

Commercial Applications of Electronic Currencies

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Abstract

Digital payment systems, also known as digital money, digital currency, or electronic money, have come a long way since the invention of computer-based communication systems. From the requirement of human-to-machine monetary transactions, it has evolved. E-money is a virtual cash model that is making its way in the online and virtual transfer domain. The authorization transaction is conducted through traditional banking systems between the payer and the payee, which issues e-money accounts for these transactions. After this amount is booked and stored by banks, it can be verified and transferred to payers/payees as e-money. One important challenge in this domain is to reduce reliance on the identifying authority, and the corresponding e-money transactions should be as simple and secure as cash transactions. Bitcoin – the electronic currency introduced in 2009 by an anonymous author and designed to work independently of a central authority – is unique and often considered news. This ignores the general history of electronic currencies. In 1998, Wei Dai introduced B-money, an efficient product of minimizing communication that serves as a method of fees and rewards for providing limited resources. Also in 1998, Adam Back introduced Hashcash – a currency that ties real computing costs to solve increasingly difficult computational puzzles. In 1999, Nick Szabo introduced bit gold – a product offering small chained proof of work and conducted via broadcast. David Chaum's eCash, based on blind signatures, was a technical principle in the paper in 1983, and in 1990 with Amos Fiat and Moni Naor in addition known as related technology.

Keywords: Commercial, Electronic Currencies, Digital Currency, Cybersecurity Threats

INTRODUCTION

The increasing acceptance of electronic currencies in society raises a couple of important questions: how do these currencies work, and what can be expected in the future of the commercial applications of electronic currencies?

BENEFITS OF ELECTRONIC CURRENCIES

Given the transformation of the financial system in the world, it is important to know in detail the characteristics of electronic money and how its operation regulates. This research, initiated by the Bank of the Republic of Colombia, falls within the lines of interest published in the Superintendence of Banks of companies and the Financial Superintendence of Colombia regarding digital money. In short, the creation of the technical team within the entity to analyze the characteristics of Bitcoin, as well as the contradictions they present on the part of the entities today authorized to issue digital money, motivated the response to dispel in a timely manner these doubts. In the course of the development of our investigation, it was possible to demonstrate that a united, strong and very well-developed Colombian financial system requires electronic money, taking advantage of the technological advances it offers today. The Colombian financial system is considered without a doubt in the digital medium as a financial organization that requires paperless transactions and cash withdrawals.

A digital currency is a money balance recorded electronically on a card or a computer, like Bitcoin. The resolution of the Bank of the Republic of Colombia regulates the issuance of electronic money and establishes the regulatory framework in relation to the operation of this mechanism by financial intermediaries. Consequently, payment and electronic money entities are the only ones authorized to issue electronic money in Colombia. The financial intermediaries that are under the supervision of the Financial Superintendence of Colombia will be responsible for this activity. The entity responsible for overseeing the operation is without doubt the Superintendence of Finance, while the Financial Superintendence of Colombia will focus on

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supervising compliance with the corresponding regulations that guarantee the proper functioning of electronic money.

Increased Security

More than ever, the low fees, cost reduction of human checking, virtually no interchange fees, and the boon from increased security (no one pays by processing unencrypted transactions by store merchants and card processors of the card) have become irresistible. Security improvements give more choices for electronic payments, other than the existing card systems, without a decrease in security. Merchants always appreciate the privilege of electronic commerce property, which bars a credit card transaction from being charged back. The property is, first, the permission to examine the products to the possible extent before having to settle for them and, second, that it is the seller who gives them over-clear evidence.

However, in all these times, it has been the exchanges that are the soft underbellies, where fraudsters make away with consumers' money and all brigade the activism, shunning the potential investment in blockchain for electronic currencies. The different systems need a re-evaluation. Automated trust without the need for a middleman must be the taxpayers. For this reason, the regulation across the world of electronic currencies, since it acts as a trust broker and middleman, becomes indispensable. This demands an extended view on digital currency beyond the framework of the USA, including the foreign counterparts. It is in existing card payment systems where rapid developments are taking place, with the virtual card issuer systems that obviate the use of card interchange fees.

All the transactions are processed using the blockchain technology, rendering hackers helpless. Each transaction is recorded in the public ledger. Considering the end-to-end solutions found on some of the blockchain digital currency systems, processors of the card can utilize these solutions and save on operation cost. Also, these solutions do not need the multiple levels of checking that are in the banks or ATM before a transaction is authorized. The only major risk associated with electronic currency is the hacking prosecution that has occurred in the past on blockchain technology.

