CRYPTO-CURRENCIES IN FINLAND

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OPINNÄYTETYÖN TIIVISTELMÄ

Kaupan ja kulttuurin osaamisala
Tradenomi, Business Information
Technology

Tekijä	Samuli Savukoski	Vuosi	2015
Ohjaaja	Tuomo Lindholm		
Toimeksiantaja			
Työn nimi	Kryptovaluutat Suomessa		
Sivu- ja liitemäärä	55 + 7		

Tämä opinnäytetyö tehtiin antamaan informaatiota Bitcoinista ja sen käytöstä Suomessa. Ensimmäinen tavoite oli selittää, mikä Bitcoin ja sen toimintaperiaatteet ovat. Näiden tietojen perusteella lukijat voivat ymmärtää, miten Bitcoin voi vaikuttaa yritystoimintaan. Lisäksi on tärkeää tietää Bitcoinin rajoitukset ja miten sitä tulisi käyttää turvallisesti ja lakien mukaisesti. Toinen tavoite tässä opinnäytetyössä oli löytää yhteisiä syitä Bitcoinin käyttöön Suomessa toimivilta Bitcoin yrityksiltä, joiden tietoja voidaan käyttää auttamaan muita yrityksiä.

Laadullisia tutkimismenetelmiä käytettiin tiedonkeruussa ja tietojen analysoinnissa. Tämä opinnäytetyö käyttää explanatiivisiä tutkimusmenetelmiä selittämään Bitcoinin käsittelistöä. Tietoja Bitcoinista kerättiin eri lähteistä, jotka olivat asianmukaisia ja uusia ja joilla selitettiin Bitcoinin jatkuvasti kehittyvää käsitettä. Moni- tapaustutkimuksen kohteena on suomalaisia yrityksiä, jotka hyödyntävät Bitcoinia. Yhteensä 17 yritystä haastateltiin ja haastatteluilla selvitettiin, miten Bitcoin ymmärretään näissä yrityksissä ja miten sitä käytetään näissä yrityksissä. Haastattelut analysointiin, jotta saatiin selville Bitcon-käytännöt ja yhteiset tekijät yrityksissä, jotka käyttävät Bitcoinia. Tapaustutkimukset paljastavat Bitcoinin käytön esteitä ja Bitcoinin käytön laajuuden Suomessa. Haastattelujen analysoinnista saatu tieto auttaa selittämään myös Bitcoinin nykytilannetta Suomessa.

Tulokset osoittavat että Bitcoinin käyttö Suomessa on lähes olematonta verrattuna kauppiaiden muihin käyttämiin maksutapoihin. Bitcoinin ajatellaan olevan markkinointihyöty verrattuna yrityksiin, jotka eivät ota vastaan Bitcoin maksuja. Tämän opinnäytetyön pohjalta parhaat kaupan alat, joihin Bitcoin sopisi parhaiten, ovat kaupat jotka myyvät tuotteita tai palveluita isolla volyymilla netissä.

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ABSTRACT

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This thesis study was conducted to deliver information about Bitcoin and its use in Finland. The first objective was to explain what Bitcoin is and its fundamentals. By understanding Bitcoin, people have the opportunity to think how it can influence business. Additionally, it is important to know the limitations of Bitcoin and how it should be used properly in terms of security and regulations. The second objective of this thesis study was to find out common reasons for use of Bitcoin in companies in Finland in order to use the information to help other companies.

Qualitative research methodologies were used for gathering data and for data analysis. This thesis used explanatory research methodologies to explain the concept of Bitcoin. The information of Bitcoin was gathered from various sources that were relevant and up to date to explain the constantly evolving concept of Bitcoin. A multi case study was conducted of the companies in Finland that utilize Bitcoin in their companies. A total of 17 companies were interviewed for receiving answers to questions with a focus on Bitcoin and its use in their companies. Analysis of the interview data was conducted to find out what the practises and factors are regarding companies that use Bitcoin in Finland. The study reveals obstacles of Bitcoin integration and the extent of Bitcoin use in Finland. The analysed interview data contributes to explaining the situation of Bitcoin in Finland.

The outcomes indicate that the use of Bitcoin in Finland is proportionally nearly non-existent in comparison with other payments used by merchants. Bitcoin is thought of as a marketing advantage compared with other companies who do not accept Bitcoin. The study conducted in this thesis implies that the best businesses suitable for accepting Bitcoin are companies that sell products or services in high volumes online.

Key words   Bitcoin, blockchain, peer-to-peer, cryptocurrency, business,

FIGURES

SYMBOLS AND ABBREVIATIONS

P2P	Peer-To-Peer
BTC	Bitcoin
DOS	Denial-of-service
VAT	Value-added tax
CPU	Central processing unit
GPU	Graphics Processing Unit
PC	Personal computer

CONTENTS

1. INTRODUCTION

The introduction chapter-discusses first the background and motivation of the thesis and continues with explanations of the research scope, objectives and the structure of the thesis.

1.1 Background and motivation

Crypto-currencies are a form of currency made possible by a digital network (Graydon 2014; Moon 2015). Other forms of electronic currency have also existed before but they have not been decentralized. The first decentralized crypto-currency named Bitcoin (Nakamoto 2008), was introduced in 2008 and has had exponential growth in transactions since then (Blockchain Ltd 2015). Bitcoin has become a part of societies where individuals may use Bitcoin to purchase goods and services.

Since Bitcoin was created, hundreds of different variations of crypto-currencies have emerged with slightly different features compared with Bitcoin. They are referred to as Altcoins (Torpey 2014). Even though there are hundreds of different options to choose from when using a virtual currency, the first invented is the most widely used by far, when comparing the market capitalization in dollars. Today, Bitcoin has a market worth roughly about 4 billion dollars according to a list by Coinmarketcap (Coinmarketcap 2015). The next two of the most valuable crypto-currencies on the same list are Ripple (Ripple Labs, Inc. 2015) with 150 million and Litecoin (Litecoin Association 2015) with 130 million dollars. In contrast, the value of Bitcoin compared with the second and third most valuable crypto-currencies are substantial. (CoinMarketCap 2015).

A survey conducted in 2014 for American citizens indicated that 51 percent of the population from age 18 and older have heard about Bitcoin (Longacre 2014). From the same group, 3% answered to have used or bought Bitcoin. This implies that not many individuals actually use crypto-currencies. In Finland, there are less than 100 shops registered that utilize Bitcoin in their businesses (SatoshiLabs 2015). Most of these businesses use Bitcoin in a way that it is an additional payment system to other more traditional payment systems such as credit card and cash transactions. Legal businesses

that use Bitcoin solely as a payment system in Finland are from few to non-existent (SatoshiLabs 2015).

One motivation of this thesis is to study the Bitcoin crypto-currency, as a value capturing opportunity. A question addressed is what kind of advantages and disadvantages the use of Bitcoin includes. To help answer this question, representatives of Finnish companies that have integrated Bitcoin in their businesses are interviewed. The objective of this research is especially to find out the common reasons for companies accepting Bitcoin. This is valuable information for businesses considering the use of crypto-currencies in their businesses.

The second motivation of this thesis is to recognize crypto-currencies and their applications. Bitcoin is a new concept and, therefore, it needs an in-depth view to understand its fundamentals. The technology of Bitcoin needs to be understood to utilize its possibilities. The possibilities of Bitcoin could be used in companies to achieve efficiency. The technology of Bitcoin and other crypto-currencies include features that could bring undiscovered opportunities for companies.

1.2 Research scope and objectives

The research scope of this thesis is limited to Bitcoin accepting companies only from Finland. Specifically, the interviewed companies in this thesis have been taken from Coinmap. The list by Coinmap includes companies that are mostly situated in the capital region of Finland. Therefore, other areas of Finland are mostly left uncovered. For example, Lapland did not have any companies that accept Bitcoin in the Coinmap list. Currently there are 57 companies listed on the Coinmap service that use Bitcoins in Finland. (SatoshiLabs 2015)

The scope of the study concerning Bitcoin itself is mostly limited to the technological part of crypto-currencies and not on business itself. This is because the thesis author is studying in Lapland University of Applied Sciences in a degree programme that focuses on Business Information Technology.

Crypto-currencies were introduced in 2008 and in Finland today they are seen as a digital form of trade but it is not recognized as money (Taloussanomat Oy 2014). The first objective of this study is to explain what crypto-currencies are. Covering the most important aspects of crypto-currencies in this research gives an opportunity for crypto-currencies to be used as financial tools by companies and individuals. Crypto-currencies offer a payment solution that can be taken into use even in distant places of the world. A statement by Bill Gates suggests that digital payment systems such as crypto-currencies could even help developing countries by offering an alternative payment network where bank services are not available (Knibbs 2015).

The second objective of this research is to indicate the common reasons why Bitcoin is used in Finnish companies. This research addresses the question of why Bitcoin accepting companies made the decision to use crypto-currencies and with what results. The findings are obtained from the small group of Bitcoin accepting companies in Finland. The findings contain valuable information for companies that do not use Bitcoin. The companies who do not use Bitcoin can evaluate if Bitcoin is beneficial for them.

The third objective is to study why and how crypto-currencies such as Bitcoin have been taken into use. To achieve this objective, Finnish companies that use Bitcoin are interviewed. All of the interviewed companies had physical premises. Out of all the crypto-currencies, Bitcoin has the main focus in this thesis because it is the most widely used crypto-currency compared with transactions, volume and price (CoinMarketCap 2015). The gathered information focuses on the advantages and disadvantages of the alternative payment method Bitcoin.

One part of the thesis is also to study the legal status and regulation of Bitcoin especially in Finland. Various countries have different policies on the regulation and legal status of crypto-currencies. For example, the status of Bitcoin in the EU is changing constantly. The statements made on Bitcoin by financial institutions and lawmakers greatly affect businesses and their attitudes towards Bitcoin. For business owners, it is beneficial to know the various regulation policies that different countries may have. Some countries, for example, do not offer the possibility to purchase Bitcoins legally due to regulation policies.

After the research and results, this thesis provides recommendations on where crypto-currencies are best situated for their use. In addition, this thesis may be used as a guideline for those who want to consider Bitcoin as a payment method.

1.3 Thesis structure

This thesis is divided into five chapters. Chapter 1 introduces the research consisting of a brief view to the topic, objectives, motivation and scope of the study. Chapter 2 explains the research questions and methodologies discussing and analysing different methods of researching the topic of crypto-currencies. Chapter 3 delivers an overall explanation of what crypto-currencies are in general. It also points out what aspects are relevant to know for businesses and individuals who use Bitcoins with a deeper look into uses and regulation of crypto-currencies in Finland. Chapter 4 focuses on the multi case study conducted on Bitcoin companies in Finland. Additionally, gathering data, analysing data and results from the interviews are presented in Chapter 4. Chapter 5 delivers the conclusions, overall findings, practical applications, results and summarizes the most important parts of the thesis.

2. RESEARCH QUESTIONS AND METHODOLOGY

Chapter 2 explains the research questions and the methodologies used in the thesis. The research questions and their justifications are presented first. Secondly the methodology of the research is indicated.

2.1 Research questions

In this thesis there are three research questions. The research questions focus on the use of crypto-currencies in Finland.

RQ 1. What are crypto-currencies?

This research question aims to provide the details to understand what crypto-currencies such as Bitcoin are. Additionally, it is important to know how crypto-currencies work, what they are and what the practical uses are compared with other forms of payment. The technical and practical aspects of crypto-currencies are explored, defined and

analysed based on literature analysis to gain understanding of crypto-currencies. Specifically, crypto-currencies are explained in order to bring a sufficient understanding of what crypto-currencies are and how they could be utilized especially in Finland. This research question is mostly discussed in Chapter 3.

RQ 2. How are Bitcoins being used in Finland?

The second research question focuses on the multi case study of Finnish Bitcoin accepting companies. These interviewed companies indicate how Bitcoin is being used in Finland. One of the objectives is to find out the scale of Bitcoin use in Finnish companies. The interviewed companies are asked about the main benefits and disadvantages of Bitcoin. The history of Bitcoin is short and the future of it is uncertain. The answers of RQ 2 can help to estimate the course of crypto-currencies in the future. RQ 2 is addressed in Chapter 4.

