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MASTER'S THESIS

CONSUMER ACCEPTANCE OF CRYPTOCURRENCY: INTEGRATING AMOUNT OF INFORMATION, TRUST AND RISK INTO THE TECHNOLOGY ACCEPTANCE MODEL

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İzmir – 2021

DECLARATION

I hereby declare that this master's thesis titled as "Consumer Acceptance of Cryptocurrency: Integrating Amount of Information, Trust and Risk Into the Technology Acceptance Model" has been written by myself in accordance with the academic rules and ethical conduct. I also declare that all materials benefited in this thesis consist of the mentioned resources in the reference list. I verify all these with my honor.

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Signature

ÖZET

Yüksek Lisans Tezi

Kripto Paranın Tüketici Kabulü: Bilgi Miktarı, Güven ve Riskin Teknoloji Kabul Modeline Entegrasyonu

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Amerikan doları ve İngiliz sterlininin birinci dünya savaşı sonrasında rezerv para olma durumları altın standardının reddedilmesine yol açmıştır. Böylece 1930lu yılların başında Amerikan doları merkez bankaları arasındaki işlemler için altına dönüştürülebilen tek rezerv para birimi haline gelmiştir. İkinci dünya savaşı sırasında 1944 yılında Bretton Woods sistemi altın standardına sahip finansal sistemin yapısını değiştirmiştir.

Kripto para birimi, önemli bir ticaret varlığı haline gelmiş ve son birkaç on yılda yaygın olarak kullanılmıştır. Günümüz dünyasında kabul gören mali düzen, küresel mali işlemlerin gözden geçirilmesini ve yeniden yapılandırılmasını gerektirmektedir. Bu nedenle küresel finansal sistem için başka bir güncelleme eşiğine ulaşılmıştır.

Bu tez çalışmasının amacı, kripto para biriminin tüketicinin kabulünü, teknolojik kabul modeline dayalı olarak bilgi miktarı, güven ve risk entegrasyonu açısından incelemektir. Çalışma özellikle katılımcıların sosyodemografik özellikleri açısından algılanan risk, bilgi miktarı, satın alma niyeti, güven, algılanan kullanım kolaylığı ve algılanan iştah boyutları arasındaki ilişkileri belirlemeyi amaçlamaktadır. Bu bağlamda son yıllarda yapılan nicel ve nitel çalışmalar incelenir.

Çalışma verilerini toplamak için yedi bölümden oluşan bir anketten yararlanılmıştır. Ankette yer alan 6 çalışma değişkeni ve katılımcıların

sosyodemografik özelliklerine ilişkin verileri toplamak için toplam 522 katılımcı anketlerdeki soruları cevaplamıştır. Katılımcılardan anketteki maddelere bir çevrimiçi veri toplama platformu üzerinden yanıt vermeleri istenmiştir. Toplanan veriler daha sonra istatistiksel analiz programı AMOS tarafından istatistiksel analiz araçlarına dayalı olarak analiz edilmiştir. Değişkenler arasındaki ilişkiler, ortalama, standart sapma, p değeri, korelasyon katsayıları ve sosyodemografik konuların diğer değişkenler açısından karşılaştırılmasını içeren istatistiksel analizler yapılmıştır. Son bölümde önemli bulgular tartışılmış ve önceki çalışmaların sonuçlarıyla karşılaştırılmıştır

Anahtar Kelimeler: Kripto para, Bitcoin, Blokzincir, Teknoloji Kabul Modeli.

ABSTRACT

Master's Thesis

Consumer Acceptance of Cryptocurrency: Integrating Amount of Information, Trust and Risk into The Technology Acceptance Model

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The US dollar and the British pound became reserve money after the First World War, which led to the rejection of the gold standard. Consequently, in the early 1930s, the US dollar became the only reserve currency unit that can be converted into gold for transactions between the nation's central banks. During the Second World War, in 1944, the Bretton Woods system changed the structure of the financial system with the gold standard.

Cryptocurrency has been an important trade entity and widely been used in the last few decades. The recognized financial order in modern world requires review and restructuring of global financial transactions. That is why another update threshold has been reached for the global financial system.

Future of the cryptocurrency is expected to dominate global economy; therefore, people should be acknowledged about the new types of financial tool. The purpose of this study is to investigate consumer acceptance of cryptocurrency through integrating amount of information, trust and risk into the technological acceptance model. Specifically, the study aims to identify relationships between perceived risk, amount of information, intention to purchase, trust, perceived ease of use, and perceived usefulness dimensions in terms of sociodemographic features of the participants. In this context, quantitative and qualitative studies conducted in recent years are examined.

A questionnaire with seven sections were utilized to collect the study data. A total of 522 participants responded the questionnaire which included six study

variables and sociodemographic characteristics of the participants. Participants responded the items on the questionnaire via online data collection platform. The collected data were later analyzed based on the statistical analysis tools by a statistical analysis program, AMOS. The relationships between the variables were identified with statistical figures including mean, standard deviation, p-value, correlation coefficients, and comparison of sociodemographic issues in terms of other variables. In addition, important findings are discussed and compared with the results of previous studies.

Keywords: Cryptocurrency, Bitcoin, Blockchain, technology acceptance model.

CONSUMER ACCEPTANCE OF CRYPTOCURRENCY: INTEGRATING AMOUNT OF INFORMATION, TRUST AND RISK INTO THE TECHNOLOGY ACCEPTANCE MODEL

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ABBREVIATIONS

A.C.	After Christ (After Century)
AOI	Amount of Information
B.C.	Before Christ (Before Century)
ICO	Initial Coin Offering
IP	Intention to Purchase
PEU	Perceived Ease of Use
PR	Perceived Risk
PU	Perceived Usefulness
T	Trust
TAM	Technology Acceptance Model

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INTRODUCTION

In the modern times, financial systems and organizations have been using cryptocurrency for the last two decades. Cryptocurrency has become more common and popular for the economic developments and payment transactions between peer-to-peer and peer-to-business and business-to-business.

One of the implementations of the cryptocurrency has been digital marketing especially for the last decade. It has become more popular in the digital marketing systems, specifically in social media platforms such as Facebook, Twitter and Instagram.

Technology acceptance model includes key variables (perceived usefulness and ease of use) of e-commerce acceptance (Pavlou, 2003: 101-134) and usage of cryptocurrency in online purchase is technology-driven. Therefore, it is significant to investigate the current cryptocurrency transactions in terms of Technology Acceptance Model (TAM). Such an approach would contribute to the modern marketing structures for catching the innovative and advanced technological developments.

The purpose of this thesis study is to investigate consumer acceptance of cryptocurrency through integrating amount of information, trust and risk into the technological acceptance model. The previous literature is reviewed including qualitative, quantitative, and other types of research studies. They are grouped and classified in terms of the purposes and implementation areas.

This study intends contribute to the understanding consumer acceptance of the cryptocurrency through integrating amount of information, trust, and risk into the Technology Acceptance Model (TAM). The findings of this thesis study are expected to add a different perspective to the related literature that would suggest research ideas for the future studies.

CHAPTER ONE
CRYPTOCURRENCIES

1.1. MONEY, ITS ORIGINS AND CONTEMPORARY DIGITALIZATION

Money has been used a source of payment, commercial or personal transaction for the individuals and organizations for centuries. It is the means of payment used when purchasing a good, products or service. It is one of the earliest and best inventions for the mankind (Orrell, & Chlupatý, 2016). The history of payment and exchange agricultural and other valuable products goes back to as early as the history of writing 5000 years ago (Orrell, & Chlupatý, 2016). Some historical artifacts and evidence show that barter-like methods were started as early as one hundred thousand years ago, but no evidence exists whether it dominated economies. Instead, gift and debt economy dominated markets and economies across the world until money was invented.

Both money and writing have been used for communications among people in the small communities. So, they were both social and personal fundamental structures of the relationships among the individuals and the governments or country rulers.

Figure 1.1: World's first money, "Lydian coin"

Source: McGregor, 2010

Money also defines social interactions and communications similar to the language. First valuable metals such as gold and silver were exchanged around 600

B.C. in Lydia (Western Turkey), accepted as the first kind of currency in the human history (Figure 1.1). The first coin had the Lydian lion engraved on it. The Lydians started making gold and silver coins for the exchanges of agricultural or other commercial products (Williams, Cribb, & Errington, 1997).

When it has become much more difficult to find gold and silver to produce coins, people started printing paper money (Chown & Chown, 1994). In addition, gold and silver coins attracted pirates' attention over time. People were afraid of carrying golden coins.

The first paper money appeared as a deed (bill) around 6th century B.C. in China and they later were converted into paper money. Chinese paper money remained valid until 13th century A.C. The Lydia coins and Chinese paper moneys coexisted at the same times. In modern times, the first paper money (bill) was published in Sweden in 1661 (Chown & Chown, 1994). Similarly, the British government in Massachusetts also printed money bills as the first banknote in the American continent.

Banks play the central role of the banknotes and paper money. They initially gave people a paper deed for their coins brought to them to keep their money safe (Williams, Cribb, & Errington, 1997). They introduced 'bonds' that carry same amount of value with the coins or golds.

First government in the western world who circulated paper money was used by the French Military in Canada in 1685 (Sproul, 2001). It was mainly used to pay the military personnel in Canada district of France. They basically used playing-cards to issue paper money because the military payroll was delayed from the French government for the soldiers in Canada. During these years, the Massachusetts colony of the British empire was the first society who printed paper money to pay the expenses of the British army in Canada. The other colonies followed them and started printing paper money for the state purposes in their territories.

Public and private banks started printing paper banknotes since it was first issued in Canada. The value of the paper money was used to determine in terms of gold. If a bank prints paper money it needs to have reserved gold in the safe. In addition, British pound sterling and US dollars were considered as important as the gold. They were considered as reserve money until the end of the second world war. In the current international finance systems, the US dollar is considered the only

reserve money around the world and most of the business transactions take place in US dollars.

1.2. HISTORY AND IDEAS OF MONEY

Money has been the greatest challenge and value for human beings since it was first discovered by Lydians around 600 B.C (Davies, 2010). There has been revolutionary change in its development and revolution in the history of mankind. There are three generations and ideas of money (Weatherford, 2009). First generation was initiated with the invention of money in Lydia almost three thousand years ago. First system of money usage enabled people to trade and free open market opportunities. This new development of trades and market tool created Mediterranean civilization and a new cultural system across the region and later other countries. It later quickly spread around the world and replaced old types of market traditions.

Second generation of money era started at the verge of renaissance following 15th century and continued through industrial revolution. This trend built what is called today 'capitalism' and laid ground rules for capitalist system. First types of paper money were produced in Europe starting in Italy to be used in the market and trades. Additionally, invention of the banking system also triggered new era for the basis of organizations towards money. Finally, prosperity of people switched from owning lands and physical areas to stocks, bonds, cash, and companies.

Last period for money history started at the start of 21st century when two earlier cultural features of money were revolutionized by modern views of financial systems. The whole world has been witnessing a converge of money and value in digital age. This stage is far more different from the previous two stages as the born of digital money, electronic money, and the virtual economies rose with rapid technological advances (Hart's, 2017). The modern generation of money is expected to revolutionize and change many aspects of our life including political systems, financial markets, and operation of companies and organizations.

There are various aspects of how money generated new types of cultures during 15th century Europe. Herbert (2002: 185-213) discussed the success of Victorian era in Europe compared to other primitive and undeveloped nations across the world at

the time of Money was started widely common in Europe during Renaissance. The author also considered revolution of human Species and their riots against the tyranny of religious leaders and churches. Money has been considered a symbol for this revolution.

1.3. RELATION BETWEEN MONEY, SOCIETY AND TECHNOLOGY

Money has been playing a major role in the structure of civilization and modern society by sociologists and economists (Smelt, 1980: 204-223). It is considered as its nature and its functions and values in financial systems by economists. In sociology, it poses two major threats to the society. First issues are to accept it as a value, sign or symbol. Secondly, it is accepted as a product of modern financial infrastructure.

Money has become a central discussion of sociology following the publication of 'The Philosophy of Money' by Georg Simmel, which discussed income levels, financial situations, and wealth inequality in societies. Sociology of money was also main topic of Viviana Zelizer's book 'The Social Meaning of Money' where who has it and why they have money were main discussion topics.

Following the second-generation revolution of money during the industrial revolution, it has been greatly influenced by developments, advancements, and innovations of society and technology. Societies have been reformed by fast and radical developments of money, bonds, and stocks of organizations. People started learning trading and generating more advanced trading systems and economic cultures. Banks were founded; credit systems and capitalist systems were developed to build the modern world.

Money's place in society has always been an issue in regard to its early usage in the nations. Money is considered to be born in well-organized societies and as a socialized object, it continued to attract attentions and interests (Smelt, 1980: 204-223). Physical and social events in a society were held by people based on the power and features of money.

When considering money as having an intrinsic value for individuals and higher subjective influences on the individuals, it is a dilemma compared to being a symbol of value (Carruthers, 2005: 643-649). Therefore, money has great impacts on

individuals' lives and basic natures on the society. One major utilization of the money is to enable individuals to be able to integrate in the social business environment and society driven financial infrastructure.

Money has major impacts on the society in various aspects including culture, history, economy, power, and politics (Carruthers, 2005: 643-649). Money mandates people to utilize it in every steps of their lives. Economic infrastructure is built around money. People of the modern society are born into the world of money. Generations spend digital money compared to their ancestors in older times.

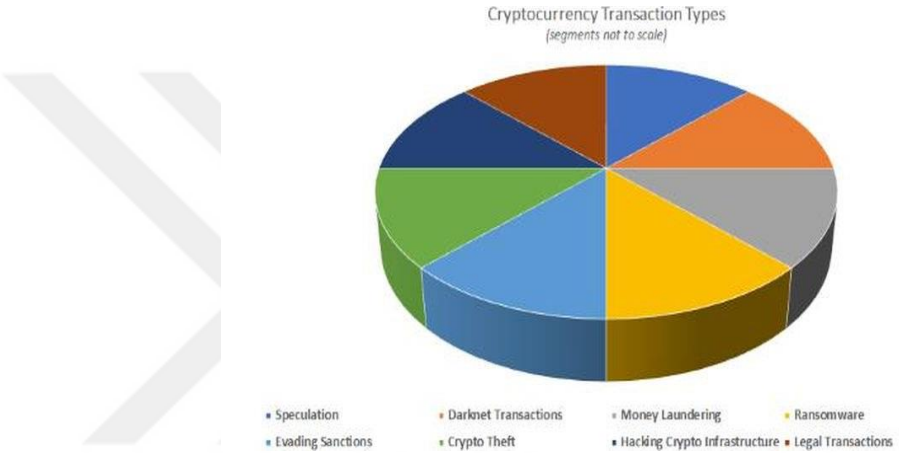
Technological advances and innovations have created several ways of utilizing money digitally and in online environments (Tobbin & Kuwornu, 2011: 59-77). Many transactions take place in digital sources. Technology is changing how we value money and use money in transactions. Technology is giving people to control their money related spending and financial lives on online shopping, automatic payments, and mobile banking applications. Technology is also changing how we perceive and value money in our lives (RBC, 2017).

1.4. CLASSIFICATION OF ONLINE MONEY

Computer technologies started influencing business works and financial transactions and money transfers. Along with the other technological innovations, in the first years of the 1990s, financial institutions started issuing and using cryptocurrency with physical paper money. Money transfers between the US central bank and commercial banks have been done by the 1990s. By the 2000s, most of the banking transactions among the banks around the world were in the form of digital money. The cryptocurrency banking has spread rapidly around other commercial banks since it is easy, faster and flexible to transfer and for payments. Since the first cryptocurrency (crypto) was introduced in 2008, it was started using for several reasons. However, since cryptocurrency does not have a guarantor bank or state behind and no regulations built by government officials, cryptocurrency was also started to be used for nonlegal transactions. Among the several illegal uses of cryptocurrency, a few are worth mentioning.

Bloomberg (2019) identified the most popular cryptocurrency transactions currently exchanged in the world (Figure 1.2). According to the information in the figure 1.2, the top three transactions of the crypto are speculation, darknet transactions, and money laundering. The percentages of each usage areas and implementations vary according to the types of cryptocurrency and transactions. Peer-peer transactions are the main criteria for the distribution in the below figure. Speculation is the most widely used transaction types of the cryptocurrencies.

Figure 1.2: Cryptocurrency transaction types



Source: Bloomberg, 2019

Although many illegal transaction types in regard to the crypto exist, there is still time to stay positive about crypto. However, it is necessary and important for the state officials to get acquainted with the nature and implementations of this innovative currency for legal purposes. Also, state regulations and legal boundaries should also be taken to protect the crypto users.

