The futures of cryptocurrencies in international trade

Uses and implications for the SME sector

Aaro Åkerman

Juuso Neuvonen

Bachelor's thesis
April 2023
School of Business
Degree Programme in International Business

Jyväskylän ammattikorkeakoulu
University of Applied Sciences

jamk

Description page

Åkerman, Aaro & Neuvonen, Juuso

The futures of cryptocurrencies in international trade - Uses and implications for the SME sector

Jyväskylä: Jamk University of Applied Sciences, April 2023, 55 pages

Degree Programme in International Business. Bachelor's thesis.

Permission for open access publication: Yes

Language of publication: English

Abstract

The financial landscape in correlation with technological development is changing all the time. As a consequence, cryptocurrencies and blockchain technologies have surfaced to the mainstream rotation and are disrupting the current and normal monetary tools and activities. They provide decentralized solutions in the general areas of investing, trading and security. Whether these technologies will be on the level of current monetary tools in depending on the set regulations and adaption of the companies and individuals.

The research aimed to create comprehension through a predictive analysis on the possible futures of cryptocurrencies as the means of payments between companies (SMEs) and also individuals in international trade. The authors wanted to find answers to if these technologies have made any recognizable impact on the current financial activities and what the possible advantages of them are for SMEs. The methods chosen to reach the answers were qualitative with futures approach implemented to them.

The methods used to reach the objectives of the research by the authors created clear segmentation of the main themes within the paper. The predictive analysis on the topic allowed the authors to reach elevated knowledge concerning the possible future implementations of the technologies in correspondence with the respondent data and literature review. The answer data was segmented by the respondent profiles determined by the authors and therefore carefully analysed with respecting the participants' anonymity.

The above-mentioned segments used in the research were finance, blockchain, cyber security and banking. These categories were determined by the authors according to the respondents' relevant experiment to gain data which would provide an analysis that is as comprehensive as possible.

Keywords/tags (subjects)

Cryptocurrencies, blockchain, technology, business-to-business

Miscellaneous (Confidential information)

-

jamk

Description page

Åkerman, Aaro & Neuvonen, Juuso

Kryptovaluuttojen tulevaisuudet kansainvälisessä kaupassa - Käyttötarkoitukset ja vaikutukset pk-sektorille

Jyväskylä: Jyväskylän ammattikorkeakoulu. huhtikuu 2023, 55 sivua

International Business tutkinto-ohjelma. Opinnäytetyö AMK.

Julkaisun kieli: englanti

Julkaisulupa avoimessa verkossa: kyllä

Tiivistelmä

Rahoitusmaailma muuttuu teknologian kehityksen myötä jatkuvasti. Tämän seurauksena kryptovaluutat ja lohkoketjuteknologiat ovat nousseet valtavirran tietoisuuteen ja häiritsevät nykyisiä ja normaaleja rahatyökaluja ja -toimintoja. Ne tarjoavat hajautettuja ratkaisuja sijoittamisen, kaupankäynnin ja turvallisuuden yleisillä alueilla. Tulevatko nämä tekniikat olemaan nykyisten rahoitus työkalujen tasolla riippuu se yrityksille ja yksilöille asetetuista säännöksistä ja sopeutumisesta.

Tutkimuksen tavoitteena oli luoda ymmärrystä ennakoivan analyysin avulla kryptovaluuttojen mahdollisista tulevaisuudesta maksuvälineinä yritysten (pk-yritysten) ja myös yksityishenkilöiden välillä kansainvälisessä kaupassa. Kirjoittajat halusivat löytää vastauksia siihen, onko näillä teknologioilla ollut havaittavissa olevaa vaikutusta nykyiseen taloustoimintaan ja mitä hyötyä niistä on pk-yrityksille. Vastausten saavuttamiseksi valitut menetelmät olivat laadullisia ja niihin sovellettiin tulevaisuus lähestymistapaa.

Tekijöiden tutkimuksen tavoitteiden saavuttamiseksi käytetyt menetelmät loivat selkeän segmentoinnin ja pääteemat. Aiheen ennakoiva analyysi mahdollisti tekijöille korkeamman tiedon teknologian mahdollisista tulevista toteutuksista vastaajatietojen ja kirjallisuuskatsauksen mukaisesti. Vastaustiedot segmentoitiin tekijöiden määrittämien vastaajaprofiilien mukaan ja analysoitiin siksi huolellisesti osallistujien anonymiteettiä kunnioittaen.

Edellä mainitut tutkimuksessa käytetyt segmentit olivat rahoitus, lohkoketju, kyberturvallisuus ja pankkitoiminta. Kirjoittajat määrittelivät nämä luokat vastaajien asiaankuuluvan kokemuksen perusteella saadakseen tietoa, joka antaisi mahdollisimman kattavan analyysin.

Avainsanat (asiasanat)

Kryptovaluutat, lohkoketju, teknologia, yritykseltä yritykselle

Muut tiedot (salassa pidettävät liitteet)

-

Contents

Figures

Tables

1 Introduction

1.1 Background

In the ever-changing landscape of finance, a wave of virtual currencies has gained a great amount of attention from the media and mass information outlets since the first public bitcoin transaction happened on 22nd of May 2010. It opened various potential opportunities and technological leaps when it comes to security, privacy, and transaction speed of notable amounts of money for instance. The blockchain technology within the currencies might offer possibilities for transactions, saving, and accounting, but in the eyes of a private investor the values of the markets move quite frequently which creates possibilities for quick profits or losses. This aspect of the rapid market lures the investors to put money into these projects but with only the expectation of getting large profits.

For this reason, it is important to recognize the differences in motives and causes between private individuals and businesses that use cryptocurrency and the technology, but more specifically the blockchain within specific currencies. As already mentioned, the reasons of using cryptocurrency might concern safety, speed of transactions, or privacy, but again the purpose of the use is on a completely different level depending on the user. At least there are various aspects that support the possible forecast of cryptocurrencies and blockchains being the new normal virtual transaction tools and technologies. As also stated in a research done by Liu and Serletis (2019) “Through innovations in its technical design, the cryptocurrency offers the potential to disrupt payment systems and traditional currencies” it could be considered as a legitimate possibility. But on the other hand, if it would happen, when and how the technology will be integrated into the financial platforms, software's and ecosystems of specific businesses and individuals. Only time will tell us for sure.

The difference in size of transactions between private investors, normal people and businesses are obviously quite significant in general, except for the minor part of the wealthiest individuals. We think that this aspect of the cryptocurrency market is the most interesting one and holds the most potential out of the viable options. Therefore, in our contemplating research we are going to focus on the transactions and payments between small and medium sized companies that are using crypto as their money moving tool now, are in middle of the process of integrating them into their

systems or are just thinking about it. In the future, will these virtual currencies hold any more significant role around financial transactions, will the technology be forgotten or is there something completely new compensating for their role in the existence of virtual money? Which makes it interesting is that technology in general is evolving and taking massive leaps year after year and for that reason the various futures and possibilities are impossible to foresee, at least with the total certainty of knowledge.

1.2 Motivation for research

The main reason for researching cryptocurrencies further comes from human nature and curiosity to try to forecast the future. We want to see what kind of outcomes are possible and how technologies can reshape the fields of international businesses and money. Over the course of human history, we have evolved from trading with squirrel pelts to gold coins and eventually to virtual money. The next step will likely involve some new technology or innovation. Likewise, blockchain technology and cryptocurrencies have been gaining attraction during the past 10 years and therefore the goal of this study is to research whether blockchain technology is a legitimate contender for becoming a widely accepted and used form of currency and if so, what is the scale of it?

Blockchain technology and cryptocurrencies are developing all the time. More individuals are looking for these new innovative solutions and possibilities that might be the new normal someday. This futures research has the aim of examining information with the objective of creating predictive analysis of these potential solutions and the attributes of them. As stated by Lansky (2019), “Compared to conventional currencies, cryptocurrencies involve a different approach to ownership and anonymity. These differences pose numerous risks but also numerous opportunities” it is probable that the outcome of this research will be versatile and therefore thought-provoking considering the future.

The authors want to emphasize the forecasting perspective of this research. Aim is to produce an analysis that would display diverse viewpoints and opinions that are carefully inspected to provide meaningful information throughout the report.

1.3 Research questions

Cryptocurrencies and blockchain technology have been gaining popularity rapidly over the last decade. Thus far, however, they have mostly been used for investing and for financial transactions on a smaller scale. According to Steimetz et al. (2021) the current literature on cryptocurrencies does not describe the variety of possible uses it can have. It is clear to see that the technology has potential to be adopted for wider application, but it is still uncertain how it will develop. For the above-mentioned reasons, the main research problem for our study was defined as:

The uncertainty of exactly how impactful blockchain technology and cryptocurrencies will be in the future of B2B transactions.

Based on our interests and the research problem that we found, we decided to focus our thesis on mapping out possible futures for cryptocurrency as a method of transferring money between small and medium sized enterprises. Based on this information we formulated the following questions to study the phenomena;

RQ 1. Have cryptocurrencies impacted the traditional financial system and what are the implications for the future?

RQ 2. What opportunities will small and medium sized enterprises gain if adopting the use of cryptocurrency?

1.4 Structure of the thesis

This thesis is implemented as futures research where our goal is to map out the possible uses for cryptocurrency as a means of making B2B transactions. To analyze the topic, we have conducted a literature review of the relevant topics and collected qualitative data from experts of this field. This data together with the literature will be used to create the findings section that gives our interpretation of the possible futures. We also have included a section discussing the potential topics that could be elaborated further in future research.

2 Literature review

The literature review aims at explaining the relevant topics that need to be familiarized with to understand this phenomenon. We want to focus on the aspects that would affect the target group of this research. The most important angle being that of sustainability and security. The literature review is constructed around these themes. As futures research our goal is to look into the possibilities of blockchain technology and help to map out the direction and purpose it might take.

2.1 Cryptocurrencies

Cryptocurrencies are digital assets which are used and designed to be utilized as tools in transactions and exchanges in the same manner as standard money (Nakamoto, 2008; Tredinnick, 2019). Bitcoin is the first cryptocurrency and token used in a legitimate transaction between two individuals where the ledger used was blockchain. All cryptocurrencies are based on cryptography, which means that they consist of a distributed network of authenticators where every single one of these so-called validators hold a duplicate version of the ledger that represents the procession of transactions. A simple example is that there are no physical Bitcoins, which means that they appear in the blockchain as notebook entries (Lee & Teo, 2020).

According to Coinmarketcap (n.d.) the three major crypto assets by their market capitalization are Bitcoin (BTC), Ethereum (ETH), and Tether (USDT). Figure 1 represents the Percentage of Total Market Cap of the 10 biggest cryptocurrencies in the ecosystem that are listed below the chart (Bitcoin, Ethereum, Tether, BNB, USD Coin, XRP, Solana, Cardano, Binance USD, Dogecoin and rest of the alternative currencies). The dominance of Bitcoin that is seen can be explained through the facts that it is the first innovation that uses blockchain technology, it is the first electric currency resembling cash, it is decentralized (which means that there are no governments or banks included that would have a major control over the system i.e. the control is delegated throughout the technology used) and it is in general very secure and fast way of managing transactions (Rahardja et al., 2021).

