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# ELECTRONIC MONEY TRENDS

– User's perspective



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# ELECTRONIC MONEY TRENDS IN USER'S PERSPECTIVE

Electronic money shows the potential to increase the efficiency of existing payment systems. E-cash possesses a number of advantages that could make it more attractive in comparison to other means of payment. At the same time, e-money use can hide serious risks that could turn into significant financial losses for its users.

To understand the essence of e-money it is necessary to see the whole story of money genesis. People always aimed at simplifying financial relations that provide guarantees of stability, reduce transaction costs associated with the money exchange. With the development of virtual economy, we can observe a change of traditional commercial relations in favor of intangible sphere, which is associated with the development of scientific and technological progress and corresponding changes in economic relations in society.

Despite huge interest shown nowadays to electronic money, one rarely can find any information about what place e-money will possibly have in future, how customers see the whole process of e-money use, is it really the most popular money type for future economy or not. And in fact this is the key to determine the feasibility and effectiveness of e-money.

Initial objective of this research was to explore the origin of e-money and its modern and possible future position from general user's point of view. After that the empirical study was conducted in the form of questionnaire between business students in TUAS (Turku University of Applied Sciences) and social media public.

The findings of this research showed that most of the respondents are interested in future electronic money development. They are open to new possibilities and technological innovations, didn't encounter a lot of troubles associated with e-money use and look forward to becoming stable customers of e-currency systems.

## KEYWORDS:

Innovation Technology Electronic Money Money Market Money Systems Money Development Money Security Electronic Business Electronic Commerce

# CONTENT

<b>1 INTRODUCTION</b>	<b>8</b>
<b>2 METHODOLOGY</b>	<b>11</b>
2.1 Research Methodology	11
2.2 Quantitative and Qualitative Research Approach	15
2.3 Inductive and Deductive approach	16
2.4 Reliability, Validity and Generalizability	16
<b>3 BACKGROUND FOR RESEARCH</b>	<b>18</b>
3.1 Introduction	18
3.2 What is money	19
3.3 History of Electronic Money	21
3.4 Advantages and disadvantages of electronic money	24
3.5 Electronic money security	26
3.5.1 Passwords	26
3.5.2 Key files	27
3.5.3 Onscreen keyboard	27
3.5.4 Passphrase	28
3.5.5 Account block	28
3.6 Electronic money market in Europe	30
3.6.1 Electronic money market in Finland	32
3.7 Comparative analysis of the most frequently used in business PayPal, Bitcoin and WebMoney	33
3.7.1 PayPal	33
3.7.2 Bitcoin	34
3.7.3 WebMoney	36
3.8 Perspectives of electronic money development	38
3.9 Legal documents concerning e-money	40
3.10 Future of electronic money – Japan example	44
3.10.1 Problems and future of contact-less electronic money standards	45
<b>4 SURVEY ON ELECTRONIC MONEY</b>	<b>47</b>
4.1 Introduction and the aim of survey	47
4.2 Data Collection	47
4.3 Demographic and Descriptive statistics	48
4.4 Perception of electronic money	50

4.5 Specifics about e-money future	60
<b>5 CONCLUSIONS OF THE STUDY</b>	<b>65</b>
5.1 Suggestions for further research	66
<b>SOURCE MATERIAL</b>	<b>67</b>

## APPENDICES

Appendix 1. Questionnaire cover letter	
Appendix 2. Questionnaire form	
Appendix 3. Table Perceptions of electronic money	

## FIGURES

Figure 1 Types of research (Malhotra, 2004)	12
Figure 2 Research process (Paurav Shukla, 2008, p. 20)	13
Figure 3 Electronic money demand	31
Figure 4 PayPal total payment volume	32
Figure 5 Smart card options	44
Figure 6 Responses on questionnaire by location of ip-adress	50
Figure 7 Question 6.1	51
Figure 8 Question 6.2	51
Figure 9 Question 6.3	52
Figure 10 Question 6.4	53
Figure 11 Question 6.5	54
Figure 12 Question 6.6	55
Figure 13 Question 6.7	55
Figure 14 Question 6.8	56
Figure 15 Question 6.9	57
Figure 16 Question 6.10	57
Figure 17 Question 6.11	58
Figure 18 Question 6.12	58
Figure 19 Question 6.13	59
Figure 20 Question 6.14	60
Figure 21 Question 7	61
Figure 22 Question 8	62
Figure 23 Question 9	63
Figure 24 Question 10	64

## TABLES

Table 1 Research design comparison	14
Table 2 Table of security methods	29
Table 3 Demographic statistics	49

## **LIST OF ABBREVIATIONS (OR) SYMBOLS**

BTC	Bitcoin (abbreviation used for Bitcoin currency)
E-cash	Electronic cash
E-currency	Electronic currency
E-business	Electronic business
ELMIs	Electronic Money Institutions
E-money	Electronic money
NFC	Near Field Communication, set of smartphone standards for radio communication
OS	Operating system
PIN	Personal identification number
WAP	Wireless application protocol, used to access internet from mobile devices
WMB	WebMoney Belarusian ruble
WME	WebMoney Euro
WMG	WebMoney Gold
WMID	WebMoney Identifier
WMR	WebMoney Ruble
WMT	WebMoney Transfer

WMU	WebMoney Ukrainian hryvnia
WMY	WebMoney Uzbekistani sum
WMZ	WebMoney abbreviation for dollar

# 1 INTRODUCTION

The first chapter represents the research approach, motivation of the study; introduce the objective of the study. Subsequently it reports contribution of the study and structure of the thesis.

## 1.1 The Research Approach

This research is based on an overview of current electronic money market situation. It examines the impact of electronic money on average person and shows weakest parts of the whole e-money system. Research tests facts that influence future development of electronic money in Europe.

As the concept of electronic money is strongly connected with Internet and internet banking, the research may also draw conclusions about people's feelings on new technologies as a whole.

### 1.1.1 Motivation of the Study

The motivations for this research are:

1. We live in 21st century when everything is connected to the Internet. Fast electronic technologies are worthwhile to study; innovations as well as conclusions of the research might be used worldwide.
2. Banking and finance in theory and practice have been studied in many Universities all over the globe, but electronic money issues are relatively new for business sector.
3. Literature shows that trends in electronic money market are developing rapidly, so there is a need to understand further development right now in order to adapt on time.

## 1.2 Objective of the Study

The main aim of research is to broaden knowledge about electronic money trends and to understand factors affecting future development of electronic money market and adoption of e-money use in different countries. It is necessary to add some limitations for the research – all information given is going not from e-system's official source, but from independent researchers or general users of e-cash.

Specifically main aims are:

1. Explore the current status of e-money use for individual and business transactions, taking as an example European countries and Japan.
2. Analyze participant's thoughts about e-money and show on these basis opportunities for future possible e-money changes.

## 1.3 Practical and Theoretical Value of this Research

Factors influencing adoption of electronic money systems in everyday life are vital for business development, banks, managers and just people. In our modern world there are many barriers, forcing people against e-money style of life – such as lack of support from providers, breaches in e-money security, no motivation for users, etc. Some barriers seem often impenetrable, but the aim of the research is to show that it can't be truth. If country has adequate legal system concerning e-money, we can accurately say that there are no huge troubles on the way of e-money development. People are different, most of them are heavy users of IT technologies – they welcome new features, which can help them and make life easier.

The result of this study could be used to improve e-money sector, the work of e-money providers, and enhance the quality of e-money services for ordinary people. The research in this sector could be enriched and the interest for e-money could be raised. Might be that this research will open new possibilities



for creativity and innovation in e-money market. Also basic interest for IT technologies will be raised.

From the practical point of view, providers and other concerned managers in banking sector may need information about how their customer reacts on e-money and what he or she wants. This research is valuable for them, because it can widen their knowledge about customers and gain a competitive advantage.

#### 1.4 Structure of the Study

Research is mainly divided into two parts: theoretical and practical. Theoretical one starts with research methodology and types of research approaches, the rest is background for study: history of e-money, types of e-money, its security, market overview, comparative analysis of e-money systems, perspectives of e-money development, short review of modern e-money legislation and possible e-money future on the basis of Japan today situation.

Empirical part is compiled by questionnaire and conclusions on its basis.

## 2 METHODOLOGY

### 2.1 Research Methodology

Research and its development are always inextricably linked with the collection, processing and analysis of information. Often researcher cannot easily find required information – he must know how to look for it, how to interpret it and determine what is the result of this interpretation.

The problem of any research is not only to identify the sources of information, but also to develop own methods of its analysis.

When starting information gathering process, I tried to answer five vital questions:

1. What information is needed for the research?
2. Where and from what sources can I get necessary information?
3. In what form do I need information?
4. How much this information is valuable for the research?
5. What are the costs and time required to obtain information?

Research can be two types:

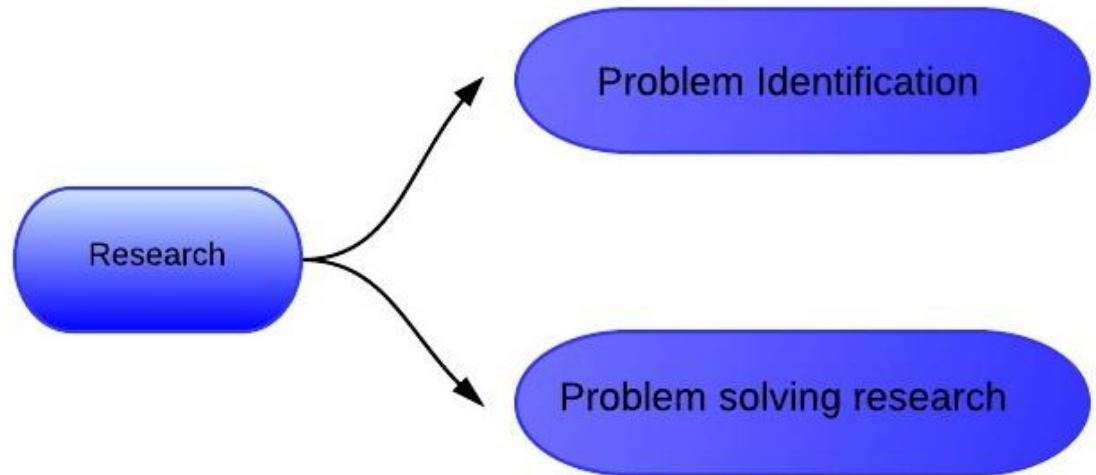


Figure 1 Types of research (Malhotra, 2004)

But research may not be so strict divided – academic research sometimes is first for problem identification, and then problem solving. In my research I tried first to find possible problems and then find the best future solution.

Usually research process goes this way:

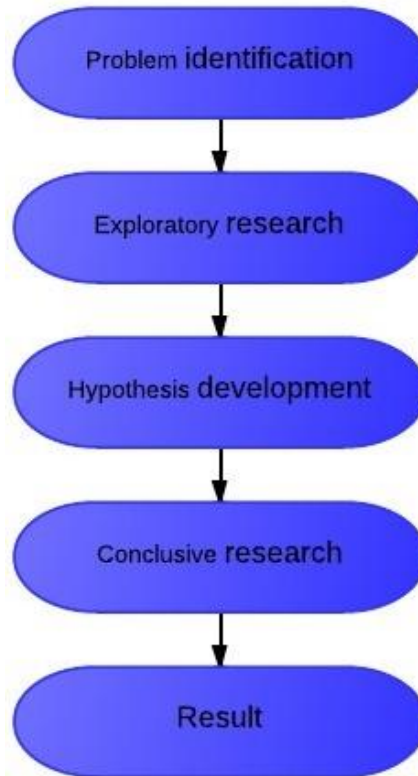


Figure 2 Research process (Paurav Shukla, 2008, p. 20)

However, there is no single, standard and accurate method to conduct research. Research cannot be started until we find the most correct approach, since both effective and ineffective tactical solutions exist. Therefore, there is no one and only best research method.

Depending on the problem all research projects can be divided into three groups: exploratory, descriptive and causal.(Paurav Shukla, 2008, p. 29)

Exploratory research – is a type of research design, which focuses on generating ideas and gathering information to help understand the problem. It is especially useful for splitting broad and vague formulation of the study into smaller and more specific questions. The main emphasis of the research is on the exploration of ideas and information to help understand the problem better. (Paurav Shukla, 2008, p. 32; Paul Hague, Market Research Guide, p. 46)

Inside this particular research I was gathering broad information about electronic money trends and finally was able to sort it in a form of specific topics, which more interest people about e-money now.

A descriptive research - is a type of research design, which focuses on identifying the frequency of a particular event, or the establishment of relationships between two variables. It is based on the hypothesis (for example - soft drinks producer suggested that the demand for a Diet Coke continues to fall, as in the previous five years the number of girls reduced; girls are the main target group for Diet Coke product). (Paurav Shukla, 2008, p.40)

Causal research – is a type of research design, which focuses on the development of a causal link. I do not use these types of research in my work.

	<b>Exploratory</b>	<b>Descriptive</b>	<b>Causal</b>
<b>Emphasis</b>	Discovery of ideas and insights	Frequency of occurrences	Determine cause and effect
<b>Features</b>	Flexible, unstructured	Hypotheses based, structured	Variable control
<b>Techniques used</b>	Focus groups, in-depth interview, mostly qualitative research	Surveys, observation, panel data, mostly quantitative research	Experimentation

Table 1 Research design comparison (Paurav Shukla, 2008, p.39)

## 2.2 Quantitative and Qualitative Research Approach

Marketing experience shows that a joint use of quantitative and qualitative techniques is the best way to obtain good result.

Qualitative research in opposition to quantitative is focused not on statistical measurements, but is based on understanding, explanation and interpretation of empirical data. Simply it does not answer to the question "how much?", but to the questions "Why?" and "How?"

