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VIABILITY OF BITCOIN IN BUSINESS ENVIRONMENT

Kansainvälisen kaupan koulutusohjelma
2017



BITCOININ KANNATTAVUUS YRITYSTOIMINNASSA

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Kansainvälisen kaupan koulutusohjelma
Joulukuu 2017
Sivumäärä: 43
Liitteitä: 2

Asiasanat: virtuaalivaluutta, maksujärjestelmät, liiketalous

Tämän opinnäytetyön aiheena oli virtuaalivaluutan, Bitcoin, kannattavuus yritystoiminnassa. Tutkimus keskittyi Bitcoinin käyttöön maksuvälineenä ja sen muihin yrityskäyttömahdollisuuksiin. Haastattelua, asiakaskyselyä ja Bitcoin palvelujen, tuotteiden ja lainsäädännön analyysiä käytettiin valuutan yrityskäytön kannattavuuden selvittämiseksi.

Teoreettinen osa työtä selitti Bitcoinin ja sen markkinoiden toiminnan. Teoreettisen osan loppussa käsiteltiin erilaisia palveluita ja tuotteita, mitä on mahdollista rakentaa Bitcoinin ympärille. Teoreettisen osan päämäärä oli selvittää Bitcoin-valuutan toiminta ja sen yleinen tarkoitus lukijoille, joille aihe on täysin tai melko tuntematon.

Opinnäytetyön empiirinen osa toteutettiin kvalitatiivisilla ja kvantitatiivisilla metodeilla. Käytetyt metodit olivat kvalitatiivinen teemahaastattelu ja kvantitatiivinen kuluttajakysely. Teemahaastattelu toteutettiin vähittäistavarakaupan kanssa, joka oli aikaisemmin sallinut Bitcoin-maksut yrityksessään. Haastattelu tehtiin puhelimen kautta ja siinä käytettiin ennalta suunniteltua teemarakennetta. Kuluttajakysely tehtiin kahdessa Bitcoinin liittyvässä yhteisössä ja sitä käytettiin aikaisempien ja suunniteltujen Bitcoin ostosten selvittämisessä.

Empiirisen tutkimuksen tuloksena tuli selville, että Bitcoin maksujärjestelmän käyttö fyysisissä kaupoissa ei ollut suosittua ja siihen sisältyi monia ongelmia ja heikkouksia. Verkkokaupoissa käytettävät ilmenivät paljon suosittumiksi Bitcoin-käyttäjien keskuudessa.

Tutkimuksen pohjalta tehtiin johtopäätös, että Bitcoin maksujärjestelmän käyttö verkkokaupoissa oli toteuttamiskelpoista valuutan normaalitilassa, kun siirtomaksut ja -ajat ovat kohtuulliset. Verkkokauppojen Bitcoin maksujärjestelmiin sisältyi paljon vähemmän riskejä ja ne eivät vaatineet paljon sijoitusta yritykseltä verrattuna fyysisiin Bitcoin maksujärjestelmiin kaupoissa, jotka vaativat panostusta henkilökunnan koulutukseen ja laitteistoon ja tämän laitteiston ylläpitoon. Verkkomaksujen kohdalla Bitcoinilla oli myös joitain etuja perinteisiin luotto- tai pankkikorttien maksujärjestelmiin verrattuna, koska Bitcoin siirtoihin sisältyi yleensä pienemmät siirtomaksut jopa kauppapalvelujen kohdalla. Tutkimuksessa oli otettu huomioon sen loppuvaiheilla ilmennyt tilanne, jossa Bitcoinin siirtomaksut ja -ajat nousivat merkittävästi ja tämän takia Bitcoinin yrityskäyttö väliaikaisesti ei ollut kannattavaa.

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Degree Programme in international business
December 2017
Number of Pages: 43
Appendices: 2

Key Words: virtual currency, payment systems, business administration

The purpose of this thesis was to provide information on whether the currency Bitcoin is viable and beneficial for businesses as a payment method or a business model. Interview, customer questionnaire and analysis of Bitcoin services, products and legislation were used to create a better understanding of viability of the currency.

Theoretical part of the thesis explains how Bitcoin and its markets function. Later parts of the theoretical part lays out different services and products that can be built around Bitcoin. The objective of the theoretical part is to give better understanding of the general idea of Bitcoin for readers who are unfamiliar with the subject as it is a new concept.

The empirical research part of the thesis was conducted with both qualitative and quantitative methods. Methods used were a qualitative theme interview and a quantitative customer questionnaire. The theme interview was conducted with a brick and mortar store, which had previously used Bitcoin as a payment method. The interview was conducted over the phone and a planned theme structure was used. The questionnaire was conducted in two different Bitcoin related communities and it was used to find out their previous and planned Bitcoin payment method usage.

Trough empirical research it turned out that Bitcoin retail payment method is not very popular and that it has many problems and disadvantages in its current form. Online payment methods appeared to be more popular among users.

From the research it was concluded that Bitcoin online payment methods using merchant solution services are viable, when transaction fees and times are at their normal level. Online payment methods involve less investment and risk compared to retail Bitcoin payment methods, which don't have much demand, require staff training and purchasing and maintaining of separate payment devices. Online payment methods appeared to have some advantages compared to traditional payment methods as well as normally they involve smaller transaction fees when using a Bitcoin merchant service as opposed to using credit or debit card company payment services. It should be noted that at the end of the research Bitcoin transaction feeds and transaction confirmation times rose significantly, which temporarily made the business use of the currency mostly untenable.

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1 INTRODUCTION

This thesis studies the use of a virtual currency, Bitcoin, in business environment as transaction currency and a tool both internationally and nationally. The focus will be on finding and examining the possible advantages and disadvantages in using such a currency compared to traditional currencies in the business world. Business applications, current and future laws for virtual currencies will also be examined.

The surprising popularity and growth of Bitcoin brought the use of virtual currencies to the mainstream audiences. The use of Bitcoins is a quickly growing trend and such developments cannot be ignored by businesses working in online and international markets. This work's objective is to explain the importance of virtual currencies and their use to the reader and examine if using them in form of payment method or other ways is beneficial or unbeneficial for businesses.

As the concept of virtual currency is new, the theoretical part of the work will be defining what type of a virtual currency Bitcoin is and how it works in context of business. The fresh and changing nature of the subject means that source material must be recent. Books, magazines, webpages and -articles will be used as research material. The theory will also focus on virtual currency related laws and regulations, which are in place and in development. Most of the thesis will examine a cryptocurrency called Bitcoin, as it is the most known, fastest growing out of all virtual currencies. Bitcoin will be a good platform to find out what businesses currently use virtual currencies and how they use them.

Multitude of international and even domestic Finnish businesses have adopted the use of Bitcoin in their business to customer transactions. The empirical part of the thesis will find out and explain the reasons as to why these businesses have adopted a cryptocurrency as a transaction method. An interview with a business like this will be used to explore this fact.

2 PURPOSE AND OBJECTIVES OF THE PROJECTS

2.1 Purpose and goals

The purpose of this thesis is to inform readers about the business viability of virtual currencies and mainly Bitcoin. The goal is to create a in depth picture on the long-term benefits and drawbacks of using Bitcoin whether it be in form of service, product or simple transaction currency.

Theoretical part of the thesis aims to explain the functions and attributes of virtual currencies. It is also meant to inform readers about the general idea on how Bitcoin works in business and what business applications it has.

As the subject of Bitcoin is still very much living and changing, it is important for the thesis to give a clear explanation on certain functions of Bitcoin to the reader, such as transaction fees. With the deeper explanation, it is easier for the reader to look at possible later changes in the market or consumer behavior and understand why they happen.

Empirical part focuses on company interview and consumer questionnaires on Bitcoin usage. In the final part of the thesis these subjects are inspected and analyzed to reach the goal of the research.

The thesis aims to answer the following questions and their sub questions.

- a. How does Bitcoin work in trade and is it trustworthy and safe to use?
- b. Is adopting Bitcoin to a business beneficial in the long-term?
 - i. What legislation exists for virtual currencies and what new legislation is planned for them?
 - ii. How are these currencies taxed?
 - iii. What variabilities effect the viability of Bitcoin in business?
- c. What different products and services can be built around virtual currencies?
 - i. What traditional products and services can be built around Bitcoin?
 - ii. What new products and services have been discovered and created with bitcoin?