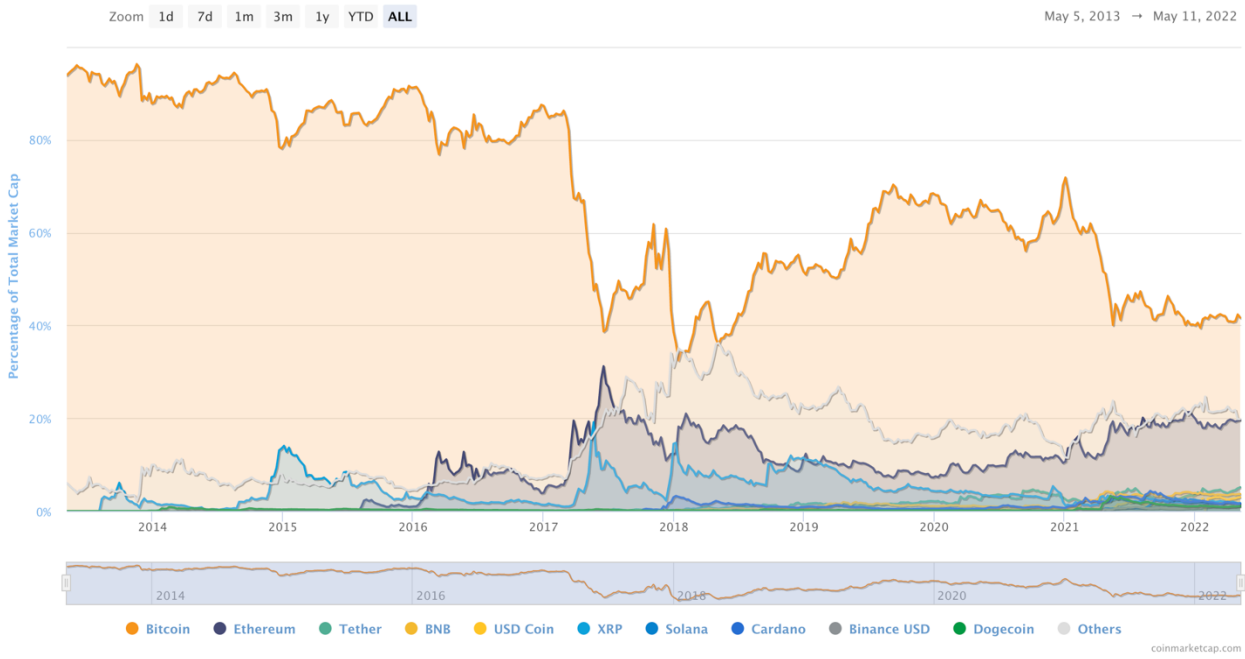

Figure 1 Percentage of total market capitalization. (CoinMarketCap, 2022)

Alternative currencies (Altcoins) are created in the hope of being better than Bitcoin or just to copy its whole meaning. Due to the status of originality that Bitcoin has, it creates an effect of imitation in the market. This means that usually when Bitcoins value goes up, altcoins follow and vice versa when the price of Bitcoin moves down, the alternative currencies' prices follow the same effect. This phenomenon is also the consequence of the market pairs that are commonly used in the cryptocurrency trading platforms. The investors want to compare the alternative coins that they are buying to the main currency in the market and ecosystem (Bitcoin), which interests them the most and therefore not comparing them to fiat currencies that are centralized (Beyers, 2021)

Obviously, the values of the currencies are not permanent, but they are formed and shifted through the action of trading, ergo transactions using these specific currencies. Therefore, the rates tend to have quite a notable instability and that is one of the several essential reasons why cryptocurrency differs from the regular monetary market (Tredinnick, 2019). The reasons why decentralized peer-to-peer crypto is not like regular money can be segmented into four simple aspects which are the following. (1) They are not controlled by any central authority such as a national or transnational central bank, (2) not any agencies or organizations endorses the value of the currency or influences more money into the particular structure, (3) deficiency of the amount

in rotation is sustained by these equations that are used in the process of validating the transactions, and (4) the currencies are decentralized for the purpose of gaining security and to provide a set up where the transaction is only between two independent individuals without any control from other factors like the state or government for instance (Tredinnick, 2019).

The general financial systems and infrastructures surrounding the electrical transactions and monetary field are centralized or in other words: under the control and influence of central banks. The decentralized management of ownership for these digital assets on the other hand is the base of the whole innovation and due to the feature of combining the usual aspects of normal virtual money and the independent way of processing transactions between two peers makes the general technology so special and potential (Berentsen & Schär, 2018).

2.2 Blockchain technology

Simple explanation of the phases involved in a blockchain's process defined by Bylund (2022):

1. The first phase is transaction, which is started when a user requests for it.
2. Second phase is the creation of the block that represents the particular transaction done between the individual nodes.
3. Third phase is for informing where the nodes in the network are informed about the creation of this block, by the data being sent to relevant shareholders and receivers.
4. Fourth phase is for validation, where the nodes verify the particular transaction when they complete a cryptographic problem called the proof of work. Another option is proof-of-stake where the new block is essentially produced based on the amount of money staked and not on the performance of computers.
5. Final phase is block linking where connecting the new block to the prior block within the chain happens and the transaction is finished.

A chain of blocks is formed because of this process, giving the concept of "blockchain" its name. It acts as a public record of all network transactions, by being safe and resistant to manipulation since it is decentralized and transparent. The previously listed phases of the process of blackchin are pictured below (Figure 2).

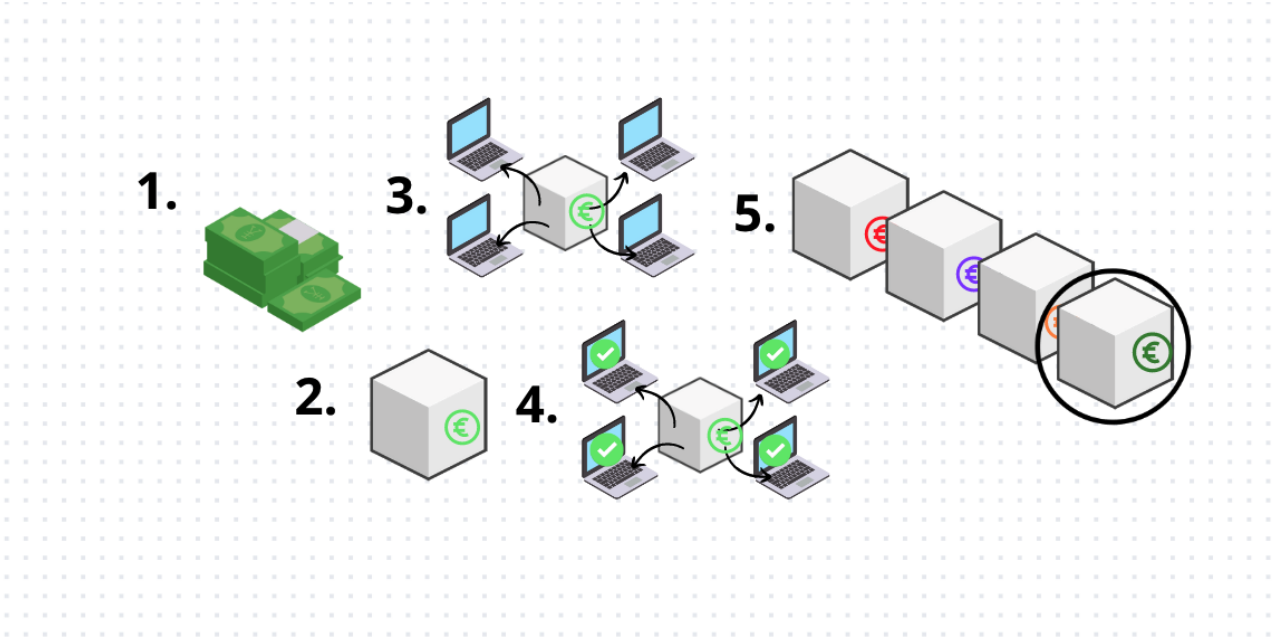

Figure 2 Process of blockchain. Adapted from What is Blockchain? by Anders Bylund (2022)

So as the name states, blockchain is formed by several blocks connected to each other. It is basically an open ledger where all the trades and transactions happening are documented and as mentioned – connected to each other. The individual blocks include a cryptographical net of the prior block, a timestamp, and the data about that specific transaction. The implementation of a peer-to-peer connection makes the technology so special; it means that it deletes the need of a 3rd party verifications such as banks, lawyers, or accountants (Dattani & Sheth, 2019). Blockchain is built around sets of data, where the transactions are stored. The chain grows when transactions are made and therefore it Is a representation of a complete ledger of the transactions happened before. The values within the blocks are unique and therefore frauds can be very precautionarily prevented, due to the blocks being a part of the chain (Dattani & Sheth, 2019).

New transactions are not marked to the ledger automatically, but the process of reaching consensus makes the agreement stored into a bitcoin blockchain for a small period. After the process is done, the transaction will be moved to the ledger and the information within cannot be changed anymore (Nofer et al., 2017). One aspect of blockchain and for instance Bitcoin, is that due to the cryptography that is used by the computers when mining this particular currency, it means that individuals from all around the globe have a way of validating and trusting other people and therefore also the capability to transfer digital assets via internet (Nofer et al., 2017).

As mentioned, blockchain systems are decentralized. Therefore, blockchain uses a consensus mechanism that is fully fault-tolerant, and it assures the total safety of the datafiles and transactions between different parties. According to Dattani & Sheth (2019) there are 4 classifications of blockchain: (1) Permissionless blockchain, (2) Permissioned blockchain (3) Hybrid Blockchain and (4) Consortium Blockchain.

Permissionless blockchain could be described as the one which public is familiar with the most. It is a public open network available for anyone, fully decentralized across all parties with full transparency of transactions and not involving any central authorities. It is normally used to trade digital assets. Permissioned blockchain involves a closed network where separately defined parties take part in the validation. It is not anonymous but holds stronger information privacy due to the need of permissions for data. Due to the security and privacy aspect, this blockchain attracts business-to-business markets as well as the business-to-consumer. These are mostly used in privacy/security applications like the verification of an identity, settlement claims and tracking of a supply chain roots (Groopman, 2021).

The proof of Work mechanism that is designed by the creator of Bitcoin - Satoshi Nakamoto is planned to reach a unilateral agreement from the network in the process of validating each bitcoin transaction. It is a decentralized consenting mechanism/application where it demands the members of the network to validate the transactions by solving mathematical issues with their computers (Kose et al., 2021). The most negative aspect about Proof of Work is the huge energy consumption which is increased due to the number of miners these days in the networks and computers working on these mathematical issues (Frankenfield, 2022). The alternative option for proof of work is called Proof of Stake. The POS application means that the currency owners authenticate the transactions using the number of tied coins during the transaction process and therefore compared to proof of work mechanism it is obviously more energy sufficient, because for example, there is no more possibility or necessity to mine Ethereum after the merge from POW to POS earlier this year 2022. As mentioned already, it is because Proof of Stake does not require or allow the miners to receive the reward by resolving the mathematical issues by using computer hardware, but simply the reward is received by staking more currency i.e., having more wealth (Frankenfield, 2022).

2.3 General efficiency of the markets and ecosystems

The total efficiency of the market and ecosystem includes the aspects of safety, reliability, and the variety of possibilities analyzed in a critical manner. Most of the information and research done and found from the sources usually covers either Bitcoin (BTC) or Ethereum (ETH). As already mentioned, it is due to the notable and trustful market capitalization, resilience, and status of these specific currencies that they hold in the ecosystem.

On an individual's level, one of the major issues in the cryptocurrency market is price manipulation. Pump and dump schemes are one of the issues concerning the altcoins, but in general the main currencies like BTC and ETH are not affected by small investors anymore due to the great market capitalization of these two currencies (Hamrick et al., 2019). Pump and dump schemes are phenomenon's where investors announce and encourage other people to buy a specific alternative coin, create an increase in that price and therefore take advantage of the current manipulation. This action creates the dump effect, which makes the price of that currency go down very quickly (Hamrick et al., 2019). As we mentioned, these schemes are not an issue that concerns the main currency holders anymore, but it can create more questions and general worrying about the safety, security, and privacy, due to the fact of blockchain being one of the new core technologies in financial technology industry today.

One of the largest changes and developments issuing security in cryptocurrency world is the merge of Ethereum in September 2022. The merge meant that Ethereum would convert from proof of work model to proof of stake model. In general, it is an improvement in sustainability and safety perspectives.

Proof of work model works in a way where computers mine Ethereum using mathematical equations called cryptography and get blockchain in exchange and in this case, it is Ethereum. The action consumes a lot of electricity and waste usage of computer hardware like graphic cards and other computer parts which led to a global shortage of these things. Ethereum is the most used crypto and the second biggest in the world after Bitcoin.

According to Brand (2022), the total estimated consumption of electricity of Ethereum is 78 terawatt hours of electricity each year before the merge, which is comparable to the power consumption of small countries. The proof of stake model means that the network is secured by validators who must stake Ethereum to validate the network. This means that there is no electricity consumption at all used in the process. And as already mentioned, the proof of stake model is there to make Ethereum network more electricity efficient, sustainable, and more secure. The reduction of electricity to secure Ethereum is aimed to be approximately 99,95 % less compared to the amount before (Brand, 2022). NFT's and other Ethereum run applications have been pointed out as the polluters of our globe, but the merge will now delete that argument as well. The merge and especially the electricity reduction makes Ethereum environmental, social and governance (ESG) compliant now. In a way this makes it more suitable for companies, governments and even other regulator driven institutions who want to explore the Ethereum ecosystem (Brand, 2022).

The relevance of the sustainability perspective in any business nowadays is notable, and therefore the solutions and innovations towards more sustainable attributes in any business are a step towards a better future. Generally speaking, sustainability means the actions which help to save and leave environmental resources for the next generations (Park & Li, 2021).

De Vries (2022) mentioned the manageable replication of the process with Ethereum were changing the mechanism from POW to POS was successful – the question is that could it be implemented into other various mineable cryptocurrencies and therefore conceivably convert the whole ecosystem and market into supplemental sustainability and energy-sufficiency? De Vries (2022) mentioned that he thought it would not be as easy and painless as it was with Ethereum. For instance, Bitcoin, the father of every cryptocurrency in the market is working with the proof of work mechanism and therefore it is mentioned to be the "world's largest polluter". So, let us use Bitcoin as an example - there are assorted reasons why the process would not work with it as easily, and the main ones are listed below very briefly:

- Community: According to De Vries (2020) the community thinks that it would be hypocritical to change the mechanism to POS from POW, since the combination of persistence and originality of the software is measured to be one of the main rationales to its success.

