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ICT in Business

Understanding Bitcoin adoption:
Unified Theory of Acceptance and Use of Technology (UTAUT) application

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Abstract

In 2008, the world's first completely decentralized digital currency Bitcoin was introduced by an unidentified programmer known as Satoshi Nakamoto. Although the Bitcoin market is fairly new in the industry overall market capitalization has already reached 8.9 billion US$ as of December 2013. The burgeoning usage of a novel currency subsequently motivates research on this phenomenon, especially centring on what affects individuals to use the currency. The thesis addresses this particular issue by employing the Unified Theory of Acceptance and Use of Technology (UTAUT) model to develop hypotheses on individuals' usage behaviour, and then test these by carrying out a survey. The empirical study took place over a 40 day period and collected 111 responses from Bitcoin users and non-users via an online survey tool. The results indicate that the factors significantly influencing the behavioural intention to use Bitcoin include performance expectancy and effort expectancy. Furthermore, actual usage of Bitcoin is affected by facilitating conditions and behavioural intention. Interestingly, the obtained results do not support, in all cases, the original UTAUT model and the hypotheses that were derived from this model, thus suggesting modification of the model for the case of Bitcoin. Moreover, this outcome encourages future research to divulge the characteristics of Bitcoin that appear in other, similar technologies, for which the modified UTAUT model would have high explanatory power. The results of this research can be helpful to the various business sectors that are planning to use Bitcoin by listing the major factors influencing the success of implementation, and also suggesting improvements for better Bitcoin acceptance and adoption in the future.

Keywords

Unified Theory of Acceptance and Use of Technology (UTAUT), Bitcoin, technology acceptance, digital currency

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1. Introduction

According to the latest data, there are more than 12 million Bitcoin in circulation, which equals to 8,864,286,593 US Dollars (Realtimebitcoin.info, Dec 2013). Bitcoin are world's first completely decentralized digital currency introduced in 2008 by the unidentified programmer known as Satoshi Nakamoto. Over the last years an active economic system has developed around the Bitcoin, including online shopping, exchanges, mining pools, remote digital wallets, and casinos. Though there are many failed attempts to launch various forms of electronic money, negative speculation about PayPal and similar e-commerce businesses, attacks on exchanges and digital wallets, associations with crime, threats from government, but Bitcoin is still thriving. Since the total number as well as price per of Bitcoin constantly rises, the businesses are facing great opportunity for operations in new huge market. However, as this market is fairly new, it is not clear what the requirements for successful Bitcoin acceptance in various industries should be.

This research focuses on the acceptance of the digital currency of Bitcoin, more precisely investigating the factors affecting the acceptance of Bitcoin. The purpose of this research is to apply the Unified Theory of Acceptance and Use of Technology (Venkatesh et al, 2003) to the case of Bitcoin. Venkatesh et al (2003) proposed a Unified Theory of Acceptance and Use of Technology (UTAUT) after comparing and testing of the eight different models about users' technology acceptance. This model consists of four core dimensions: Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Facilitating Conditions (FC), and four control variables: Gender (GEN), Age (AGE), Experience (EXP), and Voluntariness of Use (VOL). Although this model has some limitations, the UTAUT model has been previously tested by a significant dataset, and proved to have substantial explanatory power of user acceptance of technology. The main purpose of the UTAUT model is to offer managers the possibilities to weigh the introduction of new technology and predict and explain the user's behaviour in the degree of acceptance of this technology (Venkatesh et al, 2003).

This research intends to explore current Bitcoin usage, to suggest reasons why Bitcoin digital currency is accepted in the market and the major factors influencing it's the success. This exploratory study aims at proposing improvements for the

better Bitcoin acceptance and adoption in the future by revising the unified theory of acceptance and the use of technology.

1.1. Research Question

This study will determine the current usage of Bitcoin based on the UTAUT model (Venkatesh et al, 2003). Application of the model identifies the factors affecting the acceptance of the digital currency of Bitcoin. Therefore the main question of the research will be:

What are the factors that affect Bitcoin acceptance?

1.2. Academic and Managerial Relevance

From an academic point of view, this research contributes to the descriptive literature on the relationship between the UTAUT model and digital currency Bitcoin realization. Also there is limited academic work which simultaneously captures the success factors (positive) and resistance factors (negative) that drive customers to adopt Bitcoin digital currency. At the same time, while technology acceptance models have been traditionally used to understand the intended and actual use of a technology within an organisation, this research extends the scope of application of the theoretical framework to a setting outside of the organisation.

From a managerial point of view, this thesis expresses the requirements for the successful Bitcoin acceptance in various business sectors. This further could be used in a company's strategy for Bitcoin acceptance in order to gain knowledge of the actual users, possible users and non-users of Bitcoin.

1.3. Structure of the report

Chapter 2 covers the conceptual foundation of Bitcoin and the UTAUT model, introducing the definitions, review of the literature and theories.

Chapter 3 describes the research hypotheses for Bitcoin usage through the selected UTAUT model in Chapter 2. Besides that it describes the methodology of this research, data collection process and also lists the questions for the online survey.

Chapter 4 analyses and presents the data, also discusses findings from the online survey.

The final chapter deploys conclusions and recommendations from this research study.

2. Conceptual Foundation

This chapter presents the conceptual foundation of Bitcoin, its usability and legislation review. In the second part of this chapter the Unified Theory of Acceptance and Use of Technology (UTAUT) is introduced, and the theory and literature reviewed and summarised.

Initially in the design stage the review of the literature about Bitcoin and the UTAUT model developed theory for this research. General sources for this literature study research are:

- U-lib general science database

- Science Direct - scientific database

- Google Scholar - web-based scholarly search engine

- Bitcoin.org - webpage about Bitcoin

To obtain the information about Bitcoin articles, notes and other data were reviewed from the above listed data sources, as well as the videos from various conferences available on Youtube.com. This gave the brief idea of the whole Bitcoin industry, and critical challenges it is facing.

In order to gather the information about the UTAUT model the scientific databases were reviewed and various articles read. Afterwards the data was summarised and findings presented. This was the background for developing the research hypotheses. They were conducted and adopted to the specific research topic of Bitcoin.

2.1. Concept of Bitcoin

In 2008 unidentified programmer known as Satoshi Nakamoto has introduced Bitcoin- world's first completely decentralized digital currency. Bitcoin is an open-source, peer-to-peer digital currency. Among of many other aspects, Bitcoin's uniqueness is that it operates with no central authority or banks; managing transactions and the issuing of Bitcoin is carried out collectively by the network (Bitcoin.org, 2012). Furthermore as it is open-source and designed by the public, nobody owns and no one controls this digital currency, so everyone can take part in it.

Looking from users' perspective, it is another type of cash used via the Internet. There are few advantages associated with this. First of all due to Bitcoin's nature during money transaction there is no third party involvement, therefore there are no transactions fees or they are very low. Secondly, transaction is made instantly, which is a big advantage in today's markets, but it cannot be reversed. Thirdly, all Bitcoin transactions are stored publicly and permanently on the network, which means anyone can see the balance and transactions of any Bitcoin address (Bitcoin.org, 2012). However, under each address the user's identity remains anonymous. Lastly, there is no control mechanism or in other words, censorship of Bitcoin transactions.

In terms of the legislation boundaries, since this new type of currency has recently emerged, there are no legislation based regulations established for Bitcoin currency. Since Bitcoin is pseudonymous, policymakers and journalists have questioned whether criminals can use it to launder money and accept payment for illicit goods and services; for instance, as cash, it can be used for ill as well as for good (Brito, Castillo, 2013). A good example could be Silk Road, where illegal goods like drugs could be purchased. As one study estimates the total monthly transactions performed on the internet platform Silk Road amounts to approximately $1.2 million (Christin, 2012). Other attempts to restrict Bitcoin technology will only harm legitimate users while leaving illicit users largely unaffected (Brito, Castillo, 2013).

In the latest official letters release it is reported that The Department of Justice and Securities and Exchange Commission has informed the U.S. Senate committee that Bitcoin are legitimate financial instruments and thereby boost prospects for wider acceptance of the virtual currency (Raskin, 2013). An example of additional uses of Bitcoin technology could be that it offers a solution to a different problem like the Proof of Existence. The block chain technology can be used as a kind of notary service. M. Araoz launched a notary public service on the Internet, an inexpensive way of using Bitcoin's distributed computing power to allow people to verify that a document existed at a certain point in time (Kirk, 2013). This suggests the idea that an unexpected market can open up, where it will offer more solutions to wide known problems.

The current number of users has peaked sharply. As a result Bitcoin usage can account for the greater portion of advantages than disadvantages. According to Blockchain.info (Dec 2013), at this moment there are around 1 million Bitcoin users, although due to its anonymity, this is only an estimate. There are more than 12 million Bitcoin in circulation, which equal to 8,864,286,593 US Dollars (Realtimebitcoin.info, Dec 2013).

2.2. Unified Theory of Acceptance and Use of Technology (UTAUT)

In order to gain a competitive advantage companies invest in the information systems and technologies. There are several benefits, such as achieving cost effectiveness and increasing the quality of goods and services. It has been noted that users' attitudes towards and acceptance of new information systems and technologies have a critical impact on the successful information systems adoption (Davis, 1989; Venkatesh and Davis, 1996). If the users are not willing to accept the information system or technology, it will not bring full benefits to the organization (Davis, 1993; Venkatesh and Davis, 1996). Therefore, if users accept information systems and technologies at first hand, they are willing to make changes in their daily routine, spend time and effort to start using the new system. Afterwards the company can make an assumption about whether the system is good or bad and how the user feels when using it. And it is not necessarily dependent on the technology, but rather on its effectiveness and usefulness (Shani and Sena, 1994).

However innovations history shows that usually it takes too long for information technologies and systems to become part of practice. To explain how, why and at what rate the new ideas and technologies spread through cultures the Diffusion of Innovations model (Rogers, 1962) has been designed. The theory states that there are four main elements that influence the spread of a new idea: the innovation, communication channels, time, and a social system. Therefore the diffusion according to Rogers is the process by which an innovation is communicated through certain channels over time among the members of a social system. The theory explains the important factors in the diffusion process. Firstly it is important to point out that some innovations can never be adopted or that they diffuse weakly, while some innovations diffuse quickly and widely, and sometimes innovations are

adopted but later they are abandoned. Secondly, innovations can be adopted differently by subgroups of individuals. Adding to this, to explain different outcomes three groups of variables are used: characteristics of innovation, characteristics of adopters, and features of the setting or environmental context.