Figure 1.3: Cryptocurrency transaction process

Source: Kim, 2016: 365-376

Cryptocurrency process is illustrated in the figure 1.3. At the center of the business, there exists a decentralized peer-peer network system. Crypto miners constantly add transactions to the blockchain for security and verification and issue new currencies to the network. This is one-way road and miner only contribute to the network. The network center is interconnected with the individual digital, business e-wallet and cryptocurrency.

Cryptocurrency has many advantages over the paper money or other types of physical currencies (Kim, 2016: 365-376). It is first of all not very difficult to exchange between token holders. Also, it does not have any service charges, legal fees, any delays, or any intermediaries during the transaction process. It is easy to send, receive and store the value of any types of cryptocurrencies. In today's world, cryptocurrency is good for three basic purposes such as buying them, accepting them for a service or product and mining new currencies.

Trust is one of the most important elements regarding the cryptocurrency business. In a related study, Metin and Yakut (2018: 67-78) conducted a research on the relationship between the trust factor and cryptocurrency entrepreneurship. They collected the data from a total of 767 Turkish consumers to build a study model and data were analyzed with the linear regression currencies. The findings showed that the investment amount and investment status are positively correlated with the cryptocurrency and the trust of the cryptocurrency. The results also revealed that trust is important for the advance of electronic currency markets and marketing practices.

It is also an important and vital criteria for the transactions of the digital money and currency transactions. Statistically significant correlations among the trust and cryptocurrency transactions and entrepreneurship were reported.

Kim (2016: 365-376) investigated cryptocurrency in terms of finance security and business marketing. The researcher listed ten most important and most common cryptocurrencies as “Bitcoin, Ripple, Litecoin, Ethereum, DASH, DOGE (Dogecoin), Stellar (XLM), Peercoin (PPC), Bitshares (BTS), and NXT”. The researcher also discussed the advantages and disadvantage of the cryptocurrency in the digital world and marketing. The findings suggested that the business owners and entrepreneurs should consider cryptocurrency for their business transactions.

1.4.1. Electronic Money

Electronic money or e-money is described as an electronic store of money or monetary value on a tech device such as cell phone or computer that are generally used to make purchases and make payments to others (ECB, 2021). It is a form of currency that is electronically deposited in secure electronic devices. Initial usage of electronic money in Europe initiated in 1997. Required regulations and policies were passed in EU senate in 2008.

Electronic money is also known as digital currency, computer money, e-cash (Cohen, 2001). Cohen (2001) discussed types of e-money and how many electronic currencies could exist in the future. Monetary historian Jack Weatherford believes that in the future everybody could generate and issue currency including firms, banks, corporations, financial companies, local communities, Net or tech companies, and individuals (Weatherford, 2009). However, it is certain that financial structures prefer and mandate people to depend on fewer choices.

The device or mobile apps as a prepaid instrument that don’t require bank accounts or other traditional financial structure (Aker et al., 2011). E-money could exist in forms of physical (hardware-based) or virtual (software-based) in terms of the technologies of monetary systems and infrastructures (Fung, Molico, & Stuber, 2014). Hardware-based (smart card) e-money requires such devices that person should carry around such as chips, flash drives, or any other hardware security devices. Transfer of

money take place in machines (readers) that do not require any connectivity to the internet or online platforms. Software-based (networking money) e-money system works with special software or programs on personal computers or other electronic devices. The user requires to connect to a remote server in order to transfer money. One final type of electronic money transfer is also hybrid or mixed products that utilize combinations of hardware-based and software-based electronic money products.

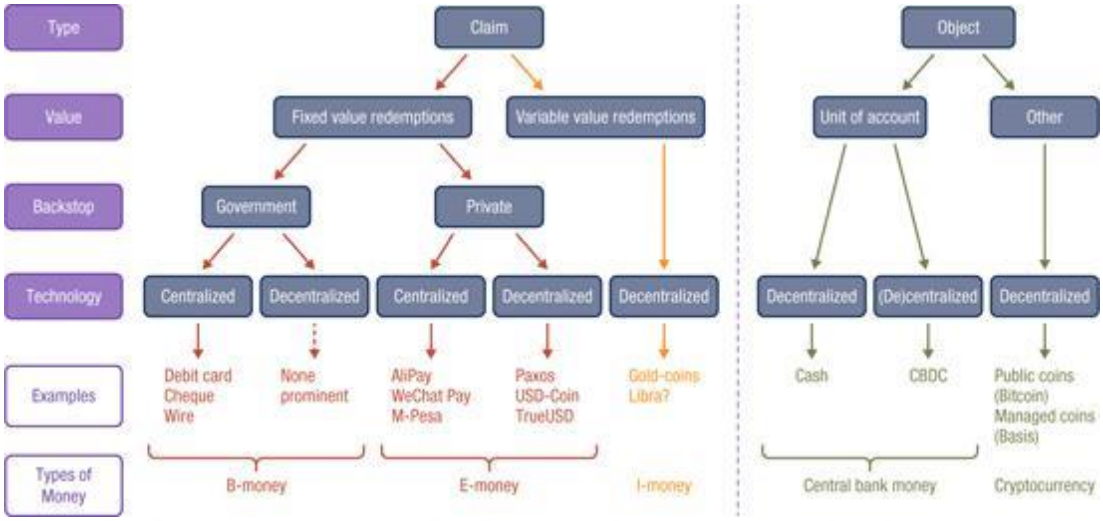
Some of the popular electronic money includes Automatic Teller Machine (ATM), EFT (Electronic Funds Transfer), Digital Gold Currency, Virtual Currency, and Direct Deposit (Aker et al., 2011). Digital transfer apps offer sending money across the world. Popular digital transfer apps include WorldRemit, Azimo, PayPal, Western Union, TransferWise, MoneyGram, Venmo, Zelle, and InstaReM. People can send money to anywhere around the world as long as its financials are integrated and connected to these services.

1.4.2. Digital Money

Digital money has been in people's lives since its first appearance in 1990s. Programs such as Alipay, Libra, or M-Pesa are emerging in the wallets at an increasing rate. It is important to answer how people, organizations, and communities accept digital money forms for payment transactions. The digital money should be integrated into the traditional banking systems especially banks and other fundamental monetary companies.

Banks including nations central banks have been experiencing pressure from digital money as it is gaining momentum to be included and integrated in many financial transactions across the world. Private banks are forced to offer more handable and competitive products or services similar to digital money companies (Adrian & Griffoli, 2019). Central banks on the other hand play crucial role when it comes to certify digital money and transactions in legal monetary systems. Similarly, organizations such as International Monetary Fund (IMF) play more important role in managing important international money transactions between countries. Therefore, IMF published below figure to specify types of money and their examples in the traditional system.

Figure 1.4: Money Trees by IMF (IMF, 2019)



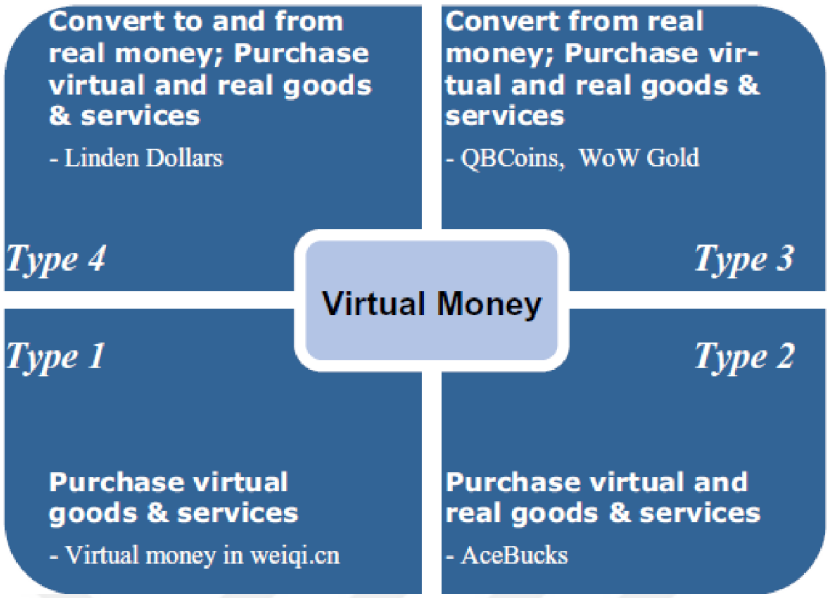
Source: Adrian & Griffoli, 2019

1.4.3. Virtual Money

Virtual money or virtual currency refers to forms of unregulated digital currency that is generally issued by certain developers for transactions in particular online platforms. Virtual money is often used by the members of virtual community for trading or purchasing. Virtual money is a digital representation of a specific value determined by its creators (Guo and Chow, 2008: 267-272).

With the development of high-tech platforms, apps, and devices, traditional money concept has been replaced by another type of money idea called virtual money. Virtual money or v-money was developed for virtual communities for transferring, purchasing, and storing money. Virtual money shares some similarities and has differences compared to the traditional money such as storing, value, and exchange. Major differences between virtual and traditional money forms include its form of creation and spending environment (i.e. digital online platforms).

Figure 1.5: Categories of Current Virtual Money Systems



Source: Guo and Chow, 2008: 267-272

Guo and Chow (2008: 267-272) identified four types of virtual money categories (Figure 1.5). First category is the use of virtual money to purchase virtual goods and services online. Second type includes for purchasing virtual and real goods and services such as AceBucks. Virtual money is also used to convert from real money to purchase goods, products, and services. Final virtual money category is to use conversion to and from real money in order to purchase virtual and real goods and services.

Traditional money or t-money is generated in terms of three forms including commodity money, fiat money, and credit or real-world money (Bek-Thomsen et al., 2014: 1-5). Commodity moneys include values of commodities such as gold and silver with their intrinsic values. Fiat money was created following the great financial depression in 1930s. Credit money consists of physical evidence of money and its value for the uses of purchasing services or goods. Non-governmental checks, bank accounts, or companies' checks are some of typical examples for the credit money. V-money similarly inherited three types of traditional value. For example, e-commodity money covers and functions similarly for values of gold, silver and other commodities. Similar to t-money, e-money could be also used to make purchases (online), storing in e-accounts (i.e. Paypal), and mobile payments.

1.4.4. Cryptocurrency

Cryptocurrency is another type of digital money that employ cryptology for verification and security. Digital coin or coin is a form of cryptocurrency. Digital coins could be generated through the mining business similar to the other cryptocurrencies. Bitcoin of the most popular and widely used coin software.

In cryptocurrency systems, one of the most challenging missions is definitely designing, creating, and securing the digital coins (Nguyens, Mu, & Varadharajan, 1997: 9-15; Neumann & Schwarzpaul, 2006: 1-15). Because digital coins that were generated for any payment transactions should be unforgeable. Therefore, the digital banking systems generally put their own digital signature of their own to approve a payment token or coin.

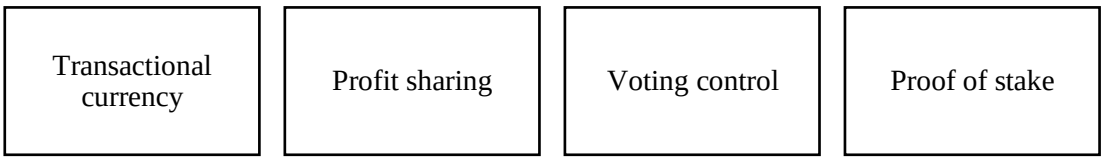
1.4.4.1. Tokens

Crypto token or crypto asset is a special kind of a virtual currency within the crypto currencies. Crypto tokens are subsets of cryptocurrency and generally used for certain specific transactions such as fundraising as well as the substitute for other valuable products (Liu & Wang, 2019: 125-144). Crypto token are also considered as tradable assets and created through an initial coin offering (ICO). ICO is described as the initial currency offer and a kind of fund that utilizes cryptocurrency. Cryptocurrency generally supports crowdfunding but sometimes it is also used for the private and public investments.

Catalini and Gans (2018) discussed crypto tokens and proposed a model that describe how entrepreneurs use product pricing choices regarding start-up costs. The entrepreneurs always prefer to rate the value of crypto token. The entrepreneurs expressed that discretionary monetary policies of the governments are the major concerns for the crypto users.

Crypto tokens show some significant properties and share certain characteristics and differences. No two crypto token is identical. However, most of the tokens have four common fundamental features. Figure 1.6 illustrates main characteristics of the crypto tokens (Conley, 2017):

Figure 1.6: Four common characteristics of the crypto tokens



Source: Conley, 2017

All of the crypto tokens are just transactional currency. The ledger is changed or updated each time when the crypto token is exchanged (Conley, 2017). Second crypto element is profit sharing. Since they are used in the exchange, it has high volatility, and nothing is equal to its value. Tokens are not as old as bitcoins, so the users are still learning its characteristics and how to use it in the exchange transactions. All of the tokens do have the property of voting control. Token holders have the priority for exchange decisions. Lastly, proof of stake is another issue for tokens, which can take any types of forms. For example, token holders are required to build a consensus for the transactions in the prediction markets.

In Turkey, blockchain technology applications are discussed by the researchers (Takaoğlu, Özer, & Parlak, 2019: 260-295; Miraz and Ali, 2018). Takaoğlu, Özer, and Parlak (2019) studied the areas and application tools that use the blockchain technology. They also investigated the advantages of the blockchain and issues that are faced during its implementation process. Takaoğlu, Özer, and Parlak (2019: 260) also identified which areas are the target systems. Takaoğlu, Özer, and Parlak (2019: 260) suggested that it could be applied to the banking, health, energy, insurance, transportation, real estates, and land registry systems.

According to Miraz and Ali (2018), maturity date for the blockchain technology is 2025, which is thought to be the end of its evolution since 2014. The stages of the implementation of the blockchain technology are called blockchain 1.0, blockchain 2.0, and blockchain 3.0. Miraz and Ali (2018) showed that the blockchain technologies could be applied to few areas for online data storage, personal and mass transportation, and financial applications. Also, they suggested that related courses on the blockchain in universities have been becoming widespread and some centers have been working in this field study are financed so that the results could be obtained faster and at the maximum and optimum turnouts.

1.4.4.2. Coins

A method against forgery is known as anonymity system (Neumann & Schwarzpaul, 2006: 1-15). In this security system, digital coin has a blind digital signature that cannot be identified even by the banks. In that way, the name of the owner of a specific digital coin is anonymous. Other security approaches against forgery and money laundering problems have been also taken by the digital money producers and financial systems.

Recently, innovative and innovative types of digital coin systems were introduced such as colored coins (Rosenfeld, 2012) and quantum coins (Mosca & Stebila, 2010: 35), which have some advantages over the regular coins such as being stored and transferred without a third-party involvement. Also, quantum coins could be exchanged even in the subatomic levels. Some other potential uses of the digital coins include (Rosenfeld, 2012):

- Bonds
- Smart property
- Bonds
- Emergent currencies
- Decentralized digital representation of physical assets

1.4.4.2.1. Bitcoin

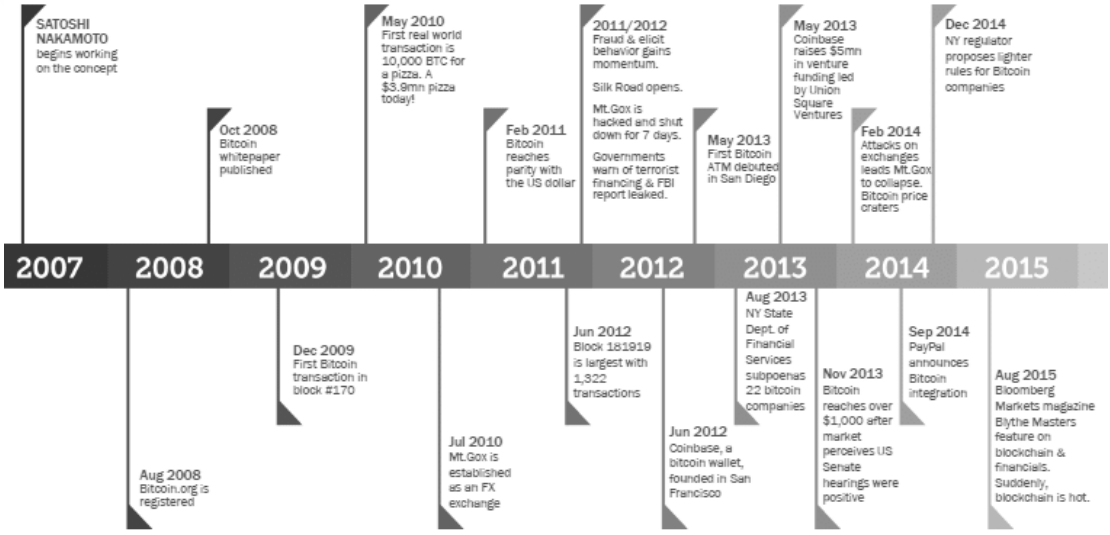
The first cryptocurrency software was the 'Bitcoin' software initiated in 2009. It is also known as the first decentralized cryptocurrency (Sagona-Stophel, 2015). Since the first release of bitcoin, more than 6,000 alternative coins (altcoins) have been generated by various cryptocurrency technology.