- Fear of centralization: As the mechanism of Proof of Stake is more sustainable and energy sufficient, it brings other issues to the table that might concern the community and users of the software. With active POS it basically means that wealth brings power and benefit in the process of generating and staking the currency (De Vries 2020).
- An application-specific integrated circuit (ASIC): The difference between devices used when mining Ethereum or Bitcoin is that the computer tools used to mine ETH were mainly normal high-quality GPUs that can be recycled and reused with other computers and software's – there was also a high demand on those from normal consumers, so it made the process a lot easier. Whereas vice versa the devices used to mine Bitcoin are called ASIC's that are optimized to only mine specific cryptocurrencies and they cannot be recycled or reused in the same sense as the normal GPUs. Thus, the process would create a lot of waste and already from that perspective the benefit of the conversion would therefore be decreased greatly (De Vries 2020).

2.4 Hype cycle

According to Dedehayir and Steinert (2016) the technology hype cycle is a graph published by Gartner Inc, that analyzes emerging technologies based on how far they have developed and what stage they are currently in regarding their usefulness and potential. The tool presents relevant factors and trends related to our research, and therefore makes it an important part of the literature

review.

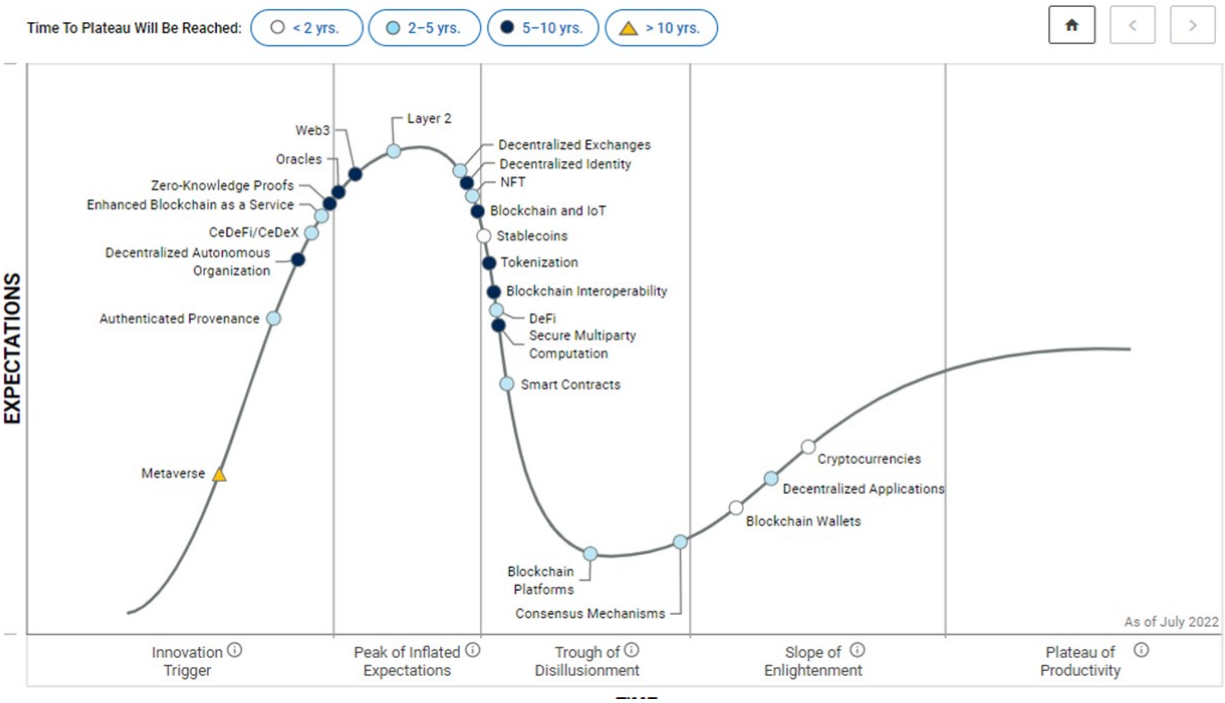

Figure 3 Blockchain hype cycle (Litan, 2022)

The chart is divided into five different phases that describe the technology's maturity and level of useability while also giving an idea about how the specific technology might develop over time according to Gartner (n.d.).

1. The first stage Innovation trigger is the introduction stage where hype begins to develop but the technology is often not realized as a product yet.
2. Secondly The Peak of Inflated Expectations has the technology get some success but no widespread adoption.
3. The Through of Disillusionment causes interest to drop and many companies using the said technology to often struggle.
4. The Slope of Enlightenment sees the technology starting to mature and become better understood as the benefits are seen by companies.
5. Finally, the Plateau of Productivity is the beginning of mainstream application of the technology.

The hype cycle can be used by companies to identify emerging technologies that could be beneficial for them while reducing the risks of making too risky investments into ones that are still too far away from being commercially viable (Gartner, n.d.).

2.5 Smart contracts

Smart contracts are self-executing agreements and tools where the terms of the deal are uninterruptedly integrated into the code. The agreements and the code exist on a blockchain network and are executed after the established conditions that have been set preliminary are met. Therefore, it allows secure and transparent execution without any additional negotiators or proofs Mohanta et al. (2018). The key idea of the process was presented by a computer scientist called Nick Szabo in 1994, which was before the whole concept of blockchain was introduced. His base idea was that the transaction would be executed with the help of a computerized application and the terms of the contract would be reached automatically without the fear of any dishonest actions. Today, it could be determined as a certain blockchain application used to operate and finalize the set terms on a contract without the need of a third-party (Mohanta et al., 2018).

A simple “Walk through” of the execution process with smart contracts is provided by Global X Research team (2022). It includes 4 following phases:

1. Contract: Two parties want to execute a contract where it is certain that the conditions of that specific deal are met. After the conditions are reached the Party A owes the Party B the value of the contract in hand.
2. Event: If the conditions are reached, the verification is done by the smart contracts by using decentralized databases.
3. Outcome: After meeting the terms in the deal, it is triggered and the value of the contract in hand is transmitted to the receiving Party.
4. Settlement: The final settlement is taken place after the blockchain process is finished and therefore the value of the contract is sent to the receiving Party’s wallet address.

According to the same research done by Mohanta et al. (2018) the main features with most potential for the future around smart contracts is offered through velocity, lower number of shareholders concerning the process, precision of the contracts, updated models of business or operations, and increased security.

The potential usage of smart contracts is presented by various research, but for example Mohanta et al. (2018) presents seven different relevant applications of the technology. The potential applications for business to business and SMEs on their list are the following 3:

1. Supply Chain - Includes various transactions on different levels that include specific terms, rules and conditions that must be met for the transaction to go through. Smart contracts and blockchain in general would make the processes more secure, quicker, and capable.
2. Insurance – The velocity of smart contract application would convert the insurance system into safe, clear and as any other application it would take away the need of a third party to validate anything.
3. Financial operations – Generally though the idea of a blockchain based finance system is that it is only peer to peer without the need of a third-party operations to transfer the money or other services provided by anyone.

There is an ecosystem built around decentralized Finance (DeFi) with blockchain applications. It is a secure, transparent, and most importantly decentralized platform that is based on already existing decentralize financial tools like Ethereum with the help of applying smart contracts (Schär, 2021). The main issue for the potential users of smart contracts might be the security of them. There is always a possibility of criminality through the internet, which could be a possible threat for smart contract users as well (Fauziah et al., 2020). Because blockchain is not a limitless network, it cannot handle data endlessly and this might cause issues during the validation process if there is a disagreement between the peers. Therefore, it is important that the individuals taking part in the process must be certain that the deal will go through – as mentioned, it might cause issues and, in these cases, it will mean that the specific block within the chain will not process as it is meant to be (Fauziah et al., 2020). Alternatively, the data, terms of the contract, and the transaction in general are certain and impossible to exploit after the process has been carried out. This

is made definite throughout the already mentioned key features of the blockchain - transparency and documentation of the data. All the information is visible and there is a possibility to ensure every detail through the hash of the specific block that includes a timestamp and other information which could be used to examine the wanted information concerning, for instance, security (Fauziah et al., 2020).

One big question about smart contracts is whether they are legally comparable to other legitimate documents concerning any specific contract or transaction. As mentioned blockchain is transparent and any individual can see the information of the processes, but the smart contracts cannot be visually examined without the decryption codes that are only given to the parties taking part in the transaction procedures (Wang et al., 2019). They also state that the main problem is caused by the fact that the contract is based on a code, which means that there is always at least a minor security threat compared to a normal document. Concerning the rights of an individual European citizen, for example, there is a law which conditions that European citizens have the "right to be forgotten" i.e., RTBF and General Data Protection Regulation. It means that as a citizen of the European Union, an individual has a right to ask for their private information to be deleted from certain search engines or other databanks. If balancing this variable with the fact that the information recorded into smart contracts and therefore to the blockchain cannot be manipulated after the terms are met, it creates legal questions and other problems concerning the laws and the rights of individuals (Wang et al., 2019).

For SME's the main purposes of smart contracts could be implemented to the use of Supply chains and therefore to convert them into Smart Supply chains. For every international company that is trying to continue on achieving relevancy in the global market, the optimization of the supply chain is a major part of the process to gain financial advantage and in other words to create profitable business operations (Jacobs & Chase, 2014; Prause, 2019). According to the research Prause (2019) did, the combination of smart supply chains, smart- contract applications & also the features of Internet of Things could be creating possible resolutions concerning the general management of the cross-department management and the business aspects of the whole process. Therefore, the potential usage of these technologies with SME's would only add value to the already existing models of operations (Wong et al., 2020).

2.6 SME's and digitalization

According to The European commission (n.d.) SME's can be defined as companies with staff between 10 to 250 people, turnover of equal to 50 € million or less than that value and a balance sheet total of equal to 43€ million or less than that value. Approximately, 99 percent of companies inside of the EU are SME's. For the economy they have a crucial role, which is proved by the facts that they provide over 66 % of the total employment in EU, and over 50 % in both export and added value within the EU markets (Rotar et al., 2019).

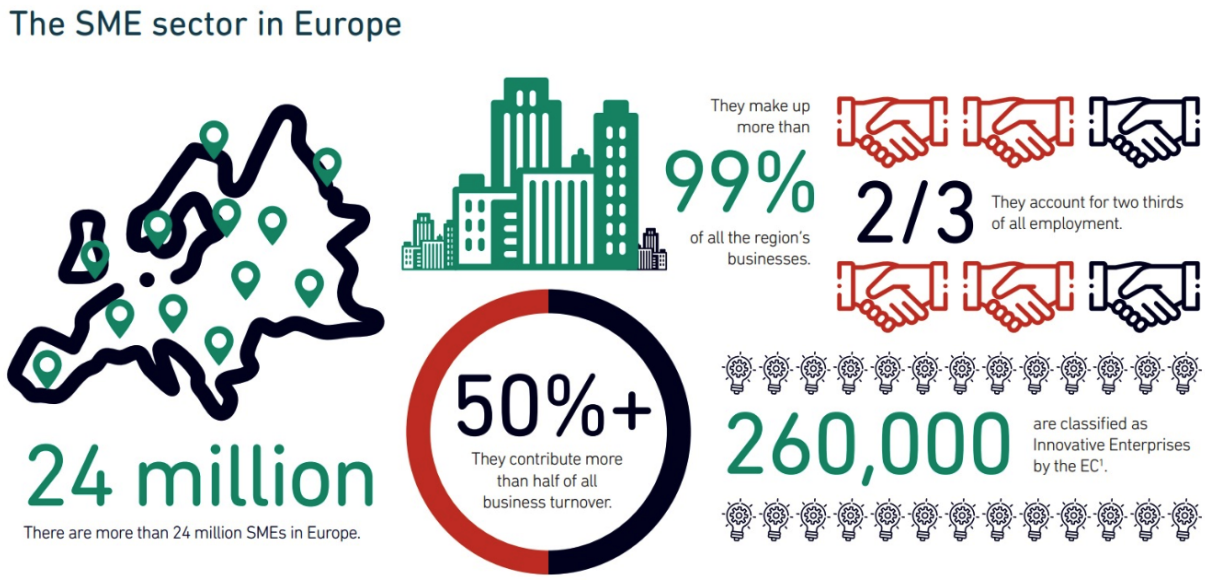

Figure 4 The SME sector in Europe (Rolfe, 2019)

The process about SME's we need to truly understand is digital transformation and the supporting actions within the whole activity. This phenomenon connects SMEs to our subject of futures of cryptocurrencies as the means of payments in international trade due to the general conversion of almost every function in the businesses to digital. Depending on the market the specific company is applying its operations in, digital transformation will take time and money. There are numerous variables affecting the number of resources lost or used in the process of digital transformation, because as already mentioned every situation is individual and therefore different. According to Ulas (2019), the process should not be used as only an opportunity to focus on updating software's or other digital tools but to remodel the previous business operations to adapt into the market with the help of digital factors and therefore generate a new business operation system.