Though the Diffusion of Innovations model has been used over several decades to understand the steps and processes required to achieve wide-spread dissemination and diffusion of innovations, Roger created it based mostly on the agricultural methods and medical practice, which are quite static inputs. Meanwhile IT innovation is always developing, and there are continuous updates created to attract more adopters along the S-curve. Although Bitcoin is a currency, it is more important to state that this is Digital Currency and refers to IT innovation, as it involves online communication (Internet), Hardware Technologies (computers, mobile phones, ATM) as well as Software Technologies (Digital Wallets, Online Exchange). To align with these characteristics of the Bitcoin currency and to understand its uptake by individuals, and alternative to the Diffusion of Innovation model was selected and reviewed in this research.

In order to predict information technology acceptance and its use on the job the Technology Acceptance Model (TAM) was developed. In this model perceived usefulness (U) and perceived ease of use (E) are the main determinants of the attitudes of potential technology users (Davis, 1989). TAM's theoretical structure is shown in Figure 1.
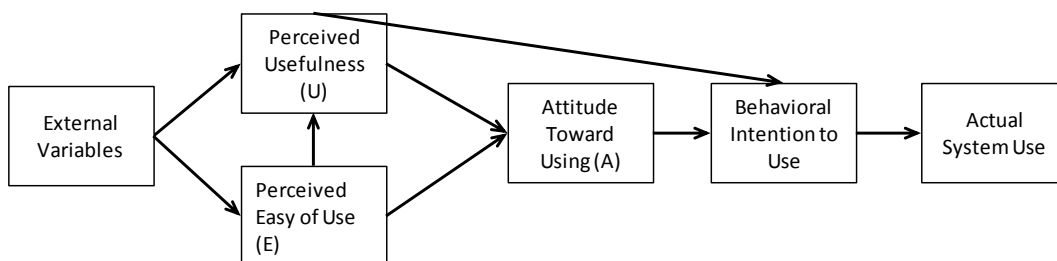
Figure 1: Technology Acceptance Model (adapted from Davis, 1989)

Perceived Usefulness is defined as the degree to which a person believes that using a particular system would enhance his/her job performance, while Perceived Ease of Use refers to the degree to which a person believes that using a particular system

would be free of physical and mental effort (Davis, 1989). TAM states that these two features are the main factors of the user's attitude towards using the computer system. This means that the higher probability of actually using the system depends on greater positive sentiment of the user's perceived ease of use and perceived usefulness of the system. Furthermore, Davis (1989) also postulated that perceived ease of use had a direct impact upon perceived usefulness, but not vice versa.

However TAM mainly offers a basic framework so as to explain the influence of external variables towards behavioural idea (Davis, 1989). While using this model, most researchers needed to add additional external variables that cover different fields, for example, to adapt the model to a different business or a culture. As a result, there have been several modifications and improvements of TAM since its first inception, gradually increasing the explanatory power of the model concerning the acceptance and use of technologies in an organisational setting. Venkatesh et al (2003) have conducted a review on the relevant studies over the years, and found eight models: Theory of Reasoned Action (TRA), Technology Acceptance Model (TAM), Motivational Model (MM), Theory of Planned Behaviour (TPB), CTAM-TPB, Model of PC utilization (MPCU), Innovation Diffusion Theory (IDT), and Social Cognitive Theory (SCT). These eight models differ from one another, and all have been verified in each field and category separately. As a result, the authors combined these eight models to form a new framework named the Unified Theory of Acceptance and Use of Technology (UTAUT). The description of the eight individual behavioural acceptance models and theories are shown in Table 1.

Theory	Core Structure	Definition	Scholars
1 Theory of Reasoned Action (TRA)	Attitude Toward Behaviour	The positive or negative feeling that an individual has towards certain behaviour	Davis et al, 1989 Fishbein and Ajzen, 1975 Taylor and Todd, 1995a, 1995b
	Subjective Norm	An individual experiences others thinking that he should or should not have what kind of behaviours	Ajzen, 1991 Davis et al, 1989 Fishbein and Azjan, 1975 Mathieson, 1991 Taylor and Todd, 1995a, 1995b
2 Technology Acceptance Model (TAM)	Perceived Usefulness	The degree that the user believes that using the information system can improve work performance	Davis, 1989 Davis et al, 1989
	Perceived Ease of Use	The degree that an individual believes its easy to use the system	Davis, 1989 Davis et al, 1989
	Subjective Norm	An individual experiences others thinking that he should or should not have what kind of behaviours	Ajzen, 1991 Davis et al, 1989 Fishbein and Azjan, 1975 Mathieson, 1991 Taylor and Todd, 1995a, 1995b
3 Motivational Model (MM)	Extrinsic Motivation	User has the feeling to perform some actions because of some activities, improvement of work, salary, and advertisement	Davis et al, 1992
	Intrinsic Motivation	User has the feeling to perform certain behaviours because he wants to, not because of any obvious stimulus	Davis et al, 1992
4 Theory of Planned Behaviour (TPB)	Attitude Toward Behaviour	The positive or negative feeling that an individual has towards certain behaviour	Davis et al, 1989 Fishbein and Ajzen, 1975 Taylor and Todd, 1995a, 1995b
	Subjective Norm	An individual experiences others thinking that he should or should not have what kind of behaviours	Ajzen, 1991 Davis et al, 1989 Fishbein and Azjan, 1975 Mathieson, 1991 Taylor and Todd, 1995a, 1995b
	Perceived Behavioural Control	The restriction that an individual has experienced from inside and outside towards his behaviour	Ajzen, 1991 Taylor and Todd, 1995a, 1995b
5 Combined TAM and TPB (C-TAM-TPB)	Attitude Toward Behaviour	The positive or negative feeling that an individual has towards certain behaviour	Davis et al, 1989 Fishbein and Ajzen, 1975 Taylor and Todd, 1995a, 1995b
	Subjective Norm	An individual experiences others thinking that he should or should not have what kind of behaviours	Ajzen, 1991 Davis et al, 1989 Fishbein and Azjan, 1975 Mathieson, 1991 Taylor and Todd, 1995a, 1995b
	Perceived Behavioural Control	The restriction that an individual has experienced from inside and outside towards his behaviour	Ajzen, 1991 Taylor and Todd, 1995a, 1995b
	Perceived Usefulness	The degree that the user believes that using the information system can improve work performance	Davis, 1989 Davis et al, 1989
6 Model of PC Utilization (MPCU)	Job-fit	The degree that the system can strengthen an individual's work performance.	
	Complexity	The degree that the system is difficult to understand and use.	
	Long-term	Consequences The result will be somewhat benefited in the future.	
	Affect Towards Use	An individual feels joyful, happy, depressed and detesting towards certain behaviour.	Thompson et al, 1991
	Social Factors	The internalization of individual towards team culture and the agreement with the group.	
	Facilitating Conditions	The subjective factor that makes people feel it is easy to take action under a certain environment.	
7 Innovation Diffusion Theory (IDT)	Relative Advantage	The degree of using new method and can do better.	
	Ease of Use	The degree of using new system and make people feel difficult to use.	
	Image	The degree that using new system can strengthen others' impression.	
	Visibility	The degree that one can observe different users to use the new system in the organization	
	Compatibility	The degree that user feels the new system is in chorus with the value of existence, demand, and experience.	Moore and Benbasat, 1991
	Results Demonstrability	The substantial result of using new system includes the things that are visible and can be expressed by languages.	
	Voluntariness of Use	The user experiences the innovation of the new system and begins to have voluntariness and freedom.	
8 Social Cognitive Theory (SCT)	Outcome Expectations - Performance	The performance expectancy is related to the result of behaviour, especially the performance expectancy that is related to work.	
	Outcome Expectations - Personal	The individual expectancy is related to the result of behaviour, especially personal respect and achievement feeling.	
	Self-efficacy	The judgment ability that an individual has when using a kind of technique to complete a specific work or assignment.	Compeu and Higgins, 1995b Compeau et al, 1999
	Affect	Personal interest towards a special behaviour.	
	Anxiety	The anxiety or emotional response that an individual has when performance behaviour is involved	

Table 1: UTAUT relevant individual behavioural acceptance models and theories (adapted from Venkatesh et al, 2003)

From mentioned relevant documents there were four main UTAUT core dimensions determined: Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Facilitating Conditions (FC), and four control variables: Gender (GEN), Age (AGE), Experience (EXP), and Voluntariness of Use (VOL). The UTAUT theoretical structure that integrates these variables is shown in Figure 2.
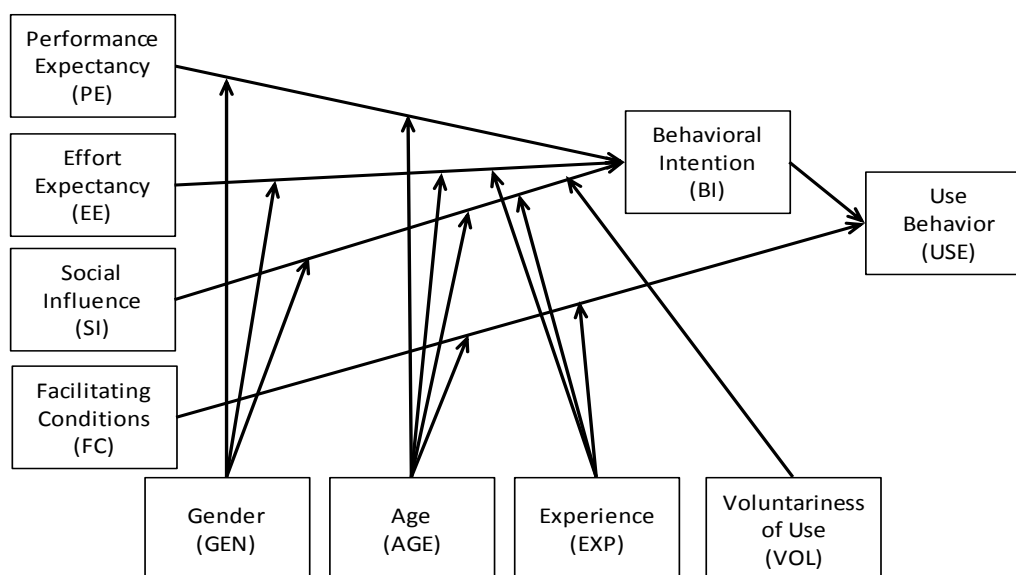
Figure 2: Unified Theory of Acceptance and Use of Technology Model (adapted from Venkatesh et al, 2003)

The four core determinants shown in the above figure are elaborated further in Table 2, which more detailed definitions are provided in Appendix A.

