), *Understanding philanthropy: Its meaning and mission*, Indiana University Press.
- Pilkington, M. (2017), “Can Blockchain Technology Help Promote New Tourism Destinations? The Example of Medical Tourism in Moldova”, *SSRN Electronic Journal*.
doi: 10.2139/ssrn.2984479
- Pongnumkul, S., Siripanpornchana, C., Thajchayapong, S. (2017), “Performance Analysis of Private Blockchain Platforms in Varying Workloads”, *2017 26th International Conference on Computer Communication and Networks (ICCCN)*. doi: 10.1109/iccn.2017.8038517
- Raiborn, C., Green, A., Todorova, L., Trapani, T., Watson, W. E. (2003), “Corporate philanthropy: When is giving effective?”, *Journal of Corporate Accounting & Finance*, 15/1: 47–54. doi: 10.1002/jcaf.10217
- Ramachandran, V., Reherrmann, T. (2017), “Can Blockchain Technology Address De-Risking in Emerging Markets?”,
<https://openknowledge.worldbank.org/bitstream/handle/10986/30364/115707-BRI-EMCompass-Note-38-Derisking-and-Blockchain-5-24-PUBLIC.pdf?sequence=1&isAllowed=y>
- Risius, M., Spohrer, K. (2017), “A Blockchain Research Framework”, *Business & Information Systems Engineering*, 59/6: 385–409. doi:10.1007/s12599-017-0506-0
- Rivera, R., Robledo, J. G., Larios, V. M., Avalos, J. M. (2017), “How digital identity on blockchain can contribute in a smart city environment”, *2017 International Smart Cities Conference (ISC2)*. doi: 10.1109/isc2.2017.8090839
- Roser, M., Ritchie, H., Ortiz-Ospina, E. (2015), "Internet", *Published online at OurWorldInData.org*, Retrieved from <https://ourworldindata.org/internet>.
- Salamon, L. M. (Ed.) (2014), *New frontiers of philanthropy: a guide to the new tools and actors reshaping global philanthropy and social investing*, USA: Oxford University Press.
- Salmon, J., Myers, G. (2019), “Blockchain and associated legal issues for emerging markets”,
<https://openknowledge.worldbank.org/bitstream/handle/10986/31202/133877-EMCompass-Note-63-Blockchain-and-Legal-Issues-in-Emerging-Markets.pdf?sequence=1>
- Scataglini, M., Ventresca, M. J. (2019), “Funding the UN Sustainable Development Goals: Lessons from Donation-Based Crowdfunding Platforms”, *SSRN Electronic Journal*.
doi: 10.2139/ssrn.3328731

Statista (2021, May 31), “How Common is Crypto?”.

Retrieved from <https://www.statista.com/chart/18345/crypto-currency-adoption/>

The Giving Block (2021, March 2), Retrieved from <https://www.thegivingblock.com/>

Unicef Innovation Fund (2021), “Funding+Support”.

Retrieved from <https://www.unicefinnovationfund.org/funding-support> (Accessed: 2021, April 13).

United Nations High Commissioner for Refugees (2020, December 8), “Refugee Data Finder”.

Retrieved from <https://www.unhcr.org/refugee-statistics/> (Accessed: 2021, January 28).

Vantsos, M., Kiroudi, M. (2007), “An Orthodox View of Philanthropy and Church Diaconia”, *Christian Bioethics*, 13/3: 251–268. doi: 10.1080/13803600701732082

Vogel, P., Kurak M., Huebner J. (2019), “Blockchain and Philanthropy Innovative Giving and Innovative Taking”.

https://www.unige.ch/philanthropie/files/3915/5292/2480/Blockchain_and_Philanthropy.pdf

Vyas, C. A., Lunagaria, M. (2014), “Security concerns and issues for bitcoin”, *International Journal of Computer Applications*, 10-12.

Wang, H., Qian, C. (2011), “Corporate Philanthropy and Corporate Financial Performance: The Roles of Stakeholder Response and Political Access”, *Academy of Management Journal*, 54/6: 1159–1181. doi: 10.5465/amj.2009.0548

Wolfond, G. (2017), “A blockchain ecosystem for digital identity: improving service delivery in Canada’s public and private sectors”, *Technology Innovation Management Review*, 7/10.

Xu, L. Z. (2018), “Will a digital camera cure your sick puppy? Modality and category effects in donation-based crowdfunding”, *Telematics and Informatics*. doi: 10.1016/j.tele.2018.06.004

Yardımcıoğlu, M., Şerbetçi, G. (2018), “Bitcoin'in Yapısı ve Yasa Dışı Kullanımı”, *Al Farabi Uluslararası Sosyal Bilimler Dergisi*, 2/4: 165-190.

Yücebaş, Ö. (2010), Suç Ekonomisi ve Terörün Finansmanı, Phd Thesis, Ankara, Ankara University, Institute of Social Sciences.

Zheng, Z., Xie, S., Dai, H. N., Chen, X., Wang, H. (2018), “Blockchain challenges and opportunities: a survey”, *International Journal of Web and Grid Services*, 14/4: 352.

doi: 10.1504/ijwgs.2018.095647