2.2 Framework

The viability of Bitcoin in business is based on what services and products it can support. There are traditional and also new types of products and services, which are based entirely around virtual currencies. It is important to examine these products and services to explain how business can use this new technology and whether using it is worthwhile for them. Significant factor in Bitcoin's viability are the advantages and disadvantages, which it has compared to traditional currencies when it comes to purchasing goods or services retail or online.

Long-term development of Bitcoin can be assessed through upcoming legislation and tax laws, as new legislation can significantly increase the currency's viability and in other instances hurt it. Consumer trends are also a great indicator on long-term development and viability. It is important to know what services and goods customers tend to purchase with Bitcoin and why they use Bitcoin to purchase them instead of fiat currency.

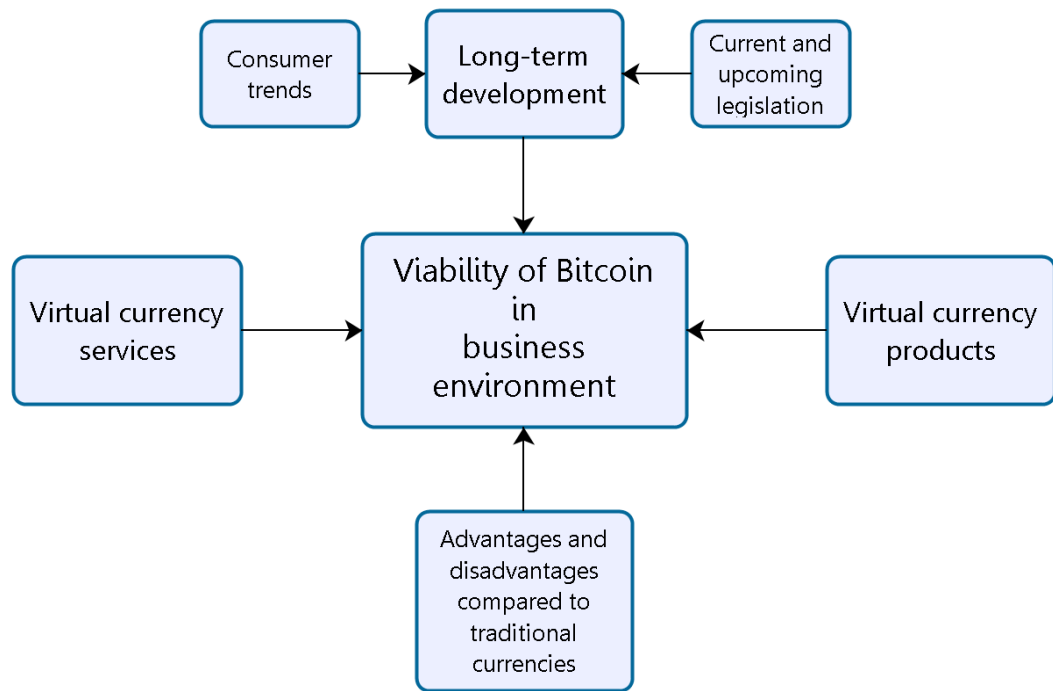


Figure 1: Theoretical framework of the thesis

3 CONCEPT OF VIRTUAL CURRENCIES

3.1 Defining virtual currencies

European Banking Authority defines virtual currencies as “digital representation of value that is neither issued by a central bank or a public authority, nor necessarily attached to a FC, but is accepted by natural or legal persons as a means of payment and can be transferred, stored or traded electronically. The main actors are users, exchanges, trade platforms, inventors, and e-wallet providers.” (European Banking Authority webpages 2014.)

The virtual currency as a concept is very new and it did not come to public knowledge before the development of Bitcoin in 2009. Bitcoin is the best platform to form a picture of what a virtual currency is and how it works as it is the archetypal virtual currency and it is currently the most used of its type. (Cryptocoins News webpages 2014.)

Bitcoin is an alternative type of currency to the traditional fiat currencies such as dollar or euro. Unlike modern fiat currency, it is decentralized, which means it is not backed or issued by a government, organizations or people. In other words, there is nobody controlling the creation and distribution of the currency. The currency is a program and the program is run by a network of “miners”. (Franco & Pedro 2014, 3-5.)

The miners are Bitcoin users, who allow their computers to process transactions in the Bitcoin network, known as Blockchain. The miners' computers are figuratively taking the role of the bank that handles the electronic transaction between two parties. The miner themselves don't know what transactions are happening, because the transactions are encrypted. This prevents fraud and increases safety of the system. The miners are compensated for this through transaction fees and "minting" of new Bitcoins. (Kelly & Brian 2014, 77-78.)

A very important subject is how the Bitcoin's network handles the encryption and transfer of currency transactions between users. The network uses a database called Blockchain. As the currency is decentralized and the network is run by the users, this means that the database is public. Every transaction that happens in the system is publicly visible, but this information displays sender's and receiver's address codes and what amount was transferred. Franco and Pedro explain in their book, *Understanding Bitcoin*, that the transactions of users could be followed if the observing party knows the account addresses of the users. This highly transparent system can be a concern to different businesses. With traditional currencies, the transactions are only known to the two parties and the bank. (Franco & Pedro 2014, 209-210.)

3.2 The Bitcoin market

As of September, of 2017, the current market capitalization of Bitcoin is 16,5 million bitcoins, which translates to total value of about 64 billion dollars with the current exchange rate of 3350 dollars for one Bitcoin. Bitcoin's database, Block chain, shows that there are between 180 000 and 300 000 Bitcoin transactions every day. The database also tells that there are 12,5 million accounts or "wallets" in the system by march of 2017. The number of accounts has doubled since March of 2016. (Blockchain webpages 2017.)

Normal markets require banks and third-party companies to transfer money and handle transactions. There are generally costs included in these transactions due to regulations and having to maintain systems, which handle these operations. Many businesses prefer using services such as MasterCard, Visa or PayPal to process their customer's payments. These services have processing fees, assessment fees and monthly fees, which increase business costs and as a result they increase the prices for the end customer. (Harrow 2016.)

Bitcoin transfers also have fees, which are based on a bidding system, where bidding a higher fee allows for faster transaction. This is generally based on how crowded the Blockchain system is and how long the average transaction takes to complete. (Bitcoinfees.github webpages 2017.)

With Bitcoins the fees are flat numbers, but they change due to factors, which will be explained in more detail in chapter 4.1. This flat fee tends to make larger transactions with Bitcoin more viable than credit cards and bank, which generally use a percentage fee. MasterCard and Visa charge from 1,4 to 2,6 percent fee from the transaction. (Franco & Pedro 2014; Harrow 2016.)

Big part of the market are companies that have built their business model around Bitcoin exchange. They provide services which allow users to convert Bitcoin to other kinds of currency or the other way around. These businesses work just like normal currency exchangers. The value of Bitcoin is not as stable as a normal fiat currency and this means that there are more risks involved with this business model. Higher risk results in increased the fees that the service users must pay. (Franco & Pedro 2014, 40-42.)

3.3 Value volatility

The value of Bitcoin currency is very volatile. The value is simply tied to supply and demand. This value based on supply and demand directly follows different events surrounding Bitcoin. Different new legislation restricting Bitcoin usage or a big company adopting Bitcoin can significantly affect the demand of Bitcoin. Even geopolitical events and statements by different influential people can disrupt the stability of the currency. These events and statements change trust in the currency and can drive people to sell or buy more of the currency, which in turn causes the prices to fluctuate. (Cryptocoinsnews webpages 2014; Investopedia 2017.)

An example of this volatility is the statement by CEO of banking service JPMorgan Chase, Jamie Dimon, on the 12th of September of 2017. In his statement, he said that “Bitcoin is a fraud that will ultimately blow up” (Monaghan 2017). The statement caused Bitcoin owners to try and sell their currency, which in turn dropped the value of the currency from 4300€ to about 3000€ in the three days after the statement (Coindesk webpages 2017).

