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THESIS WORK

Theme: «Organizational and economic aspects of introduction of new technology in the financial sector of Kazakhstan Republic»

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ABSTRACT

Keywords: New technology, Banking sector, Digitalization, Blockchain technology, Distributed ledger technologies (DLT), Digital platforms, Remittances, Cross-border payments, Intermediary Banks

Today the banking sector is competitive, stable with a convenient and attractive product line that meets the needs of customers, both individuals and corporate clients. Particular attention is paid to the innovative trends by modern leading banks from around the world to optimize existing processes, improve existing products and services, risk management systems, maintain a strong position in post-crisis situation, transforming traditional Bank into a digital one. Because of these factors, competition is conducted between commercial banks to preserve each client and, of course, attract a new one. Financial markets witness a rapid change in 2017. As technology advances, it affects business models in financial sector and how people attain financial services. One term is on everybody's lips: Blockchain, which stands for the dynamic industry in the intersection of finance and technology [1, P.3]. It is also described as a new type of financial service industry (Albert Isola, 2016), which has the main functional principles as transparency of transactions with the inability to change them by persons who do not have authorized access to it, cost reduction and high security against hacker attacks and especially it optimizes the process of cross border payments. It is possible that the blockchain technology will become the top economic layer of the organically connected world of various computing devices, including portable computing devices, "Internet of things", smart phones, tablets, laptops, smart houses, smart cars and a smart city [2, p.14]. The purpose of this thesis is to consider the use of block technology on the example of developed countries to enhance and ensure the competitiveness and economic potential of the financial sector of Kazakhstan in the world community, as well as the quality of life of the population through progressive development by digitizing the financial ecosystem, having obtained valuable data from the results of the study.

АННОТАЦИЯ

Ключевые слова: новые технологии, банковский сектор, цифровизация, технология Blockchain, технологии распределенных бухгалтерских книг (DLT), цифровые платформы, денежные переводы, трансграничные платежи, банки-посредники

Сегодня банковский сектор является конкурентоспособным, стабильным с удобной и привлекательной линейкой продуктов, которая отвечает потребностям клиентов, как частных лиц, так и корпоративных клиентов. Особое внимание уделяется инновационным тенденциям современных ведущих банков со всего мира для оптимизации существующих процессов, улучшения существующих продуктов и услуг, систем управления рисками, сохранения сильной позиции в посткризисной ситуации, превращения традиционного банка в цифровое. Из-за этих факторов конкуренция между коммерческими банками проводится для сохранения каждого клиента и, конечно же, привлечения нового. На финансовых рынках наблюдаются быстрые изменения в 2017 году. По мере развития технологий это влияет на бизнес-модели в финансовом секторе и на то, как люди получают финансовые услуги. Один термин относится ко всем устам: Blockchain, который выступает за динамичную индустрию на пересечении финансов и технологий [1, с.3]. Он также описывается как новый тип индустрии финансовых услуг (Albert Isola, 2016), который имеет основные функциональные принципы как прозрачность транзакций с невозможностью изменить их лицами, которые не имеют санкционированного доступа к нему, снижения затрат и высокой безопасность от хакерских атак и особенно оптимизирует процесс трансграничных платежей. Возможно, что технология blockchain станет главным экономическим слоем органически связанного мира различных вычислительных устройств, в том числе портативных вычислительных устройств, «Интернет вещей», смартфонов, планшетов, ноутбуков, умных домов, умных автомобилей и умного города [2, с.14]. Целью этого тезиса является рассмотрение использования блочной технологии на примере развитых стран для повышения и обеспечения конкурентоспособности и экономического потенциала финансового сектора Казахстана в мировом сообществе, а также качества жизни населения посредством прогрессивного развития путем оцифровки финансовой экосистемы, получив ценные данные из результатов исследования.

АҢДАТПА

Түйінді сөздер: Жаңа технологиялар, Банк секторы, Сандық теңдестіру, Blockchain технологиясы, Дистрибутивтік технологиялар (DLT), Сандық платформалар, Ақша аударымдары, Трансшекаралық төлемдер, Делдалдық банктер.

Бүгінде банк секторы бәсекеге қабілетті, тұтынушылар, жеке және корпоративтік клиенттердің қажеттіліктеріне жауап беретін ыңғайлы және тартымды өнім желісімен тұрақты. Дәстүрлі банкті сандық түрге айналдырып, дағдарыстан кейінгі жағдайды ұстап тұру, бар өнімдер мен қызметтерді жетілдіру, тәуекелдерді басқару жүйелерін жетілдіру, қолданыстағы процестерді оңтайландыру, әлемдегі заманауи жетекші банктердің инновациялық үрдістеріне ерекше көңіл бөлінеді. Осы факторлардың арқасында, әр клиентті сақтау үшін коммерциялық банктер арасында бәсекелестік жүріп жатыр және, әрине, жаңа тарту. Қаржы нарығы 2017 жылы тез өзгеріп отырады. Технологияның жетістігі ретінде ол қаржы секторындағы бизнес үлгілерге және адамдар қаржылық қызметтерге қалай қол жеткізеді. Бір термин әркімнің тілінде: Блокчаин, ол қаржы мен технологияның қиылысында динамикалық индустрияны білдіреді [1, б.3]. Сондай-ақ, қаржылық қызмет көрсету саласының жаңа түрі (Albert Isola, 2016), ол негізгі функционалдық принциптері болып табылады, олар онымен рұқсат етілмеген тұлғалармен оларды өзгерту мүмкін еместігі бар транзакциялардың ашықтығы, шығынды азайту және жоғары хакерлік шабуылдардан қорғану, әсіресе трансшекаралық төлемдер процесін оңтайландырады. Blockchain технологиясы әртүрлі есептегіш құрылғылардың, соның ішінде портативті есептегіш құрылғылардың, «заттардың интернеті», смартфондардың, планшеттердің, ноутбуктердің, смарт-үйлердің, смарт-машиналар мен смарт-қаланың ең ірі экономикалық қабаты болады. 2, б.14]. Диссертациялық жұмыстың мақсаты Қазақстанның қаржы секторының бәсекеге қабілеттілігі мен экономикалық әлеуетін әлемдік қоғамдастықта жақсарту және қамтамасыз ету үшін, сондай-ақ халықтың өмір сүру сапасын арттыру арқылы дамыған елдердің мысалында блоктық технологияларды пайдалануды қарастыру болып табылады. зерттеудің нәтижелерінен құнды деректерді алған қаржылық экожүйені цифрлау арқылы прогрессивті даму.

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DEFINITIONS

Below are listed the most important concepts mentioned in the research study. More detailed information is given in the following chapters. First of all, it is necessary to take into account the use of term "**Innovation",** which can be defined simply as a "new idea, device or method". However, innovation is often also viewed as the application of better solutions that meet new requirements, unarticulated needs, or existing market needs. Such innovation takes place through the provision of more effective **products, processes, services, technologies**, or **business models** that are made available to markets, governments and society. The term **"innovation"** can be defined as something original and more effective and, as a consequence, new, that "breaks into" the market or society.

New technologies are defined as any set of productive methods that offer significant improvement (whether measured in terms of increased output or cost savings) over the established technology for a given process in a specific historical context. Defined in this way, what is regarded as new is obviously subject to constant redefinition, as consistent changes in technology occur.

A "**blockchain"**, originally **block chain**, is a continuously growing list of records, called blocks, which are linked and secured using cryptography. Each block typically contains a cryptographic hash of the previous block, a timestamp and transaction data. By design, a blockchain is inherently resistant to modification of the data. It is "an open, distributed ledger that can record transactions between two parties efficiently and in a verifiable and permanent way". For use as a distributed ledger, a blockchain is typically managed by a peer-to-peer network collectively adhering to a protocol for inter-node communication and validating new blocks. Once recorded, the data in any given block cannot be altered retroactively without the alteration of all subsequent blocks, which requires collusion of the network majority.

The "**Telex"** network was a public switched network of teleprinters similar to a telephone network, for the purposes of sending text-based messages. Telex was a major method of sending written messages electronically between businesses in the post-World War II period. Its usage went into decline as the fax machine grew in popularity in the 1980s.

Cross-border payments systems set up decades ago continue to be used sometimes retrofitted, sometimes force-fitted—to meet the needs of modern corporations. The ways these payments are made can be cumbersome, error prone, and expensive. And, not infrequently, the systems creak and groan as they bear the strain.

For users of these systems, on both the paying and receiving sides, it can be difficult and time-consuming to learn how to use cross-border payments tools, and how to set up processes to make optimal use of them. Solution providers (both banks and non-banks) also face challenges, struggling to cobble together old systems to meet new demands. But for these providers, cross-border payments are both lucrative (especially given foreign exchange conversion revenue) and rewarding, in terms of the overall financial relationship created with the end customer.

ABBREVIATIONS

DLT- Distributed ledger technologies

SWIFT - Society for the Worldwide Interbank Financial Telecommunication

CAPI - computer-assisted personal interviewing

CATI - computer-assisted telephone interviewing

INTRODUCTION

At present it is already quite difficult to imagine that just 40 years ago people were not so dependent on innovations, such as computer technologies and the global network as it is now. After all at that time all the necessary information for people were stored only in libraries, gradually they gained experience and knowledge in a certain field as well as naturally became real professionals in their field. But to achieve this, it took a very long time, which is sometimes very valuable. Now compare the modern time, where everything is much simpler and faster. If you are interested in any information, you immediately turn on the computer/smartphone or other devicesand start looking for it on the Internet, the likelihood that you will find it exactly equals to almost 100%.