Qualitative research plays an important role in the development of new products; these studies allow us to understand whether there is a market niche for the new product. The use of qualitative research in the development phase provides the ability to generate ideas about the concept of the brand and evaluation of marketing communication elements (name, logo, packaging, TV commercials, etc.) (Anol Bhattacharjee, 2012, Chapter 5)

Quantitative research - is the main tool for obtaining necessary information for planning and decision-making when necessary hypotheses about the behavior of consumers have already been formed. Based on the results of quantitative research the necessary production, profitability, price, product parameters and more can be found. The main merit of quantitative research is that it reduces the risk of making wrong decisions and choices. (Johnson, B., & Christensen, L. (2008), p. 34)

The main object of this study is to find facts about e-money which might influence the development of new money systems in the future, to see trends for change in e-money field. To achieve this, logical framework for research was developed. Collected data was carefully analyzed; common views were found and led to structured conclusion. Quantitative research method is use for this type of work.

### 2.3 Inductive and Deductive approach

Deduction - is the process of research from the general facts of phenomena to the knowledge of the particular problem. In deduction, general knowledge is the starting point of the argument. Main feature of deduction as a method of research is that the truth of its premises guarantees the truth of the conclusion. Therefore, the deduction has tremendous power of persuasion and is widely used not only to prove theorems in mathematics, but everywhere including marketing and economics.

Induction – in opposite, is the process of research from the private knowledge to the general knowledge. In other words - it is a method of research, aiming on generalization of observation and experiments results.

Positive moment of the deductive method lies in the fact that we can analyze large amounts of information without overloading; we can see the whole picture and be more objective. The main disadvantage is that we can't focus on concrete minor things. For this research deductive method was used – at the beginning we can see huge pile of information, which later transforms to a couple of simple questions.

### 2.4 Reliability, Validity and Generalizability

Quality of the research depends on the basic principles of any research - reliability, validity and generalizability. Researcher must consider all factors that influence the particular point of view before all conclusions are given. He or she must be very accurate in finding research tools that provide the necessary reliability of the results.

There is a concrete reliability classification that can be adopted for any research (Easterby-Smith, Thorpe and Lowe, 2002, p. 53):

1. Will there be the same results of the study in other research situation?
2. Will other people be able to find the same results?
3. Is there a sense in conclusions given?

This research was based only on official publications, with the help of science and news articles. All information was added only after careful checking process. Statistics given is provided mostly by Deutsche Bank or European Central Bank publications.

There was no influence of the researcher's point of view to the conclusions of the study, everything is just the logical analysis of questionnaire answers, so it can be assumed that any other person will have the same results conducting this research.

Conclusions of the study are based mostly on questionnaire, but these results correlate with theoretical information provided before, which can be easily seen from the paper.

The findings of this research are objective and the result of not only one person's thoughts, but on the basis of official statistical data.

Generalizability of the research means that it can be the same applicable to other external situations (Saunders, Lewis and Thornhill, 2009, p. 151). E-money trends are the same for at least the whole European market. Study itself was almost theoretical and general.



## 3 BACKGROUND FOR RESEARCH

### 3.1 Introduction

Relevance of this topic is very high, because money is an essential attribute of a market economy. Stability of economic development depends of the money flow, how easy and fast money transactions can be done. In the past couple of years we may notice the rapid evolution of money forms, which led to the emergence of new means of payment - cash electronic money.

However, the market of electronic money is just being formed. Therefore, a number of problems - especially the formation of electronic money market, audience and safety, regulatory issues and other issues are currently poorly understood.

The purpose of this paper is to study the issues and key trends of the market of electronic money in Europe from the user's perspective.

To achieve this goal I use these steps of analysis:

A. The study of theoretical aspects of electronic money market, clarifying the concept of "electronic money", revealing nature and content of electronic money through the study of its definition and functions, overview of electronic money situation in Europe, legal issues and possible future trends.

B. Overview of electronic money market in Europe and Japan.

C. Conduct questionnaire analysis in order to understand the most relevant facts and problems associated with e-money use.

### 3.2 What is money

Money is the most important attribute of a market economy.

The essence of money lies in the fact that they:

1. Have universal, direct exchangeability;
2. Represent the crystallization of exchange value;
3. Allow contradiction between use value and value.

(John Smithin, 2002, p. 22)

Thus money - is commodity that serves as a universal equivalent.

Money is manifested through its functions. Typically, there are the following four basic functions of money: a measure of value, a means of accumulation (hoarding), a medium of exchange, and means of payment. Often we can see a fifth function of money - a function of world money, which is expressed in the maintenance of international trade. (Friedman, Schwartz, 1970, 90)

Let us consider in detail the nature of electronic money.

The term "electronic money" is often incorrectly used to refer to a wide range of payment instruments that are based on innovative technical solutions in the implementation of retail payments.

In economic terms electronic money is monetary value provided by the issuer on demand, expressed in government or private monetary units stored in electronic form on an electronic device. According to the Directive 2009/110/EC of the European Parliament and of the Council "On regulation of the institutions - the issuers of electronic money" (hereinafter - EC Directive on electronic money, Publications of the European Central Bank and the Bank for International Settlements, 2009), the main elements that characterize the electronic money as a new means of payment are:

- (1) Electronic money is a monetary value;

- (2) Storage cost is based on an electronic device;
- (3) Cost of production is based on the prior introduction of funds;
- (4) Production is provided by third party.

Electronic money is a payment product that stores monetary value provided by the issuer on demand. The term "monetary value" in the context of the definition of electronic money storage means the purchasing power of money or an asset that can handle between economic agents. The main difference between monetary value and money is that the monetary value is the means of payment, which can either share or not share other forms of money. Unlike cash, which are universal, mandatory tender for acceptance, which is expressed in government computing units used to calculate the prices of goods and services, as well as contracts for national and international level, the monetary value is not required to accept tender and can be expressed in a particular currency. Unlike traditional money that can be produced either by the central bank (in the form of cash), or other banking institutions (in the form of deposit money), the monetary value (electronic money) may be issued by specialized non-bank credit institutions, providing for a special order to regulate their activities. (Jerry L. Jordan, 2006, "The basics of money" chapter)

Electronic money is one of the means of payment, which is stored on an electronic device. This definition emphasizes that payments must be made in electronic form. In this regard instead of the term "cash value" the term "electronic value" is often used. (EC Directive on electronic money, 2009)

Electronic money is a means of payment, emitted by pre-existing funds. The value entered in a cash payment is equivalent to the value of issued electronic money. Purchase of electronic money means buying cash value.

Electronic money is a means of payment which is accepted by third parties (institutions, enterprises and individuals) other than the issuer. This means that the holder of electronic money should be able to use them to purchase goods and services from a wide range of people. For example, the electronic value

which is released by the employer for his workers and can only be used to purchase meals in the dining room of the employer is not electronic money.

Electronic money is stored in a special device, usually on the hard drive of your PC or a microprocessor card, and that can be transmitted from one device to another using telecommunication lines and other electronic media. (Serge Lansky, 2000, p. 30)

In economic terms "electronic money" is a payment instrument, which has, depending on the implementation of the scheme, the properties of both traditional cash and traditional payment instruments (credit cards, checks, etc.)

Electronic money is divided into two types: based on the cards (card - based) and on the basis of networks (network - based). In turn, the first and the second group fall into the anonymous system, allowing carrying out operations without user identification. Non-anonymous system, require mandatory identification system participants. (Frank Hespeler, 2008, p.5)

Most famous card-based systems are Mondex, Proton, CLIP, and VISA Cash. E-money based systems are: WebMoney, Yandex (in Russia), Cash, Paypal, E / Gold, RUpay, e / port, Rapida. Most systems are not anonymous.

In my work I would like to focus especially on e-money systems, which do not require cards.

### 3.3 History of Electronic Money

The idea of electronic payments is not new - the first image of a prepaid card was developed by American scholar Edward Bellamy in 1880. He, like every great fiction-writer, was few centuries ahead of his generation. In his book, the main character who suffers from severe insomnia, made a time travel to the city of Boston in 2000. Here he finds extremely strange phenomenon: the citizens of this city have completely forgotten about the existence of dollars. They pay with

cards that are marked with nominal amounts in shops, hotels, auctions. (Edward Bellamy, 1889) Mr. Bellamy looked straight into the future.

Electronic or, in other words, digital cash means of payment, are electronically traded, turnover of which guarantees anonymity. Electronic documents contain the nominal value, an indication of the issuer's individual characteristics (serial number, etc.) and elements of protection against counterfeiting (the assurance of the issuer's digital signature). They are highly mobile, easy and convenient for use, and relatively well protected from a variety of foreign criminal offenses. Moreover, the full use of such means of payment was only possible with the invention of a special "security" means - electronic digital signature - props of an electronic document intended for the protection from counterfeiting. They can be obtained as a result of a cryptographic data transformation using a private key and digital signature allowing the identification of the owner of the signature key certificate, and to establish the absence of distortion of information in an electronic document. (Riel Miller, Wolfgang Michalski and Barrie Stevens, 2002, chapter 1)

History of the first electronic payment system we can read in a book "Electronic Banking Services" by Tedeev A.

In February 1995, the British Barclays Bank became the first major European bank, which started a business using the Internet. At a special bank website storefront was opened to sell wine, toys, as well as train tickets. Bank customers could browse directories and use their bank credit card numbers to pay for goods delivered to them by courier. The project has allowed Barclays Bank for the first time to go to full-fledged banking operations in the Internet. Buyers searched electronic catalogs and filled electronic order forms. (Tedeev, 2005, chapter 2)

While traditional bank computerization continued, new automation strategy arose. The first project was in the field of credit services. Corporations began to develop program of home banking, Microsoft had an idea of electronic payments and managing personal finance strategies, banks - partners Nations

Bank of America made software for personal finance management (Managing your Pug). The implementation of e-business types of economic activity lead to extensive use of multiple versions of electronic money.

Modern electronic money represents a sequence of numbers that substitute banknotes and coins. They can be used to purchase goods in real time using remote account management tools, such as a computer connected to the Internet, Mondex, phone, mobile phone, which supports the standard WAP, bank cards (card e-banking services or card banking). Experts predict that in the long term electronic money will partially displace bank notes – all traditional money forms. For example, Sweden was the first country to introduce banknotes – might be that in the nearest future they will be first to go cash free. (inquisitr.com, 2012)

As mentioned above, the first virtual bank carrying out banking activities exclusively on the Internet was created in 1994 within the U.S. network credit-card project Technological basis of that banking operations was a simple e-mail. In this system, electronic payment numbers and customers' credit card numbers were entered into a secure computer system and never went outside the network. Instead, they issued an identification number to pay for electronic purchases.

In 1993 networks of electronic money (network-based electronic money) began to be developed. (Tedeev, 2005, chapter 3)

The starting point was when cryptographer David Chaum organized the first system of electronic money called "Digicash" (<http://www.digicash.com>); it provided anonymity payments for the buyer and the security for sellers, as well as the possibility of micropayments.

However, it should be noted that this project was not widely used, like many other revolutionary ideas at that time, so David Chaum was forced to sell his patents on digital cash. On the one hand, after some time banks might become interested in this product. On the other hand, one can think of other

unsuccessful projects, based on digital cash, which went bankrupt. (NEXT magazine, 1999)

There is a trend for development of electronic money by non-bank organizations. Although according to many forecasts, there is a likelihood Internet money development under the patronage of banks in the near future. Such structures have many competitive advantages: the current customer base, vast financial resources and experience in financial activities. In the meantime, banks have already begun to be interested in this market. (Andreas Crede)

The Bank for International Settlements, with the support of world central banks, regularly analyzes the existence and development of electronic money, as well as relevant information technology and technical systems.

It should be noted that at the initial stage analytical results were strictly confidential. In May 2000 results were made public. (Committee on Payment and Settlement Systems, 2001)

This system proved to be so successful that its fundamental principles almost immediately became widespread throughout the world. By means of digital money it became faster to make financial transfer to any place of land, utility payments, telephone and television services, Internet services, loan payments and so on.

### 3.4 Advantages and disadvantages of electronic money

Electronic money and electronic money substitutes are useful and provide maximum flexibility in the implementation of small amount bulk payments.

For example, they might be used in transport, cinemas, clubs, and payment of various fines, taxes and court orders. It is particularly easy to make calculations on the Internet when buying traditional and electronic products (e.g. software licenses). (Riel Miller, Wolfgang Michalski and Barrie Stevens, 2002, p.51-52)

It should be noted that the process of e-cash payment is fast. And there are no such common problems as the traditional queue, the need to issue change. Electronic money is transferred from the payer to the recipient in seconds.

To draw an analogy, electronic money is very similar to traditional cash. Bank money transfers are, as a rule, always personified legal details of both parties are known or, in the case of individuals, ID numbers and addresses).

Electronic money and its substitutes have many significant advantages over cash but we can find some disadvantages as well.

Central banks in many countries are concerned about e-currency development. The main threat they see is the uncontrolled emission, as well as the risk of possible abuse. (Frank Hespeler, 2008, chapter 7)

Despite the fact that electronic cash potentially provides a lot of positive effects, such as convenience and privacy, less related fees, potential new business - community transfer of financial and economic activity in the Internet, there are many controversial issues concerning the introduction of electronic money.

The establishment of electronic currency raises a number of additional issues related to taxation and money laundering procedures. Also, state governments are concerned about the problem of confidentiality and possible citizen's personal data leakage. ( Krzysztof Woda, 2006)

Negative macroeconomic effects such as exchange rate volatility, the lack of real cash collateral might appear while using electronic money. There is a probability that number of virtual money at some point may exceed the amount of real money.