The bitcoin is a type of an electronic coins as having digital signature chain such as blockchain. Every transaction is initiated by the owner one. The transaction is sent to the owner zero through the secure system. In order to complete the transaction, sender needs to provide his private key and digital signature.

Digital or electronic transaction was first introduced by Satoshi Nakamoto with the paper named "Bitcoin: A peer-to-peer electronic cash system" (Crosby et al., 2016: 71), which specifically describes basic information and implementation of a system of the electronic or digital payment peer-to-peer payment systems. Bitcoin is the first application of such a digital transaction. Historical developments of the bitcoin is presented in Figure 1.7.

As illustrated in the figure 1.7, 'Bitcoin.org' was first registered by Nakamoto as 'Sourceforge'. In 2009, Satoshi mines of 50 BTC was released. The first transaction was conducted between Nakamoto and his software programmer Hal Finney.

Figure 1.7: The historical development of the Bitcoin



Source: Leemoon, 2017

Bitcoin v.0.1 software was introduced in the same year. First offline transaction was done to purchase two pizzas in 2010. Bitcoin v.0.1 was accepted to have a parity conversion with the US dollar. In 2012, one bitcoin was equal to $13 and the price went up to $42,842 in 2021.

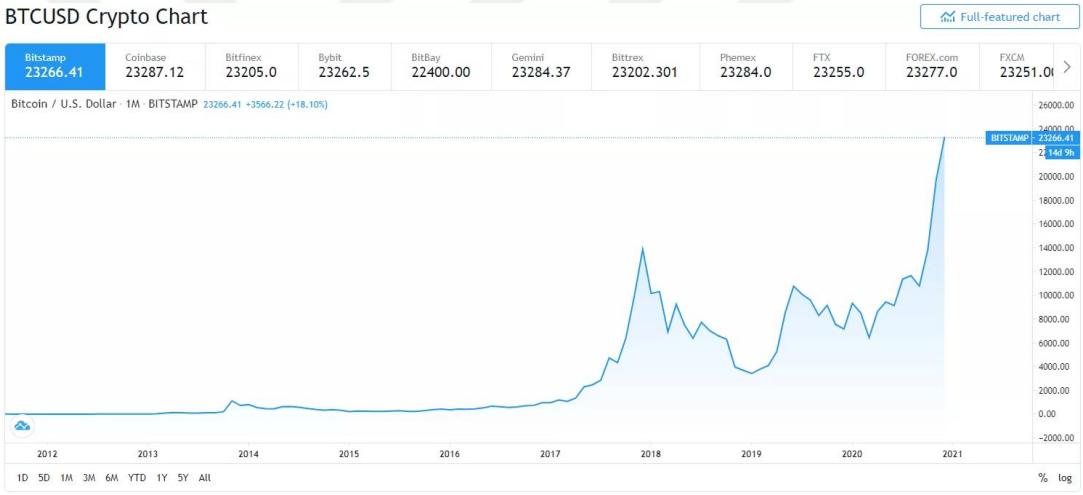
After Satoshi Nakamoto published the bitcoin whitepaper in 2008, first bitcoin block was created in early 2009. In the same month, bitcoin blockchain systems started working.

In 2009, first bitcoin exchange rate called 'New Liberty Standard' was published and one US dollar was equal to 1.3 BTCs (Böhme et al., 2015: 213-238).

First bitcoin stock exchange, Mt.Gox, was established in 2010 (Urquhart, 2016: 80-82). The market value of the bitcoin reached around o.047 US dollars in 2010. In 2011, the value of bitcoin was equal to one dollar. In 2018, Goldman Sachs one of the biggest financial advisor companies in the world announced that it would start operating bitcoin transactions.

As illustrated in the Figure 1.8, the value of the bitcoin has substantially increased since 2010 when it was first introduced to the implementation of the peer-to-peer transactions. It was only worth $0.10 (10 cents) in 2010. In the early 2013, its value increased incredibly to around $1,000. And eventually it was worth approximately $4,000 in the second period in the year of 2017.

Figure 1.8: The history of Bitcoin value between 2012 and 2021



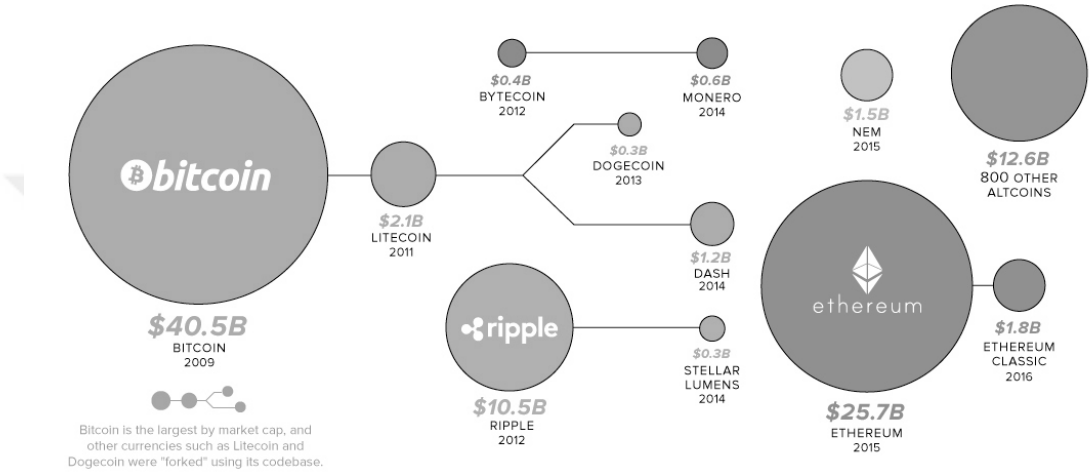
Source: Edwards, 2021

Although there were rapid increases in the value of the bitcoin in the last decade, its value shows high volatility (Ciaian, Rajcaniova, & Kancs, 2016: 1799-1815). There have been an increasing number of bitcoin users around the world. Investors and financial specialists have been dealing with the bitcoin transactions. However, its value adapted to the economic crises and went down in the period of 2008. Supply and demand have great impacts on determining bitcoin values in the last few years. Due to the pandemic of covid-10 between 2019 and 2021, the uncertainties of the global economic indicators pushed bitcoin value higher at around 24,000 USD, which is the highest value in bitcoin history.

1.4.4.2.2. Alternative Coins (Ethereum, Litecoin, Dash, Ripple)

Other popular coin software includes “Ethereum (ETH), Ripple (XRP), Litecoin (LTC), Tether (USDT), Libra (LIBRA), EOS (EOS), Monero (XMR)”. The percentage of the cryptocurrency software is shown in the Figure 1.9.

Figure 1.9: Shares of the total market capitalization



Source: Desjardins, 2017

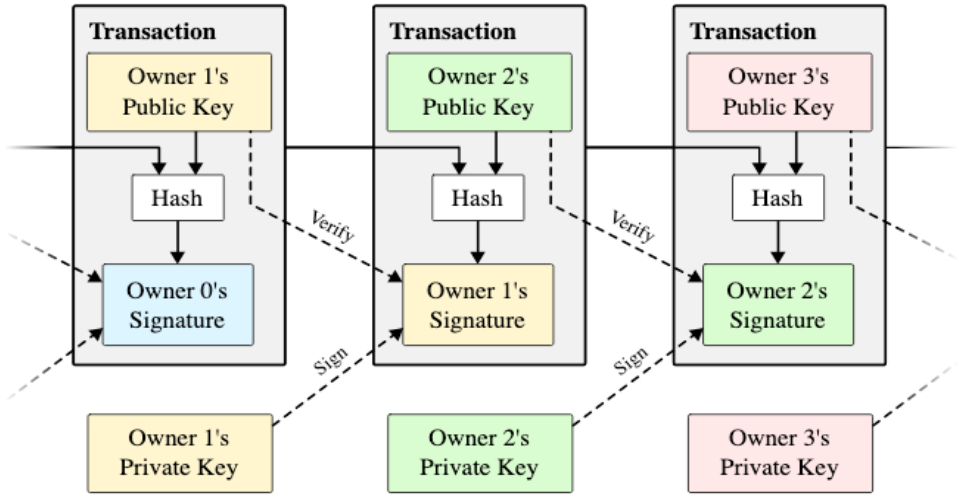
1.5. BLOCKCHAIN

In the first half of the 2000s, the digital money systems appeared (Berentsen, 1998: 89-118). Blockchain is defined as a system of encrypted and recording information in an exclusive process, which keeps it impossible for changing or hacking the system (Conley, 2017). Blockchain is a data structure that stores encrypted information of financial transactions of the digital systems. Blockchain is a giant ledger system that could keep the bitcoins and other types of cryptocurrencies secured and safe during financial transactions. Blockchain technology is required for keeping digital transactions or digital events (Crosby et al., 2016: 71). Bitcoin is one of the most popular and important example for the blockchain technology. It is not very controversial and has been working perfectly for the last decades.

Although alternative technologies, blockchain has been used by the majority of the digital money systems. Nakamoto (2019) described the bitcoin payment as a system that allow online payments to be able to be sent by the purchasers to the sellers

with any third-party financial institutions between the transactions. Nakamoto further illustrated the bitcoin system (Figure 1.10) in details.

Figure 1.10: The transaction chart flow of the Bitcoin

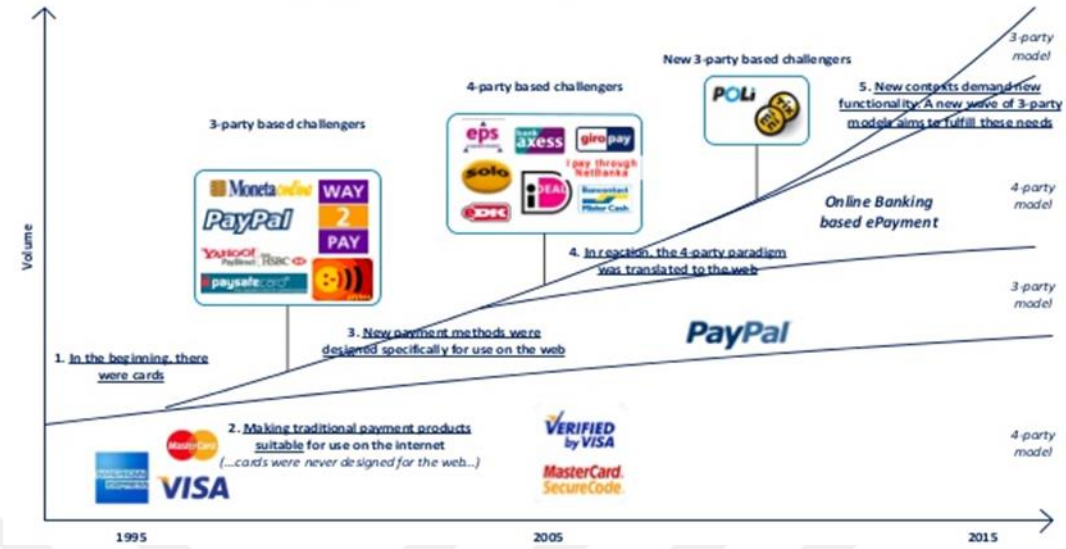


Source: Nakamoto, 2019

1.6. E-PAYMENTS

Electronic payment or e-payment started in the early 1980s with the development of the personal computers and internet technologies (Allen, 2003), which has become more advanced, sophisticated and user friendly since its first appearance. Today, people easily purchase products or services through online environments for their needs (Hartmann, 2006: 7-18). The money used in the e-payment transactions is called E-money, which is a type of digital money.

Figure 1.11: The history of e-commerce between 1995 and 2015



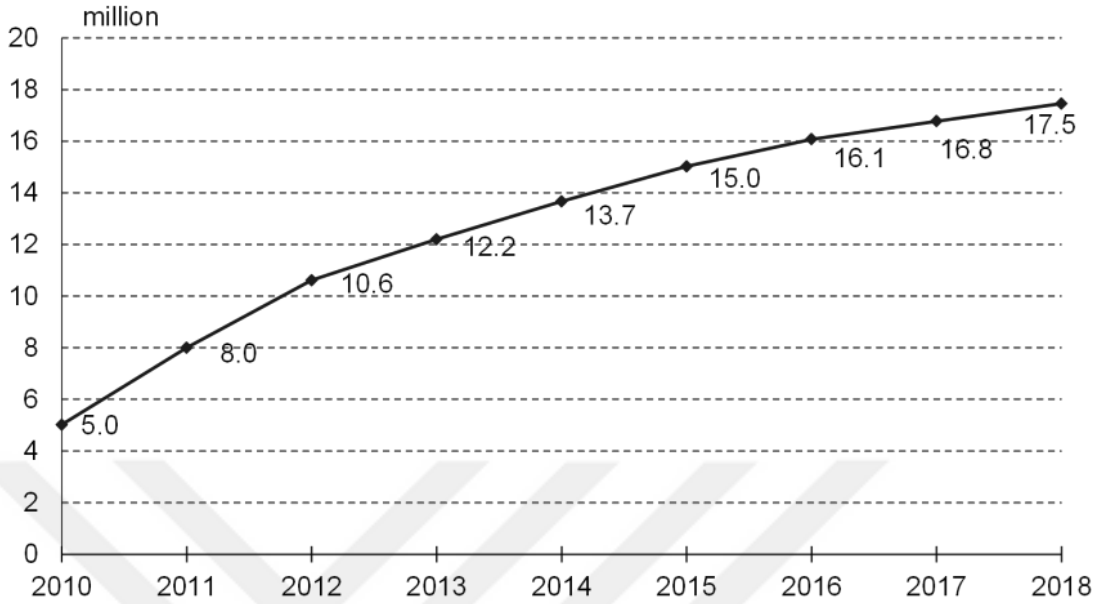
Source: Eaton, 2016

As can be illustrated in the Figure 1.11, the first commercial firms that established e-commerce or electronic commerce were American Express and VISA in 1995. In a few years, it gained momentum and other electronic payments systems emerged such as PayPal, MasterCard, and lately cryptocurrencies (Bitcoin). The volume of the transactions has also rapidly increased in the last three decades.

Today, almost all of the financial systems and banking organizations always offer electronic payments systems of various types regarding paying the bills, credit card depts., and other payments as well as purchasing products online around the world. Billions of people are currently using these services. For example, according to a recent financial statistic (ECB, 2020), the amount of money spent on the e-payment system has reached about 5 billion euros in the European Union.

The most important advantages of electronic purchase over the traditional shopping are that electronic transaction offers user friendly environment, manageable and easy tracking of the process, fast and secure transactions (Hartmann, 2006: 7-18). E-payment was greatly shaped by the information technology and communication (ICT) that provide many potential opportunities and alternatives to improve the quality and services of the e-payment systems by the financial institutions.

Figure 1.12: Total amount of the BTC between 2010 and 2018



Source: Gajdek and Kozak, 2019: 33-39

Gajdek and Kozak (2019: 33-39) discussed about how bitcoin could be used as an electronic payment method. Gajdek and Kozak (2019: 33-39) analyzed technological and economic conditions of bitcoin operation system. Gajdek and Kozak (2019: 33-39) showed that although bitcoin has been widely accepted as a tool for payment, there still exist some issues and concerns in the electronic payment systems. The findings of the statistical analysis indicated that the increase in the capitalization value of the bitcoin market volatility and exchange rate of the bitcoin is negatively affected by the e-commerce.

Gajdek and Kozak (2019: 33-39) also provided the statistics regarding the amount of bitcoins issued between the years of 2010 and 2018 (Figure 1.12). According to the information stated in figure 1.12, the total amount of issued bitcoins in 2010 was only 5 million US dollar. In 2011, it went up to around 8 million US dollars. It continued this increase rate until the end of 2015. In the later years, the rate of increased slowed down. However, the amount of the issued bitcoins closed the year of 2018 with 17.5 million US dollar and that was more than tripled in the 18-year period.