Lower Transaction Costs

While Title II of the CRB generally restricts the use of e-money as effective currency and electronic currencies closely related to the money as we know it do not have fixed value and are, according to the US Federal Reserve, "subject to the same kinds of unstable price movements as all other financial assets with variable values," e-money in general can be used to settle very small and large value payments more efficiently. Hence, there are e-money applications built for such purposes and they are not too hard to imagine even outside this application domain. The cost-reducing benefits of electronic currencies can be particularly high during times of crisis. During local or international crisis, the mentioned traditional money processing multi-layered system may be forced to stop or slow down due to various reasons. Economic costs of such events may be very high. Online electronic currencies can enable an alternative way of settling obligations. Furthermore, if a more specialized electronic form of money is used in the future, e.g., the current types of e-money that are not designed as a new form of money, but a bearer form of retail deposits held with the banks, such deposits can settle payments more cheaply than current account deposits.

Another important aspect of electronic currencies is that they are easily moved through the internet. This increases efficiency of payments, both in terms of time and costs. Online electronic currencies generally eliminate the need for physical transportation of cash, coins or checks. When embedded within a general purpose e-money-processing computer, electronic currencies intended for peer-to-peer transactions may reduce or eliminate intermediation of third parties altogether. Depending on the type of electronic currencies used, savings in the downstream merchant payment process may be passed on to consumers. It is important to understand that time and money savings for typical physically present point-of-sale transactions may be different than those for online purchases; several parameters that reduce transaction cost for online transactions are not well implementable with conventional physical presence point-of-sale transactions.

Global Accessibility

However, for big investors, this could be a showstopper, considering the minimal control the currently available platforms and implementations provide. The founder of Bitcoin would have invented an electronic currency that could bypass traditional financial markets and institutions by allowing for near-instant and very small transactions. However, by having large fees, the current implementations of Bitcoin are likely less suited for real-world applications that allow for everyday transactions worth a few dollars. By reducing the fees, however, the vulnerability to the attacks identified herein, and other types of attacks, increases significantly. Another issue that has to be confronted is the scalability aspect, in that part of the goal of Bitcoin was to reduce the amount of computational power required for performing electronic payments on a small scale. Large and many computers are used to run a Bitcoin implementation in parallel, and there is a maximum number of transactions that can be performed per second using the currently available software.

Digital currencies are global and offer seamless transfer from person to person, from person to business, from business to person, or whatever. As far as we know, MtGox, a company operating a large exchange for Bitcoins, sells Bitcoins in 38 different markets. In general, the number of markets that support a diverse range of digital currencies is high. With an electronic currency, it is no longer necessary to do exchanges for many currencies. It is sufficient to just have one for each electronic currency. By diversifying the electronic currencies that you use, you spread the risk of a failure in an electronic currency, and by buying several digital currencies from various markets, it is also possible to reduce the risk of exchanges being hacked and a hacker stealing your money. Also, regarding the markets that trade digital currencies, the risk of a market getting hacked increases with the size of the market.

CURRENT COMMERCIAL APPLICATIONS

In dealing with this discussion, the readers should bear in mind that we are actually not relating to a future that is too remote from now time. Our students of Sabi University are usually interested in knowing today where their future will go. That is why in this section of the work, we have devoted some time to already practical and/or near future realizable feasibility studies.

The commercial applications of electronic currencies, also known as electronic monies, or that is, monies based on blockchain concepts, include financial operations, operational data manipulations, the gaming industry, investments, acquisition, aviation (as modes of payments), tourism, exploration, agriculture, education, marketing, and distribution. In these articles, we shall discuss each of these economic and/or commercial activities, while at the same time linking the expected benefits of electronic money to specific areas of each activity. Welfare horizon of the entire African economy, or that arising from specific country-based economic activity such as agriculture or investments.

Students of Sabi University are usually asking about the current and/or near future commercial applications of electronic currencies.

In the landscape of today, African-origin countries, especially Sub-Saharan countries, still come last in the measure of financial inclusion, as also confirmed by the Mobile Money and Agent Banking Penetration Index of the Cafeteria Wall's work of 2014. The result of this underutilization of electronic money in the Sub-Saharan context is in diverse areas of human activities. These include difficulty in performing basic transactions such as movements, difficulties as regards credits and investments, and slow or semi-absentee banking services. The last relates to the extended banking operations shut down at the close of the business day, as also sometimes during weekends and holidays.