Innovation is a complex work that requires knowledge, ingenuity, and talent. It is noted that innovators mainly work in only one area. For example, Tomas Edison concentrated his forces only on electricity. Successful innovation requires persistent concentrated work. If you are not ready for it, neither knowledge nor talent will help. To succeed, you need to use your strengths; people should get carried away by innovation in earnest. Finally, innovation means changes in the economy, industry, society, in the behavior of buyers, producers, workers. Therefore, it should always be guided by the market, guided by its needs. For the enterprise to carry out innovative activities, it must have a structure and a spirit that would contribute to creating an entrepreneurial environment and perceiving the new as an opportunity. It is necessary to take into account a number of important points. The main organizational principle for innovation is to create a team of the best employees, freed from the current work.

According to Jan Fagerberg- “Innovation is not a new phenomenon”[3, p.3],because innovations, which determines economic growth, development and structural changes have become the essence of modern development in all sectors of the economy, including financial sector. In financial sector of Kazakhstan, the banking industry has a significant impact on the development of the country's economy, for example, the share of assets of the entire banking sector ranges from 45.10% as of 01.01.2014 to 57.60% as of 01.01.2017, as well as the macroeconomic indicator of the banking sector, which includes 32 banks has a 51% share in Kazakhstan's GDP as of01.01.2018, however, due to the global economic crisis going through bad times, which is confirmed by the decrease in the number of 2nd tier Banks from 38 to 32 for the above period. Banking institutions consist of different units and each unit has different character for developing and using innovations. Whole banking industry can be classified as retail banking, private banking, commercial banking, investment banking and etc. Their business models, structures and offerings differ in many ways.

While retail banking is serving for end users instead of companies, commercial banking is dealing with companies and corporations. Both of them are carrying out routine daily transactions and few radical innovations happened in these space. High competition and cost pressures forced them to focus their back-end systems and increase their efficiencies. On the other hand, private banking is more customers focused and it is more personal than mass market retail banking.

Share of banking sector assets in Kazakhstan's GDP, %

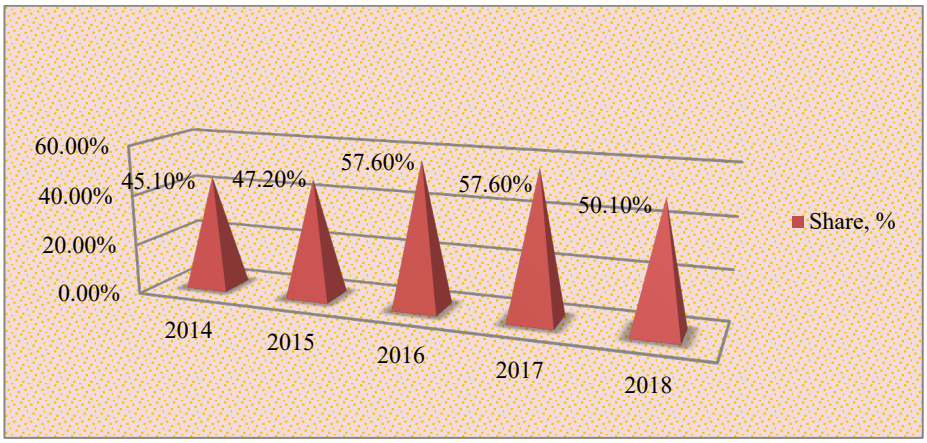


Figure 1.developed by the author based on [4]

One of the important organizational aspects of 2nd tier banks is the process of making non-cash payments, including local express and urgent transfers in KZT, SWIFT international transfers in a various foreign currencies, transfers from card Visa to Visa card, transfers with authorization code as well as by international payments systems such as Western union, MoneyGram, Faster and etc. Transfers of funds abroad to traveling friends or relatives have long been common. Small and medium-sized businesses are mastering international markets and can no longer do without international payments. In fact all of cross-border payments providing by banks are carried out with participation of intermediary banks as well as third parties. Third trusted parties work in traditional online financial transactions to verify the level of protection of records and the storage of records. The risk of fraud leads to the need for third party involvement, which increases cost of transactions. According to world experts, blockchain technology can change the procedures for making money transfers, which will lead to an improvement in quality of rendering money transfers by banks to a new level. The basic theory of blockchain is as simple as possible - it's a huge public database that operates without centralized management which stores transaction data in the registry, checked by system participants around the world. Data from the registry cannot be deleted or replaced, which is the main value of blockchain. Hence the widely

held view that this technology can eliminate intermediaries and undermine existing models of operations. According to Accenture report, blockchain technology can reduce infrastructure costs for 8 of the 10 largest investment banks in the world by an average of 30%, which will result in an annual cost savings of 8 to 12 billion US dollars for these banks by 2025 [5, p.6].

Therefore financial services need to improve the provision of international payment procedures due to rapidly developing new technologies over the past 2-3 years. Since the traditional model of providing international payments is outdated and requires the introduction of innovations. Moreover cross border payments are provided by banks with transaction fees of intermediary banks, which inhibit working process. The new technology as a Blockchain is the optimal solution to such problems as transaction cost without intermediaries between banks as well as it allows sending quickly transfers with transparency of transactions.

1.1. Background information

Theoretical bases of research of innovations and innovative processes laid the works of such scientists as J. Schumpeter, N. D. Kondratiev, B. Twiss, G. Mensch, H. Freeman, Yu.V. Yakovets, V.G. Medynsky, L. S. Blyakhman, S.Yu. Glazyev, E.G. Yakovenko, B. Santo, F. Valenta, E. Rogers, E.A. Utkin, RA Fatkhutdinov, etc. Famous researchers: L. S. Bariutin, P.N.Zavlin, S. V. Ildemenov, AL Ipatov, L.S.Kulagin, L. Ya. Kosals, AG Kruglikov, N.I. Lapin, A.I.Prigozhin, AV Murav'eva, I.P.Khominich, and others contributed to the structuring and bringing together all kinds of innovations to the common system. Works I.Yu. Karelina, A.I. Anchyshkina, V.M. Anshina, B.F. Zaitseva, I.T. Balabanova, E.M. Blech, A.I. Gavrilova, D.I. Kokurina, I.R. Gimaeva, A.A. Dagaeva, E.V. Evtushenko, S.U. Ilyenkov, N.I. Klimova, D.S. Of Lviv, OH.Makhmutova, M.Sh. Minasova, L.E. Mindeli, A.M. Mukhamedyarova, Yu.L. Morozova, et al. Contain theoretical and practical problems of increasing efficiency of various economic systems as a result of innovative activities.

And also, researchers V.I. Bukato, L.V. Kokh, V.P. Domnin, L.P. Krolivetskaya, O.I. Lavrushin, E.B. Shirinskaya, S.V. Gagarin, L.P. Belykh, M.Z. Bor, N.A. Kravchenko, Yu.S. Maslenchekov, G.S. Panova, B.E. Penkov, V.V. Pyatenko, A.Yu. Simanovsky, I.O. Spitsyn, N.T. Streltsova, A.M. Tavasiev, K.R. Tagirbekov, J. Sinky, Peter S. Rose, R. Joslin, D. Simonson, G. Mason et al., Are known in the field of development of directly innovative technologies and processes in banks, development of a banking management and innovation activity in banks.

Despite the numerous studies available, monographs and the notion of "innovation" areidentified, not the classification features of innovations in banks have been refined. Large attention is paid to innovation in general; banking innovations are

highlighted in narrow sense. There are no clear developments on the need for implementation improved innovative technologies in the domestic banking sectorsystem. The author agrees that the banking sector requires more practical skills, an in-depth understanding of domestic policy commercial bank, on the basis of which, applying theoretical skills It is necessary to build a domestic banking system that does not play the last role in the economy of the country and is able to enter the international market of banking products and services.

In this work, special attention is paid to the analysis of the existing innovative banking services, processes, on the basis of which certain innovative solutions are offered on the example of the banking sector of developed countries, which require introduction on the domestic market.

At the same time, modern realities require new scientific approaches to investigating the impact of new technologies in banks. There are still a lot of questions that need further development. The peculiarities of Blockchain technology as technical and economic phenomenon, which underlies new directions of banking business, the consequences of its application for the banking sector as a whole and individual banks, both abroad and in Kazakhstan. Terminology in this economic research has not yet settled and requires clarification and systematization. Thus, the insufficient degree of scientific elaboration of the problem, the undoubted practical significance for Kazakhstani economics determined the choice of the master's thesis title and defined its purpose. On the one hand, they are connected with the analysis of financial globalization trends, which are largely due to the comprehensive impact of innovative technologies. This group of problems was reflected in their works by a number of scientists: A. Barkovsky, M. Berezovskaya, V. Gerasimenko, S. Dolgov, A. Dyatlov, V. Ivanov, N. Ivanova, L. Krasavina, E. Kochetov, P. Linyuchev I.I. Martynov, V. Melyantsev, A. Movsesyan, A. Neklessa, V. Rogov, B. Rubtsov, P. Semikova, O. Smorodinov, V. Ugryna, I. Khominich. On the other hand, more specific issues of the development of Internet technologies as the basis of economic processes are sanctified in the publications of V. Vikulov, A. Burdinsky, A. Yegorova, G. Kryukov, A. Kuzmenko, I. Minervin, S. Parinov, I. Sagittarius, E. D. Khalevinskaya, T. Yakovleva, E. Yakovleva. The problems of Internet banking are directly dealt with by A. Vanin, N. Voevodskaya, A. Egorova, V. Ivanov, A. Yinshina, J. Maslenchenkov, G. Morozova, N. Morozova, N. Nikolsky, O. Rudakova, V. Ugryna, I. Khominich, V. Yurovitsky, I. Yarygina, M. Yarynich. This research is also devoted to the research of foreign researchers, such as: Wyttrich H.A., Gasperman J., Disterer G., Drucker P., Istenberg-Schick G., Lis FA, Mauer L. J., Mute J., Rhimes-Martinsen S., Toffler O., Toffler H., Philip AF, Shefer G., Eng M.V.