Also, problems with the use of electronic money may occur due to their liquidity, as well as a consequence of obligations imposed by the issuer (the same problems that occur when securities are used).(Phoebus Athanassiou and Natalia Mas-Guix, 2008)



### 3.5 Electronic money security

All kinds of money are a lure for cheaters since ancient times. Electronic money is no exception. True that they cannot be faked the usual way, but nevertheless frauds in the field of electronic currency need some special attention and special security methods. How electronic money is protected nowadays?

#### 3.5.1 Passwords

The concept of "password" is familiar to everybody. It involves input of character sequence, known only to a specific user. In different payment systems password may be called by different names: the control code, PIN-code, etc., but its essence remains the same. All electronic currency systems use this simple, but at the same time quite effective, way to protect client's account. In addition many electronic payment systems enhance security using not one, but several passwords that are entered by the user at various account performance stages. For example, in EasyPay payment system to access operating page client should use password as well as reusable or single-use control codes. They are stored on a special card and covered with a non-transparent paint that is erased by the user directly when he needs a code. Each code can be used only once, after it becomes invalid. The control code is entered when making any transaction and is used for extra protection in case, for example, the account holder went on account page, and then walked away from the computer without shutting it.

In WebMoney system wallet password is used in combination with the password for key file (file stored on user's computer).

Password, being fairly simple way to ensure the security of electronic money, is present in different forms in all electronic payment systems. This is not the most reliable way to ensure the safety of the electronic money account, that's why the password protection is always complemented by other measures – for example, it is common to use the combination of password and confirmation codes send to a different device (mobile phone).

### 3.5.2 Key files

Key file is a special file for electronic money program, which contains data for the authentication of information for authentication of users to access their web money account. (wiki.wmtransfer.com, 2013)

This type of security is applied in particular in the payment system WebMoney. When registering a new purse client will receive a file that contains the "keys" for the purse. Without this file the attacker, even if he knows the password, cannot open the wallet. Conversely, only a key file is not enough to open a purse – it is necessary need to know a password. Key file itself is protected by other password. In order to open the WebMoney purse three things are needed: wallet password, key file, the password of the key file. For reliability the key file must be stored on removable disk (e.g. memory stick), or an attacker who gains access to your computer, automatically gets access to the key file. In any case client needs to make a backup of the key file, because if he loses it he won't be able to open his wallet.

### 3.5.3 Onscreen keyboard

Rather unique measure of security is on-screen keyboard. Instead typing the verification code using computer keyboard, client can do it with the virtual keyboard shown on the screen, pressing corresponding numbers with the mouse. On the one hand it reduces the security in the sense that someone else can see the verification code, on the other - on-screen keyboard protects against keyloggers (programs - keyloggers). A keylogger is a program that records the keystrokes on a computer keyboard. (www.techterms.com, 2008) It should be noted that keyloggers are fought with the help of special programs, a description of which is beyond the scope of this work. However, the on-screen keyboard can be useful, for example, if client works with someone else's computer and is not sure if button presses are not recorded in the log file. Besides keyloggers there are legitimate programs installed by the user, which records all user actions (including mouse movement).

### 3.5.4 Passphrase

Every user of the system proposes a sentence, which will appear in the title of operating page - usually it is a well-known expression. The idea is that each user must have a unique passphrase. Using a passphrase allows him to fight against phishing - a kind of online fraud, which is the mass distribution of messages to users with a request to go to a specific page and enter password there. User sees the same pass phrase on operating page. If this phrase is different from that he entered, client is sure that he is on the fraud page, but not in the real system.

### 3.5.5 Account block

This method of electronic money protection is used if none of the available security measures can no longer ensure the safety of funds in the account (the user has learned that someone found or stole the password, he lost a card with security information, etc.). In this case by means of a call, text message or online system locks the user's account, making it impossible for any transaction to be made. This is a drastic measure and has a near-perfect reliability (if client blocks his account on time), and is used in almost all currently existing payment systems. (European Central Bank, 2003)

Summary table of security methods used in electronic money systems and with traditional bank cards:

<b>Method of security</b>	<b>WebMoney</b>	<b>PayPal</b>	<b>Bitcoin</b>	<b>Bank card</b>
Password	+	+	+	+
Additional password for transactions	+	-	-	+
Key file	+	-	-	-
Onscreen keyboard	-	-	+	-
Passphrase	-	-	-	-
Account block	+	+	+	+

Table 2 Table of security methods

It is worth noting that a lot of security does not mean better safety, because each of the discussed ways has different level of reliability. Furthermore, the most vulnerable point of almost any security system is the proverbial "human factor". The most important issue is the concept of social engineering – it is a method of unauthorized access to information or information storage system, without any technology use. The main goal of social engineers, like other hackers and crackers, is to gain access to protected systems – to steal information, passwords, credit card details, etc. The main difference from a simple hack is that in this case the object of attack is not a machine, but its operator. That is why all methods and techniques of social engineering are

based on the use of human weaknesses factor and are extremely damaging. (www.csoonline.com, 2012)

There are some rules, compliance with which will help to protect electronic money:

- Passwords are better be remembered by heart, if not than must be stored in a very safe place;
- Files responsible for the security of the account shouldn't be stored in open media, but it is always advisable to make a backup copy;
- When entering the password it is necessary to make sure that no one is watching;
- Using electronic account from another computer user must disable browser from saving history and passwords;
- Payment systems will never ask users to provide their password in any way, so if client gets a letter or phone call asking for his password, he is definitely dealing with scammers.

Especially with PayPal phishing is used widely. It is important to remember right PayPal web addresses and e-mail addresses, because scammers may use sites like PalPal.com or something similar.

### 3.6 Electronic money market in Europe

Demand on electronic money is rapidly growing all over the world. Electronic money became the second most popular means of payment on the internet

(according to the study of TNS research company; www.tns-global.ru). The most popular is still bank credit or debit card, third place - internet banking program.

TNS experts questioned 3, 5 thousand Internet users aged between 18 and 45 years, living in cities with a population of over 800,000 people.

During period from September 2011 to February 2012 at least one e-money payment was made by all respondents. ([unova.ru](http://unova.ru), 2012)

German official statistics shows correlating figures:

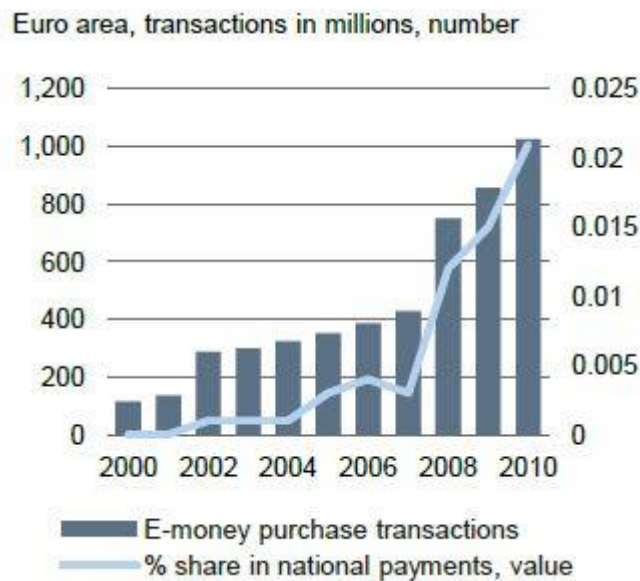


Figure 3 Electronic money demand

(Meta Zahres, 2012)

One of the most common e-money systems in Europe is PayPal. Others are Amazon Payments, Money bookers, Wirecard, Web Money. Pay Pal transactions are more widely used with US transactions – the fastest and the easiest way to pay for something on E-bay, for example.

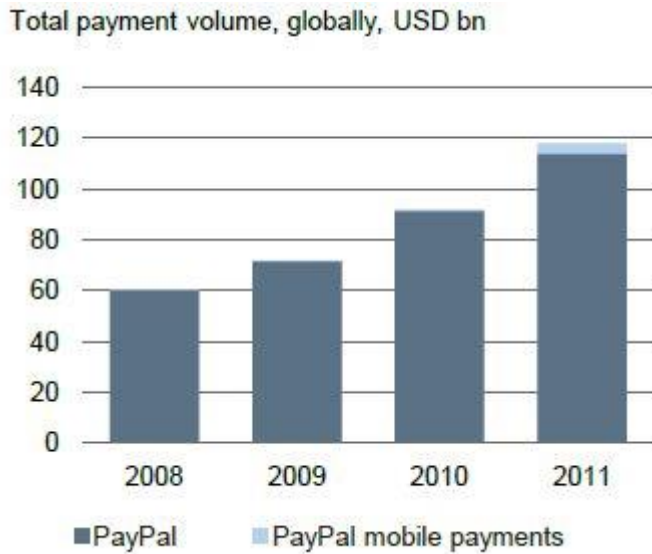


Figure 4 PayPal total payment volume

(Meta Zahres, 2012)

To my mind, growth of online money systems is directly linked to the growth of the total number of Internet users. Obviously this process will continue gradually, in parallel with the development of the Internet in regions, its penetration in smaller towns, with price cuts on Internet access.

Users of electronic money are socially active group, ready to adapt to the challenges and difficulties, actively involved in the Internet and use it in everyday life – looks like a portrait of average European citizen.

Important driver of electronic money market development is interaction with additional banking products (repayment of loans, issue of virtual cards, etc.). During past couple of years, sales of electronic tickets significantly increased.

### 3.6.1 Electronic money market in Finland

Card-based electronic money is very popular in Finland. The most important are Avant, Matkahuolto, CityCards, and UniCard. Web-based electronic money are not that important, but are getting popularity more and more – people use amazon, e-bay and they need to pay for it.

There was special Finnish e-money system Eunet e-cash, which started operations in March 1996, but was closed down in autumn 1998. (Committee on Payment and Settlement Systems, 2001, p.28)

The Bank of Finland statistics do not seem to show that e-money is replacing coins and notes to any large extent. It is very unlikely that cash will be totally replaced by e-money, at least in the nearest future, but Finland is more and more using internet-shops and businesses are going to the internet.

### 3.7 Comparative analysis of the most frequently used in business PayPal, Bitcoin and WebMoney

Each system has its own features and a set of services that have big possibility to meet the target audience. In following analysis I will speak about PayPal, Bitcoin and WebMoney.

#### 3.7.1 PayPal

The company PayPal was founded in 1998 by Peter Thiel and Max Levchin, located in San Jose, State of California. Initially the firm relied on the development of payments especially for handheld Palm Pilot owners via infrared technology, but later the emphasis shifted towards payments by electronic mail. Currently the company is a leader in electronic money niche around the world. According to the press release by PayPal from 10 March 2005, the system has more than 71 million accounts in 45 countries of the world. In 2002 PayPal was acquired by the largest Internet auction house eBay for \$ 1.5 billion. PayPal Inc. is licensed by regulatory authorities governing the activities of banks and financial institutions in 29 states. User accounts in the system are denominated in U.S. dollars; exchange rates within the system are not very beneficial to the user. Three types of accounts can be opened - Personal Accounts, Premier Accounts and Business Accounts. These accounts are insured by SafeWeb Insurance against unauthorized withdrawals in the amount of 100,000 U.S. dollars. Registration in the system is light enough to fill in the registration form. The account can be replenished by bank transfer or



payment with credit card. Work with PayPal doesn't require use of special software, because all operations are performed directly on the site. To ensure security user accounts are password protected, and the connection with transactions can be done only using the protocol SSL, 128-bit or higher. (Paypal.com, 2012)

What is special with PayPal particularly in business use?

- Entrepreneur can place on his Web-site a special tool to accept payments (Web Tools) - a button leads payer to the PayPal site. There he makes a payment (with the possible use of credit cards), and then automatically returns to the previous site. Commission for such type of payments is 1.9% of the payment sum.
- PayPal offers two types of auction services. First one is automatic distribution of payment requests (Automatic Payment Request). Second one is that auction winners can pay directly on the auction Web-site (Instant Purchase for Auctions).

### 3.7.2 Bitcoin

Bitcoin is electronic peer-currency system, established in 2009 by Satoshi Nakamoto; it still remains unknown if Satoshi is a single person or a group of entities.

This title Bitcoin also refers to the software open source and a peer network formed by this program. Money storage is software "purse" that is stored on user's computer. Money can be sent to any user on the network using the Bitcoin address.

Unlike other currencies Bitcoin is independent of any currency issuing Centre. Money movement data is stored in a distributed database. It is impossible to spend other user's money or spend same money twice, because of security cryptographic techniques.

The principle of peer network and the lack of administrative organization make it impossible for state to regulate and manipulate the system by changing the rate of money supply. Emission of bitcoins is algorithmically limited. Bitcoin involves anonymous ownership and transfer of funds.

The system does not require commission. Users may voluntarily include any amount for commission, giving more money for input transactions than the cost of output, which increases the processing priority of a transaction (system makes transaction faster, etc.)

Different Bitcoin versions have their own rules concerning fees. Let us consider the official client - Bitcoin-Qt. Current rules are:

- minimum commission - 0,0005 BTC;
- 0,01 BTC, if the output of the transaction is less than 0,01 BTC;
- 0,01 BTC by the kilobyte of transaction (if the total size of all pending transactions is less than 27 KB)

Despite the experimental status of the project it is rapidly gaining popularity. Bitcoins are accepted in exchange for network services and real goods. Many organizations accept donations in this currency. Traders exchange bitcoins for different currencies (USD, Euro, Japanese Yen, and others) on online trades.

Differences from other e-currencies are significant. Payments are made directly, without the mediation of any financial institutions. Cancellation of payment is not possible. Information about the payment is covered by the payer throughout the network and is accepted by all other members of the network, if appropriate. Wrong illegal payments are rejected. (Bitcoin.org, 2012)

What may happen with Bitcoin in the future?