An electronic currency is simply defined as mobile cash or something like a mobile bank note. Specifically, an e-currency can be defined as a currency which is computer-based, where the ownership, transfer, control, and day-to-day trust of the currencies and accounts rely on the open ledger concept known as blockchain, and the digital signature verification which relies on the dual key encryption concept.

E-commerce Platforms

There are different types of e-commerce, including Business-to-Business (B2B), Business-to-Consumer (B2C), Consumer-to-Consumer (C2C), and Consumer-to-Business (C2B). B2B e-commerce comprises all types of electronic transactions of goods and services from one company to another, B2C e-commerce refers to electronic transactions between companies and consumers, C2C is the platform on which consumers buy and sell their products through software such as eBay, Craigslist, and C2B refers to transactions where customers provide products to companies (reverse auctions) such as iStockphoto. While electronic money is not a mandatory requirement for consumers to enjoy e-commerce, it is difficult to achieve any meaningful economic improvements in global (cross-border) electronic trade, in the context of B2C, C2C, and B2C and C2B. Market platforms, instructions, limitations must have international exchange capability and must support the functions of electronic money.

Another large application of electronic money is e-commerce, which provides a platform to trade goods and services over the internet. E-commerce is a sector that can largely benefit from e-money. The concept of e-commerce is very broad, and in simple terms, it translates to buying and selling products over the internet. A major attraction of buying and selling online is that consumers can access the worldwide market of entrepreneurs with a click of a button. This means that they do not have to leave their home to buy goods, and they can even purchase unusual goods that are only available in another country. This is very attractive to countries such as Jamaica, which has limited resources (skilled and unskilled labor, manufacturing plants, infrastructure, etc.) and for countries such as Dubai, which are surrounded mainly by desert and have less agricultural production. For more advanced countries, such as Italy and France, purchasing products online enables consumers to buy products that are not found in their home country.

Digital Wallets

Digital wallets may be the ecosystem that eventually replaces traditional banks in a digital era. Research suggests that digital wallets will do everything a bank can do, but better and cheaper due to their real-time transaction support and the cost savings they generate. Digital wallets are quickly becoming a dominant threat to traditional banking and card services. The growth in this area is significantly less than what was expected, and it is likely due to the fact that the majority of the world population still holds cash, and the older generation is not ready for the change. There has been more progress in this space with mobile donations than with mobile payment because donations happen quickly and buyers do not expect a direct service as they do with purchasing. Mobile money can provide millions of people in developing countries with access to financial products and services that are safe, secure, and low-cost. For instance, many Kenyan people do not have a bank account but have access to a mobile phone. E-money services allow them to deposit and withdraw money, make peer-to-peer payments to other mobile users, and pay for goods and services online or in shops by using their phone like a credit card.

A digital wallet is an electronic device, online service, or software program that stores e-money in order to allow an individual to make electronic transactions. This can include purchasing items online with a computer or using a smartphone to purchase something at a store. Money can be deposited in the digital wallet prior to any transactions or the user's bank account may be linked. Similar payment tools are the e-wallet or an e-commerce payment system. A consumer using a digital wallet for a purchase uses these credentials to gain access to the e-money instrument (EMI) in the wallet to initiate the transaction. This article discusses how and why digital wallets (e-wallets) are being used and accepted in several countries and discusses their benefits to consumers and merchants.

Peer-to-Peer Payments

Good (2015) found security and privacy are continually top concerns for P2P payment users. When a payment requires a new step other than "confirming payment," user satisfaction decreases. Common security practices are: authenticating logins with a second-factor or biometric identification, using fingerprint authentication to unlock the mobile app, novel ways of confirming each transfer amount or preventing duplicates, and using watch-list fraud detection. Moreover, the recipient's user experience is enhanced when funds are

"withdrawable" right away so that he or she is not required to sign up and use the payment-service app to lead the funds to a previously linked bank account. A chip-and-PIN reader increasingly allows rapid response for the acceptance process. Last, other stunning features could improve the user experience for P2P payment services. For example, one patent for this is for a digital wallet system (PayPal) that keeps track of a user's historical spending and income patterns and presents predictive insights to the user. Over time, the system learns the periodicity of reacquiring in the user's bank account and suggests transferring funds to cover transactions with no sufficient funds in the digital wallet.