RQ 3. How and why could a company take Bitcoins into use? What benefits does it provide to a company?

This research question explores the possibility of Bitcoin use in companies. RQ 3 analysis how Bitcoin is taken into use and indicates what benefits Bitcoin has for company. To answers this question, RQ 1 and 2 need to be addressed first. They provide the needed information for RQ 3. The third research question is discussed in Chapters 4 and 5

2.2 Research methodology

This thesis uses qualitative research. Qualitative research offers insight to current or past events that look into the behaviour, motivation, attitudes or beliefs focusing on individuals or social human problems. Qualitative research offers an approach to have a better understanding of the behaviour in this case concerning the use of crypto-currencies (Sheikh & Bibi 2015, 5). The practical part of this research is the qualitative research that includes interviews.

The theoretical part of this research consists of the explanatory research explaining what crypto-currencies are. Explanatory research focuses on exploring a topic by studying literature why something has occurred. Specifically, explanatory research explains the causes and the reasons for why something has occurred (Kowalczyk 2015). Explanatory research was chosen because of its way to assist in explaining the wide concept of crypto-currencies. The research results and conclusions of this thesis are understood better when the concept of crypto-currencies is understood well.

As pointed out in Chapter 1, the motivation of this research is to study what crypto-currencies are and how they are used in Finland. The motivation of this research is to find out the benefits and disadvantages of crypto-currencies compared with other forms of payment. With this information, it is possible for Finnish companies to evaluate if crypto-currencies are suitable for their businesses today or in the future. A multiple case study (Yin 2009, 53-60) on Finnish Bitcoin using companies was carried out by interviews which were taped. A multiple case study consist of answers from more than one subjects of research to obtain an accurate view of an event (Yin 2009, 53-60). Using a multiple case study on Finnish Bitcoin accepting companies is justified because of their various fields of business. Recording interviews was important to get accurate information from a relatively small amount of companies. Qualitative data analysis defines the identification and interpretation of different patterns (WebFinance Inc. 2015). Data analyses of interviews were processed after the interviews to find out common factors of Bitcoin using companies in Finland. Due to this, recording interviews for the research will make it more reliable compared with gathering information online when a person has to format the text to be able to provide an opinion, which might leave an answer short of depth (Gingery 2011).

A qualitative methodology was used to obtain information on companies in Finland that accept Bitcoin. Approximately 50 Finnish companies listed on the Coinmap service were contacted and given a chance to be interviewed. The interviews included open questions for respondents to freely describe their situation to receive an overview impression on how Bitcoin is used in Finnish companies. The interviews also contained simple quantitative questions to gain statistical data to be analysed by the relatively small group of possible respondents. The questions were created to retrieve new information about Bitcoin use in Finland. The interviews were mainly conducted as

taped phone call interviews. The interviewees were the business owners or representatives that accept Bitcoins as a payment option. The interviews were mostly done in the Finnish language due to the fact that Finnish is the mother tongue of the interviewees. The analysis and results of the case study are in Chapter 4.

Sources of this research are literature reviews, news articles and scientific research. Most of the information about crypto-currencies were retrieved from various Internet sources. Since information is also obtained from news articles and sites that market crypto-currencies, sources have to be critically analysed. Literature reviews, articles, scientific studies and research for this research are found through Google search engine and various electronic databases such as EBSCO and theseus.fi thesis library. By these sources the information retrieved should be objective enough to form a picture of crypto-currencies and Bitcoin. There were no books available in the Lapland UAS library about crypto-currencies and the Internet offered only a few books discussing Bitcoin in wide sense. The criteria of using sources in this research were to obtain as new information as possible that is valid, objective and relevant to crypto-currencies. This supports the explanatory research to explain the concepts that are discussed in this research. The criteria for the sources must meet the Lapland UAS terms and sources should be established to obtain verified information.

3. CRYPTO-CURRENCIES

In this Chapter, crypto-currencies are explained, with an emphasis on how they are used in today's world. This Chapter has been divided into sub chapters that focus on the main points needed to understand crypto-currencies such as Bitcoin. The main aspects of crypto-currencies and especially Bitcoin are explained, including regulation, technology, transactions, privacy finance and finally the uses of Bitcoin. The most important aspects are presented and analysis and criticism about the different factors are introduced.

3.1 Introduction

Satoshi Nakamoto published a document in 2008 that resulted in the creation of the first crypto-currency Bitcoin (Nakamoto 2008). Bitcoin was introduced as the first

decentralized crypto-currency to exist. A decentralized network is a system of sharing data or resources. The shared data or resources are spread out in parts where all network locations have the same information and rights within them. Therefore, a single group is not in complete control of the network such as in centralized networks. Crypto-currencies are run by a peer-to-peer network. The value of crypto-currencies is based on the financial law of supply and demand (Investopedia, LLC. 2015). The more people want the crypto-currency and buy it, the more it rises in value. Crypto-currencies reward users to keep up the network and the by-product is a payment network. A payment network is a system that enables exchange of value between people (Saslaw 2012).

There are a few reasons why Bitcoin is advocated. Firstly, Bitcoin is the most widely used crypto-currency today (CoinMarketCap 2015). Compared with other Altcoins, Bitcoin has the widest support of users. Secondly, Bitcoin users have 100% ownership of the crypto-currency and Bitcoins cannot be technically frozen or confiscated by any institution. The case of 100% control of Bitcoin excludes keeping Bitcoins with a third party, for example a Bitcoin marketplace that can temporarily halt transactions of stored Bitcoins (Rushe 2013).

The movement of Bitcoin funds differ from usual transactions. Credit card transactions can be made on the weekend during the night but the money will not actually move to the rightful owners until after the weekend. With Bitcoin, when a transaction is done and the currency has changed its owner, funds can be further used on the same day. The downside of crypto-currencies are that they require Internet access to be usable. Also if Internet accessibility is slow in some areas, it can be difficult to verify transactions. If vendors and buyers are making a transaction with a slow connection to the Internet, it might take a lot of time for a transaction to get verified which is unacceptable for a real time transaction between two people. This can also happen with other electronic payments that require online access, for example bank transfers and using the internationally supported Visa Electron cards (Adyen BV 2015).

Altcoins are modifications of the first created crypto-currency Bitcoin, as stated in Chapter 1. Once a concrete implementation of the crypto-currency Bitcoin had been made, many were to follow with their own modifications. Hundreds of Altcoins have been created, each having different variations compared with Bitcoin. Despite the

differences, the main points of the Altcoins are the same as with Bitcoin. With most Altcoins, a predictable amount of coins will be generated, mining (CoinDesk 2014) is a financial incentive to keep up the crypto-currency's network and the crypto-currency networks are decentralized with no central point of authority (Wilmoth 2014). Bitcoin mining is discussed in Chapter 3. Altcoins try to appeal to new users by trying to offer something unique in comparison with Bitcoin. Some offer total anonymity and some offer faster transaction times. Altcoin mining can be different compared with mining Bitcoin. There can be differences in the hashing algorithms that define the way crypto-currencies are mined. Some are mined with a computers CPU and some with a GPU (Wilmoth 2014).

There exists a pump and dump category of crypto-currencies (Barrett 2010). This category means that a group owns most of the coins or has an advantage in pre-mining of the crypto-currency (Barrett 2010). When the crypto-currency manages to get some reputation and funds from others, the group of owners then sell coins of that crypto-currency to financially gain profits from others who have invested in that crypto-currency. After this scheme has happened the support for the coin from the owner is gone. Signs of pump and dump schemes are aggressive marketing in the name of gaining huge profits for being an early investor (Barrett 2010).

Institutions and companies may have different motives of using crypto-currencies. Since they have the possibility to make their own crypto-currencies, they can change one important aspect. Companies can use centralized forms of crypto-currencies. Unlike the original decentralized crypto-currencies where control is not with one party, centralized crypto-currencies are in the control of the makers. Centralized crypto-currencies are better suited for companies that want to be in control of their money supply. Centrally banked crypto-currencies have been introduced in the banking sector, to have all the features that Bitcoin have (Danezis & Meiklejohn 2015). One exception is that the monetary control is in favour of the bank and not the miners, because the bank has exclusive control over the creation of new coins (Danezis & Meiklejohn 2015).

Crypto-currencies such as Bitcoin support the need for a decentralized network. Decentralized crypto-currencies offer transactions without limits from organizations, institutions and governments. The people who support decentralized crypto-currencies

can suffer from control and limitations of money flow. The wikileaks public figure Julian Assange had been cut off from using payment systems to receive donations, so he switched to Bitcoin as an alternative (Hajdarbegovic 2014). Bitcoin was the only option to receive funds since it could not be restricted by governments or financial institutions. Examples such as the wikileaks create a demand for decentralized payment networks.

The miners of the decentralized networks are shifting into more professional groups with large investments involved in mining hardware. The gathering of professional mining groups lead to less contributing of individuals to mining. Even though larger groups have taken more control of the mining process, it does not mean that the users have lost control of the network at these bigger groups. It just relays information that the Bitcoin network is popular that individuals do not need to use their computational power to run the Bitcoin network. As the miners increase in numbers and computational power, so does the difficulty of mining (CoinDesk 2014). The more people are mining and keeping up the Bitcoin network, the less reward is received with more difficulty (CoinDesk 2014). The difficulty has a negative impact especially towards individual miners. Individuals cannot keep up with the big group of miners who have invested in special mining gear and suffer from the rising difficulty of mining.

Bitcoin has users found globally. An example of that are the 60 000 listed companies on the BitPay system (BitPay 2015). BitPay is a payment processor that cuts out volatility risk from accepting Bitcoin as a payment (BitPay 2015). Commercial establishments that accept Bitcoin include supermarkets, sport shops, gyms, casinos, black markets, services, stores, special stores, leisure time and accommodation. The variety of establishments where to spend Bitcoins is diverse However, these establishments are spread out unevenly across the globe. Shops on the other side of the globe are inaccessible to potential customers. These customers do not have the opportunity to spend their Bitcoins in distant physical shops that do not offer online services. Therefore, online shops and services satisfy the lack of physical shops. Shops that offer products with shipment can be located on the other side of the globe and due to that are not the most attractive ones on the market. Additionally, taxes through borders and uncertainty of delivery can scare of potential customers if products have to be shipped long distances for example from a continent to another. Moreover, language barriers and regulation of products are limits between countries.

Online services have an advantage of using Bitcoins as a payment. Specifically companies that do not depend on delivering physical products. Examples of these can be services such as website hosting, online casinos and other services. These companies can attract customers globally to use their services and get paid in Bitcoins where transactions are managed and received rapidly and can be further used on the same day. Compared with other forms of payments, global transactions require systems that utilize credit cards and bank transfers that have fees much higher than those with Bitcoin.

An online deep web black marketplace Silk Road ran from 2011 to 2013 until it was shut down by the FBI in the USA (Hern 2013). It operated solely on the crypto-currency Bitcoin, taking advantage of its anonymity as payment method combined with the security measures taken when using deep web sites that can only be operated by using the anonymous TOR network. The black market Silk Road has been estimated of having illicit sales of 1.2 billion dollars during its operating time. This a good indicator of how much trading is being done just in the illegal sector of business with crypto-currencies. Since Silk Road was shut down, more black markets have emerged to fill the demand for online black marketplaces. The fact that over 60 000 companies have registered to the BitPay Bitcoin payment processor (BitPay 2015) indicates that crypto-currencies have their place in the global economy. It seems evident that the demand for crypto-currencies clearly exists today and in the future.