Possible scenarios for failure include depreciation, loss of interest and the global conspiracy of governments to block the network. However, it is unlikely. Bitcoin project is a reaction to the attempt of the U.S. government to hinder the activities of companies such as E-Gold and Liberty Dollar. Principles of

decentralization and anonymity in the system do not leave space for future attacks which may lead to failure of the entire system.

Due to anonymity and lack of control, bitcoin is a perfect tool for shadow economy. This fact could be possibly used as a formal occasion for legal attack from governments. We can say that usual cash transactions are done anonymously and cash deals are out of control, but they are less useful for remote payments.

Since Bitcoin has no controlling Centre, theft unauthorized transactions might happen anytime. Bitcoin exchanges can be hacked – it occurred in practice before.

### 3.7.3 WebMoney

WebMoney is an international electronic payment system, at the beginning of 2012 having more than 16 million accounts. System is used mostly for private account, but due to its simplicity some businesses use it also.

Originally this system was targeted to Russian clients, but now has been spread worldwide.

The system has several types of accounts, which can be stored in appropriate "electronic purses":

- WMR - equivalent to RUB, R-purses
- WME - equivalent to EUR, E-purses;
- WMZ - equivalent to USD, Z-purse;
- WMU - equivalent to UAH, U-purses;
- WMY - equivalent to UZS, Y-purses;
- WMB - equivalent to BYR, B purses;

- WMG - equivalent to 1 gram of gold, G-purses;

WMC and WMD – are WMZ equivalent for credit transactions on the C-and D-purses.

Fund transfer is only possible between wallets of one kind; the exchange can be made using services not related directly to the WMT (Web-Money Transfer).

In order to work in the system you can use a client program WM Keeper Classic for OS Microsoft Windows, or website WM Keeper Light or WM Keeper Mini, allowing users to use the system on any OS. There are versions of Web Keeper Mobile for Symbian, Android, iPhone, and Windows Phone.

When logging in WMT, the user gets a random 12-digit WM-identifier (WMID) - for example WMID # 123456789012. User can create any number of WM-purses. Each purse is identified by one-letter code used in the form of signs and WM-12-digit number (e.g., Z123456789012 for WMZ-purse). (Wmtransfer.com, 2012)

There are several WebMoney advantages for business use. Special attention is paid to the possibility of complete system integration with online-store sites. Thanks to the system programming interface, any resource is able to conduct financial transactions in an automatic mode. For example, all payments on the website can be done by automated service interface Merchant WebMoney. Website integration with the service does not require special knowledge and skills, can be performed in several steps.

When making a payment or transfer to another WM-purse payer can use free services: «protection by the code," "protection by time", "Service Escrow». In the case of "protection by the code", the payee is not able to take advantage of cash received until he shows right, known only to the sender, digital code. If the digital code has not been entered by the payee within a specified time or has been entered incorrectly 8 times, the money is returned to the sender. "Protection time" allows the recipient to use payment received funds only for a certain period. "Service Escrow» secures deal with the security amount.

### 3.8 Perspectives of electronic money development

Currently in Europe and abroad there is an active discussion on the prospects of e-money. Based on article analysis of various economists and experts opinions three scenarios of e-money future can be formulated (according to Aaron Smith et al, 2012; Leo Van Hove, 2003):

1. Electronic money won't be popular and will completely disappear from circulation;
2. E-money will be widely used as a payment instrument and will be applied commonly in addition to traditional cash;
3. Electronic money will completely replace traditional cash.

Despite the quarter-century experience of e-money implementation, vast majority of retail trade and services use only traditional types of cash. The time of electronic money rapid development in the mid-90 is over. At that time several hundreds of pilot projects were developed, but many of them were not able to attract enough customers and had ceased to exist.

Financial failure of some electronic money issuers, lack of interest from commercial enterprises allowed individual scientists to make the assumption that electronic money are not able to compete with traditional cash in the future, and will operate only within some closed systems (the first scenario ).

Such a conclusion is premature. Information and financial technologies are constantly improving; many countries are developing or adapting new laws governing the process of production, circulation and redemption of electronic money, telecommunication infrastructure is growing, as well as the share of e-commerce. All of this should contribute to the new system of electronic money, which will be really reliable, efficient and low-risk, and therefore attractive to consumers.

In other words, e-money will be used frequently in the future, although not in the form in which they exist today.

Some people think that in the future e-money on the hardware basis may completely replace traditional cash and checks, while the electronic software-based money will replace bank cards (the third scenario). This seems to me the least likely. Traditional cash is the most easy to use payment instrument. It do not require any special software or technical devices, as in the case of electronic money, payment can be made by a simple transfer of a physical object (banknotes) to the payee.

The probability of this scenario is even less if electronic money didn't acquire the status of legal tender in the state. This would mean that any payee may refuse to accept electronic money in payment for his goods and services. In other words, the owner of e-money in theory can be left without means of subsistence.

In addition, traditional cash issued by the central bank has zero credit risk, while the electronic money, as the obligation of private credit institutions, has a much higher degree of credit risk. Therefore traditional cash is initially will have a significant competitive advantage over electronic money.

Second scenario appears to be the best and most probable version of the future. In this case electronic money competes with other payment instruments for the right to be used as a means of payment for goods and services.

The greatest decrease in banknotes and coins share is observed in the following countries - Germany, Belgium, the Netherlands and Singapore (European Central Bank Statistics, 2012). These countries are currently world leaders in the development and use of electronic money.

Predictability horizon of the industry does not exceed more than five years. Indeed eight / ten years ago enthusiasts developed a progressive system PayPal for payments between PDA via infrared, system Digicash was leading

online solution, providing absolute privacy for users – what is going to be next step of evolution?

The main reasons explaining slow development and use of electronic money might be wide range of troubles: limited purchasing power of population (because of economic crisis), lack of a well-functioning domestic banking system, weaknesses in the legal framework, adequate guarantees on electronic money are not provided, or there might be lack of clear government policy regarding the development of electronic money.

In order to expand the use of electronic money and regulations for its implementation some measures must be provided. First there must be a clear definition of "electronic money" in state law, the list of possible transactions with them and participants of electronic money system. It is necessary to prohibit participation of offshore financial institutions in e-money system.

Banks -participants of electronic money system should have adequate technical, organizational and procedural safeguards to prevent, deter and detect the risks of the system failure

All countries must have common standards of electronic money conversion from one type to another.

The implementation of the proposed measures, in conjunction with the overall economic growth, the rise of living standards, the development of the payment infrastructure, will create favorable conditions for the development and use of electronic money in future. The growing use of electronic money should reduce the share of banknotes and coins in the narrow money supply and a decrease in the share of bank transfers.

### 3.9 Legal documents concerning e-money

Main e-money law in Europe is The E-money Directives (on the taking-up, pursuit and prudential supervision of the business of electronic money

institutions) and 2009/110/EC (relating to the taking-up and pursuit of the business of credit institutions).

The most important aspects of such European legal framework are:

- in the EU issuers of electronic money (Electronic Money Institutions (ELMIs)) must obtain a license, and if it is given, they become under control of the authorized regulatory authority, to which they must regularly report;
- issuers of electronic money must comply with the requirements contributing to their reliable and prudent operations;
- issuers of electronic money in the EU are limited in investing funds received from users. Companies must have investments in highly liquid assets with low risk in the amount of not less than they released into circulation;
- electronic money / payment instruments made solely by issuers are not subject to regulation.

EU issuers of electronic money must have an initial capital in the amount of more than EUR 1 million. In addition they must provide bonds with a guarantee or a similar security.

Directive 2009/110/EC allows national regulators not to apply some or all of the requirements for companies that issue electronic money in a limited scale.

In the EU e-money issuer's activities should be limited to the emission of electronic money. One of the basic principles of Directive 2009/110/EC is the mutual recognition of electronic money issuer's licensing and prudential supervision in different countries - EU member states.

Developers of Directive 2009/110/EC aimed to:

- create legal certainty to support newcomers and fair competition and, thus, contribute to the development of e-commerce in Europe;
- reduce barriers to technological innovation and help e-money widening its potential;



- create the same "field" for all issuers of electronic money and provide users with a wide choice of systems;
- ensure the stability and reliability of the issuer, and therefore, to protect the interests of users;
- facilitate access for ELMIs from one Member State to another, and thus to facilitate the free movement of capital and the development of cross-border services. (EC Directive on electronic money, 2009)

The European Commission, guided by art. 11 of Directive 2009/110/EC on electronic money carried out a fundamental study on how the Directive has influenced the development of the European market of electronic money. The main source of information was statistical data and an extensive program of survey that covered 75 European organizations and national institutions from all 25 states - members of the European Union, and more than 40 companies - representatives of electronic money industry. Objective and independent information about the electronic money market in Europe was collected, as well as about the number of licensed issuers.

Despite the diversity of opinions, participants and market regulators recognized that vast amount of Directive's 2009/110/EC objectives were achieved.

One of the benefits of the Directive 2009/110/EC is its technological neutrality - Directive does not cover issues on electronic devices, and actually cares only about electronic money itself and its issuers. That's why it is possible to use its standards for the legal regulation of future technological developments.

It is recognized that the Directive 2009/110/EC has succeeded in ensuring the stability and reliability of the companies emitting electronic money. There was no single case of bankruptcy of the issuer, fraud or damage to electronic money users. It seems clear that there is no need to establish more rigorous legal regime. Certain legal rules, such as requirements for equity issuers, investment restrictions, and some national legislation on issuer's activities, do not meet the risks of electronic money industry.

Directive 2009/110/EC established the rule of ELMIs license recognition across the European Union (single passport regime). It was welcomed as an attempt to facilitate cross-border activities of companies and establish a framework for the integration of the market in the future. Problem is that due to market conditions, not because of legal obstacles, only couple of companies used single passport rule.

In accordance with Art. 10 of Directive 2009/110/EC changes were made to the national legislations of EU member states. Different approaches to the implementation of the Directive were made in three directions:

- make it possible for individual issuers do not use the Directive in some occasions;
- interpret the limits of the Directive application;
- develop tailored set of legal rules concerning management, performing and accounting procedures, internal controls, anti-money laundering regulations, etc. (EC Directive on electronic money, 2009)

Approach to the status of ELMIs in the states - members of the European Union is the same. In all cases these companies are classified as a category of credit institutions. However, national legislation governing the activities of traditional lending institutions in practice is applied differently to ELMIs. At the same time, the UK has developed special rules for financial and non-financial risks inherent ELMIs. Obviously the more tailored approach has a positive impact on the market. (Phoebus Athanassiou and Natalia Mas-Guix, 2008)

There are issues that are not directly related to the Directive 2009/110/EC, but have potential impact on its application. The most important are strict requirements to prevent legalization of crime proceeds and financing of terrorism, which is likely to affect the development of the market. This also applies to excessive restrictions on anonymous accounts.

### 3.10 Future of electronic money – Japan example

Electronic money in Europe is developing slowly, but still many people don't know what it is and how it must be used. Japan is a completely different story.

Small coins are rarely used in Japan. In 2011 1 yen coins were not produced by central bank at all. (Shohei Makiuchi, 2012)

One yen and 5 yen coins were made only for gift sets before. Usage of 10 and 50 yen coins was also declined. Experts believe that this is due to the increasing popularity of electronic money.

The annual volume of electronic money in Japan has increased by more than 30% (2011).

Osaifu keitai is the name of the service for cell phones that works like "mobile wallet". Smart card is inserted into a phone, and allows user to add a wide variety of phone applications, including electronic money program and even a credit card. To do this, client just needs to download the necessary software. Strength of this system is that the technology is intended for a single smart card Felica from Sony.



Figure 5 Smart card options

(Sony.net, 2012)

NTT DoCoMo, the leading provider of mobile phones in Japan, provides all customers with an email application to a credit card DCMX Mini with a credit limit of 10,000 yen (\$ 94). If necessary it is possible to increase the credit limit and use your phone as a regular credit card. To pay in a store user should

place the phone near special reader for mobile devices and monetary transactions will be made.

Electronic money has also become very popular in Japan due Osaifu keitai. In Japan, the most spread system of electronic money is the one from the company Edy BitWallet. This kind of money is taken in more than 71,000 supermarkets, book stores, coffee chains and vending machines. Currently the Japanese market has several million cards and cell phones working with Edy. On an average day about a million transactions through electronic money Edy are made. (Dr. Taiji Inui et al,2011)

As we can see, it is popular to use contact-less electronic money system in Japan. The main technology related to this type of money is NFC – type of communication technology for wireless short range, which enables data exchange between devices at about 4 inch distance ( 10 centimeters)(NFC-forum, 2012). In 2006-2007 technology was tested in Oulu and by Elisa Company in Finland (Innovations Report, 2006).

### 3.10.1 Problems and future of contact-less electronic money standards

On the conference EuSecWest Security, held on 19-20 September 2012, company MWR Labs represented exploit 0day that showed the vulnerability of NFC technology in mobile devices. “Zero-day exploit” is a computer program code snippet or a sequence of commands that exploit vulnerabilities in software and used for an attack on the computer system. Security specialists managed to pass through the NFC-connection malicious file and get full control of the receiver. Thus privacy and money of the "victim" were under threat. To prevent seizure control it is necessary to introduce modifications for NFC devices to limit the activity data received by the NFC (MWR Labs info, 2012).

But technological gaps and possible threats are not the biggest problem of new technology adaptation. Nowadays almost every new device has integrated NFC-module. However, as it is often the case, people are not capable to keep up with new technological progress.

There are two big troubles on the way of any new development:

1. People who could popularize the technology, but do not see its benefits or its implementation costs money and inadequate returns in future;
2. People don't want to know about new technologies and are not willing to use them.