1.7. E-PAYMENTS CHARACTERISTICS

The basic characteristics of the e-payment system could be listed as follows (Lohar, Gajare, & Kumar, 2017: 19-23):

- Acceptability
- Convertibility
- Flexibility
- Efficiency
- Security
- Usability
- Reliability
- Scalability

E-payment system should firstly be acceptable around the world for any types of business services. Its value is stored as digital cash and is accepted by any financial and business organizations. Secondly, the electronic currency is expected to be exchangeable with other types of e-currency, banknotes, paper currencies, and other financial payment tools. It is supposed to be used to pay for any types of products or services so it should accept various types of payment systems.

The ideal cost for using any type of e-payment system should be close to zero in terms of its efficiency. The e-payment system should be secured for duplication, tampering or double use. The e-payment system is easily used like real and physical currencies. The e-payment system should be reliable for any hacking and other illegal electronic risks. Finally, the e-payment system needs to offer same levels of quality services for everybody.

Studies (Öztürk & Büşra, 2018: 421-437) showed that e-business and e-payments in Turkey have been growing in the last decade. According to a 2014 report, 35% of the Turkish consumers purchased products through online store with e-payment. The percentage of the e-payment amount was about 2% of the GDP in 2017. The efficiency depends on come certain factors that could accelerate or decelerate electronic payment and digital advertisement and marketing, which include-payment methods, social effects, social networks, web sites, and blogs.

Electronic money system is simply known as e-money. E-payment and e-money are related as purchasers pay with the e-money transactions (Vlasov, 2017: 215-224). This payment system offers several advantages for the personal and business buyers with fast transaction advantages.

With the increasing number of e-payment system annually around the world, e-payment systems and financial organizations also provide efficiency and opportunities for payment and trading businesses (Vlasov, 2017: 215-224). E-payment system could be integrated into the mobile systems, so the security is the main concern for the e-payment.

E-payment has some important advantages for the individuals and businesses. Firstly, the users can load e-money easily (Guttmann, 2002). Any types of cash and currencies could be easily converted into the e-money. Also, E-money can be loaded with a credit card or bank transfer. The money transfer transactions take place very fast and easily. There is not waiting period to convert traditional money into the e-money.

The transactions and results are very efficient. People could also manage e-payment tools with different payments systems in the financial accounts (Guttmann, 2002). Most of the e-payment organizations also offers useful implementations of the electronic money payment with one-click transaction. Such procedures integrate the payment systems of the financial institutions with the e-payment methods. Mobile payments could take place on different channels including online shopping sites.

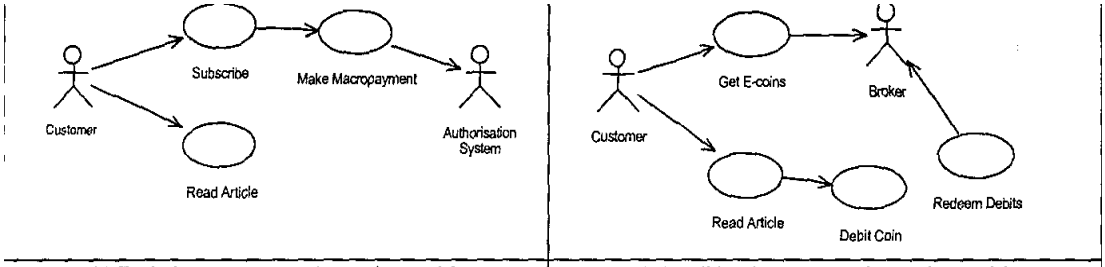
1.8. MICRO AND MACRO ONLINE PAYMENT SYSTEMS

Micro-payment systems included transactions with small amounts in any kinds of P2P or B2P. It is an e-payment transaction equal to about 10 US dollar and lower amounts (Stiller et al., 2002). Micro-payment takes place in the digital systems from the buyer to the sellers on the internet or local public network schemes.

Macro online payment system is defined as the online transaction with the amount of at least 10 USD or higher (Dai, Grundy, & Lo, 2001: 35-41). Based on the different amount of the micro and macro-online systems, some of the personal online purchases with e-money and e-payment could be considered as micro shoppers and

commercial companies generally use macro-online payment systems since they usually purchase their needs with wholesale stocks. Figure 1.13 presents typical micro and macro payment interaction models.

Figure 1.13: Two online newspaper interaction scenarios

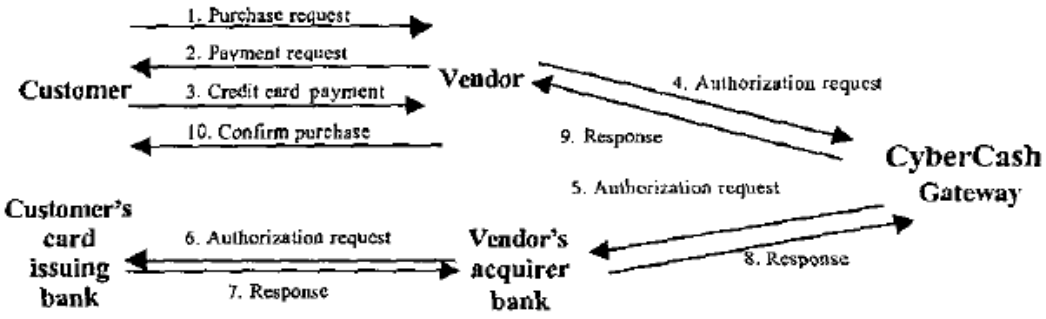


Source: Dai, Grundy, & Lo, 2001: 35-41

As can be seen in figure 1.13, there is a typical macro-payment transaction models on the left. Customer subscribes, makes micro-payment to the authorization system and is able to read the newspaper. This process often takes place in online environment with e-payment and e-money.

A possible micro-payment system is illustrated on the right side of the figure. The customer initially get the e-coins and send them to the broker who can redeem the debits. Then, the customer can read the newspaper and debit coins. Lately, macro-online payment system are regularly used by the most e-commerce systems. Such systems mostly accept digital cash, bank transfers, and credit card debiting. The customers make payments for the services and products before receiving it in the online systems.

Figure 1.14: Macro-payment interaction model



Source: Dai, Grundy, & Lo, 2001: 35-41

Figure 1.14 presents a macro-payment model for a transaction. Customer, vendor, vendor's bank, and CyberCash gateway are the main characters for this interaction model. Customer and vendor exchange purchase is initiated with a purchase request to the vendor. Vendor starts payment request and customer makes the payment. Vendor then sends the payment to the CyberCash and the payment is deposited in the vendor's acquirer bank. The payment comes from the customer's card issuing bank. Macro and micro-online payment system take place similarly except no banks or other financial organizations are included in the transactions.

CHAPTER TWO
TECHNOLOGY ACCEPTANCE MODEL

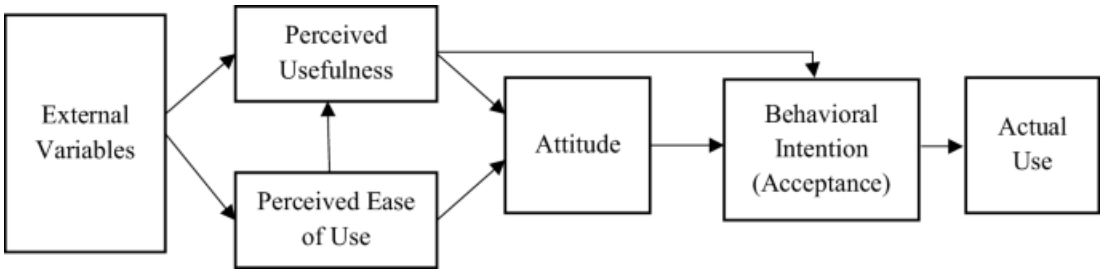
In this section, the previous studies on Technology Acceptance Models and modified technology acceptance models will be briefly discussed in terms of perceived risk, trust, and amount of information.

2.1. TECHNOLOGY ACCEPTANCE MODEL (TAM)

Technology Acceptance Model (TAM) is an information system theory for modeling how the user (of technology) utilizes and embraces technological devices and tools and has also been used to determine consumer behavior (Kern, 2018; Tobbin & Kuwornu, 2011: 59-77). TAM is based on perceived risk and usefulness, and amount of information. TAM has been considered as the most influential and the most applied model in Information System (IS) area for the last three decades (Derlek, 2020).

The history of TAM goes back to 1986 when it was first introduced in IS field (Lee, Kozar, & Larsen, 2003: 50). TAM was originally developed and proposed by Davis (1986) assuming two individuals' IS acceptance depending on two fundamental variables including "perceived usefulness (PU) and perceived ease of use (PEU)". TAM process could be illustrated with several factors (Figure 2.1) including external variables (PU, PEU), attitude toward use, behavioral intention to use, and system usage.

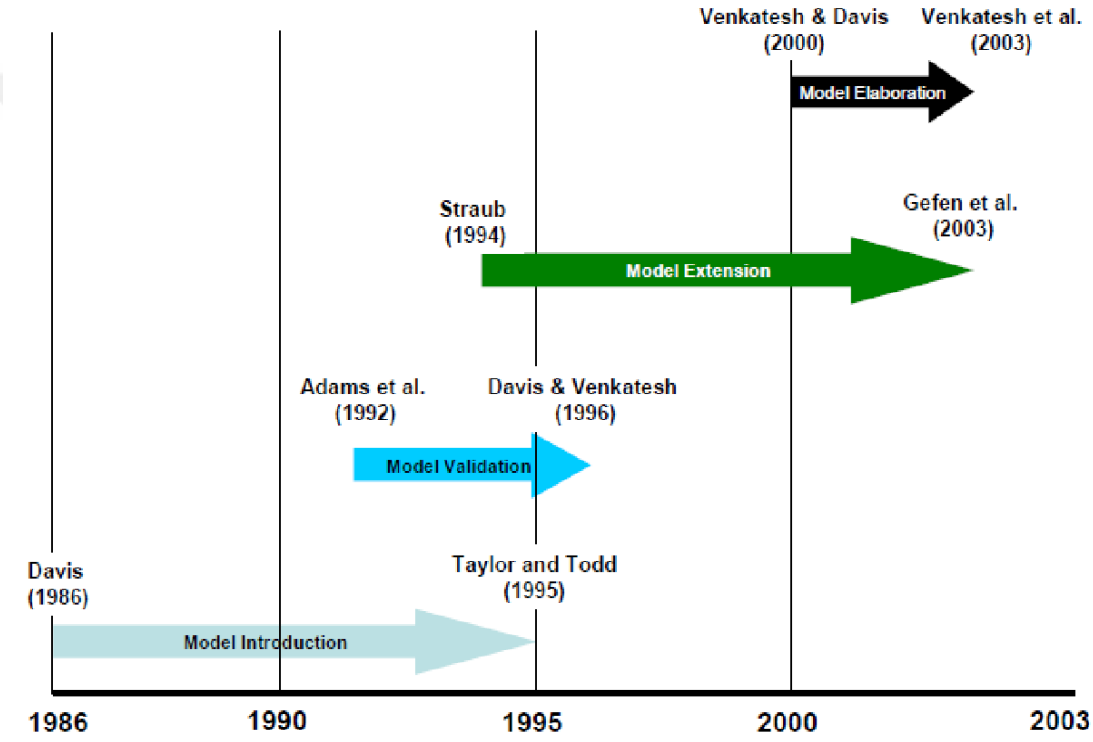
Figure 2.1: TAM Model



Source: Davis et al., 1989

In the initial development of TAM, researchers mainly studied to identify TAM in terms of replacing other technologies, research settings as well as investigating the origin and comparing TAM with Theory of Reasoned Action (TRA) previously developed by Ajzen and Fishbein (1980) (Marangunić & Granić, 2015: 81-95). Chronological improvement process of studies on TAM could be summarized as in Figure 2.2 (Lee, Kozar, & Larsen, 2003: 50).

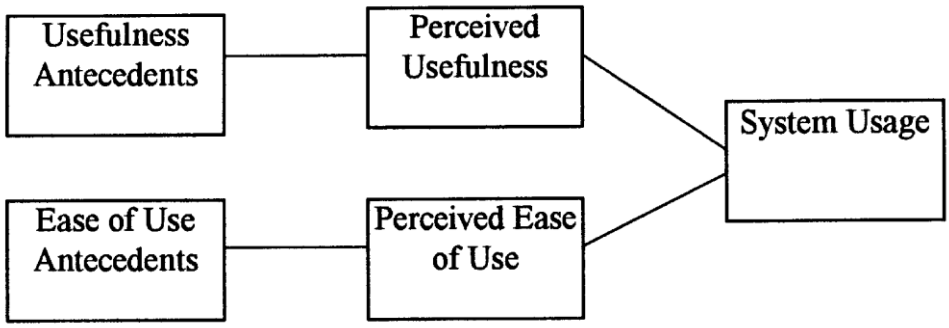
Figure 2.2: The chronological process and development of studies on TAM between 1986 and 2003



Source: Lee, Kozar, & Larsen, 2003: 50

TAM has been utilized in many areas including the acceptance of world wide web (WWW) usage of the individuals (Lederer et al., 2000: 269-282). The model generated by Lederer and colleagues (2000: 269) included other factors such as unsuccessfulness antecedents, ease of use antecedents in addition to PU, PEU and system usage (Figure 2.3).

Figure 2.3: TAM and WWW usage model



Source: Lederer et al., 2000: 269-282

Such proposed models and theories have been also proposed as expectancy theory, self-efficacy theory, channel disposition, cost-benefit theory, and innovation research. Above model expressed the importance of the ease of understanding and ease of finding in the decision process as illustrated in figure 2.3. Additionally, information quality is an important factor for predicting usefulness for the websites revisited according to the TAM and WWW model.

TAM has been utilized in several sectors including education and training (Scherer, Siddiq, & Tondeur, 2019; Dumpit & Fernandez, 2017: 13-35). Recently, Scherer and Teo (2019) investigated a group of teachers' intentions for integration with technology. Scherer and Teo (2019: 90-109) used TAM to explicitly describe teachers' intentions for utilizing technology in their classrooms with a meta-analysis approach. A sample of 45 studies were extensively reviewed and discussed. 300 correlations regarding the studies were discovered. The overall fit of TAM and structural parameters as well as characterizing between-sample variations via structural equation model. The results showed that TAM model described about 39.2% of teachers' intentions towards technology. Such results confirmed that TAM is a valid model for explaining technology acceptance of educators such as teachers.

Chang, Hajiyev, and Su (2017: 128) explored college students' behavioral intentions for using e-learning. They conducted an empirical study with the use of general extended technology acceptance model for e-learning initially proposed by Abdullah and Ward (2016: 238). The data was collected from 714 undergraduate and graduate students and analyzed by structural equation modeling. The findings revealed

that experience, enjoyment, subjective norm affected the students' perceived ease of use positively.

Pavlou (2003: 101-134) conducted a study on prediction of consumer acceptance for e-commerce with some elements to engage consumers in online purchasing. Theory of reasoned action was applied as main factors for online acceptance. The proposed model was tested with two empirical studies. The findings revealed that e-commerce acceptance model was confirmed and supported by data analysis.

