Proceedings of IYSC, (2021), vol. 10

Journal homepage: http://journals.sdu.edu.kz/index.php/iysw

2021 International Young Scholars' Conference

E-MONEY AND ELECTRONIC PAYMENT SYSTEMS. PROBLEMS AND TRENDS

Firuzakhon Meraliyeva
Master student of Private Law, Department of Jurisprudence, Faculty of Law and Social Sciences, Suleyman Demirel University, Republic of Kazakhstan
firuzo4ka@gmail.com

Abstract

This research paper focuses on e-money and electronic payment systems that is extremely relevant topic within the current pandemic situation. Recently, we became witnesses with the globalization of markets and growth of e-commerce. It is obvious that money transactions became digital, electronic payments systems became our daily payment tool. All these globalization and digitalization are changing the culture of shopping, conducting business, accepting e-money as means of payment. At the same time, there are number of people that cannot accept any type of money except cash money. However, a number of issues, especially the digital money market, coverage and security, legal issues and some other aspects remain poorly understood. Thus this paper is made to make majority of population to be acquainted with the e-money, electronic payment systems, their problems, trends, their advantages and disadvantages as a whole from the legal perspectives.

Keywords: electronic money; electronic payment system; means of payment; monetary regulation.

Money is the most important attribute of our daily life. The stability of economic development of the country depends largely from the functioning of the monetary system. With the development of information technologies and digitalization., we see the rapid evolution of money forms as well. If 20 years ago the terms like ‘electronic payment system’ or ‘electronic money’ was something awkward, today it is our reality.

Taking the history of electronic payment system development in Kazakhstan, there terms are still new and e-money market is only forming. Therefore, there are a number of issues as formation of the market of electronic money, coverage and security, legal issues and some other aspects remain poorly understood.

The term ‘electronic money’ or ‘e-money’ is often inaccurately used for a wide range of payment tools that are based on innovative technical solutions in the implementation of retail payments.

Let me introduce the reader with brief history of money. Speaking about money, ‘paper money’ term is more familiar to us. Money first appeared in China in 812, and the earliest banknote issues in the world were made in Stockholm in 1661.

The closest to understanding the essence of money was the founder of Economics theory Adam Smith. He called the monetary system ‘the Great Wheel of Circulation’ and emphasized that money and goods should not be confused. Income should be measured in goods, not money. But due to a misunderstanding of the nature of value, A. Smith could not explain the nature of money.

Being an integral component of commodity production, money exists and acts where economic life is carried out through the movement of goods. At the same time, money continues to remain a product, but a special product with its own specific properties. Thus, they begin to fulfill a specific social function - to be an intermediary in the exchange of goods on the market.

The social utility of money lies in the fact that they mediate the movement of goods between producers and consumers.

Money manifests itself through its functions. The following four main functions of money are usually distinguished:

1. a measure of value;
2. a means of accumulation (hoarding);
3. a means of circulation;
4. a means of payment.

Often, the fifth function of money is singled out - the function of world money, which is manifested in the maintenance of international commodity exchange.

Let me now consider the essence of electronic money.

Electronic money is monetary value represented by a claim on the Issuer expressed in governmental or private currency units stored in electronic form on an electronic device. According to the Directive of the European Parliament and of the Council No. 2000/46/EC "On the regulation of institutions issuing electronic money", publications of the European Central Bank and the Bank for international settlements on the topical issues of development of electronic money, it is possible to allocate following basic elements that characterize e-money as a new means of payment:

1. e-money represents a monetary value;
2. storage cost is based on an electronic device;
3. the issue price shall be made on the basis of prior depositing of funds;
4. the admission cost is third parties.

Electronic money is a payment product that stores a monetary value represented by a claim on the Issuer. The term 'cash value' in the context of the definition of electronic money means a store of purchasing power or monetary asset that may apply between economic agents.

