

# **Can digital currencies serve as an everyday means of payment in commerce?**

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Bachelor Thesis for Obtaining the Degree  
Bachelor of Science in  
International Management

Submitted to Stefan Bauer

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## Affidavit

I hereby affirm that this Bachelor's Thesis represents my own written work and that I have used no sources and aids other than those indicated. All passages quoted from publications or paraphrased from these sources are properly cited and attributed.

The thesis was not submitted in the same or in a substantially similar version, not even partially, to another examination board and was not published elsewhere.

Date

23.08.2023.

## **Abstract**

Money has always played an essential role in people's society. Means of payment come in various forms. Through the internet, the most modern form of money, the so-called cryptocurrency, has emerged. It is hard to imagine our society without it; this Bachelor Thesis gives insight into the understanding and definition of cryptocurrencies using the most famous, Bitcoin. Furthermore, it discusses the possible use as a general mean of payment and their acceptance among society and especially for the commerce. The goal is to cover the phenomenon of cryptocurrencies and highlight some of their advantages and disadvantages. The knowledge is based on scientific papers, journals and conducted interviews with experts.

**Keywords:** money, cryptocurrency, acceptance, mean of payment, commerce

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# 1 Introduction

The term cryptocurrency gained public prominence back in 2009 with the introduction and launch of Bitcoin. The break out of the real estate bubble in 2008 led to one of the most acute economic crises. As a result, 2.6 million employees lost their jobs in 2008, and the unemployment rate jumped to 7.2 percent in December (Uchitelle. 2012). The global interest rate level in the European Monetary Community was at a deficient level and led, among other things, to the absolute insolvency of Greece (Feldstein. 2012). It was shown that the deficits caused by applied financial market regulation methods could neither guarantee the stability of the financial system nor the functionality of the financial markets.

Furthermore, seemingly effective measures for the protection of potential investors proved to be ineffective. As a result, banks developed new plans, reforms, and even new sectors to prevent such a further potential disaster. As a result, many citizens have lost confidence in the monetary policy and the banking system.

That is the reason why cryptocurrencies play such an important role. The collapse of trust in the banking system and the possible devaluation of a currency by central banks are essential for using electronic currencies. They are digital and enable cashless, uncomplicated payment transactions via a cryptographic system based on an encryption procedure. The advantage, no intermediary is needed to carry out a transaction between two parties. The transaction is not under the control or regulation of states or banks. In other words, there is no control by a so-called independent body such as the ECB. Therefore, cryptocurrencies, in our example the best known, can be seen as a potential alternative to traditional payment systems. The bachelor thesis will give an answer.

As early as 2010, the first exchange rates for Bitcoin were created, and the first transactions were completed. A few numbers of investors saw advantages in cryptocurrencies, and the interest grew steadily. Greece can be cited as a good example. In 2015, when the Greek banks closed, capital controls were imposed on investors with a maximum withdrawal of 60 euros per day. Through the use of Bitcoin, investors have been able to make unrestricted cross-state transactions despite capital controls. (Bouoiyour & Selmi. 2015)

For a general understanding, the different manifestations of money are considered, their functions explained, and the motives for investors to hold money. Subsequently, the term cryptocurrency is explained and gives an overview of the history of cryptocurrency. With this knowledge, an attempt is made to answer part of the research question, whether digital currencies can act as a global currency. Furthermore, how digital currencies are working and listed from professional journals books, academic sources. Finally, data and the view of the new technology in society are collected with the help of interviews with some experts, which included critical questions. The general conclusions are summarized at the end of this thesis.

The question of whether cryptocurrencies can be used without restriction as a means of government payment, especially in commerce, and whether they will replace traditional cash is clarified in this thesis.



## 2. Literature Review

### 2.1. What is money?

Whether cryptocurrencies are used as a means of payment, it must be clearly defined what money is.

The fact is that money determines our daily lives. Capitalism is found worldwide, and everything revolves around making money, earning money, spending money, and saving money. Economists use the term money when three properties are met when it acts as a unit of account or medium of exchange or a store of value. (Yermack. 2015)

In what different manifestations, therefore, money can occur. The first concrete form is called commodity money. It is a physical good that has an "intrinsic value," which means a utility outside of its use as money. Gold, silver, tea, or copper can be cited as examples (Boyce. 2021). Commodity money has the property of being durable, divisible, and rare. This means, in other words, the state does not have to guarantee the value, and the amount that is traded on the market regulates itself. (Boyce. 2021)

As a second manifestation, banknotes and paper money are indicated. As the name already describes it, paper money is the classical cash.

Paper money is the currency of an economy; for the acquisition of goods and services, this form of money is circulated. The production of money is carried out by the central bank or by the respective responsible ministry of finance. Thus, money and monetary policy flow can be controlled as far as possible (Barone. 2020). Here a risk arises since paper money can lose value quite fast and always closer, an exchange equilibrium is reached. Therefore, measures are taken such as introducing taxes to pay interest on government liabilities or tighten the supply of non-interest-bearing liabilities to resolve the indeterminacy and create a determined price level. (Sims. 2013)

The third form is book money or better known as fiat money. Fiat money can and is a medium of exchange; it is considered irredeemable paper money, not a commodity, production good, or consumption good (Hoope. 1994). Also known as

credit money, one grants credit to the issuer of valuable money because, in exchange for surrendering a tangible value (e.g., a commodity), one receives a certificate in the form of money. It defines a future real value. Here, digital cash plays an essential role in transfers transacted or using an ATM, credit cards, or digital purses, which is enormously essential for digital currencies. (Zerbs. 2002)

After clarifying which forms of money can occur, it must be dealt more precisely with the main functions. Money must be transportable, storable, and exchangeable. As already mentioned, money must be able to be used as a medium of exchange. In summary, a thing is sold for money and then used to buy another good. There are money units to measure the value of goods and services. From this follows that money is therefore also used as a store of value. (Camp et al. 1995)

The reasons people have for holding money in their bank accounts are explained in the following paragraphs. Keynes' general theory asserts that there is a total of three notable different motives for holding money. (Davidson. 1990)

First, the transaction motive, money is held back to meet daily personal and business needs. The precautionary motive is the second purpose and states that cash is held to make unpredictable and unexpected payments. The amount depends on the particular income, the risk appetite of the husband or wife, and the current fee levels. The third motive is the speculation motive. The individual tries to know the uncertain future better than the market itself in order to make profits. (Davidson. 1990)

The inventor of these motives, John Maynard Keynes, believed, despite the separate division from the motives of the money attitude, the sum forms the need for money, in other words, a large whole. Strict division from the motives is simply impossible; preferably, they should function as a consecutive series. (Davidson. 1990)

## **2.2. History of Bitcoin**

The first attempts at cryptography came from the unknown inventor Nakamoto. The latter published the paper "Bitcoin: A Peer-to-Peer Electronic Cash System" in 2008, in which he outlined the plan for a peer-to-peer network that would promote a "system for electronic transactions without trust" (Nakamoto. 2008).

In contrast, the concept of using a digital currency dates back to the late 1980s. The Internet provided the atmosphere to bring people together in vast online communities with comparable interests regarding a secure payment system for online transactions. Wei Dai (1998) was the first to propose the concept of a cryptocurrency at that time, which he called B-money. In this community, participants shared products and services. They need a medium of exchange to enforce contracts to collaborate effectively—a mechanism based on an invisible network of people identifiable by a digital pseudonym, similar to Bitcoin. Satoshi Nakamoto claimed in 2008 that there was a need for a purely peer-to-peer version of electronic money to bypass financial institutions. (Dumitrecu. 2017)

Today, however, many young people consider Bitcoin as a means of investing or saving money. Currently, there are over 4000 virtual currencies on the market (Conway 2021). These are clones of the well-known Bitcoin, which differ in terms of the issuing system, block time, and supply. (Dumitrecu. 2017)

### **2.2.1. Is Bitcoin a real currency?**

Whether Bitcoin can be defined as a currency is discussed in the following chapter. First of all, there is no general legal understanding of cryptocurrencies, i.e., there are no official currency rates, for example, for national currencies, which the ECB sets. They are traded on Krypto currency exchanges and barter platforms, and the exchange rate is determined solely by supply and demand (Kirillova et al. 2018). Due to the created transaction system of Bitcoin, which is composed of individual equal participants who connect via the Internet, the network is decentralized and does not require a server (Dhamija. 2018). In other words, this new technology no longer needs a national bank to set rates or regulate total volumes of currency in circulation.

