

CURRENT ADOPTION STATE OF CRYPTOCURRENCIES AS AN ELECTRONIC PAYMENT METHOD

Zlatko BEZHOVSKI

*Faculty of Economics, "Goce Delcev" University, Stip, Macedonia
zlatko.bezovski@ugd.edu.mk*

Ljupco DAVCEV

*Faculty of Economics, "Goce Delcev" University, Stip, Macedonia
ljupco.davcev@ugd.edu.mk*

Mila MITREVA

*Faculty of Economics, "Goce Delcev" University, Stip, Macedonia
mila.mitreva@ugd.edu.mk*

Abstract

The original intention behind Bitcoin, the first decentralized cryptocurrency, was to serve as an electronic payment system allowing peer-to-peer transactions without the need for a trusted third party. Since its introduction in 2009, Bitcoin faced high volatility, performance issues, increased energy consumption, legality issues, criticism and ultimately slow adoption. Additionally, many new cryptocurrency projects arose to utilize the blockchain technology that enables transparent, trusted, fast, efficient, and secure transactions. All new cryptocurrencies, some complementing - some competing Bitcoin, face the same challenges, especially the slow adoption and therefore lag behind the current payment means in e-commerce as digital wallets, banking cards, bank transfers and even cash on delivery. In this paper we examine the current state of adoption of Bitcoin and the other cryptocurrencies as means of online payment. The main purpose of our research was to set a starting point for an additional research addressing the main issues for adoption of this promising technology

Keywords: digital currency, cryptocurrency, Bitcoin, blockchain, electronic payment

1. INTRODUCTION

First attempts to create digital currencies preceded Bitcoin. Projects like DigiCash in 1990, e-Gold in 1996, Liberty Reserve in 2006 and some others (Trautman 2014) didn't live long enough to see the light of the day. DigiCash, centralized in nature, can be considered as the first cryptocurrency (type of digital currency) since it used cryptography to protect the payments. Electronic payment systems as credit and debit cards (VISA, Mastercard), payment gateways (Apple Pay, Google Pay, PayPal) and digital wallets (Alipay, M-Pesa, WePay) could also be considered as some sort of electronic money (Fung, Molico and Stuber 2014) but they largely rely on the existing monetary system and can be perceived as digital representatives of the fiat currencies.

Bitcoin, that was introduced in 2009, as the first decentralized cryptocurrency (or shortly crypto) differs from previous digital currencies in a way that uses blockchain technology, what is a type of distributed ledger that stores encrypted, consecutive blocks of transactional data. The decentralization is one of its main features, what means that it's not controlled by a single entity, but by a larger number of participants, known as miners, who utilize own computing power to maintain the network. The Bitcoin's proof-of-work consensus (verifying of blocks) is proposed to enable secure digital cash, improve the double-spending problem that digital currencies face and in the same time to ensure trust in the system (Karame, Androulaki and Capkun 2012).

Since the blockchain is publicly hosted on a large number of nodes (participants), uses encryption (cryptographic hash) and keeps timestamped historical data it empowers transparent, auditable, secure, resistant to modification and trusted financial transactions. Although, opponents of cryptocurrencies argue that all these features are questionable (BIS 2018).

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The original idea proposed by Bitcoin's creator(s), known under the pseudonymous Satoshi Nakamoto, was to develop "an electronic payment system based on cryptographic proof instead of trust, allowing any two willing parties to transact directly with each other without the need for a trusted third party" (Nakamoto 2008). More than 10 years after its introduction, Bitcoin still hasn't fulfilled its original vision on all counts.

Meanwhile, thousands of new cryptocurrencies emerged. Currently there are more than 6000 different cryptocurrencies, traded on more than 300 specialized crypto exchanges (CoinMarketCap 2020). However, only 184 coins are traded on Binance (2019), one of the largest cryptocurrency exchanges. Some of these cryptocurrencies are trying to capitalize on Bitcoin's "flaws", some are introducing new features like smart contracts (coding instructions that self-execute under specified conditions) or revenue sharing, some focus on fast payments and P2P transactions, some emphasize anonymity, some improve on cross-border payments, some address the volatility issue and so on. Other use cases for blockchain technology besides digital money and payments include (not in scope of this research): storing value, interbank remittance, trading financial assets and instruments, safe data storage, supply chain management, supercomputing power, decentralized notary, digital identity, voting, crowdfunding, stock share issuing, insurance etc. (Zile and Strazdina 2018).

