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Review Article

ONLINE PAYMENT SYSTEMS FOR E-BANKING AND BLOCKCHAIN TECHNOLOGY

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Abstract

Technology plays a significant role in the area of development of new methods of payment and settlement. Banking and financial systems are closely linked to information and communication technologies. In general, the existence and functioning of virtual banks and the usage of Internet is part of developed countries practice. In this paper we attempt to throw light on the advantages of E - payments and E-banking as innovative products so as the costumers tend to benefits more from them. In the near future the traditional banking services will be completely replaced with electronic banking services. Blockchain technology as undeniably ingenious invention will change the way payments are conducted and fulfilled.

The aim of this study is to analyze the potential impact of Blockchain technology and its rapidly growing development. The Blockchain technology and cryptocurrency provides a large field for the implementation of new ideas in new areas and provide new solutions for consumers worldwide. Thus, it is quite possible to suppose that Blockchain technology will shortly become one of the important components of many areas.

Keywords: online payment systems, Blockchain technology.

1. Introduction

Every year electronic payment systems reach a new stage of development. The issue of payment through open networks has become important due to the rapid growth of electronic commerce in the last decade. Electronic payment systems should provide people with the necessary infrastructure to facilitate payments. (Lukina & Dolgachev, 2018)

Conventional banking system is being replaced by electronic based business models. Thus, banks practically are rethinking the business process plan and design and the relationship management strategies with the costumers.

E- banking provide a new delivery mechanism for the banks in reaching the costumer.

Today online payment systems have become entire part of trade and entrepreneurship.

Online banking which provides various Internet E-channels to use banking services i.e. ATM, credit card, debit card, Internet banking, mobile banking, electronic fund transfer, electronic clearing services. (Mathiraj & Saroja Devi, 2018)

The Blockchain technology and cryptocurrency provide a large field for the implementation of new ideas in new areas and provide new solutions for consumers worldwide.

People have a general, open attitude towards online payment systems. They are free and positive towards integration of technology and payment. Thus, a descriptive study with respect to online payment systems and Blockchain technology will help to understand the areas where the major pillar is lagging behind. The study attempts to throw light on the areas where the system has quite advantages so as the costumers tend to benefits more from it.

2. Online payment systems for E-banking

Payment systems play important role in improving financial intelligibility and stimulating business growth and consumption.

How successful a banking system would be depends on the quality and efficiency of clearing system of the industry. Online payments system is one of the major pillars for a successful E-commerce system. A lot of payment options are available for a costumer who associates himself with E-commerce activities. Two major categories of payment options for E-commerce are Cash on Delivery and online payments. Online payment system is an umbrella term and includes a wide variety of payment methods ranging from credit/debit cards to mobile wallets.

As far as the costumer is concerned both these payment options will have their own benefits and drawbacks. E-payment systems are said to be true to the spirit of E-commerce as there is no 'real' transaction taking place

If we take a global look, the technological advancements have changed this system drastically. It is evident that Information Technology recently contributed on improving the financial system worldwide. Due to fast transactions, comfort, time saving and appealing sale's promotional offers the online payment has been used widely these last years.

On the other hand, there are various transactional issues and non- transactional issues such as discomfort of the users. However, despite the numerous advantages and disadvantages, the future for online payment looks bright and promising.

This is especially true in case of small cities and countries, such as North Macedonia where online payment and E-banking are still new or slightly used. The common reason is that consumers are less familiar with these kinds of methods and often more skeptical towards it.

The main reason why people would choose Cash on Delivery option of payment rather than online payment system is the safety and security of the environment. Among the various online payment systems, people find higher degree of acceptability for debit cards and E-banking. These are some proven facilities, though not error free, of online payment.

Though most people have not encountered any risks or problems while doing online payments, there are still people who feel and believe that E-payment systems are not fool-free. They think that there are flaws in the existing technologies and believe that the security aspect needs to be improved along with general easiness of accessing the facilities. Server issues and double payments are the most occurred glitches when considering online payments. Still, it will take more time for online payment systems to supersede Cash on Delivery as a preferred method in the market, while E-banking and E-wallets need to prove their suitability and adaptability to find breakthrough in the market.

In a world full of Internet technologies and new inventions of course are expected a lot of challenges. In addition, the financial industry lately has faced a various number of challenges concerning trust, reliability, and value.

Nowadays consumers and businesses are seeking alternative options for their wealth and transactions. Wherefore, traditional banking is now considered as outdated and somewhat unreliable.

There have been many predictions that in the near future virtual currency will replace the real money. Virtual currency is known as cryptocurrency and has number of advantages. It exists only in a form of information stored on a physical medium.

As a result, Blockchain technology and cryptocurrencies have disrupted the industry entirely. It has completely transformed the business of large financial institutions, retailers, and international businesses, changing the way payments are conducted and fulfilled. (Celine & Shawn, n.d.)