In the literature on blockchain technology, problems and possibilities are generally mentioned about the blockchain as a whole, but not much literature looks at cross-border payments opportunities.

1.2. Research Problem

In order to understand more precisely the essence of the research problem we need to consider two models of providing money transfers by banks such as: Traditional model and an alternative new modelof provision of money transfer services.

1.2.1. Traditional model of money transfers by banks

In a traditional model of money transfers any financial flows between banks are made through correspondent accounts, which banks open from each other. In principle, they do not differ from bank accounts of individuals and legal entities. Therefore, we can say that bank which opens an account in its name becomes a client of another bank. When banks conclude partnership agreements and open accounts to each other, they are called correspondent banks. The totality of such accounts of one bank is its correspondent network. Despite the fact that we live in the age of high technologies, banks traditionally use two types of communication in the conduct of international operations between correspondent banks. Firstly - it's “Telex”, i.e. usual international telegraph communication. Secondly, an increasing number of financial organizations are using the international system of banking telecommunications “Society for Worldwide Interbank Financial Telecommunications” (SWIFT). SWIFT is a member-owned cooperative that provides communication platform, products and services to connect more than 10,800 banking organisations, securities institutions and corporate customers in over 200 countries and territories [6, 20 p]. Of course, other electronic means of communication are used to transmit payment messages, but Telex and to a greater extent SWIFT play a key role. Here the main role is played by the fact that they are generally available to the overwhelming number of banks, and, which is also very important in a conservative banking environment, traditional. Banks minimize risks associated with obtaining counterfeit orders for transferring funds, accepting payment messages from correspondents through the SWIFT system. In addition, all information transmitted through the system is encrypted. Banks can protect communication lines they use to send messages through SWIFT. Figure 2 illustrates implementation of cross-border payments between financial institutions. Consider the example of the Kazakhstani sending bank and the beneficiary's bank is a small bank in France, for instance transaction currency is US dollars, as you can see below, there are three intermediary banks, each of which charges a service fee, and

SWIFT charges a commission for each message sent. Bank 2 is a correspondent bank of the sender bank

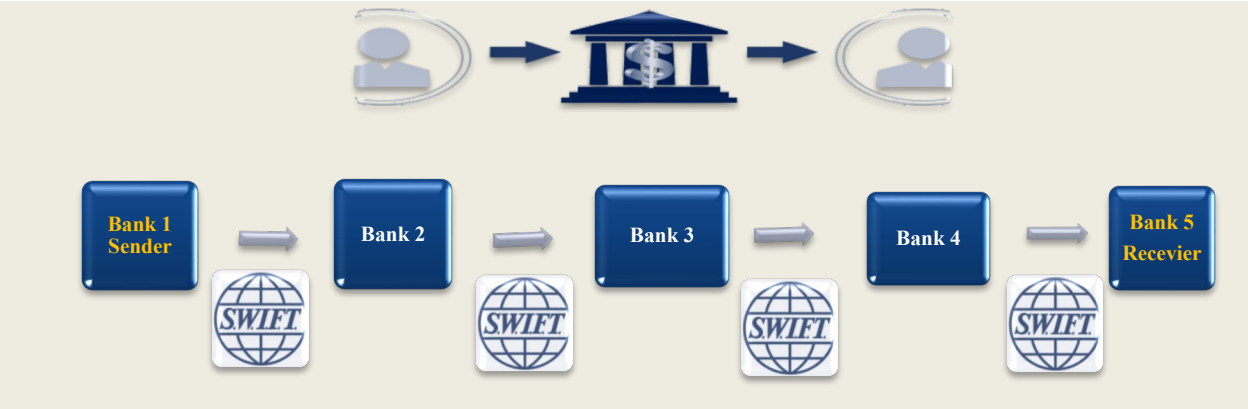


Figure 2. The traditional model of SWIFT money transfers scheme, prepared by the author based on [7, p.7-13]

(Bank 1), Bank 3 is US Bank because of the currency transfer, Bank 4 is a correspondent bank of the Receiver Bank (Bank 5), and the last one the beneficiary bank itself. Transfers through the SWIFT system are considered to be among the cheapest, however they have a significant drawback: it is difficult to predict the commission for such a transfer. In total, with SWIFT-transfer, three types of commissions can be withheld: for the services of sending bank, for the services of receiving bank, and also separately the commission of correspondent bank, the foreign bank through which message is sent between the banks of the sender and receiver. How exactly these fees will be paid, the sender himself determines: when sending a transfer, he pays commission of the sending bank and indicates how commission of the correspondent bank will be charged.

1.2.2. An alternative new model of money transfers

The blockchain technology, also known as Distributed ledger technology (DLT) was originally invented in 2008. By allowing digital information to be distributed, but not copied, the blockchain technology created the basis for a new kind of Internet. This technology was originally developed for the digital currency- Bitcoin, but now the world crypto community is looking for other potential uses for this technology. More specifically, this is a common database that is updated in real time, having the ability to process transactions in minutes using computer algorithms without the need to verify third- party vendors, which makes these transactions very secure. The distributed ledger is not kept in one place, which means that it keeps the record publicly available and can easily be checked. There is no centralized version of this

information that could be damaged by the hacker. Copies are stored on millions of computers at a time, and its data is available to everyone on the Internet. Obviously it can be absorbed by existing institutions with central banks, governments utilizing to support information systems, and commercial banks that invest into payment system digital platforms based on Blockchain technology. Many intermediaries can become obsolete, and many new financial instruments can be created by companies that do not exist yet. The original developer of blockchain technology wrote that "the main benefits are lost if a trusted party is still required" (Nakamoto 2008).

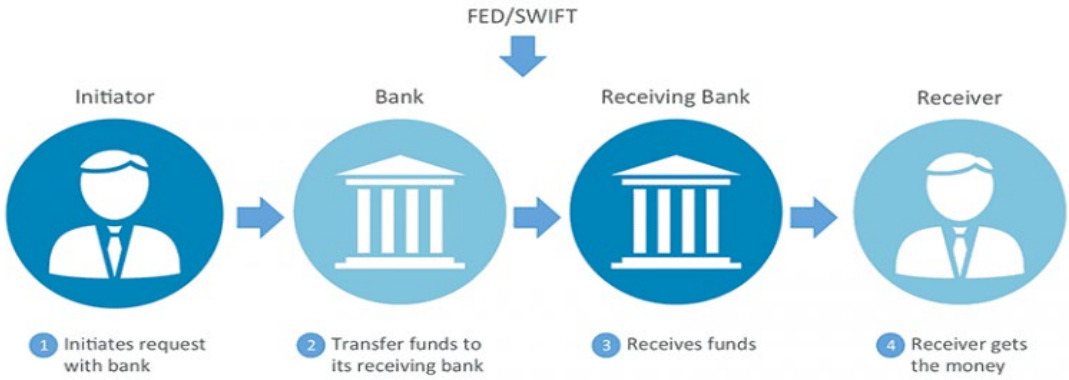


Figure 3.Scheme of alternative model of money transfers using blockchain technology [8]Source:https://www.heropay.com/glossary/wire-transfer/

In fact, future benefits can arise precisely because instead of correspondent networks blockchain technology will replace to trusted parties, as it shown in figure 4 above.

1.3. Field of research

Thesis is devoted to the study of utilization of blockchain technology in modern foreign banks in developed countries and possibility of its adaptation in the financial sector of Kazakhstan.

1.4. Research purpose and Research question

Thus, to effectively explore the purpose of the thesis related to innovation, the prospects for its application are being actively studied by the government of the country, there is a need to move a bit forward by imagining of existing use of blockchain technology, as a platform for money transfers in the financial sector of Kazakhstan, in order to obtain answers to the research question of the study:

RQ:*What is the potential value of utilization of blockchain as a platform for money transfer?*

As well as with a view to a broad and deep understanding this phenomenon researcher need to ask additional questions specified below:

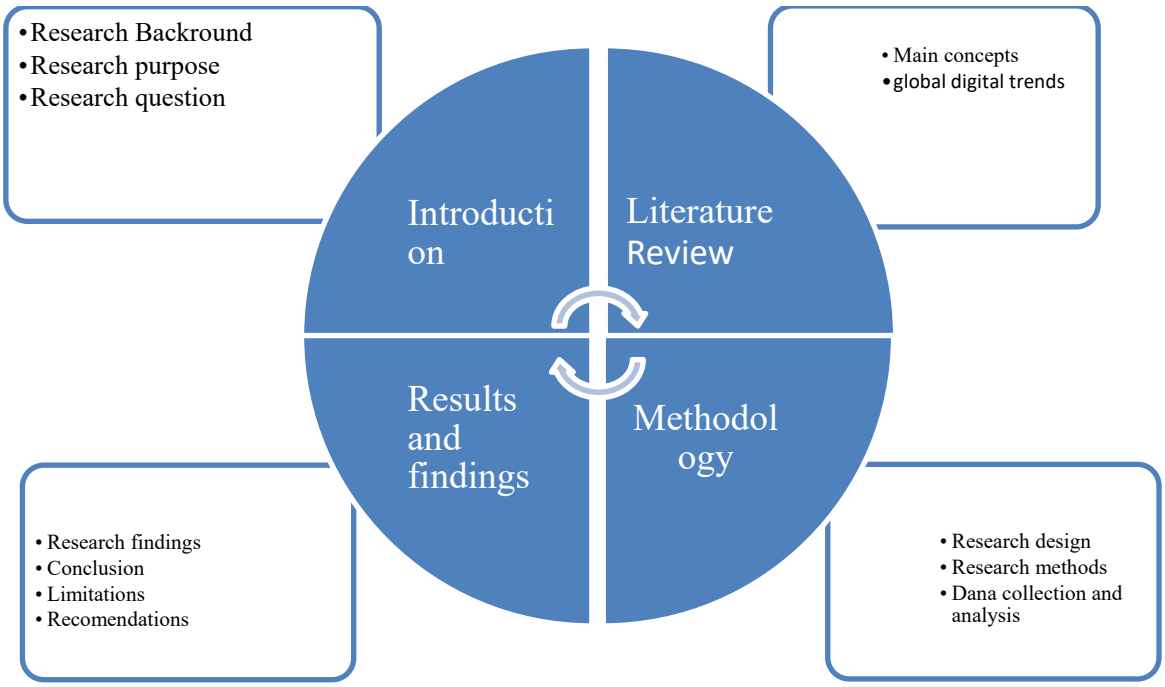
Table 1.