Currently, dominant worldwide payment methods for e-commerce, by volume, include digital wallets 41,8%, banking cards (credit and debit) 39,8%, bank transfers 9%, cash on delivery 4,5% (Clement 2020). These number may vary, more or less, by country or region. While there is no available data on exact percentage of the cryptocurrency share in online payment transactions there are estimations that in 2019 nearly \$4 billion in value of Bitcoin were sent to and from online payment processors (Popper 2020), what is a very tiny portion (around 0,1%) of the total \$3.5 trillion of retail ecommerce sales worldwide (Orendorff 2019). If we have in mind that cryptocurrency owners might use debit cards to spend cryptos (explained below), this figure may go a bit higher but it's still a small portion of the total pie.

While it is evident that adoption of the cryptocurrencies is steadily rising (as this research reveals), several challenges like volatility, legislation, energy consumption etc., keep Bitcoin and other cryptos from achieving their full potential. (Further research is needed to address the adoption issues and their possible solutions)

The adoption of cryptocurrencies as payment method involves several types of participants. The most prominent parties, besides the cryptocurrency projects themselves (that are abundant), are the companies that accept cryptocurrencies (merchants) and the customers (crypto owners) that use them to pay for goods and services. Third parties (supporting services) are also involved to facilitate the process, but if we have the original Bitcoin idea in mind, they are not essential or should be kept aside if possible. The governments, that impose legislation, also play crucial role in adoption, in positive or negative direction.

2. CRYPTOCURRENCY USERBASE

According to a Deutsche Bank research, the blockchain's adoption rate mirrors that of the Internet in its early years - although its actual user numbers are 10 times smaller. While, currently there are approximately 50 million blockchain wallet users there could be 200 million by 2030. (Laboure and Reid 2020)

The most recent data from Glassnode, a company that investigates the blockchains, reveals that number of Bitcoin and Ethereum non-zero addresses (that hold value) rise constantly. Bitcoin rose from 10 million non-zero addresses in 2017 to 31 million addresses in 2020, while Ethereum, the second largest cryptocurrency, rose from 10 million addressees in 2018 to 46 million in 2020 (Glassnode 2020) . It is important to note that number of wallets and addresses don't give us exact number of crypto owners since every user (individual or a company) can have none (if on exchange) or several wallets and addresses on the blockchain.

Another way to assess the potential userbase of cryptocurrencies is the number of traders on cryptocurrency exchanges. Estimations are that the number of crypto traders (on and off exchanges), reaches 56 million across the globe with average holdings of 0.04 BTC (around \$450) per user (Bucquet, Lermite and Jo 2019). The main goals of the crypto traders may not be online purchases, but they are active users of cryptocurrencies and may also decide, sooner or later, to spend their digital holdings for other purposes too.

According to a recent study done for ING (Table 1.), majority of the population in Europe, USA and Australia is aware of the existence of the cryptocurrencies (around 60% and above) but only less than 10% own them. If

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we rely on this survey, the cryptocurrency owners only in these regions near 100 million. Another important issue to note in this survey, while skepticism still prevails, is that up to promising 35% of the respondents believe in the future of the cryptocurrencies for online payments.

Table 1. Survey on cryptocurrency usage by customers

	Europe	USA	Australia
Have heard of cryptocurrencies:	66%	57%	70%
Own cryptocurrencies:	9%	8%	7%
Expect to own cryptocurrency in the future:	25%	21%	15%
Cryptocurrencies are the future of online spending:	35%	31%	18%
Would use cryptocurrencies to make and international payment online:	30% (From those who have heard of, own or expect to own Bitcoin)	/	/
Bitcoin only interests me as an investment:	~16% (Our assumption)		

Source: Adapted from ING International Survey (Exton and Doidge 2018)

The website Buy Bitcoin Worldwide (2020), using several sources, estimates that there are around 100 million Bitcoin holders of which only 400 thousand use Bitcoin on daily bases.