Ulas (2019) introduced a list of major actors in the general process of digital transformation, which includes the following factors: Internet of things, 3D printing, robotics, AI, VR & AR, (cyber) security, blockchain, cloud computing, big data and nanotechnology. Main tools of digital transformation, specifically relevant to our research on the other hand are blockchain, (cyber) security, IoT and integration of software's.

Integration of the software's is the main process of digitalization and digital transformation. According to Ulas (2019) it includes the following steps:

1. Analysing - This phase includes the process of recognizing the objectives and practical operations are going to be changed and in which way. Ulas (2019) states that it is vital to define the goals and therefore set the digital business model what to follow.
2. Learning - After analyzing the new model - according to Ulas (2019) it is turned to set the new company culture that is based on learning. For instance, hiring consults or other subcontractors that have the ability to share knowledge about the process and softwares in use.
3. Strategy – Based on the statement by Ulas (2019) it can be assumed that the most important thing is to acknowledge the factual needs of the customers. What aspects of the operations are essential to reach customer necessities and still manage to go through the process of digitalization or digital transformation while keeping the operations rolling.
4. Awareness – According to Ulas (2019) after creating the strategy, the company needs to be aware of the practical things IT is going to change. For instance, in which way has the revenue been measured and stated before and therefore due to the new software or other tools, how it will be done now and by who.
5. Cooperation – Ulas (2019) states that there are various possible shareholders to help the companies in the process of digital transformation or digitalization. For example, Universities, startups or consults that have knowledge about the current and upcoming trends or operations can be hired to do research for them and then using their help – implement that information to the current plan.
6. Help – After cooperation there is always a possibility to get support. According to Ulas (2019) whether the problem is about investigation, the operations, strategy or any of the phases there are shareholders to help in these situations. Specific institutions can offer

their knowledge on various digital transformation issues and therefore execute these strategies with you.

As blockchain is basically the base of our research topic it is especially important to include it within the main tools of digital transformation and digitalization. As already explained previously, blockchain is a distributed decentralized ledger basically working as a databank. Blockchain can be used by SMEs to most importantly up the level of security concerning moving data or financial transactions (McDaniel & Nordberg, 2019). The point that is reached by using blockchain technology is again the ecosystem that is not centralized and therefore offers an opportunity for the shareholders to finish contracts that would include anything that was not agreed on beforehand, as mentioned before. McDanie & Nordberg (2019) state that it would be almost impossible to fabricate the information which is already entered into the blockchain and therefore it provides a perfect storage of information about anything related to the specific contract. Various intended purposes SMEs can have for blockchain concerning international trade are supply chain- and operations management due to the transparency and ability to store data in such sense (McDaniel & Nordberg, 2019). As stated by them as well, blockchain could be used as a tool to improve the velocity of transactions concerning money and the goods delivered.

Cyber security is one of the main aspects concerning internet related actions in general as we already mentioned before. To reach the wanted targets in any segment, whether it is productivity, speed or profitability after the process of digital transformation, the main variable is always data (Möller, 2020). Depending on the model of business the company is active in, with digital transformation it can be assumed that they operate through applications or platforms based on the internet. According to Möller (2020), the key is to make these tools used by consumers as secure as possible by working on continuous elevation of the application safety. This is also done by data security. In general, they are levels of quality to simply avert uncertified users like hackers for instance to get into the private servers. Eventually the task is to defend private data from any sort of deception (Möller, 2020). According to him as well, whether the security is concerning software's, applications, tools, information, or network the main point is the same: to prevent anyone from stealing data, unauthorized surveillance, or any other deception that would cause any harm for the specific company.

Internet of things (IoT) is a technology that generally makes it possible for different tools and applications to communicate with each other. According to Ulas (2019) IoT offers, everyday objects to have an IP-address and the ability to act as the receiver or sender of data. Therefore, they could be used to implement as sustainable business operations as possible by following emissions through various devices or infrastructures for example. A simplification of IOT is provided by Drishti IAS (2022).

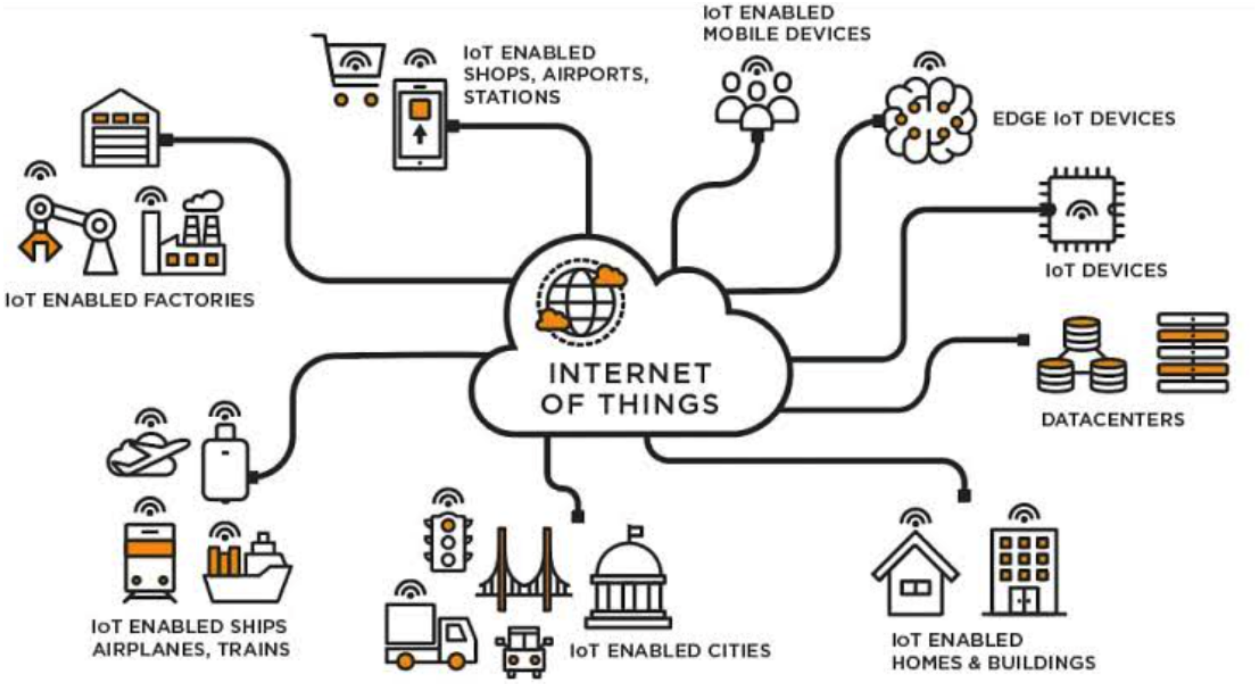

Figure 5 Internet of Things (Drishti IAS, 2022)

2.7 Summary of the information

Throughout the literature review we were able to find more relevant information and aspects concerning our research topic. The collected information in the literature review functions as the base for our entire predictive examination and therefore we can implement it to our research questions. According to the various sources used in the literature review, concerning blockchain, cryptocurrencies, IoT, digitalization and digital transformation the main aspects introduced were cyber security, transparency, sustainability, and the general efficiency of the technologies. For SME's the main pressure would be pushed to the management if the digitalization process would be taken into use and more specifically integrate the digital payment tools to the supply chain or financial operations.

As mentioned, the decentralized management within the ownership of these digital assets is the base of the entire innovation. According to Berentsen & Schär (2018), the potential is created through combining the aspects of normal virtual money and the independent process concerning the transaction between peers.

Regarding SME's the main points to understand were the actions within the whole activity of digital transformation or digitalization. Within individual enterprises, the use of cryptocurrencies as the means of payments in international trade would demand various processes to convert and adapt specific operations to match the new digital needs and objectives. The variety of change will determine the number of resources lost in the process of adaptation and the prevailing situation is different to every company. Ulas (2019) stated that the process of digitalization should be used to update the current business model and operations to adapt into the market in larger scale and not only to update practical tools like software's to gain the maximum advantage of the situation and resources.

Sustainability as a subject is very relevant and important also in the world of business. As said by Park & Li (2021) the actions to save and leave the environmental resources for the next generations is the key idea of it. One meter that was introduced is called the ESG (environmental, social and governance) and it can be used by companies to examine specific ecosystems, like the Ethereum (Brand, 2022). In this case, it means that when the sustainability aspect is taken into consideration through practical actions, it gives public companies also the possibility to examine these new technologies to work towards a better future.

So, when it comes to processes of digitalization, the considerable effects, and actions to be taken are completely independent between different enterprises. For this reason, our research is done by applying a predictive state of mind to examine as variable but relevant factors as possible.

3 Methodology

The methodology chapter explains the reasoning behind how the authors decided to conduct the research, how to collect data and how to analyze it. “The purpose of any futures exercise is to create a guiding vision, not a final solution or a limiting blueprint. It is proper, especially in an environment of rapid technological and hence social and environmental, change for visions of the futures change as new opportunities and problems present themselves” (Dator, 2019, p. 2). The aforesaid quote formed the basis of the methodological thinking process for the analysis. The objective is to map out possible outcomes for the phenomena and create a more solid basis for future research of the topic by the following research questions.

RQ 1. How have cryptocurrencies impacted the traditional financial system and what are the implications for the future?

RQ 2. What opportunities will small and medium sized enterprises gain if adopting the use of cryptocurrency?

3.1 Approach

As mentioned, this research is speculating the potential attributes of cryptocurrency and blockchain technology as the alternative tool used for transactions in the future. According to DeMatteo et al. (2010) the general meaning behind every research is to gain new information and answer any possible questions. As futures research, the idea is to examine the information gained from previous research done on the subject and the collected data to acknowledge what is the actual purpose and potential of these technologies in the sphere of business. DeMatteo et al. (2010) identifies the principles of methodology and design within the research to the following points:

1. Observation – It composes the idea of being open to ideas and seeking information from various sources that is relevant towards the research problem.
2. Empirical mindset – The main recommendation of this point is for the authors to be able to conclude justifiable and valid interpretations from several sources simultaneously.
3. Innovation – Finding creative ideas for the research process by internalizing valid methodology and research design that is based on accepted scientific concepts.

4. Logical progression – The research needs to possess a logical structure that supports the final objective of presenting the foundational results.
5. Appreciation of ethical principles – By adherence to ethical rules the work is more valid and reliable. Through this principle the authors will also ensure that their mindset is professional and responsible.

Due to the authors targeting findings that are based on futures perspective, they have applied an inductive research approach. According to Thomas (2006), inductive approach is valid for researchers that want to implement manageable processes to carry through qualitative analyses and therefore provide effective and simple reporting that targets to be useful and convenient in the future. Due to the general frame of mind concerning the futures research, this method is fitting for it, because it is endorsed to be used with research that includes specific categories and perspectives that fabricate the analysis in the end.

In his major study Duin (2006) identifies the standpoint of futures research as partially to be a form of investigation. It is not possible to predict the future indubitably, which means that the possible option is to gain knowledge about the prevailing situation and technologies as much as possible and create valid hypotheses and valuable propositions about the future. Therefore, the authors believe that by analyzing the qualitative data with predictive approach, this study will provide valuable insights through careful evaluation of it. The authors chose qualitative approach over quantitative, because they believe that before applying quantitative approach there is a need for a qualitative analysis to eventually gain enough knowledge on the research topic to figure out the most relevant segments to apply and seek the quantitative data from.

3.2 Collection of Data

Due to the nature of the research, a qualitative approach was determined to be the best for the study. The primary source of data was chosen to be gathered from structured and semi-structured interviews with experts to gain valuable information and to help understand the phenomenon better. Interviews were conducted mostly online and afterwards converted into a transcript text form. The profiles of the interviewees are presented in the figure below this paragraph presented in Table 1.

Table 1 Participation Segments

Code	Specialization and Category
I1	Cyber Security
I2	Cyber Security
I3	Banking
I4	Blockchain
I5	Finance

The authors determined structured and semi-structured interviews as the method for the study, because the methods are generally used in studies that analyses qualitative data. According to Sandelowski (1995), the specific technique allows the researchers to involve aspects like communication and creativity that eventually support the validity of the results from the readers perspective more importantly. When applying inductive research models, the data that is used in the analysis is vital to represent the information in a form that is as accessible and usable as possible to maximize the communication between the authors and the reader. The authors' objective was to get information from participants that have knowledge and experience from the area of cryptocurrency, blockchain, finance and/or cyber security. Due to the futures aspect of the research, it was important to have the option of asking additional questions if the answers would not have provided any further information and knowledge that would have been beneficial for the analyzing process.