Cryptocurrencies are the product of super-fast extended computing operations that have no physical existence. If cryptocurrencies should be accepted as a currency, the specifics of cryptocurrencies must be considered (Kirillova et al. 2018). The currency is theoretically a form of money (Scott. 2014). Virtual money measures value and is used as a medium of exchange and as a unit of account. (Kirillova et al. 2018)

### **2.2.2. The use of Bitcoin as a general means of payment**

Briefly mentioned in the introduction, distrust in banks reached historically low levels in January-February 2009 in the ECB and recorded an unprecedented decline in the meantime (Gros & Roth. 2009). Accordingly, the possibility of transactions where no single entity is doing authentication and authorization became attractive. (Nelms et al. 2017)

However, the advantages equal the disadvantages, more or less. Is it right to say that, one day, Bitcoin can act as a global currency in the next few years in every area from trade, the chapter will preferably prove the opposite. As has already been made clear, digital currencies, especially Bitcoins, exist all over the world. A not insignificant number of people now pay or own a Bitcoin, and several companies offer them as a payment option (Spiro & Ahn. 2016). The benefits such as faster money transfers, immunity to inflation, or lower money transfer costs are incredible and speak for Bitcoin. It is expected that there are currently about 70 million wallet users (De Best. 2021). Furthermore, there are 1 million users who transact Bitcoin per day worldwide. (Mitchell. 2020)

The fact is that Bitcoin is one of the most widely used online currencies in the world; in 2016, about 10 million people already owned a Bitcoin, and in 2017 Bitcoin already had a market capitalization of \$216,996,366,219 (Dumitreacu. 2017). However, only a maximum of 21 million Bitcoins can be produced, and there are currently 7.67 billion people living in the world (Van Alstyne. 2014). Meanwhile, in May 2023 the United States, the Circulation of dollar historically peaked at 2332.69700 Billion \$. (Currency in Circulation. 2023)

In comparison, from 2005 to 2018 alone, retail sales in the European Union were 3.04 trillion euros (Ahrens. 2020). The time and money savings are incredible. If someone needs several days for a single transfer at the bank, it takes a maximum of half an hour with Bitcoin; if someone wants to transfer 100 dollars, he/she will be charged on average about 3.37 dollars; with Bitcoin, it is about 0.061 dollars (Dumitrecu. 2017). As already mentioned, Bitcoin is virtually anonymous, and the government does not influence the global market of online digital currency. However, there is a significant risk of "dubious activities" such as money laundering, tax evasion, or illegal payments. Also, people's trust in something wholly new or fear of being scammed is enormously high. (Dumitrecu. 2017)

For Bitcoin to be legally approved as a means of payment in commerce, it must be accepted by a country's laws and an official currency unit. Neither of these requirements is met by Bitcoin, making it currently unusable for commerce (Chi 2021). Another issue is the energy consumption; in August 2018, some estimates showed that the Bitcoin system consumes 73.12 TWh, a similar amount of energy as a country like Austria consumes (Conesa. 2019). Furthermore, it shows that the non-intervention of the state makes the currency rate completely unpredictable. For example, during 2017, the price rose from less than \$1000 to more than \$19,000 and fell back to \$8000 in 2018 (Baur & Dipfl. 2021). In other words, the Bitcoin market, which the buyer and seller control, is considered highly speculative and more like a delicate investment rather than a currency (Baek & Elbeck. 2014).

## **2.3. How does crypto currencies are working?**

### **2.3.1. What is a Blockchain**

After its early 2009 inception, Bitcoin led a rather clandestine existence for almost five years. Beginning in 2014, a bigger audience started to get interested in the Bitcoin cryptocurrency and the underlying “Blockchain” technology that is used to securely record Bitcoin transactions. (Meunier. 2018)

Blockchain is a distributed ledger technology that eliminates the need for middlemen like banks or governments and enables safe and transparent transaction record-keeping. Satoshi Nakamoto initially discussed blockchain in a whitepaper titled "Bitcoin: A Peer-to-Peer Electronic Cash System," published in 2008. (Nakamoto. 2008)

According to Swan (2015), blockchain is a decentralized, immutable, and transparent ledger that keeps track of transactions securely and consensually. A network of users verifies each transaction, and after it has been approved, it is added to a block. A blockchain, also known as an immutable chain of blocks, comprises individual cryptographic hashes that connect each block to the one before it.

Immutability, or the inability to change or remove a block after it has been put into the blockchain, is one of the main characteristics of blockchain technology. As a result, all transactions that are recorded on the blockchain are secure and unchangeable (Swan. 2015)

The decentralization of blockchain is another key characteristic. Blockchain is run by a network of users who jointly validate and verify transactions, unlike traditional centralized systems where a single person controls the data. In addition to ensuring that there is no single point of failure, this increases the resistance of blockchain to attacks. (Böhme et al., 2015)

From finance to healthcare, blockchain technology has the potential to upend several sectors. Blockchain technology can potentially improve the efficiency and transparency of the transaction settlement process in the financial sector.

Additionally, it can be used to develop new financial services and goods, such as cryptocurrencies and smart contracts. (Swan. 2015)

Blockchain technology can also be used in the healthcare sector to safely store and distribute medical data, protecting the privacy and security of patients. Additionally, it can be used to monitor the pharmaceutical industry's supply chain, lowering the possibility of illicit drugs reaching the market. (Dmitry. 2023)

The blockchain technology does, however, present some difficulties. Scalability is one of the key difficulties. Processing these transactions may become time-consuming and expensive as blockchain gains popularity and more transactions are uploaded to the network. (Geroni. 2021)

The regulation presents another difficulty. As a decentralized technology, blockchain can be challenging for governments to regulate adequately. This may result in a lack of clarity in the law and regulations, preventing some industries from adopting blockchain technology. (McQuinn & Castro. 2019)

### **2.3.2. Where can we get Bitcoins?**

However, a maximum of 21 million Bitcoins can only be created, and there are presently 7.67 billion individuals on the planet, as was already explained in the section "The use of Bitcoin as a general means of payment" 2014's (Van Alstyne. 2014). Around \$7.6 billion was the overall worth of the Bitcoin system by the middle of 2014, which is ten times more than the value of all other cryptocurrencies combined. With today's cutting-edge technology and accessible mining services, mining, which is the process of synchronizing transactions over a network of computers, can be profitable. (Bhaskar & Chuen. 2015)

Mining requires powerful computer hardware, such as specialized application-specific integrated circuit machines or graphics processing units, to solve these challenging mathematical problems. The first computer to solve the cryptographic task wins a reward in the form of newly minted Bitcoins. (Nakamoto. 2008)

The mining process enables the creation of new Bitcoins and the validation of transactions without the need for a central authority, which is critical to the

functioning of the Bitcoin network. Bitcoin eliminates the need for traditional financial institutions by decentralizing the transaction validation process, enabling secure and private transactions (Vigna & Casey. 2015).

It is a fact that mining consumes much energy, so concerns about the impact on the environment are quite high (Gonzalez. 2022). The need for more powerful computer hardware is increasing, which consumes more energy as mathematical problems become more challenging (Hileman & Rauchs. 2017). According to a report of Oscar Gonzalez Bitcoin mining uses around as much energy as Argentina. (Gonzalez. 2022)

Apart from environmental concerns, there are legitimate concerns about mining energy consolidation. Large mining pools have developed due to increasing competition in mining and now control the industry. As a result, there is increasing concern about the concentration of power and the potential manipulation of the Bitcoin network. (Reijers & Coeckelbergh. 2017)

### **2.3.3. How can we pay with crypto wallets on the example Bitcoin?**

Vigna and Casey (2015) state that various procedures involve making a Bitcoin payment. The user must first choose a wallet provider and register for an account before generating a Bitcoin wallet. Public and private keys for transmitting and receiving cryptocurrencies are stored in cryptocurrency wallet software. Private keys are used to sign transactions to transmit bitcoins, whereas public keys are used to receive them. (Kshetri. 2018)

The wallet must then be funded by making purchases with or receiving Bitcoins. Finally, by scanning a QR code or inputting the recipient's Bitcoin address, users can utilize the wallet to send money. (Vigna & Casey. 2015)

Benefits include the security and confidentiality of transactions. Bitcoin transactions are secured by cryptography, making them difficult to hack into or change. The public ledger where transactions are recorded also ensures accountability and transparency while safeguarding user privacy (Nakamoto. 2008). Nevertheless, there are drawbacks to using Bitcoin as payment. The necessity for broad acceptability is one of the major obstacles (Joshi. 2021). Although some companies



have begun to accept Bitcoin as a form of payment, its utility for customers is still limited because of the requirement for widespread acceptance. (Brooke. 2023)

The erratic nature of Bitcoin presents another difficulty. Bitcoin is an unreliable store of value because of its well-known price volatility. This implies that before a user makes a payment, the value of their Bitcoin in their wallet may decline noticeably, incurring a loss. (Vigna & Casey. 2015)

Additionally, there are worries about the security of Bitcoin wallets. Cryptography protects Bitcoin transactions, but wallets are susceptible to hacking and other security flaws. Users must take additional security measures, such as employing two-factor authentication and strong passwords, to safeguard the security of their wallets. (Eyal & Sirer. 2014)

## **2.4. Global Acceptance of Bitcoin**

### **2.4.1. Current state of global acceptance**

According to Halaburda, H. and Fung, B., (2014) digital currencies are transferable among users. They have the potential to gain acceptance as a standard method of payment outside of the platform.

Different nations and jurisdictions have quite different laws governing Bitcoin. Several nations have restricted its usage, while others have outright forbidden it (Böhme et al. 2015). Despite acceptance rates continuously rising in recent years, Bitcoin is still not widely used as a form of payment. Around 100 million cryptocurrency users are expected worldwide in 2020, according to a study by the Cambridge Centre for Alternative Finance. (Cambridge Centre for Alternative Finance. 2021)

About 36% of small and medium-sized enterprises in the US accept Bitcoin as a form of payment, according to a different HSB survey (HSB. 2021). As a result, many big online retailers, including Microsoft, Shopify, and Ralph, now accept Bitcoin as a form of payment (Brown. 2023). For instance, the Internal Revenue Service (IRS) in the United States has designated Bitcoin as property for taxation purposes (Yermack. 2015).