While owning cryptocurrencies does not necessarily mean that they would be used for payments a research that focuses on "Consumer Payment Choice" discover that in 2018 only 2% of USA customers used cryptos to pay for goods and services, what is more than a double rise from 0.6% in 2015 (Foster, Greene and Stavins 2019).

3. MERCHANTS ACCEPTING CRYPTOCURRENCIES AND CRYPTO PAYMENT SERVICES

The second part of the equation, if not more important, for the adoption of cryptocurrencies as means of payment are the merchants that accept, or are going to accept digital coins as exchange for their goods and services. Other cryptocurrency supporting services, like wallets, gateways and processors are also present to facilitate the process of exchange.

According to a research done by Zogby Analytics 36% of small business in USA accept cryptocurrencies as payment method while 59% of those companies purchased digital currency for their own use as well (Business Wire 2020). Among the well-known brands that accept cryptocurrencies are AT&T, Namecheap Overstock, Expedia, Badoo, Subway, Newegg, Shopify, Microsoft, Norwegian Air and more (Beigel 2020). In 2018, WeMakePrice, the largest South Korean e-commerce platform with annual turnover of \$400 million, started accepting 12 cryptocurrencies including Bitcoin, Ethereum, and Litecoin in collaboration with Bithumb, the country's largest cryptocurrency exchange (Young 2018).

Specialized payment gateways such as BitPay, Coinbase Commerce, CoinPayments, Ikajo International, PaySpacelv, Shopify Payments and others, offer checkout services for acceptance of cryptocurrencies for e-commerce websites (Mamonova 2020). The biggest cryptocurrency payment gateway BitPay in 2013 reached 10,000 merchants in their network (Lomas 2013) and in 2019 facilitated \$1 billion worth of transactions mostly in Bitcoin. Coinbase Commerce processed \$135 million worth of cryptocurrency payments in 2019, which represents a 600% increase from 2018 (Cuen 2020). Shopify and iKajo are among the first payment gateways to accept both, banking cards and cryptocurrencies within the same payment system. Common for all these payment gateways is that they tend to convert the cryptocurrencies in fiat currency instantly, if possible, in order to avoid financial loss if received cryptos depreciate.

BTCPay Server is a free and open source solution for merchants wanting to accept cryptocurrencies. There are (at least) 171 websites using BTCPay to accept payments and donations in crypto (BTCPay 2020). This

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open source solution seems insignificant having in mind the number of merchants using it, but it is important because eliminates the need of third party involved in the transaction what was one of the original purposes of Bitcoin.

Since the options to use crypto for online and offline purchases are still limited, users can instead obtain cryptocurrency supporting debit cards. The website Cryptowisser.com (2020) lists 36 debit cards issuers, mostly VISA and Mastercard, that support up to 87 different cryptocurrencies. The number of ATMs that support cryptocurrency exchange has grown from 1000 machines in 2017 to 9600 in September 2020 (Coinatmradar.com 2020). Projects like Swipe, Crypto.com and Spend Wallet enable storage of cryptocurrencies together with fiat money, with option to withdraw or spend them using Visa cards.

While Bitcoin (BTC) is still the most popular cryptocurrency for payments and ATM withdrawals, Bitcoin Cash (BCH), as 5th by market capitalization (CoinMarketCap 2020), has also incising acceptance with almost 7,000 locations accepting this currency (Bitcoin.com Maps 2020). The venues included in the map don't exclude the acceptance of other cryptocurrencies too. Nano (NANO), a fee-less, fast and highly scalable cryptocurrency, designed especially for online and in store payments, struggles to increase its adoption and list only 117 merchants that accept this crypto on usenano.org website.

According to the one of the most comprehensive crypto merchants listings, CoinMap.org (2020), there are over 19,639 venues worldwide that accept cryptocurrencies, including the ATM machines.

Regarding the reasons for acceptance of cryptos as payment means, retailers in The Netherlands answered that : 42% are accepting them to attract extra customers, 23% because their customers ask for it, 21% because are interested in new technologies, 7% for low transaction fees etc.. On the other hand, among the reasons for not-acceptance the leading is unfamiliarity with the crypto (58%), followed by lack of consumer demand (36%) (Jonker 2019).