3.2 Technology

Crypto-currencies such as Bitcoin are held up by a network that stores every transaction to a decentralised database. A group of computers that run the network of Bitcoin are using nodes which control this decentralised database. Anyone, who wants to use Bitcoins, has to be connected to this decentralised database. Specifically, nodes are machines that give their computational power to the Bitcoin's network. Nodes have various tasks in the Bitcoin network. Firstly they check that all the transactions are registered and verified on the Bitcoin network. Technically, nodes verify signatures when users send Bitcoins to another address. When a signature fails, the transaction is rejected. Reasons for a rejection can be transaction fees being too low or attacks to the Bitcoin network. Nodes also verify that Bitcoin addresses have enough funds to

complete a transaction. Insufficient funds lead to invalid transactions. Nodes do all these tasks and they are updated to the Bitcoin network database. The fact that a decentralized network is not controlled by one group is why it easier to keep safe from inside attacks. There is no single point of failure in the network such as a centralized database that could bring it down. The network can only be brought down by gaining advantage against all other members of the network which is explained later in this chapter. The disadvantages of the decentralized network are the lack of regulation possibilities by one group. If something needed to be done to the network, it would be only possible if the majority of users agreed to do so. (Franco 2015. 11–14 & Augur 2015.)

The blockchain is a database of all the transactions that have been performed over the crypto-currency's network. The block chain consist of all the users running the network. The ones that run the block chain network are so called miners. The transactions can be publicly viewed and it offers transparency to a system. Every transaction is confirmed by all members that operate the block chain. Once the transaction is verified, it can't be reversed. (Ali, Barrdear, Clews, & Southgate, 2014. 2; Lee, Long, Steiner, Handler & Wood 2015. 1.)

The decentralized network of Bitcoin which uses the blockchain technology is based on peer-to-peer technology. Peer-to-peer (P2P) technology shares distributed resources in an area that has no central service. It is operated through autonomous peers which makes the system self-organized. The use of resources in a decentralized network such as Bitcoin are the following: Processing power is equally distributed. The processing capacity of peers is shared with other peers to be used within the P2P network. Peers are globally connected to the network without connecting to a certain point. The typical addresses of the peers change and sometimes are out of reach so new peers are assigned to replace them. The interaction between peers is done straight with each other and accessing and sharing of resources is done without depending on other entities. All of the peers can act as clients or servers and are autonomous. (Steinmetz & Wehrle 2005. 10–11.)

Bitcoin was the first invention to utilize the Blockchain technology which is a way of storing data. Blockchain technology is derived from the word itself. Storage of all

transactions made in the Bitcoin network are recorded on blocks. Once a block is filled with transaction details around every 10 minutes, it is stored into a chain of blocks. A block consists of four different pieces of information which are depicted in Figure 1 below. (Franco 2015.)
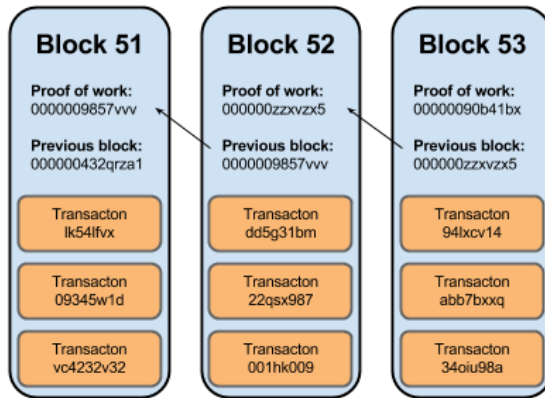

Figure 1. Pieces of information stored into a block that together make the Blockchain (Brikman 2014)

As seen in the Figure 1 above, the four pieces of information in a block are transaction details, references to what the previous block was, timestamps of the block and the proof of work that identifies the block (Ali 2014. 2; Lee et al. 2015. 1). The Blockchain contains the history of every transaction made with Bitcoin. The transactions can be publicly viewed and it offers transparency to a system (Blockchain Ltd 2015).

To verify how much Bitcoins are in each account, public ledgers keep count of funds in Bitcoin addresses. These ledgers are a part of the blockchain what every user of the Bitcoin network keeps. Every transaction that is done, is updated to the Bitcoin network in each node which means that every miner and user updates the blockchain constantly to verify consistency of the transaction records. The purpose of storing information as in blocks through the peer-to-peer network gives certain advantages over basic database storage. The alteration of previous blocks is practically impossible and even if the newest block were to be targeted to malicious activities, the rest of the blocks that remain in the blockchain are safe and remain unmodified. (Augur, 2015; Pedro Franco, 2015)

The blockchain could be utilized in elections to prove that votes have been inserted without fraud. Such a system would record votes on a blockchain based database and the votes could not be modified later. The blockchain would then contain a piece of information only known by the voter which would be used to verify that votes have gone to the right person. When the voters have satisfaction and trust that their personal votes have reached their candidates, the election system would have enough transparency. Election results would be reliable as long as other security measures were taken care of. The most crucial part is to secure the insertion of right information into the blockchain which cannot be modified later.

Hashing is an algorithm that generates verifiably numbers randomly by using computational power of a CPU or a GPU (bitcoin.it & Bitcoin community 2015). Hashing is a measure of the Bitcoin networks power. The current maximum hashing peak of 510 Petahash (Peta=10^{15}) was recorded on 30.09.2015 and the average is about 15-20 percent lower of the record (Blockchain.info 2015). An example is given to perceive the scale of the Bitcoin network. According to an estimation (Smart 2015a), when comparing the computational power of the corporation giant Google with the Bitcoin network, Google's servers do not even make up 1% of the computational power of the Bitcoin network. The power of the Bitcoin network is remarkable even if the estimation would be wrong a little bit in either way. A network of this scale is practically impossible to overrun by one company or government because of tremendous investments needed in infrastructure. Bitcoin network relies on the peer-to-peer network of miners that give the hardware power to keep the network safer. Possible attackers on the Bitcoin network would need to exceed the amount of hashing power that already exists. The scale of the Bitcoin network intimidates small groups to avoid attacking a huge network to waste their resources. The Bitcoin network has some flaws. Bitcoin is controlled by the people and organizations that have most of the resources. The fact that the Bitcoin network is huge in its power does not convince the future of the crypto-currency. If Bitcoin will regularly grow in its use and governments show the green light for Bitcoin then it could have a bright future for nodes to keep running the network and protect it from attacks. As soon as the nodes run out for reasons to keep up the Bitcoin network, it is highly vulnerable to attacks.

Bitcoins are generated by mining blocks (CoinDesk 2014 & Novikov 2014). Blocks are lists of transactions that are stored into the blockchain. Blocks verify and keep track of the Bitcoin network transactions. Block miners are rewarded with Bitcoins so the Bitcoin network has an incentive to keep it running. Block mining requires computational power to solve a mathematical formula. When miners give out their computational power to mine blocks, they are keeping up the network at the same time. Mining pools (Novikov 2014) are a group of miners aiming to solve the same block. Miners are distributed by their choice over the Bitcoin network into different mining pools. Mining pools have different policies on the rewards of blocks that contain Bitcoins. The bigger the pool that miners are in, the more stable the income whereas smaller pools can offer better rewards but also can end up bringing smaller rewards (CoindDesk 2014).

Figure 2 below indicates differences in mining pool sizes. The information in Figure 2 is based on the mining pool distribution of November 2015 (Blockchain Ltd 2015).
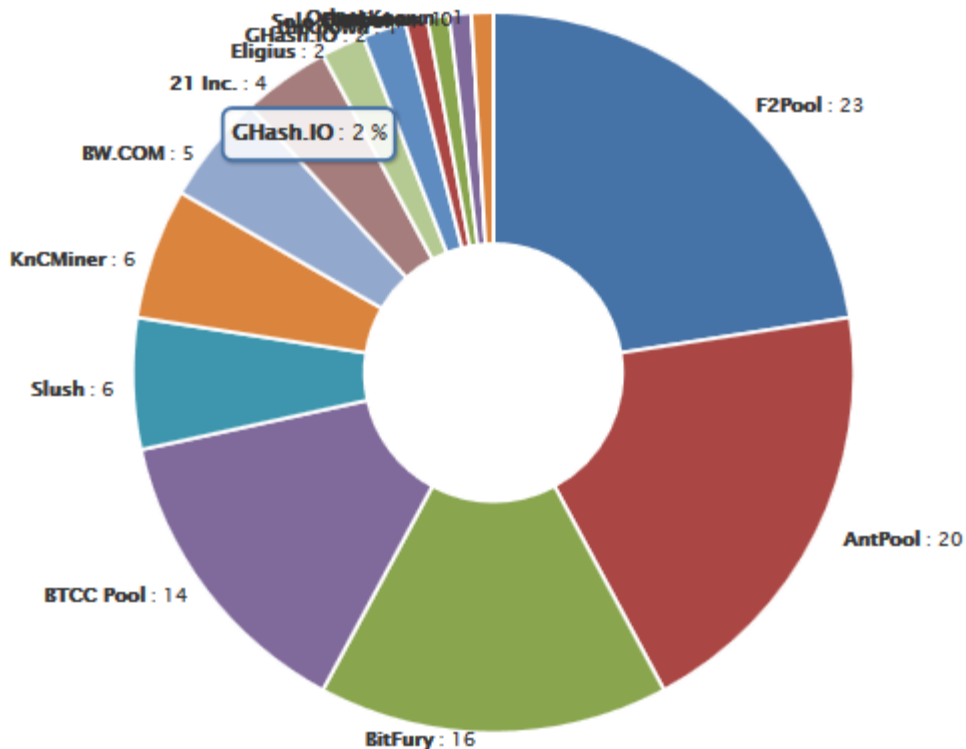

Figure 2. Mining pool distribution as of November 2015 (Blockchain Ltd 2015)

As is shown in Figure 2 above, the current mining pool distribution is diverse. Theoretically to scramble the whole network of Bitcoin, it is required to obtain computational power of over 50% of the whole Bitcoin network (Roop 2014). This was close to being true on one occasion with the Ghash.io mining pool being exactly 50% (Roop 2014). Since then Ghash.io mining pool has stated to limit the hashing power to 40 percent to effectively prevent the possible majority control of the network (Farivar 2014). It is speculated that an over 50% control attack could not go on for long. The harm caused to Bitcoin would be minor considering an active community to prevent catastrophe. Investments on Bitcoin businesses and infrastructure are an example that there are groups that do not want the network to be attacked. The fact that the Bitcoin network can possibly be taken down is a big risk for anyone involved using Bitcoins. Miners, businesses, investors, users and anyone who has any Bitcoins could one day wake to a disaster that the network had been attacked and Bitcoin would not be in the control of its community.

There are several ways to misuse the Bitcoin network if the hashing power of over 50% is gained for a single hashing pool (Novikov 2014). They include the possible of spending Bitcoins twice in a transaction, reject other miner's transactions, take higher fees from larger accounts or even launch a denial-of-service attack (Farivar 2014). Double spending Bitcoins is possible only when the network is not evenly distributed so that one party controls over half of the network power. Since it is mostly in everyone's interest to keep the network safe, the network power is distributed as much as possible to different mining pools that run the network. The purpose of denial-of-service attacks on the Bitcoin network would be disruptive and degrading with clients not being able to use Bitcoin or at least slow down the service so that transactions would take much longer (Gu & Liu 2007).

Bitcoin relies on internet access. Scientific researchers have sought various ways of sending Bitcoins since Bitcoins have the flaw of requiring internet access to be usable. Radio waves have been introduced as one form of sending Bitcoins, the technology has been developed in Finland. This can act as a tool for distant areas but work as a faulty network saver as well. If the Bitcoin network cannot be updated with internet access, it could be done with a patented Kryptoradio technology and the network can be kept

going for locations that have temporarily a shortage on internet access. (Bradbury 2014.)

Crypto-currencies are made with an open source principal. In example, the programming code is publicly available to review. When a code is open source, others can take the code and modify it to their own needs. There are a few terms to follow when using an open source code. When publishing a modified copy of the original code, notes must be included to point out the original author of the codes and making the new code open source to the public.