Figure two displays the price development from day before Jamie Dimon’s statement all the way until 23rd of October of 2017. It is clear from the figure that such events change the trust of the consumer towards the currency and cause the value to change drastically, but such events are temporary, and so the price will over time correct itself as the trust returns.

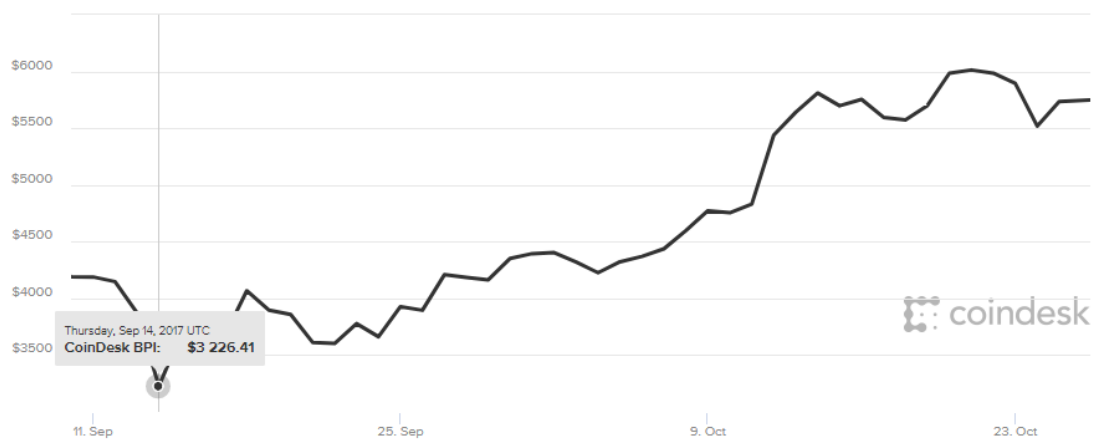


Figure 2: Bitcoin value development from 11th of September to 23rd of October 2017 (Coindesk webpages 2017)

Similar event was when China cracked down on virtual currency trading in September of 2017. This meant that all virtual currency trade was ordered to be stopped as Chinese authorities feared that virtual currencies, especially Bitcoin, are a hindrance to its financial system (Hsu 2017). This had a significant effect on the value of Bitcoin as 10 % of Bitcoin trade happens in China according to Sara Hsu's article on Forbes. This caused the value of Bitcoin to drop from about 5000 dollars down to 3200 dollars, close to a 40 % drop in value.

The value of the currency recovered quickly at the end of September of 2017 as Japan set up new rules regarding Bitcoin and recognized it as a payment method (Kollewe 2017). For proper stability of value Bitcoin will require big, known business brands to adopt it as a payment method, which would in turn increase trust of the currency holders. It should be noted that this can pose a problem, where increased stability requires businesses to adopt the currency, but due to the instability businesses aren't adopting it.

4 COMMERCIAL USE OF BITCOIN

4.1 Use of Bitcoin as payment method

Bitcoin payment methods can be divided into two categories: online payments and retail payments. Online payments are what bitcoins are generally used for, because local payments can be difficult to set up for businesses. This chapter goes into detail about how Bitcoin works as a payment method and its advantages and disadvantages compared to traditional payment methods.

There are currently many global companies such as Coingate, Bitcoinpay and Bitpay, which offer merchant solutions for online payments. These services generally advertise their low, flat transaction costs. All these services state similarly that ordinary “credit card companies charge up to 3%” from transactions (Coingate webpages 2017.) The transaction fees on Bitcoin merchant solution are usually only flat 1 %. Bitcoin pay has a 0,8 % fee (Bitcoinpay webpages 2017).

Chargebacks are not a feature in these services and the service providers advertise this fact. This is not due to the services themselves, but it is because Bitcoin transactions are naturally irreversible. This is a positive feature as it reduces chargeback fraud and makes transactions less risky and simpler for the business. Refunds are still a feature in almost all services.

Setting up a Bitcoin payment system in retail store requires extra investment from the business. These systems require separate devices such as smart phones or tablets, which allow use of point-of-sale applications such as “Coinbox”, “Bitcoin Wallet” or “CoinBase”. The purchase process starts with the seller creating a transaction request with their own device, which creates a QR(Quick Response) Code on the screen that the customer reads with their own device using the application. Once the code is read by the customers device, they proceed to confirm the payment and the Bitcoins are sent to the seller. This QR Code contains the paid amount and the transaction’s target wallet address. (Coindesk webpages 2015.)

For certain consumers and companies, privacy is an important matter. With Bitcoin, there are many important privacy factors that must be considered. This part of the thesis will explain how private Bitcoin is and what risks and challenges come from it and how to minimize these risks.

Bitcoin is often falsely understood as an anonymous way of making payments. This is not true as the network is incredibly transparent and every transaction is traceable and permanently logged in the system. Every user can see what transactions happen and from what Bitcoin addresses they were made from. Only privacy provided is that by default nobody knows who owns what address. Knowing a company’s Bitcoin address would allow seeing what transfers they make and when. Although it would still be unknown who those transactions were made to. (Bitcoin.org webpages 2017.)

Viable solutions to this level of transparency is to create multiple addresses or Bitcoin wallets for receiving payments and sending payments to make it more difficult for third parties to assess which addresses are owned by what company (Bitcoin.org webpages 2017). This does increase costs due to transaction costs, which will affect this strategy in variable amounts as is explained in the transaction costs part of the thesis.

Other ways for companies to improve the privacy of their transactions is to use merchant services. These merchant services act as a middleman for customer to business transactions and doing so prevents outside tracking of the companies' wallet addresses.

With every Bitcoin transaction, there will be an extra fee added with the normal transaction. The size of the fee is chosen by the person making the transaction and higher fee increases priority of the transaction in the system. This system creates an incentive structure, where users "bid" to increase their transaction's priority and it can cause the average fees to fluctuate as there is a limit to how many transactions can go through the system at a time. Very low bids could take unreasonable times to process as the size of the bid and the age of the transactions are the main factors that decide the priority. (Cohen 2015.)

This transaction fee is used to pay the "miners", who keep the information of the transaction network running and allowing transactions to proceed securely and privately. Transaction cost changes appear to be tied to one main factor, which is how full the "Bitcoin Mempool" is. Size of the Mempool tells how many transactions are unconfirmed. More unconfirmed transactions mean higher cost. This can be assessed from multitude of sites following Mempool sizes and transaction costs (Bitcoinfees.github webpages 2017; Bitcoinfees.info webpages 2017). Following graphs in figure three demonstrate that after Mempool size increasing or decreasing there is a 1-2-week delay after which transaction costs will also go increase or decrease respectively.