In futures research, the objective is to provide as analytical and relevant information as possible, and therefore the results are not very specific. The advantages that the authors expected there to be due to the specific methodology are the abovementioned creativity and experimental aspects that in the end elevate the variability and relevancy of the results if utilizing the modularity of the provided information. In his major study Galvin (2015), identifies the quality of interview data with smaller number of participants to be more saturated and therefore also completely analysed,

which will reflect the concept of the entire research in a more understandable way. For that reason, the authors made the decision of interviewing a smaller group of participants that would represent particular segments of the research problem to provide data that is offered from various perspectives with relevant attributes, but in an understandable and manageable way.

The interviewees were provided with the questions and a brief introduction of the main idea of the research beforehand, to maximize the reliability and validity of the data to eventually reach trust between the interviewees and the authors. The validity of the participants was also tested by asking their knowledge about the general subject of the research - cryptocurrencies and/or blockchain.

3.3 Analysing the data

When analysing qualitative data over quantitative data, it is more complex, and it demands conclusions between different sources of information simultaneously. Most importantly the main operations are surrounding the predictive and acknowledging actions concerning the research problem (Jamieson, 2016).

To determine the stages of qualitative analysis which the authors have processed their data according to, Jamieson (2016), has created a paper which represents the phases in a clear way. It includes the five following steps:

1. Preparation of the data – This step composes the process of turning the gathered data into a form which is easier and clearer to handle with. The authors converted the interview data (questions, answers and participant profiles) into simplified tables for the idea of making it visible also for the reader to maximize the intelligibility of the work.
2. Examination of the data – After preparing the data into a form which is more handleable, it needs to be analysed and examined very carefully, but still in a general way as done by the authors as well. The advantage which the authors had in this phase is that there is two of them and therefore it increased the accuracy of the examination and decreased any bias.
3. Coding – Following the step of examination, the data needed to be coded. The authors linked steps 2 and 3 together, where they broke down the data very carefully by searching for connecting themes, words, and other relevant factors. As the authors have emphasized,

they had clear themes already planned in the beginning of the research process - cyber security, banking, blockchain and finance.

4. Inception of the themes – For this step the main purpose for the authors was to go deeper into the data and through the connecting factors make conclusions that attatch with the previous literature and research to eventually find relevant facts concerning the research themes.
5. Shaping the theory – By going through all of these previous steps the authors were able to finalize the themes and based on the analysed data, shape the base for the results and discussion chapters.

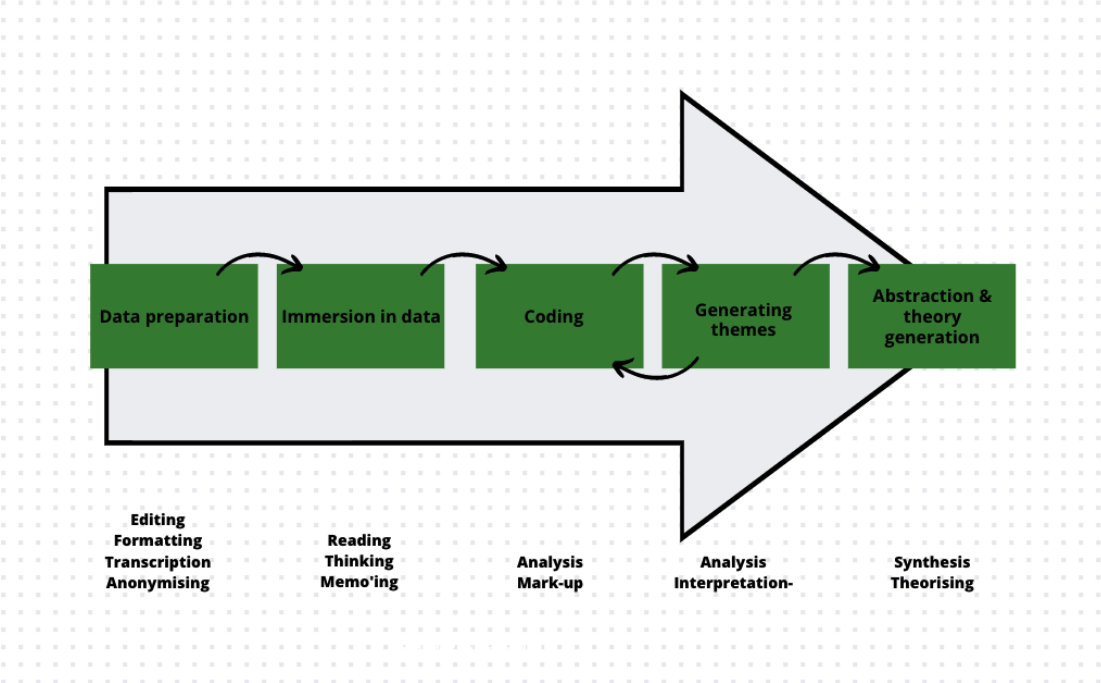

Figure 6 The process of qualitative data analysis. Adapted from How to analyse qualitative data by Susan Jamieson (2016)

3.4 Research validity

"Furthermore, qualitative research is conducted within a number of paradigms, or ways of understanding the nature of reality and knowledge, each associated with different ways of defining, understanding and reporting quality" (Bennet et al. 2020). To guarantee the trustworthiness of the

data within the qualitative research, the authors take account of the procession, analysis, and clarification of the information in every step.

Due to the research being qualitative futures research and the results being more predictive, speculative and explorative, it can be stated that the consequences of the study will be very minimal. All the questions were conducted in English, which was not the native language of three of the participants and neither the authors', which could have affected on the understanding of the questions and answers. In the end the process was painless and there was a common understanding between the respondents and the authors, which led to the successful collection of the data. As mentioned before, the authors held the option of making further questions if the quality of the answer would have not reached the wanted level concerning the general subject of the study. The data was analyzed from the written versions of the information produced by the participants in a careful combination of coding and examination as described in Figure 6. The answer and participant profiles are also attached in the research by the authors to create transparency and clarity between the reader and the researcher, in the hope of making the interpretation of the report more apparent.

The authors want to emphasize the importance of the literature review and the specific information gathered from it towards the complete process of the research. The extensive analysis of the literature review gave the authors knowledge that was the base of the creation of the research questions and problem. Thus, the author's objective was to create issues that would be relevant towards the already mentioned literature, but also respecting the perspectives that futures approach demands in correlation with the knowledge of the participants. They were determined to match the criteria which fits the research themes of cryptocurrencies, blockchain, finance and cyber security.

For the reason that cryptocurrencies are not assessed as mainstream assets and topics, they might create very different opinions and therefore the authors tried to find participants that would be in different age-groups and life-stages to collect variable thoughts that would offer most importantly, an interesting research. Two of the participants are set in the category of finance, two of the participants are set in the category of cyber security and one participant is set in the category of bank-

ing and all of them have the needed knowledge on the research subject. Authors wanted participants that would specifically have knowledge from the selected segments of cryptocurrency, blockchain, finance, banking and cyber security to gain opinions and thought-provoking information from these relevant areas to generate as variable, but qualitative results as possible.

4 Results

This specific section is used to represent the concluding findings of the qualitative and predictive research done through interviews. The authors' study aimed to find various perspectives and gain new insights from the participants' experiences and viewpoints regarding the research topic concerning cryptocurrencies and their implementation to business operations. Their attitudes, general thoughts and experiences brought up some of the themes they were anticipating for, which made the analyzing process more compelling. The authors hope that these themes together in equation with the literature review supplies a diverse, but understandable inspection of the entire phenomenon.

4.1 Research process

The authors objective during the process was to examine the research subject from different angles and therefore hear from various perspectives to gain versatile knowledge. In order to reach that objective, the authors have structured the interviews around specific themes concerning the areas where the interviewees are specialized in. The main themes were the following:

1. Cyber security
2. Banking
3. Blockchain
4. Finance

As mentioned, the interviewees were selected by the authors according to their area of knowledge and the predicted value their answers would bring to the research. In view of the fact that that the entire research is more in the area of predictive analysis, due to the aspect of speculating the state of future implementations concerning cryptocurrencies and SMEs, the authors had to emphasize this particular characteristic to the interviewees carefully to get as relevant data as

possible. The number of questions were narrowed down to maximize the quality over quantity of data on every theme during the interviews, which were composed according to the research methods between semi-structured and structured models. The authors identified the research questions that were selected in the beginning of the process and to which they wanted answers for. The research questions are supported by the general objectives, literature review and knowledge used in the study to generate a comprehensible package. Authors determined the most valuable interview format after analyzing the research questions, objectives and literature review. In correlation with the interview format, they had to generate the questions for the interviewees while taking those previously listed themes, objectives and other aspects into consideration. The key with the questions was not to lead the participant into any biased responses, but just to get relevant data that has value for the specific research questions. Below this paragraph you can see the specific questions asked from the interviewees in Table 2.

Table 2 Interview questions

Code	Category	Interview Questions
I1	Cyber Security	1. Do you see any future possibilities for cryptocurrencies to be more mainstream or even on the level of traditional money and transactions? 2. From the experience of your profession, what are the risks or cyber security threats concerning these technologies in your opinion? 3. In your opinion, can the replacement of traditional financial tools with cryptocurrencies make the transactions between companies more secure?
I2	Cyber Security	1. Do you see any future possibilities for cryptocurrencies to be more mainstream or even on the level of traditional money and transactions? 2. From the experience of your profession, what are the

		risks or cyber security threats concerning these technologies in your opinion? 3. In your opinion, can the replacement of traditional financial tools with cryptocurrencies make the transactions between companies more secure?
I3	Banking	1. Do you see any future possibilities for cryptocurrencies to be more mainstream or even on the level of traditional money and transactions? 2. Do you see any potential benefits companies could gain from adopting cryptocurrency? 3. What challenges might the adaptation of cryptocurrencies create?
I4	Blockchain	1. Are there advantages if companies would use crypto over traditional money and transactions? 2. What kind of companies would benefit most from the adopting of cryptocurrencies? (Small, medium, big?) 3. Are there any possible challenges the adaptation of cryptocurrencies might create for those companies?
I5	Finance	1. Do you see any future possibilities for cryptocurrencies to be more mainstream or even to match the level of traditional money and transactions? 2. Are there any potential financial advantages for individuals or companies to start using crypto over traditional money and transactions? 3. What financial challenges might the adaptation of cryptocurrencies create for individuals or companies?

From the Table you can see in which methods the authors used to categorize the interviewees and the themes of the questions asked from each participant. The entire process of data analysis was set up by reading the interviews, and carefully categorizing the participants. After, the authors started to connect the themes of the research to the answers and started the operation of pre-

fitting the data to the specific research questions, thus examining the equation of validity and relevancy of the information.

As mentioned in chapters before, the authors operated using a comparative analysing method for the interview data. According to the steps listed in Figure 6, the authors broke down the data by preparing the information into a version that was more in a manageable form that can be seen above. Then the process continued by re-reading and examining the information more carefully, but still in quite general terms to create a base for the next stage. Then the authors combined the phases of coding and analysis together to go through the gathered data in a very careful way to eventually shape the theory and research perspectives together, which ended up forming to map out possible outcomes for cryptocurrencies being the new possible transaction tool for companies and create a more solid basis for future research of the topic in general. Following that, the authors extracted citations that were considered as most relevant without focusing on the specific theme this participant was representing in Table 3.

Table 3 Extracted citations

"Crypto market is way too volatile, creating a financial risk to transactions"	*"no price stability in an unstable currency."*
"Conventional currency is and will remain the mainstream of financial transactions between corporations"	*"how money laundering can be controlled when cryptocurrency is used"*
"Cryptocurrencies will remain a fringe market in terms of financials, at least in the short term (5-10 years)"	*"the biggest advantage for companies to use crypto over traditional transaction methods is the lack of a third party in control"*
"Market volatility for crypto is a huge risk"	*"there is less confusion about transaction records and everyone will be able to see the exact same record"*

"Traditional banking transactions are secure enough - blockcchain does not add security"	*"all companies will benefit from cryptocurrencies because all companies will be able to reduce their costs.*
"increasing adoption and acceptance of cryptocurrencies by both individuals and institutions."	*"they can send money instantaneously with very little service charges, thereby reducing their time cost and money cost."*
"as more people begin to use cryptocurrencies for everyday transactions and more businesses accpet them as payment, they will become more integrated into the global economy.“	*"biggest challenges for companies to adopt cryptocurrencies is regulation"*
"This is already evident in the adaptation of cryptocurrencies in e-commerce stores, where you might frequently find the option to pay the vendor using cryptocurrencies.”	*"if authorities do not figure out a proper way to tax cryptocurrencies, then the companies that use them will also face tax repercussions"*
"It is crucial for the cryptocurrency industry to develop robust regulatory frameworks, address security vulnerabilities and mitigate price volatility."	*"cryptocurrencies becoming insured if a large exchange, like FTX goes bankrupt customers still are entitled to some if not all their money back"*
"risks and threaths associated with cryptocurrencies stem from having digital wallets storedon online exchange platforms.”	*"who start using crypto over traditional money and trasnaction methods is that they'll be ahead of everyone else"*

"high degree of vulnerability to malicious actors"	*"Individuals and companies can look at it as an asset, with a growing value"*
"significant threats is the potential for hacking and theft of cryptocurrencies"	*"advantage would be that it's technically inflation protected"*
"resulting in significant financial losses for individuals and businesses alike."	*"transactions cannot be reversed if wrong payments are made"*
"blockchain techniology has the potential to revolutionize many industries beyond finance."	*"crypro wallets are not insured"*
"transparent, secure, and decentralized systems could be applied to everything from supply chain management to voting systems"	*"how transactions will be conducted and to ensure secure transfers of payments"*
"has the potential to significantly increase the safety of transactions between comapnies"	*"security risk, if a crypto wallet gets hacked or just lost then you'd lose everything you have in it"*
"increased security that comes with the use of cryptographic protocols"	*"I don't see an advatage for companies to adopt it."*
"smart contracts can automate the execution of contractual terms and conditions, reducing the risk of errors and fraud in transactions"	*"I don't think it will be mainstream for a long time"*

"vulnerable to attacks and scams"	*"crucial to implement strong security protocols and adhere to best practises to mitigate these risks"*

In the previous table it can be seen how the relevant themes were shaping from the interviews. Following that step, now every topic has value in terms of addressing research problems and tackling them from various perspectives. In the section that follows, specific findings are listed in relevant categories (cyber security, finance, banking, and blockchain) with a colour representing the particular code (I1 = Red, I2 = Green, I3 = Yellow, I4 = Blue, and I5 = Purple). The idea of this section for the authors was to find the connecting themes between the statements, generate a list of factors which are repeated the most and therefore assemble the principal components for further speculation, but also this time to focus on the expertise in Table 4 below.