There is debate about the ecological aspects of the Bitcoin network. Arguments from one side (Malmo 2015) say that it takes a huge amount of electricity to power up the payment system. Others say that the financial sectors are really the ones that are using the huge amounts of electricity to keep up other payment systems (Quentson 2014). Estimating the power usage of Bitcoin is very difficult. Firstly, the variety of mining hardware greatly impacts the power usage. Professional mining equipment such as ASIC miners are solely made to mine Bitcoins which have an advantage in the power usage in w/Gh (watt per gigahash). Secondly it is hard to estimate who is using what hardware since there are not any public logs on what hardware is used in which node. Thirdly, the hash rate of the Bitcoin network is constantly changing. The hash rate required to mine blocks in the Bitcoin network increases or decreases depending on the difficulty of the mining. One estimation was made on 2014 that concluded the energy assumption of the Bitcoin network to be in comparison with Ireland's energy consumption(O'Dwyer & Malone 2014). This statement has had critics saying the estimation is not to be trusted since it was conducted in 2014 when Bitcoin specialized mining gear with lower energy consumption had not been introduced yet (Quentson 2014). Questions arise if this amount of computational power and energy could be used for more usefully. The only outcome from the Bitcoin network is to keep up a payment system. Altcoins have sought the answer but they lack the revolutionary incentive to replace Bitcoin. None of the Altcoins with or without ecological features have come even close in their acceptance compared with Bitcoin. The exceeder of Bitcoin should solve the energy problems and offer some extra uses for the computational power. As a payment system, Bitcoin is relatively safe to operate but it requires resources.

3.3 Transactions

Bitcoin users need to have Bitcoin wallets to be able to own or use Bitcoins. Bitcoin wallets are embedded with private and public keys. Private keys are used to authenticate a user as the owner of a Bitcoin wallet. Public keys are a way to let others know the Bitcoin wallet address of a user. The public and private key address of a Bitcoin wallet consist of 26-35 alphanumeric characters. Figure 3 provides an example of a public key address where Bitcoins can be sent. (Bitcoin community & bitcoin.it 2015)

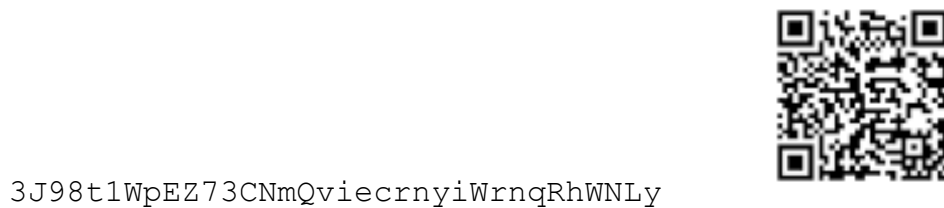`3J98t1WpEZ73CNmQviecrnyiWrnqRhWNLy`

Figure 3. Bitcoin wallet address in the form of alphanumeric characters, left, and a QR code, right (Blockchain Ltd 2015)

Anyone with Bitcoins can send their coins to a public key address by using either of these two forms indicated in Figure 3. The QR code can be scanned for example by a smartphone camera. If the phone uses a Bitcoin wallet application, the application will transform the QR code into a Bitcoin public key address. The QR code is only needed to make a transaction between two counterparts if both parties have the right technical equipment. The QR code method of obtaining a Bitcoin address is swift in comparison with typing in the string of alphanumeric numbers one by one. Typing the string of numbers one by one is time consuming and could be prone to errors due to its long length of mixed characters. (CEX.IO 2015.)

A Bitcoin wallet can be created for free however a Bitcoin wallet service provider might charge for depositing money into a Bitcoin wallet they offer. Bitcoin wallets are created with applications that can be run with smartphones, PCs or tablets that have internet access. Applications are freely available that run Bitcoin wallets. The applications are available on the most used operating systems of smartphones and desktops. Web services and other hardware enabled applications are also available for creating Bitcoin wallets (bitcoin.org 2015). Once the wallet has been created for the user, it is registered into the block chain network of Bitcoin. This means that every wallet created for Bitcoins stored into the Bitcoin network that is visible to the public. Every Bitcoin

address can be viewed publicly including the information about how much Bitcoins are in that address and where from and where to have transactions been made from that address. Every Bitcoin address can be located in the block chain (Bitcoin Statistics 2015).

Bitcoin wallets can be in electronic or physical form. In a physical form of a Bitcoin, the private key is written out for example on a piece of paper and it is not stored electronically. In an electronic wallet, the private key is stored in an application that can only be used with internet access to send Bitcoins. Cold wallets mean that the private key of a Bitcoin is stored offline so that it is not accessible through the internet and it only exists physically (Coindesk 2015). Cold wallets can be created with applications that don't require private keys to be given to a third party. Cold wallet private keys can also be written down somewhere in the form of the string of alphanumeric characters or the QR code that it matches. Bitcoins can take various physical forms as well. The inscription of the private key can be embedded almost anywhere. An example of this is to embed them into physical coins in the form of a hologram (Prasos Oy 2015). Such holographical inserted coins have their private keys inside the physical coin. To export the Bitcoins out of the physical coins, the private key has to be extracted by removing an obstructed layer until the private key is visible.

A few factors determine the fees of a Bitcoin transaction. CoinTape states that "the fastest and cheapest transaction fee is currently **80** satoshis/byte**"** (CoinTape 2015) which translates at today's price 351,22 EUR (Bitstamp Ltd 2015) roughly into three euro cents (0.0281EUR). Satoshi is determined as the smallest transaction that can be sent with BTC which is equal to 0.00000001 BTC (bitcoin.it & Bitcoin community, 2015). The desired fee is up to the owner of the coins. The fee can be reduced or increased depending if the aim is to get the transaction verified quickly or saving money by paying less fees which can make verification times longer. The transaction is instantly seen by both parties but the funds are verified later. Once the transaction is verified, the funds are available for further use. Verification times vary on a number of factors. Generally verification times on the past year on a medium with fees paid with the transaction ranged from six to twelve minutes (Blockchain Ltd 2015). The fees are given to miners as an incentive that supports the Bitcoin network. When paying no fees

at all, the transaction can take a long time or even be rejected by the network (bitcoinfees.com 2015).

Even though the fees of using Bitcoin are small, it can be hard to gain an advantage of using it if the user base is nearly non-existent. According to the interviews conducted in this thesis, the average sales made with Bitcoins in Finnish companies only account to 1% of all sales. This indicates that domestic use of Bitcoins in Finland is relatively small right now.

The words by the creator of Bitcoin suggest that it should have the attributes of cash that can be transferred without having to trust any financial institution or organization "*A purely peer-to-peer version of electronic cash would allow online payments to be sent directly from one party to another without going through a financial institution.*" (Nakamoto 2008. 1). In this way, Bitcoin could be thought of as electronic cash. When Bitcoins are spent, the only people involved in the transaction are the two counterparts that trade them. Transaction are verified between two people when one has sent the coins and the other has seen the confirmation of payment received. Bitcoins are sent from point A to point B where it does not go through any other parties. This is the same situation with cash since when cash is given out to another counterpart, it is just the two counterparts in the deal giving and receiving. This is why exchange of cash and Bitcoins is nearly similar. Figure 4 shows how different transactions affect the control of funds.
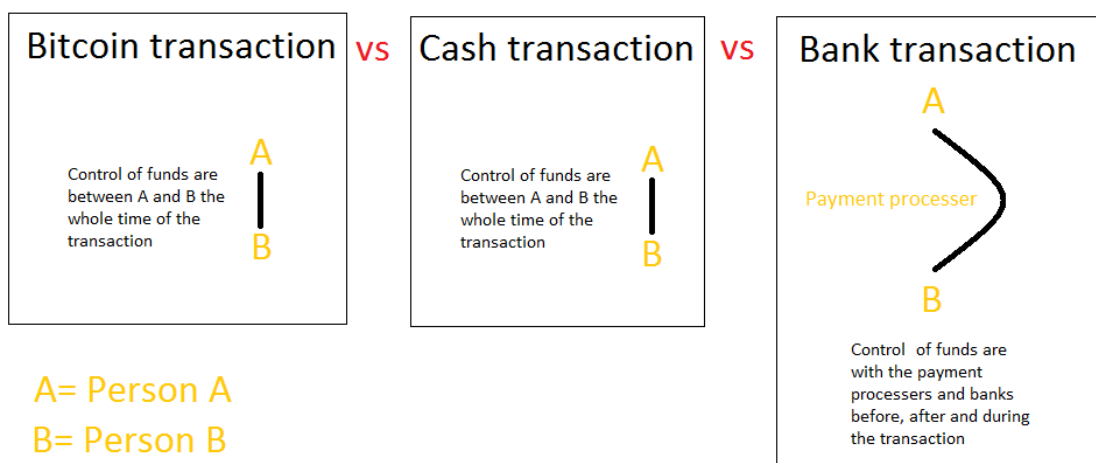

Figure 4. Comparing control of funds in transactions

As Figure 4 indicates, cash and Bitcoin have similar features. When Bitcoins work in the same way as cash, they also come with unwanted features that cash has. If you lose your Bitcoins like you would your cash, because Bitcoins cannot be retrieved back in any way. When the private-key or the Bitcoin wallet is lost, also the Bitcoins contained in that wallet are gone forever unless someone else has access to that private key so it could be obtained. Not even the creators of Bitcoin can retrieve the lost coins. It impacts the amount of Bitcoins that are in circulation if some of them are lost forever. The lost coins are not indicated in the Bitcoin network. The sensitive nature of Bitcoin itself is why users have to take extra precautions of how they handle their wallets though these precautions also apply to those who use cash.

With the technology of Bitcoin, there is no trust given to any institutions or intermediaries that handle the transaction (Nakamoto 2008. 1). On the contrary, when money is sent from a person's bank account to another location, the money that you own in your account, is controlled by institutions, which have to be trusted to make transactions. Funds in a bank account can be seen as debt that the bank owes a person. The bank keeps track of how much they are in debt to their customers. This requires trust to the bank to keep your money safe.

Irreversible transactions are a part of crypto-currencies. Once a transaction in the Bitcoin network is handled, it cannot be reversed (Bitcoin Project 2015). If Bitcoins are accidentally sent into a wrong address or with too much coins, the transaction cannot be reversed by the system. This way users always have a risk of using crypto-currencies. However, trying to send coins into an address that doesn't exist will make the transaction give an error of a faulty address. Due to this, the risk of sending coins to a wrong address is low because the addresses are randomly generated strings consisting of numbers and letters. The probability to gain a similar kind of address in the Bitcoin network is negligible.

Although the risk of sending too much coins into an address is possible. Sending too much coins can be avoided if the sender and the receiver know exactly how much coins should be sent. Both can then verify the rightful amount of coins to be sent with the transaction. Applications offer tools such as requesting a certain amount of Bitcoins. The sender will see how much in BTC and EURO/DOLLAR is going to be sent to the other person. Using application tools such as this will reduce the risk of sending an unwanted amount of Bitcoins. Figure 5 demonstrates how Bitcoins are requested.
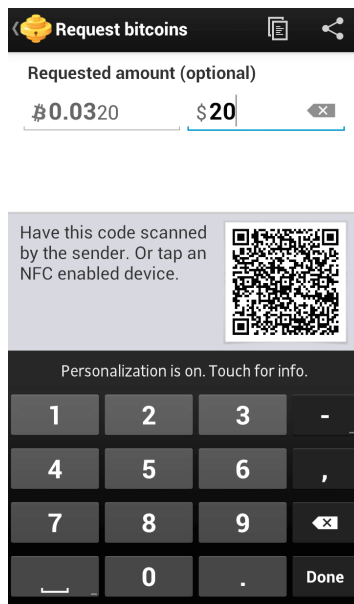

Figure 5. Requesting Bitcoins with a QR code before confirmation of payment (99 Coins ltd. & CoinBrief 2014)

Figure 5 indicates the practical view of requesting Bitcoins. The requested amount of Bitcoins can be typed in as in Bitcoin or other currency format to quickly view what amount is going to be sent.

3.4 Regulation

The currency is being accepted worldwide even though some countries such as India and Russia have banned or made the use of Bitcoins illegal (Smart 2015b). As discussed in the previous examples, the whole concept of Bitcoin is evolving and taking different aspects of security, finance and law all the time and it is an interesting subject to study.