A peer-to-peer (P2P) payment is the transfer of funds directly from one person to another. A P2P payment is facilitated by a P2P payment service where funds are pulled from the sender's bank account or payment card and pushed to the recipient's bank account or received as cash. P2P payments can facilitate domestic and cross-border payments, including among strangers with little information about each other. Examples of P2P payment services include mobile apps (e.g., PayPal, Venmo) and digital wallets (e.g., Google Wallet, Apple Pay Cash), and web services. For domestic P2P payments - available to unbanked, underbanked, and fully banked in high-income countries - companies like TransferWise, Square, and Chime operate.

FUTURE POTENTIAL

While cryptocurrencies were invented to serve as electronic cash (or even as non-legal tender store-holders of value), other commercial, business-to-business applications have been proposed. These applications posit electronic currencies not just as transaction media, but as communications or protocol/data scraping tools between counterparties in financial markets. In a similar manner, argues electronic currencies could, in theory, be shaped as 'smart financial contracts' (e.g., warranties) in the (traditional) P2P lending space. In principle, any financial market contract could be secured and enforced by cryptocurrency tokens. Finally, rized assets manipulation. Conversely, propose that Blockchain technology can also be modeled as market-based security instruments too, utilizing cryptocurrency technologies in the pricing, management, and manipulation of traditional financial derivative securities.

The more salient question, particularly for those not focused on the specifics of payment or financial processes, is what other potential non-payment centric applications electronic currencies can be deployed for? In this final section, we outline some of the potential applications of interest to the business community as alternative currencies (or 'coins'), as platforms or protocols to facilitate other transactions or contracts, as well as some under-discussed matters in the press and research literature that we believe have a critical bearing on the success and uptake of electronic currencies.

Integration with Internet of Things (IoT)

Through a series of research funded by VAROCARE European Project, we propose a distributed system sub-layer of the IoT entity that interacts directly with e-currency. The work is supported by industrial partners interested in leveraging e-currency for their particular niches.

In today's fast-evolving society, where technology progress opens the development of a plethora of different types of devices and nontraditional ways to access them that approach different problems, may it seem weird posing the question: Where exactly is e-currency? Even still, the majority of the population in western countries might think that e-currency is related to buffers at a computer network, where the famous peer-to-peer Internet victories them all, but this encrypted cash sits into some commercial data center or is simply a different way for online commerce.

We propose an IoT entity that can be situated in any smart environment, focusing on security and scalability issues that spring in the context of accessing e-currency. Our research aims at creating an infrastructure that supports different use case scenarios, especially focused on developing countries, where scarcity takes part, where Internet connectivity is facilitated by nowadays telecommunication companies, but the interaction copes with e-currency as a main issue.

The integration with the Internet of Things (IoT) will lead to a different vision of e-currency. The e-currency entity will become an actuator that will be part of the environment where commerce will happen. One direct

consequence is the integration of the device in the local, regional, or global communication infrastructure (namely, mobile communication generations), that a priori access to specific Internet address is provided. Another aspect is that e-currency will receive the commodity edge, becoming no different from its traditional currency: e-money or cash.

Cross-Border Transactions

Companies using electronic currencies with the third characteristic of being a medium of exchange include financial institutions, payment system providers, and other large companies. Within each company, electronic currencies have potential applications for cross-border transactions as well as other company-specific commercial applications. Industry trends, including company needs for competitive and financial innovation and advanced technology, and the industry-specific uses of electronic currencies for electronic money, influence the electronic currencies used for these cross-border transactions, though each company and cross-border transaction is unique with respect to these transactions.

A company is considering whether to use electronic currencies for an application in which electronic money is sent from one country to another. The company is thinking of requiring the currency transfer to be done through intermediating local electronic currencies using XRP as the bridging currency. The company has two concerns with respect to this plan: (i) uncertainty in the percentage costs of using XRP for these intermediating transfers, given the current price volatility of some electronic currencies; and (ii) dealing with the regulations regarding electronic and anti-money laundering (AML) laws of the international governments involved, including the US, in using XRP for the intermediating transfers.