Because the Japanese government accepted Bitcoin as legal cash in 2017 (Pauline. 2023). Japan is one of the most Bitcoin-friendly nations in the world. As a result, Japan is becoming a hub for Bitcoin-related commerce, and there are constantly more businesses that accept Bitcoin payments. Many in the cryptocurrency community view the adoption of Bitcoin in Japan as a positive development, as it has contributed to establishing Bitcoin as a respectable substitute for fiat money. (Pauline. 2023)

Australia is another illustration of a nation that is largely accepting of bitcoin. Australian businesses will now find it simpler and less expensive to accept Bitcoin payments thanks to the Australian government's announcement in 2017 to do away with double taxation of Bitcoin transactions. (Young. 2017)

Nevertheless, due to worries about fraud and financial stability, China has outlawed the use of Bitcoin for financial transactions (Böhme et al. 2015). Similar to other countries, India has adopted a strict policy on cryptocurrencies. Based on the various critical statements made by the Governor of the Reserve Bank of India and various government spokespersons, may assume that cryptocurrencies are illegal. Regardless, there is also no specific ban in India. Because of this, the spread of Bitcoin in these nations has been severely constrained. (Jain. 2023)

In the US, the legal status of Bitcoin is unclear. There is no federal restriction on the use of Bitcoin as a form of payment, despite the fact that the IRS has classed it as property for tax reasons (Böhme et al. 2015). However, according to an HSB study, 36% of small and medium-sized enterprises in the US accept Bitcoin as a means of payment (HSB. 2021). Additionally, a number of big online retailers, like Microsoft, Shopify, and Ralph, now accept Bitcoin as a form of payment. (Brown. 2023)

Furthermore, last, in Europe, there are significant regional differences in how legal Bitcoin is in each nation. Switzerland and Malta are two nations that are generally open to cryptocurrencies. (Narain & Moretti 2022; Attlee. 2022)

#### **2.4.2. Factors affecting global acceptance**

Various factors significantly influence the global acceptance of Bitcoin, including regulatory frameworks, technological advancements, and user trust and awareness. (Sagheer et al. 2022)

A noteworthy factor impeding the widespread acceptance of Bitcoin is technological restrictions. Although Bitcoin is frequently referred to as a quick and effective payment mechanism, it has some technical difficulties. For instance, an organization like a bank cannot guarantee the finality of Bitcoin transactions. While some may see this as an advantage, it may only be vital to some end users. In other words, there may be little demand for this distinction. The complexity is a disadvantage in that using the system requires unconditional trust in the knowledge of unknown persons. (Dwyer. 2015)

Regarding Bitcoin's widespread acceptability, structural obstacles are also persuasive. The current financial system in many nations is not designed to facilitate the mass adoption of Bitcoin. For instance, restricted internet or mobile device connection may be necessary to utilize Bitcoin in areas where cash is still the primary payment method (Böhme et al. 2015). It is difficult for businesses and consumers to use cryptocurrencies conveniently since they lack interoperability between them and conventional payment methods. (Kshetri. 2018)

Additionally, environmental concerns are increasingly touching. Bitcoin mining uses much energy, which raises questions about how it may affect the environment (Rose. 2015). Businesses and customers may search for more sustainable alternative payment systems as environmental concerns gain importance.

As well as the problems with security and the need for increased confidence have a big impact on how well-accepted Bitcoin is. Due to the irreversible nature of Bitcoin transactions, they are a popular target for fraudsters and cybercriminals, which can harm the standing of virtual currencies. In addition, consumers have no protection in the event of fraud or the loss of private keys, which makes Bitcoin a riskier investment than conventional payment systems. (Huynh et al. 2020)

Also, geopolitical issues are playing an enormous role in implementing cryptocurrency. For instance, capital controls and limits on foreign currency can hinder the uptake of Bitcoin in some nations. According to Chiu et al. (2019), nations with high creativity and openness to new technologies are more likely to accept Bitcoin.

The adoption of innovation, trust, and risk-taking varies between cultures. For instance, lacking familiarity or comprehension of digital currencies may lead to greater skepticism in some societies. Others, however, might be more open to utilizing them for diverse purposes. (Narayanan et al. 2016)

Social impact is one of the most crucial considerations for embracing cryptocurrencies, given that people still regularly deal with one another using cash (Walton & Johnston. 2018). The claim that one of the elements that can contribute to the development of digital currency is the network's enormous influence because

online and social interaction is always growing. According to Venkatesh et al. (2003), social impact is the extent to which a person perceives that important others think they should utilize the new system.

### **2.4.3. Future outlook for global acceptance**

The author William J. Luther described 2015 the future of Bitcoin in the following words "I expect the share of electronic transactions will continue to increase; blockchain technology will be widely adopted to process these digital payments; bitcoin and other cryptocurrencies, to the extent that they survive at all, will likely function exclusively as niche monies; and bitcoin or some other cryptocurrency might function as more than niche money in countries with especially weak currencies, even though these countries would seem to pose the greatest regulatory risk to bitcoin." (Luther. 2015)

For Bitcoin to gain more global recognition, regulatory certainty is crucial. Businesses and consumers will feel more legally secure utilizing digital currencies as more nations create regulatory frameworks (Adrian et al. 2023). Businesses can feel more secure in the legitimacy of Bitcoin and other digital currencies with clear regulatory restrictions. In the long run, people will have more faith in cryptocurrency technology and its usability if Bitcoin remains stable in the future and is widely acknowledged globally. (Sahoo. 2017)

Future cryptocurrency acceptance depends on raising public awareness of the technology underlying Bitcoin and the advantages of cryptocurrencies. More people may adopt Bitcoin as they become more aware of its functions and benefits over more conventional payment methods. Public interest in digital currencies has surged due to the rising popularity of Bitcoin and other cryptocurrencies. (Chen et al. 2019)

The use of Bitcoin as a haven asset may grow due to the uncertain global economic climate. Many investors are anxious about protecting their investments due to the COVID-19 pandemic's broad economic disruption, which has prompted them to look into alternative investment opportunities like Bitcoin. More consumers may turn to digital currencies like Bitcoin due to the increasing economic unpredictability seen

globally. (Yang & Tian. 2021) Nevertheless, as long as the market is yet to mature, it is probably not worth considering Bitcoin as a haven. (Smales. 2018)

Furthermore, technological advancements and people's openness to Bitcoin, government, and financial power intervention by enacting regulations around cryptocurrencies, and external events closely related to the Bitcoin community will impact the future of Bitcoin circulation and price. (Mirzayi & Mehrzad. 2017)

Future acceptance of Bitcoin needs to be improved by environmental issues and energy usage associated with Bitcoin mining. Anyway, there are several projects which are seeking to reduce Bitcoin's environmental impact (Cho. 2021). Businesses and customers may favor more environmentally friendly payment solutions as environmental awareness rises worldwide.

## **2.5. Commerce Acceptance of Bitcoin**

### **2.5.1. Current state of commerce acceptance**

Initially, cryptocurrency's need and use were mostly avoided, but over the years and now, they have become accepted. Especially Bitcoin is accepted worldwide by a wide variety of companies and, in some countries, even counted as a legal means of payment. (Nagir. 2023)

Nowadays, there are 15.174 businesses in total worldwide accepting Bitcoin. Besides that, 2300 of them are located in the USA. Gambling, tourism, banking, food, and retail are among the top 5 uses of Bitcoin, and the U.S. currently (as of 2022) has 36,659 active Bitcoin ATMs. The 28% 2020 percentage of all U.S. small businesses accepting cryptocurrency payments shows a clear upward trend, reaching 260,000 Bitcoin transactions daily in the U.S. as of May 2022. That the implementation of Bitcoin in retail could work is shown by the fact that up to 40% of customers who pay for goods and services with Bitcoin are new customers who spend twice as much money as credit card users. To get a better overview of the daily payment with Bitcoin, more than \$1 million is spent daily on goods and services with Bitcoin. (Tuwiner. 2023)

### **2.5.2. Examples of businesses accepting Bitcoin**

In this chapter, a few successful companies that accept Bitcoin payments are listed and discussed in more detail.

In 2014, the multi-national technology company Microsoft started accepting Bitcoin as a payment option for its digital content offerings, such as Xbox games and mobile applications. The business partnered with BitPay, a well-known Bitcoin payment processor. (Qrius. 2023)

Through a collaboration with CoinPayments, Shopify, a well-known e-commerce platform, has integrated cryptocurrency payments. Due to the integration, businesses may now take more than 1,800 cryptocurrencies in exchange for goods and services, which lowers transaction costs and gives customers more payment options. (Chen et al. 2021)

In 2014, Overstock.com, a US-based online store, became one of the first significant merchants to accept Bitcoin as payment. The company integrated Coinbase, a well-known cryptocurrency trading platform. (Song & Park. 2019)

Expedia, a website for making travel arrangements, declared in 2014 that it would begin taking Bitcoin as a payment method for hotel reservations. In order to enable Bitcoin payments, the business teamed up with Coinbase; afterward, support for additional cryptocurrencies, including Litecoin and Ethereum, was added. (Srivastava & Thakur. 2021)

Users of the U.S. and the U.K. now use PayPal to immediately purchase Bitcoin and three other cryptocurrencies, which they can store in their digital wallets. Users of PayPal in the U.S. can now use Bitcoin to make purchases. The other three accepted cryptocurrencies are Litecoin (LTC), Ethereum (ETH), and Bitcoin Cash (BCH). The "Checkout with Crypto" feature is utilized during the payment procedure. The appropriate coin is converted into U.S. dollars if the online retailer accepts cryptocurrencies. (Nagir. 2023)

Also, Lieferando, a food delivery service, has been accepting Bitcoin since 2017. (Nagir. 2023)

Lastly, AMC is a U.S. cinema chain. AMC started accepting Bitcoin (BTC), Bitcoin Cash (BTH), Ethereum (ETH), and Litecoin (LTC) for movie tickets in late 2021. (Nagir. 2023)

## **2.6. Population Acceptance of Bitcoin**

### **2.6.1. Current state of population acceptance**

According to Triple-A, a licensed cryptocurrency payment gateway, there will be over 420 million cryptocurrency users worldwide by 2023, with a global average ownership percentage of 4.2%. 72% of Bitcoin owners are under the age of 34, 63% of them are men, and 37% of them are women. The cryptocurrency market is expected to expand at a compound annual growth rate of 56.4% in 2021, with Bitcoin experiencing a 60% compound annual growth rate in that year. (Triple A. 2023)



## **3. Methodology**

### **3.1. Research Design**

In order to come to an efficient conclusion, a qualitative research approach is conducted for this thesis; qualitative research seeks to explore individual experiences and should not be seen as an alternative to quantitative research but complementary due to differences in principles and practices (Nicholls. 2008). The necessary data for this thesis is gathered from interviews along with the qualitative research approach, which entails gathering data through interviews, focus groups, observations, and open-ended questions in questionnaires. (Chabra et al. 2018)

### **3.2. Data collection**

The information was obtained through expert interviews with a clear structure. This non-traditional interview method, in which the interviewer conducts the conversation with the respondents based on a prepared list of open-ended questions, was selected because it can cover a variety of topics that are determined by the purpose of the investigation rather than by the interviewee's responses and because it can be used to collect specific, individualized information.