In Japan people are aware and use NFC for electronic money, because they have special net of banks and stores, which work in cooperation with each other and provide information for citizens. Nokia started developing NFC phones 10 years ago, but we still even do not know where we can use them.

## 4 SURVEY ON ELECTRONIC MONEY

### 4.1 Introduction and the aim of survey

After extended literature review questionnaire was developed. The questionnaire was translated also to Russian language to have larger amount of participants.

The final questionnaire consists of two sections. The first section gathers general information about respondent like gender, age, education, country of origin, income. The second section is about perception of respondent about electronic money. The five point scale is used for statements of the second section ranging from "1" for strongly disagree, "2" and "3" for no opinion, "4" agree, "5" for strongly agree.

The aim of the survey was to understand how people see electronic money today, in what they see innovation and technological developments. The broader aim was to show electronic money developers their weak points, why development of electronic money is slow and where they should improve. It is interesting that my questionnaire is for people of all kinds, from different cultures and countries, with different experiences. Detailed analysis of technologies and developments is beyond the scope of this study. In questionnaire I also don't compare concrete e-money systems, it is a general overview.

### 4.2 Data Collection

Data collection method is used in this study in form of internet questionnaire.

First we need to identify the target audience for data collection. Usually with student Thesis work University e-mail distribution is used, as well as social media services. Sample was taken from people with internet user background randomly, but with a certain extent – they must speak English or Russian, to be able to understand pole questions properly.

Questionnaire was sent to 165 people within Turku University of Applied Sciences and to 223 people from social media sites – Facebook.com and Vk.com. 112 answers were collected, it makes total response rate of 28, 9 %. As we can see response rate is quite high; normal response rate for general public is around 20% (practicalsurveys.com, 2012).

#### 4.3 Demographic and Descriptive statistics

Variable	Classification of variables	Frequency	Percentage
Gender	Female	52	46.8%
	Male	59	53.2%
Age	Less than 20	15	13.5%
	20-30	75	67.6%
	30-40	16	14.4%
	40-50	4	3.6%
	Older than 50	1	0.9%
Education	High school	23	20.7%
	College	20	18.0%
	Bachelor	45	40.5%
	Master or more	23	20.7%
Income	Less than 1000 per month	66	59.5%
	Between 1000-2000 per month	33	29.7%
	Between 2000-4000 per month	9	8.1%
	More than 4000 euro per month	3	2.7%

Country of origin	Russia	47	42.3%
	Finland	40	36.0%
	Germany	8	7.2%
	France	4	3.6%
	Spain	3	2.7%
	Italy	1	0.9%
	Other	8	7.2%

Table 3 Demographic statistics

The results shows that respondents are both genders almost equally, most of them are male (53.2%), age between 20-30, with Bachelor level of education, income less than 1000 for month and from Russia. However, it is usual for a Russian citizen to have income less than 1000, as well as for Finnish students, living on state money. Other "half" of respondents are from Finland – which is logical, because questionnaire was spread around Turku University of Applied Sciences students.





Figure 6 Responses on questionnaire by location of ip-adress

Three respondent were from Vietnam, one from Nigeria, one from Brazil and one from Estonia.

#### 4.4 Perception of electronic money

Next question was about different spheres of e-money use. Respondents chose the most preferable answer – level of agreement.

The question was: “Please select the appropriate responses that best describe your perceptions of electronic money (from 1 to 5; 1- I strongly disagree, 5- strongly agree)”.

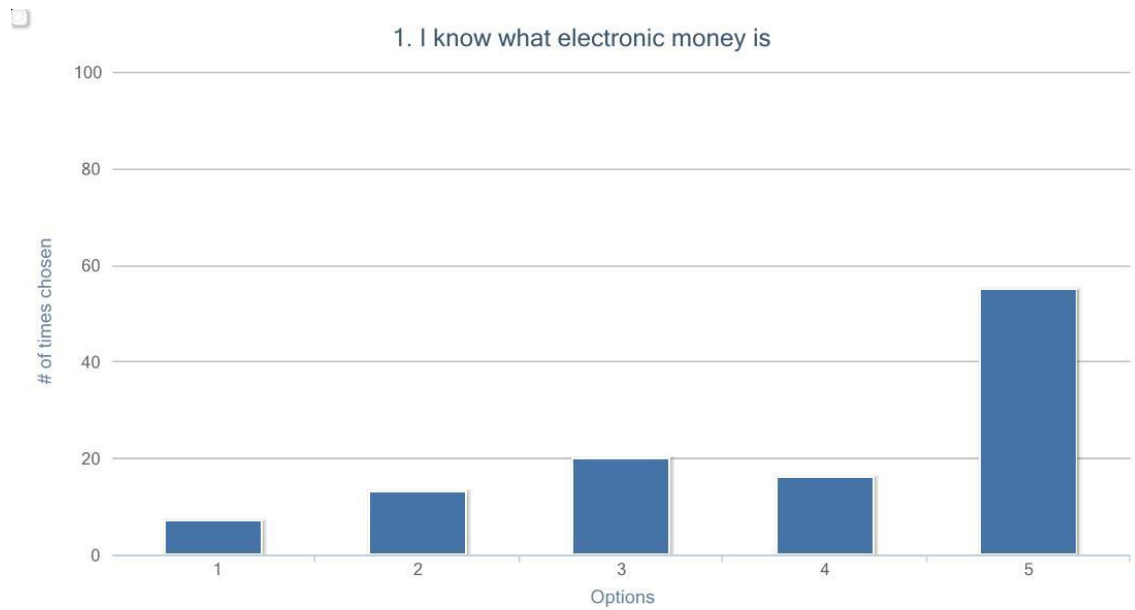


Figure 7 Question 6.1

Only 7 (6.31%) respondents didn't know what electronic money is, 13 (11.71%) and 20 (18.02%) were not completely sure, but 16 (14.41%) and 55 (49.55%) were familiar with the term. More than a half of respondents had knowledge at least what is electronic money.

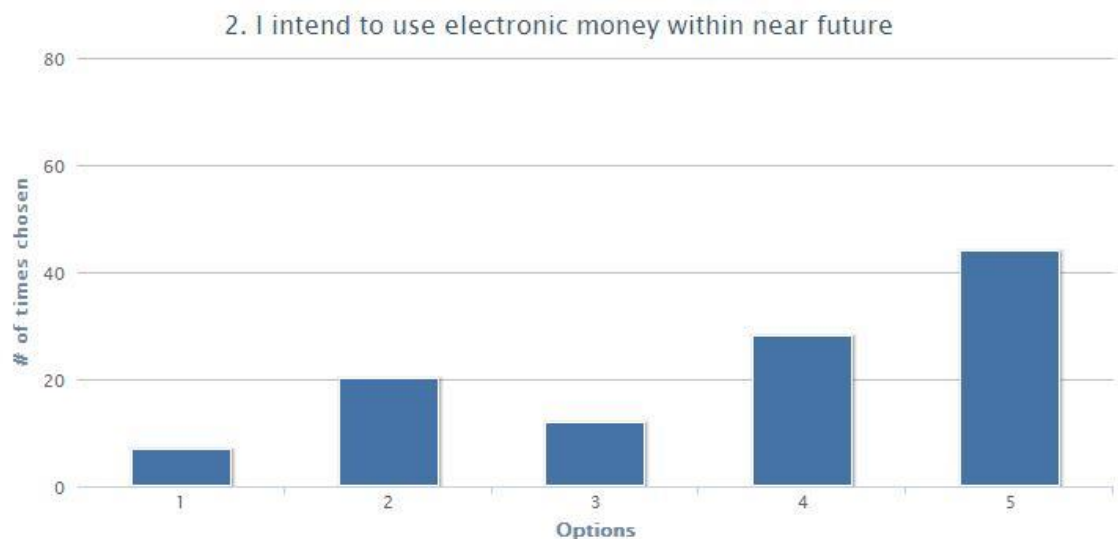


Figure 8 Question 6.2

7 (6.31%) respondents were not thinking about using e-money in the future, 20 (18.02%) and 12 (10.81%) doubted the probability of e-money use, 28 (25.23%) and 44 (39.64%) respondents were sure that they will use e-money in the future. More than a half of respondents will put electronic cash to use.

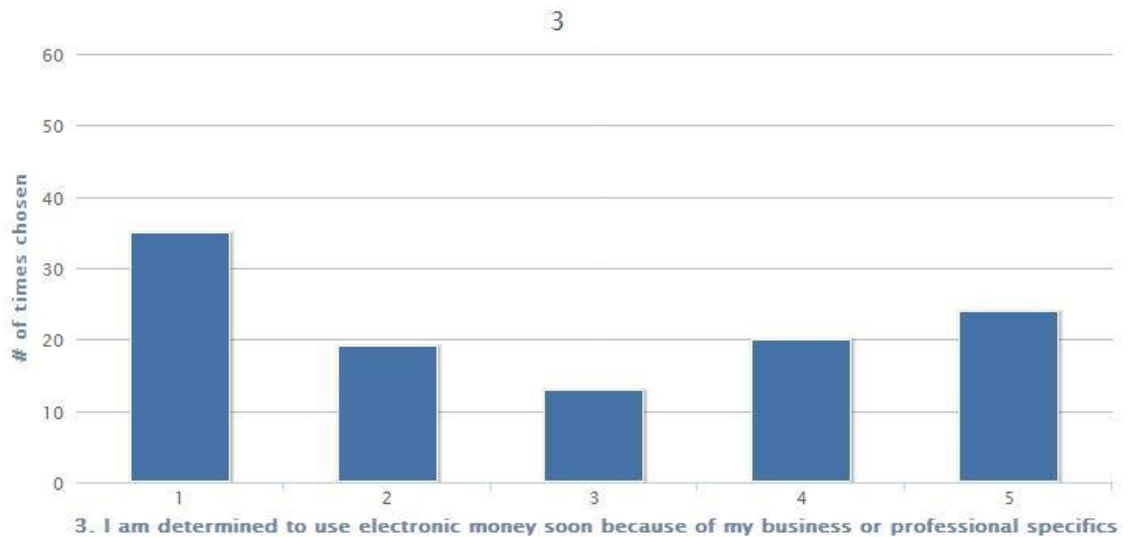


Figure 9 Question 6.3

Still 35 (31.53%) respondents were not determined to use e-money because of their business or professional specifics. 19 (17.12%) and 13 (11.71%) respondents were thinking that they might be in a position to use e-money for business, but not soon. 20 (18.02%) and 24 (21.62%) had strong assurance that they will use e-money because of their job position or other business condition. More than half of the respondents won't need e-money for official business needs.

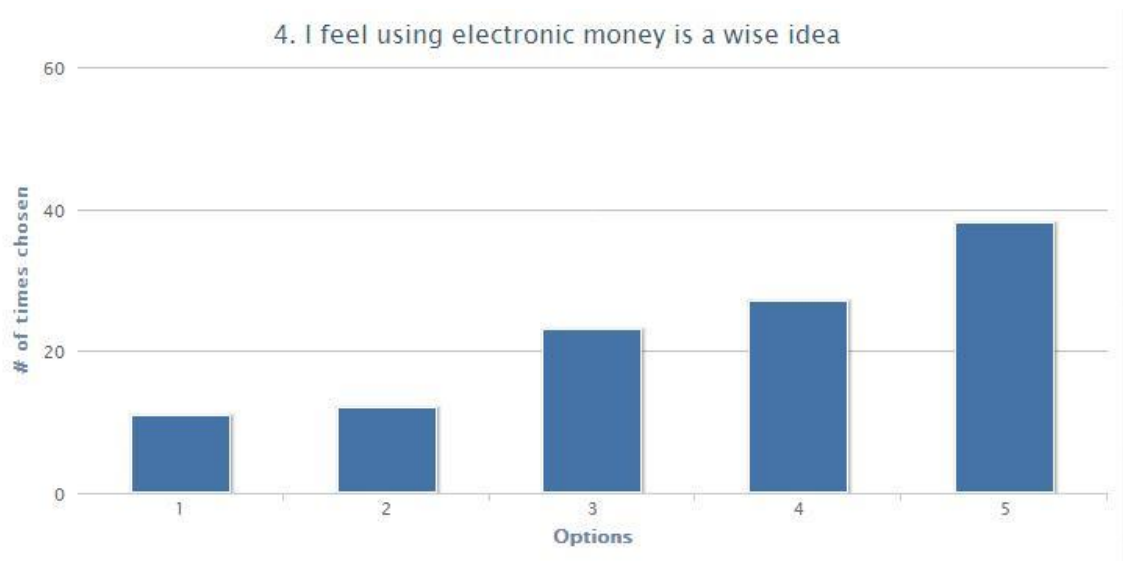


Figure 10 Question 6.4

11 (9.91%) respondents didn't think that using e-money is a wise idea. 12 (10.81%) and 23 (20.72%) were not sure about is it wise or not. 27 (24.32%) and 38 (34.23%) respondents were confident that electronic money is a good concept. More than a half of respondents truly liked the idea of electronic cash.