UTAUT determinant	The sub-determinant	The source of integrated model
Performance Expectancy (PE)	Perceived usefulness	TAM/TAM2/C-TAM-TPB
	Extrinsic motivation	MM
	Job-fit	MPCU
	Relative advantage	IDT
	Outcome expectations	SCT
Effort Expectancy (EE)	Perceived ease of use	TAM/TAM2
	Complexity	MPCU
	Ease of use	IDT
Social Influence (SI)	Subjective norm	TRA, TAM2, TPB/DPTB, C-TAM/TPB
	Social factors	MPCU
	Image	IDT
Facilitating Conditions (FC)	Perceived behavioural control	TPB/DTPB, C-TAM-TPB
	Facilitating conditions	MPCU
	Compatibility	IDT

Table 2: UTAUT four core determinants (adapted from Venkatesh et al, 2003)

2.2.1. Literature Review

Due to its nature, the UTAUT as well as extended TAM models are mostly applied for research in information technology and system fields. Quite a few recent reports and articles are from mobile, education, health and banking fields.

Yu (2012) employed the UTAUT model to investigate what impacts people to adopt mobile banking. The study used online survey with Likert scale and concluded from 441 valid respondents that social influence (SI), perceived financial cost, which is a facilitating condition (FC), performance expectancy (PE), perceived credibility, which is effort expectancy (EE), influence intention (BI) to adopt mobile banking. Besides that, behaviour (USE) was significantly influenced by intention (BI) and facilitating conditions (FC). Adding to this gender (GE), specifically men, considerably affected performance expectancy (PE) and perceived financial cost (FC) on intention (BI) to adopt mobile banking. While age (AGE) for older individuals was a moderating effect of effort expectancy (EE), younger moderating effect on social influence (SI), and both- younger and older, moderate facilitating financial cost (FC) on intention (BI). Besides that age (AGE) and Gender (GE) - for under 30 and over 50 years old men, considerably affected facilitating conditions (FC), and perceived self-efficacy (FC) was affected by the same age group but more on females on actual behaviour (USE). This means that the study majorly supported UTAUT model.

Another article from the banking industry was conducted by AbuShanab et al (2010). The report is conducted about internet banking in Jordan, and 940 cases were collected for the final sample of the survey. The study uses the UTAUT model and extends it with two additional variables. This extended model supported the influence of performance expectancy (PE), social influence (SI), self-efficacy (FC), perceived trust, and locus of control on the individual's intentions (BI) to use Internet banking. Therefore the results indicated partial support for the UTAUT model.

Foon and Fah (2011) have, in turn, analysed Internet Banking Adoption in Kuala Lumpur. They have aimed to investigate the factors and determinants of internet banking adoption among Malaysians while using some of the factors from the UTAUT model. Using questionnaires a total of 200 answers from respondents were collected. Research results show that performance expectancy (PE), effort

expectancy (EE), social influence (SI), facilitating condition (FC) and trust have positive effect on behavioural intention (BI). This suggests that the study majorly supports UTAUT model.

Another major field where UTAUT model is used to analyse users' acceptance is the mobile industry. Carlsson et al (2006) in their research studied the factors affecting intention to use mobile devices/services. From a survey they have collected 157 responses, and they have found that performance expectancy (PE) and effort expectancy (EE) are affecting behavioural intention (BI), but social influence (SI) is not influencing behaviour intention (BI) to use mobile devices/services. By analysing the actual use of three different mobile services (Multimedia Messaging Service (MMS), search services and icons and ring tones) the research also concludes that behavioural intention (BI) will have a positive influence on the usage (USE). Therefore obtained results do not support in all cases the original UTAUT hypotheses.

In another article by Wu et al (2008) a revised UTAUT model was also used. One of the reasons the study was conducted was to find how to improve customers' willingness to adopt 3G mobile telecommunication services. It was carried out through expert interviews as well as consumers' questionnaires, which summed up 394 valid responses altogether. The study found that performance expectancy (PE), social influence (SI), and facilitating conditions (FC) significantly influence behavioural intention (BI) to adopt 3G mobile telecommunication services. Interestingly, effort expectancy (EE) did not support behavioural intention (BI). Also three non-assumed relationships during the Structural Equation Model analysis were discovered, therefore in conclusion the UTAUT model was revised for 3G telecommunication services.

Lu et al (2005) has also conducted research in the mobile industry about wireless internet services via mobile technology. They have collected 357 valid data entries from MBA students via survey questionnaire. The paper concluded, that social influence (SI) and personal innovativeness in information technology have a direct positive impact on perceived usefulness (PE) and perceived ease of use (EE), however it did not support the hypothesis that both of them have a direct positive impact on intention (BI) to adopt wireless internet services via mobile technology. However perceived usefulness (PE) and perceived ease of use (EE) have a direct

positive impact on behavioural intention (BI), and perceived ease of use (PE) has a positive effect on perceived usefulness (EE). The research concluded, that in the mobile industry context, studies do support several relations between factors, but do not fully support UTAUT model.

The UTAUT model is also used in the education field to analyse users' acceptance of studying tools. Marchewka, Liu & Kostiwa (2007) have analysed a web-based tool, Blackboard, as a software application in higher education. 132 students have participated in a created online survey for this research. The paper concluded that there was no significant relationship between performance expectancy (PE) and behavioural intention (BI). However, significant relationship can be found between effort expectancy (EE) and social influence (SI), and behavioural Intention (BI). These findings also point out, that age and gender do not pay a significant moderating role. Therefore the results of the study did not find strong support for the UTAUT model.

Ngai et al (2004) have also conducted research in the education field, to be more precise, analysing adoption of the Web Course Tools (WebCT). The aim of this study was to investigate the role of the extended model in users' acceptance of WebCT. Proposed structural model was analysed from a collection of 836 responses. The results show that technical support (FC) has a significant direct effect on perceived ease of use and usefulness (EE), and technical support (FC) has a strong indirect effect on attitude. Besides that perceived ease of use and usefulness (EE) has significant effect in the attitude of students using WebCT. Adding to this perceived usefulness (PE) and perceived ease of use (EE) both demonstrated a significant direct effect on system usage (USE), while not that significant on behavioural intention (BI) and attitude. This might be due to the mandatory use of this tool. The results show that research doesn't fully support UTAUT model.

In another article by Thomas et al (2013) a revised UTAUT model was also used to explain mobile learning adoption in higher education in Guyana. The data was obtained through a web survey of university students, and there were 322 completed responses. This research confirms several relationships suggested by Venkatesh et al (2003) are being confirmed, like performance expectancy (PE) and social factors (SI) have effect on behavioural intention (BI). Performance

expectancy (PE), effort expectancy (EE) and facilitating conditions (FC) have significant positive effects on attitude. Besides that attitude has a significant impact on the behavioural intention (BI) as well as facilitating conditions (FC). It is suggested that contradictions are due to culture and country differences.

The UTAUT model is used also in the health industry to analyse information technology adoption in Thailand's community health centres by Kijsanayotin et al (2008). Data was collected using a survey, and there were 1607 valid responses. The research results suggest that IT acceptance (BI) is influenced by performance expectancy (PE), effort expectancy (EE), social influence (SI) and voluntariness (VOL). Also health IT use (USE) is predicted by previous IT experiences (EXP), intention to use the system (BI), and facilitating conditions (FC). According to the authors this research fully supports the UTAUT model in health industry.

While reviewing and summarising studies from various industries, it is clear that the UTAUT model is mostly only partially supported. The most common factor that influences behavioural intention (BI) to use is social influence (SI). Also half of the reports suggest that performance expectancy (PE) and effort expectancy (EE) have an effect on the behavioural intention (BI). Though not all studies analysed the factor of actual use, but in those that did, the results show that facilitating conditions (FC) and behavioural intention (BI) have effect on usage (USE). Mostly moderating factors: gender (GEN), age (AGE), experience (EXP), and voluntariness of use (VOL), were not included into model analyses. However, in those studies where they were partially included, studies show inconsistent results. Furthermore it appears that the most common tool used to conduct research related to the UTAUT model is survey with questionnaires.

3. Research Design

This chapter will present the research design. Firstly it suggests and describes 12 hypotheses. Secondly the research methodology is presented, which includes description of sources, the data collection process and the list of survey questions.

3.1. Hypotheses

After the analysis of all linkages in the UTAUT model (Figure 1) and literature review all hypotheses were formed regarding the usage of Bitcoin. However, there were modifications made to the model. Firstly, since the term digital currency is fairly new in today's economy and the usage of other digital currency prior to Bitcoin were not expected, the moderating variable experience is not included in the list of factors for this study. Also this research is not longitudinal and it is not capable to capture increasing levels of user experience at different periods of time, like Venkatesh et al (2003) used future, present and past tenses (T1, T2 and T3) to assess experience. Secondly, Venkatesh et al (2003) used voluntariness as a dummy variable to separate voluntary and mandatory use. However, the use of Bitcoin is completely voluntary, therefore there is no expected interaction between voluntariness of use and any other interactions. Consequently experience and voluntariness of use were removed as moderating factors in the proposed structure model of this research.

For the remaining variables form the framework it is firstly expected that performance expectancy will have a positive influence on the behavioural intention. This was concluded in the findings of Venkatesh et al (2003), Carlsson et al (2006), Yu (2012), Wu et al (2008), Lu et al (2005), Thomas et al (2013), AbuShanab et al (2010), Foon and Fah (2011), Kijsanayotin et al (2008). This causal relationship will be moderated by the gender and age, such that the effect is anticipated to be stronger for men and particularly for younger men to use Bitcoin. This was concluded in Venkatesh et al (2003) findings, though other studies show inconsistent results. Thus, the hypotheses are:

- **H1**: (PE) Performance expectancy will have a positive influence on behavioural intention (BI) to use Bitcoin.

- **H2**: Gender (GEN) will positively moderate the influence of performance expectancy (PE) on behavioural intention to use Bitcoin for men.

- **H3**: Age (AGE) will positively moderate the influence of performance expectancy (PE) on behavioural intention to use Bitcoin for younger men.

Secondly, it is expected that effort expectancy will have a positive influence on behavioural intention to use Bitcoin. In other words, increased levels of ease of using Bitcoin should be associated with increased behavioural intention to use them. This was concluded in the findings of Venkatesh et al (2003), Yu (2012), Lu et al (2005), Marchewka et al (2007), Foon and Fah (2011) Kijsanayotin et al (2008). Furthermore, it is expected that the influence of effort expectancy on behavioural intention will be moderated by gender and age, such that the effect will be stronger for women, and particularly older women. This was concluded in Venkatesh et al (2003) findings, though other studies show inconsistent results. The hypotheses that emerge from this discussion are as follows:

- **H4**: Effort expectancy (EE) will have a positive influence on behavioural intention (BI) to use Bitcoin.