Additional questions
Q1. Assess banking sector current situation
Q2. Assess the quality of providing cross-border payments by banks and suggestions for improving
Q3. Country prospects in transforming the processes of international transfers into blockchain technology
Q4. Forecasts about the full use of Blockchain technology in financial industry

1.5. Thesis structure

Structure of thesis is represented in Figure 2 below. In order to introduce relevant literature and the findings profoundly, this consists research of three sections. Introduction involves background information, research problem and research purpose. While research background is providing the basis for the research, research problem is identifying the reasons to conduct this research. Research focus, objectives are clearly provided in research purpose section. Second section, Literature Review depicts theories behind Innovation, organizational and economic aspects of innovations with valuable sources written by eminent scholars in the field. Secondly, it handles global digital trends in a broad perspective including emergence of new technologies, business models, and technologylaunch in the field. Methodology consists of research design, data collection and analysis in order to enlighten the reader for the methods used and the quality of the research.

Figure 4.


•Research Backround
•Research purpose
•Research question
Introducti on
Literature Review
• Main concepts
•global digital trends
Results and findings
Methodol ogy
• Research findings
• Conclusion
• Limitations
• Recomendations
• Research design
• Research methods
• Dana collection and analysis

II. LITERATURE REVIEW

2.1. Introduction

The second section "Literary Review" examines Innovation's research in a broad sense from the theories of the organizational and economic aspects of new technologies in financial services, business models in the financial market. The review of the literature is based on the main peer-reviewed articles. Google Scholar is the main resource to access these publications.

At present, innovations are an active link in all spheres of society. It is impossible to imagine the modern world without the already implemented innovations and become habitual, and without future, contributing to further evolution. Most scholars agree that innovation has become the main driving force of economic and social development. Innovative activity has led the world community to a new, higher stage of development. The concept of "innovation" is used almost everywhere, it is the topic of conversations both at the domestic and professional level, including at the level of heads of state, international organizations, etc. Innovation can be understood as the end result of innovation, embodied in the form of a new or improved product introduced on the market, a new or improved technological process used in practice, a new approach to social problems. In principle, the term "innovations" can be interpreted in different ways; it has an infinite number of formulations and definitions. After analyzing the set of definitions, we can conclude that "innovation" is understood as either an end result or a process. This, in fact, diametrically opposite points of view. The first point of view is held by Balabanov I.T., Borisenko I.A., Vinokurov V.I., Dorofeev V.D. and Dreviasnikov V.A., Ilyenkov S.V., Korovina A.N., Medynsky V.G., Surin A.V. and Molchanova O.P., Fatkhutdinov R.A. and others, the second - Anshin V.M., Grinev V.F., Drucker P., Rumyantsev A.A., Atasheva O.M., Tsvetkov A.N., Shumpeter J. and others.

As well as researchers V.I. Bukatov, L.V. Kokh, V.P. Domnin, L.P. Krolivetskaya, O.I. Lavrushin, E.B. Shirinskaya, S.V. Gagarin, L.P. Belykh, M.Z. Bor, N.A. Kravchenko, Yu.S. Maslenchekov, G.S. Panova, B.E. Penkov, V.V. Pyatenko, A.Yu. Simanovsky, I.O. Spitsyn, N.T. Streltsova, A.M. Tavasiev, K.R. Tagirbekov, J. Sinky, Peter S. Rose, R. Joslin, D. Simonson, G. Mason and others are known in the field of developing directly innovative technologies and processes in banks, developing a strategy for banking management and innovative activity in banks.

2.2. Organizational and economic aspects of innovational technologies

The term "innovation", common in scientific literature, occurs from the Latin "innovus" (in-in and novus-new). It is often found that the terms "innovation" and "innovations" are interpreted as meaning synonyms. The well-known term "innovation" is directly related to the notion of "innovation", and often these two terms are identified. The connecting link of these terms is the analysis of innovations (innovations) in two interpretations, namely, as innovations (new products, processes, services) and as the process of its implementation [9].

Historically, according to O. Sokolova, the concept of "innovation" is very distant relation to the economy [10]. It first appeared in culturology and designated the movement of individual elements of one culture in another, later such a concept was encountered in linguistics (with the aim of definition of new phenomena in the language), and already in the XX century was used to expression of technical innovations [10, p.20]. The term "innovation" is considered to be fairly composite and versatile. Regardless of the volume of research and development on the theory of innovation, in science there are no generally accepted formulations of this concept.

As Krasnova N.A. notes, innovation is basically an economic one category [11]. In this form, innovation includes mainly general and essential properties, features, relationships and relationships of development and development of innovations.

Despite the fact that the presence of unanimity in economic field in identifying the categorical nature of the interpretation "innovation", the current situation is the opposite. Individual scientists regardless of the widespread use of the term "innovation"is not has the exact content. Until the necessary stage of its development, complete, categorical design of innovation did not own [12, p.10]. Some scientists argue that "with regard to innovation, there are problems terminology and classifications".

The primary sources of the history of the theory of innovation are the Austrian economist J. Schumpeter (1883-1950), who laid the foundations of her in the work "Theory of economic development " in 1911, J. Schumpeter represented innovation as the application of new combinations of operating productive forces with aimed at resolving issues in entrepreneurial life, thereby highlighting five main types of similar combinations:

1) work with new technology, a new technological process;

2) promotion of goods with new (improved) characteristics;

3) work with new raw materials;

4) modification in the formation of production and its material and technical base;

5) the formation of new markets for sales [13].

The future development of the theory of innovation was significantly influenced by the ideas of N.D. Kondratiev, who is the author of the theory of long waves (large cycles). Having completed the study of the nature of long-term economic fluctuations in the course of 1789-1920, Kondratiev N.D. determined their relationship with the technical prosperity of production.

German scientist Gerhard Mensch, based on the teachings of J. Schumpeter and V. Kondratiev, the classification of innovations for degree of significance. G.Mensch identified three types of innovations that were basic: basic, improving and pseudo-innovations [14]. This statement was criticized by H. Freeman, since there was a high risk for organizations investing in innovation at the stage of economic recession. According to Freeman, the "storm of innovations" should begin at the phase of economic revival, and the demand for basic innovations is created by fast-growing sectors of the economy that form the basis of a large business cycle [15]. Later A. Kleiknecht noted that innovation products mainly appear in the phase of long wave depression, and innovation-processes - in the ascent phase [16]. American economist B. Twiss, who is the author of the book "Management of scientific and technicalinnovations" approached innovations as to the process where the invention or idea has an economic content: "This is a one-of-a-kind process that unites science, technology, economics and management. It consists in obtaining novelty and lasts from the origin of the idea to its commercial realization, embracing complex of relations, production, exchange, and consumption [17].

For example, according to R.A. Fathutdinov innovations are the "final result of creating an innovation for changing the management object and economic, social, environmental, scientific and technicaland another effect" [18].

The study of the works of the above scientists made it possible to identify a number of significant approaches, along with which innovation was considered as:

1. Change (J. Schumpeter, YV Yakovets, LS Blyakhman, F. Valenta);
2. The process (B. Twiss, S.Yu. Glazyev);
3. Result (R.A.Fatkhudinov, I.N.Molchanov, E.A.Utkin).

At the micro level, the economic effect of innovation manifests itself in the form of super profits and competitive positive qualities of the innovator organization. At the macro level, the effect manifests itself in the future forcing scientific and technological progress and diffusion of innovations. The term "diffusion of innovations" has become more famous since the publication of the book by E. Rogers in 1962. Rogers points out the diffusion of innovation by a process whereby innovation over time develops in the right channels among members of the social system [19]:

1. Innovators (innovators, 2.5% of the total number of firms that implemented innovation);

2. Early users (early adopters, 13.5%);
3. Early majority (early majority, 34%);
4. Later majority (late majority, 34%);
5. Lagging (laggards, 16%).

The innovative process is understood as a set of actions that are necessary for the phased implementation of the idea in innovation. Famous a number of different models of the innovation process: linear, marketing, interactive, linear models with feedbacks, etc. In each model innovation process "ends" on the emergence of innovation, first of its commercialization or the process of diffusion of innovations. In all cases, the emergence of innovations should be studied as a composite part of any innovation process.

According to P.F. Druker, innovation is a specific tool enterprise, he writes: "Technologies provide for imports at low prices and with minimal cultural risk. But for the successful growth and development of institutions, they must be firmly rooted in culture". According to the statements Drucker, innovation is not considered a technical phenomenon, but more economic or social [20].

The developmental theory reached its peak of development only in the 1990s. Robert Solow and Paul Romer created models of economic growth with endogenous and exogenous technological progress. On the modern stage financial result from the launch of innovation is considered the main the current economy.

Proceeding from the foregoing, depending on the strengthening of economic interaction, the development of economic situations, the development of products and services in domestic banks on the basis of foreign experience, it becomes possible to develop and implement innovative banking technologies, currently popular methods and models of financial management that are aimed at improving its effectiveness, competitiveness and scope of activity. The reason for the relevance of this approach is that banks are considered to be the most active representatives of the economy in the international community.