Technically, crypto-currencies are free from bureaucracy. No one will ask to show a person's ID when creating a Bitcoin wallet. This applies when Bitcoins are used by software that is obtainable for free and the managing of Bitcoins is done by the owner of the coins. Using third party services may require filling in forms and providing account credentials. Paperwork regarding crypto-currencies is needed in businesses. Taxation and accounting of Bitcoin have sections that need be understood to operate legally. A decision by the top court of the EU made a decision on October 2015 to make all Bitcoin selling tax free in the EU without having to pay value-added tax (VAT) which clearly mitigates the process of handling Bitcoins (Bodoni & Thomson 2015).

Using Bitcoins can be a way of avoiding taxes. For the anonymous part of Bitcoin, it can be a challenge for governments to track the use of Bitcoins. The lack of regulation policies is why crypto-currencies such as Bitcoin can be used to evade taxes. Governments cannot point out which Bitcoin wallet belongs to who. The law in Finland abides users to report their Bitcoin uses when doing business but this law can be abused also in normal payments. There is no direct indication that Bitcoin is a reason to avoid taxes since people can do it with or without Bitcoin.

The technology of Bitcoin and other crypto-currencies offer traceable transactions without fees to help for example in accounting. Also the nature of the peer to peer network that crypto-currencies use, can be viewed to support democracy, since the use of crypto-currencies are available for everyone. Even in places where others forms of currencies could not be used. However, it must be kept in mind that the use of crypto-currencies can be limited by governments, if they are made illegal.

3.5 Privacy

Bitcoin is considered a transparent payment network because of the fact that transactions are stored into the blockchain which can be viewed by anyone (Augur 2015). The privacy of Bitcoin depends on its users. To grasp the most privacy out of Bitcoin, users must understand how Bitcoin transactions are logged and what good practises are there to ensure the most privacy for their users.

When a person sends Bitcoin from one wallet to another, the transaction is registered to the payment network which is the blockchain. The information stored in the blockchain contains the public address of the sender and the receiver. The logs will keep track of how much was transferred and the addresses where the transaction started and ended. This is the basic form of a Bitcoin transaction and the factors that can be viewed publicly. It can be assumed that only the people who made a transaction know their public addresses where the Bitcoins were sent and received. If this information was kept within these two people, no one else would know who owns the Bitcoins in these public key addresses. Privacy of the users is limited to these two who made the transaction with each other.

Now if the person who received the transaction decides to use that Bitcoin address to purchase something, he will then reveal his public address to someone. The privacy of the person's identity is then revealed little by little. With every transaction, more information of the wallets owner is revealed into the public. This does not mean however that the person can be easily identified just by transactions. Every transactions of a Bitcoin wallet will leak information about the owner into the public. Information pieces about the owner are left by purchases and trades. The wallet of a Bitcoin address is anonymous until the point someone finds out which address belongs to a certain owner. To find out which address belongs to who is difficult if there are no clues to start from. To a certain point, using Bitcoin will ensure the privacy of not revealing any information about the owner but when there are enough trails to follow, evidence can be gathered to point out who is using a certain address. (bitcoin.org 2015.)

Compared with other payment systems, Bitcoin is keeping the privacy of the users intact. Credentials cannot be harvested in the same way as in credit card and bank

transfer payments. The only public information of Bitcoin payments is the public key addresses which do not reveal any credentials such the identity of a person or other information such as the date of birth or the place of residence.

3.6 Finance

Bitcoins price is determined by supply and demand as pointed out in Chapter 3. The more Bitcoins are bought, the more in value it rises and the less they are wanted the less is the price. Figure 6 indicates the history of the price of Bitcoin starting from late 2011.

Figure 6. Bitcoin price 2011-2015 - BitStamp USD

A bubble refers to a commodity being overbought and shocking amounts of increase in value can be seen in a relatively short amount of time. The bubble rises for as long as buyers realize that the bought commodity is overvalued which eventually leads to a dramatic setback of price decline. The decline is because of stock owners want to sell their highly valued investments at a good price but the decline of the price leads to panic selling. While the price is already dropping, stock owners want to sell as fast as possible not to lose money if the price declines rapidly. (Investopedia LLC 2015; NASDAQ Inc. 2015).

The history of Bitcoin has a correlation with the price. The prices have mostly been on the move during the bubbles in the history of Bitcoin as seen in Figure 6 and 8. The three main bubbles in the price of Bitcoin were situated on June 2011, April 2013 and December 2013. The bubble of June 2011 cannot be seen in Figure 6 for two reasons. Firstly, the graph contains data from the exchange BitStamp which was established in late 2011 which does not cover transactions on June 2011. The bubble of June 2011 is small in this scale that it could not even be noticed.

The breakthrough of knowledge on Bitcoin to the masses came in the first two bubbles which were on June 2011 and April 2013. Before the first two bubbles, Bitcoin had appeared in the news headlines relatively in small amounts and awareness of Bitcoin was not concentrated on the masses. After the first two substantial bubbles in June 2011 and April 2013, Bitcoin was globally acknowledged, at least in Google searches. The correlation between the time stamps of the Google searches and the bubbles without doubt had a link with each other. Below the charts show the Google trends search increases over time and the price of Bitcoin. The bubbles and search increases in Google happen on June 2011, April 2013 and December 2013 that can be seen from Figures 7, 8 and 9.
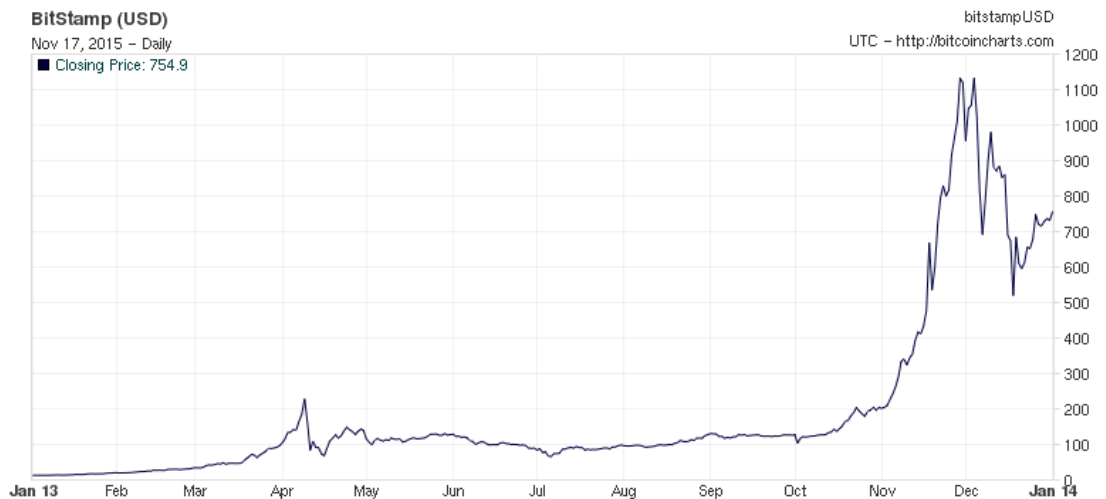

Figure 7. Bitcoin bubbles in 2013 – Bitstamp USD (bitcoincharts.com 2015a)

Figure 7 indicates the financial bubbles of Bitcoin on April 2013 and November-December 2013.

Figure 8. Bitcoin bubble in 2011 June – MtGox USD (bitcoincharts.com 2015b)

Figure 8 indicates Bitcoins financial bubble of June 2011. Starting from June 2011 the price of one Bitcoin increased from around USD 10 to USD 30 in less than a month.
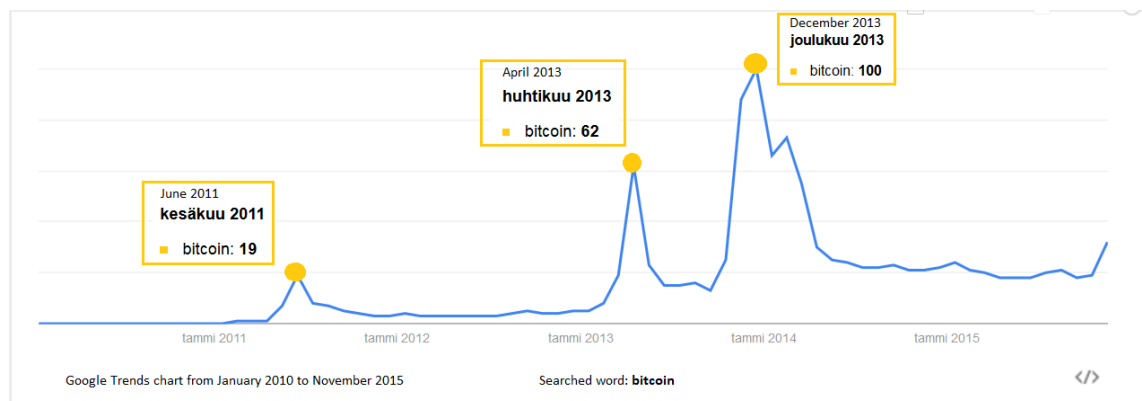

Figure 9. Google trends searches for Bitcoin over time (Google Inc. 2015)

Figure 9 indicates the search indexes of the history of Bitcoin searches. Clearly there have been three different spikes during the years 2011 to 2015. These spike increases in Google searches are clearly linked with Bitcoin bubbles which are seen in Figures 7 and 8. The Figure 9 graph can be read by the following "The numbers that appear show total searches for a term relative to the total number of searches done on Google over time. A line trending downward means that a search term's relative popularity is decreasing. But that doesn't necessarily mean the total number of searches for that term is decreasing. It just means its popularity is decreasing compared to other searches." (Google Inc. 2015). Since Google is the number one used search engine in the world, reaching the figure 100 in the index number clearly indicates that a significant amount of information is being searched about Bitcoin. The number is only an indicator of searches for Bitcoin and not comparable to other searches.

On the year 2014, Bitcoin tolled millions of EUR from investors and users when one of the biggest online Bitcoin marketplace named MtGox suddenly shut down its services. About 6% of all Bitcoins in existence were lost from this marketplace to unknown hands (Wile 2014). The act was suspected to be a hack or an inside job of thievery. The CEO of the exchange company was arrested in Japan. It affected the price of Bitcoin negatively since such a proportion of coins went missing from consumers. A misfortune for the consumers such as this does not convey trust. The fear that such a thing could happen in the future can impact the minds of consumers to stay away from Bitcoin.

The capital raised for funding Bitcoin startups has skyrocketed in the past few years. Startups are new companies that raise money from different sources to accomplish their business plans. According to CoinDesk, the total gathered amount of funds raised for Bitcoin startups on November 2015 reached a total of USD 940M which only includes publicly disclosed funding.. From the USD 940M raised funds, USD 480M have been raised just in 2015. Funding towards Bitcoin startups only in 2015 is tremendous despite the price of Bitcoin declining since the bubble of 2014. Services and technology revolving around Bitcoin will surely be seen in abundance in the upcoming years if the pace of funding towards Bitcoin startups continues. (CB Insights 2015; CoinDesk 2015.)

4. BITCOIN COMPANIES IN FINLAND

4.1 Background

Today there are roughly 57 listed companies in Finland that report using Bitcoin through a service by Coinmap (SatoshiLabs 2015). Coinmap is a service that lists Bitcoin accepting companies into a global map which can be viewed with Internet access. The companies on the Coinmap list are limited to physical shops but can additionally offer online services. According to Coinmap, today there are 57 locations in Finland that accept Bitcoin (SatoshiLabs 2015). From the Coinmap list of 57 locations, some of the companies on the list have the same owner which resulted in the overall amount of different companies to be around 50. Most of Bitcoin using companies on Coinmap are situated around the capital city of Finland. This is

geographically measured just a tiny fracture of Finland having Bitcoin accepting merchants.