The information relevant to the study emerged from the working hypotheses. The hypothesis H0 is that Bitcoin can be used as an official means of payment in commerce, and the counter hypothesis H1 is that Bitcoin cannot be used as an official means of payment in commerce.

### **3.3. Selection of interview partners**

The number of planned interviews was restricted to four to collect enough data to address the research question on the one hand, but on the other hand, to make the execution and analysis of the interviews manageable within the constraints of a Bachelor's thesis. The interview participants should be well-versed in crypto to offer a reliable opinion or response. So, I chose two older interviewees and two who were younger. The two elder ones, though, deal with cryptocurrency publicly and privately daily. One of the other two is employed by a large corporation as a crypto consultant, while the other is a staff member of an Austrian research facility.

All who were approached instantly consented to an interview under the condition that their information and statements would be kept private. The German Federal Data Protection Act states that individuals' authorization is required before personal information or data about them may be published by scientists. All personal information that does not specifically identify a person but, when combined with other information, enables the identification of that person is likewise covered by this law. (Gläser & Laudel. 2010)

### **3.4. Conducting the interviews**

All interviews were conducted between 28.04.2023 and 12.05.2023 in private or outside the working hours of the respondents via teams. The interviewees were informed about the topic and the title of the bachelor thesis, and it was explained to them that it should be found out the personal opinion and estimate to the topic cryptocurrencies as means of payment on the example Bitcoin by the interview. How can the current and future situation be assessed, and what experiences have they had made in the environment with it? It was pointed out that neither employer nor name would be mentioned by name. Consent for the digital recording of the conversation utilizing an iPhone was obtained. The reasons for the interview or the thesis were explained to them at the beginning.

### **3.5. Transcription of the interviews**

Transcription was done by using the Word dictation software. All interviews were transcribed completely and verbatim. The interviewing person was designated by "I." the interviewed persons by "E1" to "E4", where by the numbers resulted from the order of the interviews. The transcribed interviews can be read chronologically in the appendix.

### **3.6. Evaluation**

The goal of the evaluation is to test the hypothesis based on collected data from the interviews.

In this thesis, ten questions were created for the interviews, and structure the evaluation accordingly. Each question, which resulted from the structure of the work, was answered by the expert personally, which is now analyzed comparatively. These questions are now analyzed comparatively, regardless of whether a younger or older expert answered them.

### **3.6.1. The interview questions**

- Question 1** Can you briefly explain the basics of blockchain technology and what it has to do with digital currencies?
- Question 2** Can you provide examples of successful implementations of blockchain technology for payment processing in commerce or other industries?
- Question 3** How has global interest/trust in blockchain-based cryptocurrencies, including Bitcoin, evolved over time, and what factors have contributed to this evolution?
- Question 4** What are the potential barriers to widespread adoption of Bitcoin and other digital currencies as an everyday means of payment, and how might these barriers be overcome?
- Question 5** What indicators play an important role in the decision of companies or governments whether digital currencies should/could be approved as official means of payment?
- Question 6** Does people's ignorance affect the acceptance and usability of blockchain technology and cryptocurrencies?
- Question 7** Do you think that major currencies such as the euro or dollar can eventually be replaced by a cryptocurrency?
- Question 8** Will banks be replaced by blockchain technology and consider cryptocurrencies (e.g. Bitcoin) as an official means of payment?
- Question 9** Would you welcome a society where digital currencies are allowed as official means of payment?
- Question 10** What potential future developments or innovations in blockchain technology could have a significant impact on the use of digital currencies as an everyday means of payment?

## **4. Presentation and discussion of the results of the study**

The results of the interviews are summarized in the following chapter, subdivided into headlines.

### **4.1. The basics of blockchain technology and the connection with digital currencies**

The general understanding of the experts regarding blockchain is that blockchain technologies are distributed databases where you cannot alter rules because they have been established in advance and works permissionless in the case of Bitcoin. Also, Blockchain technology existed prior to Bitcoin, but Bitcoin popularised it. Furthermore, a blockchain peer-to-peer database allows anonymous payments from point A to point B. A general fact is Bitcoin shows as the first use case that it could be used as a means of payment.

### **4.2. Examples of successful implementations of blockchain technology for payment processing in commerce**

Two of the experts first clearly mentioned Bitcoin as a successful implementation for payments but then gave examples such as Strike, a payment solution that offers low-cost payments via the Bitcoin lightning network through its app or Bitcoin replicas such as Bitcoin cash and Litecoin, but which were never that successful in daily payments. However, stablecoins were also mentioned, which have not been discussed in more detail in this paper. According to the experts, they could be used for payments and trading, and traditional players also use these public stablecoins.

### **4.3. The evolution of global interest and trust in blockchain-based cryptocurrencies, including Bitcoin and influential factors**

The two older experts pointed out the tremendous growth and change Bitcoin has made over the years. One expert pointed out that Bitcoin is seen as the dominant form of blockchain when someone uses the entire stack as a decentralized protocol for Bitcoin funds. One of the younger ones took a more critical view of the trust in cryptocurrency worldwide, comparing the regulations to the wild west and

defining Bitcoin as pure speculation. The other younger expert emphasized security and transparency and stressed the existing trust in cryptocurrency given by wallets. It clearly shows that opinions differ on the question of trust.

#### **4.4. Potential barriers for Bitcoin adoption and other digital currencies as an everyday means of payment**

All four experts named different barriers to the widespread adoption of Bitcoin and other digital currencies as an everyday means of payment. These range from speed, costs, and scalability to the lack of payment infrastructure. Also, as mentioned in the paper, vitality plays a major role along with ethical and political issues. Cryptocurrency as a means of payment requires that everyone has a mobile device or something equivalent to pay with it or political issues such as who can pay with what means that come along with digital and financial literacy. All experts agree that many major barriers exist to adopting cryptocurrencies.

#### **4.5. Indicators which play an important role in the decision of companies or governments whether digital currencies should or could be approved as official means of payment**

Economic and technological risks were mentioned as essential, and in the first place. Every country in Europe needs its crypto regulations. Mika, the new crypto regulations have some regulatory requirements, especially for governments or institutions and financial institutions, for example, to use cryptocurrencies or tokenized forms of money. Further, down the line, one expert advocated for scale and inflation risk as important indicators, giving Bitcoin, Ethereum, and perhaps Ripple as working adequate examples. Once again, scalability was also an indicator of blockchain technology itself. For example, the Solana blockchain has a scalability problem, and some blockchains do not get anywhere because they cannot perform transactions. Another expert also mentioned the protocol layer, whether we want to have a decentralized and distributed architecture and want a digital euro network layer, which again raises the question of who is a stakeholder in that system. With a centralized system, the European Central Bank has to turn on and off, but again in a distributed way. That should be one of the selected permissions.

#### **4.6. People's ignorance may affect the acceptance and usability of blockchain technology and cryptocurrencies**

Three out of four experts answered question six with a clear yes. Nevertheless, one must share different views; for example, one expert mentioned that one should consider the technology side when discussing the business side. However, businesspeople will not ask how the cloud works or this AI model works; they are interested in the results. The next one added the given progress that a change is happening, and we see excellent apps comparable to banking apps, making it simpler to purchase cryptocurrencies than four or five years ago. The reality of widespread adoption was raised again, and the difficulty of fulfilling this came up again. One of the younger experts said he would not confirm that people are generally ignorant about technology, but some still have bad feelings about it and need to trust it.

#### **4.7. Major currencies such as the euro or dollar can eventually be replaced by a cryptocurrency**

Half of the experts can imagine a replacement of a major currencies by a cryptocurrency. One expert was convinced that if any cryptocurrency would replace a fiat currency, it would be Bitcoin, but doesn't believe that this will occur because there will still be nations, national economies, and currencies that are a part of these national economies. Another said he knew of some examples of countries with a Bitcoin-based payment processing system and could see it happening. From the other two, one took the example of the U.S. dollar, an important part of the government's confidence and power, because the U.S. dollar is a leading currency and will not be replaced. The last one said, at least at this point, it is not a scalable enough payment solution to be used as a central bank's money and described Bitcoin as a kind of digital gold or a store of value, but of course, that value is finite.

#### **4.8. Banks being replaced by blockchain technology and considering cryptocurrencies as an official means of payment**

The experts have varying views on the future of banks and their role in the financial landscape. Some argue that there will still be a need for banks due to their centralization and status as trusted entities. However, the rise of peer-to-peer

payments and decentralized finance (DeFi) may alter their role as payment processors. Many banks are already exploring ways to integrate DeFi concepts into their operations. While banks may not be entirely replaced, their services could evolve. If governments implement digital currencies, such as central bank digital currencies (CBDCs), banks may lose some influence. Banks are currently crucial for the infrastructure of capital markets and modern payment systems, but blockchain technology introduces new possibilities. The debate centers around whether monetary sovereignty should remain a public good or be shared with other entities. The future rules may change for banks, potentially allowing them to offer cryptocurrency-related services and enter the crypto market. However, specific regulations and recognized forms of payment with cryptocurrencies remain uncertain at present.