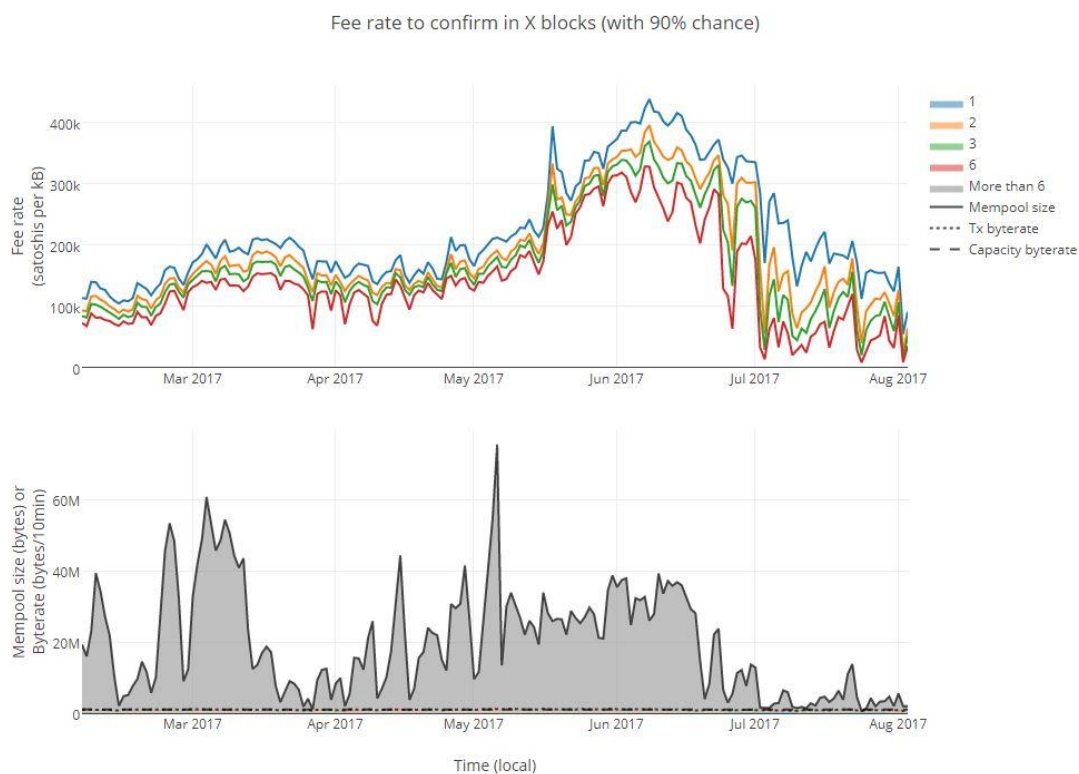


Figure 3: Transaction costs and Mempool size graphs (Bitcoinfees.github webpages 2017)

Similarly, to transaction fees the confirmation speeds of Bitcoin transfers are affected by the Mempool size. More unconfirmed transactions in the system will mean that the Mempool size is higher and it will take longer to confirm payments. The longer confirmation times is the main driving factor for transaction fees as it will incentivize users to “bid” more on their transaction to have it confirmed faster. The average confirmation times tend to range between ten minutes and three hours, when the Mempool is almost empty. On days when the Mempool transaction que starts growing in size, the average confirmation times can at worst go up to a single day or two days (Blockchain.info webpages 2017).

The confirmation times tend to fluctuate very rapidly and this can cause trouble for consumers and businesses. It should be noted that when the transaction confirmation times become longer temporarily, there is nothing that a wallet provider or a merchant solution service can do about it as the problem is in the Mempool size. Selecting a higher transaction fee will increase the transaction speed, because it increases the priority of your transaction. (Bitpay webpages 2017.)

These transaction costs have been becoming progressively more and more expensive due to less Bitcoins being released to the market and more unverified payments filling the “Bitcoin mempool”, from which transactions are confirmed from. In May and June of 2017, the average transaction costs were at their highest at about two and a half euros per transaction (Bitcoinfees.github webpages 2017). For businesses it is important to know that transaction costs can change dramatically, because this can discourage customers from using Bitcoin as a payment method for considerable periods of time. This could lead to disproportionately high fees when it comes to small products such as coffee or groceries, while more expensive purchases such as electronics are less affected. It is unviable to sell a one-euro coffee and have two-and-a-half-euro transaction fee added to it, but it would still be viable to sell a 500-euro phone with such fee.

When high transaction fees and times are combined, this can cause many problems for businesses. On December 6 of 2017, a fairly large digital distribution platform, Steam, suspended their Bitcoin payment method due to combination of risen transaction fees, times and high volatility of the currency. They cited that at worst a customer would have to pay close to 20 dollars in transaction fees and in case of refunds, the business would have to pay that amount as well. The business explained in their statement that there is also a risk of them being underpaid for their digital products due to abnormally long transaction confirmation times combined with volatile value of the currency. (Steam webpages 2017.)

4.2 Services

Digital currency exchangers or DCEs are companies, which provide a service where they exchange fiat currency or other virtual currencies to Bitcoins and vice versa (Investopedia web pages 2017). Example of this type of service is a Finnish company, Prastos, which runs a Bitcoin exchange service called Coinmotion. These services provide a safer and simpler way to exchange their currency, while taking a few percent commission from each exchange. These companies add value through providing quicker exchange and trade speeds for clients. (Coinmotion web pages 2017.)

Payment service provider and merchant solutions are a traditional type of business to business service, which can be provided in virtual currency environment. These service providers generally provide increased value by handling the customer purchases on behalf of the client company (Bitcoin.com webpages 2017).

Some providers increase value by converting Bitcoins to euros or dollars after the transaction if the client company so wishes. This appears to be a satisfactory solution for companies, which want to allow Bitcoin transactions for their customers, but do not want to hold Bitcoins whether it be due to fluctuating exchange rates or other risks. In this system, the merchant service carries most of the risks on behalf of the client company. (Bitcoin.com webpages 2017.)

4.3 Products

While some businesses provide traditional bank services for storing Bitcoins, other businesses have started to innovate and sell new type of cryptocurrency wallets. The cryptocurrency wallet is a mix between a bank account and your traditional wallet. (Crypto Currency Facts webpages 2017.)

The new wallets are a mix between a service and a product. These virtual wallets are used by consumers because of they are easy to create for temporary storage of currency. Other consumers use them because they're anonymous and secure. There are four distinct types of cryptocurrency wallets: App wallet, online wallet, hardware wallet and paper wallet. With all these wallets, the currency is stored online, but it can only be accessed through the wallet software or link. Accessing the wallet also requires a private key, which is granted when the wallet is created. This creates an additional layer of security for the customer's currency. (Crypto Currency Facts webpages 2017.)

Wallet apps are software that can be downloaded to computers or smartphones. The app allows users to connect to their wallet to see, use and transfer their currency. Online wallets are similar, but they don't require the software to connect to the wallet. The wallet is accessed through the company's web page. (Crypto Currency Facts webpages 2017.)

Paper wallets are printed wallets, where the company allows customers to print out a QR code, which allows accessing the wallet. This is much safer than the former wallets as the code is physical, not virtual. Paper wallets are generally used as gift cards, because they are cheap and easy to create. (Cryptocoins News webpages 2014.)

Hardware wallets are a new innovation created by companies. They store the private keys of cryptocurrency wallets in physical devices. The devices are generally protected from viruses and the keys cannot be transferred out of the device. There are range of different types of hardware wallets as some look and function like USB flash drives, while others look like smart phones or tablets and have a wider range of functions for the user. This product is marketed towards people who value security of their currencies. (Bitcoin wiki 2017.)

As there are multiple merchant solution and point of sale services, there are physical products which fulfill the same purpose. A Canada company, Coinkite, sold a terminal product, which is a handheld point of sale device. It allows Bitcoin transactions by printing out QR code receipts, which can be read by the customer's device to accept the payment. It provides live exchange rates for currencies and conversion of those rates to local currency to make pricing easier. The devices allow buying and selling of Bitcoins as well. As of 2017, it appears that Coinkite no longer sells this product. (Coinkite webpages 2017.)

5 VIRTUAL CURRENCY LEGISLATION

5.1 Legislation in the European Union

Exchange of Bitcoin and other virtual currencies has been tax free in the almost all EU-countries since October of 2015 (Fortune webpages 2015). Since then virtual currencies have been fairly untouched, but new, stricter legislation has been expected. In early 2017 Wendy McElroy wrote an article on Bitcoin.com about how legislation on new virtual currency taxation is underway in the EU and the US. It is explained in the article that the legislation will target the privacy of virtual currency users to combat illegal activity, specifically money laundering.

The article talks about proposed “know your customer” policies on virtual currencies. The “know your customer” policy target businesses providing virtual currency services. Such policies would require businesses to identify and verify the identities of their customers. This would make currency exchanges more difficult and slower for the customers. (Bitcoin.com webpages 2017.)

Currently Finland is the only EU-country, which has made specific regulations on virtual currencies. These regulations focus only on taxation of the currency (Dibrova 2016.)

5.2 Legislation in Finland

In Finnish law Bitcoin and other virtual currencies are not recognized as an official, real currency. They are not very tightly regulated in general and the currencies are regarded as other undefined deals between private citizens. The beforementioned points mean that losses businesses take from value changes of Bitcoin are not tax deductible. This also means that the realized profits from value increases of the virtual currency are taxed as capital gain. Official currencies are exempt from this tax on profits made from value changes. (Vero.fi webpages 2017.)