All these figures and estimations about owners of cryptocurrencies, merchants, supporting services and turnover suggest that the adoption of cryptocurrencies as means of payment is still minor but there are notable and promising signs of growth. The rise of crypto debit cards and ATMs suggest that, in lack of more purchasing options, owners of cryptocurrencies have a need to withdraw and/or spend their possessions in cryptocurrencies, but these transfers and withdraws come with considerable fees. These fees can be avoided if the cryptocurrencies are used for purchases of goods and services directly from the merchants. So, it seems that even in the current state of adoption, merchants can further increase the use of cryptocurrencies for payments if they implement the available crypto payment systems while staying compliant with the legal requirements in the country(es) they operate.

4. CRYPTOCURRENCY LEGISLATION AROUND THE GLOBE

The third important component for the adoption of cryptocurrencies as payment methods is the legislation or the attitude of authorities towards use of cryptocurrencies. The main concerns of authorities regarding use of cryptocurrencies are to protect their citizens form financial loses and fraud, to prevent money laundering and financing illegal activities, should they recognize crypto as money or other type of asset, to ensure proper taxation and to regulate capital rising via initial coin offerings (ICO's) (The Law Library of Congress 2018).

The question of legality of the cryptocurrencies in different countries and their proper status and taxation is a complex matter and is out of the scope of this paper. Our research aimed to determine whether cryptocurrencies are legal or illegal to be used as means of payments in specific countries, especially in the leading economies in the world.

Regarding the legislation and legality, we can distinguish countries that regulate the status of cryptocurrencies and countries that leave this field unregulated. Not having specific regulations usually means that cryptocurrencies are not illegal in that country and need to be treated under the existing laws, but this status could rise concerns among companies and customers about current and future legality of use of cryptocurrencies including online payments. It also happens that the authorities only issue warnings about the risk associated when using cryptocurrencies what discourages and limits their use, what can be considered, in some cases, as an implicit ban (The Law Library of Congress 2018). It is also important to note that the matter

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of regulating cryptocurrencies is new, still not stable and definite, and changes in favor or against crypto may occur rapidly in any country.

Among many countries that don't specifically regulate cryptocurrencies are Turkey, Brazil and India. Countries that totally ban cryptocurrencies include Egypt, Pakistan, Iraq, Vietnam, Bolivia etc. Countries that don't recognize/forbid cryptocurrencies as means of payment include China and Russia, but they do not explicitly ban mining of cryptocurrencies.

On the other hand, there are countries that accept cryptocurrencies as means of payment as USA, EU, Japan, UK, Canada, Australia, South Korea etc. (Bajpai 2019; Reuters 2015; Wikipedia 2020). Usually these countries don't consider cryptocurrencies as legal tender (as money) but rather as commodity, asset, security, property or similar and therefore are subject of capital gain taxation what suggests that accepting cryptocurrencies as means of payment may require additional and complicated bookkeeping (Jayaraj 2020; Bitcoin Exchange Guide 2017).

It is evident that authorities are becoming aware of the unavoidable existence and the importance of the blockchain technology and the cryptocurrencies and therefore started to regulate their status and usage. However, while cryptocurrencies are mostly accepted as investment assets, the legislation is not favorable for accepting cryptos as means of payment since they are treated as commodity, asset or property what brings complexities with taxation and bookkeeping. Having this in mind, we can consider that one of the main barriers for adoption of cryptos as payment method is the unfavorable legislation across the globe.

So, instead of waiting for more favorable legislation, cryptocurrency creators and proponents of this technology could practice proactive approach and work together with regulators to address the legal issues and complexities in a more favorable way as Ripple (XRP) (Sharma 2020) and the Libra association are doing (Libra.org 2019). The Libra association changed its name to Diem association in December 2020.

5. CONCLUSIONS

Even a decade after the introduction of Bitcoin (the first decentralized cryptocurrency) and many other cryptocurrencies that promise to serve as peer-to-peer payment method also aiming to improve or even disrupt the current payment systems, the expected mass adoption seems still far away.

Our research aimed to investigate the current state of adoption through the number of cryptocurrency owners, available supporting services, merchants that accept cryptocurrencies, volume of payments and favorable legislation among the world's countries. While there is evident rise of cryptocurrency owners (~10%), supporting services and merchants that accept cryptocurrencies, the share of crypto payments in e-commerce with less than 1% is still negligible. Additionally, the current legislation globally seems unfavorable to use cryptocurrency as means of payment and further limits their use.