#### **4.9. A new society where digital currencies are allowed as official means of payment**

Regarding accepting cryptocurrency, experts hold different opinions on digital currencies. One perspective sees digital currencies, like Bitcoin, as relevant mainly for restricted communities or troubled nations seeking anonymous payments outside the regulated world. They believe that for the majority of people, it may not be a practical choice. Another view supports adopting digital currencies as an essential change for the future, especially with countries like China launching digital currencies that could pressure other nations to adopt them for international transactions. However, this perspective also acknowledges the volatility of cryptocurrencies like Bitcoin and expresses concerns about using them for everyday payments due to price fluctuations.



#### **4.10. Potential future developments or innovations in blockchain technology and their possible significant impact on the use of digital currencies as an everyday means of payment**

One perspective of an expert emphasizes the importance of user convenience, security, trust, and global adoption to bring clear value to the masses, focusing on usability, trust, and legal frameworks. Another view highlights that the technology itself is already quite advanced, but faster devices and hardware blockchain development is needed for enhanced usability. The need for a "blockchain killer application" or a browsing moment for the internet is discussed, with an emphasis on machine-to-machine payments and automatic payment processes. Additionally, the potential of zero-knowledge proofs for scalability is recognized, but their full development and stability are still required, as well as the improvement of bridge solutions for inter-blockchain communication.

## 5. Conclusion

Bitcoin is a term and an invention that has fascinated and occupied the world from 2008 until today. Money, no matter which form, influences us, humans, since the beginning of time. The first chapter of this Bachelor thesis shows how quickly and prematurely the term money is used in our society. The motives for holding money are also explained. The transaction motive to hold back money to cover needs of all kinds and the speculation motive, where people try to know the uncertain future better than the market itself by holding money to be profitable, prove that the question of this Bachelor thesis is entirely justified.

The next chapter gives insight into the history of Bitcoin. It is first mentioned that in 2008, Nakamoto thought that a peer-to-peer system would be helpful and relevant later on. Even the aspect came up that Bitcoin should be seen as an investment rather than as a currency.

One chapter explores the question of whether Bitcoin can be seen as a currency. A system that would relieve the ECB of all its activities and has no official rate may not be called a general currency. Furthermore, another chapter clarifies the complexity and functions behind cryptocurrency to understand the topic of cryptocurrencies better.

In the following three chapters, the global, business, and societal acceptance of cryptocurrencies is addressed with the conclusion that more and more people own cryptocurrencies but, there is still a long way to go to become an official worldwide currency.

The question of whether digital currencies can be used as a general means of payment in trade can be answered with a simple "no" according to the gathered data through the interviews and from the journals, books, and academic sources. The qualitative data also has been shown that the hypothesis H0: Bitcoin can be used as an official means of payment in commerce can be rejected and accept H1: Bitcoin cannot be used as an official means of payment in commerce. Due to several technical, political, environmental reasons a general use of cryptocurrency in commerce is impossible for now.

Briefly mentioned in the introduction, there are many advantages for its use, a means of payment that preserves anonymity in times of data protection. Fast money transfers, low money transfer costs are aspects of a general means of payment. As Baek and M. Elbeck have already been quoted, Bitcoin can only be described as highly speculative despite its popularity and reach. In other words, it can only be described as an investment. In summary, the use of a global currency with unpredictable rates proves impossible, especially in commerce.

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## 7. Appendices

### 7.1. Appendix 1

*Interview 1*

*Time: 27:40*

*Date: 28.04.2023*

*Participant: Employee/Consultant in a bank specialized on Crypto& Blockchain*

I: I would suggest we can start directly to start with questions the title of a thesis is hopefully not too boring for you but it sounds like it's the title is can digital currency serve as an everyday means of payment and be implemented in commerce and among the population worldwide using bitcoins as an example. A broad topic I know but I'm the same as the questions really general not too specific especially about Bitcoin, but I will start with the first question can you briefly explain the basics of blockchain technologies and what this has to do with digital currencies really short in your words how you would describe blockchain technologies and why is it useful digital currencies

E1: So how I understand blockchain is basically as two major this centralized database that you cannot change the rules are set up in advance there's something that's not that's not possible and on the future what what's also the proposition of Ethereum for example so network that is running also completely decentralized and you can build applications on this so this is how I would describe blockchain and when it comes to Bitcoin. Bitcoin was the first currency that solved this so blockchain was there blockchain technology was there already before Bitcoin but Bitcoin popularized it because digital currencies were also something that people were thinking about, but they couldn't solve this double spending problem and blockchain was the first technology that could help Bitcoin and digital currencies solve this and in this respect yeah I mean you know Bitcoin is or should I continue

**I:** No it sounds perfect sounds perfect this is what I want to hear because my first chapter is about blockchain and why it's important and all this stuff and as you know as the interviewer you just need or you just want to have to prove that the expert sees the same way so all goes perfect thanks then the second question Can you provide some examples of successful implementations of blockchain technologies for payment processing in commerce or other industries.

**E1:** For payment processing so the first thing that comes to my mind are then obviously the stable coins here you have the implementations or you have all these big stable coins so you just better you have USC you have binance USD and they are used mostly for crypto trading and holding and defi so this is I would say one aspect then there's some kind of middle aspect where also the traditional players are using this public stable coins and you have the example of MoneyGram processing USD for donations in Ukraine together with the UN HCR this is a united nation agent agency for refugees by the way RBI was also invited to participate there but we couldn't convince our retail colleagues and then you have the other part where you have these traditional financial institutions that are issuing their own stable coin and here for example you have JP Morgan coin and they are already using their internal stable coin for intragroup liquidity management then you have KBC they are also using this but mostly using their own stable coin but mostly for some kind of loyalty solutions and then you have for example substitutional last week issued a stable coin and they plan to use it for for different use cases among others also the settlement of securities and wholesale payments OK so this is how I would describe this OK

**I:** OK perfect wonderful then let's go to the next question how global interest or trust in blockchain has based cryptocurrencies including Bitcoin evolved over time and what factors have contributed to this evolution

**E1:** I think that I mean crypto started from a very noble with a very noble idea but then of course there were a lot of people that saw that potential that they can earn a lot of money with this so it became a super speculative yeah space there still are some good projects but I would still say that it's 95% of everything is pure speculation for now what are the factors the factors are yeah definitely this rogue participants FDX data Luna Celsius not just decentralized but not just in the decentralized space but also in the centralized space so then you also have the regulation probably is one

of the factors I do believe that we need more regulation because this crypto space is still a Wild West but I think that's it this also has to be balanced with the innovation

I: Yeah, about the implementation we come later a little bit closer to the detail but absolutely agree OK perfect thank you next question is what are the potential barriers to widespread adoption of currency of cryptocurrencies and other I mean especially Bitcoin or other digital currencies as an everyday means of payment and how might these barriers be overcome

**E1:** One is definitely the volatility I wouldn't pay with the Super volatile asset the second one is then also how you perceive these cryptocurrencies what they actually are so if you perceive them as an investment instrument then you probably wouldn't spend them for payment and currently at least my opinion is also that Bitcoin falls into this category so I wouldn't pay with Bitcoin because I see it as an investment I don't see it as a means of payment maybe in some countries this is different but for me here in Europe yeah I see it more as an investment so volatility and what did I say to the second one and to see it as an investment instrument or not

I: OK perfect so you don't think so it can be used as a public payment I mean of payment you don't see it as a public mean of payment

**E1:** I do see I do see stable coins as the means of payment because they're stable, but I don't see Bitcoin and company

I: OK yeah thanks I hope it's not too similar the question but also next question I am a tech a lot of topics and what are the indicators what is important and when you when you want to implement the new currency in the system or in an economic system so I also have a question regarding what indicators play an important role for the decision of companies or governments where they go digital currencies approved as a means of official mean of payment you know so when you want to implement this crypto currency what are the indicators well and when they do they check the blockchain or what they are what do they to know OK this is a secure we can trust on this system so I assume you and when you have this opinion you don't have such a clear answer about it which indicators are important for you or what you think which indicators they have?

**E1:** I mean give you a short answer I think it's really you have the technological risks that you have to take care of you have the economic risks so for technological risk for example if a fork happens what do you do then for economical risk there is so much market manipulation and yeah if the price of the stable coin drops for 30% in a day what will you tell your clients you know and also you have the regulatory risk and for example we as a bank we cannot I mean we could hold cryptocurrencies on our balance sheet but we're paying a lot for this according to this Basel rules because you have to have enough capital and for to hold the cryptocurrencies and this capital requirements for cryptocurrency holdings are extreme and it it doesn't even pay off to hold it on the balance sheet so just to give you yeah

**I:** I also have the same opinion yeah so, I mean I'm in general I'm also I'm totally convinced that it's not a good idea to do it but anyway it's the topic and I'm happy to finish it as far as I can but thanks OK then let's go to the next question does people ignore and affect the acceptance and usability of blockchain technologies and cryptocurrencies

**E1:** Can you repeat the question

**I:** Does people's ignorance affect the acceptance of usability of blockchain technologies and cryptocurrencies but not only focused on cryptocurrencies also in general blockchain technologies that when you want to implement blockchain technologies in the near future has it the ignorance of the people has an effect on it or not in your opinion

**E1:** Basically we're question us should we or does the fact that people don't know blockchain affect the implementation hmm yes my answer would be yes and we've done here a lot in the Raiffeisen for example in the last five years so many presentations explaining what blockchain is to the colleagues and everything but at the end of the day you know also then you come to the conclusion that maybe they don't have to know everything about blockchain technology and how it works and how it's used maybe they just don't have to know their let's say business side and we should take care of the technology side because how it is with other technologies if you're implementing a new use case you know business people won't ask how does the cloud work or how does this AI model work they are interested in the results and

if the results are good then they're happy so here yeah there's a thin line I I still haven't figured out what what's the right way