- **H5**: Gender (GEN) will positively moderate the influence of effort expectancy (EE) on behavioural intention to use Bitcoin for women.

- **H6**: Age (AGE) will positively moderate the influence of effort expectancy (EE) on behavioural intention to use Bitcoin for older women.

Thirdly, it is expected that social influence will also have a positive influence on behavioural intention to use Bitcoin. This statement supports findings from Yu (2012), Wu et al (2008), Marchewka et al (2007), Thomas et al (2013), AbuShanab et al (2010), Foon and Fah (2011), Kijsanayotin et al (2008). Also it is anticipated that influence will be moderated by the gender. According to Venkatesh et al (2003) effect will be stronger for women. Also this relationship will be moderated by age, such that the effect will be stronger for younger people, as social image is critical for such an age. This was not supported by Venkatesh et al (2003), however later findings by Yu (2012) and Marchewka et al (2007) do support these statements. Consequently, the hypotheses are:

- **H7**: Social influence (SI) will have a positive influence on behavioural intention (BI) to use Bitcoin.

- **H8**: Gender (GEN) will positively moderate the influence of social influence (SI) on behavioural intention to use Bitcoin for women.

- **H9**: Age (AGE) will positively moderate the influence of social influence (SI) on behavioural intention to use Bitcoin for younger people.

Lastly, since there is involvement of high importance matter as money, there should be strong positive relationship between facilitating conditions and use behaviour. This was concluded in the findings of Venkatesh et al (2003), Yu (2012), Thomas et al (2013), Kijsanayotin et al (2008). The increased levels of facilitating conditions should lead to lower uncertainty and ambiguity with respect to Bitcoin usage. Additionally, the confidence level of using this currency is expected to be important for all older groups. Therefore according to Venkatesh et al (2003), age is anticipated to have negative interaction to the influence of facilitating conditions on Bitcoin usage. Therefore these observations lead to the following hypotheses:

- **H10**: Facilitating conditions (FC) will have a positive influence on Bitcoin usage behaviour (USE).

- **H11**: Age (AGE) will negatively moderate effect on the influence on facilitating conditions on Bitcoin usage behaviour (USE).

The last hypothesis is expected to be positive influence between behavioural intention and use behaviour. This was concluded in all of the reviewed studies that analysed usage: Venkatesh et al (2003), Carlsson et al (2006), Yu (2012), Kijsanayotin et al (2008).

- **H12**: Behavioural intention (BI) will positively influence on use behaviour (USE).

Proposed structure model for the acceptance of Bitcoin with summarised hypotheses is shown in Figure 3.
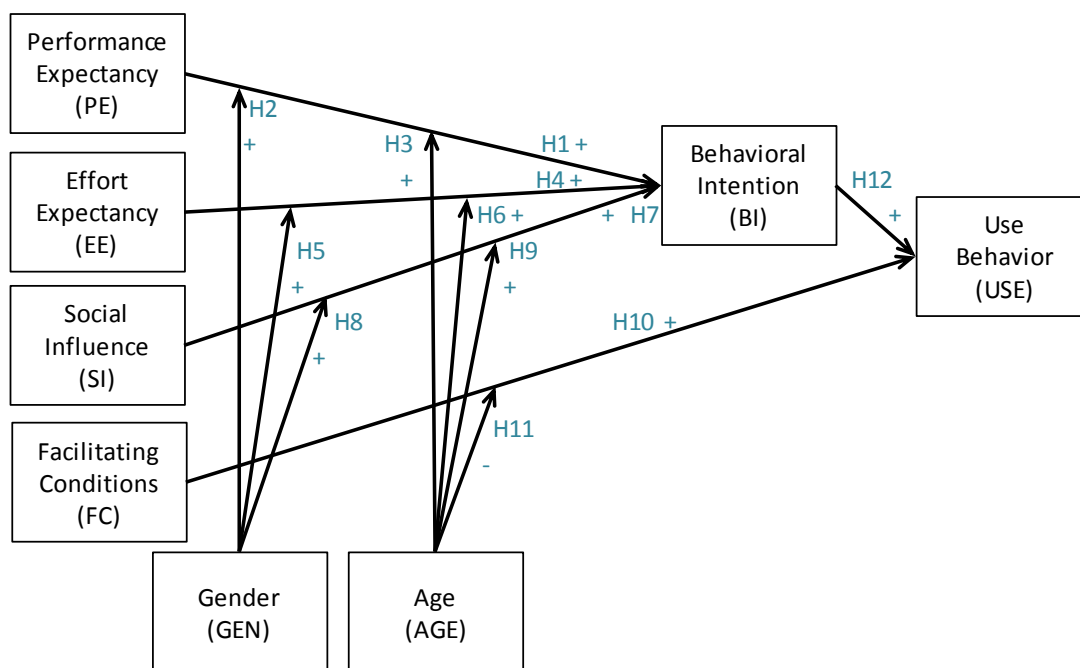
Figure 3: Proposed structure model for the acceptance of Bitcoin

3.2. Research Methodology

The thesis relies on input gathered from actual users and non-users of Bitcoin. In order to answer the research question, the basis is an exploratory quantitative research.

A survey was conducted during January- February 2014. The research sample was selected randomly from various sources that include online Bitcoin communities and societies as well as Bitcoin forums. Also at this stage for the data collection a questionnaire was used, as for this type of research it is a commonly chosen option. Most of the reviewed and summarised UTAUT studies in literature review also use questionnaires to conduct the data. As it is stated, that quantitative research refers to the systematic empirical investigation of social phenomena via statistical, mathematical or numerical data or computational techniques (Given, 2008). This stage also consists of collected data analysis. Questionnaire data collection method makes it possible statistically to analyse the answers. The results of the survey are analysed and verified using various statistical methods like the Mean, Standard Deviation, Cronbach's Alpha, Pearson's Correlation and Regression's Beta. After the analysis is completed, empirical results are related to the previously developed hypotheses. Conclusions, recommendations and implications are then developed in

turn. From the empirical evidence a summary of research limitations, final conclusions and future research suggestions are outlined.

3.2.1. Data Collection

In order to gather all factors why Bitcoin might be accepted or not accepted for the survey all users were selected. This means that not only actual users were included, but as well possible users of Bitcoin and non-users, who at this moment do not have and do not intend to have or use Bitcoin in the future. The target population was chosen from the internet (Appendix B) and consists of:

- 9 Bitcoin Groups in Facebook and 1 group in Google+, which in total have 32.891 members;

- 13 Facebook Bitcoin pages, which have in total 360.693 followers;

- 3 Bitcoin Forums, with total approximate 262.307 members.

In this manner, the research targets people who choose to voluntarily participate in Bitcoin related group/communities/forums discussions, follow Bitcoin pages, gather information about Bitcoin online, are willing to know more about Bitcoin and/or want to have/use Bitcoin. Also these sources will provide a satisfying number of survey respondents. Since the size of the total population is only an approximate and therefore a variable a sample size of 50 is chosen to analyse the results. As a rule of thumb a sample of 50 is considered valid when the size of the total population is unknown (Neuman, 2000).

The questions used in the survey were established and tested with selected Bitcoin users. Two Bitcoin users and one non-user participated in a pilot survey. Feedback and observations from participants resulted in minor wording changes to the questionnaire. For the execution of this survey an online tool has been chosen, namely SurveyPlanet.com. Using this online tool offered several advantages, including flexibility in executing the survey remotely and making results available immediately in digital format, which also makes analysing the data easier. The survey was structured to include a 'Hello' message with an explanation about the survey at the beginning and a 'Thank You' note at the end (Appendix C). Thereafter the Cover Message (Appendix D) together with the link to this online

survey was shared for the targeted audience described above. The online survey had 111 responses, which is more than 50, and is therefore seen as valid.

3.2.2. Survey

Below is a list of questions used for the online survey. The survey commenced with the general questions, which were devised to acquire basic information about the person completing the survey. These questions were designed to be single choice or essay option questions.

The following questions were generated to describe the linkages from the UTAUT model (Venkatesh, 2003) that had resulted in hypotheses. These are single choice questions and are assessed on a seven-point Likert scale anchored with strongly disagree to strongly agree. Essay questions were also incorporated into the survey to get more detailed opinions of the respondents' plans of using/having Bitcoin. To get some insight about the respondents usage behaviour there are answers with single choice from 5 and 6 options. All of these questions are set up in order to link users and non-users. This provides the freedom to have responses from people that are aware of Bitcoin but do not have them yet.

Gender (GE)

GE1 What is your gender?

Age (AGE)

AGE1 What is your age?

General other questions

G1 What is your occupation?

G2 What is your location?

Performance Expectancy (PE)

PE1 In my opinion, Bitcoin are/could be useful.

PE2 I believe I can/could save time by using Bitcoin.

PE3 I believe I can/could save money by using Bitcoin.

Effort Expectancy (EE)

EE1   In my opinion, I find/would find Bitcoin easy to use.

EE2   Learning to use Bitcoin is/would be easy for me.

EE3   In my opinion, using Bitcoin is/could be beneficial.

Social Influence (SI)

SI1   My friends/family members value my choice of Bitcoin or suggest to use/have Bitcoin.

SI2   Society/media suggests to use/have Bitcoin.

SI3   I am/would be trendy while using Bitcoin.

Facilitating Conditions (FC)

FC1   Bitcoin community guides/could guide me in the use of Bitcoin.

FC2   Bitcoin community was/would be available to help with Bitcoin related problems.

FC3   I have/could have the knowledge and ability necessary to use Bitcoin

FC4   Bitcoin technology is/could be compatible with the technology I use.

FC5   In my opinion, the operating costs do/would not inhibit the use of Bitcoin.

Behavioural Intention (BI)

BI1   I intend to have/use Bitcoin in the next 12 months.

BI2   I use/would use, when possible Bitcoin instead of the traditional money.

BI3   I use/would use, when possible Bitcoin as an investment.

BI4   I want to be among the first ones to try out Bitcoin.

BI5   I want to use Bitcoin instead of the traditional money.

Use Behaviour (USE)

USE1 How long have you been using/having Bitcoin?

USE2 On a monthly basis, how many times do you review Bitcoin related data?