Although the cryptocurrency is ruling the online world, it has been poorly used for daily payments and purchasing. Because a number of complications with regulation and trust, consumers avoid using virtual currency for everyday needs.

E-banking is electronic payment system that allows bank clients and financial institution to perform financial transaction on the bank website. The origins of the E-banking dates back to 1981 in New York where four big banks Citibank, Chase Manhattan, Chemical and Manufacturers Hanover began with E-banking services through videotext system.(Cronin , 1997) This was a failed attempt without any success at that time. However, this system become popular in Europe, mainly France and UK where the telecom provider Minter (France) and Prestel (UK) were offering this system.(viewdata.org , n.d.) This system was based on Prestel. Stanford Federal Credit Union was the first financial institution that offered E-banking to its clients in October 1994.(sfcu.org , 1995)

M-banking is new branch of E-banking that developed rapidly in the past few years. E-banking is experiencing dramatic increase, especially in the well developed countries, and this is partially due to M-banking. (Pew Research Centre, 2020) Research shows that 61% of the Internet users do online banking whereas 35% of the cell phone owners use mobile banking.(Pew Research Centre , 2013)

3. Blockchain technology

The Blockchain is an undeniably ingenious invention – the brainchild of a person or group of people known by the pseudonym, Satoshi Nakamoto. But since then, it has evolved into something greater. By allowing digital information to be distributed but not copied, Blockchain technology created the backbone of a new type of Internet. (Rosic, 2016)

Blockchain is a special technology for peer-to-peer transaction platforms that uses decentralized storage to record all transaction data. The first Blockchain was developed in the financial sector to serve as the basis for the cryptocurrency “Bitcoin”.

Bitcoin is an untouchable virtual currency, it is not a fiat money and can be used as a kind of payment system, namely for purchases in online stores.

The process of transferring Bitcoins from one owner to another is the process of transferring encrypted data. Furthermore, Bitcoin is based on Blockchain and it is important that this technology ensures a wide domain for the implementation of new ideas in new areas.

Blockchain is a technology that enables so-called “peer-to-peer” transactions. With this type of transaction, every participant in a network can transact directly with every other network participant without involving a third-party intermediary. (Hasse & Hillebrand & Smole, 2016)

Blockchain is built according to specific rules and represents chain of transaction blocks.

The transaction block is a special structure which records a group of transactions in the Bitcoin system and similar ones.

Blockchain is a chain of data blocks, where each block is associated with the previous one. The block contains a set of records. And new blocks are always added strictly to the end of the chain. This chain is built on three principles: (Lukina & Dolgachev, 2018)

Distribution \Rightarrow Openness \Rightarrow Security.

Every user of the block system from a network of computers has a copy of the Blockchain data.

In general, this is a full copy of all the blocks. The user basically can store only the needed data on a particular computer.

In principle, all the Blockchain data are always open for everyone. The blocks and their content can be easily read by the user. Also, the user can see all the records in the block, look at the chain and actually track the change of information. Hence, the users do not need to trust other network members because all the data in the Blockchain can be always checked and easily verifiable. So, the answer is reliable and guaranteed.

Blockchain system protects their user and data by using encryption. Thanks to this widely used technology, users receive authenticity and freedom outright, even they mistrust other participants moreover their malicious intent.

Fortunately, cybersecurity provides lower probability of hacking by utilizing advanced cryptographic methods. This method ensures no interruption of the data in the interim period, check the data transmission and detect that the data came from the right source, despite the fact that the main register of Blockchain is public.

Thus, by having no intermediaries in its operations make the Blockchain system more secure, less possibility of hacking and also makes corruption impossible.

So, the more common Blockchain technology becomes, the lower chances of hacking.

A block in the Blockchain consists of a header and a list of transactions. The master data is stored in the header, which includes its hash, hash of the previous block, as well as transaction hashes and additional overhead information. (Lukina & Dolgachev, 2018)

Traditionally, international enterprises face high banking fees and time delays due to physical distance. However, Blockchain can improve cross-border payments by offering added security, higher transfer speed, and lower conversion fees. Such payments can be further supported with smart contracts, adding more certainty for the sender and receiver. (Celine & Shawn, n.d.)

Many businesses are following the new trend of utilizing Internet of Things or IoT. This IoT device provides more efficiency and accuracy for their business operations. In these terms, Blockchain has the capability to work with IoT devices to track payment histories and automatically fulfill invoices and payments.

Tracking accounts and numerous business deals is quite difficult for big companies and also cost them financially. Blockchain transaction model can deliver huge cost reductions and make processes more efficient, all within a short length of time by speeding up the process of accounts payable and receivable with its immediate ledger update and accuracy of information, especially for insurance companies and vendors.