The main difference between a cash value and money is that the monetary value is a means of payment, which may be transferred to any money forms. Unlike cash, which are universal, obligatory to receive a means of payment, which is expressed in the government of the counting units used for the calculation of prices of goods and services, and also contracts on a national and international level, the cash value is not required to receive the means of payment and can be expressed in the private currency. Unlike traditional money that can be issued 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 nonbank credit institutions, providing for special procedure for the regulation of their activities.

Electronic money is a means of payment that is stored on an electronic device. This definition emphasizes that electronic money is exclusively an electronic means of payment. The cost is stored in electronic form, and payments using it are made in electronic form. In this regard, the term ‘electronic value’ is often used instead of the term ‘monetary value’. In the economic sense, in the context of electronic money, it is not so much about value, but about the amount of purchasing power that its owner can dispose of. The fact that the electronic medium can be magnetic does not limit the possibility of its use as an electronic money medium. So, for example, the value stored on a personal computer is not excluded from the definition of electronic money just because it is stored on a hard disk of a computer. Similarly, the value that is stored on a plastic card using magnetic stripe technology can also be included in the definition of electronic money if the consumed value is transferred using electronic technology.

Electronic money is a payment instrument issued on the basis of the previously received funds. The value submitted as payment of cash equivalent to the value of issued electronic money. In the case of electronic money, the consumer pays for its purchase power in advance. The purchase of e-money means the purchase of cash value. This does not mean that the

electronic money paid by credit card are not included in their definition. In this case, there are two transactions: one is the sale of electronic money, the second loans. The fact that the means of storing the monetary value is made on the basis of a plastic card, which can also function as a debit or credit card, does not mean that the monetary value is electronic money.

Electronic money is a payment instrument that is accepted by third parties (institutions, companies 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 individuals, for example, electronic value which is released by employer for their workers and can only be used to purchase meals in the dining room of the employer, is not an electronic money. The fact that a monetary value can be spent by third parties, does not mean that it can't be spent from the Issuer.

From a legal point of view, ‘electronic money’ are open-ended monetary obligations of the Issuer to the bearer in electronic form, the issue (emission) into circulation by the Issuer after receipt of funds in an amount not less than the volume assumed obligations, and the form of the loan. From the point of view of their material form, ‘electronic money’ provide information in electronic form in the possession of the owner and stored on a special device, usually on the hard disk of a personal computer or a microprocessor card and which can be transmitted from one device to another using telecommunication lines and other electronic means of information transfer.

In economic terms, ‘electronic money’ constitutes a payment instrument, which has, depending on the implementation scheme, the properties of both traditional cash and traditional payment instruments (Bank cards, cheques, etc.).

History of electronic payment systems and electronic money.

Historically, the payment instructions that provide access to the money on a bank account was performed orally or, as a rule, in writing. Note that invention of telecommunications, first

telegraph, and then the transatlantic cable refers to the middle of the nineteenth century. The electronic banking operations started with the automated processing of paper documents, such as checks that appeared in the middle of the twentieth century. Nevertheless, the development of an electronic banking, where payments are processed, and also transmitted electronically, turning into electronic payments, is the achievement of the second half of the twentieth century. As soon as it became possible to transfer information from a computer or terminal, the electronic translation of funds developed rapidly, as well as data transmission through telecommunication devices. In the very beginning, the cable (wire) channels were used, and wireless connection was available a bit later, and, ultimately, the data began to be transmitted via the Internet. Progress and development of wireless communications allowed us to tremendously accelerate the transfer processes of money as well.

Electronic payments are made in cases where payment instructions, initiated by the device, such as a computer or mobile phone, enter the payment system via the Internet.

In the middle of the twentieth century, a breakthrough in the field of computing for mainframes allowed to produce interbank calculations, which led to the appearance of payment cards. In the 1960s and 1970s, the technology of magnetic strips brought digitizing the POS (points of sale). By the end of the 1990s, e-commerce became the main activity by creating new opportunities for payments over the Internet. The appearance of smartphones and other connection devices in the 2010 led to the emergence of mobile and multichannel trade, eroding the boundaries between the shop and online purchases. In order to keep up, Internet markets, retailers, and other participants of the economy, require new methods for settlements and payments. Companies using payment technologies expand networking opportunities to support a long innovation process. The retail payments industry is characterized by specialization and cooperation, while many companies work together to ensure reliable service.