4. Analysis and Results

This chapter will present data statistics, analysis and results. Firstly the demographic statistics are reviewed, and secondly the descriptive statistics presented, which include reliability, frequency and mean analysis. Afterwards the correlations between construct items is analysed via Pearson's correlation and Regression Analysis. And the last section contains analysis of essays from users that are not planning to have/use Bitcoin in the near future.

4.1. Demographics statistics

Survey sample characteristics are illustrated in Table 3, comprising of 111 responses collected from 77 posts to 26 groups, pages and forums. These include Bitcoin users and non-users from Asia (14%), the Americas (North 18%, South 5%) and a majority from Europe (64%). The demographic profiles of respondents show that male is the dominant gender group with 90% of respondents, while females only constituted 10%. Regarding age composition, it is clear that respondents are predominantly young people, with 51% of the respondents between 21 and 30 years of age; also 23% between ages of 31 and 40.

	Frequency	Percentage
Gender		
Female	11	9,9%
Male	100	90,1%
Total	**111**	**100,0%**
Age		
under 20 years	7	6,3%
21-30 years	57	51,4%
31-40 years	25	22,5%
41-50 years	12	10,8%
51-60 years	7	6,3%
over 60 years	3	2,7%
Total	**111**	**100,0%**
Location		
Asia	15	13,5%
Europe	71	64,0%
North America	20	18,0%
South America	5	4,5%
Total	**111**	**100,0%**

Table 3: Profile of Respondents

In terms of occupation, significant ratios of respondents were from the IT industry (41%) or Education (23%), as it is presented in Figure 4.
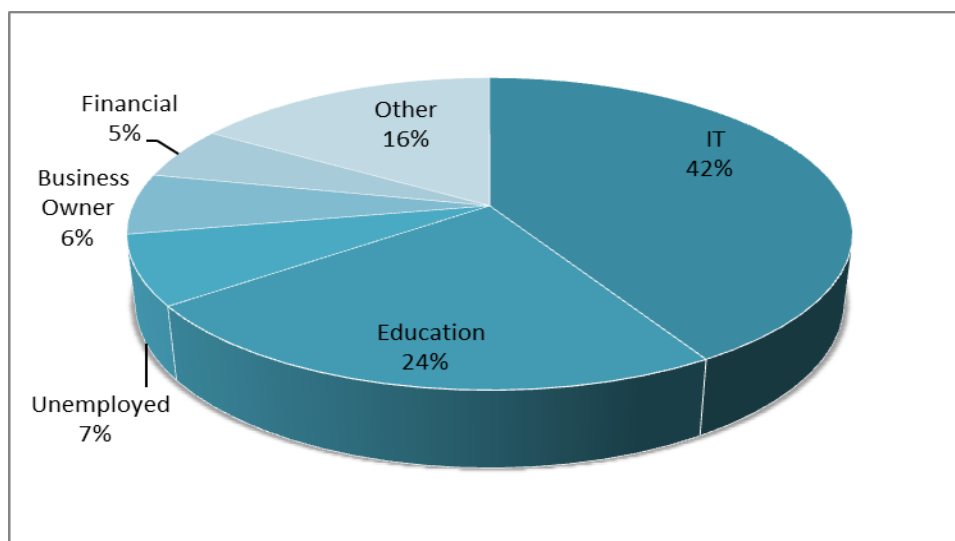
Figure 4: Respondents Occupation Statistics

4.2. Descriptive Analysis

In this study, the collected data was analysed using MS Excel spreadsheet with Data Analysis additional functionality. Quantitative descriptive statistics were employed to analyse data from the survey, where answers were aligned to numbers:

- Female = 1, Male = 2

- 20 or under = 1, 21-30 = 2, 31-40 = 3, 41-50 = 3, 50-60 = 4, Over 60 = 5

- No = 1, Yes = 2

- Strongly Disagree = 1, Disagree = 2, Slightly Disagree = 3, Neither Agree or Disagree = 4, Slightly Agree = 5, Agree = 6, Strongly Agree = 7

- I do not have Bitcoin = 1, Less than a year = 2, From 1 to 2 years = 3, From 2 to 3 years = 4, More than 3 years = 5

- Less than once a month = 1, Once a month = 2, A few times a month = 3, A few times a week = 4, About once a day = 5, Several times a day = 6

4.2.1. Reliability of Results

It is important to test reliability of the results in order to make sure that the survey results are consistent. The most common internal consistency measure is Cronbach's alpha, which is usually interpreted as the mean of all possible split-half coefficients (Cortina, 1993).This test can be used for various questions on a ranking scale and in this case on a Likert-scale as well. A commonly accepted rule of thumb for social sciences is $\alpha \geq 0.70$ and a higher α value means a higher consistency in the answers. This research alpha resulted in 0,891, and is therefore considered consistent and valid.

4.2.2. Frequency of Results

While reviewing the frequency test (Table 4) for all the Likert-scale questions a small trend is visible in the median which gives the value of 6 (i.e. Agree) as the most frequently occurring response. The average mode is 6,17 which is much higher than the neutral answer on the Likert-scale. This gives the view that in general people have a strong opinion and it is positively oriented. This is confirmed by the analysis of the separate questions which will show us in the upcoming paragraphs that the opinion of the respondents is rather positive.

Construct	N	Mean	Standard Error	Median	Mode	Standard Deviation	Sample Variance	Skewness	Range	Minimum	Maximum
PE1	111	6,07	0,13	7	7	1,37	1,87	-1,85	6	1	7
PE2	111	5,45	0,15	6	7	1,57	2,45	-0,86	6	1	7
PE3	111	5,65	0,14	6	7	1,46	2,12	-1,04	6	1	7
EE1	111	5,19	0,14	6	6	1,51	2,28	-0,91	6	1	7
EE2	111	5,80	0,12	6	6	1,21	1,47	-1,26	5	2	7
EE3	111	6,05	0,11	6	7	1,19	1,41	-1,79	6	1	7
SI1	111	4,40	0,14	4	4	1,53	2,33	-0,35	6	1	7
SI2	111	4,06	0,15	4	4	1,59	2,51	-0,11	6	1	7
SI3	111	4,87	0,15	5	6	1,58	2,51	-0,74	6	1	7
FC1	111	5,70	0,12	6	6	1,22	1,48	-1,25	5	2	7
FC2	111	5,85	0,11	6	6	1,18	1,40	-1,40	6	1	7
FC3	111	6,14	0,11	6	7	1,12	1,25	-1,76	5	2	7
FC4	111	6,09	0,11	6	7	1,20	1,45	-1,77	6	1	7
FC5	111	5,41	0,13	6	6	1,36	1,84	-0,88	6	1	7
BI2	111	5,15	0,17	6	6	1,76	3,09	-0,92	6	1	7
BI3	111	5,73	0,14	6	7	1,45	2,09	-1,44	6	1	7
BI4	111	5,40	0,15	6	6	1,53	2,35	-0,97	6	1	7
BI5	111	5,16	0,16	6	6	1,65	2,72	-0,75	6	1	7

Table 4: Frequency test

4.2.3. Means of Results

A low standard deviation indicates that the data points tend to be very close to the mean, which is the expected value; a high standard deviation indicates that the data points are spread out over a large range of values (Bland, Altman, 1996). Table 5 displays the lowest standard deviations for Gender (GE1), Intention to use Bitcoin in next twelve months (BI1), and actual Use of Bitcoin (USE1). The analysis shows that the expected answers for these questions are Male, Yes (I intend to use/have Bitcoin in the next 12 months) and most participants have Bitcoin for less than a year, respectively. The other responses have higher standard deviation, which tells that answers to these questions have broader distribution and have bigger variety in answers.

Construct	N	Mean	S. D.
GE1	111	1,90	**0,30**
AGE1	111	2,68	1,13
PE1	111	6,07	1,37
PE2	111	5,45	1,57
PE3	111	5,65	1,46
EE1	111	5,19	1,51
EE2	111	5,80	1,21
EE3	111	6,05	1,19
SI1	111	4,40	1,53
SI2	111	4,06	1,59
SI3	111	4,87	1,58
FC1	111	5,70	1,22
FC2	111	5,85	1,18
FC3	111	6,14	1,12
FC4	111	6,09	1,20
FC5	111	5,41	1,36
BI1	111	1,86	**0,34**
BI2	111	5,15	1,76
BI3	111	5,73	1,45
BI4	111	5,40	1,53
BI5	111	5,16	1,65
USE1	111	2,12	**0,98**
USE2	111	4,33	1,87

Table 5: Means test

4.3. Pearson's Correlation

Testing the UTAUT in the digital currency Bitcoin environment concentrated on the one hand examining the factors affecting the intention to use/have Bitcoin and on the other hand on factors affecting the use of Bitcoin. The attained data was

firstly analysed through Pearson's correlation to review the strength of correlations between variables.

Pearson's correlation is widely used to measure the degree of linear dependence between two variables, and this correlation coefficient gives a value between +1 and −1 inclusive, where 1 is total positive correlation, 0 is no correlation, and −1 is total negative correlation (Pearson, 1985). Table 6 deploys all Pearson's correlations between all variables, however deeper analysis on relationships is analysed only between those variables that are described in UTAUT model. Also, since the gender and age columns have all p above > 0.01 or >0.05, the results are considered as not significant, therefore there will not be more in depth analysis in next correlation sub-sections regarding these variables.