On the other hand, the currently dominant electronic payment systems (wallets, cards, bank transfers) seem stable and fully functional. Anyway, they also have some perceived weaknesses that, as the proponents of the cryptocurrencies believe, could be bypassed using the blockchain technology.

Having in mind the current circumstances and the perceived potential of the blockchain technology, several questions arise: Are cryptocurrencies here to stay as means of payment? Are they going to take significant market share? Are they going to disrupt the current monetary system and/or other industries? Is the current banking system going to transform in order to prevent disruption? Are the other applications of the blockchain technology more justifiable than the payment processing function? While all these questions may direct the future studies in this field our next intention is to research the main issues for adoption of the cryptocurrencies as online payment means and their possible solutions.

REFERENCES

Bajpai, P. (2019, May 9). Countries Where Bitcoin Is Legal & Illegal (DISH, OTSK). Retrieved September 4, 2020, from <https://www.investopedia.com/articles/forex/041515/countries-where-bitcoin-legal-illegal.asp>

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- Beigel, O. (2020, April 27). Who Accepts Bitcoin as Payment? Retrieved September 4, 2020, from <https://99bitcoins.com/bitcoin/who-accepts/>
- Binance. (2019, December 31). Binance 2019: Year in Review. Retrieved September 4, 2020, from <https://www.binance.com/en/blog/418708327988203520/Binance-2019-Year-in-Review>
- BIS. (2018). Annual Economic Report June 2018. Bank for International Settlements. Retrieved September 4, 2020, from <https://www.bis.org/publ/arpdf/ar2018e.pdf>
- Bitcoin Exchange Guide. (2017, December 8). Bitcoin Taxes – Asset, Commodity, Property Or Capital Gains Income? Retrieved September 4, 2020, from <https://bitcoinexchangeguide.com/bitcoin-taxes/>
- Bitcoin.com Maps. (2020). Find Stores That Accept Bitcoin Cash near You - Bitcoin.com. Retrieved September 3, 2020, from <https://map.bitcoin.com/>
- BTCPay. (2020). Merchants, projects and organizations using BTCPay Server. Retrieved September 3, 2020, from BTCPAY directory: <https://directory.btcpayserver.org/>
- Bucquet, P., Lermite, M., & Jo, A. (2019). How many active crypto traders are there across the globe? (Updated). Study, CH & Co.
- Business Wire. (2020, January 25). HSB Survey Finds One-Third of Small Businesses Accept Cryptocurrency. Retrieved September 4, 2020, from <https://www.businesswire.com/news/home/20200115005482/en/HSB-Survey-Finds-One-Third-Small-Businesses-Accept>
- Buy Bitcoin Worldwide. (2020). How Many Bitcoin Users Are There? Retrieved September 2, 2020, from <https://www.buybitcoinworldwide.com/how-many-bitcoin-users/>
- Clement, J. (2020, April 20). Global e-commerce payment methods 2019, by share of transaction volume. Retrieved September 4, 2020, from <https://www.statista.com/statistics/348004/payment-method-usage-worldwide/>
- Coinatmradar.com. (2020). Bitcoin ATM Installation Growth. Retrieved September 3, 2020, from <https://coinatmradar.com/charts/growth/>
- Coinmap.Org. (2020). Crypto ATMs & Merchants of the World. Retrieved September 3, 2020, from <https://coinmap.org/view/#/world/38.41055825/14.41406250/2>
- CoinMarketCap. (2020). Top 100 Cryptocurrencies by Market Capitalization. Retrieved September 2, 2020, from <https://coinmarketcap.com/>
- Cryptowisser. (2020). Cryptocurrency Debit Card List with 30+ Debit Cards. Retrieved August 15, 2020, from <https://www.cryptowisser.com/debit-cards/>
- Cuen, L. (2020, February 3). Bitcoin Usage Among Merchants Is Up, According to Data From Coinbase and BitPay. Retrieved September 4, 2020, from <https://www.coindesk.com/bitcoin-usage-among-merchants-is-up-according-to-data-from-coinbase-and-bitpay>
- Exton, J., & Doidge, F. (2018). Cracking the code on cryptocurrency - ING International Survey Mobile Banking – Cryptocurrency June 2018. Ipsos.
- Foster, K., Greene, C., & Stavins, J. (2019). The 2018 survey of consumer payment choice: Summary results. Federal Reserve Bank of Atlanta, Research Data Reports.
- Fung, B., Molico, M., & Stuber, G. (2014). Electronic money and payments: Recent developments and issues. Tech. rep., Bank of Canada Discussion Paper.
- Glassnode. (2020). Glassnode Studio - On-Chain Market Intelligence. Retrieved September 2, 2020, from <https://studio.glassnode.com/metrics>