2.1.1. Technology Acceptance Model 2

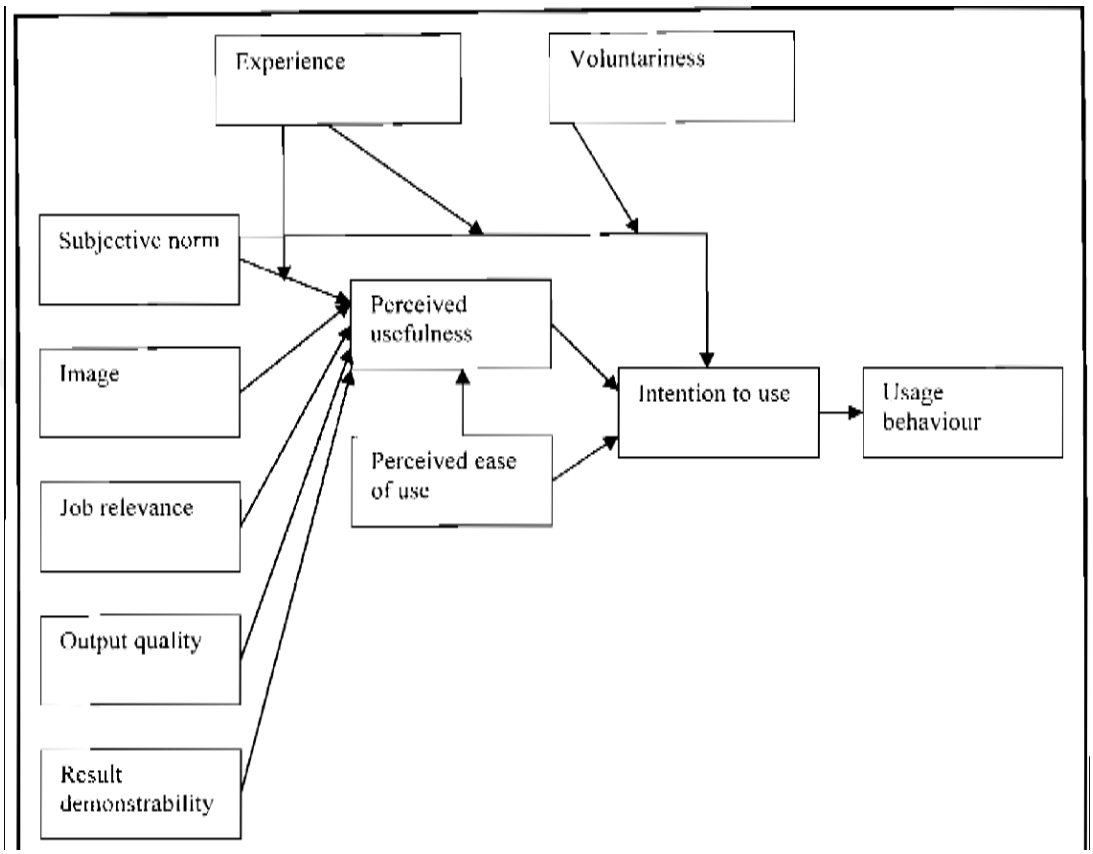
Since the development of original technology acceptance model by Davis in 1986, other alternative models have been proposed by the researchers including the Technology Acceptance Model 2 (TAM2) (Venkatesh, 2000: 342-365), the Decomposed Theory of Planned Behavior (DTPB) (Taylor & Todd, 1995: 137-155), Technology Acceptance Model 3 (TAM3) and Perceived Characteristics of Innovating Model (PCI) (Moore & Benbasat, 1991: 192). Alternative and new theories and models for technology acceptance have been used to explain individuals' perception, acceptance, and adoption of new technologies (Pollock, 2004).

TAM models have been developed to describe people's acceptance for new technological devices from various perspectives and with several variables. From these perspectives TAM2 was developed Venkatesh and Davis in 2000, which is considered as a major update and revision to the original TAM model. TAM2 was also considered as a unified theory of acceptance and usage of technology (UTAUT) according to Venkatesh, Thong, and Xu (2012: 157).

Venkatesh, Szajna, Prasad, Agarwal, Lucas, and Spitler (2000: 342) have worked on technology acceptance model in order to better identify and explain such adoptions and changes in intentions. Davis and Venkatesh (2000: 342) later developed a revised version of TAM called TAM2. TAM2 consists of more variables and contents for the perceptions and adoption progress based on cognitive process and social influences. Subjective norms, image, and voluntariness form social influences. Output quality, job relevance, and result demonstrability make up cognition

instrumental processes. TRA, specifically subjective form, was utilized to form TAM2. TRA is an important variable of adoption analysis.

Figure 2.4: TAM2 conceptual model



Source: Venkatesh & Davis, 2000: 351

The user behavior is affected by the variable of intention to use and subjective form via experience and voluntariness, perceived usefulness, and perceived ease of use. Experience is an effective variable between subjective norm and perceived usefulness. Perceived usefulness is disturbed by subjective norms, images, job relevance, output quality and result demonstrability.

Zhang, Cocosila, and Archer (2010: 49-56) investigated factors of adoption of mobile information technologies used by homecare nurses. Zhang et. al. expressed that although healthcare support of mobile information technologies plays a significant role in healthcare sectors to reduce the costs of caring and their attractive appearance, many mobile technology and applications cannot be utilized and implemented as expected by professionals. The researchers included 91 nurses' perceptions of personal digital

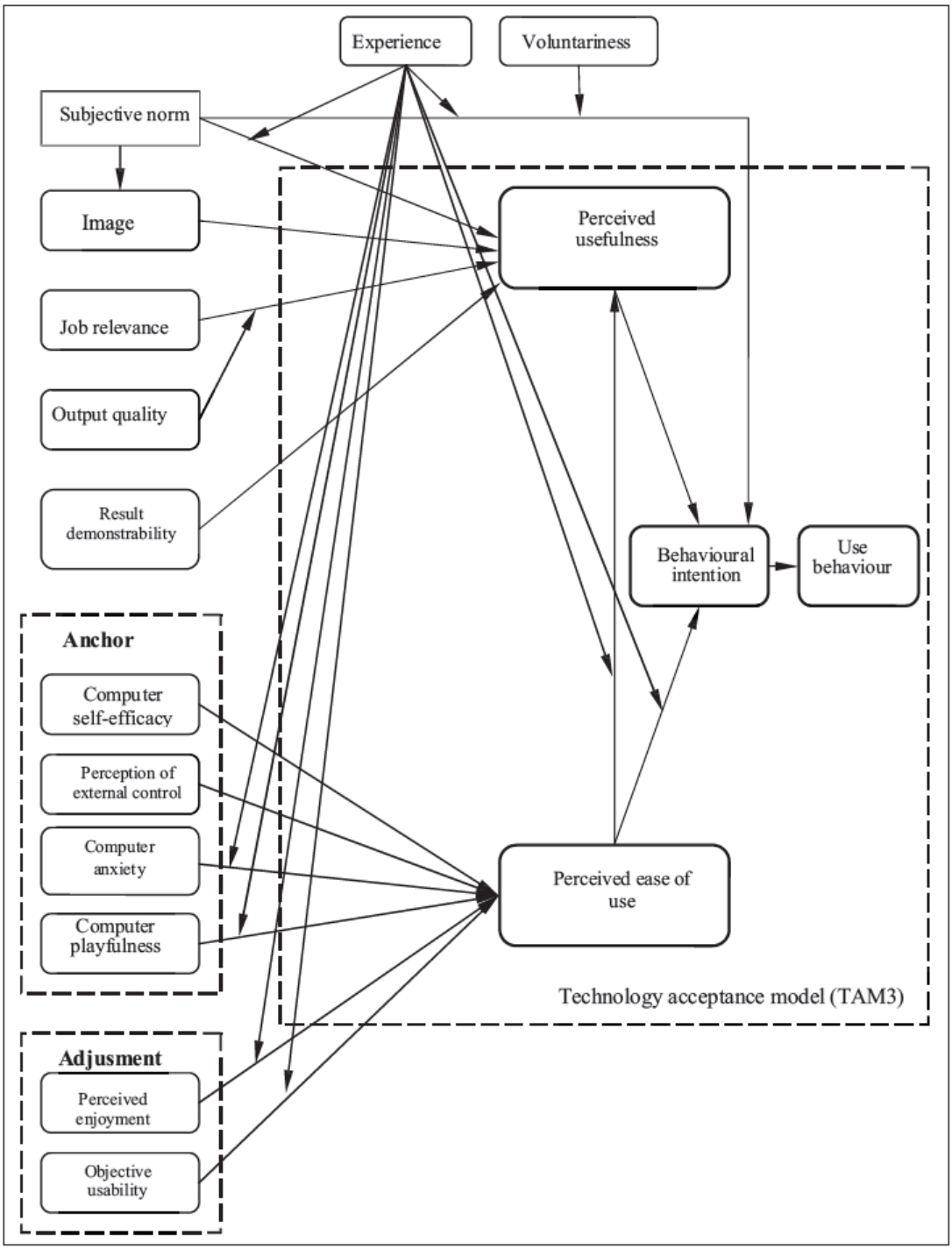
assistants for 30 days in daily routines in Canada. They analyzed data collected with partial least squares modelling. The findings showed that usefulness perceptions are main factors in mobile tech adoptions for the nurses. Subjective norms and image in the organization were found as important antecedents.

2.1.2. Technology Acceptance Model 3

Technology acceptance model 3 (TAM3) was initially proposed by Venkatesh and Bala (2008: 273-315) regarding e-commerce context and including possible effects of perceived risks and trust on the system usage. Figure 2.4 presents the fundamental conceptual model of TAM3. The variables of perceived usefulness and perceived ease of use affect behavioral intention that promote usage behavior of an individual. Perceived ease of use is influenced by two major elements, anchor and adjustment. Anchor element is affected by several variables including computer self-efficacy, perception of external control, computer anxiety, and computer playfulness.

Adjustment is characterized by two variables, perceived enjoyment and objective usability. Anchor and adjustment are affected by experience. Subjective norm, image, job relevance, output quality, and result demonstrability affect perceived usefulness, which eventually affect behavioral intention (Cengiz & Bakırtaş, 2020). Voluntariness is another variable affecting behavioral intention through subjective norms.

Figure 2.5: Technology acceptance model 3 conceptual model

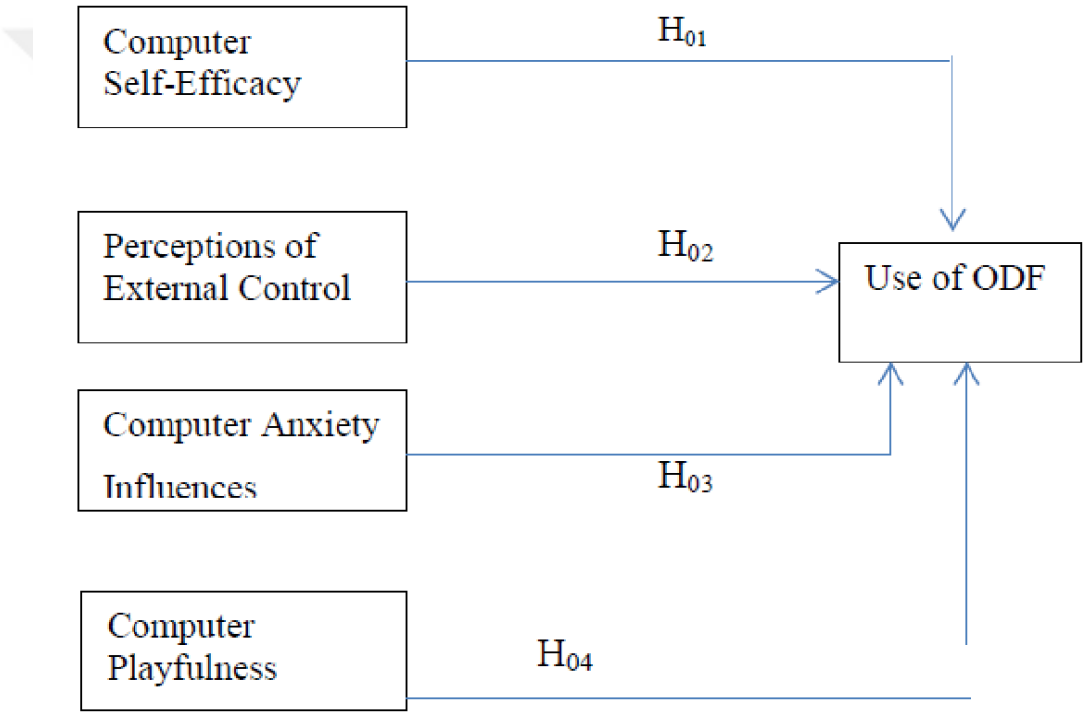


Source: Venkatesh & Bala, 2008: 287

TAM3 implementations on various sectors and organizations have been studied for the last two decades. Adetimirin (2015: 257) analyzed online discussion forums with library and information science graduates regarding utilizing and

implementing TAM3 model. Online discussion forums are very important tools for online learning across the world because students could communicate, share ideas, documents, and files with other students in order to enhance learnings. The researchers selected 121 students enrolled in collection management courses in the academic semesters. A survey design was utilized in the study. 76 responses from the participants were found useful for data analysis. Below structural models were constructed for hypothesis in the study, revised from TAM3

Figure 2.6: The conceptual framework based on TAM3 model



Source: Adetimirin, 2015: 260

As illustrated in Figure 2.6., the conceptual framework in the study was designed according to the original TAM model. The relationships and cause-effect analysis were investigated between computer self-efficacy, perceptions of external control, computer anxiety influences, computer playfulness and the use of online discussion forums. The researchers suggested that the college instructors should provide a positive environment and consider behaviors of postgraduates in order to promote e-learning based online forums for class discussions.

2.2. STUDIES ON MODIFIED TECHNOLOGY ACCEPTANCE MODEL

Various studies recently have been conducted on modified technology acceptance models in several sectors including health, education, and management (Aggelidis & Chatzoglou, 2009: 115; Gagnon et al., 2012; Orruño et al., 2011: 303-307; Byun, Chiu, and Bae, 2018; Koksalmış and Gozudok, 2021: 57-77). Health industry has been one of the main industries where revised TAM models have been implemented. Particularly, health personnel should be trained at the optimum levels so that cost of expenses could be reduced. Training was found as a significant factor for behavioral intentions via the course of ease of use and conditions. Behavioral intentions are typically affected by social influences, attitude, ease of use, perceived usefulness, conditions, and self-efficacy of the individuals.

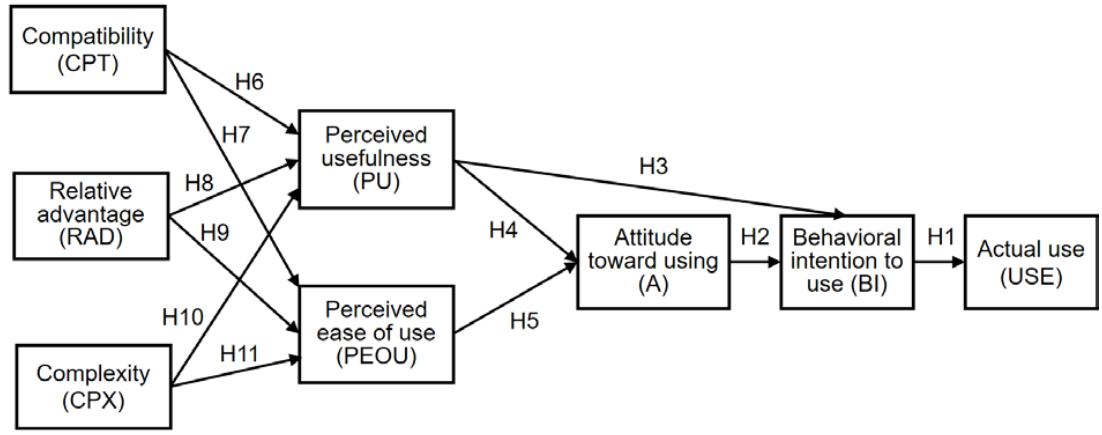
Byun, Chiu, and Bae (2018: 52-65) explored the adoption of sports brand applications in terms of modified TAM. They investigated the implementation of modified technology acceptance model and its factors on consumers' behaviors and intentions when using sports brand apps. They included a total of 261 Korean customers via convenient sampling. Data were analyzed with d SmartPLS 3.0 and findings showed that enjoyment levels of the consumers had positive impacts on perceived ease of using sports apps. In addition, perceived ease of using apps led to positive effect on perceived usefulness. Perceived enjoyment, perceived usefulness, and perceived ease of use relatively influence usage of sports brand apps. They conducted a multi-group analysis regarding three ages groups for the use of sports brand apps.

Koksalmis and Gozudok (2021: 57-77) investigated the impacts of e-commerce acceptance on the modified technology acceptance model by z-generation. They emphasized that z-generation's behavioral intentions to use e-commerce based on the modified technology acceptance model are influenced by various factors. Such factors included price savings, time, trust, perceived satisfaction and risks. They collected data from 162 high school students and university students and utilized the structural equation modeling method by using SmartPLS software for data analysis. Results showed that trust and perceived usefulness are major factors for behavioral

intentions for using e-commerce directly and significantly. On the other hand, price savings were not found as a significant factor for determining of generation-z individuals' satisfaction with their e-commerce tools.

Lou and Li (2017. 299-302) studied financial technology, a new business model and technology, which focuses on taking on and competing with traditional financial systems. Blockchain is considered as one of the most popular tech usage of financial technology. They expressed that bitcoin is one of the well-known and types of application for cryptocurrencies. It could also be used in various commercial and financial transactions around the world. They also discussed Ethereum as another important cryptocurrency for smart contracts. They proposed a modified model assembling innovation diffusion theory model and TAM to further explore people's intentions to use blockchain technology.

Figure 2.7: The proposed research model of blockchain technology as a financial technology



Source: Lou and Li, 2017: 299-302

Lou and Li (2017: 299-302) proposed their own model for implementing technology acceptance model for investigating cryptocurrencies such as blockchain. According to the model, compatibility, relative advantage, and complexity particularly affect perceived usefulness and perceived ease of use. Perceived usefulness and ease of use also have impacts on attitude towards using, which affects behavioral intention to use and actual usage.