When purchasing and selling services or products, a similar realization of profits will happen. If the value of Bitcoins has increased and a customer buys a product from a company, then the increased value will be taxed as capital gain. Similarly, losses are not tax deductible. (Vero.fi webpages 2017.)

In business accounting, profits made from selling goods in exchange for Bitcoins, are calculated by the fair value of Bitcoin in euros on the day that the exchange was made. The euro value of profits will be taxed. Losses made from selling goods in exchange for Bitcoins will be calculated similarly, but these losses are tax deductible. (Vero.fi webpages 2017.)

The above tax laws present a clear disadvantage and a risk for customers and businesses when it comes to keeping and exchanging Bitcoins. These risks will most likely remain until Bitcoin is recognized as a real currency by Finnish law.

5.3 Legislation in major western countries

In the United Kingdom, virtual currencies are treated as foreign exchange and same laws and tax directives apply to it. This means that profits and losses on are taxed as capital gains. According to Her Majesty's Revenue and Customs(HMRC) whether profits are chargeable or losses allowable are to be considered on the basis of its own individual facts and circumstances. This statement is vague and it means that certain Bitcoin transactions may not be taxed. As a further explanation, the HMRC elaborates that highly speculative transactions may not be taxable. (Gov.uk webpages 2014.)

German law treats virtual currencies as private money, which is similar to how foreign money is treated in Germany. This means Bitcoin transaction gains and losses are taxed as private sales transactions. Taxation under private sales transaction means that gains from Bitcoins sold after a period of at least one year after acquiring them are tax-exempt. (Mittermeier 2017; Dejure webpages 2016.)

The tax law of United States views virtual currencies same as in Finland. They are not viewed as currency, but as property and capital assets. According to the Internal Revenue Service of the United States, consumers and businesses are advised record the

dates and fair values of the Bitcoins when they receive them as the increase in value is viewed as capital gain when the virtual currency is disposed of. The difference with Finnish law is that virtual currencies in the United States are considered property and capital assets, which means that capital losses can be deducted. It is important to note that in the United States all virtual currency payments must be reported to Internal Revenue Service. (IRS webpages 2016.)

6 IMPLEMENTATION OF THE RESEARCH PROJECT

6.1 Overview of research

The thesis research project will focus mainly on qualitative methods through company interviews and research on consumer behavior relating to use of Bitcoin. Qualitative methods focus on experiences and different views on subjects. These experiences and views are then interpreted or analyzed. Through this interpretation or analysis process the researcher will create new directives, descriptions and models, which relate to the subject of research. (Vilka 2005, 97-98.)

The research requires a mix of inductive research methods as well to reach its goal. The research and analysis are inductive since the subject is a new phenomenon and there is little previous research that exists. Finally, the empirical findings from the interview and customer behavior questionnaires will be analyzed with the theoretical information of the project.

The research form will focus on the qualitative theme interview, which will look at subjective experiences of a business relating to the use of Bitcoin as a payment method. The interview is not made to support previous theory, but instead it is meant to explore a new area of the subject, where there is very little theory covering it. This means once again that the research is inductive. The customer questionnaire is meant to be more of a quantitative counterpart to the qualitative interview, but the content of the questionnaire is used for inductive purposes.

6.2 Interview

Theme interview is an often-used qualitative research method, where the most important subjects or themes from research problems are picked and explored further through an interview. It is important that the selected interviewee can give their own description or experiences of the selected themes. (Vilka 2005, 100-102.)

Theme interview is the chosen method as the subject of must be looked at from four distinct themes. Discussing the themes will be the most effective method in creating a whole picture of what experiences the interviewee has had with the subject and what views they hold relating to these themes.

The research interview part focuses on businesses, which have used Bitcoin as a payment method in their business in retail setting, but have ceased the use of the payment method. The themes of the interviews focus on how and why the business ended up adopting Bitcoin as a payment method. Other three themes are about setting up the payment system, customer reaction to the new system and what general experiences the business had this new payment system. The last theme explores the reasons for abandoning the currency as well. These four distinct themes will be looked at in the interview.

6.3 Questionnaire

Quantitative methods cover questionnaires, systematic observation or pre-made registries or statistics. Questionnaires are the most typical quantitative method. This type of research is standardized, and it means that all the participants of the questionnaire are presented with the same questions. Questionnaire is a good method when a somewhat large and a scattered group of people are part of the research subject. (Vilkkä 2005, 73-74.)

The customer questionnaire part of the empirical research will be done online in different Bitcoin using communities, where the members will free to answer the questionnaire at their own discretion. The questionnaire form itself will be made with the Google Forms system, which helps in compiling the information more easily for analysis. The customer behavior research focuses on global scale, not certain countries or regions, which requires the use of a questionnaire research method.

The contents of the questionnaire are very straightforward multiple-choice questions, which help in forming a picture of where and how typical holders of Bitcoins use their currency. The most important questions for the research are questions regarding what payment methods are used, how often the currency is used for payments and what

purchases have been made with Bitcoins. There are also questions regarding attitudes towards the currency to find out whether the consumers are willing to use the currency in the future.

Questionnaire will be performed on two webpages: www.reddit.com/r/bitcoin and www.bitcointalk.org. These are the most optimal areas to perform the questionnaire as they host active and sizeable Bitcoin related consumer communities.

6.4 Reliability and validity of the research

The reliability of research in case of this research means repeatability and accuracy of the results. The reliability is good, when the results are not based on happenstance. If the research is reliable, then repeating the research should yield the same results. Questions, whether used in an interview or a questionnaire, should be straightforward and understandable. (Hiltunen 2009, 11)

To maximize the reliability of the interview results, the structure of the theme interview was made clear and straight forward as possible. The subjects of the interview did not concern information that the interviewee does not have or does not want to give. The answers in the theme interview reflected this fact and they were very easy to understand and interpret. In the questionnaire the answers were very simple and easy to understand. The structure of the questionnaire document had a logical order, which made answering the questions easier for the participants.

The reliability of the results may change over time as the subject of Bitcoin is a very new and changing concept. The results may drastically change if for example after the research new legislation is introduced or a better retail payment system is created for bitcoin payments. Low number of participants in the questionnaire weakens the reliability somewhat. On the case of this research, the results of the questionnaire the results would show the same general trends if the same questionnaire was performed on a bigger group in the same communities. The researcher believes that the results of the interview and questionnaire are reliable at this moment.

Validity of research is good, when the target of the research is correct, and the questions fit the target. It is important that the chosen research methods fit what is meant

to be researched. The conclusions of the research also need to be valid. The methods and results of the research must justify the conclusions made. If the research has no validity, the research is worthless. Lack of validity means that the research did not look into what it was supposed to research. (Hiltunen 2009, 3, 7)

The empirical research questions and interview themes were made to be clear and direct as possible in order to ensure that the participants answered what was actually asked or discussed. The validity fits well with the questionnaire as it was conducted in online Bitcoin community discussion websites, which is generally populated by consumers who own and use Bitcoin. The interview was valid as well, the interviewee had been the main actor in the adoption process of the Bitcoin payment method and they had over three years of experience with the payment system.

7 INTERVIEW AND QUESTIONNAIRE

7.1 Company interview findings

For the company interview part of the research, two Finnish businesses were contacted by phone. According to online articles and sources, these businesses allow bitcoin to be used as a method of payment in their retail stores. Upon further inquiry it appeared that both of these businesses had recently gotten rid of the payment method. Due to this the theme interview structure had to be changed slightly to allow exploration into why they had abandoned bitcoin payment method in their stores.

Upon directly contacting the businesses by phone on 8 of November 2017, both confirmed the fact that the payment method had been abandoned. Only one of the two businesses agreed to an interview. The interview themes and purpose of the interview and research were explained to the interviewee and they felt that they would be able to have the interview right away. The interview was performed over the phone shortly after. All the planned themes were explored during the interview and the interviewee was able to discuss them all.

As the first theme of the interview we discussed both adoption and abandonment of the payment method in the store. The interviewee of the business explained that they adopted the currency as a payment method about three years ago, in 2013. He explained next that the payment method was abandoned around the summer of 2017. The payment method was actively used roughly for about three years.