**I:** But brilliant answer yeah who answer thanks definitely OK then let's move to the next question do you think that major currencies such as the euro or the dollar can eventually be replaced by cryptocurrency but also as an example when you for example they're trying right now to put on the euro to dollar on Ethereum or something like that so do you think they once they can replace them or not I mean not especially Bitcoin but I'm another currency or something like that

**E1:** If yes then I think Bitcoin is in the best position to do so

**I:** Oh interesting

**E1:** OK but I don't think that this will happen because you will still have countries you will still have national economies and I think that currencies are also a part of this national economy so the world would have to be completely different if so that we would really have one single currency on global currency let's say I think that this is maybe possible in some countries that the currency gets replaced in practice so for example if you have Argentina Venezuela or any of these countries with super high inflation and their people would be using Bitcoin more umm but I don't think that's in the developed world this is an option

**I:** OK that welcome thanks OK then next question will banks be replaced by blockchain technologies and consider cryptocurrencies as an official means of payment or not

**E1:** No so we're talking a lot about decentralized finance but this space is currently still pure speculation there are super nice concepts they work this is pure speculation for now and a lot of banks are already observing what the guys are doing in the defi and trying to somehow integrate these concepts into their way of working and how I think this will work is banks will be some kind of entry point to defi so that consumers won't even know that we're doing something with defi and we will do something with the defi in the back end and when it comes to other currencies I don't think so I think we still need centralized players we still need trusted entities so I think that there are still a lot of space for the banks however the rules might change so it



might be that we will not if we start using it to peer to peer payments it might not be that we are the payment processor but we might be I don't know the wallet holder you know the custodian of these assets so the rules might change but I think that's yeah redevelopment since this will not replace us

**I:** OK perfect so it's the same opinion as it in the Internet and when I did my research everyone says we need the national institution we need some we need this institution clear rules that stuff but yeah perfect OK and we are also the last question would you welcome a society where digital currencies and blockchain technologies are allowed as a official means of payment I assume what is it that you're not the biggest fan of I mean

**E1:** I'm not the biggest fan but I'm just thinking from a normal user perspective and for a normal user I don't think this is super relevant because you know if we're talking about Bitcoin we're talking about I mean the idea was also to have some kind of anonymous payments outside of the regulated world because everybody's tracking us and so on but you know I think this story for zero point 1% of people but 99% of people don't really care hmm you know because they don't have super crazy lives that they would something hide or so and just looking from the user perspective from a normal user perspective I think this is possible for a for a some closed communities or for some countries even that have some problems but for the rest of the population I don't think this is an option

**I:** OK perfect I have one question and then we're finished what potential future developments or innovations in blockchain technology could have an impact significant impact on the use of currencies in the commerce or in the analogue commerce

**E1:** Could you repeat the question once again

**I:** What potential future developments or innovations in blockchain technology could have significant impact on the use of digital currencies as an everyday means of payment uh yeah sorry so boom

**E1:** Definitely the first thing is user convenience so all these things are super inconvenient right now and you have to have quite a lot of knowledge to interact with yeah beads I don't know just Bitcoin lightning or bits yeah whatever other application so I think that this has to be definitely much better here I think you also have then the developments of the wallets um you're we also have to decide whether we're going to go in the direction of mount custodial wallets or custodial wallets because at the end of the day if I would be transacting with somebody I had I €15,000 I don't think that I would keep it on my long custodial wallet I would rather put it in a the custodial wallet of a bank can have you know pay something so user convenience security trust maybe fees are also the affect her but I think it's just also global adoption of these currencies not to be seen that this is a speculation but to rather to really to see clear use cases and to bring clear value to the masses but just to the few perfect

**I:** I totally agree yeah.

## 7.2. Appendix 2

*Interview 2*

*Time: 20:00*

*Date: 04.05.2023*

*Participant: Crypto & Blockchain entrepreneur & enthusiast*

**I:** Of my thesis is can digital currency serve as an everyday means of payment and be implemented in commerce and among the population worldwide using Bitcoin as an example so this is the overall title but and I also go in detail in Bitcoin but the interview questions are not super specific about Bitcoin but in total there are 10 questions and I think every question can answer it in 234 sentences and I would say let's start directly with the first question and the and also when you have an owner opinion or something like that please express it as you wish and this this will work out OK perfect so the first question can you briefly explain the basics of blockchain technology and what it has to do with digital currencies in your opinion

**E2:** Yeah blockchain is a peer-to-peer database which enables dark payment from point A to point B this has been mentioned for the first time by Milton Friedman in his interview in 1989 but it was took ten years to realize this in a code in form of a code as a bitcoin it has to do with digital currency digital currency not necessarily is linked to peer-to-peer blockchain networks there are three different kind of digital currencies one they are based on blockchain that's what we call cryptocurrencies there is are currencies which are backed by governments that they can be digital they could be based on blockchain or not and the third type is currencies implemented or released minted by companies or yeah and then their currencies also mean that the force but it's not the currency such by blockchain project protocols of course he said yes

**I:** OK wonderful thanks and I would say definitely answered and let's continue on to next one and second question can you provide examples of successful implementations of blockchain technology for payment processing in commerce or other industries

**E2:** Of course the first successful not yet hacked blockchain has been the Bitcoin blockchain the oldest blockchain and it's underlying our currency Bitcoin as a currency although the currency here when we look at Bitcoin shifted from what was in the beginning even in the white paper Bitcoin white paper mentioned as digital cash but it turned over the years it changed its function from currency to digital gold to a store of value that's a big change that we've seen the reason is that Bitcoin itself has 10 minutes transaction time confirmation time which doesn't make it very practically in day to daily use to wait for 10 minutes for transaction to be confirmed or longer that would be but that's the first second there are other currencies Bitcoin cash for instance Litecoin which are copies of Bitcoin they tried to overcome this problem but they never really have been so successful in day-to-day payments we don't have a full-fledged successful cryptocurrency at the moment in the market for payments because the Fiat usually money works well and there is no need there's no urgent need but there is inflation and increased inflation especially in some countries which didn't treat their currencies well like Venezuela Turkey Argentina where the implementation of cryptocurrencies like Bitcoin El Salvador has it as a national currency besides the US dollar is more important so they gained more important in those countries in the euro zone in the dollar zone it's not and also in the Chinese yuan we later we go also a little bit more detail in this but definitely yeah perfect thanks

**I:** OK and then the next question how global interest and trust in blockchain has based cryptocurrencies including Bitcoin but not only Bitcoin so the overall meaning evolved over time and what factors have contributed to this evolution first it was a evolution

**E2:** Technically evolution Bitcoin itself the blockchain has been improved technically through different versions Ethereum the second largest has underwent several changes and improvements and it's it shifted from the energy consuming proof of work into low energy proof of stake version whereas Bitcoin still has the high energy efficiency problem that energy consumption problem when it's first the technically improvement is clear to be seen so that contributed but most of all people umm in the beginning it was really a nerd thing it was a compute computer scientists computer nerds they laughed blockchain cryptocurrencies later it's this changed the

people who wanted to make money faster that was in the 13,14,15 with 17/19/17 the first peak was the first Bitcoin run yeah and that brought some in 17 we had some institutional investors are showing interest in the 21 run or 2021 run there's a second round of four years later they're kind of mass adoption of cryptocurrency in general Bitcoin plus altcoins started so there people more people use people and there is a statistic in South Korea have 34% of Koreans held or hold cryptocurrencies except that of the working population that's a lot compared to Austria is 4 to 6% Germany same so the in in some countries there is more trust into these new currency systems than in others

**I:** That's perfect yeah thanks OK then of course we know all the problems and advantages but I'm of cryptocurrencies but what are the potential barriers to widespread adoption of Bitcoin or cryptocurrencies and other digital other digital currencies as an everyday means of payment how might these barriers be overcome

**E2:** Everyday payment is the hen egg problem because you cannot pay everywhere you cannot use it even if you want to and because not so many people have wallets on their phones or on the yeah phones mainly literally give him companies or whatever companies shops there cannot offer payment because they wouldn't so it's a it this evolves slowly that's the big hurdle is this hen egg who starts first who will offer payment that's the first second is that there is still a lot of skepticism and amongst the general population they it's still to be thought I thought that it's only for criminals that it's for of a fraud and they began which is partly true but not cryptocurrency through cash can be traced yeah so there is a traceability because it's a digital currency there is a record where it's cash as a means of bribing and red tapping is still cannot be followed up still however it's one of the limits why it's not implemented because the skepticism and the non-availability yet

**I:** OK perfect the next question would be a little bit similar but what indicate does play an important role in the decision of company's government digital currency should be approved but what indicators are playing important role yeah after decision of companies or governments for differences

**E2:** One indicator of course it must be a currency which a certain reputation so we are looking at the large currencies Bitcoin Ethereum maybe ripple but they have some floor with their lawsuit going on 1.4 billion lawsuit in the US so it's size it's really size it's also who founded it founders is this trust trusted people or not have their record that's important that's an indicator and of course the home whether it's open whether the minted coins can be minted which means the influence the risk of inflation is an important indicator if you can print more money then you have the same problem like the Fiat currency or if it's limited like Bitcoin then you have not this problem and there are some have limited supply some have unlimited supply that's an indicator another indicator is the blockchain technology itself how is scalability so when look at looks at technology and this scale Solana blockchain for instance they have a scaling problem these blockchains sometimes just got stuck yeah no transaction possible that's it that's the main indicator I would say yeah

**I:** OK alright thanks next question does people's ignorance affect acceptance and usability of blockchain technologies and cryptocurrencies

**E2:** Yeah they yes it does and they are still scared when it comes to money into that of a trust cryptocurrency are not trusted yet in terms of usability yes they're one of the reasons is because the lack of visibility but this change is now we see excellent apps which are compared to banking apps you can buy crypto easier than it was four years five years ago and this will improve and plus banks will integrate like the Raiffeisen bank Niederösterreich has cooperation with bit panda, recently announced so these kind of corporations they help