2.2.1. Perceived Risk

Perceived risk (PR) could be defined as perceived uncertainty for the consumers in main purchasing decisions. First studies about perceived risk concept were conducted by Bauer (1960). Several studies have been conducted to investigate consumers behaviors from various perspectives. Researchers (Roselius, 1971: 58) utilized various ideas and proposed some approaches to reduce perceived risk for consumers when shopping.

Jacoby and Kaplan (1972) in one of the earliest studies on the perceived risk classified five forms of perceived risks as follows:

- Financial risk.
- Performance risk.
- Physical risk.
- Psychological risk.
- Social risk.

Financial risk is described as chances of losing money for the consumers if they plan on purchasing unfamiliar products. Performance risk refers to the particular products being wrong in some way or nor working properly as described and intended (Roselius, 1971: 60). Physical risks include actual harmful or injurious when using the product. Consumers could be psychologically hurt if they use an unfamiliar product. Social risks are related to the purchasing of unfamiliar products and others socially distancing themselves or changing their ideas against the person. Finally, these five varieties of the perceived risks generate all types of risks (Roselius, 1971: 58-61).

Perceived risks in addition to perceived usefulness and perceived ease of use negatively affect technology adoption for the individuals (Im, Kim, & Han, 2008: 1-9). Also, user experience, gender, technology type, and perceived risk are interweaved regarding technology adoption. Perceived risk could also be described as uncertainty of the services or products negatively affects people's decisions. There are also known as the risky situations and decisions that people have low confidence because they don't know the outcomes of their decisions.

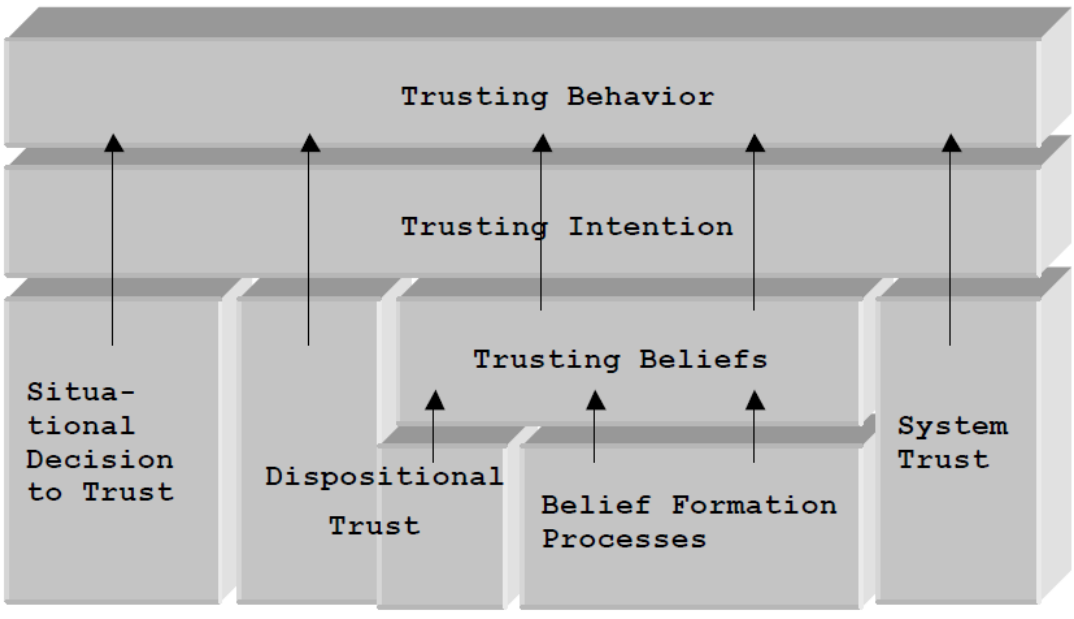
There are some discrepancies among people's purchasing performances and their pre-judgement about their decisions for purchasing services or goods. In these perspectives, technology play an important role for conveying possible outcomes for the shoppers. Otherwise, consumers might suffer from their purchasing decisions socially, physically, financially, and psychologically.

2.2.2. Trust

Trust is defined as a concept or a term regarding combination of perceptions (White, 1985). Trust has been investigated in the literature since early 1990s. Trust is also related to various concepts including cooperation, confidence, and predictability.

Its importance and cooperative endeavors have been popular topics for the researchers. Trust is a key component for positive interpersonal relationship. Ellen Berscheid and Larry Cummings laid the foundation of trust concept in 1985 (McKnight & Chervany, 1996).

Figure 2.8: The proposed construct model of trust and its relationships



Source: McKnight & Chervany, 1996

McKnight and Chervany (1996) represented trust construct with mediated relationships with other concepts as shown in Figure 2.8. Trust is the outcome of other

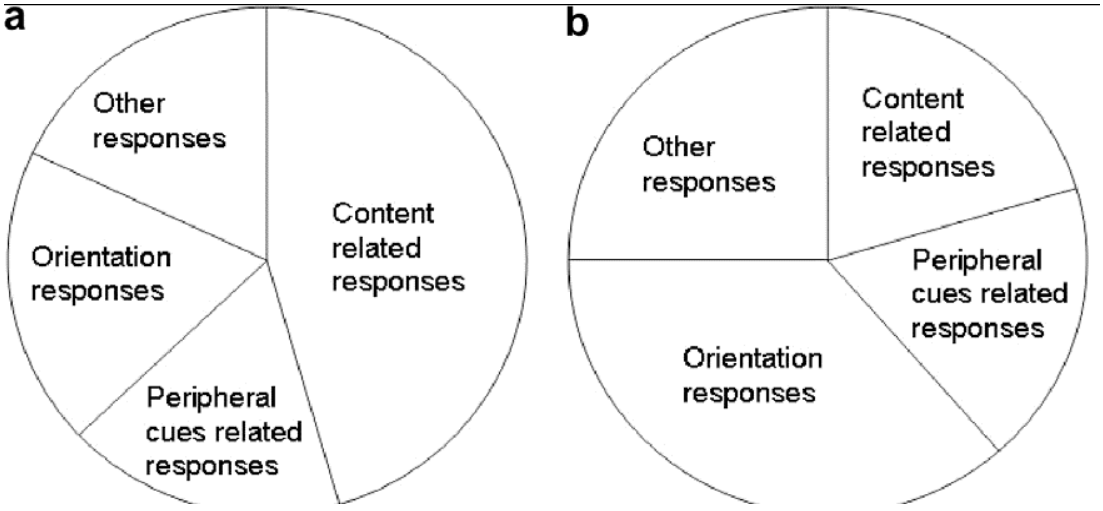
concepts such as trusting intentions. In addition, other underlying component and variables that make up trust foundations include situational decision to trust, dispositional trust, trusting beliefs, belief formation process, and system of trust. Such variables finally complete trusting behaviors at the end of the process.

2.2.3. Amount of Information

Amount of information is another important element for the consumers when deciding on purchasing a product (Ting, 1962: 439-447). Consumers probably spend most of their times to gain information and feedback about the product when they are considering buying. The importance of the products determines how much information are required before purchasing. Amount of information is also an essential factor for decision making process as it leads to a successful outcome if implemented properly during purchase decision process.

Sicilia and Ruiz (2010: 186) investigated cognitive responses of consumers during purchasing and how they are affected by the amount of information within online sites used for purchasing. According to the information of distribution illustrated in Figure 2.8, content related responses, peripheral cues related responses, orientation responses, and other responses generate consumers' purchasing decisions when shopping online. However, the distributions of such variables could be foddering based on the amount of information gathered about the products.

Figure 2.9. Examples of cognitive responses in processing by individuals



Source: Sicilia & Ruiz, 2010: 183-191

According to the information pyramid, raw data is the lowest type of information that are generally utilized by scientists and field level practitioners (Fancy, Gross, & Carter, 2009: 161-174). The second level of information is called statistics or processed data that is the border between sound science and science environment. Third level of information is called indicators, indices, and information. Second and third levels of information are generally used by expert assessment to translate scientific findings for decision-making and policy. At the top of the pyramid, highly aggregated indices exist, which are basically simple and clear public messages. They are also considered as public environment and effective communication elements usually used by policy makers and non-scientists.

CHAPTER THREE
RESEARCH METHODOLOGY AND FINDINGS

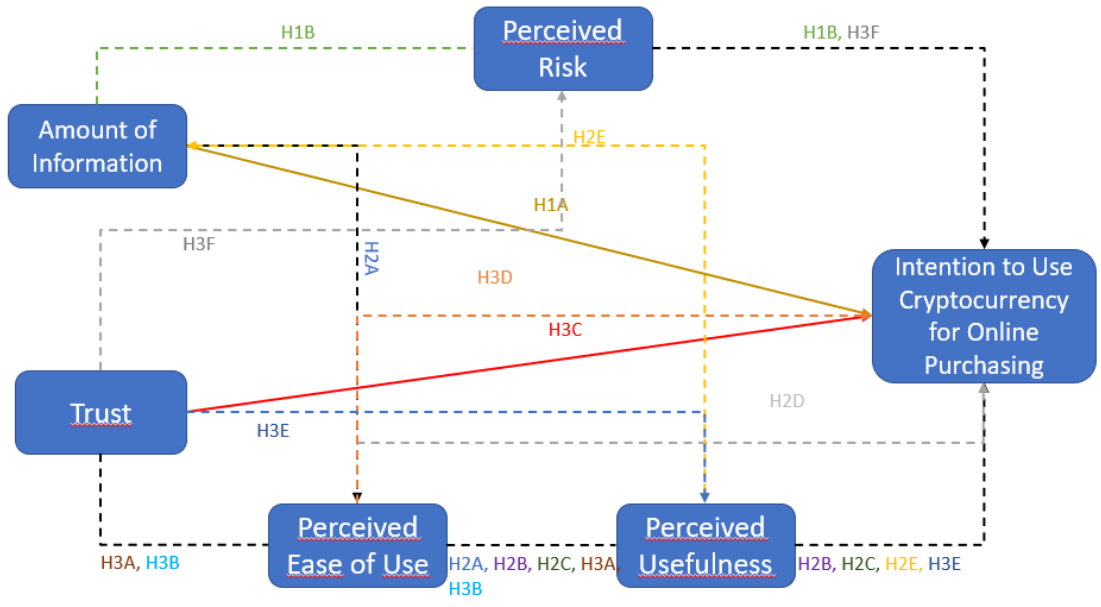
3.1. PURPOSE OF THE RESEARCH

This thesis study was designed to investigate consumer acceptance of cryptocurrency through integrating amount of information, trust and risk into the technological acceptance model. The relationships between perceived risk, amount of information, intention to purchase, trust, perceived ease of use, and perceived usefulness are explored in terms of sociodemographic features of the participants.

3.2. RESEARCH MODEL AND HYPOTHESIS

In aligned with the aims of the study, quantitative and qualitative studies conducted in recent years are examined. Based on the findings from the literature review (Pavlou 2003: 101-134), the following study model was designed (Figure 3.1).

Figure 3.1: Research Model



Based on the literature review, the following hypothesis are proposed (AOI: Amount of Information, PR: Perceived Risk, PU: Perceived Usefulness, PEU: Perceived Ease of Use, IP: Intention to Purchase):

H_{1A}: AOI → IP Amount of information positively affects the intention to use cryptocurrency for online purchasing.

H_{1B}: AOI → PR → IP Perceived risk mediates the positive effect of amount of information on intention to use cryptocurrency for online purchasing.

H_{2A}: AOI → PEU → PU Perceived ease of use of cryptocurrency mediates the positive effect of amount of information on perceived usefulness of cryptocurrency for online purchasing.

H_{2B}: PEU → PU → IP Perceived usefulness mediates the positive effect of perceived ease of use on intention to use cryptocurrency for online purchasing.

H_{2C}: AOI → PEU → PU → IP Perceived ease of use and perceived usefulness mediate the positive effect of amount of information on intention to use cryptocurrency for online purchasing.

H_{2D}: AOI → PEU → IP Perceived ease of use mediates the positive effect of amount of information on intention to use cryptocurrency for online purchasing.

H_{2E}: AOI → PU → IP Perceived usefulness mediates the positive effect of amount of information on intention to use cryptocurrency for online purchasing.

H_{3A}: T → PEU → PU Perceived ease of use mediates the positive effect of trust on perceived usefulness of cryptocurrency for online purchasing.

H_{3B}: T → PEU → PU → IP Perceived ease of use and perceived usefulness mediate the positive effect of trust on intention to use cryptocurrency for online purchasing.

H_{3C}: T → IP Trust positively affects intention to use cryptocurrency for online purchasing.

H_{3D}: T → PEU → IP Perceived ease of use mediates the positive effect of trust on intention to use cryptocurrency for online purchasing.

H_{3E}: T → PU → IP Perceived usefulness mediates positive effect of trust on intention to use cryptocurrency for online purchasing.

H_{3F}: T → PR → IP Perceived risk mediates the positive effect of trust on intention to use cryptocurrency for online purchasing.

3.3. MEASUREMENT SCALES

The data for the study were collected through a questionnaire with six subjections:

1. Amount of Information: The first section of the questionnaire includes items testing amount of information was developed by Pikkarainen et.al. (2004: 224-234) and consist of two items regarding the participants' knowledge of using cryptocurrency in online purchasing. The questions are answered with 7-point Likert scale for completely agree (7) to completely disagree (1) responses.

2. Perceived Ease of Use and Perceived Usefulness: Second section includes the survey of the perceived ease of use and perceived usefulness developed by Davis (1986). The items on the survey are answered based on 7-point Likert scale from completely agree (7) to completely disagree (1). This survey consists of total of 20 questions. First ten questions are related to the perceived ease of use. Second half of the survey questions are related to the perceived usefulness.

3. Perceived Risk: Third section includes 20 questions on financial risk (4), performance risk (5), privacy risk (3), time risk (4), and overall risk (4). It was developed by Featherman, Pavlou (2003: 451-474). The questions were answered based on 7-point Likert scale from completely agree (7) to completely disagree (1).

4. Trust: Fourth section developed by Jarvenpaa, Tractinsky, and Vitale (2000: 45-71). It consists of four items and answered based on 7-point Likert scale from completely agree (7) to completely disagree (1).

5. Intention to Purchase: Fifth section includes three questions regarding intention to purchase. The survey was developed by Barber and colleagues (2012: 282-292). The questions are answered based on 7-point Likert scale from completely agree (7) to completely disagree (1).

6. Demographic: The last section of the data collection tool included demographic characteristics of the participants such as age, gender, marital status, education levels, and monthly income. In addition, a question has been added to measure the cryptocurrency usage experience.

This questionnaire has been shared with participants under the approval of the ethics committee. (Document Number: E-87347630-640.99-33885, Date: 25/03/2021)

3.4. DATA COLLECTION AND SAMPLING

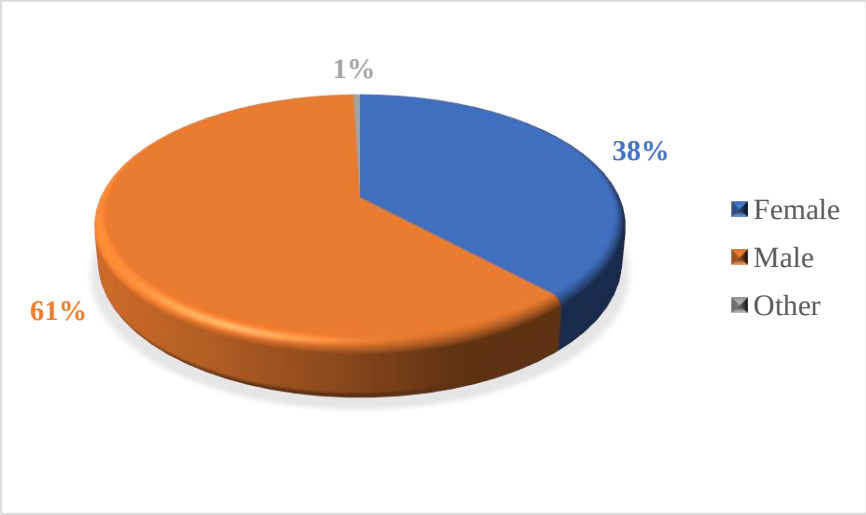
Data collection process took place in online data collection system (Google forms). The questionnaire was uploaded to the online system and potential participants were contacted via social media platforms. They volunteered to participate into the study.

A total of 522 participants' records were collected. The selection process therefore was convenience sampling.