In this theme we also discussed the reasoning and motivations behind the adoption of the payment method. It turned out that the motivations or the pushing factor did not come from customers or from within the company. The interviewee explained that a nearby Bitcoin-business had asked the store to try out the payment method. It is clear that the businesses attempted to create a symbiotic relationship and use a push strategy to gain more bitcoin users for both.

The next theme concerned the setting up of the payment method and its use. It appeared that the local Bitcoin-business had advised and helped the store on setting up system for bitcoin payments. The payment system was a separate regular tablet device, which had a bitcoin merchant application installed on it. When using the system, the cashier would input the cost of the goods in the application and after that the device would generate a Quick Response code, which the customer would scan with their own application in their own phone. After this the customer would confirm the payment and the cashier received a confirmation of payment on their own device.

Third theme of the interview explored the customer reaction and the popularity of the payment method. In this theme the interviewee revealed that the customer use did not grow during the three years of use. The use had stagnated and there were very few, only two or three, regular customers who used bitcoin as a payment method in the business. Rest of the customers who used bitcoin were irregular customers or people who wanted to simply test out the payment method once or twice.

Last theme of the interview was about the general impressions on the payment method and the reasons behind abandoning it. It became apparent that the abandonment of the payment method was due to the very low use, which we explored in the third theme. The interviewee told that it was not popular enough to warrant keeping a separate device at the cashier's workstation at all times and that this added extra work and costs having to recharge the device and keeping up an internet connection for the device to process potential bitcoin payments.

Interviewee revealed also that use of the payment method was too slow and complicated compared to the traditional payment methods. He told that the bitcoin payment process would have to be more straightforward and less complicated for it to not cause problems and customer congestion at the store cash register. It appeared that the cashiers found the payment method somewhat difficult to use. Interviewee told that he felt that there were no distinct advantages that bitcoin had compared to other payment methods.

7.2 Questionnaire findings

The bitcoin user questionnaire was performed on two webpages, which host fairly big bitcoin communities. The first webpage was www.reddit.com/r/bitcoin and the second one was www.bitcointalk.org. The questionnaire was posted on www.reddit.com/r/bitcoin on two separate occasions.

The questionnaire was linked as a new discussion on both forums accompanied with explanation for the questionnaire and description for the research and its purpose. First time the questionnaire was posted on the Reddit webpage on 11 of November 2017. On 13 of November 2017 the questionnaire was posted on Reddit webpage again and it was sent to Bitcointalk webpage as well on the same date. In total the questionnaire research garnered 18 responses. Only one response had to be disqualified from the results.

The questionnaire focused on the user's previous of Bitcoin as a payment method and what they would like to use Bitcoins for in the future. The first question explored whether the participant had used Bitcoin as a payment method. The answers were designed to see whether the participant had used Bitcoins in online, retail, both or not at all in payments. As seen in figure four, 58,9 % of participants had used bitcoin as a payment method and of those 58,9 % only 11,8 % had used both retail and online payments, the rest, 47,1 %, had used only online payment methods. No participant had used Bitcoins solely for retail purchases. The remaining 41,2 % had never used bitcoins as payment method even though they owned Bitcoins.

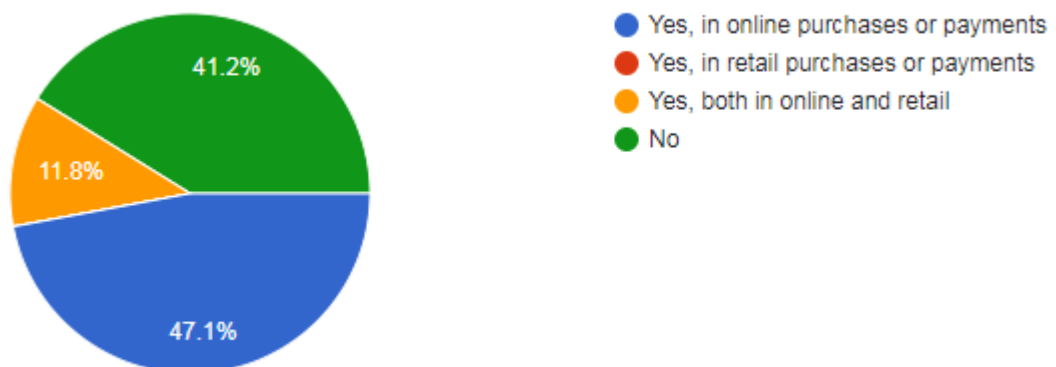


Figure 4: Have you used Bitcoin as a method of payment? Results

The second question inquired about how often the participants used bitcoin for payments. The results found out that no participant used Bitcoins for payments more often than two to three times a month. In figure five it is displayed that 47 % of the respondents said they don't use Bitcoins regularly or at all, this percentage includes the 41 % that had never used Bitcoins. This means that 6 % of users who had used bitcoins use the irregularly. Biggest group of regular users was in the category of once every three months at 23,5 %. About 12 % used Bitcoins for payments once a month and 17,6 % used Bitcoins two to three times a month.

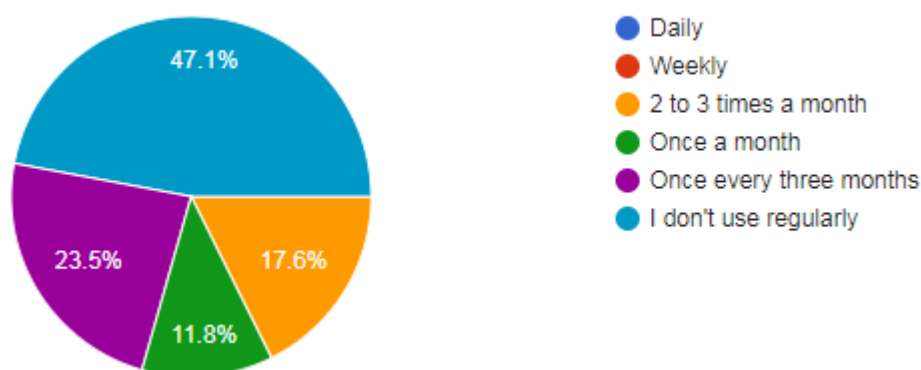


Figure 5: How often do you use Bitcoins for purchases or payments? Results

On the third question the types of purchases were examined. The participants had a wide range of purchase types to choose from to describe their past purchases using Bitcoin. In the figure six it is shown that the five most popular purchases were electronics at 54,5 %, software at 36,4 %, games and in-game purchases at 36,4 % as well, restaurant purchases at 27,3 % and website subscriptions at 27,3 %. Smaller groups were travel purchases, bill payments and gambling purchases all at 18,2 %. Only 9,1 % had used Bitcoin for food items and clothes.

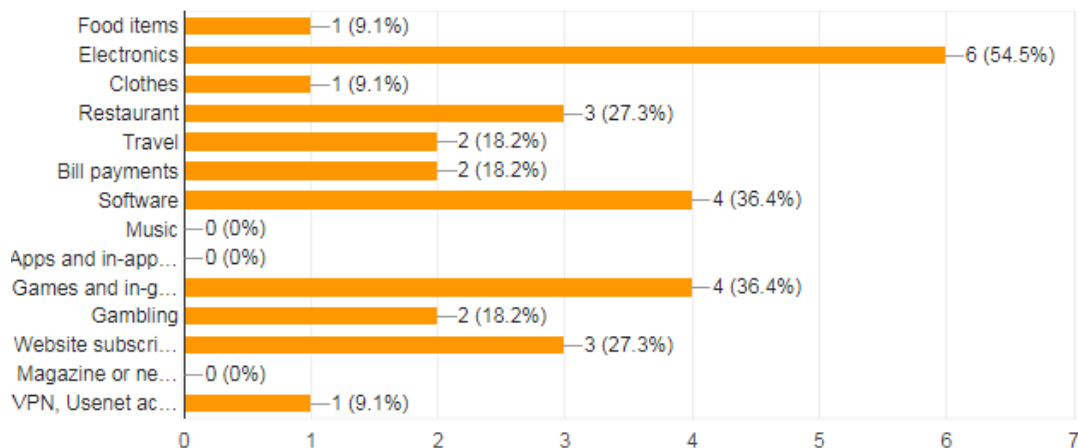


Figure 6: What type of purchases or payments have you made in the past using Bitcoin?
Results

Fourth question looked at whether the users would use bitcoin in the future as a payment method and it served as a leadup to the last question. Solid 82,4 % of participants responded that they will use Bitcoin in the future. This led up to the last question which looked at what would be the most important purchases the participants would want to use Bitcoins for. The participants were advised to select four out of the thirteen categories. Results are shown in figure seven. Electronics, software, games and in-game purchases were once again the highest categories, but with much higher percentages. 71,4 % felt that electronics would be important Bitcoin purchases. 57,1 % believed that software and games and in-game purchases respectively were important purchases that they would use bitcoins for. Other popular categories were travel at 42,9 %, restaurant, bill payments and website subscriptions all at 35,7 %. Food items were next at 28,6 %. Clothes, music, apps and in-app purchases were selected by only 21,4 %. Least popular were gambling at 7,1 % and magazine or newspapers at 0 %.