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- Jayaraj, D. (2020, April 14). Can We Accept Bitcoins as a Payment Method in India? What Is the Legality Involved in It? Retrieved September 4, 2020, from <https://www.quora.com/Can-we-accept-bitcoins-as-a-payment-method-in-India-What-is-the-legality-involved-in-it/answer/Divyanth-Jayaraj>
- Jonker, N. (2019). What drives the adoption of crypto-payments by online retailers? *Electronic Commerce Research and Applications*, 35, 100848.
- Karame, G. O., Androuraki, E., & Capkun, S. (2012). Double-spending fast payments in bitcoin. Proceedings of the 2012 ACM conference on Computer and communications security, (pp. 906–917).
- Laboure, M., & Reid, J. (2020). The Future of Payments - Part III. Digital Currencies: the Ultimate Hard Power Tool. Research, Deutsche Bank.
- Libra.org. (2019). Libra White Paper | Blockchain, Association, Reserve. Retrieved September 16, 2020, from <https://libra.org/en-US/white-paper/>
- Lomas, N. (2013, September 16). BitPay Passes 10,000 Bitcoin-Accepting Merchants On Its Payment Processing Network. Retrieved September 4, 2020, from <https://techcrunch.com/2013/09/16/bitpay-10000-merchants/>
- Mamonova, Y. (2020, April 9). Top 7 bitcoin payment gateways for merchants in 2020. Retrieved September 4, 2020, from <https://ikajo.com/blog/top-7-bitcoin-payment-gateways-merchants>
- Nakamoto, S. (2008). Bitcoin: A peer-to-peer electronic cash system. Tech. rep., Manubot.
- Orendorff, A. (2019, February 18). Global Ecommerce Statistics and Trends to Launch Your Business Beyond Borders. Retrieved September 4, 2020, from <https://www.shopify.com/enterprise/global-ecommerce-statistics>
- Popper, N. (2020, January 28). Bitcoin Has Lost Steam. But Criminals Still Love It. Retrieved September 5, 2020, from <https://www.nytimes.com/2020/01/28/technology/bitcoin-black-market.html>
- Reuters. (2015, October 22). Bitcoin Currency Exchange Not Liable for VAT Taxes: Top EU Court. Retrieved September 4, 2020, from <https://www.reuters.com/article/us-bitcoin-tax-eu/bitcoin-currency-exchange-not-liable-for-vat-taxes-top-eu-court-idUSKCN0SG0X920151022>
- Sharma, R. (2020, June 25). Why Does Ripple Want More Government Regulation? Retrieved September 4, 2020, from <https://www.investopedia.com/news/why-does-ripple-want-more-government-regulation/>
- The Law Library of Congress. (2018). Regulation of Cryptocurrency Around the World. Report, Library of Congress. Retrieved September 5, 2020, from <https://www.loc.gov/law/help/cryptocurrency/world-survey.php>
- Trautman, L. J. (2014). Virtual currencies; Bitcoin & what now after Liberty Reserve, Silk Road, and Mt. Gox? *Richmond Journal of Law and Technology*, 20(4).
- Young, J. (2018, January 29). South Korea's Largest ECommerce Platform Is Integrating Bitcoin. Retrieved September 5, 2020, from <https://www.ccn.com/south-koreas-largest-e-commerce-platform-integrating-12-cryptocurrencies-including-bitcoin/>
- Zile, K., & Strazdina, R. (2018). Blockchain use cases and their feasibility. *Applied Computer Systems*, 23, 12–20.