**I:** OK perfect OK and do you think the major currencies such as the euro or dollar can eventually be replaced by cryptocurrency one day not especially bitcoin

**E2:** No not in not even in the long run we will always have a euro we'll have a U.S. dollar because governments it's an important part of governments confidence and power like the US dollar is a leading currency if you if there is no near if a product it could happen when a blockchain protocol could become strong in in in certain way that we could see that but I don't OK

**I:** OK I think it's obvious but OK thanks will banks be replaced by blockchain technology and consider cryptocurrencies as official payments from the side of the bank not from the side of the society from the side of young banks

**E2:** Yes banks could be replaced when it comes to not fully replaced but they changed their there will be a large chain important change to what services they can offer in future at the moment but when for instance digital currency by government which implemented the government itself produces the produces mints the money you don't have to have it minted by banks anymore created through credit line and it it's it goes back to the national banks the central banks and central banks sorry so the central banks so the banks could lose power because central banks take back this responsibility of creating new money yeah that's definitely the case

**I:** OK perfect and one more question would you welcome a society where digital currencies are allowed as official payment or not it's just started would you welcome a society with digital currencies are allowed as an official means of comment

**E2:** Yeah of course I personally of course yes I would I would of course be in I would of course also try to get rid of cash I mean we pay with the way pay with cash with paper and coins like 1000 years ago it was similar with coins yeah but even more that's not where we're how we can enter the age so this is definitely something we have to change digital currencies are an important part it will come especially for instance if countries like China we'll start with an digital currency where you have to have a protocol technician currency is a it's based on a protocol it's not that somebody says this money but it is itself when they started we have to follow otherwise we are for instance obliged to use the Chinese yuan system people to buy our goods which we ordered on Amazon or wherever we would order our computers and then which comes from China so there is a pressure and of course we have to have it the countries have to offer and this could also be cryptocurrency in the future as well

**I:** OK yeah thanks I unfortunately missed one question and then we are done so perfect timing what potential future developments or innovations in blockchain technology could have a significant impact on the use of digital currencies as an everyday means of payment

**E2:** The technology itself is already quite developed so we have the possibility of what we would need is faster devices we were certain we don't need other technology side much development renovation we need faster devices hardware blockchain hardware doesn't exist but you can peer-to-peer maybe for instance like a camera can make a pick and then picture and directly save it to the blockchain and not save it to a server which is centralized but in terms of payment we have all the technology that is just the usability of the trust and the legal framework of course that needs innovation and then an ability to make it easier to make use of cryptocurrencies perfect

**I:** OK wonderful thank you so much.



### 7.3. Appendix 3

*Interview 3*

*Time: 21:50*

*Date: 05.05.2023*

*Participant: : Crypto& Blockchain entrepreneur &enthusiast*

**I:** Can digital currency serve as an everyday means of payment and be implemented in commerce and among the population worldwide using Bitcoin as an example first question can you briefly explain the basics of blockchain technology and what it has to do with digital currencies in your opinion

**E3:** Yeah Blockchain technologies is an transaction Ledger which operates on a infrastructure stack which is independent from a central control agency or single point of single point of control in fact a blockchain is nothing else than a chain of blocks or a transaction Ledger is compiled and there are first and the predominant use case of a blockchain is a means of Nakamoto who to put it international peer-to-peer cash settlement system so and this is also the underlying principle of a blockchain it is in simply language and distributed database where bitcoin shows as the first use case that it could be used as a means of payment

**I:** OK perfect second question can you provide examples of successful implementations of blockchain technologies for payment for payment processing and commerce for other industries

**E3:** Well it's interesting because depending on the implementation of a blockchain it depends whether it is only at distributed Ledger technology being implemented or is it a fully decentralized blockchain so to take your question in the Broads sense Bitcoin would be the first would be the first implementation of payment processing in commerce other than that there are many let's say payment service provider implemented cryptocurrencies in commerce as a means of payment but there is not such a blockchain which is specifically used for commerce payment means so that's I wouldn't that wouldn't qualify that there are a lot of block chains who on a recall and

protocol layer focus on the aspects of transaction speed and low transaction costs for functionalities as a means of payments and commerce but there is not such an implication as to speak from the whole production development speak which directly applies to a payment function commerce

**I:** How has the Interest trust and global interest and trust in blockchain based cryptocurrencies including Bitcoin evolved over time and what factors have contributed to this evolution

**E3:** Yeah the development the lightning development of the technology itself right so if you if you look at the development of blockchain itself you have now for three generations of blockchains it's not clear right now where we already have the first generation or whether it's already the 4th but in the grand scheme of things you have you have Bitcoin as the predominant form of blockchain when you use the whole stack as on decentralized protocol for the means of of Bitcoin like a transaction processes second generation of courses is Ethereum with the ability to generate tokens and now the fruit is for example prosperity and forms for so I guess this technological development shows the ups and downs of the development of the whole let's say development stack and depending on their technology technological development the use cases and implementations and applications vary

**I** What are the potential barriers to widespread adoption of Bitcoin or other digital currencies as an everyday means of payment and how might these barriers be overcome

**E3:** Well it is mass adoption so and the question is how do you achieve mass adoptions so so you have from let's say token engineering perspective at least four dimension which is crucial to first one is because we're talking about crypto assets or virtual currencies or cryptocurrencies so here we are So what is it exactly what we what we use as a means of payment is the currency really or is it a means of payment or a mean of asset so that's first secondly of course the economic perspective as to whether the forms of money needs to be defined right so we used to have certain standards of issuing public currencies or state issued currencies in the past from Bretton woods onwards to adapt based issues process so and that's the same foundation which goes with which goes with crypto assets So what are the economic

engineering perspective the third one clearly is the technological perspective take credit card payments and take Bitcoin lasts let's say from 2 minutes to 12 minutes visa and Mastercard's protection processes in milliseconds so this is a technological barrier the full form of course the political aspect or ethical aspect so who is able to pay with what means that comes along with digital and financial literacy and all that let's say ethical questions alongside with it which also needs to be clearly defined if we if we want to argue in a in an ethical political sense that let's say cryptocurrency should be a means of mass adoption for payment there's obviously also entails that everyone has a mobile device or something equivalent to be able to pay with it and this is this is a matter of ethical or let's say let's say political discount assumptions before so big question a big answer to simple question it's all about mass adoption and mastered option is clearly dependent on the those four lines again.

**I:** What indicators play an important role in the decision of companies or governments whatever digital currencies should be approved as official means of payment

**E3:** Yeah well I mean the Oxford Business School provides A framework is the Oxford blockchain documentation framework whereas on the three layers of that block chain or block chain decision tree can be made first is of course the protocol layer whether it's really do you really want to have a decentralized and distributed architecture well I might ask you do you envisage euro being issued on a decentralized basis or do you envisage to European issued by a central institution like the European Central Bank so that's the protocol level the second level is the network layer which of course has a lot of to do with economic and technical aspects as to whether who is a stakeholder to that system so if you have a centralized system of course the European Central Bank has to switch on and switch off mode but if you open that to an even distributed way who should be one of the selected permissions stakeholders or should it be permissionless and to further of course on application layer which which key aspects should that payment function fulfill of course if you talk about payment and commerce but it saved transaction speed is key and low costs transaction data is key.

**I:** Does peoples Ignorance affect acceptance and usability of blockchain technologies in cryptocurrencies?

**E3:** Yeah, absolutely and that's the fact of massive adoption and there comes especially the 4th dimension into play is the political and ethical because it's all of them and an educational aspect which is which relates the key role here

**I:** Do you think that major currencies such as the euro or dollar can eventually be replaced by a cryptocurrency?

**E3:** Yeah, and it clearly depends on the mass adoption of tufted coin and the and the EL Salvador discussion clearly shows that where you have an economy which is U.S. dollar dependent as to say they are they are they do not they lack since I know several centuries now military sovereignty for them it's clear to also have a bitcoin-based payment settlement system so yeah of course could be possible right

**I:** Will Banks be replaced technology and consider cryptocurrencies as an official means of payment as from the side of the bank

**E3:** Yeah it could be of course clearly could be I mean but there are there are two main factors I mean why do we have banks right I mean first from economic perspective we need banks in also in issuing process of money and the usual process of money as to whether banks also consistent or integrating well let's say the flow of money in modern societies first and secondly in the banks itself are parts to fundamental parts of modern day payment and capital market infrastructure and especially the letter on this is clearly A use case on for blockchain technology just provided by the duality biology machine the deity pilot machine cleaning visage regime or capital markets issuance settlements intersection processes can be done on a transaction settlement layer which is a block which is a blockchain so banks who take shares into custody are not needed for the purpose anymore so clearly the latter is a matter of blockchain technology it's pretty out there there's a study by European Central Bank since 2016 so I think that is the cheese out-of-the-box since already quite some time now at the first is again a question of well monetary sovereignty is that still a public good in modern day scientists which is up to these institutions set up that modern day societies which we in the western world would say our

democracies or should we give that tool away to let's say a public good or let's say a phenomenon like Bitcoin which is in the code or in the proper code itself

**I:** Next question would you welcome a society with digital currencies are allowed as officially means of payment?

**E3:** Sure, I mean with the case yeah so absolutely

**I:** OK and I forgot one question what potential future developments or innovations in blockchain technology could have a significant impact on the use of digital currencies as an everyday means of payment or is there no

**E3:** No I mean what is clearly missing is the browsing moment for the Internet I mean everybody know understood the truth assets can be used as a as a as a means of as a means of payment everybody understands that crypto assets are a speculative asset but nobody clearly have the let's say the blockchain killer application now everyone is clear that there that there is there's crypto I don't know whether we are all talking about blockchain they're all talking about blockchain but it's not necessarily the case that we need to talk about proxy because it's in the background I mean what clearly is obviously the case could be is if you have a machine to machine payments automatic payment processes error you're operating a digital world so I guess it's a it's a it's an essential tool in agile space to operate also in economic way but it but a long side with the adoption off the digital sphere to everyday processes that have figured fundamental for the adoption of approaching technology in one of these societies

**I:** Yeah, that's it

## 7.4. Appendix 4

*Interview 4*

*Time: 24:38*

*Date: 12.05.2023*

Participant: Employee at an Austrian research center with focus on Crypto

**I:** So the general title of my bachelor Tim thesis is called can digital currencies serve as an everyday means of payment and be implemented in commerce and among the population worldwide using Bitcoin as an example in general we have 10 questions and if you can answer every question as fast as you can and simple it would be perfect and also please include your personal opinion and i would say let's start the first question and what it has to do with digital currencies in your words you?