3.5. DEMOGRAPHIC ANALYSIS OF RESPONDENTS

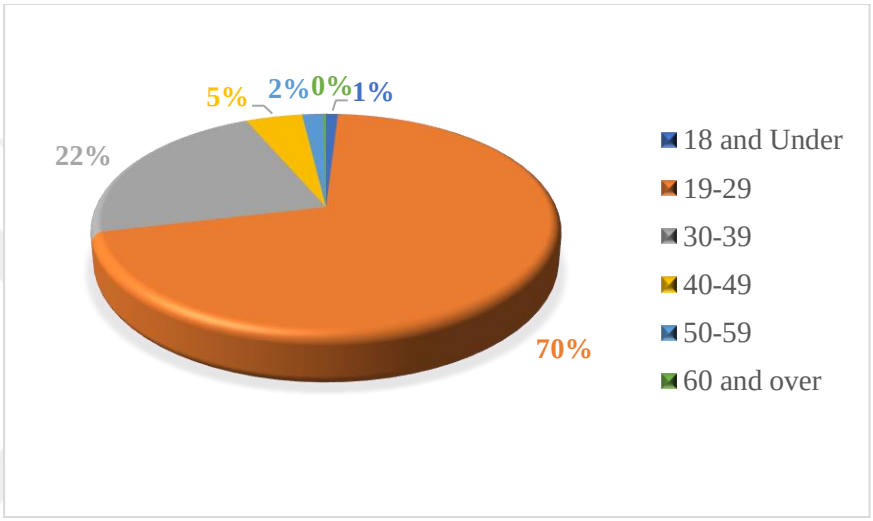
107 participants stated that they never heard of cryptocurrency so, their records have been removed and analyses were done for 415 responses. 158 participants were female while 255 of them were male. The remaining 2 consumers' gender were other than male and female. In figure 3.2 below, gender percentage of the participants has shown.

Figure 3.2: Gender Distribution



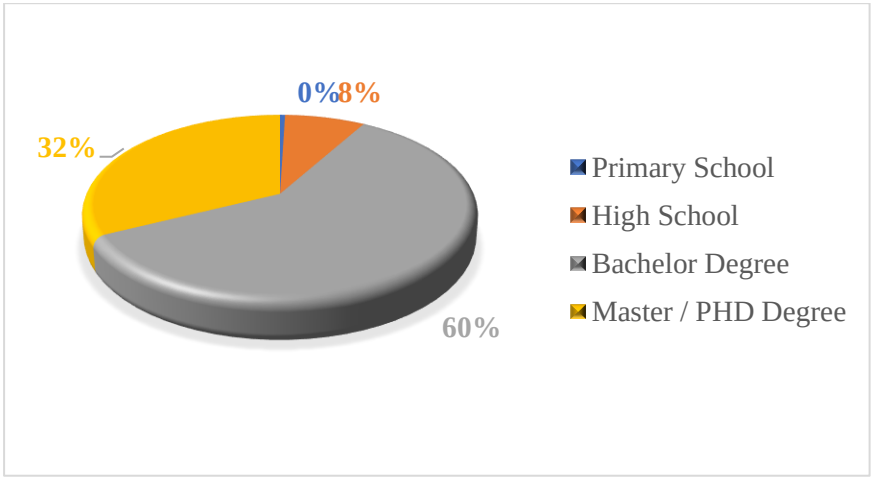
Most of the participants were young consumers. When the age groups of the participants are examined; 4 participants are in the 0-18 age range, 292 participants are in the 19-29 age range, 92 participants are in the 30-39 age range, 19 participants are in the 40-49 age range, 7 participants are in the 50-59 age range and only one participant is in the 60 and over, respectively. In the figure 3.3 below, the percentages are shown.

Figure 3.3: Age Range Distribution



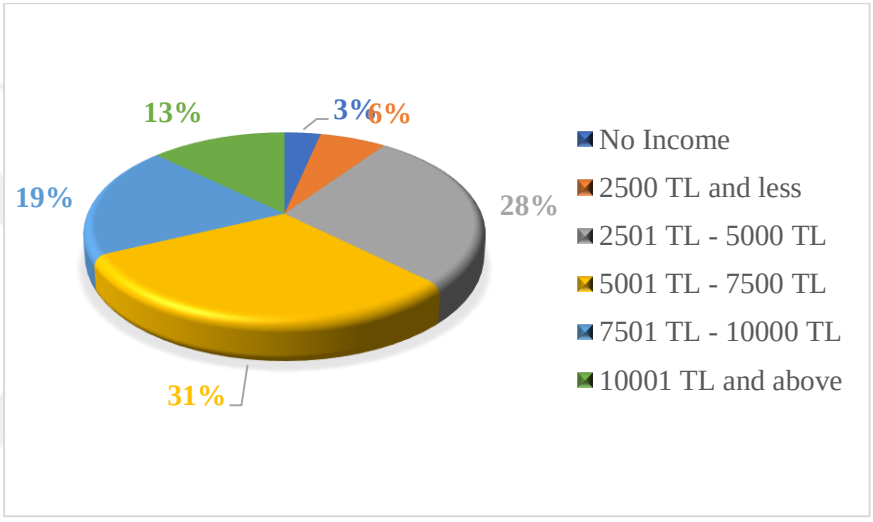
When educational status of participants observed, it can be said that most of the participants (247) had bachelor degree. The figure 3.4 demonstrates participants' education with percentages.

Figure 3.4: Education Level Distribution



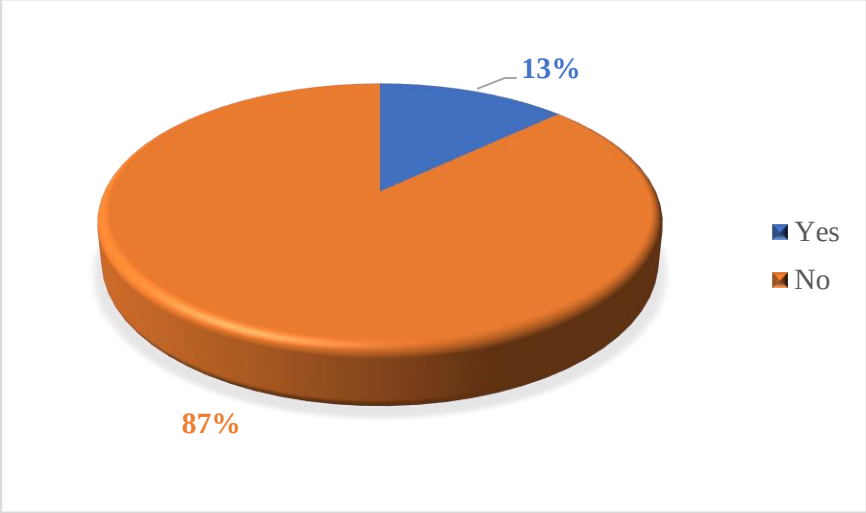
When the monthly household income data are analyzed, it can be seen that 14 participants have no income. 26 participants have an income of 2500 TL and less, and 115 participants have an income of 2501 TL – 5000 TL, 127 participants have an income of 5001 TL - 7500 TL, and 80 participants have an income of 7501 TL - 10000 TL. Lasty, the remaining 53 participants have an income of 10001 TL and above. The figure 3.5 shows income level with the percentages. In addition, 124 participants are married while 291 of them are single.

Figure 3.5: Income Level Distribution



Lastly, a question has been included to survey to measure online purchasing experience of participants with cryptocurrency. In spite of the fact that there is no popular online shopping store that accepts cryptocurrencies as payment method, it is observed that 54 participants answered yes which means that some of their online payments have been realized with cryptocurrency. The Figure 3.6 shows the percentages.

Figure 3.6: Cryptocurrency Usage Experience in Online Purchasing



3.6. DATA ANALYSIS

Data analysis was conducted based on the statistical or quantitative analysis such as comparison and correlational methods.

3.6.1 Analysis Model

The model was tested utilizing the SPSS program. First, the factor analysis is done. Factor loadings greater than 0.50 are taken as basis in the data set (Costello, A. B., & Osborne, J. W., 2005: 1-9). T3 had no load factor in any variable. For this reason, first, the variable T3 is removed from the model and the results are observed. Because there was no improvement, another variables PEU1, PEU2, PEU4, PEU6, PEU8 and PEU10 which had low factor loadings were removed from further analysis. In the Figure 3.7 below, the pattern matrix values of the variables are shown.

Figure 3.7: The Pattern Matrix of Variables

	PR	PU	PEU	AOI	IP
Cronbach's Alpha	**0,975**	**0,950**	**0,778**	**0,902**	**0,960**
PR1	0,700				
PR2	0,786				
PR3	0,689				
PR4	0,840				
PR5	0,803				
PR6	0,822				
PR7	0,880				
PR8	0,820				
PR9	0,919				
PR10	0,852				
PR11	0,831				
PR12	0,900				
PR13	0,768				
PR14	0,775				
PR15	0,844				
PR16	0,766				
PR17	0,791				
PR18	0,830				
PR19	0,781				
PR20	0,818				
PU1		0,704			
PU2		0,787			
PU3		0,777			
PU4		0,861			
PU5		0,874			
PU6		0,855			
PU7		0,795			
PU8		0,877			
PU9		0,856			
PU10		0,629			
PEU3			0,502		
PEU5			0,561		
PEU7			0,774		
PEU9			0,758		
AOI1				0,923	
AOI2				0,891	
IP1					0,801
IP2					0,945
IP3					0,854
KMO:	**,957**		**Barlett's Sig:**		**,000**

To test to reliability of the scales, Cronbach's alpha values were calculated and were found as 0,975 for perceived risk, 0,950 for perceived usefulness, 0,778 for perceived ease of use, 0.902 for amount of information and finally 0,960 for intention to purchase which are all above the acceptable level of 0,7 (Fornell & Larcker, 1981). Composite reliability (CR) values were found as 0,975 for perceived risk, 0,951 for perceived usefulness, 0,772 for perceived ease of use, 0,903 for amount of information and 0,961 for intention purchase. All values are above than 0,7 which is lowest threshold for composite reliability (Fornell & Larcker, 1981). In the meantime, average variance extracted (AVE) was calculated for all variables which are found as 0,633 for perceived risk, 0,660 for perceived usefulness, 0,461 for perceived ease of use, 0,823 for amount of information and 0,890 for intention to purchase. Average variance extracted values for all variables are above than 0,5 except for perceived ease of use. As Malhotra N. K., Dash S. specified that AVE is often too strict, and reliability can be established through CR alone, so reliability is supported. (Malhotra & Dash, 2011)

Figure 3.8: Results of Reliability Analysis

	Composite Reliability (CR)	Average Variance Extracted (AVE)
PR	0,975	0,663
PU	0,951	0,660
PEU	0,772	0,461
AOI	0,903	0,823
IP	0,961	0,890

When discriminant validity was analyzed, as shown in Figure 3.9 below, each block has a higher load in its structure than the others and the model meet the discriminant validity criterion (Fornell & Larcker, 1981: 382-388).

Figure 3.9: Factor Correlation Matrix

	PR	PU	PEU	AOI	IP
PR	1,000				
PU	-0,405	1,000			
PEU	0,537	-0,283	1,000		
AOI	-0,349	0,500	-0,188	1,000	
IP	-0,532	0,667	-0,380	0,557	1,000

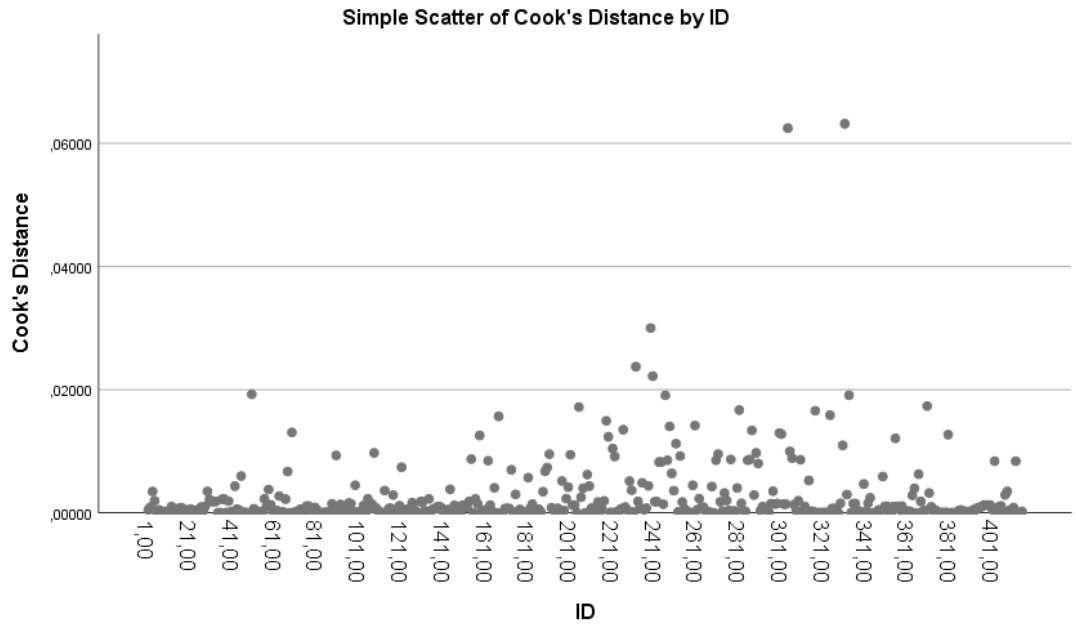
3.6.2 Structural Model

Here, the structural model is tested to investigate the relationships between structures. The Confirmatory Factor Analysis (CFA) in AMOS is used to analyze model fit.

The results are (χ2/d.f. = 2,64, goodness-of-fit index [GFI] = 0,81, comparative fit index [CFI] = 0,93; Tucker-Lewis index [TLI] = 0,92, normed fit index [NFI] = 0,89 and root mean square error of approximation [RMSEA] = 0,063). The values proved that model fit is acceptable (Hu & Bentler, 1999: 1-55).

In addition, existence of common method bias is tested. In this test, unconstrained common method bias model compared with the constrained common method bias model. As a result of chi-square test, there is significant difference in chi-square, difference in degrees of freedom and p-value (Chi-square = 259.9, df = 39, p value = 0.000). A common latent factor which comprises all items was added to the model (Bagozzi, 2011: 982-1003). The model fit indices were χ2/d.f. = 2.39, GFI = 0.839, CFI = 0.94; TLI = 0.93; NFI = 0.90 and RMSEA = 0.058. Any significant change did not appear for each construct; therefore, no common method bias has been found.

Figure 3.10: Cook's Distance Graph



As shown above Figure 3.10, Cook's Distance analysis has been made and two abnormal records has been found. These records were removed in order to strength regressions.

Additionally, multicollinearity analysis has been done and results are shown at Figure 3.11. Variance inflation factors (VIF) for all independent variables are less than 3,0 and all tolerance values are more than 0,1. Thus it is observed that, each independent variable is explaining unique variance in the dependent variable (O'Brien, 2007: 673-690).

Figure 3.11: Collinearity Statistics

	Tolerance	VIF
PR	0,455	2,198
PU	0,556	1,798
PEU	0,434	2,302
AOI	0,647	1,545

3.7 RESULTS

Before the hypothesis's analyses have been made, path model was created and model fit values were analyzed in Amos. The results are ($\chi 2$/d.f. = 0,955, goodness-of-fit index [GFI] = 0,99, comparative fit index [CFI] = 1,00; Tucker-Lewis index [TLI] = 1,00, normed fit index [NFI] = 0,99 and root mean square error of approximation [RMSEA] = 0,000). After model fit has been provided (Hu & Bentler, 1999), hypotheses analyses were completed. Below, Figure 3.12 shows the standardized estimate values and p-values with the result of each direct hypothesis.

Figure 3.12: Hypotheses Testing for Direct Effects

Hypothesis Code	Hypothesis	P Value	Standardized Estimates	Result
H1A	AOI → IP	0,001	0,164	Supported
H3C	T → IP	-	-	Dropped

The finding of hypotheses testing can be summarized as:

- The amount of information positively affects the intention to use of cryptocurrency for online purchasing (β = .16, $p < .05$), therefore H_{1A} is supported.

In order to explore the mediating effects, bootstrapping bias-corrected confidence interval procedure, which is accepted as a better method for testing mediation (Preacher & Hayes, 2008a,b; Zhao, Lynch, & Chen, 2010: 879-891) was used. In Figure 3.13 below, the results are summarized.