When it comes to the practical application of Blockchain technology, by far the most progress has been achieved in the financial sector. In finance, unlike in other industries, Blockchain solutions are not only used and developed by small communities but also by established players, e.g. international commercial banks. (Hasse & Hillebrand & Smole, 2016)

Relating to privacy and security of Blockchain, the Blockchain technology offers storage for private client information that cannot be manipulated unless every participant of the chain approves of the modification, thus creating a higher level of security.

Due to these advantages and operational benefits, the Blockchain technology has been implemented by large institutions such as Mastercard and Visa. Blockchain is mainly utilized in their data storage, cross-border transactions, and payment system.

A cryptocurrency wallet is a software program or a hardware device that allows sending, receiving and storing of a specified cryptocurrency. Powered by Blockchain, these innovative wallets store the private keys and public addresses of a user, making accessing funds on the Blockchain relatively simple. Essentially, a cryptocurrency wallet is a bank account minus the bank. It doesn't rely on a single financial institution, making the user free from the complicated, difficult constraints and restrictions related to traditional banking.

Blockchain technology contains the following concepts: (Lewis, 2018)

- This technology keeps data, serving as a data-base and their change.
- Reflects and shares the information into a network of computers in real time.
- Offers the function option “peer-to-peer” eliminating the need for a possible intermediary.
- Offers cryptographic methods such as digital signatures that prove the ownership and authenticity as well as hash codes as reference for realized transactions.

Blockchain as a technology can be public where everyone has access and private where the access is limited to certain individuals. There is also a consortium type which is used as a co-operation and in coordination with institutions or other junctions.

The blocks within the Blockchain technology consist of parts of digital information that actually contain three key elements. One is that blocks contain information regarding the transactions i.e. date, time and amount. Secondly, blocks contain information of the participants of the transaction. And thirdly, blocks contain info that differs from other blocks in this case every block contains a unique code called “hash” that makes it different and noticeable from other blocks. Every block contains info of approximately 1 megabyte storage. (Blockchain, n.d.)

Blockchain technology has to do with the “block” that refers to digital information that is being stored in a data base, in this case known as “chain”. (Gates, 2017)

3.1. Advantages of the Blockchain technology: Blockchain technology as a new technology, without doubt it has its own strong and weak points concerning its implementation. Main advantages of Blockchain technology are:

- Accuracy of transactions – in the process of verifying transactions through Blockchain technology, the factor of human error is eliminated. This process is being carried out by thousands or millions of computers, resulting in making less errors and doing it with high accuracy and un-changeability.(Treiblmaier & Beck , 2018)
- Reducing costs – Since the Blockchain technology eliminates the need of a third party mediator verification, this leads also to the elimination of costs for the realization of particular transactions.(Gates, 2017)
- Decentralization – Blockchain technology does not keep the information in any central location, hence it copies the same and spread them to the network of computers. When a block is added to a chainblock, every computer updates its own Blockchain in regards to reflecting the changes being made. This way of keeping the data makes difficult manipulation to occur.(Gates, 2017)
- Efficiency of transactions – Contrary to the transactions that are being made through central authority and which need more time for their verification, the transactions made by Blockchain technology can be done in minutes.(Gates, 2017)
- Anonymity and privacy of transactions – Although Blockchain technology operates as a public base of data, means that everyone with a computer and an Internet can see the historic list of transactions realized by this technology, still no one can access the info relating to the

user of the transactions, all this leading to keeping anonymity and confidentiality of clients safe.(Treiblmaier & Beck , 2018)

- Safety of transactions – After a transaction is being logged in a Blockchain technology it has to be verified its authenticity. Thousand and millions of computers attempt to confirm the transaction with exactness. After the computer confirms the transaction, information is added to Blockchain in form of a block. Every block in the Blockchain, possesses its hash identity with the previous block hash. Here we see the inability to change or correct the data in a block.(Gates, 2017)
- Transparency at work – Although the personal information in a Blockchain are kept private, the nature of Blockchain technology is open-source. And this way of functioning makes it harder to misuse the information. (Gates, 2017) It is hard to attempt to change data in and not to be seen from the users of millions of computers in Blockchain technology. (Treiblmaier & Beck , 2018)

4. Blockchain technology and business

With the technology boom, the field of cryptography is developing enormously, thus leading to the applying Blockchain technology in various types of projects and social aspects. Blockchain as decentralized register for realization and evidencing transactions through the peer-to-peer network is finding place from day to day in various business industries.

By using this technology, participants – businesses can confirm their transactions without an authorized central certificate.

The concept of Blockchain technology and decentralized register is a clear indicator that the world is ready to transform itself into another level of digitalization and development of technology. This technology is being widely used in the field of transfer of financial means, trade relations, elections, and other fields where the locomotive are the businesses in all forms.