Banking is a special branch of the economy, which has significant characteristics, first, in the pricing of banking products and services, which does not provide opportunities for second-tier banks to conduct a full-fledged price competitive struggle. In this connection, the improvement of the quality of the provided service on the basis of the creation and implementation of new banking technologies, financial transactions and products is one of the ways to attract customers by banks.

In connection with this, such a study pays particular attention to the goals, opportunities, mechanism, the results of the development of the economic process, which are formed based on the work of the bank with financial innovations.

Although the concept of "bank" as an economic category is considered more than once the concept of "financial innovation" requires further study in economic and financial sources in connection with the constant transformation, the permanent change of scientists to its essence. Current scientific studies show us following:

- Banking innovation is not only a product, or only a service, or only method (S.V. Vikulov, big economic dictionary);
- Banking innovations are not always just a new product (Semikova P.);
- Bank innovations are not always a step-by-step change; they sometimes provide for a one-time implementation and change (Bezdelev VA);
- Banking innovation is not always a result; it is a process, and this a change (Ternovskiy D.N.);
- Banking innovations first of all consider the maximization of profit (Lavrushin O.I.).

The theory of "Disruptive innovation" was first introduced by Clayton Christensen in 1997 in his book "The innovator's dilemma: both because of the new technologies kill powerful companies". "Disruptive innovation" such an innovation (or new technology), which undermines existing market. In other words, such an innovation or technology qualitatively changes the properties of the goods or services, thereby cardinally changing existing markets and creating new ones [21].

Banking innovations as a result - this is a positive result, which has advantages among previously operating products and services in second-tier banks, and also minimizes the risks of losses for both the bank and the client.

Banking innovation as a change is an update aimed at the decision of scientifically methodical questions in the banking sphere.

Banking innovations as a competitive product are those innovations that contribute to the improvement of the quality of services provided on the basis of the created banking technologies in order to attract new ones and keep existing customers.

Studying of modern interpretations of bank innovations, allowed to conclude that banking innovations are the introduction and successful development completely new or improved on the basis of previous experiments innovations in the banking sector, which maximize bank profits and customer comfort.

2.3. The global trend of Blockchain technology by 2018

One of the world phenomena of recent years is blockchain technology, which appeared in 2008, when a group of people or person named Satoshi Nakamoto developed a digital platform of the first cryptocurrency- bitcoin and created the first version of the software, in which the protocol has been implemented. Several attempts were made to identify a real person or group behind this name, but none of them led to success. October 31, 2008 Nakamoto published an article entitled "Bitcoin: Peer-To-Peer Network (P2P Network) in cryptography mailing list, which describes Bitcoin - a fully decentralized system of electronic money, which does not require the involvement of third parties.

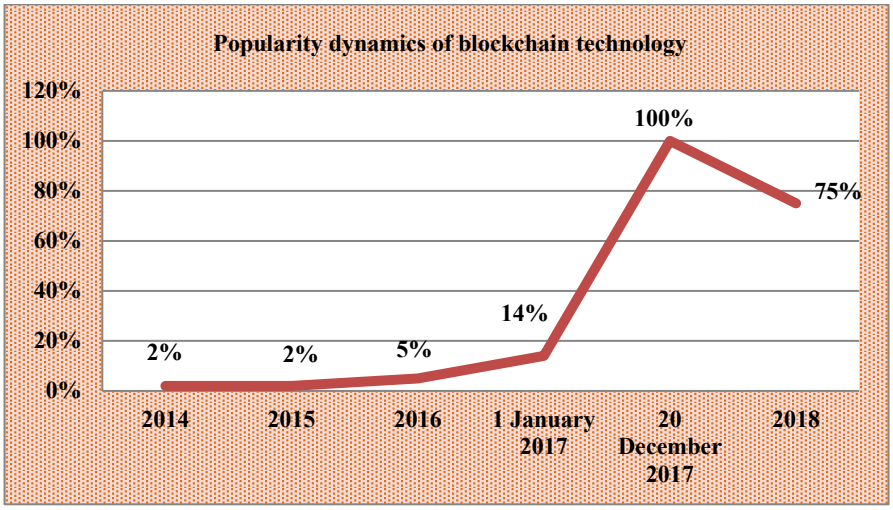


Figure 5. The diagram was compiled by the author based on [22]

In early 2009, he released the first version of the bitcoin-wallet and launched the Bitcoin network. Firstly, few people took it, only those who studied the algorithm of the process of this digital technology saw in it a tremendous potential and the solution of many existing and pressing problems. Leaders of large financial institutions, in which security is of paramount importance, see the huge potential in blockchain technology, in which they are willing to invest millions, to find out how best to implement it. And they are not alone. Any business with valuable digital assets who has from contacts to contracts that they need to protect can find a legal precedent for blockchain technology. Google trends analysis confirm the fact of popularity of this technology, dynamics of interest from 2013 till 2018 in blockchain technology shows us a sharp leap from 15% to 100% in 2017 and a slight decline in 2018, but the level of interest to date is at least 75%.

Blockchain, whether open or closed, is a real-time record protocol stored in a distributed peer-to-peer model, regardless of any central authority. Because each record

is encrypted and has timestamps, users can access and edit the block that they own through the private key, which is very secure. Each block is bound with the previous one and after it, and whenever the change occurs, the whole chain is updated. Blockchain helps to effectively protect and optimize transactions without requiring intermediaries to manage the process. Blockchain technology is revolutionary in terms of accounting and can track and document all changes in a record or transaction.

Potentially, this technology covers all spheres of economic activity without exception and has many fields of application. Among them: finance, economics and cash settlements, as well as operations with tangible (real property, real estate, cars, etc.) and non-material (voting rights, ideas, reputation, intentions, medical data, personal information, etc.). In fact, this is a new organizational paradigm for coordinating any kind of human activity. Blockchain technology has a huge potential - its application will make most processes in the financial industry transparent, fast, and affordable also will significantly reduce costs. The preconditions for the use of blockchain in the financial sector are as follows:

- Reduction of the time for customer servicing for any operations
- Reduced cost of processes
- Reduction in the number of documents required from the client
- Reduce the risk of personnel errors
- Reducing the risks of external and internal fraud
- Transparency of operations for audit
- A secure way of exchanging information between members of a block chain
- Lower compliance costs
- Reduction of commission costs for direct settlements and guarantees
- An additional tool for creating and implementing new products using the block
- Launch of new joint products (co-financing of projects, provision of joint guarantees, etc.) [23, P.4].

If, literally three or four years ago, experts said that this innovation is destructive for the banking sector as a whole, in the last two years attention to the technology of the blockchain and its derivatives has only increased, as the introduction of digital technologies into various fields of activity has taken the most important place in developed and developing countries at the state level for the further development of the digital ecosystem.As Blockchain technology effectively solves long-overdue technological problems in the financial sector and will change the system of all types of business relations between participants, excluding intermediaries. Obviously, this is one of the breakthrough technologies, and this will greatly change all sectors of the economy. First of all, for this, it is necessary to amend the legislation, since there are

many opportunities and obstacles for implementation. Fortunately, despite the existing problems of developing and implementing new technologies, the world does not stand still, especially this implementation process covers various areas of activity in developed countries.

2.4. Digital banking

The digital revolution changes the banking sector as deeply as other aspects of people's lives. All the existing innovations are directly related to the emergence of smartphones. According to the statistics portal, USA, it is estimated that by 2020 year number of smartphone users worldwide will increase to 2.87 billion and definitely most of online sales will be carried out by smartphones.

In many industries technological innovation is now the most important driver of competitive success, as evidenced the results of the Boston Consulting Group's 2018 survey. As mentioned below, representing the most diverse countries and the most diverse industries, the most innovative companies in the world in 2017 were Apple, Google, Microsoft, Amazon and Samsung. At the same time, Apple has been in first place since 2005, and Google has been invariably since 2006 behind the iPhone manufacturer.

As indicated in the report, 11 out of 50 companies were created already in the digital age, and therefore they offered digital products and services from the very beginning. This year, the top 10 included two more digital companies: the Chinese Internet giant Alibaba Group, which first entered the top 50 of the BCG rating and the mobile Uber taxi service. Also this report involves one of the most innovative Banks – JP Morgan Chase Bank.

Figure 6.BCG report: Most Innovative Companies 2018 [24, p.3-4]

Source:http://image-src.bcg.com/Images/BCG-Most-Innovative-Companies-Jan-2018_tcm9-180700.pdf

In this new environment, the key rules of banking services are the ease of using mobile banking alone, saving money and time saved on visiting a bank. Today, banks offer profitable services/products, for example, consumer credit, using mobile applications for rapid messaging, can report up to approval in the issuance of a loan with all conditions.

Customer-oriented, open innovation and organizational flexibility have become an incentive for the adoption of digital banking in existing financial institutions. Digital trends in banking are the 24/7 mode of operation, the banking of things, digital delivery, the acceptance of mobile payments, secure authentication, increased customer incentives, investing in innovation and increasing the impact of digital destroyers. There are profound differences between traditional and digital banking models. While the traditional model is focused on the industry, customer access to banking services anywhere at any time. The customer remains at the digital banking center, where he is the customer, who must decide how to interact with the bank. Services should not entail a visit to the branch. While the traditional model aims at providing duplicate products and services across many channels, digital trends emphasize individual products that are suitable for customer preferences. Customers demand new services, such as opening paperless accounts, electronic billing, and other new online financial tools. It is impossible to satisfy customers with traditional banking channels that rely on visiting their branches. Nowadays there are numerous online banks that operate without branches, which are growing in popularity every day by offering many services and products that are only a few clicks away, such as: Barclays Bank, Bank of Internet USA, Capital One 360, CIT Bank, Ever Bank, Discover Bank and etc.