Coinmap can be considered as an accurate source of legal physical shops that accept Bitcoin. These companies have gone through the process of integrating Bitcoin. In sum, they can offer unique information on the situation of Bitcoin since they are already utilizing Bitcoin. They can give answers to other companies that might consider Bitcoin integration. Consequently, a total of 17 Bitcoin accepting companies were interviewed. The interviews were conducted as taped phone call interviews. (SatoshiLabs 2015.)

All of the companies in this thesis that were contacted for interviews are selected only from the list on Coinmap. Bitcoin accepting and advocating companies in Finland also exist although they are not covered in the interviews with this research.

4.2 Collecting data

Data was gathered from Finnish Bitcoin accepting companies on Coinmap. Data collection was conducted as a qualitative research through interviews. Interview questions were asked from companies in Finnish from which three were then translated into English that can be viewed in the appendices section. The interviewees were key informants of companies which enabled accurate information to be retrieved of Bitcoin use.

Interviews were implemented as semi-structured interviews which contained follow up questions and open discussion of a topic (PhDStudent.com 2015). Follow up questions and open dialogue are justified in this research because of the complexity and the wide variety of themes that Bitcoin has. All interviews were done by phone calls which were taped and later transformed them into text. The interviews contain a structure of a self-report containing a set of questions (PhDStudent.com 2015).

Interview questions in this thesis contained qualitative and quantitative features. All together 10 questions were asked in the interviews. Four of the interview questions were qualitative open ended questions and six of them were quantitative single variable questions. As Appendices 1 indicates, the quantitative interview questions that were asked from interviewees were questions number 1, 2, 3, 4, 6 and 7. The qualitative interview questions that were asked were questions number 5, 8, 9 and 10. The

quantitative questions focus more on background information such as which year Bitcoin was taken into use. The qualitative questions focus on interviewee's opinions, feelings and aspects about Bitcoin (PhDStudent.com 2015). The nature of the open ended questions required dialogue which could not be achieved for example through a questionnaire (PhDStudent.com 2015). Open ended questions justify the need for an interview rather than a questionnaire.

Combining qualitative and quantitative research methods allowed for more accurate and deeper information to be retrieved in comparison with only one of these options. Combining qualitative and quantitative methods is also known as data triangulation (Denmark University & Copenhagen University 2015). Useful information regarding Bitcoin is retrieved through the use of the triangulation method of combining both qualitative and quantitative methods with the research questions.

4.3 Analysing data

The data analysed in this chapter is divided into two parts. One part is for the qualitative data and the other part is for the quantitative data gathered from the interviews in this thesis. The qualitative and quantitative analysis are both gone through separately.

Qualitative

The purpose of the qualitative research analysis is to find out the general picture of a phenomena. The data gathered from interviews is coded into themes. A content analysis was made from interviews. A content analysis includes labelling data into different categories. After the categories have been labelled, the results of the interviews can be concluded. The content analysis of data used a higher level of analysis to analyse the interviews. The interviews were analysed to know what was said and to know what may have been implied by interviewees. As Chapter 4.2 indicates, the qualitative interview questions were numbers 5, 8, 9 and 10. Every question was analysed separately. The analysed questions were written down on a list to identify and connect the main themes. All the data from the same question numbers from different interviews were written down on a single document. When the data for the same question from different interviews were on the same document, connections, themes and problems can be recognized. The most relevant information was chosen from the notes to be placed in

the results section of Chapter 4. Results of the interviews indicate the perspectives of the interviewees.

Quantitative

As Chapter 4.2 indicates, the quantitative questions were numbers 1, 2, 3, 4, 6 and 7. The quantitative data was analysed with a different manner due to the countable formula of the questions that were asked in the interviews with Finnish Bitcoin accepting companies. The data analysed in the quantitative questions focused on how frequently something occurred and what where the differences between the answers. The majority of the quantitative questions contained easily understandable and presentable data. Data was mostly consisting of pure numbers that can be statistically presented. The data from each quantitative question was gathered into a list and presented as charts that can be viewed in from the figures at the end of Chapter 4. Figures were conducted of each quantitative interview question except for question number 7 because answers were not so well presentable statistically. The results of the statistical presentations of the quantitative interview questions are from the perspective of the interviewed companies.

4.4 Results

The results of the interviews are presented below. The results are divided into qualitative and quantitative questions of the interviews. Qualitative interview questions are presented in text format while quantitative parts have charts and images to indicate and support the results. The qualitative interview question section is presented first followed by the quantitative interview question section.

Results of qualitative interview questions.

Question 5. Were there any particular problems of taking Bitcoin into use?

From 17 interviews the majority stated that there were no problems or did not remember having any problems. One did not give an answer to this part. Two interviewees stated problems with plugins as. Particularly, it was hard to find plugins that match and work with systems that companies had as Appendix 2 indicates. One company had problems with the integration since the service provider did not indicate clearly enough that the money received from Bitcoins were gone to USD and not EUR. According to the

company, the USD conversion of Bitcoins was a feature that made losses for the company because the USD had to be turned into EUR later to be able to be spent in Finland. One problem occurred with the application of the tablet used for the payments. It seems like as if the problem was with the application software and not with the tablet itself.

Question 8. Do you exchange your Bitcoins into euro straight when you receive a payment in Bitcoins, yes or no? If you answered no, what do you do with the Bitcoins?

From 17 interviews, 10 people were sure to answer that they exchange or will exchange all received Bitcoin payments straight into EUR. Three companies did not give any statement to this. One company stated that they have various uses for the Bitcoins they receive. The various uses for the Bitcoins were such as paying bills, the salary, network domain and hosting and paying an importer with Bitcoin. Paying bills is possible with Bitcoin by a service from a Finnish company Prasos Oy that operates the website Bittiraha. One company stated that they exchange 90% of the Bitcoins straight to EUR and keep the rest in Bitcoin as stated in Appendix 2. Volatility is one of the main reasons to exchange Bitcoins straight to EUR.

Question 9. What are the most significant benefits of Bitcoin payments?

From 17 interviews, 16 of these interviews answered question 9. At least eight companies stated that the biggest benefit of Bitcoin is the payment option for customers. A payment option for customers is related to customer service to offer another payment possibility with Bitcoin. Being a payment option is the biggest theme occurring in question 9. At least five companies stated Bitcoin to be an image aspect for a company. According to the companies, using Bitcoin would benefit their company's image to others. A few companies stated that Bitcoin is relatively a fast payment option. Bitcoin is thought to be inexpensive unless there are no users from which no savings are to be made through transactions. Using Bitcoin can possible bring new customers into the market. Being ahead of others is a feature of Bitcoin. Using Bitcoin in a company states that it is ready for the future where some believe the currency to raise in popularity. Using Bitcoin is seen also as a marketing benefit to the company which is related to the image question of accepting Bitcoins.

Question 10. What are the most significant disadvantages in using Bitcoin as a payment?

Interview question 10 indicated many disadvantages regarding Bitcoin use. From 17 interviews, 14 participants gave a comment about Bitcoin disadvantages. One interviewee did not give any answer to interview question 10. The most frequent comments about Bitcoin disadvantages were regarding volatility and the negative image of Bitcoin.

Volatility of Bitcoin is considered a disadvantage because if Bitcoins are not exchanged into euro straight when they are received then the volatility risk may make losses to a company. Volatility can be reduce by using a service that exchanges Bitcoins for use straight when they are received but it comes with risks. The risks of using an exchange service were stated to be the lack of trust in the service for example if it were to be shut down. The negative image of Bitcoin was related to the stereotypes of people that use them. The stereotypes of Bitcoin users were referred to as nerds or technically high skilled people that only use the highly advanced technology of Bitcoin. People are considered sceptical about Bitcoin.

At least two answers stated that transferring Bitcoin into accounting and taxation required extra work which is a disadvantage. Also it was stated that the use of Bitcoin is not being used enough by people and is not so popular and ultimately the use of Bitcoin is marginal. When the use of Bitcoin is marginal, profits cannot be gained so well through it. Profits cannot be gained so well because the low transaction fees are not utilized enough.

Results of quantitative interview questions

<u>Question 1. Which year was Bitcoin taken into use?</u>

The first interview question number 1 indicated the time of when Bitcoin was taken into acceptance in companies. From 17 interviews only one did not state at all what year Bitcoin was taken into use. The year 2015 was the most frequently occurring year to take Bitcoin into use and the year 2012 was the least occurring. Figure 10 declares the time when Bitcoin acceptance was taken into use from interviewed companies.
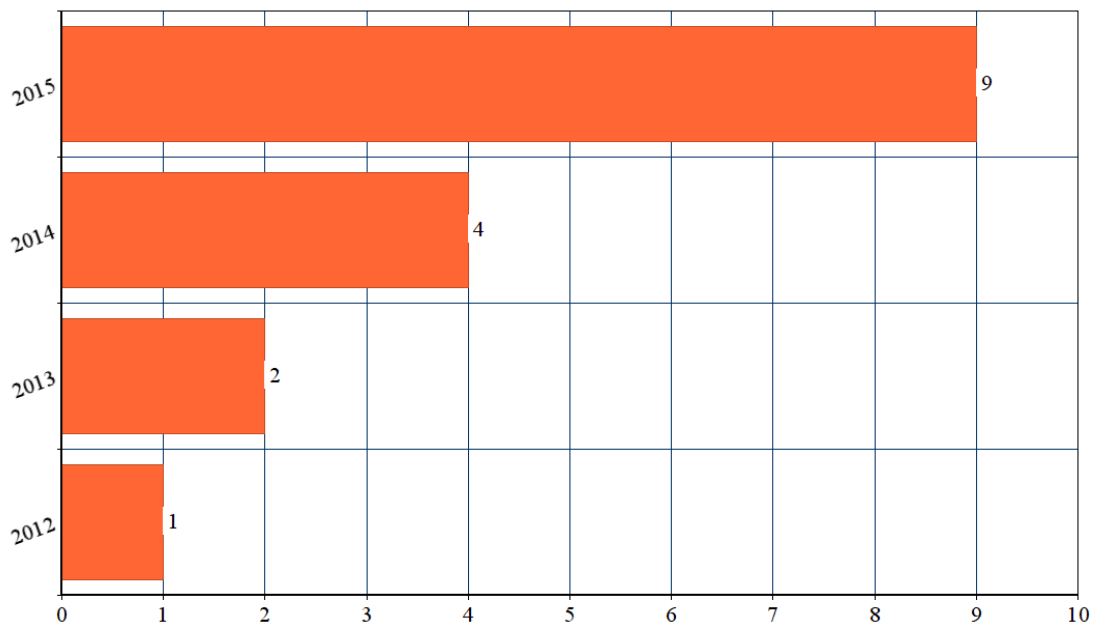
Which year was Bitcoin taken into use

Figure 10. Year of Bitcoin acceptance from interviewed companies

As Figure 10 indicates, the year 2015 had the most instances in accepting Bitcoin from the interviewed companies.

<u>Question 2. Do you accept Bitcoins in your store, online or both?</u>

Interview question 2 declared where Bitcoins are accepted in. From 17 interviews, one did not clearly state to which category the company belonged to so it was not included in this. One company did not answer this question at all, so all together two of the interviews were not included in the calculations of this interview question. Figure 11 indicates the interviewees ways of accepting Bitcoin in shops or online. By a margin, physical shops occurred more by one answer.