Table 6: Pearson's Correlation

		GE1	AGE1	PE1	PE2	PE3	EE1	EE2	EE3	SI1	SI2	SI3	FC1	FC2	FC3	FC4	FC5	BI1	BI2	BI3	BI4	BI5	USE1	USE2
GE1	Pearson Correlation	1,00																						
	p - value																							
	N	111																						
AGE1	Pearson Correlation	-,015	1,00																					
	p - value	,874																						
	N	111	111																					
PE1	Pearson Correlation	,151	0	1,00																				
	p - value	,115	0,051																					
	N	111	111	111																				
PE2	Pearson Correlation	,115	0	,563**	1,00																			
	p - value	,228	0,621	,000																				
	N	111	111	111	111																			
PE3	Pearson Correlation	,107	0	,529**	,684**	1,00																		
	p - value	,265	0,715	,000	,000																			
	N	111	111	111	111	111																		
EE1	Pearson Correlation	,122	0	,249**	,510**	,435**	1,00																	
	p - value	,202	0,270	,008	,000	,000																		
	N	111	111	111	111	111	111																	
EE2	Pearson Correlation	,245**	0	,212*	,191*	,213*	,398**	1,00																
	p - value	,009	0,271	,026	,044	,025	,000																	
	N	111	111	111	111	111	111	111																
EE3	Pearson Correlation	,242*	,221*	,744**	,572**	,651**	,325**	,322**	1,00															
	p - value	,010	0,020	,000	,000	,000	,001	,001																
	N	111	111	111	111	111	111	111	111															
SI1	Pearson Correlation	-,013	0	,243*	,366**	,398**	,353**	,259**	,251**	1,00														
	p - value	,895	0,342	,010	,000	,000	,000	,006	,008															
	N	111	111	111	111	111	111	111	111	111														
SI2	Pearson Correlation	-,120	0	-,103	-,023	,084	,310**	,182	-0,045	,230*	1,00													
	p - value	,208	0,662	,283	,814	,378	,001	,057	,639	,015														
	N	111	111	111	111	111	111	111	111	111	111													
SI3	Pearson Correlation	-,046	0	,113	,144	,225*	,405**	,200*	0,134	,321**	,289**	1,00												
	p - value	,634	0,413	,236	,131	,018	,000	,035	,162	,001	,002													
	N	111	111	111	111	111	111	111	111	111	111	111												
FC1	Pearson Correlation	,167	-,01	,324**	,433**	,351**	,342**	,243**	,381**	,211*	,13	,15	1,00											
	p - value	,079	0,91	0,00	0,00	0,00	0,00	0,01	0,00	0,03	,17	,12												
	N	111	111	111	111	111	111	111	111	111	111	111	111											
FC2	Pearson Correlation	,187*	,02	,333**	,405**	,316**	,458**	,226*	,367**	,391**	,16	,188*	,718**	1,00										
	p - value	,049	0,81	0,00	0,00	0,00	0,00	0,02	0,00	0,00	,09	,05	0,00											
	N	111	111	111	111	111	111	111	111	111	111	111	111	111										
FC3	Pearson Correlation	,205*	,07	,522**	,378**	,271**	,15	,350**	,475**	,200*	,01	,07	,392**	,380**	1,00									
	p - value	,031	,44	0,00	0,00	0,00	,11	0,00	0,00	0,03	,96	,49	0,00	0,00										
	N	111	111	111	111	111	111	111	111	111	111	111	111	111	111									
FC4	Pearson Correlation	,226*	-0,14	,422**	,398**	,226*	,246**	,393**	,418**	,213*	,04	,15	,391**	,354**	,652**	1,00								
	p - value	,017	,15	0,00	0,00	0,02	0,01	0,00	0,00	0,02	,68	,11	0,00	0,00	0,00									
	N	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111								
FC5	Pearson Correlation	,099	,05	,18	,251**	,13	,308**	,13	,15	,04	,15	-,08	,282**	,288**	,18	,217*	1,00							
	p - value	,299	,60	0,07	0,01	0,18	0,00	,19	,12	,64	,11	,42	0,00	0,00	0,06	0,02								
	N	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111							
BI1	Pearson Correlation	,133	,14	,699**	,453**	,450**	,08	,11	,595**	,190*	-,05	,14	,338**	,239**	,453**	,338**	,08	1,00						
	p - value	,163	,13	0,00	0,00	0,00	,38	,25	0,00	,05	,60	,16	0,00	0,01	0,00	0,00	,41							
	N	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111						
BI2	Pearson Correlation	,046	,07	,434**	,599**	,603**	,331**	,249**	,519**	,333**	,09	,07	,318**	,251**	,312**	,264**	,11	,320**	1,00					
	p - value	,630	,46	0,00	0,00	0,00	0,00	0,01	0,00	0,00	,34	,49	0,00	0,01	0,00	0,01	,23	0,00						
	N	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111					
BI3	Pearson Correlation	,063	,11	,433**	,376**	,352**	,315**	,218*	,442**	,226*	,04	,13	,393**	,374**	,373**	,307**	,200*	,475**	,342**	1,00				
	p - value	,508	,26	0,00	0,00	0,00	0,00	0,02	0,00	0,02	,65	,18	0,00	0,00	0,00	0,00	,04	0,00	0,00					
	N	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111				
BI4	Pearson Correlation	-,052	,13	,333**	,330**	,372**	,187*	,11	,355**	,262**	,203*	,19	,477**	,414**	,364**	,207*	,12	,483**	,294**	,537**	1,00			
	p - value	,587	,17	0,00	0,00	0,00	0,05	,27	0,00	0,01	0,03	,05	0,00	0,00	0,00	0,03	,21	0,00	0,00	0,00				
	N	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111			
BI5	Pearson Correlation	-,022	,15	,527**	,620**	,630**	,389**	,14	,554**	,328**	,06	,251**	,305**	,315**	258**	,254**	,206*	,408**	,668**	,358**	,424**	1,00		
	p - value	,816	,13	0,00	0,00	0,00	0,00	,13	0,00	0,00	,52	0,01	0,00	0,00	0,01	0,01	,03	0,00	0,00	0,00	0,00			
	N	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111		
USE1	Pearson Correlation	,225*	,10	,503**	,410**	,399**	,18	,196*	,442**	,279**	-,192*	,09	,228*	,266**	,333**	,253**	,10	,453**	,280**	,196*	,241*	,388**	1,00	
	p - value	,017	,29	0,00	0,00	0,00	,07	,04	0,00	0,00	,04	,37	0,02	0,00	0,00	0,00	,29	0,00	0,00	0,04	0,01	0,00		
	N	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	
USE2	Pearson Correlation	,253**	,215*	,608**	,425**	,526**	,334**	,297**	,553**	,280**	-,06	,13	,318**	,355**	,519**	,357**	,18	,537**	,329**	,342**	,371**	,432**	,498**	1,00
	p - value	,007	,02	0,00	0,00	0,00	0,00	0,00	0,00	0,00	,54	,16	0,00	0,00	0,00	0,00	,06	0,00	0,00	0,00	0,00	0,00	0,00	
	N	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111,00

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

4.3.1. PE and BI correlation analysis

At first, the relationship between performance expectancy (PE) and intention to use (BI) Bitcoin was studied, as the UTAUT model states that there is a relation between these two variables of the model. From table 7 it is clear, that there is positive correlation between PE and BI construct items as all correlations are higher than 0, and mostly significantly higher. Besides that all p are equal to 0.00, therefore the results are being considered as significant.

		BI1	BI2	BI3	BI4	BI5
PE1	Pearson Correlation	,699**	,434**	,433**	,333**	,527**
	p - value	,000	,000	,000	,000	,000
PE2	Pearson Correlation	,453**	,599**	,376**	,330**	,620**
	p - value	,000	,000	,000	,000	,000
PE3	Pearson Correlation	,450**	,603**	,352**	,372**	,630**
	p - value	,000	,000	,000	,000	,000

**. Correlation is significant at the 0.01 level (2-tailed).

Table 7: Pearson's Correlation between PE and BI

4.3.2. EE and BI correlation analysis

Secondly, the relationship between effort expectancy (EE) and intention to use (BI) Bitcoin is described, as the UTAUT model states that there is a relationship between these two variables. From table 8 it is clear, that there is a positive correlation between EE and BI construct items as all correlations are higher than 0. Though not all p are <0.01 or <0.05, the results show significant correlation, therefore the relationship between effort expectancy (EE) and intention to use (BI) Bitcoin is not being eliminated at this point.

		BI1	BI2	BI3	BI4	BI5
EE1	Pearson Correlation	**,085**	**,331****	**,315****	,187*	**,389****
	p - value	**,376**	,000	,001	**,049**	,000
EE2	Pearson Correlation	,110	,249**	,218*	,106	,144
	p - value	,251	,008	,021	,267	,133
EE3	Pearson Correlation	**,595****	**,519****	**,442****	**,355****	**,554****
	p - value	,000	,000	,000	,000	,000

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 8: Pearson's Correlation between EE and BI

4.3.3. SI and BI correlation analysis

Thirdly, the relationship between social influence (SI) and intention to use (BI) Bitcoin is described, as the UTAUT model states that there is a relationship between these two variables of the model. From table 9 it is clear, that there is a positive correlation between SI and BI construct items as most correlations are higher than 0. Though not all p are <0.01 or <0.05, the results show correlation, therefore the relationship between social influence (SI) and intention to use (BI) Bitcoin is not being eliminated yet.

		BI1	BI2	BI3	BI4	BI5
SI1	Pearson Correlation	,190*	**,333****	,226*	,262**	**,328****
	p - value	,046	,000	,017	,005	,000
SI2	Pearson Correlation	-,051	,091	,043	,203*	,062
	p - value	,595	,342	,653	,033	,517
SI3	Pearson Correlation	,135	,066	,128	,185	,251**
	p - value	,156	,493	,181	,051	,008

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 9: Pearson's Correlation between SI and BI

4.3.4. FC and USE correlation analysis

The relationship between facilitating conditions (FC) and use behaviour (USE) of Bitcoin is also considered, as the UTAUT model states that there is a relationship between these two variables. From table 10 it is clear, that there is positive correlation between FC and USE construct items as all correlations are higher than

0. Almost all p are <0.01 or <0.05, therefore the relationship between facilitating conditions (FC) and use behaviour (USE) of Bitcoin is considered as significant.

		USE1	USE2
FC1	Pearson Correlation	,228[*]	**,318**[**]
	p - value	,016	,001
FC2	Pearson Correlation	,266[**]	**,355**[**]
	p - value	,005	,000
FC3	Pearson Correlation	**,333**[**]	,519[**]
	p - value	,000	,000
FC4	Pearson Correlation	,253[**]	**,357**[**]
	p - value	,007	,000
FC5	Pearson Correlation	,101	,179
	p - value	,293	,061

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Table 10: Pearson's Correlation between FC and USE

4.3.5. BI and USE correlation analysis

The study also considers the relationship between behaviour intention (BI) and use behaviour (USE) of Bitcoin, in alignment with the UTAUT model which states that there is a relation between these two variables. From table 11 it is clear that there is positive correlation between BI and USE construct items as all correlations are higher than 0. Besides that almost all p are equal to 0.00, therefore the results are being considered as significant.

		USE1	USE2
BI1	Pearson Correlation	**,453****	**,537****
	p - value	,000	,000
BI2	Pearson Correlation	,280**	**,329****
	p - value	,003	,000
BI3	Pearson Correlation	,196*	**,342****
	p - value	,039	,000
BI4	Pearson Correlation	,241*	**,371****
	p - value	,011	,000
BI5	Pearson Correlation	**,388****	**,432****
	p - value	,000	,000

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Table 11: Pearson's Correlation between BI and USE

4.4. Regression Analysis

In order to confirm Pearson's analysis, the regression analysis is also performed. This statistical tool is used for the investigation of relationships between variables, when it is important to ascertain the causal effect of one variable upon another variable. To explore this relationship regression is employed to estimate the quantitative effect of the causal variables upon the variable that they influence (Freedman, 2005).