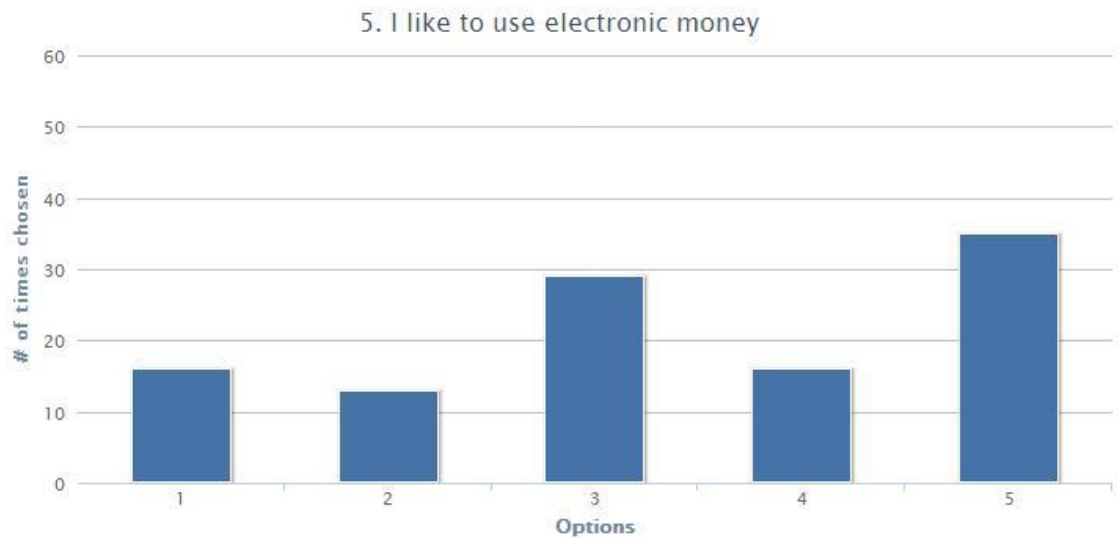


Figure 11 Question 6.5

This question appeared to be not that simple – only 109 respondents answered. 16 (14.68%) of them didn't like to use e-money at all, 13 (11.93%) and 29 (26.61%) were indifferent about that, 16 (14.68%) and 35 (32.11%) liked to use electronic cash. To like or not to like – answers were divided equally between variants.

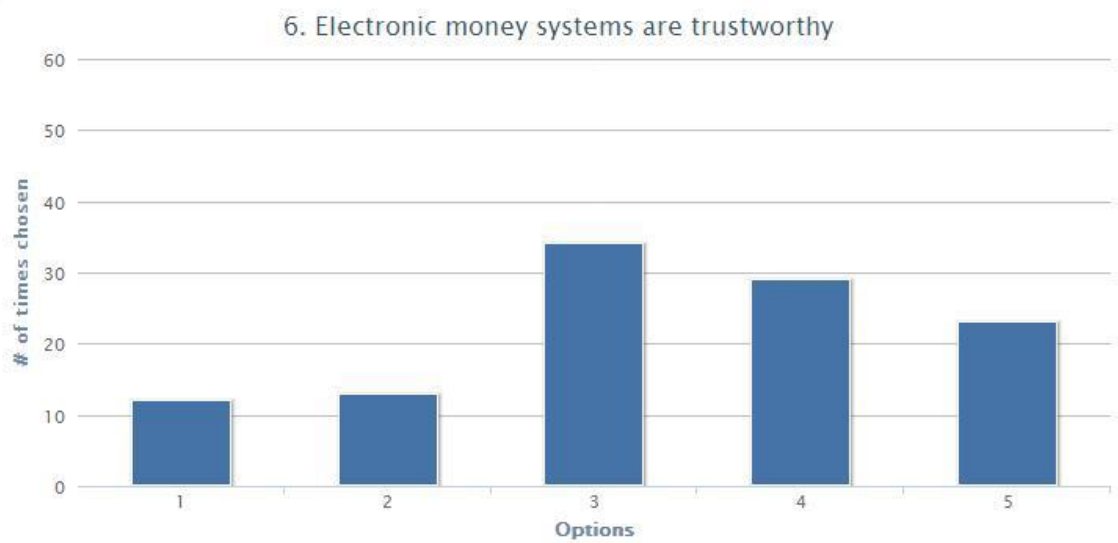


Figure 12 Question 6.6

As we can see from the graph, most of the respondents were not completely sure are e-money systems trustworthy or not. Maybe because they never had troubles with internet scam or didn't use e-money a lot. 12 (10.81%) didn't trust their security to e-money systems, 13 (11.71%) and 34 (30.63%) didn't have an opinion about that, 29 (26.13%) and 23 (20.72%) thought that e-money systems are reliable.

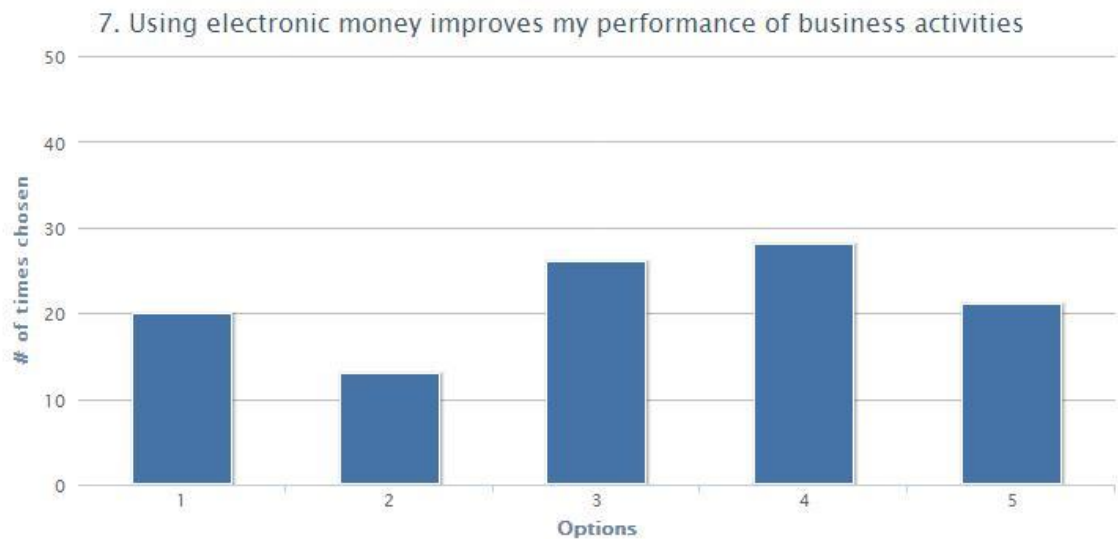


Figure 13 Question 6.7

Only 108 respondents answered on this question – might be that they don't use e-money at all. 20 (18.52%) thought that e-money doesn't improve the

performance of their business activities, 13 (12.04%) and 26 (24.07%) had the opinion that e-money is not the best tool for business performance development, 28 (25.93%) and 21 (19.44%) were sure that e-money will definitely enrich their business activities. Most of the respondents were close to the thought that e-money is good for their business.

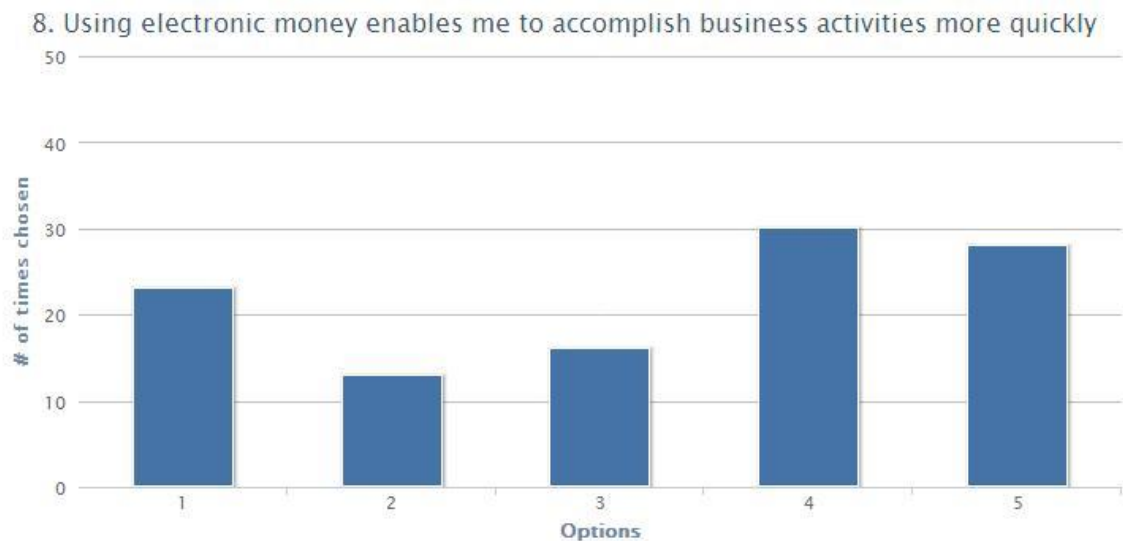


Figure 14 Question 6.8

23 (20.91%) respondents didn't recognize any difference in speed when using e-money in business or using traditional money systems, 13 (11.82%) and 16 (14.55%) didn't think that business activities went a lot more quickly with e-money than usual, but most of the respondents (30 (27.27%) and 28 (25.45%)) noticed that their business activities were accomplished faster with e-money.

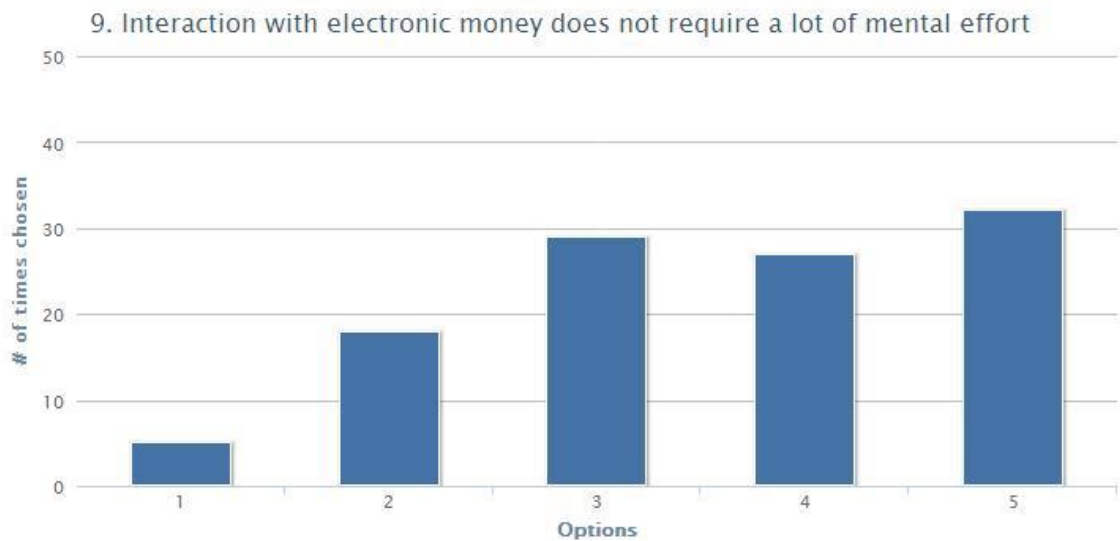


Figure 15 Question 6.9

Only 5 (4.50%) needed a lot of mental effort when dealing with e-money, 18 (16.22%) and 29 (26.13%) had slight problems with e-money interaction. Most of the respondents - 27 (24.32%) and 32 (28.83%) decided that any e-money activities can be done easily.

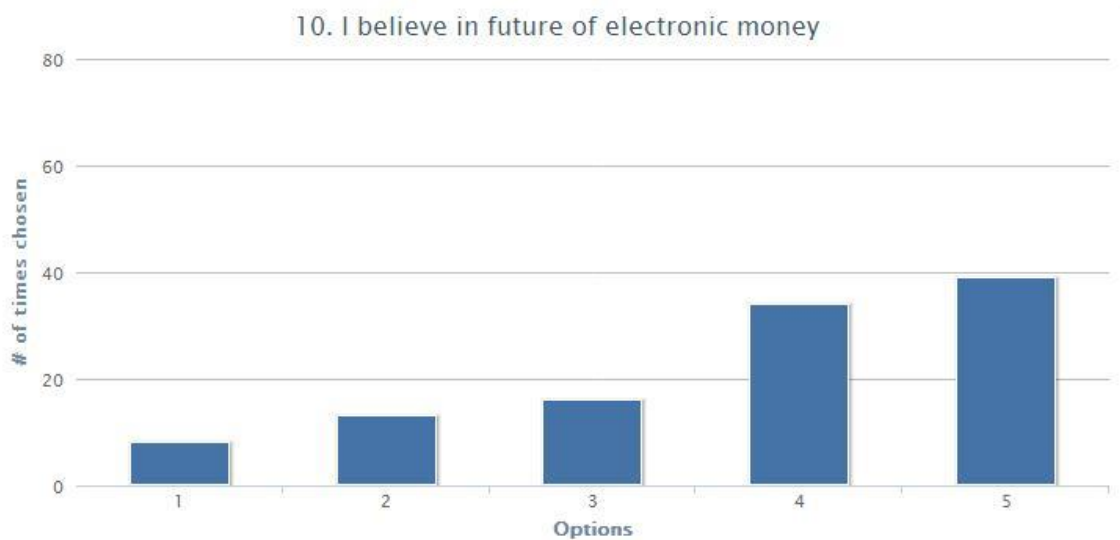


Figure 16 Question 6.10

No future for e-money saw only 8 (7.27%) respondents. 13 (11.82%) and 16 (14.55%) questioned the possibility of e-money future. Major part of the respondents (34 (30.91%) and 39 (35.45%)) believe that e-money future exists.