The replies on where Bitcoin are accepted by companies is pretty balanced. Physical shops accepting Bitcoin occurred more by one answer

Question 3. Was there enough information available concerning the integration of Bitcoin as a payment system? Scale 1-10, 1=No information, 10=Sufficient information

Interview question 3 asked how much information was available about the integration of Bitcoin into a company. From 17 interviews a total of 15 participants answered question 3. Answers are presented in Figure 11.
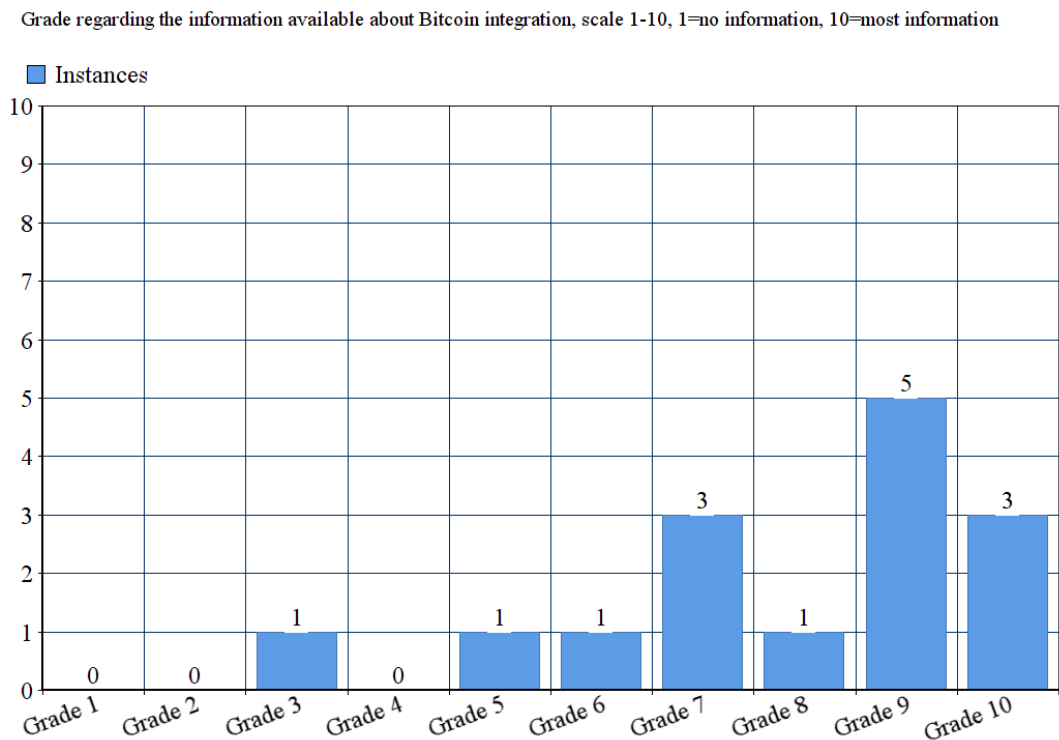

Figure 11. Grade on information available about Bitcoin integration

As Figure 11 indicates, the most instances of the grades given are near the perfect score of 10. The calculated average grade given for interview question three was 7.866 from a scale of 1-10.

Questions 4. How easy was it to integrate Bitcoin as a payment system in your company? Scale 1-10, 1=Hard, 10=Easy

From 17 interviews, a total of 14 gave an answer regarding interview question number 4. The results of the interview question number four are presented below in Figure 12.

How easy was it to integrate Bitcoin into your company ? Scale 1-10, 1=hard, 10=easy

Figure 12. Chart of how easy the Bitcoin integration process was
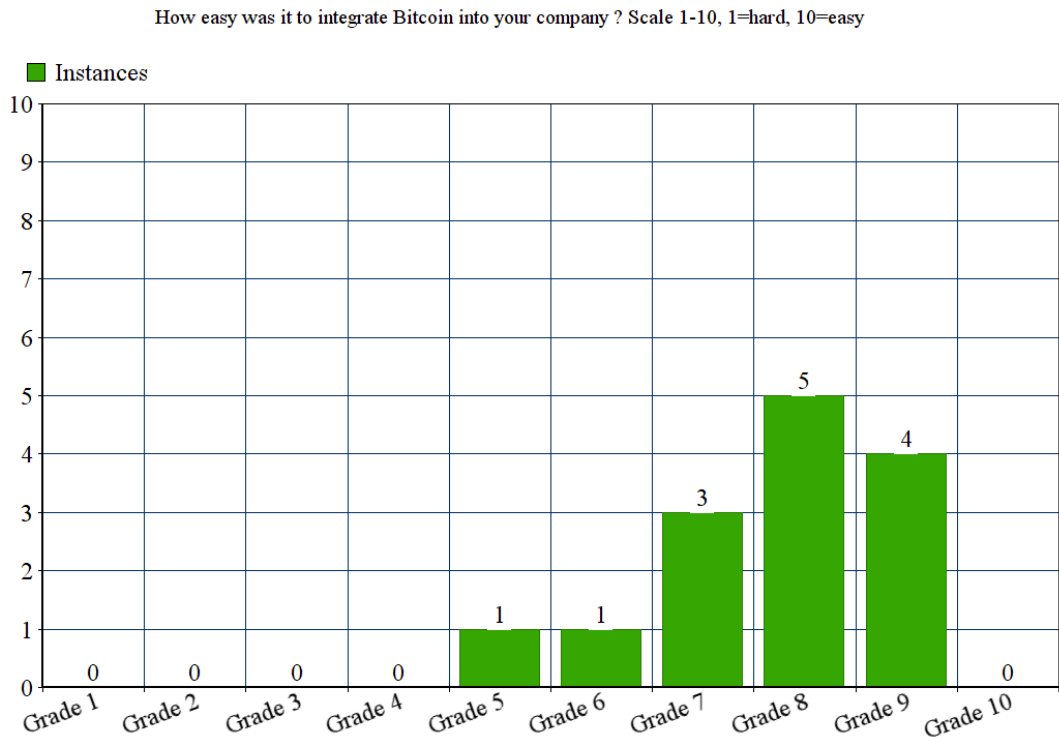
As Figure 12 indicates, majority of the interviewed companies found the Bitcoin integration process to be easy or quite easy with an average grade from 14 answerers to be 8.307. The scale of the answers were from 1-10 which the lowest grade means the hardest and the highest grade meaning the easiest.

Questions 6. How many percent of customers estimately use Bitcoin?

From 17 interviews a total amount of 15 companies replied to interview question 6. One company stated to have a different percentage of sales in Bitcoin in the physical and online shop which are both included in the Figure 12. Figure 12 does not differentiate the answers between physical or online shops. One of the companies stated to have online sales to be of 15% and the physical shops sales to be 1% with Bitcoins which are both included in Figure 13 below.

How many percent of customers estimately use Bitcoin?
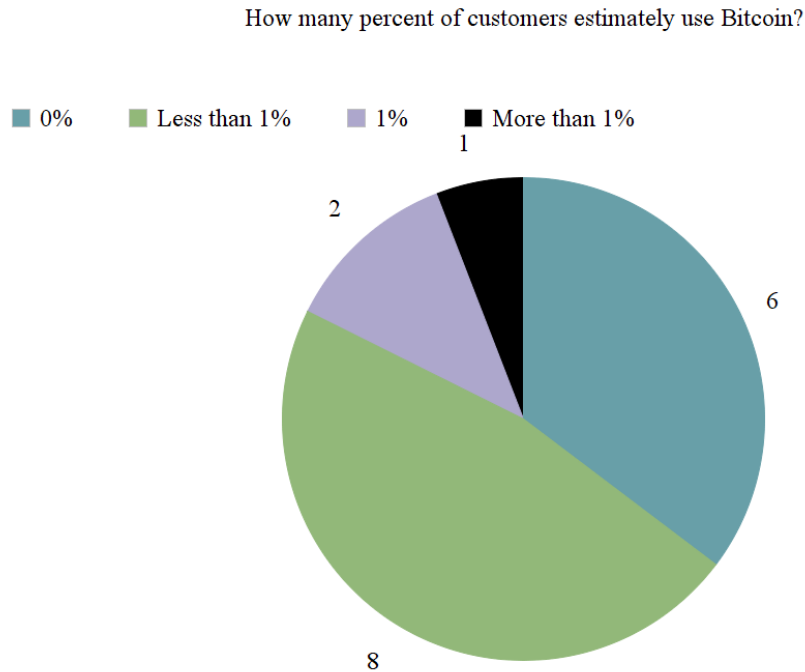
Figure 13. Spread of estimated Bitcoin usage in interviewed companies

Estimations of how many percent of a company's customers use Bitcoin were asked from the business owners. The findings in Figure 13 point out that the majority of Bitcoin use with customers is mostly 1% or less. One company stated that 15% of online customers use Bitcoins for purchases but on the other hand only 1% of customers use Bitcoins in that company's physical shop.

Question 7. How often does someone use Bitcoins in your store? For example once a month or a week etc.

From 17 interviews, a total of six companies stated they had no transactions with Bitcoin. Below are gathered the different statements on how often Bitcoin is used. These statements do not include statements of the six companies that had no transactions with Bitcoin.

More than once in a month:

"Almost every day, Twice per/month, Twice per/week, Twice per/2weeks, Few times a week "

Less than once in a month:

"Once per/3 months, Once per/2months, Twice per/year, Once per/6 months, Twice per/year "

Other:

"Once in a month"

The make comparison easier, at the end of each statement there is category of the statements. A comment is stated whether Bitcoin is used more or less than once in a month to make comparison of answers easier. A total of five answers stated that Bitcoin is used more than once a month. A total of four answers stated that Bitcoin is used less than once in a month. One answer stated that Bitcoin is used once a month.

The use of Bitcoin more or less than once in a month is balanced. The most frequent use of Bitcoin was stated to be "almost every day" while the least frequent use was stated to be "twice per year".

5. CONCLUSIONS

Bitcoin is a relatively new and complex system of trading value amongst other payment systems. The challenge is to understand how Bitcoin functions from its technological and practical points of view. This thesis studied the different aspects of Bitcoin and the use of it in Finland. The study of crypto-currencies and Bitcoin in Chapter 3 fulfilled the first objective of this thesis of explaining what crypto-currencies and Bitcoin are. Different aspects of Bitcoin use were covered from a technological and practical side to

gain a reasonable understanding of crypto-currencies. After the research in Chapter 3 is covered, findings of Bitcoin use in Finland are found in Chapter 4.

The objectives of this research were to find out how companies in Finland utilize Bitcoin in their businesses. Therefore, companies accepting Bitcoin in Finland were interviewed. A multi case study of interviewing 17 companies was conducted to relay their views regarding the use of Bitcoin in Finland. The research findings are presented to give objective information about the use of crypto-currencies in Finland. The results in Chapter 4 indicated conclusions that can be clearly noticed.

It was discovered that the use of the crypto-currency Bitcoin is marginal at the moment. As Chapter 4 indicates, the majority of the companies in Finland accepting Bitcoins only account for 1% of sales or less done with Bitcoin. The reports of the 17 interviewees stated that Bitcoin transactions are received depending on the field of business and services or products that a company offers. As stated in Chapter 4, Bitcoin are received by merchants varying from "almost daily" to "twice per year" depending on the company. From the 17 interviewed companies, a total of six stated that they have never received any Bitcoin transactions.

Bitcoin payment benefits and disadvantages were asked from interviewed companies. According to the interviewed companies, the biggest benefit of using Bitcoin is a payment option for customers. The possibility of paying with Bitcoin instead of other currencies is seen as benefit of using Bitcoin. The second biggest benefit of Bitcoin is a better image for a company if Bitcoins are accepted. Other benefits included statements that Bitcoin payments are swift and easy and using Bitcoin is inexpensive at least if many transactions are performed with it.

The biggest disadvantage of Bitcoin was clearly stated to be the volatility of Bitcoin. High fluctuations in the price of Bitcoin even in a day can cause losses of value and is also seen as a negative impact on the crypto-currency. The volatility is a risk for companies especially that do not convert their Bitcoin into other currencies. Despite the fact that all fiat currencies such as euro and dollars are impacted by volatility, the volatility of fiat money is marginal in comparison with Bitcoin. There is a way to reduce the volatility for merchants accepting Bitcoin. Volatility risk is reduced by using

a service that converts Bitcoins straight to euro when received. Chapter 4 revealed that using Bitcoin payment services that convert Bitcoins into euro may bring uncertainty because of the trust needed to use these services. Also selecting the right Bitcoin payment service provider can be challenging because they have different practises and transaction fees.