Micropayments

It takes a first approach and trustee handling and trustee-based remedies can import zero marginal cost for transactions conditional on a medium and top-tier electronic money for other transactions. Transactions where no convenient medium is found — about half of all transactions in the U.S. in 2001 — are done with cash, but all-cash commerce is socially inefficient. Hence, consumers benefit from extending credit card payment capability, in effect, to micropayments. Regulatory economics gives a formula that aims to answer the pressing question: where does money come to fund trustee-based remedies? Specifically, what should be the optimal fee for the mandatory retail capital requirement and other monetary burdens? Additionally, by curbing fees, regulators can reduce underpayments and so nudge retail payments towards the high-deposit subgame putatively played by the welfare-maximizing monopolist bank, where the rate at which retail payments process deposits can be higher than the deposit rate.

As digital goods proliferate, the importance of small electronic payments known as micropayments grows. Because credit card fees greatly exceed the value of digital goods, and because no one wants to be charging bills for every small coffee purchase at a cybercafé and no one will be lugging quarters to the cybercafé, people have sought payment systems that can handle micropayments as easily as large payments. Although small, micropayments are important because they can process capital massively and move commerce as a whole into a more efficient mode. For example, consumers are likely to try out more software, movies, and music samples when doing so involves neither a complex sign-up process nor any payment, and sellers get more revenue from undistorted user choices. In practice, it has proved difficult to deploy a payment system that scales and that looks economically efficient.

CHALLENGES AND RISKS

To date, the majority of e-commerce activities have focused on the supplier side and have been providing proof of concept for new commercial and consumer applications. EPEGA is confident that there is a substantial market potential attached to e-money-intensive applications such as electronic government, e-learning and m-learning, access to scientific resources, or copyright-protected commercial video, film, and audio materials. It should be noted, however, that large-scale m-commerce can be largely replaced by e-commerce carried out by consumers over the WWW on their home desktop computers. Thus, the next generation of internet technologies, however called, should support e-commerce with seamless portable transactions based on electronic depositories that can be used at consumer and commercial sites with integrated security solutions.

With respect to market-based obstacles, the key finding is that electronic payment products will only gain acceptance with commercial end-users as soon as the products feature the same benefits and opportunities that are currently associated with the use of cash and current account-based instruments. EPEF is of the view that the future success of commercial e-money applications and the development of a critical mass of end-users will largely depend on the willingness and readiness of the legal and economic environment to offer benefits that users associate with e-money payments and costs that are at least partially paid by the end-users themselves.

As outlined in the previous sections, the analysis of the application prospects for all e-money schemes shows that there are certain potential applications where these schemes can facilitate commercial activities at the national, European, and international level. However, both e-money service providers and their customers are currently facing a number of regulatory, commercial, and security-related obstacles.

Regulatory Compliance

Considering the difficulties concerning a strict identification of the customers responsible for the units supply, which are controlled cash flow, and identification of the customer and banks when they get cash in exchange for the electronic currency or electronic currency units, financial authorities generally advise measures that allow the identification of the users, user licenses, and the record of all activities, when the commands were introduced and can be reviewed (for example, the first accessible cryptocurrency web page at the British Virgin Islands). Even though some financial authorities do not recognize the validity of electronic currencies, others introduce regulations that allow their activities. At that time, these rules have as their principal objective the coexistence between coins and paper monies already regulated as a means of exchange.

Since they are decentralized, and the telecommunication companies which offer them do not have information about other companies' customers, how can one customer trust the units issued by another company, which should be accepted for the payment of goods and services, if they have no control over the activities of a specific company that offers the electronic currencies? Since they are implemented directly in the customer's device and vary according to the user's choice and capacity, how can you prevent their supply from surpassing the traditional currency capacities, and thus causing the principal function of money, which is being a medium of exchange, to be prejudiced? What would be the necessary units availability guarantee, and who should offer such guarantee, the telecommunication companies that offer the electronic currencies, or the companies that accept these units as means of payment?

Identity is not directly linked to cash, since there is no record of who has it. With electronic currencies, who has the units is recorded, but the identities are intentionally anonymized. Since preventing money laundering is a key issue of any financial regulation, it is also necessary to implement laws which ensure the identification of the customers when exchanging electronic currency units for cash or for any other means of payment that are currently regulated. If new regulations were created expressing the control of a financial authority over electronic currencies, other questions also arise.

The traditional currencies are ruled by a specific authority. The central banks in a country control the currency supply and are responsible for many rules and regulations meant to ensure that they are accepted as means of payment. Electronic currencies are not controlled by any central authority, so it is not clear to whom these regulations apply, if these rules are still valid, if new regulations are necessary, or how telecommunication companies that offer them will properly identify the customers when exchanging them for traditional currencies.