Figure 3.13: Hypotheses Testing for Mediating Effects

Hypothesis Code	Hypothesis	Unstandardized Estimates	Lower	Upper	P Value	Standardized Estimates	Result
H1B	AOI → PR → IP	0,067	0,041	0,098	0,001	0,071	Supported
H2A	AOI → PEU → PU	0,084	0,058	0,117	0,001	0,084	Supported
H2B	PEU → PU → IP	-0,329	-0,414	-0,253	0,001	-0,201	Supported
H2C	AOI → PEU → PU → IP	0,064	0,044	0,089	0,001	0,115	Supported
H2D	AOI → PEU → IP	0,022	0,000	0,047	0,098	0,022	Not Supported
H2E	AOI → PU → IP	0,259	0,212	0,312	0,001	0,270	Supported
H3A	T → PEU → PU	-	-		-	-	Dropped
H3B	T → PEU → PU → IP	-	-		-	-	Dropped
H3D	T → PEU → IP	-	-		-	-	Dropped
H3E	T → PU → IP	-	-		-	-	Dropped
H3F	T → PR → IP	-	-		-	-	Dropped

CONCLUSION

With the increased usage of online purchasing and the popularity of cryptocurrency, the question of consumer acceptance of cryptocurrency for online purchasing has arisen. Consumers prefer to use easier payment methods and an alternative payment method was formed with the emergence of cryptocurrency which provides immediate and 7/24 money transfer option. Also, in this study there are consumers who already adopted to use cryptocurrency for online shopping, however; a big portion of the consumers never used cryptocurrency for online purchasing even when their awareness increased year by year. Therefore, this study aimed to analyze and describe the consumers' motivations of using cryptocurrencies in online purchasing.

In this study, consumers' online purchasing intention has been studied with the technology acceptance model (TAM). The proposed model integrated TAM with the amount of information, trust and perceived risk to predict the drivers of consumer intentions to accept cryptocurrency in online purchasing. It was seen that trust did not emerge as a significant factor during the analysis and therefore, the variable of trust and related hypotheses were eliminated from further analysis. In the Pavlou's research in 2003, technology acceptance model was also extended with trust as in this one and it was almost non-significant. So, this can explain why trust did not have significant factor in this research. Thus, the remaining hypotheses were analyzed and it was observed that the amount of information negatively affects perceived risk.

When consumers have more information on cryptocurrency, the perceived risk level has decreased. With this in mind, amount of information's positive effect has been found on the intention to use cryptocurrency. Thus, it can be said that consumers are more likely to use cryptocurrency when they have more information. At the same time, the perceived ease of use of cryptocurrency has been positively affected by the amount of information. If provided with more information about cryptocurrencies, the intention to use will increase for consumers. Besides, perceived usefulness is also positively affected by the amount of information.

In the literature, it is seen that consumer intentions are negatively related to perceived risk (Pavlou, 2003: 101-134). Similarly in this research, it is found that perceived risk negatively affects the intention to use cryptocurrency in online purchases. Consumers tend to give up their intention when the risk is high. With this in mind, when the amount of information towards cryptocurrency increases, consumers will be more likely to use cryptocurrencies in their online shopping processes due to decreasing perceived risk level.

When the perceived usage of cryptocurrency is easier, it has been proved that the perceived usefulness has increased as investigated in the literature (Featherman & Pavlou, 2003: 451-474). Thus, consumers' perception of cryptocurrency's usefulness is being positively affected by the amount of information while perceived ease of use is mediating this effect. Consumers' perception of cryptocurrency's usefulness is related to their information amount. On the other hand, it was observed that perceived ease of use did not positively affect the intention to use cryptocurrency in online purchases. According to that, ease of use of cryptocurrency does not improve consumers' preference towards cryptocurrency. In the meantime, it has been found that the perceived ease of use does not mediate the effect of the amount of information on intention to purchase.

In addition, the positive effect of the perceived usefulness of the cryptocurrency on the intention to use cryptocurrency for online purchasing has been supported as in the literature (Pavlou, 2003: 101-134). Additionally, it is seen that perceived usefulness positively mediates first the effect of perceived ease of use and on intention to use cryptocurrency in online purchases, second the effect of the amount of information on intention to use cryptocurrency in online purchases. Consumers are being motivated to use cryptocurrency when they have more information about it and when they thought that it is easy to use. Lastly, as stated in the literature (Pikkarainen et al., 2004: 224-235), in this study also, perceived ease of use and perceived usefulness mediated the positive effect of the amount of information on the intention to use cryptocurrency for online purchasing. Consumers who perceive that cryptocurrency is easy to use and useful, their information level significantly affects their motivation to use cryptocurrencies for online purchasing.

When the managerial implications of this study are analyzed; it can be said as cryptocurrency's popularity increased in the recent years, governments started attempts to set rules to regulate this field. Even though there is no popular online market which accepts cryptocurrencies as payment method in Turkey, there are online shopping stores in the world such as Newegg and Overstock which accepts cryptocurrencies for online payments. Due to Covid 19, consumers tend to prefer online shopping and it pushes the retailers to improve their online stores. Therefore, accepting cryptocurrencies for online purchasing may positively affects consumers and it can improve sales volume. However, as this study mentioned in previous sections, perceived risk negatively affects consumers' intention to use cryptocurrency while amount of information affects positively. So, managers should provide enough information to their consumers to reduce the risk level. At the earlier stages, providing informative training and videos to consumers would make it easier for them to adapt this process. In addition, consumers' intention positively affected by perceived usefulness. Also, it is a fact that international shopping requires more time and commission due to exchange rates. Hence, introducing the useful sides of cryptocurrency for online purchasing such as fast and low commission rates can improve international sales volume.

LIMITATIONS AND RECOMMENDATIONS FOR FURTHER RESEARCH

There are several limitations of this study. Firstly, data analyses were limited to 415 records due to time constraint which means the results cannot be generalized to all Turkish consumers. Second, there is lack of awareness of the cryptocurrency subject and its usage areas in Turkey so, analyses results may change as awareness increases.

Focusing specific product categories to observe the differences can be recommended for further research. Additionally, in this research, amount of information, trust, perceived risk, perceived usefulness and perceived ease of use have been determined as independent variables, however; new independent variables can be added like perceived enjoyment or technology acceptance model can be extended with innovation of diffusion theory to analyze the intention with different perspectives.

Due to current circumstances and like other technology acceptance studies, there is a gap between intention and behavior in this study. Therefore, further studies should analyze and measure the behavior to see the behavioral results. Also, this study can be conducted in other countries to compare the online purchasing intention with cryptocurrencies.

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APPENDIX

Appendix 1: Questionnaire

The companies that offer both product and service has started selling their products online throughout the Internet in the light of the development in technology. Thus, it hasn't been so common; we can face the fact that crypto currency –still developing-may be serviced to the customers at online shopping integrated to the online payment.

Section 1. Amount of Information (Pikkarainen, T., Pikkarainen, K., Karjaluoto, H., & Pahnila, S. (2004). Consumer acceptance of online banking: an extension of the technology acceptance model. *Internet Research, Vol. 14 Iss: 3 pp. 224 – 235)*

1. Have you ever heard cryptocurrency before?
    - Yes
    - No
2. I have generally received enough information about online purchasing with cryptocurrency.

Strongly Disagree	①	②	③	④	⑤	⑥	⑦	Strongly Agree

3. I have received enough information about benefits of using cryptocurrency at online purchasing.

Strongly Disagree	①	②	③	④	⑤	⑥	⑦	Strongly Agree

4. Have you ever been used cryptocurrency for online purchasing?
    - Yes
    - No

Section 2. (Perceived Ease of Use & Perceived Usefulness) (Davis, F. (1986). A technology acceptance model for empirically testing new end-user information systems. *Research Gate)* 7 Likert

Perceived ease of use

5. I think using cryptocurrency for online purchasing is unfavorable.

Strongly Disagree	①	②	③	④	⑤	⑥	⑦	Strongly Agree

6. It is easy learn how to use cryptocurrency at online purchasing.

Strongly Disagree	①	②	③	④	⑤	⑥	⑦	Strongly Agree

7. Using cryptocurrency at online purchasing is annoying most of the time.

Strongly Disagree	①	②	③	④	⑤	⑥	⑦	Strongly Agree

8. Using cryptocurrency at online purchasing makes my desires easily.

Strongly Disagree	①	②	③	④	⑤	⑥	⑦	Strongly Agree

9. It is hard to use cryptocurrency at online purchasing.

Strongly Disagree	①	②	③	④	⑤	⑥	⑦	Strongly Agree

10. It is easy to remember the things with the help of using cryptocurrency at online purchasing.

Strongly Disagree	①	②	③	④	⑤	⑥	⑦	Strongly Agree

11. Using cryptocurrency at online purchasing requires too much mental effort.

Strongly Disagree	①	②	③	④	⑤	⑥	⑦	Strongly Agree

12. Using cryptocurrency at online purchasing is clear and understandable.

Strongly Disagree	①	②	③	④	⑤	⑥	⑦	Strongly Agree

13. Developing the ability of using cryptocurrency at online purchasing requires great effort.

Strongly Disagree	①	②	③	④	⑤	⑥	⑦	Strongly Agree

14. I think using cryptocurrency at online purchasing is easy in general.

Strongly Disagree	①	②	③	④	⑤	⑥	⑦	Strongly Agree

Perceived Usefulness

15. Using cryptocurrency at online purchasing improves the quality of shopping.

Strongly Disagree	①	②	③	④	⑤	⑥	⑦	Strongly Agree

16. Using cryptocurrency at online purchasing ensures me more control on my shopping.

Strongly Disagree	①	②	③	④	⑤	⑥	⑦	Strongly Agree

17. Using cryptocurrency at online purchasing helps me make things quicker.

Strongly Disagree	①	②	③	④	⑤	⑥	⑦	Strongly Agree

18. Cryptocurrency at online purchasing supports me about critical aspects of my shopping.

Strongly								Strongly

Disagree ① ② ③ ④ ⑤ ⑥ ⑦ Agree

19. Using cryptocurrency at online purchasing raises efficiency.

Strongly Disagree ① ② ③ ④ ⑤ ⑥ ⑦ Strongly Agree

20. Using cryptocurrency at online purchasing increase my shopping performance.

Strongly Disagree ① ② ③ ④ ⑤ ⑥ ⑦ Strongly Agree

21. Using cryptocurrency at online purchasing makes me shop more.

Strongly Disagree ① ② ③ ④ ⑤ ⑥ ⑦ Strongly Agree

22. Using cryptocurrency at online purchasing raises my efficiency on shopping.

Strongly Disagree ① ② ③ ④ ⑤ ⑥ ⑦ Strongly Agree

23. Using cryptocurrency at online purchasing helps me make things easier.

Strongly Disagree ① ② ③ ④ ⑤ ⑥ ⑦ Strongly Agree

24. I think using cryptocurrency at online purchasing is beneficial in general.

Strongly Disagree ① ② ③ ④ ⑤ ⑥ ⑦ Strongly Agree

Section 3. Perceived Risk (Featherman, M. S., & Pavlou, P. A. (2003). Predicting e-services adoption: a perceived risk facets perspective. *International journal of human-computer studies*, *59*(4), 451-474)

Financial Risk

25. I may lose money if I shop online via using cryptocurrency.

Strongly Disagree ① ② ③ ④ ⑤ ⑥ ⑦ Strongly Agree

26. My account may face some kind of trouble if I shop online via using cryptocurrency.

Strongly Disagree ① ② ③ ④ ⑤ ⑥ ⑦ Strongly Agree

27. Using cryptocurrency at online shopping causes a financial loss for me.

Strongly Disagree ① ② ③ ④ ⑤ ⑥ ⑦ Strongly Agree

28. My account gets into risk if I shop online via using cryptocurrency.

Strongly Disagree	①	②	③	④	⑤	⑥	⑦	Strongly Agree

Performance Risk

29. Using cryptocurrency at online purchasing may not go well and my account can get into trouble.

Strongly Disagree	①	②	③	④	⑤	⑥	⑦	Strongly Agree

30. The security systems of using cryptocurrency at online purchasing are not good enough to protect my account.

Strongly Disagree	①	②	③	④	⑤	⑥	⑦	Strongly Agree

31. Cryptocurrency payment systems can suffer from some trouble or they may not work well.

Strongly Disagree	①	②	③	④	⑤	⑥	⑦	Strongly Agree

32. It would be risky for me to use cryptocurrency at online purchasing.

Strongly Disagree	①	②	③	④	⑤	⑥	⑦	Strongly Agree

33. The performance of using cryptocurrency at online purchasing might be low, and then the payment can go wrong.

Strongly Disagree	①	②	③	④	⑤	⑥	⑦	Strongly Agree

Privacy Risk

34. I can lose my control of private payment methods if I shop online via using cryptocurrency.

Strongly Disagree	①	②	③	④	⑤	⑥	⑦	Strongly Agree

35. Using cryptocurrency at online purchasing would lead to a loss of privacy for me because my personal information would be used without my knowledge.

Strongly Disagree	①	②	③	④	⑤	⑥	⑦	Strongly Agree

36. Hackers may take my control of my account if I shop online via using cryptocurrency.

Strongly								Strongly

Disagree	①	②	③	④	⑤	⑥	⑦	Agree

Time Risk

37. If I started using cryptocurrency at online purchasing, I would lose some time when I want to choose another payment method.

Strongly Disagree	①	②	③	④	⑤	⑥	⑦	Strongly Agree

38. It might long time for me to undo the payments that are done by mistake, if I choose cryptocurrency as a payment method at online purchasing.

Strongly Disagree	①	②	③	④	⑤	⑥	⑦	Strongly Agree

39. When I consider the time that I spend while purchasing online via using cryptocurrency, purchasing online via cryptocurrency is risky.

Strongly Disagree	①	②	③	④	⑤	⑥	⑦	Strongly Agree

40. Purchasing online via using cryptocurrency is risky because of the possible time loss of the necessity of learning using cryptocurrency.

Strongly Disagree	①	②	③	④	⑤	⑥	⑦	Strongly Agree

Overall Risk

41. In general using cryptocurrency at online purchasing is risky when I consider all the features of it.

Strongly Disagree	①	②	③	④	⑤	⑥	⑦	Strongly Agree

42. Purchasing online via cryptocurrency is dangerous.

Strongly Disagree	①	②	③	④	⑤	⑥	⑦	Strongly Agree

43. Using cryptocurrency at online purchasing would make my shopping uncertainty.

Strongly Disagree	①	②	③	④	⑤	⑥	⑦	Strongly Agree

44. It would be risky purchasing online via cryptocurrency.

Strongly Disagree	①	②	③	④	⑤	⑥	⑦	Strongly Agree

Section 4. Trust (Jarvenpaa, S. L., Tractinsky, N., & Vitale, M. (2000). Consumer trust in an Internet store. *Information technology and management, 1*(1), 45-71)

45. Using cryptocurrency at online purchasing is safe.

Strongly Disagree	①	②	③	④	⑤	⑥	⑦	Strongly Agree

46. I think using cryptocurrency at online purchasing serves my profits well.

Strongly Disagree	①	②	③	④	⑤	⑥	⑦	Strongly Agree

47. I find necessary to be careful while purchasing online via cryptocurrency. [reverse]

Strongly Disagree	①	②	③	④	⑤	⑥	⑦	Strongly Agree

48. Using cryptocurrency at online purchasing fills my expectations.

Strongly Disagree	①	②	③	④	⑤	⑥	⑦	Strongly Agree

Section 5. Intention to Purchase (Barber, N., Kuo, P. J., Bishop, M., & Goodman, R. (2012). Measuring psychographics to assess purchase intention and willingness to pay. *Journal of consumer marketing*, 29(4), 282-292)

49. I think of using cryptocurrency at online purchasing.

Strongly Disagree	①	②	③	④	⑤	⑥	⑦	Strongly Agree

50. I intend to use cryptocurrency at online purchasing.

Strongly Disagree	①	②	③	④	⑤	⑥	⑦	Strongly Agree

51. I have a plan to use cryptocurrency at online purchasing.

Strongly Disagree	①	②	③	④	⑤	⑥	⑦	Strongly Agree

Section 6. Demographic

52. Age:

- 18 and below
- 19-29 years old
- 30-39 years old
- 40-49 years old
- 50-59 years old
- 60 and above

53. Gender:

- Female
- Male
- Other

54. Marital Status:
- Married
- Single

55. Education Level (your last degree):
- Primary School
- High School
- University
- Master Degree – Doctor’s Degree

56. What is your household income?
- We have none.
- 2500 TL and under
- 2501 TL -5000 TL
- 5001 TL - 7500 TL
- 7501 TL - 10000 TL
- 10001 TL and above