The reasons for taking Bitcoin into use in the interviewed companies suggested that it is an image or marketing question whether a company uses Bitcoin. Reasons suggested that having an image of accepting Bitcoin would be positive at least for the marginal group of people who use Bitcoins. Chapter 4 also stated that using Bitcoins is a marketing advantage. The interviewees stated that the advantage is gained through using Bitcoins compared with companies who do not use Bitcoins. The marketing advantage was seen to be a part of the customer service which is to offer a payment option for customers. On the other hand, the interviewed companies stated that Bitcoin itself was considered having a negative image to some extent. The negative image was related to stereotypes that some people have about Bitcoin being a currency for highly technically skilled people.

Most companies whose representative were interviewed had started to accept Bitcoin in the year 2015. If new companies accept Bitcoins with the rate that has occurred in the recent years, the total number of merchants are expected to rise in numbers. The representatives of companies interviewed mostly stated that the information available on integrating Bitcoin was satisfactory and challenges in the integration of Bitcoin did not occur to a wide extent. The integration of Bitcoin for companies was reported being simple except for few cases.

Based on the findings of this research, the location of a Bitcoin accepting business does not seem to matter as much as the service or products offered. Especially businesses that offer products or service that are used frequently will receive more Bitcoin using customers than companies that offer products or services that are needed only a few times a year. As an example, grocery shops have customers daily whereas another company sells products that are only bought a few times a year. A company that has more customers has a wider range of different customers. The more there are customers,

the more likely someone of them will use Bitcoin. The less there are customers, the less likely Bitcoin payments are to be received.

The technology of Bitcoin such as the blockchain has already been taken advantage of in different companies that build their own systems to improve security. It seems evident that in the future even more technologies are based on the blockchain which offers transparency and traceability to a system. The blockchain could be used for example in elections to prove that votes have been calculated in the right way.

Users have to be careful when handling their Bitcoins. Bitcoins should not be used without understanding the most important aspects of how they work. Bitcoins can be forever lost in multiple cases. Private keys can be lost due to hackers, damaged hard drives and human made errors. Forgetting passwords or simply sending Bitcoins to a wrong address will make them also disappear mostly likely forever. Knowledge from a set of guides is to be absorbed to safely use the virtual currency Bitcoin.

As Chapter 3 indicates, Bitcoin can be used with people who have financial payment restrictions. Bitcoins can be transferred without limits regarding institutions, governments or frozen bank accounts. The regulation of Bitcoin in Finland has recently changed. The direction of the regulation has taken a more positive change regarding consumers. Directives of the EU court ruled Bitcoin use to be free from VAT taxes. Also Finnish banks have recognized Bitcoin and seem to have good understanding what Bitcoin and its fundamentals are. It is yet to be seen if there are changes in regulations and directives resulting in a change to the status of Bitcoin. Companies should keep tabs on regulations constantly if they are involved in accepting Bitcoins.

The total 17 interviewed companies for this thesis only cover roughly one third of all the Bitcoin companies in Finland that are listed on the Coinmap service. Also Bitcoin accepting companies are situated mainly in or near the capital region of Finland. This thesis did not differentiate the success or failure of Bitcoin use between different business sectors. All of the results and conclusions of this thesis are from the same 17 interviewed companies and they are not separated by business sectors.

In the recent events and the findings of this thesis regarding Bitcoin indicates a bright future Bitcoin. The relieved regulation policies, massive funding and increasing trend of popularity towards Bitcoin, all point out to a positive near future of Bitcoin. The popularity of accepting Bitcoin with merchants is increasing slowly but steadily. One aspect of the popularity of Bitcoin use with consumers can only be indicated from the sales of Bitcoin accepting companies in this thesis.

As indicated in Chapter 4, this research suggests that companies that have high volumes of selling products or services are more likely to benefit from using Bitcoin because more transactions are received. Additionally, the findings in Chapter 4 indicate that businesses, which use Bitcoin online, receive more frequent sales with Bitcoin. Accepting Bitcoins in an online shop selling products in high volumes can attract more Bitcoin using customers. More Bitcoin using customers reduces overall payment fees and additionally gives control over funds.

On the basis of this thesis, further research is suggested. The information on the Bitcoin use of consumers is something that has not been measured well. It would be beneficial to know how widely Bitcoins are used by consumers. One research suggestion could include a study of what restrains companies from taking Bitcoin into.

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APPENDICES

Appendix 1.   Interview transcript of Ostosmarket.fi

Appendix 2.   Interview transcript of K-Market Rosmarin

Appendix 3   .   Interview transcript of HUG Bikeshop

Interview with Ostosmarket.fi

1.) Which year did you start to accept Bitcoins in your store?

2012

2.) Do you accept Bitcoins in your store, online or both? (x for the input)

Choose: Store() Online() Both(x)

3.) Oliko Bitcoin maksujärjestelmän käyttöönotosta tarpeeksi/riittävästi tietoa?

asteikolla 1-10, 1=ei tietoa ,10=eniten tietoa

Numero: (10)

3.) Was there enough information available concerning the integration of Bitcoin payment system? Scale 1-10

1=No information, 10= Sufficient information

Number: (10)

4.) How easy was it to integrate Bitcoin as a payment system in your company? Scale 1-10, 1=Hard, 10=Easy

Number: (9)

5.) Were there any particular problems of takin Bitcoin into use?

COMPANY: Well no, there was no problems, the most got me thinking was the price fluctuations, but it didn't kind of effect the integration process, but it demanded kind of like other sort of business, like that you have go through it when you take this kind of currency where the price swings a lot so you have to think, but in taking use there was no problems.

6.) How many percent of your customers approximately use Bitcoin?

COMPANY: emhh, the online store has been in 15 percent and local store we could say, one out of hundred

INTERVIEWER; So about one percent?

COMPANY: Yes

7.) How often does someone use Bitcoins in your store? For example once a month or a week etc.

COMPANY: Well, we have had almost every day, if we count the online and local shop.

8.) Do you exchange your Bitcoins into euro straight when you receive a payment in Bitcoins, yes or no? If you answered no, what do you do with the Bitcoins?

COMPANY: No we do not exchange. We have been able to use them for different for example hosting, network and domain costs, and then, what else, we have had one importer that accepts bitcoin where we have managed to get items for sale from, and we have paid bitcoins to our workers, and that's pretty much it, well in fact we have paid bills in bitcoin, it involves if the importer doesn't accept bitcoins, there are available bill services which can be used to pay bills in Bitcoins.

INTERVIEWER: Is it the service of Bittiraha?

COMPANY: yes, there is a small fee but it is worth it because of a pretty good increase in value of bitcoin.

9.) What are the most significant benefits of Bitcoin payments?

COMPANY: So only two? Hmm let's think, well maybe the perfect control over that money which is like the most important thing, so it involves that the money also moves during the weekend, like I want it to move, and in banks it doesn't work, no matter how much I asked them it doesn't move with the banks. And also the thing I get to move it anywhere I want unlike other traditional payment methods it's not so easy. So the full control over that money is one, and another is well, mm, it's like there is limited amount of bitcoins, the 21milllion so it isn't printed out more like in traditional currencies.

INTERVIEWER: So the currency isn't printed out more than the maximum amount,

COMPANY: well it has a maximum limit which agreed on beforehand and it stays that way.

INTERVIEWER: the amount of money printed is known beforehand.

COMPANY: indeed, yes all, like bitcoins which in circulation is know exactly.

10.) What are the most significant disadvantages of Bitcoin payments?

COMPANY: Hmm, maybe the most significant disadvantage is that it has formed somewhat a negative like image, so it's like some money for nerds or that others are not capable of using it other than information technology professionals or that is used to do a lot of criminal activity, so it's kind of like a negative image so that is kind of like the biggest disadvantage, when the question is about in fact actually a remarkable, kind of like technology and very advanced so a pity that has become such a negative image

INTERVIEWER: Yes so an image questions?

COMPANY: yes indeed

Interview with K-Market Rosmarin

1.) Which year did you start to accept Bitcoins in your store?
COMPANY: 2014

2.) Do you accept Bitcoins in your store, online or both? (x for the input)
Choose: Store(x) Online() Both()

3.) Was there enough information available concerning the integration of Bitcoin payment system? Scale 1-10 1=No information, 10= Sufficient information
Number: (9)

4.) How easy was it to integrate Bitcoin as a payment system in your company? Scale 1-10, 1=Hard, 10=Easy
Number: (6)

5.) Were there any particular problems of takin Bitcoin into use?

COMPANY: no, no there was not

6.) How many percent of your customers approximately use Bitcoin?

COMPANY: less than 1%

7.) How often does someone use Bitcoins in your store? For example once a month or a week etc.

COMPANY: a few times a week

8.) Do you exchange your Bitcoins into euro straight when you receive a payment in Bitcoins, yes or no? If you answered no, what do you do with the Bitcoins?

COMPANY: Yes right now the thing goes like that 90% of bitcoins turn into euro directly and 10% stay in bitcoins. At the start all come in bitcoins but then I changed the system so that I don't have to worry about volatility.

9.) What are the most significant benefits of Bitcoin payments?

COMPANY: Well in this situation when this is so new and so few few use it it's like the biggest benefit is kind of this image thing and and also, let's say if the handful of people who use them and are happy then its good, so this is like a positive publicity and also different payments when I accept for example bank and credit card, they gather in a year a substantial amount from those payments.

INTERVIEWER: yes, so it would be this inexpensive concerning the payment method or?

COMPANY: yes yes, well as long as when it is small it isn't, then cause it not so remarkable that it could be counted to bring savings directly

10.) What are the most significant disadvantages of Bitcoin payments?

COMPANY: Well it is in so small scale use so, can you wait I have customers here…… so where did we left of?

So it doesn't directly concern that it would be a bad payment but, what should I add, well if, if you don't have this system that it changes to euros directly than the volatility is quite a lot. Quite a lot because it is so lively………so what did you say?

INTERVIEWER: So it was about the disadvantages

COMPANY: yes indeed this price of bitcoin, if someone, who says it is cheap to use that it doesn't take any fees like the bank, so if you don't have the system that changes them to euros then the benefit losses instantly if, if there is a market price loss so so so,

Interview with HUG BikeShop

1.) Which year did you start to accept Bitcoins in your store?

2015

2.) Do you accept Bitcoins in your store, online or both? (x for the input)

Choose: Store() Online() Both(x)

3.) Was there enough information available concerning the integration of Bitcoin payment system? Scale 1-10, 1=No information, 10=Sufficient information

Number: (9)

4.) How easy was it to integrate Bitcoin as a payment system in your company? Scale 1-10, 1=Hard, 10=Easy

Number: (8)

5.) Were there any particular problems of takin Bitcoin into use?

COMPANY: Mm yes with the integration was, I don't actually remember carefully anymore that what it was but the plugin had something, something small code changes needed to be made.

6.) How many percent of your customers approximately use Bitcoin?

COMPANY: 0.1%

7.) How often does someone use Bitcoins in your store? For example once a month or a week etc.

COMPANY: once in 6 months

8.) Do you exchange your Bitcoins into euro straight when you receive a payment in Bitcoins, yes or no? If you answered no, what do you do with the Bitcoins?

COMPANY: well pretty much yeah

9.) What are the most significant benefits of Bitcoin payments?

COMPANY: From our side or from the customer side?

INTERVIEWER: Well overall the benefits of bitcoin from your side

COMPANY: Yes yes, well from our side maybe like a marketing benefit, mostly that and new customers, reaching possibly, at the moment not so much has led to that, but pretty like an experiment and that way there is these, I have looked into the matter, that way is that payment possibility and we have given at as extra service for the customer. Yes.. Maybe an image benefit could be..

10.) What are the most significant disadvantages of Bitcoin payments?

COMPANY: Well I would not see that it would greatly produce any disadvantages, that is why we have kept have kept it there, there even though at the moment the transactions with bitcoins has been minimalistic, cause there is no disadvantage in it then we can offer that opportunity to pay with bitcoins. Actually only that in accounting it produces a little complexity but it I don't think it is a major thing in that.. so so, we use the BitPay service from there the payment goes and report is given out which is similar to all other payment systems so it can be pretty easily be delivered to accounting.