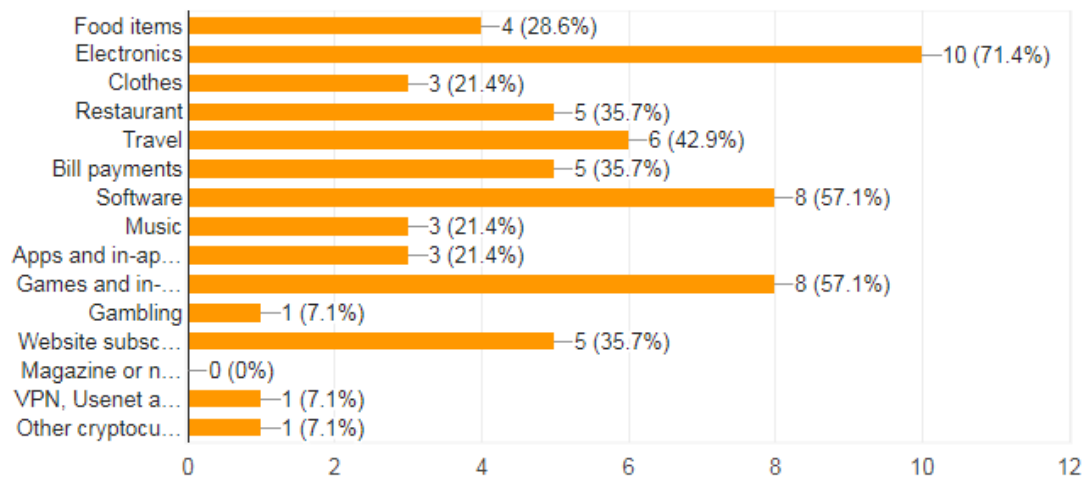


Figure 7: Select the top four most important purchases or payment you would like to use Bitcoin for in the future. Results

7.3 Analysis of findings

The findings from the interview brought out many problems that relate to retail payment method use of Bitcoin. From the interview it came to view that the business did not adopt the payment method through consumer support, but the motivation came from another business which expected to gain a symbiotic relationship through this. It is most likely that the previously mentioned bitcoin store wanted this payment method to be adopted in the interviewed business to garner both businesses more customers. The adoption was a simple push tactic as there was not customer demand for the payment method.

This push tactic and lack of demand for the bitcoin payment method could be the reason it did not end up being successful and why the payment method was abandoned eventually. Possibly a lack of customer awareness of the payment method could have been a reason. Although the store is listed in many Bitcoin related webpages, which list retail and online stores that allow Bitcoin as a payment method, it is possible that it was not advertised much or adequately in other forms. Pushing out this new payment

method, which does not have much existing demand, would require some advertisement for it to gain users.

Other reasons are the problems with the retail payment system itself, which were described in the interview part. The payment system can be difficult to use, and it can cause extra problems and work for the store cashier. This retail payment system can be difficult for the consumer as well and it could drive the consumers away from using it. This could explain why there were only few regular users for the payment method in the store.

The questionnaire findings showed a somewhat of a similar trend. Most users had never used retail bitcoin payment methods. 47,1 % of participants had used bitcoin in online payment methods and only 11,8 % had used retail and online payment methods. There was not a single participant who had used only retail payment methods. This hints that the retail aspect of Bitcoin use is not attracting users, but that the interest is more in online payments as there the system is much easier to use and more similar to other payment methods.

In the previous purchases part of the questionnaire it came clear that participants had preferred to buy electronics, software, games and in-game purchases, restaurant food and website subscriptions with Bitcoins. All these can generally be paid and ordered online, which the participants most likely did. Less popular categories were travel and food items, which are generally paid for at the location, which will require a retail payment system.

There was a clear disparity between previous purchases and important future purchases on the case of food items. In previous purchases only 9,1 % had purchased food items using Bitcoin, but for important future Bitcoin purchases 28,6 % selected food items. It is possible that lack of possibilities to use Bitcoins in grocery stores has caused this disparity.

In the later part of the questionnaire participants overwhelmingly agreed that they are willing to use bitcoin as a payment method in the future. Same purchases appeared most popular in the most important future bitcoin purchases: electronics, software,

games and in-game purchases. Electronics are generally more expensive, less frequent, bigger purchases, which can be made retail and online. Software, games and in-game purchases in modern day tend to be online purchases. It is possible that consumers would be willing to make less frequent and more expensive bitcoin purchases both retail or online, while preferring to make more frequent, less expensive bitcoin purchases online. From the findings and looking at the bigger picture it seems that bitcoin users clearly gravitate more towards online payments.

The frequency of purchases showed had interesting results as well. No participant used bitcoins more often two to three times a month. This can be explained by the fact that the goods and services they bought with Bitcoins are normally bought infrequently. This applies to products like electronics, software and games. If food items had been more popular, then the findings on purchase frequency should have shown more frequent purchases as food items are goods that people buy frequently as opposed to electronics or software. Another reason for infrequent purchases with Bitcoin could be low number of possibilities to make Bitcoin purchases in daily life. Very few businesses accept Bitcoin as a payment method.

8 CONCLUSIONS

8.1 The results

From the empirical research it became apparent that bitcoin's business viability as a payment method has clear weaknesses in retail setting. Using a bitcoin as a payment method in a retail setting does not seem to have much demand based on the interview and the questionnaire findings support this.

This lack of demand is most likely because the payment system is somewhat more complicated than traditional payment methods such as cash, credit or debit cards. The retail payment system is more difficult for the consumer and the operating cashier, because it requires use of a separate device, such as a phone or a tablet, for both parties to confirm and complete the payment. These difficulties could be reduced by having devices where the credit and debit cards payment methods are integrated with the bitcoin payment in a single device, but such does not exist currently.

Online payments appear to be the more viable option, especially when using merchant services. Using the online payment methods don't require such high maintenance or separate work to keep working. With merchant services, the payment system is integrated to the normal purchasing process with other payment methods. This is much better than the retail system as customers are used to this type of system as it works same as normal payment methods using bank account, credit or debit card payments.

If a company is interested in adopting a bitcoin payment method to their business, then the best system would be an online payment system. Such system is low maintenance, but the fluctuating transaction costs and times should still be considered. In the case that the business is unsure about holding bitcoins, but wants to allow a bitcoin payment method, they should consider using a merchant solution service. The preferred merchant service would be one that pays the bitcoin payments to the business in fiat currency as mentioned in chapter 4.2 of this thesis (Bitcoin.com webpages 2017). Such service simply processes the bitcoin payments and transfers the paid amount to the

business in preferred currency such as euros, pounds or dollars. Another benefit of these merchant services is also the low transaction fees that they charge compared to credit card companies (Coingate webpages 2017).