Electronic payments increase speed, efficiency and security of payments. In particular, the support provided by e-payments facilitates retailers all over the world, while non-monetary payments can be carried out in non-bank channels. It brought significant benefits to both sellers of goods and services and their customers. Advantages for sellers is that electronic payments facilitate the collection of payments, sellers can place their products on different markets as e-commerce supported by electronic payments, facilitates access to a much broader base of customers around the world. On the other hand, e-payments provide customers with more comfort and choices by access to a wider range of suppliers and products.

All these benefits are essential for both suppliers and customers in developing countries, where a significant part of the population does not have access to the retail physical network. This applies to both the internal and international e-commerce, supported by the electronic payment infrastructure, which can help developed countries to become more competitive and diversify their exports. Since electronic payments have become the norm in developed countries, they are essential for the growth, integration and competitiveness of developing countries in the framework of the global economy, which is increasingly becoming digital and no boundaries.

The development of card turnover was durable, lasting and mutually beneficial for buyers and sellers. The first associated with the opening of a credit line in the Bank that allowed the holder to use the credit for purchases of goods and receipt of cash loans. The second is designed to obtain cash in ATMs or purchase goods with payment via electronic terminals. The money is debited from the account of the cardholder in the Bank. The total amount of debt in their use must be repaid fully in a certain period of time after receipt of the statement without the right to extension of credit.

The first credit card appeared in 1951. It was issued by Franklin National Bank. And in 1967, several large regional associations combined under the auspices of the Interbank Card

Association, then received the title of ‘Master Card International’. At the same time American Express system started to operate. Four years later, in 1971, was the birth of VISA USA Inc., later renamed ‘VISA International’. Today these are the most popular systems in the world. According to the data provided by National Bank of Republic of Kazakhstan, 99.55 % of all money transferred in our country during Y 2020 was performed by MasterCard and VISA.

Electronic or digital money are means of payment presented and circulated in electronic form, the circulation of which guarantees anonymity. E-money, like electronic documents, contains a nominal value, an indication of the issuer, individual signs (series, number, etc.) and elements of protection against fraud (certification by digital signature of the issuer). They are very mobile, simple and convenient in their use and relatively reliably protected from various extraneous criminal encroachments. Moreover, the full use of such means of payment became possible only with the invention of a special security means - an electronic digital signature - the requisite of an electronic document designed to protect this electronic document from forgery, obtained as a result of cryptographic conversion of information using a private key of electronic digital signature and allowing to identify the owner of the signature key certificate, as well as to establish the absence of distortion of information in electronic document.

Saying simply electronic money represents a sequence of digits representing (replacing) banknotes and coins, and this is their informational nature. They can be used to purchase goods and services in real time using the tools of remote management of Bank account such as a computer connected to the Internet, Internet banking, mobile phone that supports the standard WAP (mobile banking), banking plastic cards (card e-banking or card banking). According to forecasts of the experts, electronic money will partially displace the traditional banknotes.

The first virtual Bank carrying out banking activities exclusively in the Internet, was created in 1994 as part of the American network credit card draft First Virtual Holdings. Since 1993 started development of electronic money based on cards (card-based) and network e-

money (network-based). In 1996, the heads of Central banks of the ‘Great ten’ (G10) countries, said the intention of monitoring electronic money in all countries of the world. As of 2004 electronic money used in 37 countries. This system has been so successful that its fundamental principles almost immediately spread around the world.

Features of electronic money

Anonymity and cryptographic protection of electronic money

Electronic money can be anonymous and personalized. By its nature, electronic money closer to anonymous cash than to personalized non-cash money. The presence or absence of anonymity, provided the rules and mechanisms of electronic circulation of money in a particular payment system.