Table 4 Principal statements

Cyber security	"Blockchain does not add security"
	"vulnerable to attacks and scams"
	"there is less confusion about transaction records and everyone will be able to see the exact same record"
	"cryptowallets are not insured"
	"security risk, if a crypto wallet gets hacked or just lost then you'd lose everything you have in it"
	"crucial to establish and adhere to strong security protocols"
	"how transaction will be conducted and to ensure secure transfers of payments"
Banking	"Traditional banking transactions are secure enough "
	"The biggest advantage for companies to use crypto over traditional transaction methods is the lack of a third party in control"
	"As long as cryptocurrency is not issued by the central bank and is not an official means of payment, I don't see an advantage for companies to adopt it."
	"Cryptocurrency cannot replace money and I don't think it will be mainstream for a long time"
	"the company can fully manage their money on their own without a third party such as a bank that gets to control it"
	"many cases around the world now where banks have become politicized and therefore can work with government to block access to banking and payment channels for businesses and this is a great concern for businesses and crypto can provide them with a solution to the problem"
Blockchain	"Blockchain does not add security"
	"smart contracts can automate the excecution of contractual terms and conditions, reducing the risk of errors and fraud in transactions"
	"I don't think it will be mainstream for a long time"
	"they can send money instantaneously with very little service charges, thereby reducing their time const and money cost"
	"The ability to create transparent, secure, and decentralized systems could be applied to everytinh from supply chain management to voting systems"
	"Crypto is built on the technology of blockchain, which is a public ledger that every person can access, there is less confusion about transaction records"
Finance	"Crypto market is way too volatile, creating a financial risk to transactions"
	"Conventional currency is and will remain the mainstream of financial transactions between corporations"
	"Cryptocurrencies will remain a fringe market in terms of financial, at least in the short term (5-10 years)"
	"increasing adoption and acceptance of cryptocurrencies by both individuals and institutions."
	"no price stability in an unstable currency"
	"how money laundering can be controlled when cryptocurrency is used"
	"The biggest advantage for companies to use crypto over traditional transaction methods is the lack of a third party in control"
	"all companies will benefit from cryptocurrencies because all companies will be able to reduce their costs"
	"I don't see an advantage for companies to adopt it"
	"Companies I deal with (banking, insurance, manufacturing, MSP etc.) simply do. Not use cryptocurrencies in any transactions."

Word cloud was also created by the authors based on the interviewee data that represents the main variables concerning the research topic of cryptocurrencies and blockchain technology that came up during the process the most (Figure 7).

Figure 7 Word cloud based on answer data

Based on previous research on word clouds conducted by Heimerl et al. (2014), the tool is surprisingly capable of assembling very relevant information, if supported with unifying factors between the visual instrument and the research. The smaller the font of the word is, the less times it was mentioned in the answer data and vice versa.

The themes that were repeated the most were cryptocurrencies, security, transactions, and companies. Following that stage, the authors can note that these themes are directly in correlation with the research segments that were used as the categorizing tools for the participants. This statement is supported by the relevant citations from the answer data seen above in Table 4. Due to the futures perspective of the research, the participants were capable of offering their free opinions obviously in the terms of the interview questions. The authors' objective was to find various ideas on the implementation of cryptocurrencies as terms of financial tools in correlation with the risks, possibilities, and themes showcased in the interviewee questions in Table 1.

4.2 Potential capabilities of cryptocurrencies and blockchain technologies

The backgrounds of the participants were regarded as important attributes when collecting the information, since the analysing of the data is strongly dependent on variable experiences and opinions to build a relative predictive report on the subject. The main objective of the collection of the data for the authors was to gain knowledge from various perspectives that were related to the research topic. Thus, the authors did not care about the category of the participant when analysing the information in the beginning of the process to avoid any bias. In this way, the authors hoped to maximize the experimental mindset that would offer predictions and be visible in correlation with the provided suggestions as well.

After the data collection, the authors found that the main advantage of the technology that was shared between the participants is the long-term potential of it ("C*ryptocurrencies will remain a fringe market in terms of financials, at least in the short term, 5-10 years" - Int.1; "I think that the potential financial advantages individuals or companies who start using crypto over traditional money and transaction methods is that they'll be ahead of everyone else for adaptation and the transition" - Int.5).* The aspect of potential for cryptocurrencies and blockchain was also presented in more concrete way with implementing it into business operations ("*it is important to note that the underlying blockchain technology has the potential to revolutionize many industries beyond finance. The ability to create transparent, secure, and decentralized systems could be applied to everything from supply chain management to voting systems"* - Int.2).

Participants described the company's ability of controlling its finances as one of the potential capabilities ("*the biggest advantage for companies to use crypto over traditional methods is the lack of a third party in control*" - Int.4; *"the company can fully manage their money on their own without a third party such as a bank that gets to control it."* - Int.4). Following those valuable perspectives was the adaptation of smart-contracts and blockchain applications as means of contracts concerning financial transactions, that would allow the companies and individuals to make quicker and safer payments in comparison to standard money and transactions ("*smart contracts can automate the execution of contractual terms and conditions, reducing the risk of errors and fraud in transactions*" - Int.2; "there is less confusion about transaction records and everyone will be able to see the exact same record" - Int.5; *"cryptocurrencies to offer advantages over traditional forms of money, such as faster and more secure transactions, lower fees, and greater privacy"* - Int.2).

The business aspect of the research was an important part of the analysing process. Because the authors did not want to make the questions too broad, they had to implement the SME aspects to the given data and make conclusions based on the combination of literature, predictions and the answers of the participants that included knowledge on companies ("many cases around the world now where banks have become politicized and therefore can work with government to block access to banking and payment channels for businesses and this is a great concern for businesses and crypto can provide them with a solution to the problem" - Int.4; "*I believe all companies will benefit from cryptocurrencies because all companies will be able to reduce their costs. This is because right now all companies either have to rely on traditional banking payment channels like SWIFT or third-party payment channels like Visa or PayPal" - Int.4).*

The information that was gathered from the respondents was versatile, and relevant towards the research subject. Blockchain's attributes concerning the safety and speed of transactions was recognized as one of the main elements within the company environment ("*The businesses incur costs on time and money but with cryptocurrencies, they can send money instantaneously with very little service charges, thereby reducing their time cost and money cost"* – Int.4; "*The use of cryptocurrencies, especially blockchain technology, has the potential to significantly increase the safety of transactions between companies." - Int.2).*

4.3 Challenges and disadvantages of the technologies

After the data collection, the authors found that the main issue between all the participants was the safety of the technology, whether it was concerning financial, cyber security, blockchain, or banking aspects. The participants stated that the normal financial tools and monetary systems are good enough, without any specific reasons to convert them into cryptocurrency and blockchain based models ("*Traditional banking transactions are secure enough - block chain does not add security, but merely creates an artificial limit to cryptocurrency numbers, which is in a large part designed to hold the value of the cryptocurrency"* - Int.1; *"As long as cryptocurrency is not issued by the central bank and is not an official means of payment, I don´t see an advantage for companies to adopt it"* - Int.3; *"Financial risk associated with cryptocurrencies far outweighs any perceived security benefit from using cryptocurrencies"* - Int.1; "*Disadvantages would have to be a security risk, if a crypto wallet gets hacked or just lost then you'd lose everything you have in it" - Int.5).*

The issues surrounding the general security of the wallets, exchanges, and ecosystems was listed as one of the possible obstacles ("*Yes, I think that cryptocurrencies could become mainstream once some of the issues are resolved, i.e. cryptocurrencies becoming insured if a large exchange, like FTX, goes bankrupt customers still are entitled to some if not all their money back" - Int.5; "Along with unlike traditional money and transactions with bank accounts, crypto wallets are not insured" - Int.5; "*As with any digital technology, cryptocurrencies are vulnerable to attacks and scams" - Int.2). Additional obstacles were listed as legal concerns surrounding the process of owning crypto assets and implementing them to the business operations ("*Obviously, if the government of the country that the business is operating in declares cryptocurrencies as illegal, then the business will now own an illegal item which can cause serious legal repercussions" - Int.4; "Also, if authorities do not figure out a proper way to tax cryptocurrencies, then the companies that use cryptocurrencies will also face tax repercussions that can affect their business" - Int.4).* The legal aspect is one of the aspects that the authors wanted to go deeper into, but the knowledge base of the participants and the authors is not on the needed level. Therefore, it will be handled further in the discussion chapter.

On individuals level, the authors found a pattern of vulnerability and cyber security being the main concerns in the thought of implementing cryptocurrencies ("As with any digital technology, cryptocurrencies are vulnerable to attacks and scams" - Int.2; "The most severe attacks occur when threat actors exploit and penetrate exchanges and the wallets that are stored in them to steal digital currencies, resulting in significant financial losses for individuals and businesses alike" - Int.2). Authors noticed that these cyber security threats were a common trend in the answer data, which also made the respondents to provide solutions and ways to prevent the already mentioned issues ("Therefore, it is crucial to implement strong security protocols and adhere to best practices to mitigate these risks" -Int.2; "*Therefore, it is crucial for the cryptocurrency industry to develop robust regulatory frameworks, address security vulnerabilities, and mitigate price volatility in order to gain wider acceptance and adoption" - Int.2).* The authors also want to emphasize the diversity of the opinions and perspectives made by the participants (Figure 8).

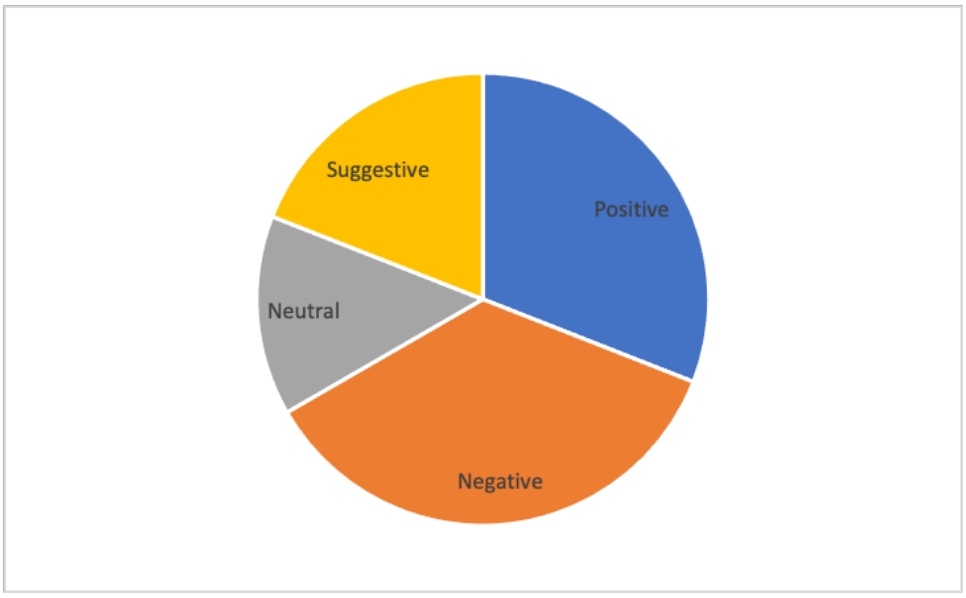

Figure 8 Distripution of opinions based on the answer data

5 Discussion & Conclusion

The chapter of discussion and conclusion associates the eventual findings of the qualitative research conducted through the interviews with the analysis of the entire process. This chapter is used to discuss the meaning of our study, highlighting the principal themes, and apply them to the research questions and objectives we provided in earlier parts. We also try to supply insights into the practical implications of the findings for future research that would be done in quantitative methods. In general, our study contributes to the existing knowledge on our research topic and provides qualitative predictions though the participants' perspectives and experiences. Our study was limited, which we acknowledged and therefore we issued recommendations and suggestions for the potential future research we have in our mind. In the end of the chapter, we have provided a summary of our main findings and their significance highlighting the predictive perspective to again, make the future research more relevant and called for.