2.5. Digital platforms

Today, existing business models are changing rapidly. Digitalization leads to the creation of new digital platforms, which, in turn, change existing services. Examples include "Over" - the largest taxi service system. Cloud services Amazon Web Services is the fastest growing and most profitable business for the company. Social platforms: Instagram, Facebook, Twitter, etc. These are digital platforms that unite service providers and provide the right, necessary information; Finteh companies that contribute to digitization, control the entire ecosystem and determine the direction of its development. New technologies along with buyers and sellers are becoming even more interconnected and interdependent than previously thought. Digital platforms

have become a new center of attraction for business innovation, thanks to emerging technologies that provide tools for developing increased-value advertising and business models with superior performance and efficiency. According to Ian Pollari Global Fintech Co-Leaderand Head of Banking KPMG Australia- “based on current trends, digital platforms will become the preferred and dominant business model for banks and financial institutions in the future. Digital platforms offer consumers and small businesses the ability to connect to financial and other service providers through an online or mobile channel as an integrated part of their day-to-day activities”.[25, P.1]

2.6. Example cases of blockchain technology in money transfers:

Table 2.

DLT platforms/applications, Company name/Fintech collaboration	**Serviceprovisionform**	**ScalabilityandtransactionSpeed**	**Aims/dispositions**
MasterCard blockchain API, MasterCard	Business-to-business (B2B) transactions, cross-border payments	The company claims that its blockchain technology will help solve problems related to speed, transparency and costs associated with cross-border payments	MasterCard believes that corporate customers can use their blockbuster platform to track the movement of pharmaceuticals, as well as luxury items such as branded handbags and diamonds, thereby reducing fraud by providing "proof of origin."
R3 Corda platform, The Financial Innovation Consortium, which includes the 22 largest banks in the world (including such names as Barclays, BBVA, Commerzbank, DNB, HSBC, Intesa, KBC, KEB Hana Bank, US Bank, etc.), which co-operate with more than 200 companies and regulators bodies	cross-border payments platform based on distributed ledger technology (DLT)	The company intends to store digital coins in distributed registries that can be converted into different currencies of the world, speeding up settlement processes with back-office banks, and also helping them buy securities such as bonds or shares, without having to wait for traditional payments to be settled	Fintech solution will be a game changer for any bank or company whose business relies on cross-border payments and is a key part of the broader R3 strategy for using DTL for faster and more efficient execution of all types of financial transactions. "The goal of the solution is to improve the traditional model of international transactions, which R3 calls "extremely inefficient, expensive and slow."
The Canadian JASPER platform, a joint research initiative from Payments Canada, the Bank of Canada, the R3 Financial Innovation Consortium and a number of Canadian financial institutions	DLT for Domestic Interbank Payments Settlement	Carrying out more than 50,000 payment items per day and at least 14 items per second	The main aim to process, at a minimum, over 50,000 payment items per day, and at least 14 items per second, based on observation of the LVTS today

Ripple.net, USA,more than 100 financial institutions have already joined the corporate block network Ripple Net. Banks such as Santander, UniCredit, UBS, RBS Bank and Royal Bank of Canada	cross-border payments in real time, instant transfers of fixed currencies and existing central bank currencies that will be broadcast through a platform based on the "blockchain"	The platform allows you to send 1500 transactions per second, which reduces the cost of commission of banks, operators and at the same time the settlement period. Another advantage is the full traceability of transactions, which makes the transaction auditable	The company aims to launch the platform by the end of 2018 and a wider adoption in 2019
SWIFT (DLT), Belgium, Consortium of SWIFT and 22 global banks including names like ABN Amro, BBVA, China Construction Bank, TC Ziraat Bank, Deutsche Bank, Erste Group, FirstRand Bank, JP Morgan, Rabobank, Santander and etc.	Pave the way for Nostro reconciliation and optimization of liquidity in real time	processing of any financial institution actions in real time, i.e., updating the transaction status, monitoring all routes, visibility of expected and available balances, confirming simplified account confirmations in real time, identifying unfinished records and potential related issues, generating the data needed to support regulatory reporting	The company's goal is to solve the identified problems, which include: Less optimistic positions of financing on Nostro accounts due to the lack of visibility of records in the account in real time and monitoring of the relevant intraday expected and available balances, savings of operating funds due to increased effectiveness of Nostro's reconciliation
Interbank Information Network (IIN), J.P. Morgan including Royal Bank of Canada and the Australia & New Zealand Banking Group are the first joined the blockchain network	Business actively invested in technology to improve end-to-end customer experience	IIN minimizes friction in the process of global payments, allowing payments to receive beneficiaries faster with fewer steps and better security	The company has created a network to reduce the number of participants required to respond to compliance and other data requests that delay payments
Hyperledger, IBM and 30 major banks, technical giants and other organizations, including J.P. Morgan Chase, Microsoft and Intel, launched the Enterprise Ethereum Alliance	launch of a cross-border payment platform for banks	IBM blockchain only transmits money in the form of Lumens, a virtual currency created by Stellar	The goal is to modernize the processes of universal cross-border payments aimed at reducing settlement time and reducing the cost of completing global payments for businesses and consumers
Mojaloop, Bill & Melinda Gates Foundation. The API for mobile system companies, developed by Ericsson, Huawei, Telepin and Mahindra Comviva, hope to facilitate the integration of mobile services for mobile money suppliers and build products for Mojaloop	The Fund launched a mobile open source payment platform as a payment service for poor people for national and cross-border payment infrastructure in Africa	Free mobile application for adaptation and implementation by software developers and banks, financial services providers	The goal of open source software is to create payment platform that will help non-bank people around the world access digital financial services

FundsDLT or Fund Link, France, BNP Paribas in collaboration with Fundsquare, InTech and KPMG Luxembourg	end-to-end fund transaction	The test work of payments between BNP Paribas bank accounts located in Germany, the Netherlands and the United Kingdom was processed within a few minutes. Stressing the real potential of this innovative technology that eliminates delays, unexpected failures and processing errors, paving the way in real time	While all investors have focused on the benefits of reduced transaction time, BNP Paribas also benefits from a smoother, more orderly system

Prepared by the author based on [26, 27, 28, 29, 30]

The figure above shows the latest development of platforms that operate on the basis of blockchain technology for remittances in developed countries by leading fintech companies in collaboration with financial institutions. The mission of all these organizations is to improve the provision of domestic, international and cross-border payments by eliminating intermediaries that play a key role in traditional payment systems and to use such platforms for faster and more efficient execution of all types of financial transactions.

2.7. Kazakhstani steps in implementation of digital projects based on Blockchain technology

On behalf of President NursultanNazarbayev, Kazakhstan was one of the first countries in the world made a decision on the introduction of blockchain technology at the state level. Also, a special program "Digital Kazakhstan" with aiming of "The third modernization of Kazakhstan: global competitiveness" was adopted. The main goal of the Digital Kazakhstan program is to improve the quality of life of the population through the progressive development of the digital ecosystem and the competitiveness of Kazakhstan's economy [31]. The program will be implemented through innovative companies in Kazakhstan that contribute to the development of innovative IT technologies and e-commerce in Kazakhstan. For the implementation of the Program in 2018-2022 the budget is allocated in the amount of 141 048 387 000 tenge [31, P. 5]. Tasks of the state program are following:

1. Digitalization of industry and electric power.
2. Digitalization of transport and logistics.
3. Digitalization of agriculture.
4. Development of electronic commerce.
5. Development of financial technologies and non-cash payments.
6. The state - citizens.
7. The state - to business.

8. Digitalization of internal activities of state bodies.
9. Smart cities.
10. Expanding the coverage of communication networks and the infrastructure of Information Communication Technologies
11. Ensuring information security in the field of Information Communication Technologies
12. Increase of digital literacy in secondary, technical and vocational, higher education.
13. Improving the digital literacy of the population (training, retraining).
14. Support of innovative development sites.
15. Development of technological entrepreneurship, start-up culture and R&D.
16. Involvement of "venture" financing.
17. Formation of demand for innovation [31, P. 3-4].

2.8. Kazakhstani Implemented Blockchain projects

The company Sirin Labs, founded by KenesRakishev, has developed the world's first FINNEY cryptosmartphones based on blockchain, which will be launched for sale in 2019.Sirin Labs has reached achievements in the creation of a ready-made commercial product with hardware and software encryption, has a working experience in creating a premium phone, after attracting capital, the team will develop and implement blockchain technology with a minimum cost of a transaction that does not require mining, which will provide easy scalability of the system and its popularization in the mass market of consumer electronics.

NBK has launched a new mobile application “Invest online” for committing the population to purchase and sell securities based on blockchain. According to the regulator, this allow retail investors to trade short-term liabilities of the NBK with a nominal value of 100 tenge (about $ 0.3) using a smartphone online. Thus, third parties will not be involved in the trade. Also in support of the State Program Digital Kazakhstan signed the Innovation Pact to become a "blockchain Singapore." The government of Kazakhstan together with Deloitte, “Waves” and Kesarev Consulting, are developing a project to study how blockchain technology can work in government structures aimed at determining its legal status.

III. METHODOLOGY

3.1. Introduction

In the "Methodology" chapter the quality of research and the reliability of the results obtained are of particular importance. The research design, the research method, as well as the methods of data collection and analysis, have a profound effect on the reliability and validity of the results. Although Research Design provides information on the research methodology, Data Collection and Analysis processes data sources, their analysis, and the quality of the data.

3.2. Research design

This study is devoted to identifying the latest developments in the field of remittances in the global financial world, which must solve existing problems. This requires a deep understanding of the traditional model and alternative new models of providing money transfers by banks that are actively developing around the world. To answer the main question of the study, we need to be competent in both models mentioned above to assess the current situation in this area and to assess future values in using the blockchain for remittances for customers, for banks, for the country's economy as a whole, i.e., consider all the advantages of this new technology from different angles. In addition, it is important to discuss these developments with experts from different fields. By the nature of competition, respondents can contradict each other on the same issues. It is important to objectively compare the findings in order to understand the whole picture and achieve a reliable conclusion.