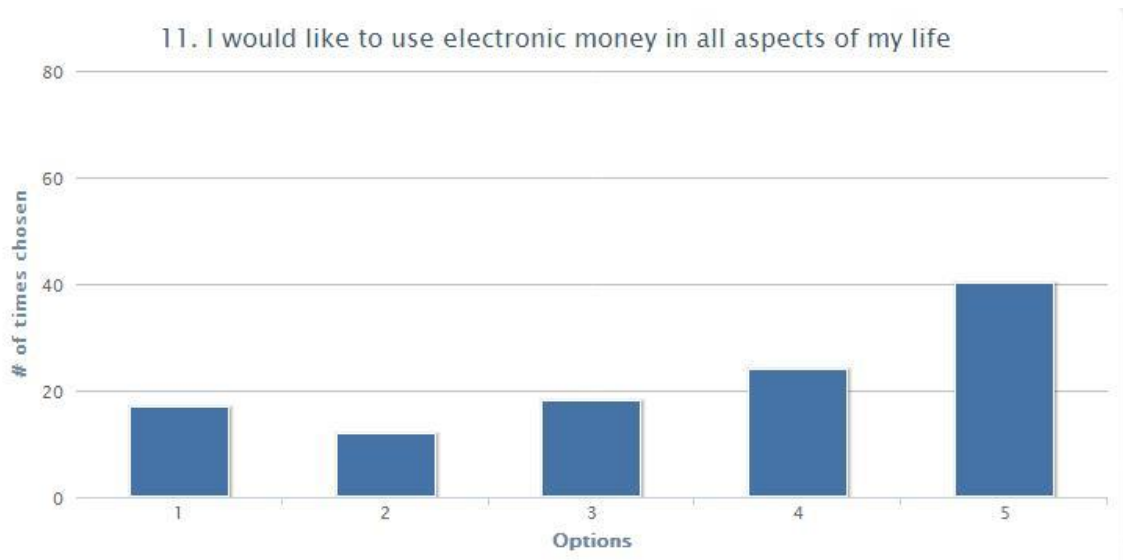


Figure 17 Question 6.11

Most of the respondents - 40 (36.04%) and 24 (21.62%), will certainly use e-money in all aspects of their lives. 12 (10.81%) and 18 (16.22%) were not that sure that there will be a need to use electronic money for private use or other matters. 17 (15.32%) respondents will never use e-money in all spheres of their needs.

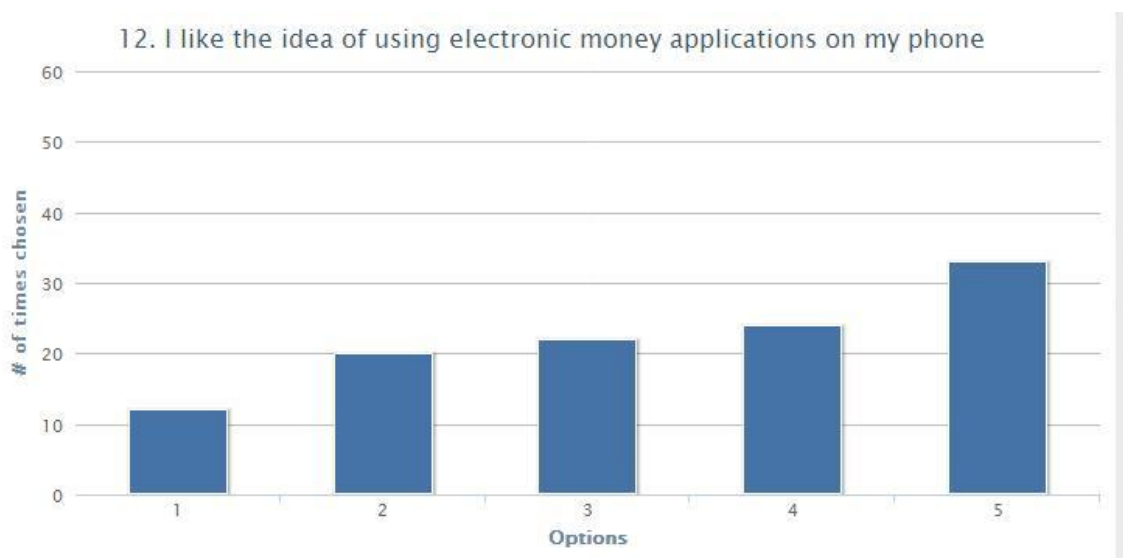


Figure 18 Question 6.12

12 (10.81%) respondents were against the idea of e-money mobile applications. 20 (18.02%) and 22 (19.82%) had no opinion about this. 24 (21.62%) and 33 (29.73%) respondents enjoyed the concept of e-money mobile application. We can definitely say that mobile e-money programs will be popular at least among young generation.

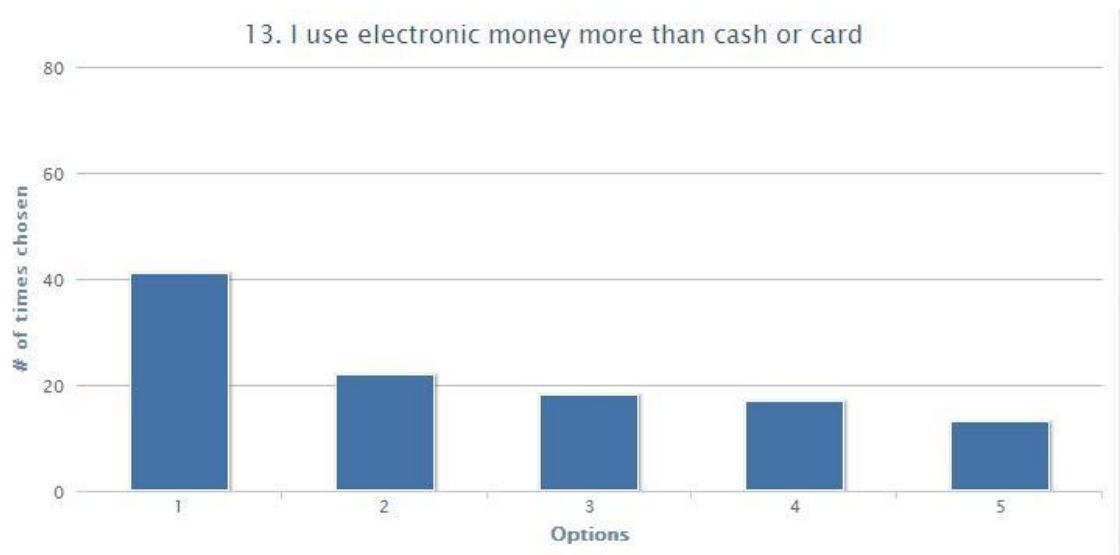


Figure 19 Question 6.13

41 (36.94%) respondents – major part – used cash or bank cards much more than electronic money. 22 (19.82%) and 18 (16.22%) were not sure whether they use e-money more than other means of payment – maybe they made a lot of internet payments along with usual payments. 17 (15.32%) and 13 (11.71%) used e-money more than cash and card payments.

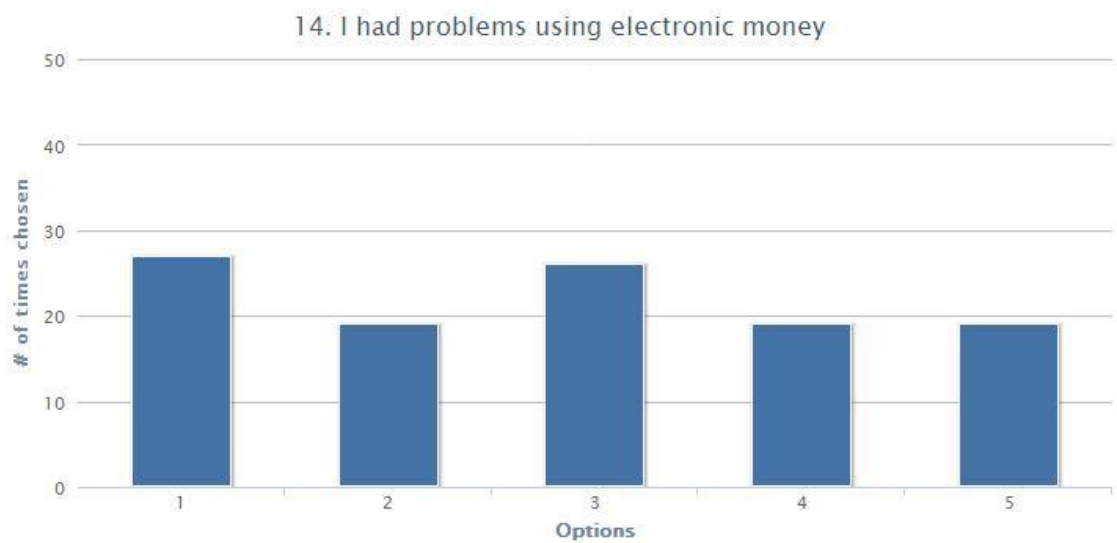


Figure 20 Question 6.14

Most of the respondents (27 (24.55%), 19 (17.27%) and 26 (23.64%)) had at least some problems with e-money payments. 19 (17.27%) and 19 (17.27%) respondents never had problems with e-money, or their problems were not crucial.

#### 4.5 Specifics about e-money future

Other part of the questionnaire is about how people see future for e-money. The most important questions are raised – if it is possible to replace traditional money by e-money, when it is going to happen, what will be the access method to e-money systems and last “fantastic” question: does e-money have a potential to destroy all national currencies.

Can e-money replace traditional money? ...

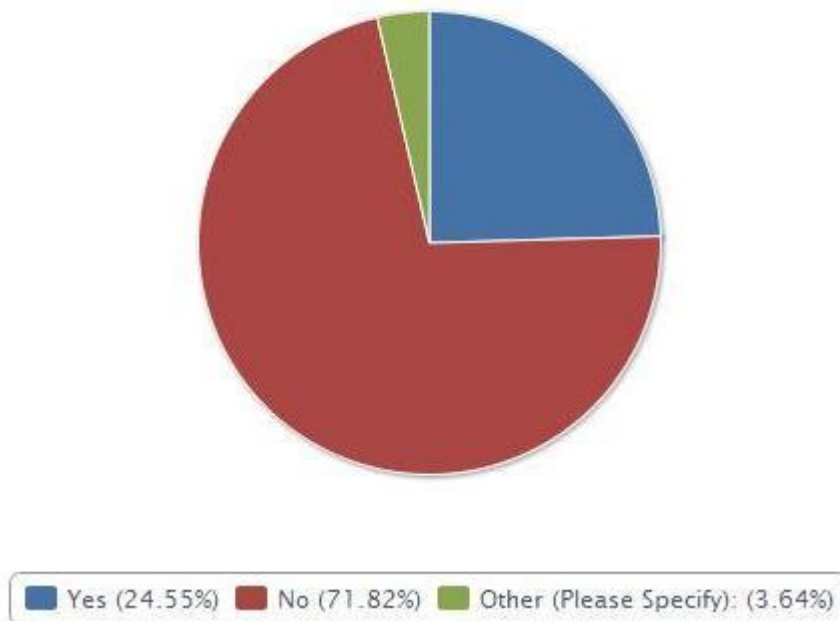


Figure 21 Question 7

Most of the respondents (79 (71.8%)) thought that it is absolutely not possible for e-money to replace traditional kinds of money – cash and bank cards. 27 (24.5%) believed in other vision of e-money future. Other interesting answers include: “not in every situation”, “in Finland yes, but not in the majority of countries. You will still need traditional money when traveling”, “never fully”.

If e-money can replace traditional money, when?

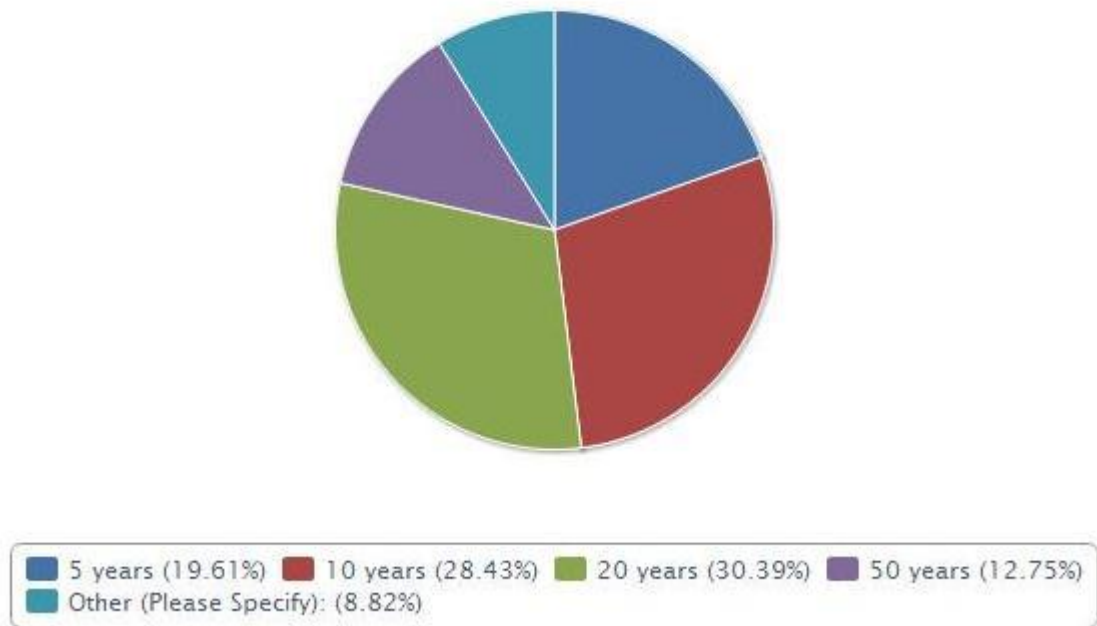


Figure 22 Question 8

Majority of respondents (29 (28.4%) and 31 (30.4%)) were sure that if e-money can replace traditional money, it can happen not earlier than after 10-20 years from now. 20 (19.6%) were positive and believed in e-money triumph in a 5 years. 50 years became the best answer for 13 (12.7%) respondents. Others answered the same way: “never”, “100 years”.