Relantionship of variables	Standartised Coeficient β	p - value	Significance
PE->BI	0,707	p < 0.001	Yes
PE, GE->BI	-0,083	n.s.	No
PE, AGE->BI	0,0554	n.s.	No
EE->BI	0,473	p < 0.001	Yes
EE, GE->BI	-0,119	n.s.	No
EE, AGE->BI	0,0545	n.s.	No
SI->BI	0,295	n.s.	No
SI, GE->BI	0,037	n.s.	No
SI, AGE->BI	0,106	n.s.	No
FC->USE	0,448	p < 0.001	Yes
FC, AGE->USE	0,203	n.s.	No
BI->USE	0,487	p < 0.001	Yes

Table 12: Regression Analysis

Table 12 shows the obtained standardized beta coefficient values. The data shows that the coefficients for PE, EE, FC, and BI are statistically significant (p-value < 0.001). The standardized beta coefficient value indicates that one standard deviation increase in performance expectancy (PE) score brings about 0.707 standard deviation increase in behavioural intention (BI) towards Bitcoin acceptance, which is the highest score and has the greatest positive impact. Additionally effort expectancy (EE) with β = 0.473 also has a positive impact on behavioural intention (BI) towards Bitcoin acceptance. Furthermore, behavioural intention (BI) with β = 0.487 contributes significantly towards actual Bitcoin usage (USE) followed by facilitating conditions (FC) with β = 0.448. The data indicates that other variables are not statistically significant to the BI or USE assessment.

In summary, the results from the analysis mean that only performance expectancy, effort expectancy, facilitating conditions and behavioural intention are significant factors to determine the users' acceptance on Bitcoin. Therefore figure 5 presents the final structure model for the acceptance of Bitcoin.


Figure 5: Final structure model for the acceptance of Bitcoin

4.5. Non-user Analysis

This research analyses users as well as non-users of Bitcoin, although the survey findings indicate that the latter are likely to become users at a future point in time. Additionally, the survey also captures all non-users that are not planning to have or use Bitcoin in the future. Though there are only 13 individuals who fall into this category, it is important to review their answers as well in order to gather important facts that can be useful in profiling of these individuals behaviour.

Table 13 displays all the answers to the open-ended question posed in the survey from negative users, which are summarized and split into three generic response types. The first type of response is the 'No Trust', encompassing 4 responses in the table. The individuals with demonstrating this attitude do not believe in the future of this digital currency, and are not willing to invest their money. The second response type is the 'No Use Possibilities', which consist of 2 answers. Respondents who belong to this group seem to be in favour of Bitcoin, however in their living country it is not possible to use Bitcoin broadly. The last response type accounts for the majority (i.e. 7) of the answers in the table is 'No Knowledge'. Respondents in this group are not aware how Bitcoin work and they see no advantages in using this digital currency. From all of these responces, it is possible that individuals displaying 'No Use' and 'No Knowledge' characteristics could be willing to change their mind and start using Bitcoin in the future. As a tentative conclusion, it could be suggested that 69% of the negative responses could be turned into users if they are to acquire more knowledge of this digital currency, and if the Bitcoin market would open up in their country.

Negative users answers	Type
I have no trust in bitcoins and think that it might become useless soon.	No trust
Not interested in earning money from risky bussiness.	No trust
I see no reason to use them.	No knowledge
I am not ready for that.	No trust
Currently I do not have bitcoins, but if the adoption rate in Lithuania would increase, I would definately consider buying Bitcoins.	No use possibilities
I'm not sure yet actually - if I will find where to use them, I will.	No knowledge
I do not intend to use bitcoins because I do not believe in anarchy.	No trust
I have to learn more about it.	No knowledge
It is requesting very good equipment if you want to make it profitable.	No knowledge
I don't understand this service.	No knowledge
I don't know anything about it, just heard of it, that it's becoming more popular and popular. Also I don't know, maybe I will change my mind in the future.	No knowledge
I don't know what Bitcoins are and how it works.	No knowledge
It is not possible to use in my country.	No use possibilities

Table 13: Negative responses to the open-ended question

5. Conclusions

A revised UTAUT model (Venkatesh et al, 2003) was chosen to carry out this research to investigate the factors affecting Bitcoin's user acceptance, where the experience and voluntariness from UTAUT's moderating factors were suggested to be excluded. After the theory's establishment, research design, formulation of the hypotheses, survey, and collecting and analysing data, the model and hypotheses were validated. The results in table 14 show that only 4 out of 12 hypotheses were supported in this research. Therefore this concludes that the results indicate only partial support for the UTAUT model when employed to the case of Bitcoin.

Hypotheses	Conclusion
H1: (PE) Performance expectancy will have a positive influence on behavioural intentions (BI) to use Bitcoin.	**Supported**
H2: Gender (GEN) will positively moderate the influence of performance expectancy (PE) on behavioural intentions (BI) to use Bitcoin for men.	Not supported
H3: Age (AGE) will positively moderate the influence of performance expectancy (PE) on behavioural intentions (BI) to use Bitcoin for younger men.	Not supported
H4: Effort expectancy (EE) will have a positive influence on behavioural intentions (BI) to use Bitcoin.	**Supported**
H5: Gender (GEN) will positively moderate the influence of effort expectancy (EE) on behavioural intentions (BI) to use Bitcoin for women.	Not supported
H6: Age (AGE) will positively moderate the influence of effort expectancy (EE) on behavioural intentions (BI) to use Bitcoin for younger women.	Not supported
H7: Social influence (SI) will have a positive influence on behavioural intentions (BI) to use Bitcoin.	Not supported
H8: Gender (GEN) will positively moderate the influence of social influence (SI) on behavioural intentions (BI) to use Bitcoin.	Not supported
H9: Age (AGE) will positively moderate the influence of social influence (SI) on behavioural intentions (BI) to use Bitcoin for younger people.	Not supported
H10: Facilitating conditions (FC) will have a positive influence on Bitcoin usage behaviour (USE).	**Supported**
H11: Age (AGE) will negatively moderate the influence of facilitating conditions (FC) on Bitcoin usage behaviour (USE).	Not supported
H12: Behavioural intention (BI) will have a positive influence on usage behaviour (USE).	**Supported**

Table 14: Hypotheses conclusions

Most of the hypotheses were formed according to Venkatesh et al's (2003) original hypotheses. However, these hypotheses were formed to assess the likelihood of success for the new technology introductions in 2003. In the last ten years information systems and technologies have rapidly developed and became a crucial

factor for not only various businesses to successfully grow, but IT also became an important tool in everyday life for any regular kid, teenager, student, worker or pensioner. Although the original UTAUT hypotheses concluded that relationships between constructs will be positively moderated by age and gender, this research confirms that nowadays various age generations do not have a moderating affect, and moreover, the results suggest that it is equally important for both- men and women. These are evident in the seven hypotheses that were related to age or gender, and which were not supported in this research.

Besides that, from the supported hypotheses it is clear that social influence is not an important factor upon the intention to accept Bitcoin. Currently it seems that to strengthen users' belief that they should use or have the Bitcoin is not reliant on their relatives, colleagues or media. This might be due to such a sensitive topic as money, or that there is no influence presently from the important others. However, as the Bitcoin algorithm was introduced only in 2008, it is a relatively new topic, and only in the most recent couple of years has it become increasingly popular, not only in media, but also between friends and relatives too. If the S-Curve from Diffusion of Innovations model (Rogers, 1962) would be used, the Bitcoin today would fall under early adopters' category (Bitcoin.org, Apr 2014). Therefore, the factor of social influence might become important factor in later years.

5.1. Findings and Implications

In line with Venkatesh et al (2003) suggestion, this research confirms that performance expectancy (PE) has a significant positive effect on behavioural intention (BI) to use Bitcoin. Besides that this research found that effort expectancy (EE) affects behavioural intention (BI) as well, but social influence (SI) is not influencing behaviour intention (BI) to use Bitcoin. Furthermore, analysis results show that gender (GE) and age (AGE) do not affect either of these relationships between performance expectancy, effort expectancy and social influence towards behavioural intention, which contradicts Venkatesh et al (2003) findings. These findings reveal the importance of recognizing performance and effort expectancies: i.e. in order to enhance intention to use Bitcoin it is needed to emphasize usefulness of Bitcoin, possible benefits like saving time and money, as well indicate easiness of use and learning. The analysis of non-users also reaffirms this, where negative

responses could be turned into users if they would have better understanding about this digital currency, its usefulness, benefits and gains.

Additionally facilitating conditions (FC) have a positive effect on actual Bitcoin usage (USE). However research suggests that this relationship is not being moderated by age (AGE). Adding to this behaviour intention (BI) affects actual usage as per UTAUT model. These findings point out the significant role of facilitating conditions and behavioural intention, which means that successful actual usage of Bitcoin rely on friendliness of the Bitcoin community, possibilities for easy learning, as well as compatibility with existing technologies and living conditions. This is also confirmed in the non-users analysis, where the negative responses could be turned into users if they would have existing Bitcoin market in their living country. Furthermore, behavioural intention to use Bitcoin plays an important role in actual Bitcoin's usage, as it implies that people who are planning to have, use or even invest in Bitcoin, will actually do it in the near future.

To conclude, it is clear, that from the proposed structure model for the acceptance of Bitcoin both control variables age and gender have no moderating effect on any of the relationships between the four core dimensions: performance expectancy, effort expectancy, social influence, facilitating conditions and behavioural intention to use Bitcoin or actual use of Bitcoin. This contradicts the originally suggested Venkatesh et al (2003) UTAUT model. The other contradiction is also regarding the relationship between social influence and behavioural intention to use Bitcoin. However, four important relationships between the main three out of four core dimensions and behavioural intention and use behaviour from the original UTAUT model have been confirmed in this research.