In order to stimulate the personalization of users of electronic money and transactions with them there can be different approached depending from country to country. For example, for electronic money of payment systems limit the size of e-wallet for the anonymous user, increasing the limits of the personalized system users. For electronic money on the basis of the cards restrict the maximum amount in your wallet and introduce personalized mechanisms of replenishment.

When using the offline scheme of e-cash will also need to be protected from dishonest traders. Security of electronic money systems is achieved using cryptographic techniques. Historically, the use of cryptography in electronic cash was first proposed by David Chaum. David Chaum (born 1955) is an American computer scientist and cryptographer, known as a pioneer in cryptography and privacy-preserving technologies. He used the algorithm confidential communication to help achieve concealment of the relations between transactions withdrawal and deposit of money. The basic idea was the system of ‘blind’ electronic digital signature i.e., when signing the information one party sees it only in the part that he\she needs,

the receiver on the other part sees the amount on the bills, but do not know their serial numbers or other sensitive information.

The use of electronic digital signature is expected to carry out the following important directions in the e-economy:

- Full control over the integrity of the transmitted electronic payment document: in the event of any accidental or deliberate changes to the document, the digital signature will become invalid, because it is calculated by a special algorithm on the basis of the original document and corresponds only to original document.
- Effective protection from change (forgery) of the document. A digital signature provides a guarantee that will be revealed all the forgeries in the implementation of integrity control. As a result, forging of documents becomes impractical in most cases.
- Fixation of the impossibility of repudiation of this document. This follows from the fact that, once again to create a correct digital signature can only be knowing the so-called private key, which in turn must be known only to the key owner (the author of the document). In this case, the owner will not be able to form a rejection of his signature.
- Formation of evidence for the authorship of the document: based on the fact that the creation of a valid electronic signature can be only by knowing the private key, and by definition, it must be known only to the owner-the author of the document, the owner of the keys can definitely prove his authorship of the signature under the document.

Using mathematical methods, it is possible to prove that this ‘blind’ signature guarantees the authenticity of the content of bills with the same reliability as when using a conventional digital signature. Note that recently the use of digital signatures has become one of the most popular means of confirmation of authenticity of certain electronic documents, including electronic money.

The advantages and disadvantages of electronic money and electronic payment systems

Electronic money and electronic payment systems are useful and provide maximum convenience in carrying out mass payments of small amounts.

For example, electronic payment system can be used for payments in transport, cinemas, clubs; payment of utilities, payment of various fines, taxes and fees; payments in the Internet for the purchase of traditional and electronic products (e.g. software licenses).

The user should note that the process of e-payment is quick. There are no such common problems as the traditional queue or the need to provide change. An electronic money is transferred from the payer to the recipient in seconds.

The e-money is most similar to traditional cash, because the circulation of non-cash money, as a rule, personified (known legal details of both the parties or, in the case of individuals, passport data and address of residence).

Electronic money and electronic payments (non-cash payments) have many significant advantages over cash, but along with its advantages, there are several disadvantages.

Central banks of most countries are very wary of the development of electronic money circulation. The main threat they see the uncontrolled emissions that can lead to inflation, and the risk of a large number of possible abuses.

Despite the fact that electronic cash potentially provides many positive effects, such as usability and privacy, lower ancillary fees, new opportunities for the business community with the transfer of financial-economic activity in the Internet, there are many controversial issues regarding implementation of electronic money.

The establishment and operation of electronic currency raises a number of additional issues related to taxation and questions of procedures of money laundering. Also, many countries worried about the problem of confidentiality and possible leakage of personal data of their citizens.

Using electronic money may bring to exchange rate volatility, the lack of real financial support. That is, there can appear the likelihood that the amount of virtual money at some point will exceed the amount of real money. Also, problems with the use of electronic money can arise due to their liquidity, expressed in the value of real money, as well as to obligations that are imposed on the issuer.

Electronic payments require new regulatory decisions that take into account both perspectives and risks associated with the acceleration of development rates for all the above benefits.

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