3.3. Research methods

Research methods are a technique which specifies how data is collected. In research methods “Qualitative research” strategy is widely-used in business researches in addition to quantitative and mixed methods. It emphasizes words instead of quantification and qualitative researchers don’t apply measurement (Bryman and Bell, 2011). In contrast to quantitative research, it focuses on understanding social relationships through interpretation.

Qualitative research substantially reflects an inductive approach (Bryman and Bell, 2011) [32]. It is also known as inductive reasoning. This approach starts with observations and the theories which are built with respect to these observations in the end (Goddard and Melville, 2004). In addition, it is iterative. The researcher can update the theory and research questions with respect to new data (Bryman and Bell, 2011). This gives the researcher the freedom to change the research process. A qualitative

research design in an inductive way is applied in this research. No hypothesis is done in the beginning in accordance with an inductive reasoning strategy. It is required to understand the money transfers provision from the perspective of interviewees before building theories. Researcher aims to build a framework after conducting interviews. In addition, researcher also restructures the research questions in accordance with the data obtained from respondents. In this sense, an inductive way makes more sense than a deductive way. It is required for the researcher to assess deeply the topic by combining different views of different respondents. This entails obtaining qualitative data with in-depth interviews. Therefore, carrying out a qualitative strategy is more effective than a quantitative strategy in this research.

3.4. Data collection method and sampling technique

Research instruments are tools such as semi-structured interview or questionnaire. Semi-structured interview refers to an interview including series of questions, but the interviewer can add or subtract questions or change their sequences. Interviewer can ask further questions with respect to the answers of the respondent. Semi-structured interviews also enable researchers to address topics with fairly clear focus (Bryman and Bell, 2011). In recent years, there is an increase in the number of computer-assisted interviews. There are two basic types as computer-assisted personal interviewing (CAPI) and computer-assisted telephone interviewing (CATI) (Bryman and Bell, 2011). All of the interviews will be recorded with the permission of respondents. Afterwards, these interviews will be transcribed by the researcher with various transcription programs. Researcher will compare different views to decide which answer has more value.

Peer-reviewed articles, books, economic organizations' reports, consulting company reports and company websites are the secondary data sources. Most of the secondary data is obtained from peer-reviewed articles. Books which were written by eminent scholars in the field of research are chosen. World Economic organizations' reports include reports which were written by economic organizations like World Bank Group and etc. In addition, consulting company reports are selected from world-wide known consulting companies with high reputation. They provide beneficial information especially in market figures.

Primary data is collected from semi-structured interviews. It is required to add and subtract some questions in the interview guide according to the expertise of the respondents. In addition, it is important to give freedom to respondents to receive in-depth answers regarding specific comments. It may also entail for the researcher to ask additional questions. Respondent may want to share his/her experience in a specific field and it is hard to manage it before the interview. In order to obtain most beneficial

information, there is a need for dynamic attitude in asking questions. Therefore, a semi-structured interview with open ended questions is the best method to use in this research. Providing a copy of the interview guide can strengthen the dependability of the research (Bryman and Bell, 2011). Interview guide can be seen below.

Table 3. Interview guide

•Assess banking sector current situation and how we lag behind Western banks?
•Have you ever conducted international transfers through second-tier banks?
•Assess the quality of providing cross-border payments by banks and give suggestions for improving?
• Are you familiar with blockchain projects such as "Masterchain", "Waves", SWIFT (DLT) and etc.?
•Country prospects in transforming the processes of international transfers into blockchain technology?
•What are the underlying drivers and what problems will Blockchain solve in our country?
•Forecasts about the full use of Blockchain technology in the financial sector of Kazakhstan

Purposive sampling is the most common type of non-probability sampling (Guest et al., 2006).A purposive sampling method is applied by researcher to select the respondents, since itinvolves identification and selection of individuals or groups of individuals that are proficient and well-informed with a phenomenon of interest. The aim is conducting interviews with respondents who have expertise in different fields with new technology competence.

Totally, 12 semi-structured interviews were carried out. According to Guest et al. (2006), twelve interviews are sufficient to reach saturation for no probabilistic samples. While some respondents preferred a face-to-face interview via Skype, some of them preferred to conduct it via telephone by whatsapp audio/video call. Interviews were substantially conducted in Russian. Then interviews were transcribed and translated by the interviewer. Most of the interviews took around 40 minutes. Lengths of interviews varybetween 20 and 75 minutes. Interviews were recorded with the permission ofrespondents; however 5 of them refused from recording by allowing writingto the note. Android MPEG4 audio record softwarewas used to record the interviews. Afterwards,these interviews were transcribed. Firstly, various transcription programs were tried by theresearcher. However, none of them were

satisfactory. Researcher transcribed theinterviews without using any program. While some of the respondents allowed sharingtheir name and companies, some of them refused it. Researcher kept all the respondents'identities anonymous. Respondent list is given in the table below:

Table4.Interviewee list

Participant	Titleofparticipant	Expertise	Workexperience	Currentorganization	Location
A	CEO- founder	Banking, Jurisprudence	National Bank, State Credit Bureau JSC	Blockchain & Cryptocurrency Association	Almaty
B	CEO, World Crypto community Member	FMCG, Cryptocurrency market	Professional marketer in FMCG, Unix Co. Ltd (TASSAY brand)	Blockchain & Cryptocurrency expert, speaker	Almaty
C	CAMS (Certified Anti-Money Laundering Specialists|USA), Member of ACAMS	Banking, AML/CFT, Compliance culture	Banker, Phd in Management Science	Forte Bank JSC, Head of Compliance Control Department	Astana
D	CEO-founder, Blockchain.kz community	Fintech, Blockchain	Fintech, Blockchain internships (USA)	Digitaleconomyconsulting, education	Astana
E	Postgraduate Degree in Blockchain and Digital Currency, Nicosia University, Cyprus	Fintech, Blockchain	Engineer at Schlumberger (Canada), Internship in Tesla, Project and product management	MBA Candidate at Duke University - Fuqua School of Business	USA, NorthCarolina
F	Postgraduate Degree in Blockchain technology, Lappeenranta University of Technology, Finland	Fintech, Blockchain	EngineeratBosch	Business Development Manager at Marfle	Finland, Helsinki
G	SAS company consultant in Kazakhstan, Phd in economics	InnovationManagement, Bigdata	PhdinEconomicScience	Universityprofessor	Almaty
H	Co-founder, Innovation technology, Mentor, Speaker	Fintech, Blockchain	Chief Financial officer at Kazakhstan-Korean Cooperation Promotion Centre	FinTech& Green Finance Coordinator – AIFC Bureau for Continuing Professional Development	Astana
I	CEO-founder, Digitalagent	Digitalization, Blockchain, Artificial Intelligence, Modernization of State services	Director of MirusDesk LLP, about 200 projects and startups	Digital economy developer, Game changer technologies	Almaty
G	CEO-founder	Jurisprudence, MBA, FMCG	L-trade LLP Atyrau Branch Director, Regional Director of Western KZ area at Farabcombinate LLP	Importer, Décor Design company representative in Kazakhstan	Atyrau
K	CEO-founder	Georgetown University, ESADE Business & Law School, MBA,	Representative of Genesis Mining in Kazakhstan. A huge management experience in the energy sector.	Presidetional of National Blockchain &Cryptotechnology Association of Kazakhstan	Astana
L	CentralizedOperations DepartmentDirector	Banking, Digitalization, Blockchain	Banker, IT, Bigdata	SB KZI Bank JSC, Correspondent Banking, Cross-border payments	Almaty

3.5 Data Analysis methods

Triangulation is a method to increase the quality of the research. More than one methods or data sources are used in triangulation. In addition, different respondents can be used to employ triangulation (Bryman and Bell, 2011). In this thesis, researcher will have about 12 interviewees to support and compare the findings. Secondary resources are mostly consulting company reports, official company websites and economy news websites. In order to reach unbiased information with high quality, these resources will be carefully selected. As consulting company resources, most of the information will be selected from the work of prestigious companies including World Bank Group, Big 4 companies etc.

IV. RESULTS AND FINDINGS

Summary of evidences illustrate research results, which involvesmany subchapters in accordance with the main research question below:

4.1. Analysis results

Research question	Results	Quotes
What is the potential value of utilization of blockchain as a platform for money transfer?	Blockchain gives reliability and trust for the population	Respondent A: *What values will Blockchain give us? This is the first technology of distributed registries that do not have the ability to change, configure, and secondly, there is no single center, that is, decentralized, providing confidentiality and secure storage of the database, and this is the main advantage of this technology, because when there is no single center, hacker attacks are impossible, which can affect its full functioning.*
		Respondent D: *The potential benefit of using blockchain as a platform for remittances is firstly the optimization of processes, simplification of procedures, the call of trust all this leads to an improvement in the provision of services.*
		Respondent I: *Thus one of main values of this technology is reliability.*
		Respondent K: *Two parties can exchange without the supervision or mediation of a third party, greatly reducing or even eliminating the risk of the counterparty.*
		Respondent B: *What gives us the platform of blockchain for making transfers is security, people's trust in this technology due to the inability to change data*
		Respondent L: *.In addition to these factors, blockchain can replace the current inter-bank transfers by offering more reliable form of money transfers*
		Respondent E: *Potential benefits of blockchain at a country or government level can be increased trust. A blockchain service for international money transfer allows citizens and government to share access to the records, resulting in improved trust in the financial institutions and governm*ent
	Costreduction	Respondent A: *What is the reason for this? With the fact that such technologies are cheap*
		Respondent B: *What gives us the platform of blockchain for making transfers is security, people's trust in this technology due to the inability to change data, reducing costs on commissions*
		Respondent C: *What benefits I see in the first place, of course, this will reduce the commission*
		Respondent E: *Elimination of intermediaries and manual works, removes charges such as service and clearing fees, penalties and other costs associated with money transfers. Improved efficiency and reduced costs – Central bank and government agencies are obliged to manage resources efficiently and responsibly. Blockchain technology allows not only reduce costs associated with transaction processing but enforce governance, streamline processes and decrease audit overload.*
		Respondent F: *It is estimated that this technology can reduce the cost of the banks' infrastructure for trading in securities, compliance with regulatory requirements and cross-border payments of up to $ 20 billion annually 2022.*
		Respondent K:*Excluding third-party intermediaries and overheads for asset swapping, block chains can significantly reduce transaction fees*
		Respondent H: *Reducing transaction costs Blockchain allows you to conduct without an intermediary, transaction participants, users or financial institutions, do not bear the costs associated with the work of the intermediary, which reduces their costs.*
		Respondent J: *Moreover this technology provides cheaper fees for transaction made.*
		Respondent L: *There are several drivers of blockchain disruption in the banking industry, including but not limited to reducing costs*
	Transparency	Respondent L:*The biggest interest in using blockchain technology by banks is to streamline transfers.*
		Respondent E: *One of the key properties of blockchain technology is transparency. This transparency comes through decentralization – everyone in the network can see and verify transactions*
		Respondent D: *The transparency, a full understanding of where my money is in comparing with the current situation in banks of the 2nd level, openness*