5.1 Ethics

"Qualitative authors focus their research on exploring, examining, and describing people and their natural environments. Embedded in qualitative research are the concepts of relationships and power between authors and participants" (Orb et al. 2001, 93).

The trust between the authors and the participants is an outstanding part of the entire process of the research. The objective of applying and respecting the ethical guidelines is to generate research where the answers are clear, information is correct, and the participants can trust the confidentiality aspect of the authors. The participants were informed that their answers would stay anonymous, and that their profiles would only include the category which was determined by the authors. Their anonymous profile is guaranteed, and their answers are stated as they provided them without interpreting the process of answering. As also mentioned above, the authors held an option to change the structured interview model into semi-structured and add questions if the quality of the data would have not reached the wanted or needed level, but the authors felt like this was not needed. The participants were completely voluntary after the authors asked the specific respondents if they would be open to take part in the research process, which made the collaboration very straightforward and prompt. The factors that might have affected the general quality of the answer data and research process are going to be provided in the upcoming chapter of research quality.

5.2 Answering the research questions

The author's main objective was not to find a specific result, but to gain new knowledge through a process of predictive analysis as mentioned several times before. They created two research questions that both generated versatile, but relevant thoughts due to different backgrounds and experiences concerning the global extensive equation of technologies, business, finance, economics, banking, cryptocurrencies, blockchain and cyber security. According to the analysis of the data, the opinions and mindsets surrounding the technologies and ecosystems are varying a lot, which was also expected by the authors in their hypothesis. This particular quality of the data was looked for and as a consequence it makes the presentation and examination of the findings more thought-provoking.

The first research question (RQ1) was: *Have cryptocurrencies impacted the traditional financial systems and what are the implications for the future?*

After the analysis of the data, it can be stated that cryptocurrencies have not made a substantial impact on the traditional financial systems at this point of time. The potential of cryptocurrencies and blockchain is evident, but the development of those technologies is figuratively still staying on

its own lane with users like early adaptors and innovators concerning the big image. Based on the statements done by the participants and the information gained from the previous literature (presented in the literature review), the authors can conclude that the technologies have both immersive possibilities and amendment threats that thusly could create an outcome that would be ambivalent and consequently, conduct to a feeling of contradictory still at the moment. The use of these technologies is still more on the investment aspect rather than offsetting normal transactions and money. According to the data analysis there are companies that use the applications mentioned as alternative transaction tools, and the choice of using the method is given to the consumer.

The adversities of the technologies are mainly caused by the factors of cyber security and financial risks, as well as the general viewpoint of why converting the financial operating systems if they work well enough. Authors conclude that the viewpoint is generated through the novelty of the technologies and the process of adaptation they would demand regarding the financial operations of companies of all sizes and market positions.

When authors compared the positive citations to negative ones, the security aspect was mentioned the most in both potential advantages and disadvantages for the adaptation of the technologies. Based on the previous literature the authors compared the data to it and as a result, the general safety of the technologies could be asserted as the main theme of the research at this point. Whether the attributes of the technology would be about individuals or company's possibilities, as abovementioned the general safety would be seen as capacities to develop the financial operations, but also simultaneously create a certain figure of threat.

According to the previous literature and data analysis the authors can make a conclusion that company's future implications would be surrounding the operations of adapting the technologies in early stages of business. In general, the idea would be that for smaller and medium sized companies (start-ups) in their earlier stages it would be easier to adapt these technologies to more specifically replace the normal transactions and usage of financial tools. The authors believe that this sort of invigoration is demanded to begin the process of elevating usual transactions and other financial operations, which would not be possible by only using the currencies for investing purposes. For SME’s that have functional operations with traditional financial operations and have

been running for a longer period, the authors believe that the cleverest way would be to invest into these technologies, and simultaneously slowly drive the adaptation process step by step. For instance, companies could offer the consumers options to pay for their services or products with cryptocurrencies, but the full adaptation process would probably take too many resources in terms of time and money. Therefore, based on the previous literature and data-analysis, the authors can conclude that the full adaptation process would include too many risks if it would be done too quickly with companies that have been functioning for a longer time. Mainstream usage of the technologies will build up towards the future in correlation with the creation of new companies and therefore potential of the technologies is unnecessary to deny. To revolve on the research materials the authors strongly believe that the regeneration process of the financial systems to cryptocurrencies and blockchain based applications will generally be more in use in 5 to 10 years.

The second research question (RQ2) was: *What opportunities will small and medium sized enterprises gain if adopting the use of cryptocurrency?*

For SME's that seek to adopt the use of cryptocurrencies and blockchain, the process demands a careful evaluation of what they want to develop within their operations. As the authors mentioned above, to renovate and elevate the normal financial tools and transactions it requests startups to adopt cryptocurrencies into their financial operations directly from the beginning.

Based on the previous literature and data-analysis, the authors can determine attributes like international trade and business operations to be the aspects vitally affecting the mainstreaming of these technologies and also regenerating the current financial transactions and tools. One of the positive attributes that came up several times during the data-analysis was the combination of the velocity with transactions and no third-party involvement. According to the data analysis and literature review, international transactions between companies take longer which is eventually caused by the third-party involvements of banks. This would be solved by the usage of peer-to-peer cryptocurrencies that would complete the processes in fraction of the time done through third parties. Other potential use than financial tools, offers the technology of blockchain ("The ability to create transparent, secure, and decentralized systems could be applied to everything

from supply chain management" - Int.2) that locate around the operation management tools like supply chains and data management.

The authors believe that to acquire the full potential from the adaptation process of these technologies, the enterprise should start to acquire them from the creation of the company functions and integrate them into the financial activities during the first years of business. If the company does international trading that includes transactions between nations, cryptocurrencies give the benefit of faster money movement between countries, due to the peer-to-peer attribute that deletes the third-party involvement from the process which has been explained before several times. As Even though the technologies bring benefits of velocity, they obviously include security threats like any other services that are based on the internet. Authors also want to notify that according to the literature review, and interview data the blockchain technology offers very secure base for business functions that can be maximized by careful security arrangements ("Therefore, it is crucial to implement strong security protocols and adhere to best practices to mitigate these risks" - Int.2).

5.3 Practical implications

In general, the quickly developing technology and the tools it provides are part of the lives of people today whether they wanted so or not. Therefore, the digitalization of societies adds to the need for speed of networks, transactions and data movement progressively. Companies and individuals are continuously looking for solutions that would elevate the business operations or factors that in general would make their lives easier in some way. Due to the narrow number of participants, the true potential of the technologies in business operations would require quantitative research from various industries to eventually reach a better understanding of the state of it as well.

Based on the data analysis, the authors strongly believe that the particular technologies will be at least used in correlation with the current financial transactions and tools. Concerning the hypothetical potential of cryptocurrencies and blockchain which was introduced already in the Gartner's hype cycle (Figure 3), the companies of any size will in some way try to include them to their business operations regarding operations management, data storage or eventually financial tools as well with the abovementioned timeframe of 5 to 10 years in mind. The attitude of innovation

would be considered to be one of the key attributes of an enterprise today, which the specific technologies would support very well by recharging the current possibilities with attributes of velocity, safety and technological advantage. As the authors already mentioned, the regenerative effect would be reached after all of the new companies founded would automatically start to use these technologies as the base for their operations. Therefore, the former companies that have not followed the unfolding trends would now need to begin the adaptation process, which again would possibly slow down all the other current business operations, give the advantage to the new companies and therefore the cycle would be ready.

5.4 Research limitations

To ensure the quality of the research, the authors have included a tool of referential adequacy into the operations of the data analysis. The authors mentioned that in the beginning of the data analysis process they identified relevant lot of the answer information but did not focus on the specific categories of the respondents to eliminate any bias caused by those factors. Following that step, the authors conducted the analysis process on it to generate the main findings and then divided the citations and data into the colored segments to finalize the process. “These recorder supportive materials provide a form of standard against which later data analyses, interpretations, and conclusions (i.e., the critiques) could be assessed for adequacy” (Lincoln and Guba, 1985, as cited in, Leech and Onwuegbuzie, 2007).

In general, the answers and opinions of the participants were variable, but the quality of them still stayed on a good level. The authors inspected the problem from explorative and predictive perspectives, which the answer data gave an adequate opportunity to. The variety of the data makes the business application inspection a bit more difficult for the authors, and therefore they want to emphasize again the predictive perspective of the research objectives. According to Duin (2006), futures research cannot make a final closure between the subjects dealt with, but the authors need to provide continuous innovation analysis within the result process, that includes predictive analysis based on conclusions between previous literature, answer data, and knowledge gained from the investigation.

To ensure the interviewees' anonymity, the authors could not provide more details about their detailed experience due to also the ethical and confidentiality basis. The authors provided information that proves the relevancy of the participants' answers and the valuable data they provided for the research. As stated before, the authors segmented the contributors to specific categories to support the validity of the data and quality of the research, but still not giving any other information about their profiles. In this way the authors wanted to give the reader some tools to understand the given information even more.

As mentioned above, the author's objective is to continue the research by applying quantitative research methods to the problem as well as qualitative to gain data which would be further comprehensive and very well founded. Taking into consideration the amount and quality of the information, the researcher's goal of providing experimental and predictive acknowledgements that are stated based on the answer data, literature review and conclusions done between the authors was successful. Obviously, the authors wished to include aspects like law in the research subjects but could not provide any information from those due to the lack of knowledge and participants. In general, the authors believe that the quality of the research is on a good level, but the main problem would be the lack of segmentation within the examination which is targeted to be improved in the potential following research.

For this qualitative research the predictive and explorative type limits the trustworthiness of the "results" provided by the authors and therefore it was emphasized by the authors several times during the reporting period to cut any confusion from readers. Obviously, when the number of participants is lower, the precision of predictions is also lower and might not provide any results that would arise in the future, which is also caused by prompt technological development in general.

5.5 Suggestions for future research

The technologies of cryptocurrencies and blockchain are still proportionally fresh in the mainstream circulation, which means that there are several potential research topics around the subject. In general, they can be implemented to any industry that demands data storaging, transactions, or operations managament. This research aimed to create predictive analysis on the potentiality of cryptocurrencies as the means of payments between businesses in international

trade, which the authors believe that the following areas for future research will elevate the quality of analysis on the topic.

Authors have been maintaining the subject of security being the most valuable research topic for the future of this area. More specifically the authors believe that even before predicting the future opportunities, the situation of how the security and general safety of the technolgies for the progressive need and usage of them will be added and therefore guaranteed. How the usage of cryptocurrencies and blockchain technologies would generate more secure financial systems between companies and individuals; to this extent, is the adaptation process already in progress. Because, this research aimed to create a predictive analysis regarding the possible usage of cryptocurrencies and blockchain technologies in the future, the following one should be executed in quantitative manner to gather data which would be based on wider scale of experts and industries. If the aspects of security, regulations, scalability, volability, coaction and adoptation would be added to the themes of the research, the general quality of the information provided would be elevated considerably.

As mentioned above, the technolgies are quite fresh which means that the laws and or regulations around them could be considered as temporary and the knolwedge of how and in which ways will they be regulated in the upcoming years are questions without answers at the moment. Therefore, the payments between companies using these technologies should be done to be as safe and secure as possible, which would also be supported by the proper scalability of the cryptocurrencies and blockchain technologies as well. When the added usage of these technologies will be actually topical, the networks have to successfully process more and more transactions and data, which eventually could slow down the capabilities and positive attributes of the tools. Thus, the following 5 to 10 years will hopefully provide information that will show what is the following stage for these technologies.