Cybersecurity Threats

One of the most serious consequences of cyber incidents is the theft or loss of electronic money. Cybersecurity concerns all stages of transaction and payment processing and all elements of electronic money operating systems. Electronic pickpocketing and fraudulent transactions are carried out using the stolen credentials or personal information of electronic money holders. Private keys, QR codes, and mnemonic strings to access electronic wallets can be easily intercepted, and personal identification information embedded in the owner's computer or smartphone can provide access to cryptographic assets of the owner to the external attacker. These

methods allow criminals to mount Man-in-the-Middle (MitM) attacks. Since transactions with cryptocurrencies are normally irrevocable, once the transaction between at least one of the digital coin owners and a cybercriminal was registered, in-occe transactions made in the attacked block could not be reliably traced in the future of the attacked block.

Five categories of cybersecurity threats are associated with cryptocurrencies: 1. Thefts or losses of digital currencies. 2. An increased number of weaknesses or discovered cryptographic breakthroughs resulting from the constantly increasing number of digital financial transactions. 3. Methods of digital financial frauds based on current information technology vulnerabilities. 4. Weaknesses in the regulation of digital financial markets and businesses. 5. The peculiarities associated with blockchain technology, such as the irremovability of a verified record after adding it to a hacked block. For example, malware in the Amazon premium cloud-based web services in the blockchain has been digging digital currencies for a long time, while also infecting other users' local computers.

Volatility and Price Fluctuations

With the near universal use of just one clearing, payment, and store of value medium for all products, the potential for the horror of dramatic shifts in relative pricing of just those goods and services in most demand among world populations, and the ability to pay for them, frequent and impulsive enough to bankrupt all participants in a financial structure itself of course part of world commerce in the end, should not be underestimated.

Furthermore, the now common sight of month-to-month and day-to-day shifts of orders of magnitude across world and regional pricing structures of the same product do more than complicate the process of world trade. They retard and reverse the significant advances that have clearly been made in efficient logistics management and globally distributed production and warehousing in general. The solvency of all participants and their ability to somehow keep the wheels of world commerce turning day to day must be of paramount concern if they willingly take the risks we speak of above in order to benefit from their relative gains against their competitors.

The effect of a shifting 100% float of the U.S. dollar-based electronic currency, both within its own domain and indeed as commonly traded against official world currencies including the U.S. dollar itself, has been nothing short of catastrophic thus far and will likely worsen. But consequences aside, the clear emergence of an effective universal world currency from the world of electronic commerce can hardly be dismissed out of hand.

With the potential for significant variations in value, much additional work will be necessary to define how to deal with volatility in the trading of electronic currencies and how to mitigate the risks inherent in the currently unavoidable practice of converting between official world currencies and electronic currencies used in commercial transactions. Yet, the increased use of all world currencies, and in particular official world currencies, by electronic commerce and far greater acceptance of electronic rather than hard currency will invariably bring with it relative price stability. This itself would represent a far lower premium for carrying this form of currency risk for economies and merchants alike.

ADOPTION AND ACCEPTANCE

The most essential features of electronic currency are that it's fast, digital, and no physical evidence is needed to prove ownership. As demonstrated by Figure 1, the amount of e-money transactions between 2009 and 2014 grew 3.7 times and made 588 million transactions by 2014. As discussed in the previous section, one of the most essential aspects of a successful electronic money system is security, particularly privacy of the parties involved as well as the irrevocability of transactions. Currently, the largest companies that have adopted electronic money systems are eBay and Amazon. Moreover, they frequently cooperate with electronic money platforms like PayPal. Another important e-money activity is Japan's successful e-money model, where over 9 million satisfaction payment terminals are active and processing more than 78% of the transactions made in Japan. At the same time, there have been 4.6 million cards in circulation. In Japan, e-money is digitized yen and is thus known as e-currency. Due to the fact that cash is charged with various fees for every single transaction

made, a factor which is not the case with electronic money, Japan has experienced an easy path of e-money acceptance since their introduction in 2012.