In order to relate this research back to the initial research question: "What are the factors that affect Bitcoin acceptance?" and to summarise the above presented implications, it is important to point out that successful acceptance of Bitcoin depends on:

- Users' knowledge about Bitcoin easy use of the system and benefits

- Easy learning possibilities, friendly Bitcoin communities

- Compatibility with existing technologies and living conditions

Adding to this, it is important to point out that policy makers and regulators from various jurisdictions are taking steps to provide individuals and businesses with rules on how to integrate this new technology with the formal, regulated financial system (Bitcoin.org). For example, the European Central Bank has described virtual currency schemes, where the current situation of virtual currencies is described and possible implication while using them are outlined (Ecb.Europa.eu). Another example would be the Financial Crimes Enforcement Network (FinCEN), a bureau in the United States Treasury Department, which recognised the opportunities of this developing innovation and instead of banning Bitcoin issued guidance, like what are virtual currencies, described involved parties, and specified activities like exchange, mining, software development and investment activity (Fincen.gov). Although this digital currency Bitcoin is not a fiat currency with legal tender status in any jurisdiction (Bitcoin.org), tax liability can be implied to a variety of income, sales, payroll, capital gains, or some other form that can arise with Bitcoin. Therefore it is important to point out, that governments and financial institutions could review and adopt previously created guidance by other jurisdictions in the near future.

5.2. Limitations and Recommendations

This thesis has limitations that can be addressed in the future extensions of this work. First of all, the design of the survey mainly uses the constructs of the UTAUT model and then revises and tests constructs so as to discuss the users' behavioural model towards the acceptance of digital currency Bitcoin. In the future research about the same subject of Bitcoin is suggested to adopt different technology acceptance theories and weighing models, in order to undertake the study of acceptance of the user's behavioural model towards Bitcoin further. Secondly, not all moderators from the collected theoretical data in the original UTAUT model were used, as experience and voluntariness were excluded from this research. Future research that aims to retest the UTAUT model are encouraged to use all moderators, as it can be possible to better predict the factors that affect Bitcoin's acceptance. Adding to this, because demographic statistics has a high response ratio for one of the possible answer (90% of respondents were males, 57% were between ages of 31 and 40 year olds, and 64% are from Europe), the results of

the study may be different in other groups. However it is clear, that the model from this research still has explanatory value towards the behavioural intention and actual usage of Bitcoin. And lastly, as this research mainly focuses on Bitcoin users that are consumers, it would be useful to conduct the research about Bitcoin users and companies, who adopted Bitcoin alongside regular money in their businesses. It would be beneficial to analyse and compare advantages and disadvantages of using regular and digital money, as well as another perspective from various industries about Bitcoin. Adding to this, Bitcoin has limited number of total coins. Currently there are 12.7 million (Blockchain.info, Apr 2014) Bitcoin in circulation, and Bitcoin.org predicts that in 2040 all 21 millions of coins will be released. It is suggested to conduct future research in the later years where there will be all or almost all Bitcoin released.

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Appendix A - UTAUT Construct Definitions

Construct	Definition
Attitude	Individual's positive or negative feeling about performing the target behavior (e.g., using a system).
Behavioral intention	The degree to which a person has formulated conscious plans to perform or not perform some specified future behavior.
Computer anxiety	The degree of an individual's apprehension, or even fear, when she/he is faced with the possibility of using computers.
Computer playfulness	The degree of cognitive spontaneity in microcomputer interactions.
Computer self-efficacy	The degree to which an individual beliefs that he or she has the ability to perform specific task/job using computer.
Effort expectancy	The degree of ease associated with the use of the system.
Facilitating conditions	The degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system.
Image	The degree to which use of an innovation is perceived to enhance one's status in one's social system.
Job relevance	Individual's perception regarding the degree to which the target system is relevant to his or her job.
Objective usability	A comparison of systems based on the actual level (rather than perceptions) of effort required to complete specific tasks.
Output quality	The degree to which an individual believes that the system performs his or her job tasks well.
Performance expectancy	The degree to which an individual believes that using the system will help him or her to attain gains in job performance.
Perceived ease of use	See the definition of effort expectancy.
Perceived enjoyment	The extent to which the activity of using a specific system is perceived to be enjoyable in it's own right, aside from any
Perceived usefulness	See the definition of performance expectancy.
Perception of external control	See the definition of facilitating conditions.
Result demonstrability	Tangibility of the results of using the innovation.
Social influence	The degree to which an individual perceives that important others believe he or she should use the new system.
Subjective norm	Person's perception that most people who are important to him think he should or should not perform the behavior in question.
Voluntariness	The extent to which potential adopters perceive the adoption decision to be non-mandatory.

Table 15: UTAUT Construct Definitions (adapted from Venkatesh et al, 2003)

Appendix B - Target Audience

Name	Number of followers/members*	Number of posts	Link
Bitcoins	767	3	https://www.facebook.com/groups/bitcoins/
Bitcoin PH	1.193	3	https://www.facebook.com/groups/bitcoinph/
Bitcoin News	1.701	3	https://www.facebook.com/groups/BitCoinNews/
Bitcoin Indonesia	9.439	3	https://www.facebook.com/groups/614293125283500/
Bitcoiniacs Pseudoanonymous	1.283	3	https://www.facebook.com/groups/bitcoiniacs/
Bitcoin	2.246	3	https://www.facebook.com/groups/minebitcoin/
Bitcoin	1.384	3	https://www.facebook.com/groups/314463725349150/
Bitcoin	1.441	3	https://www.facebook.com/groups/BitcoinDiscuss/
Bitcoin	7.171	3	https://www.facebook.com/groups/TheBitcoin/
Bitcoin	6.266	2	https://plus.google.com/communities/115591368588047305300
Bitcoin Peru	548	3	https://www.facebook.com/bitcoinperu?ref=stream
Bitcoins	10.157	3	https://www.facebook.com/Bitcoins15vXhHkfVcRrzzdFFQpJDLeUumyLDsid8P?ref=stream
Bitcoin Singapore	616	3	https://www.facebook.com/pages/Bitcoin-Singapore/431452580303555?ref=stream
Ganha Bitcoins Grátis	193	3	https://www.facebook.com/pages/Ganha-Bitcoins-Gr%C3%A1tis/648794121825592?ref=stream
Bitcoin Vietnam	1.302	3	https://www.facebook.com/BitcoinVietnam?ref=stream
Bitcoin Mendoza	437	3	https://www.facebook.com/BitcoinMendoza?ref=stream
Buy Bitcoin UK	11.150	3	https://www.facebook.com/BuyBitcoinUk?ref=stream
Coinsider This - a Bitcoin podcast for everyone.	2.607	3	https://www.facebook.com/coinsiderthis?ref=stream
Bitcoin Users	2.695	3	https://www.facebook.com/getbitcoins?ref=stream
Bitcoin	17.983	4	https://www.facebook.com/bitcoinchart?ref=stream
Bitcoin P2P Cryptocurrency	20.841	4	https://www.facebook.com/bitcoins?ref=stream
Bitcoin News-www.bitcoins.am	33.821	4	https://www.facebook.com/Bitcoinsnews?ref=stream
Bitcoin Users Org	258.343	4	https://www.facebook.com/bitcoinusers?ref=stream
Bitcoin Forum	247.326	2	https://bitcointalk.org/
Bitcoin Forum Chat	3.917	2	https://www.bitcoinforum.com/
Bitcoin Stack Exchange	11.064	1	http://bitcoin.stackexchange.com/

* data taken on 15th Feb 2014

Table 16: Target Audience

Appendix C - Online Survey

HELLO note in the beginning of the online survey

Hello dear participant! You are invited to participate in the Master's Thesis survey Understanding BITCOIN Adoption. Bitcoin is digital currency and a peer-to-peer payment system introduced as open source software by pseudonymous developer Satoshi Nakamoto. Completion of this survey will take approximately 5-10 minutes. Your participation in this study is completely voluntary. However, if you feel uncomfortable answering any questions, you can withdraw from the survey at any point, though it is very important to learn your opinions about Bitcoin, even if you don't have Bitcoin yet. Your survey responses will be strictly confidential and data from this research will be reported only in the aggregate level. Thank you very much for your time and support. Please start with the survey by clicking on the Begin button below.

Questions:

1   What is your gender? a

2   What is your age? b

3   What is your occupation? c

4   What is your location? d

5   I intend to have/use Bitcoin in the next 12 months. e

6   In my opinion, Bitcoin are/could be useful. f

7   I believe, I can/could save time by using Bitcoin. f

8   I believe, I can/could save money by using Bitcoin. f

9   In my opinion, I find/would find Bitcoin easy to use. f

10   Learning to use Bitcoin is/would be easy for me. f

11   In my opinion, using Bitcoin is/could be beneficial. f

12   My friends/family members value my choice of Bitcoin or suggest to use/have Bitcoin. f

13   Society/media suggests to use/have Bitcoin. f

14   I am/would be trendy while using Bitcoin. f

15 Bitcoin community guides/could guide me in the use of Bitcoin. f

16 Bitcoin community was/would be available to help with Bitcoin related problems. f

17 I have/could have the knowledge and ability necessary to use Bitcoin. f

18 Bitcoin technology is/could be compatible with the technology I use. f

19 In my opinion, the operating costs do/would not inhibit the use of Bitcoin. f

20 I use/would use, when possible Bitcoin instead of the traditional money. f

21 I use/would use, when possible Bitcoin as an investment. f

22 I want to be among the first ones to try out Bitcoin. f

23 I want to use Bitcoin instead of the traditional money. f

24 How long have you been using/having Bitcoin? g

25 On a monthly basis, how many times do you review Bitcoin related data? h

Answers:

a Single Choice: Male, Female

b Single Choice: 20 or under, 21-30, 31-40, 41-50, 51-60, Over 60

c Essay

d Single Choice: South America, North America, Europe, Asia, Africa, Australia

e Multiple choice: Yes, No, and Essay to question 'If you have selected No and you do not intend to have Bitcoin, please specify why?'

f Single Choice: seven-point Likert scale anchored with strongly disagree to strongly agree

g Single Choice: I do not have Bitcoin, Less than a year, From 1 to 2 years, From 2 to 3 years, More than 3 years

h Single Choice: Less than once a month, Once a month, A few times a month, A few times a week, About once a day, Several times a day

THANK YOU note after the online survey

Thank you for participating in this survey. This will help the Bitcoin community.

Appendix D - Cover Message for Link Distribution

Hello, I am Jurate and I am writing my Master's Thesis Understanding BITCOIN Adoption for Leiden University in the Netherlands. I invite you to participate in the survey for this thesis. Participation is completely voluntary and anonymous, the questions are simple about Bitcoin and this survey will take approx. 5-10 minutes to complete. It is very important to learn your opinions about Bitcoin, even if you don't have Bitcoin yet. Your answers will contribute to the research which will suggest reasons why Bitcoin digital currency is accepted in the market and what are the major factors influencing the success. Thank you very much for your time and support.

https://www.surveyplanet.com/survey/ca5ce19abd7c0357cde107b0295705e6