References

Abdulsaleh, A. M., & Worthington, A. C. (2013). Small and medium-sized enterprises financing: A review of literature. International Journal of Business and Management, 8(14), 36. https://www.researchgate.net/publication/288075194_Small_and_Medium-Sized_Enterprises_Financing_A_Review_of_Literature

Berentsen, A., & Schär, F. (2018). The case for central bank electronic money and the non-case for central bank cryptocurrencies. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3194981

Brand, T. (2022). Mitä the Merge tarkoittaa https://osf.io/qn43t

Bylund, A. (2022) *Process of blockchain* https://www.fool.com/investing/stock-market/market-sectors/financials/blockchain-stocks/what-is-blockchain/

Choo, K. K. R., Ozcan, S., Dehghantanha, A., & Parizi, R. M. (2020). Blockchain ecosystem—technological and management opportunities and challenges. *IEEE Transactions on Engineering Management*, *67*(4), 982-987.https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=9226671

CoinMarketCap (n.d.). *Total cryptocurrency market cap* https://coinmarketcap.com/charts/

Dedehayir, O., & Steinert, M. (2016). The hype cycle model: A review and future directions. *Technological Forecasting and Social Change*, *108*, 28-41. https://eprints.qut.edu.au/221181/1/95588.pdf

De Vries, A. (2023). Cryptocurrencies on the road to sustainability: Ethereum paving the way for Bitcoin. *Patterns*, *4*(1). https://www.cell.com/patterns/pdf/S2666-3899(22)00265-3.pdf

Duin, P. A. (2006). *Qualitative futures research for innovation*. Eburon Uitgeverij BV. https://www.researchgate.net/profile/Patrick-Duin/publication/272477777_Qualitative_futures_research_for_innovation/links/54e4b4ca0cf22703d5bf23f2/Qualitative-futures-research-for-innovation.pdf

Drishti IAS (2022) Internet of Things. *Securing Internet of Things* https://www.drishtiias.com/daily-news-analysis/securing-internet-of-things/print_manually

European commission. (n.d.). *Internal Market, Industry, Entrepreneurship and SMEs https://ec.europa.eu/growth/smes/sme-definition_fi*

Fauziah, Z., Latifah, H., Omar, X., Khoirunisa, A., & Millah, S. (2020). Application of blockchain technology in smart contracts: a systematic literature review. *Aptisi Transactions on Technopreneurship (ATT)*, *2*(2), 160-166 https://media.neliti.com/media/publications/369961-application-of-blockchain-technology-in-405e965d.pdf

Frankenfield, J. (2022-2023). What is Proof of Work in Blockchain? 2022-2023, Investopedia https://www.investopedia.com/terms/p/proof-work.asp

Galvin, R. (2015). How many interviews are enough? Do qualitative interviews in building energy consumption research produce reliable knowledge?. *Journal of Building Engineering*, *1*, 2-12. https://journals.sagepub.com/doi/pdf/10.1177/1049732316665344

Gartner. (n.d.) *Gartner Hype cycle.* https://www.gartner.co.uk/en/methodologies/gartner-hype-cycle

Groopman, J. (2021, June). Permissioned vs permissionless blockchains: Key differences 2021, Kaleido Insights, https://www.techtarget.com/searchcio/tip/Permissioned-vs-permissionless-blockchains-Key-differences

Hamrick, J. T., Rouhi, F., Mukherjee, A., Feder, A., Gandal, N., Moore, T., & Vasek, M. (2021). An examination of the cryptocurrency pump-and-dump ecosystem. *Information Processing & Management*, *58*(4), 102506.https://discovery.ucl.ac.uk/id/eprint/10133232/1/SSRN-id3303365%20%281%29.pdf

Heimerl, F., Lohmann, S., Lange, S., & Ertl, T. (2014, January). Word cloud explorer: Text analytics based on word clouds. In *2014 47th Hawaii international conference on system sciences* (pp. 1833-1842). IEEE. https://web.archive.org/web/20180724060729id_/https://ieeexplore.ieee.org/ielx7/6751593/6758592/06758829.pdf?tp=&arnumber=6758829&isnumber

Jacobs, F. R., Chase, R. B., & Lummus, R. R. (2014). *Operations and supply chain management* (pp. 533-535). New York, NY: McGraw-Hill/Irwin. https://d1wqtxts1xzle7.cloudfront.net/54938663/jacobs14e

Jamieson, S. (2016). Analyse qualitative data. *Education for Primary Care*, *27*(5), 398-402. https://eprints.gla.ac.uk/129830/1/129830.pdf

John, K., O'Hara, M., & Saleh, F. (2021). Bitcoin and beyond. *Annual Review of Financial Economics*, *14*. https://www.researchgate.net/profile/Fahad-Saleh/publication/359408058_Bitcoin_and_Beyond/links/627926d3973bbb29cc6ebcd8/Bitcoin-and-Beyond.pdf

Julia, B. (2021) Why does bitcoin have such a big influence on other cryptocurrencies? 2021, Commpro https://www.commpro.biz/news/why-does-bitcoin-have-such-a-big-influence-on-other-cryptocurrencies?rq=bitcoin

Južnik Rotar, L., Kontošić Pamić, R., & Bojnec, Š. (2019). Contributions of small and medium enterprises to employment in the European Union countries. *Economic research-Ekonomska istraživanja*, *32*(1), 3296-3308. https://hrcak.srce.hr/file/333868

Lansky, J. (2018). Possible state approaches to cryptocurrencies. *Journal of Systems integration*, *9*(1), 19. https://pdfs.semanticscholar.org/c14a/cbbb00b5baee7f10b24d224d429ee6b39e0e.pdf

Lee, D. K. C., & Teo, E. G. (2020). The New Money: The Utility of Cryptocurrencies and the Need for a New Monetary Policy. *Available at SSRN 3608752* https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3608752

Lincoln, Y. S., & Guba, E. G. (1988). Criteria for Assessing Naturalistic Inquiries as Reports. https://miguelangelmartinez.net/IMG/pdf/1994_Guba_Lincoln_Paradigms_Quali_Research_chapter.pdf

Litan, A. (2022, July 22) Gartner Hype cycle for Blockchain and Web3, 2022. *Gartner, Inc.* https://blogs.gartner.com/avivah-litan/2022/07/22/gartner-hype-cycle-for-blockchain-and-web3-2022/

Liu, J., & Serletis, A. (2019). Volatility in the cryptocurrency market. *Open Economies Review*, *30*, 779-811. https://link.springer.com/article/10.1007/s11079-019-09547-5

Marczyk, G. R., DeMatteo, D., & Festinger, D. (2010). *Essentials of research design and methodology* (Vol. 2). John Wiley & Sons. http://dspace.vnbrims.org:13000/xmlui/bitstream/handle/123456789/4650/Essentials%20of%20Research%20Design%20and%20Methodology%202005.pdf?sequence=1&isAllowed=y

McDaniel, C. A., & Norberg, H. C. (2019). Can blockchain technology facilitate international trade?. *Mercatus Research Paper*. https://www.researchgate.net/profile/Hanna-Norberg/publication/

Mohanta, B. K., Panda, S. S., & Jena, D. (2018, July). An overview of smart contract and use cases in blockchain technology. In *2018 9th international conference on computing, communication and networking technologies (ICCCNT)* (pp. 1-4). IEE https://www.researchgate.net/profile/Bhabendu-Mohanta/publication/328581609_An_Overview_of_Smart_Contract_and_Use_Cases_in_Blockchain_Technology/links/5bf398a592851c6b27cbfeac/An-Overview-of-Smart-Contract-and-Use-Cases-in-Blockchain-Technology.pdf

Möller, D. (2020). *Cybersecurity in digital transformation: Scope and applications*. Berlin/Heidelberg, Germany: Springer. https://edu.anarcho-copy.org/

Onwuegbuzie, A. J., & Leech, N. L. (2007). Validity and qualitative research: An oxymoron?. *Quality & quantity*, *41*, 233-249. https://link.springer.com/content/pdf/10.1007/s11135-006-9000-3.pdf

Orb, A., Eisenhauer, L., & Wynaden, D. (2001). Ethics in qualitative research. *Journal of nursing scholarship*, *33*(1), 93-96. http://www.columbia.edu/~mvp19/RMC/M5/QualEthics.pdf

Park, A., & Li, H. (2021). The effect of blockchain technology on supply chain sustainability performances. *Sustainability*, *13*(4), 1726. https://www.mdpi.com/988860

Prause, G. (2019). Smart contracts for smart supply chains. *IFAC-PapersOnLine*, *52*(13), 2501-2506. https://www.researchgate.net/profile/Gunnar-Prause/publication/338165899_Direct_Smart_Contracts_for_Smart_Supply_Chains/links/5e03dc9ca6fdcc28373efbf0/Direct-Smart-Contracts-for-Smart-Supply-Chains.pdf

Rahardja, U., Aini, Q., Harahap, E. P., & Raihan, R. (2021). GOOD, BAD AND DARK BITCOIN: A Systematic Literature Review. *Aptisi Transactions on Technopreneurship (ATT)*, *3*(2), 1-5. https://att.aptisi.or.id/index.php/att/article/view/175

Rolfe, A. (2019) The SME sector in Europe. Report: *Payment services for SMEs – Jump – starting digital payment services* https://www.paymentscardsandmobile.com/payment-services-for-smes-jump-starting-digital-payment-services/

Sandelowski, M. (1995). Qualitative analysis: What it is and how to begin. *Research in nursing & health*, *18*(4), 371-375. https://onlinelibrary.wiley.com/doi/abs/10.1002/nur.4770180411

Schär, F. (2021). Decentralized finance: On blockchain-and smart contract-based financial markets. *FRB of St. Louis Review*. https://edoc.unibas.ch/86500/1/decentralized-finance-on-blockchain-and-smart-contract-based-financial-markets.pdf

Sheth, H., & Dattani, J. (2019). Overview of blockchain technology. *Asian Journal For Convergence In Technology (AJCT) ISSN-2350-1146*. https://asianssr.org/index.php/ajct/article/view/728/579

Steinmetz, F., Von Meduna, M., Ante, L., & Fiedler, I. (2021). Ownership, uses and perceptions of cryptocurrency: Results from a population survey. *Technological Forecasting and Social Change*, *173*, 121073. https://www.blockchainresearchlab.org/wp-content/uploads/2020/05/BRL-Working-Paper-19-Ownership-uses-and-perceptions-of-cryptocurrency.pdf

Stenfors, T., Kajamaa, A., & Bennett, D. (2020). How to… assess the quality of qualitative research. *The clinical teacher*, *17*(6), 596-599. https://onlinelibrary.wiley.com/doi/pdfdirect/10.1111/tct.13242

Thomas, D. R. (2006). A general inductive approach for analyzing qualitative evaluation data. *American journal of evaluation*, *27*(2), 237-246. https://www.researchgate.net/profile/David-Thomas-57/publication/228620846_A_General_Inductive_Approach_for_Qualitative_Data_Analysis/links/0f31753b32a98e30f9000000/A-General-Inductive-Approach-for-Qualitative-Data-Analysis.pdf

Tredinnick, L. (2019). Cryptocurrencies and the blockchain. *Business Information Rev iew*, *36*(1), 39-44. https://journals.sagepub.com/doi/full/10.1177/0266382119836314

Ulas, D. (2019). Digital transformation process and SMEs. *Procedia Computer Science*, *158*, 662-671. https://www.sciencedirect.com/science/article/pii/S1877050919312712/

Wang, S., Ouyang, L., Yuan, Y., Ni, X., Han, X., & Wang, F. Y. (2019). Blockchain-enabled smart contracts: architecture, applications, and future trends. *IEEE Transactions on Systems, Man, and Cybernetics: Systems*, *49*(11), 2266-2277. http://khcnbinhduong.gov.vn/ImageUpload/file/TTTK%20KCN/2019/Nguon%20tin%20KHCN/Blockchain_A3.pdf

Wong, L. W., Leong, L. Y., Hew, J. J., Tan, G. W. H., & Ooi, K. B. (2020). Time to seize the digital evolution: Adoption of blockchain in operations and supply chain management among Malaysian SMEs. *International Journal of Information Management*, *52*, 101997. https://core.ac.uk/download/pdf/343508779.pdf

Yermak, S. O., & Zhabrovets, J. O. BLOCKCHAIN TECHNOLOGY FOR BUSINESS STRUCTURES. *СВІТОВІ ТЕНДЕНЦІЇ РОЗВИТКУ ІНТЕРНЕТ БІЗНЕСУ*, 64.https://economics.net.ua/wp-content/uploads/2022/04/tezy.pdf#page=48

Appendices

Appendix 1. Interview questions

Do you see any future possibilities for cryptocurrencies to be more mainstream or even on the level of traditional money and transactions?

From the experience of your profession, what are the risks or cyber security threats concerning these technologies in your opinion?

In your opinion, can the replacement of traditional financial tools with cryptocurrencies make the transactions between companies more secure?

Do you see any future possibilities for cryptocurrencies to be more mainstream or even on the level of traditional money and transactions?

Do you see any potential benefits companies could gain from adopting cryptocurrency?

What challenges might the adaptation of cryptocurrencies create?

Are there advantages if companies would use crypto over traditional money and transactions?

What kind of companies would benefit most from the adopting of cryptocurrencies? (Small, medium, big?)

Are there any possible challenges the adaptation of cryptocurrencies might create for those companies?

Do you see any future possibilities for cryptocurrencies to be more mainstream or even to match the level of traditional money and transactions?

Are there any potential financial advantages for individuals or companies to start using crypto over traditional money and transactions?

What financial challenges might the adaptation of cryptocurrencies create for individuals or companies?

Appendix 2. Simplified figure of the analysis process