Electronic money or electronic currency refers to money or currency that is conveyed with electronic technology. Conventional money has been remodeled into electronic money as digital encrypted value and is transferred from a paying entity (e.g. consumer) to the other receiving entity through electronic processes. Electronic money originally only referred to financial transactions over the internet, but with the development of card, mobile phone, and Internet of Things (IoT) technologies, the radius of usage of electronic money has rapidly expanded. Electronic money is most frequently issued by banks or other financial organizations through the deposit which the consumer kept in a bank account. In specific cases, electronic money could also be stored on cards, likewise where the money is stored in a client's mobile device and is backed up using one's credit card account as an auto load source.

Consumer Awareness and Education

Bitcoin has often been portrayed as a hacker currency or a criminal currency, attributing crimes and security flaws of other systems to Bitcoin. This perception is gradually changing, though, as governments, monetary authorities, big corporations, organizations, and prestigious people talk about it. Public perception shaping has already been observed with hackers, the internet, open source software, online banking, social networks, and contemporary consumer gadgets. However, this recently raised demand for Bitcoin as an investment vehicle opens a new category of misunderstandings which might alter the path from early adopters to the early majority phase of diffusion. This paper is a primer on digital currencies and blockchain technologies and tries to provide a practical guide for the first adopters who face some substantial risks in current implementations. DECISION has expressed its interest in providing a free security and risk workshop around digital currencies at a European scale.

The public awareness, and more importantly the misunderstanding, of electronic currencies can become a limiting factor to their adoption. People require a certain level of understanding and trust to use electronic money for their financial transactions. This is commonly known as the trust barrier and can be lowered by consumer awareness and education. The consumer has to know and have some understanding of the underlying technology, be convinced that the solution is sustainable and trustworthy, and also understand the economic motivation of the actors maintaining the network. In this section, we summarize the public misunderstandings related to Bitcoin and we discuss the currently available sources of information and educational materials.

Merchant Acceptance

Because of this difficulty, the list of businesses that accept an electronic currency is most often published on the internet by the owner of this currency. If this list is not freely available, the electronic currency would most likely fail in the long run. With the advent of Bitcoin and then cryptocurrencies, websites have been opened that allow users to group on a map or by city the businesses that accept an electronic currency for payment. These sites allow individuals around the world to locate the closest businesses they can use to pay for their purchases. Thus, the people who visit these sites can find the businesses that accept an electronic currency for payment in just a few clicks.

The success of an electronic currency depends, and will always depend, on its acceptance by people. If people are sure that businesses accept an electronic currency, they will certainly use it to pay for goods and services. Conversely, if a business is sure that customers will pay for goods and services using an electronic currency, the business will certainly accept this currency. Generally, potential users must have reliable information, which includes the list of businesses that accept the electronic currency as a means of payment. It is difficult for potential users to know all the businesses that accept an electronic currency, either by word of mouth or by direct mail.

Government Support

For successful profitable net-based selling and sustained proportionate net-based pricing on a global scale, the key interest of world governments is connected with the problems of security, suppression of fraud, crimes of

computer terrorism, theft, forgery, and unauthorized spreading. The European countries go further. The special report published by "The European Electronic Money Association (EEMA)" shows that the European government organizations currently continue rendering various methods to lower the barriers to successful implementation and profitable execution of electronic transactions. It grew out of a special agreement named the E-money directive, elaborated under the control of the states that are members of the European Union.

Currently, the main power and influence on net-based selling and purchasing processes comes from governments of world countries. State and international cooperation and technical regulation of electronic transactions are executively organized in the document published by the Organization for Economic Co-operation and Development and named "Guidelines for Consumer Protection in the Context of Electronic Commerce" (2000). Information about many governments' interests in and support for net-based schemes is published at, where the legal and commercial approaches for profitable sale and purchasing processes are analyzed.

CONCLUSION

To summarize, recent developments in internet commerce have highlighted the need for a complementary priced market mechanism for the trading of goods and services. This requirement generally refers to the issue of a centralized and coordinated medium to exchange value, and to record negotiation and trading activities, usually called currency. In the larger scale of things, a pricing mechanism is vital with the presence of external diseconomies, with search, information, and bargaining costs. Our conclusion is that there is a market for electronic currency whose objective is to settle transactions between electronic merchants, to replace the payment and collection services currently provided by the existing banking infrastructure.

This book provides an introduction to electronic currency and market mechanisms, where transactions are not only initiated, executed, and settled electronically, but where the payment and the medium of exchange is value in the form of a currency. As part of this, we have looked at the background of money in society, as well as introduced the payment processing industry and the novel approach of distributed, or peer-to-peer transactions.

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