The legislative side of bitcoin should also be considered. Trough new upcoming legislation bitcoin could gain a status of a more legitimate currency inside EU, which could increase the popularity. Although there is a concern that new legislation could limit and hinder the use of bitcoin for customers and businesses, which would in turn reduce the popularity. These legislations could include the suggested “know your customer” policy legislation, which would force businesses to identify their customers when performing a bitcoin transaction. This would further complicate the transactions and discourage use of bitcoin as a payment method. (Bitcoin.com webpages 2017.) This means that the long-term viability is uncertain.

Most of the risks and problems that still relate to online payments are transaction fees and times. As was mentioned at the end of chapter 4.1, these transaction fees and times can cause situations, where even big businesses are forced to suspend the use of Bitcoin payment methods entirely. During research project, the transaction fees and times were reasonable and viable for business use, but as of December of 2017 the transaction fees and times have risen to untenable levels as the owners of the digital distribution platform, Steam, mentioned when they suspended the payment method from their service on 6th of December 2017 (Steam webpages 2017). The rise of fees and confirmation times was likely due to Bitcoin’s growth of popularity and rising amount of transactions per day in the end of year 2017.

In conclusion, adopting an online payment method is the more viable choice as it requires very little investment and it is competitive with traditional payment methods. Using an online payment method with a merchant solution service, does not require staff training or much knowledge of the currency for it to be viable. Adopting a retail payment method would require investment in staff training and devices to process the payments. Only problem that the online payment method has are the high transaction fees and times, which at the end of the research are very high. It is unclear when and if the transaction fees and times will return to low, normal levels, where the use of the payment method is actually viable.

8.2 Final words

The research did reach its goal and almost all the research questions were answered. Only thing that the thesis was not able to exactly answer was the long-term viability of the currency's business use. It came clear during the research that Bitcoin's long-term viability is very difficult to estimate due to new possible laws, value volatility and changing transaction fees and times. I tried to amend this difficulty by finding out if there is a risk free or a least a low risk way of utilizing Bitcoin in business and the result was the online payment method using merchant solutions.

Long-term viability of Bitcoin in business would be its own entire research project and a further study recommendation. A further study would have to look into Bitcoin related legislation and the transaction fees more deeply as they appear to be the main variables dictating the long-term viability. The research made was at most part only able to explain the current viability of Bitcoin in business. A long-term viability research could take much longer and require observing how the viability changes over time, which was outside the extent of this research.

Both research methods served their purpose well in the research process and did not limit the results. It should be noted that the questionnaire had a small number of responses, which possibly influenced the results and reduced the reliability somewhat. Despite this, the research gave fairly in depth look into how viable Bitcoin currently is in online and retail store payments. The problems with retail Bitcoin payments became very apparent and the reasons why online Bitcoin payment methods are superior were explained in detail. This is useful and valuable information for any business, which is considering adopting a Bitcoin payment method to their business.

In case I would do this research again, I would focus more on the empirical research. I would perform more interviews on Bitcoin using businesses and gather a larger number of participants for the questionnaire. I would not change the methods, but gather a larger amount of material. The problem with the subject was that there wasn't much ready, central theory and I had to collect the theory from multiple sources and evaluate what is true and what is not. The theoretical part took much time, which could have been used to work on the empirical research. The project and gathering of theory was

officially started on June of 2017. The research should have been performed in a shorter time span, because Bitcoin is a very new and living subject, which often forced me to go back to add or correct things in the theoretical part of the thesis.

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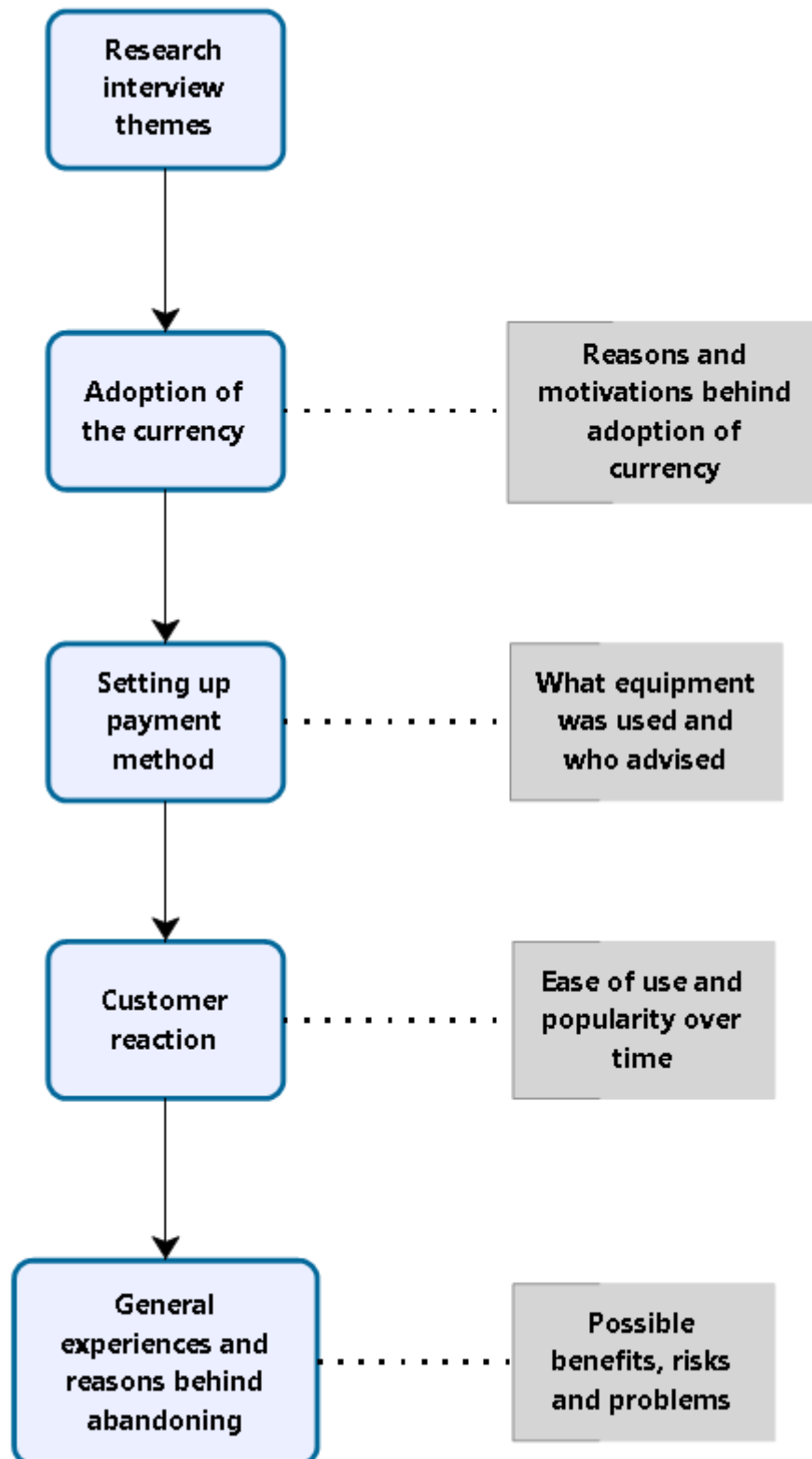
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Theme interview structure:



APPENDIX 2

User questionnaire:

Have you used Bitcoin as a method of payment? *

- Yes, in online purchases or payments
- Yes, in retail purchases or payments
- Yes, both in online and retail
- No

How often do you use Bitcoin for purchases or payments?

- Daily
- Weekly
- 2 to 3 times a month
- Once a month
- Once every three months
- I don't use regularly

What type of purchases or payments have you made in the past using Bitcoin?

- Food items
- Electronics
- Clothes
- Restaurant
- Travel
- Bill payments
- Software
- Music
- Apps and in-app purchases
- Games and in-game purchases
- Gambling
- Website subscriptions
- Magazine or newspaper subscriptions
- Other: _____

If yes, select the top four most important purchases or payments you would like to use Bitcoin for in the future.

- Food items
- Electronics
- Clothes
- Restaurant
- Travel
- Bill payments
- Software
- Music
- Apps and in-app purchases
- Games and in-game purchases
- Gambling
- Website subscriptions
- Magazine or newspaper subscriptions
- Other: _____

Are you planning to use Bitcoin as a method of payment in the future? *

- Yes
- No