## Access method for e-money in the future

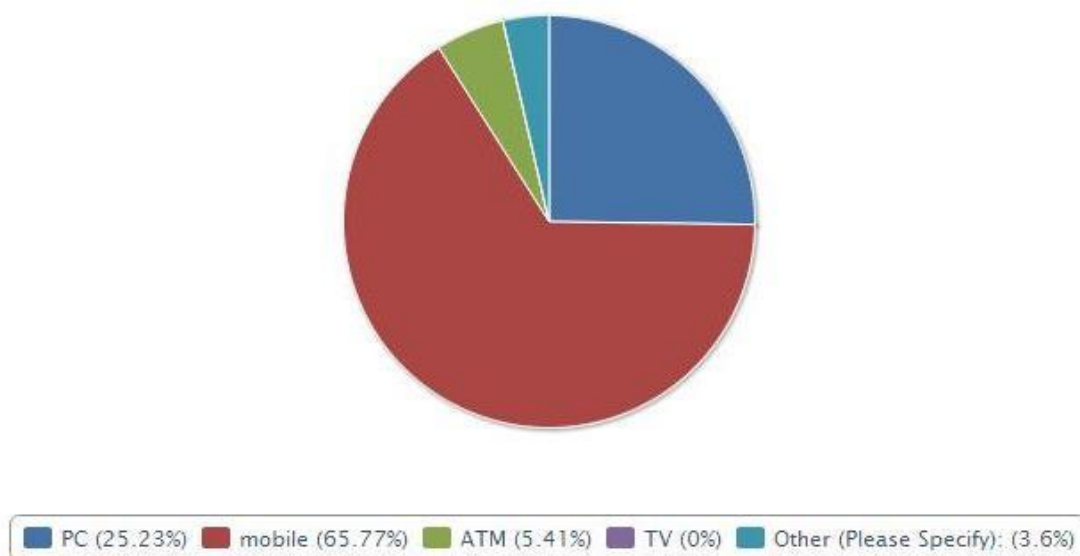


Figure 23 Question 9

The most popular access method to e-money systems will be mobile application (73 respondents). Second one is PC program – 28 respondents. Some answered that it will be possible to use ATM for this purpose (6 respondents). Others had multiple answers: “electronic chip in your head”, “connected internet devices” – sad that respondent didn’t specify more about it, “Maybe in all of these”.

Can e-money create a “world currency” destroying all national...

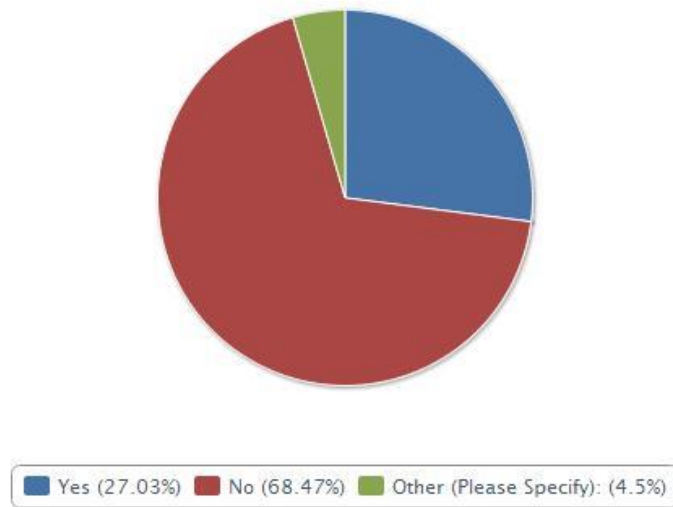


Figure 24 Question 10

Almost all respondents – 76 - denied the idea that e-money could become some kind of a “world currency” and destroy all national currencies throughout the world. Still it is interesting to mention that at least 30 respondents thought – it could be possible. Others answered: “maybe”, “no opinion”, “Idea of a world currency sounds good”.

## 5 CONCLUSIONS OF THE STUDY

The main aim of the study was to understand simple questions: who uses electronic money, for what purpose, do they like it or not, do they have any problems with it or not, in what technologies do they believe when speaking about e-currency. All these questions are strictly important when drawing conclusions for possible future visions of money.

Research showed that young people are active on the internet, use e-money for different business activities, they are motivated to use e-money in the future, despite of some problems occurred. Respondents had no concrete opinion about trustworthiness of e-money – which can be a good sign, because they might had no security problems ever at all. They believe that it is possible to use e-money in all aspects of life and without a lot of mental effort. But still they don't use e-money more than cash or bank account cards.

We can see that e-money is not that developed now. Some researchers thought that it might be possible for e-money to become one world-currency, but the statistics of this particular study shows that people don't believe in e-money that much. Also, e-cash will never replace traditional cash.

21<sup>st</sup> century is the time of predominant mobile technology – and respondents believe mobile applications to be a potential future way for e-money use. Japan situation with e-money is a good example for European e-money systems.

From the answers we can say that electronic money have their niche in money market, but are not always used for business matters – people will better use and integrate them in their private lives.

I should note, however, that it took years to ATMs and debit cards to spread widely in the U.S. and Europe. In the end, these innovations in the payment system became effective and low-cost to users. Electronic money could go the same way, and after the small initial failure and further innovation still win the recognition of general public.



Open any newspaper and you'll be shocked by a story, for example about how traditional economics has been discredited because of the major sale of dolls collection on eBay – virtual auction website. Turn on the TV and you will hear about e-commerce companies selling goods and services on the internet. For all of these people need e-money, so prosperous future for it is quite predictable.

### 5.1 Suggestions for further research

Time and scope of research are always limited, especially when it comes to the questionnaire. Obviously, it is not possible to observe all future trends for e-money market in one research – and this information will be irrelevant in 5 years already. But it is interesting to use qualitative method in further research, to take one small group of people and analyze particularly what they know about e-money and how they see a future of it. Concrete information will help in drawing the most reliable and desirable type of money future.

This research was completely based only on general person's vision of e-money modern and future situation. Now it is obvious that e-money system provider's view might have been opened new opportunities for such a study, showed e-money trends also from broader professional perspective. This idea could be a good suggestion for future study.

It is important to add that company's view might have been strict and formal; also big money companies have a tendency to hide any information that can be called "secret". From the other hand, user's point of view is a bright living desire, something that is very interesting to dig into, because it can show almost fantastic thoughts, like the idea of e-money as a one existing world-currency.

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## Figures

Figure 1: Types of research. Malhotra N, 2004. Marketing research: An applied Orientation, Pearson Education, New Jersey.

Figure 2: Research Process. Paurav Shukla, 2008, Essentials of marketing research, Paurav Shukla & Ventos Publishing Aps, p. 20. Available on the web at <http://dl.is.vnu.edu.vn/bitstream/123456789/255/1/marketing-research-an-introduction.pdf>

Figure 3 Electronic money demand (Meta Zahres, 2012), available on the web at [http://www.dbresearch.com/PROD/DBR\\_INTERNET\\_EN-PROD/PROD0000000000288496/E-money%3A+Niche+market+that+might+be+expanding.pdf;jsessionid=DDA520288FD7AB0DD3888BC207D87BEF.srv-net-dbr-com](http://www.dbresearch.com/PROD/DBR_INTERNET_EN-PROD/PROD0000000000288496/E-money%3A+Niche+market+that+might+be+expanding.pdf;jsessionid=DDA520288FD7AB0DD3888BC207D87BEF.srv-net-dbr-com)

Figure 4 PayPal total payment volume (Meta Zahres, 2012), available on the web at [http://www.dbresearch.com/PROD/DBR\\_INTERNET\\_EN-PROD/PROD0000000000288496/E-money%3A+Niche+market+that+might+be+expanding.pdf;jsessionid=DDA520288FD7AB0DD3888BC207D87BEF.srv-net-dbr-com](http://www.dbresearch.com/PROD/DBR_INTERNET_EN-PROD/PROD0000000000288496/E-money%3A+Niche+market+that+might+be+expanding.pdf;jsessionid=DDA520288FD7AB0DD3888BC207D87BEF.srv-net-dbr-com)

Figure 5 Smart card options (Sony.net, 2012), available on the web at <http://www.sony.net/Products/felica/about/index.html>

Figure 6 Responses on questionnaire by location of ip-adress

Figure 7 Question 6.1

Figure 8 Question 6.2

Figure 9 Question 6.3

Figure 10 Question 6.4

Figure 11 Question 6.5

Figure 12 Question 6.6

Figure 13 Question 6.7

Figure 14 Question 6.8

Figure 15 Question 6.9

Figure 16 Question 6.10

Figure 17 Question 6.11

Figure 18 Question 6.12

Figure 19 Question 6.13

Figure 20 Question 6.14

Figure 21 Question 7

Figure 22 Question 8

Figure 23 Question 9

Figure 24 Question 10

## Appendix 1 Cover Letter

Dear students,

I am an International Business student from Lemminkäisenkatu and now I am working on Thesis about Electronic Money trends. It is the topic that has relation to any of us, so it would be nice if you can help me with my questionnaire. It was designed specially to take only 5 minutes of your time.

The questionnaire is in English, for Russian version you can contact me directly

<http://freeonlinesurveys.com/app/rendersurvey.asp?sid=3803wp581w6mn4p158818&refer=>

Thank you for your time

Best regards,

Kristina Sova



## Appendix 2 Questionnaire Form

### Part 1 Personal information

- |                      |                                  |
|----------------------|----------------------------------|
| 1. Gender            | Female/Male                      |
| 2. Age               | less than 20                     |
|                      | 20-30                            |
|                      | 30-40                            |
|                      | 40-50                            |
|                      | Older than 50                    |
| 3. Education         | High school                      |
|                      | College                          |
|                      | Bachelor                         |
|                      | Master or more                   |
| 5. Income            | less than 1000 euro per month    |
|                      | between 1000-2000 per month      |
|                      | between 2000-4000 euro per month |
|                      | more than 4000 euro per month    |
| 6. Country of origin | _____                            |

**Part 2 Please select the appropriate responses that best describe your perceptions of electronic money (from 1 to 5)**

Electronic money (also known as digital cash) is money that is only exchanged and used electronically. Usually it is used in internet-store trade, online-games, online-business and so on. The most well-known example of electronic money system is PayPal.

2.1

1. I know what electronic money is
2. I intend to use electronic money within near future
3. I am determined to use electronic money soon because of my business or professional specifics
4. I feel using electronic money is a wise idea
5. I like to use electronic money.
6. Electronic money systems are trustworthy
7. Using electronic money improves my performance of business activities
8. Using electronic money enables me to accomplish business activities more quickly
9. Interaction with electronic money does not require a lot of mental effort
10. I believe in future of electronic money
11. I would like to use electronic money in all aspects of my life
12. I like the idea of using electronic money applications on my phone
13. I use electronic money more than cash or card

14. I had problems using electronic money

2.2

1. Can e-money replace traditional money?

Yes/No

2. If e-money can replace traditional money, when?

5/10/20/50 years

3. Access method for e-money in the future

PC/mobile/ATM/TV/Other

4. Can e-money create a “world currency” destroying all national currencies?

Yes/No

### Appendix 3 Perception of electronic money

1. I know what electronic money is	7 (6.31%)	13 (11.71%)	20 (18.02%)	16 (14.41%)	55 (49.55%)	111	3.89 / 5(77.80%)
2. I intend to use electronic money within near future	7 (6.31%)	20 (18.02%)	12 (10.81%)	28 (25.23%)	44 (39.64%)	111	3.74 / 5(74.80%)
3. I am determined to use electronic money soon because of my business or professional specifics	35 (31.53%)	19 (17.12%)	13 (11.71%)	20 (18.02%)	24 (21.62%)	111	2.81 / 5(56.20%)
4. I feel using electronic money is a wise idea	11 (9.91%)	12 (10.81%)	23 (20.72%)	27 (24.32%)	38 (34.23%)	111	3.62 / 5(72.40%)
5. I like to use electronic money.	16 (14.68%)	13 (11.93%)	29 (26.61%)	16 (14.68%)	35 (32.11%)	109	3.38 / 5(67.60%)
6. Electronic money systems are trustworthy	12 (10.81%)	13 (11.71%)	34 (30.63%)	29 (26.13%)	23 (20.72%)	111	3.34 / 5(66.80%)
7. Using electronic money improves my performance of business activities	20 (18.52%)	13 (12.04%)	26 (24.07%)	28 (25.93%)	21 (19.44%)	108	3.16 / 5(63.20%)
8. Using electronic money enables me to accomplish business activities more quickly	23 (20.91%)	13 (11.82%)	16 (14.55%)	30 (27.27%)	28 (25.45%)	110	3.25 / 5(65.00%)
9. Interaction with electronic money does not require a lot of mental effort	5 (4.50%)	18 (16.22%)	29 (26.13%)	27 (24.32%)	32 (28.83%)	111	3.57 / 5(71.40%)
10. I believe in future of electronic money	8 (7.27%)	13 (11.82%)	16 (14.55%)	34 (30.91%)	39 (35.45%)	110	3.75 / 5(75.00%)
11. I would like to use electronic money in all aspects of my life	17 (15.32%)	12 (10.81%)	18 (16.22%)	24 (21.62%)	40 (36.04%)	111	3.52 / 5(70.40%)
12. I like the idea of using electronic money applications on my phone	12 (10.81%)	20 (18.02%)	22 (19.82%)	24 (21.62%)	33 (29.73%)	111	3.41 / 5(68.20%)
13. I use electronic money more than cash or card	41 (36.94%)	22 (19.82%)	18 (16.22%)	17 (15.32%)	13 (11.71%)	111	2.45 / 5(49.00%)
14. I had problems using electronic money	27 (24.55%)	19 (17.27%)	26 (23.64%)	19 (17.27%)	19 (17.27%)	110	2.85 / 5(57.00%)