**E4:** Blockchain technology is about let's say at distributed Ledger a kind of distributed yeah distributed Ledger that in the case of Bitcoin is also permissionless so every participant that is connected to the Internet could join the network see the transactions and also validate them in the case of Bitcoin this validation is very computational intensive this is called the proof of work consensus mechanism and also this is also how it is distributed Ledger consensus about the transaction is established and how different people that don't even know each other or participants don't even know each other and can agree on transactions or which transactions are let's say stored in this district

**I:** Can you provide examples of successful implementations of blockchain technology for payment processing and commerce or other industries?

**E4:** I mean OK we have the bitcoin blockchain that we briefly touched upon just now but briefly described and then there is some kind of layer two solution which is a scalability approach for a Bitcoin blockchain this is called the Bitcoin lightning network and also payment solution that adapt this technology one promising solution is strike for example and they provide cheap payments via their app using the Bitcoin lightning network OK but it still has some drawbacks and disadvantages of course but at least in theory but under certain condition it works perfect work

**I:** OK perfect so and any other examples or is this is the only one that you have in mind?

**E4:** Right now, for payments and commerce you could use some stable coins for example like they used to see like for example of course other state records is available and so on but they mean the dollar back stable coins so there are hardly mainly europac stable coins at the moment OK.

**I:** How has global interest and trust in blockchain based cryptocurrencies including Bitcoin evolved over time and what factors have contributed to this evolution?

**E4:** I mean what is astonishing is that for example the Bitcoin blockchain it's up and running for more than 10 years already and it's as we said before it's permissionless open public but it has never been successfully attacked until now which is astonishing also if you compare other IT systems also from public authorities for example that are act sometimes so we see that blockchain has some security advantages and this has attracted public interest already and also the fact that you can globally transact via the Bitcoin blockchain for example or also with Ethereum or Ethereum layer two solutions using stable coins for example and you could directly transferable you from one peer to the another

I: OK and the trust and I'm well how would you define the trust in the from the people how the people see on the Bitcoin blockchain I mean it's not the special question about it but I mean it's a little bit included in the question but when you focus or when you have to express your opinion about the trust how you see how do you think how do people see other people see blockchain and of course people who has to do something with it and with the blockchain they're a fan of the blockchain but what's about the trust specifically?

E4: Also a very good point OK but trust is a very general term and yeah different aspects and about it's not just the Bitcoin blockchains you also need for example a wallet where your bitcoins are let's say stored yes and there are different kind of wallets there's self-hosted wallets for example that you where you are responsible for your keys so this is the way how you access your bitcoins for example and then you have to trust yourself and that you store the key in the in the proper way and if you lose this very long cold we're goanna take the account forever probably so but what you could do is to trust the big customer in order to have let's say a hot wallet for example trust crypto exchange for example OK and again OK but this there it is the private keys are the keys for the for accessing cryptocurrency that the current storage with the exchange but then you also have to trust the exchange it's some kind of central point in this system that yeah

I: Definitely but personally I'm not the expert as you are but I have the feeling that as more into take I'm over the years it's getting more and more popular of course but also the trust is rising of the people and at the first point everyone thought OK cryptocurrency so Bitcoin and all this stuff it's just for illegal stuff and it's bad thing and over the years it it's changed and the people get the trust in other words so like they think OK it's not so bad maybe it's a good thing and the trust was raised but i totally get what you mean.



**E4:** And that's how you define trust it's a very general term yeah expect but of course daily transactions are also possible or there are some illegal transactions conducted problem but in recent studies recent studies showed that it's rather very small percentage of the transaction that is actually illegal transactions and we also have to think that they'll keep in mind that permissionless blockchains like the Bitcoin blockchain they're very they're fully transparent so you can track all the transactions so it only has its advantages and disadvantages

**I:** What are the potential barriers to widespread adoption of bitcoin and other digital currencies as an everyday means of payment and how might these barriers overcome?

**E4:** It's also very valid question and still some kind of problem in the crypto space especially the transaction the scalability problem of block chains so there's this blockchain trilemma of speed costs and scalability if I remember correctly and scalability is at no disability centralization cost and scalability and blockchains like Bitcoin or Ethereum focus a lot on decentralized decentralization but the lack of scalability you have just a few transactions per second at least under 20 transactions per second for the Bitcoin blockchain you need some solutions to you know to scale the bitcoin blockchain which could be a layer two solutions for example

**I:** What indicators playing important role in the decision of companies or governments whatever digital currency should or could be approved as official means of payment?

**E4:** Important is of course there's some regulatory requirements especially for governments or institutions financial institutions for example to use cryptocurrencies or to use tokenized forms of money for example and these are currently regulated for example the European Union in the various countries way so every country everything European country has its own crypto regulations and like the new crypto regulations that were just I think 123 weeks ago released a release like the group in parliament they will contribute to a common legal framework at least within the EU and the European Union and at least within the European Union then the usage of crypto assets will be yeah from a legal perspective much easier it would probably lead to increase the adoption of blockchain technology

**I:** But again, a little bit I would like to talk about the trust but the next question does people's ignorance affect the acceptance and usability of blockchain technology and cryptocurrencies so not only cryptocurrencies general term blockchain technology based firms or but also in cryptocurrency so both sides?

**E4:** Also again very broad question actually and I would not say that people are in general ignorance about the technology but of course some blockchains are rather energy intensive so it's you know use a lot of electricity which was better you solve but if you're broke them a few months ago they changed from the proof of work to proof of stake mechanism and knowledge it's much more energy efficient so that and the applications run on the Ethereum blockchain so some of the little prejudices about blockchain technology are getting solved let's see like that and the other is some people still have a bad feeling or some parents also paid pressure does about the illegal transactions for example and they don't trust it and that's why we would need some more KYC processes on the blockchain and two transaction legally in environment that's also something that should be established by or implementing the like regulation that we talked about before. One more thing because we said we have some very efficient systems already and to be really proactive this is for example regarding payments this is partly true so this is true again within Europe for example where we have very efficient systems like the safer system for example but it's not true regarding international payments for example when there are different countries from different continents in both for example and the payments they hop from one country to the other there lot of intermediaries it takes a long time and

cost a lot of money usually for example transacting from Austria to a African country or sub-Sahara country it can take more than two days and cost more than 6% which is not a lot actually.

**I:** Continue to the next question and it's called do you think that major currencies such as the euro or dollar can eventually be replaced by cryptocurrency or Bitcoin?

**E4:** I don't think they will be replaced maybe complemented and it also has they also have different functions potentially for example and Bitcoin at least currently is not the it's appear payment solution as they as like Nakamoto claimed on the white paper it's simply not scalable enough and it's also not the central bank money central banked money you could maybe record Bitcoin as some kind of digital gold maybe some kind of digital store of value but of course this values is also very volatile for example.

**I:** The next question will banks be replaced by blockchain technology and consider cryptocurrencies as an official means of payment?

**E4:** I don't think they will be replaced but the rules will change probably, or they might get some murals for example like crypto custodian for example borrow some kind of crypto on offering where you are as a banking customer or able to in your banking using your banking apps to exchange cryptocurrencies for example or to enter the crypto space and they will probably also conduct KYC on customers. I'm not sure if currencies can be used or which crypto currencies or if any crypto currencies can be used as an official means of payment for example the ECP also has its opinion about that for example and then it's still it's discussed about at the moment which kind of tokenized money could be used for what for example regarding the digital euro for example which would probably focus on some commerce and person to person payments.

**I:** Next question would you welcome a society with digital currencies are allowed as official means of payment?

**E4:** I don't think it makes much sense to use for example Bitcoin BTC Bitcoin as a means of payment because I would not like my coffee to cost 1.50 let's say I mean I think it's about the price of my coffee in Euro yeah and there's an exchange rate between the euro and Bitcoin and I don't want my coffee to be 1.50 cost 150 on today and tomorrow it costs three euros years or maybe \$0.40 would be good OK but it can also be much more expensive the next day and that's why it's not why I think it's not suitable the means of payment some but there's some kind of store of value or some kind of additional saving asset why not look at something interesting asset

**I:** Forgot one question um and this is also the last question and it's the last question this was the last question, but the next question will come what potential future developments or innovations in blockchain technology could have a significant impact on the use of digital currencies as an everyday means of payment or are there not any potential developments in your mind or innovations?

**E4:** One very interesting development technical development is for example the zero knowledge proofs that would make them making blockchains really scalable but they're still not 100% developed and for example blockchains and layer two solutions that are based consumer knowledge proofs they still have to be let's say tested and battle proof yet so they're just getting released now and let's see how stable they are because looking forward to see the developments there also the bridge solutions for example still have been some attacks on bridges between those two between different blockchains and this is also something that is improved you know and very important to it's important for the different blockchains communicate with each other OK.

**I:** OK yeah looking forward and but in general I'm really excited what the future will bring and how it will change.