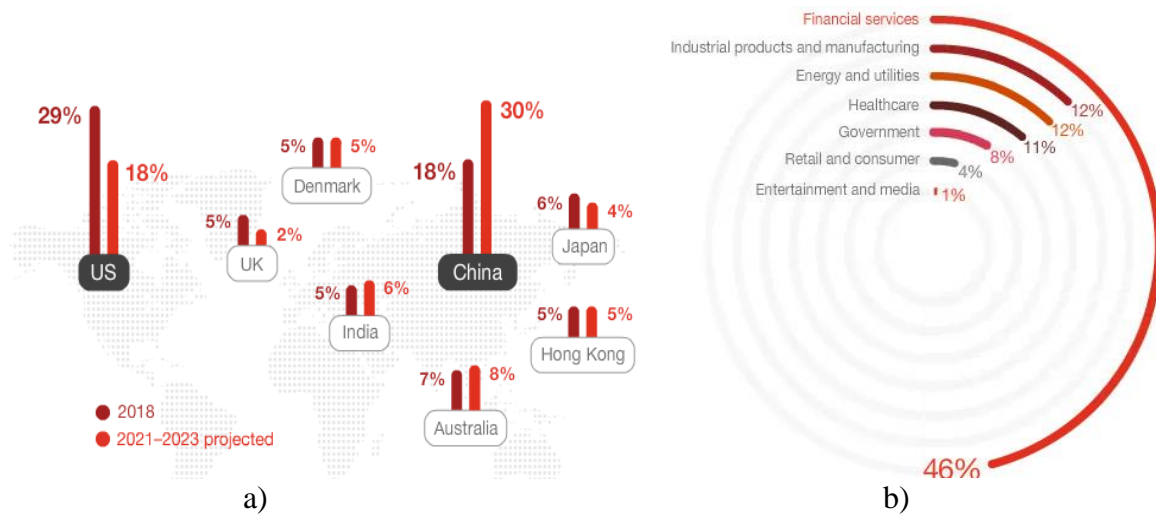
Today we are witnessing the revolution of Blockchain technology in the manner of the function of many social processes including the process of governing and doing business.

Lately, new eco-systems develop new solutions based on Blockchain technology for the purpose of creating innovative business models and to avoid traditional models of business. This happens in almost every industry especially in the developed economies.

This is ascertained from the research (Deloitte's 2019, 2019) conducted from Deloitte, pointing out the whole potential of Blockchain technology that can be applied in various businesses for the purpose of improving economic results.

Financial technology company FinTech remains the leader in applying Blockchain technology. But, other organizations of different sectors like the sector of technology, media, telecommunications, medical, governing and administrative, enlarge and diversify their initiatives on behalf of this technology.

There are many countries in the world applying Blockchain technology in their social systems. As an illustration and comparing look the chart below, where we see that world leaders on applying this technology in operations of socio-economical systems are China and United States of America.



Graph. 1 a) Countries with advanced Blockchain technology, b) Which industries are seen as leaders in Blockchain¹²

Despite functionality, effectiveness and efficiency of Blockchain technology, positive and negative sides bear the challenge of the application of this technology in many spheres and social systems, such as:

Blockchain technology and banking – It seems that banking industry is by far the one that benefits mostly by the use of Blockchain industry. This technology can be applied in the banking industry by posing real potential for selected services in transactions between banks that intends to replace SWIFT service, making it more efficient in reducing the transaction costs. For example if banking system works eight hours a day and five days a week, and if we deposit a check in a bank and want to draw a sum from the bank, we need to wait for a couple of days for the transaction to take place. This is not the case with Blockchain technology. Customers can realize their transaction in minutes no matter the hour or day. Through this technology, banks can easily realize transfers between different institutions in a fastest and safest way.

5. Conclusion

Technology has arguably made our lives easier and online payment is one of the technological innovations in banking and finance. (Mathiraj & Saroja Devi, 2018) While analyzing and comparing various modes of online payment systems we conclude that they are quite similar but differ from each other with some very small details. Online payment refers to financial transactions electronically and they provide huge freedom to individuals. There are a lot of advantages of online payment systems such as time saving, avoiding long lines, they are available whichever time of the day, easy access to information 24 hours, quality customer service, online application and reduce pepper work.

Recently the Blockchain technology and cryptocurrency provides a large field for the implementation of new ideas in new areas and provide new solutions for consumers worldwide. Undeniably it is going to change the payment methods even though true innovation comes in many shapes. Probably, this idea sounds contemplative, but nonetheless this technology development is rapidly growing. Thus, it is quite possible to suppose that Blockchain technology

¹²<https://www.pwc.com/gx/en/issues/blockchain/blockchain-in-business.html>, access 25.03.2020

will shortly become one of the important components of many areas. It will dominate not only the economy but other areas of activity as well. It is not a wonder that we will find Blockchain utilized even in politics, such as unforgettable election results.

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