		Respondent K: *Changes in public block chains are available to all parties, which in turn creates transparency and stability of the transaction.*
		Respondent H: *I counted 5 advantages compared to existing "traditional" payment networks: transparency is one of the main reasons why the blockchain became so attractive for business, is that the chains almost always have open source code.*
	Securityandcyberdefence	Respondent A: *What is the reason for this? With the fact that such technologies are s*afe
		Respondent B: *What gives us the platform of blockchain for making transfers is security*
		Respondent E: *Implementing blockchain into the banking sector, specifically in money transfer and transaction related activities can reduce the number of frauds and security breaches. Security – Since blocks are written onto the blockchain are immutable, hacking or manipulating records is virtually impossible. Unlike bank accounts, where an account can be accessed by several parties, a blockchain based account can be accessed only by the account holder, who usually has the private key.*
		Respondent G: *For the bank's client, the main value is security*
		Respondent K: *Because of decentralized networks, the block does not have a central point of failure and is better able to withstand malicious attacks.*
		Respondent F: *The greatest value of Blockchain, respectively, is considered as maintaining anonymity in the process of online payments, the average exchange in developing countries, sending remittances, online payments and financial investments.*
		Respondent J: *Remark about secrecy: if all transactions can be tracked, this does not mean that all your names and appearances are recorded in the detachment. The sender and the receiver can also be encrypted in the form of random numbers (block-addresses), which will also change with each transaction - then the network becomes absolutely anonymous.*
	Removes charges such as service and clearing fees	Respndent E: *Cheaper transaction fees – Elimination of intermediaries and manual works, removes charges such as service and clearing fees, penalties and other costs associated with money transfers.*
	Convenience and benefit for the economy	Respondent C: *As long as there are barriers like the requirements of legislation, cost and timing, some will work on the Blockchain platform, part of it will carry out transfers of other private providers, but the transition itself to the blockchain will definitely positively effect on country economy*
		Respondent D: *The benefit for the country's economy is that all transfers will be made openly, what the government will see, do not need accounting, know the exact turnover of incoming and outgoing transfers, there will be no concealment from taxes, that is, when there is a single common platform, like a payment system, when an entire ecosystem is created , we see who for the intended purpose, no one will take your money, since everything is clear that they are your money, in case of buying a property, it will show that it was you who bought it.Also emission, for example, if you compare it to the amount of US dollars, can America constantly print, and the value is equal to the usual candy wrappers, we do not know the exact amount of this world currency, that is, there is no initial data, if we create our national crypt, we will know for sure. Theamountofemissionandvaluetothismoney.*
		Respondent G: *The benefits of using blockchain as the platform for making transfers are: The first thing, the most basic and main benefit is the savings on the manager, since the bank will not spend money on its advice, analytics, in what currency it needs to be transferred, when and how much it is more profitable to implement, functions of the manager should be automated, that is, in this case the bank will switch to artificial intelligence*
		Respondent H: *I would like to indicate the advantages, instead of explaining the benefits of use. In order to be profitable for banks and institutions that provide cross-border transfers, first of all the platform for money transfers should be convenient and beneficial for users. If such benefits are available to users, institutions will always benefit from the provision of services, and customers are willing to pay to get high-quality service.*
		Respondent I: *The main benefits from the introduction of technology are expected in the reduction of operating expenses (73% of respondents), reduction of settlement time (69% of respondents), risk reduction (57% of respondents), an increase in the possibility of receiving additional income (51% of respondents). And all of the above is a value for the population of the country, for business and for the State as a whole.*

		Respondent J: *The main benefit of blockchain is decentralization. Everyone duplicates the history of all transactions, as it would be if everyone collected paper checks about their transactions on the account, and then posted them on the Internet.*
	Transacti onacceler ation	Respondent G: *second one you can save on time, the main principle of blockchain is the number of processed operations, i.e. the data transfer rate*
		Respondent A: *What is the reason for this? With the fact that such technologies are fast*
		Respondent J: *Blockchain is speed, because the speed of the Internet is now high, the processors are powerful, and the data can be transmitted in large volumes. To assess the advantages of using blockchain technology for mutual settlements between companies, it is enough to compare the speed of transactions - especially in international transfers. If a traditional bank transfer to another country usually goes from several working days to a week, then the payments in blockchain usually take about ten to fifteen minutes and can be made at any time, without reference to the banking day. This method is beneficial for the business, because the speed of the transactions determines the revenue of the company.*
		Respondent K: *Blockchain operations can reduce transaction time to minutes and can be processed 24 hours a day and 7 days a week.*
		Respondent L :*In addition to these factors, blockchain can replace the current inter-bank transfers by offering relatively faster form of money transfers.BNP Paribas – In its innovation lab, experimenting with faster transactions using blockchain.*
		Respondent H: *At the same time, the blockchain technology works 24/7, which means that transactions based on it will always work, and faster.*
		Respondent E: *Faster transfer time – In blockchain network, manual work and intermediaries are replaced with digital technology. This allows significantly reduce processing time and number of errors.*
	Eliminati onofinter mediaries	Respondent E: *In blockchain network, manual work and intermediaries are replaced with digital technology. Elimination of intermediaries and manual works, removes charges such as service and clearing fees, penalties and other costs associated with money transfers.*
		Respondent H: *In this case, for crypto currency, the growth of excitement was the technology of blockchain. Blockchain is a digital decentralized register that allows you to register transactions without the involvement of a financial intermediary.*
		Respondent I: *In theory, the blockchain invented that there should be no intermediary banks, since the Bank is just an extra chain between customers, the Blockchain emerged after the economic crisis in 2008.When the crisis arose banks as well as mortgage banks, left people without a roof over their heads, just as banks did not enter into the provisions of the common people, punishing them with penalties more than the main debt on outstanding loans, and therefore financial transactions had to be resolved without the participation of any intermediaries.*

4.2. Blockchain –reliability and trust without intermediaries

The global economic crisis that began in the United States in 2008 and, according to some estimates, continued until 2015, was the result of a financial crisis. The emergence of the crisis is linked to the general cyclical nature of economic development, the imbalance in international trade and capital flows, as well as overheating of the credit market and a particularly pronounced mortgage crisis as a result of the expansion of lending. According to the data of the American Congress of the causes of the crisis of 2008-2009, the crisis was caused by the following factors: failures in the financial regulation of the credit market, violations in the sphere of corporate governance, which led to excessive risks; excessively high household debt; which led to an increase in the unregulated "shadow" banking system. According to some respondent's opinions, the global economic crisis was the main reason for the

emergence of blockchain technology to exclude any intermediaries to restore public trust [33].

Respondent A: *"In theory, the blockchain invented that there should be no intermediary banks, since the Bank is just an extra chain between customers, the Blockchain emerged after the economic crisis in 2008. When the crisis arose banks as well as mortgage banks, left people without a roof over their heads, just as banks did not enter into the provisions of the common people, punishing them with penalties more than the main debt on outstanding loans, and therefore financial transactions had to be resolved without the participation of any intermediaries. Thus one of main values of this technology is reliability".*

Respondent K*:" Two parties can exchange without the supervision or mediation of a third party, greatly reducing or even eliminating the risk of the counterparty. Entrepreneurs, start-up companies, investors, global organizations and government - all identified the blockchain as a revolutionary technology".*

Blockchain technology is used in areas where a trusted third party has traditionally been required to verify and protect transactions. And this may not only concern finance. So, the introduction of technology will significantly reduce piracy in the field of content distribution, and the music industry in the future can completely switch to the block-platform. It is expected that the block will have a significant impact on the telecommunications industry - operators will develop a block system to improve billing systems, provide financial services, and identify users as well as decentralized voting services.

Respondent B: "*What gives us the platform of blockchain for making transfers is people's trust in this technology due to the inability to change data, reducing costs on commissions, minimizing different types of securities, as technology reliably stores information about the customer in the form of a chain of blocks that continues to write down about the ongoing transactions on the chain".*

Traditional financial service providers and banks in particular, lag behind the pace of technology development. According to one of Accenture's reports, most large banks use systems from the 1970s or even 1960s, and newer computing technologies are simply superimposed over this framework to support the provision of online banking services or through mobile devices. This means that most of the money goes to support the working condition of these systems, and not to introduce innovations, while old technologies still work [34].

Respondent D: "*The potential advantage of using blockchain as a platform for money transfers is, first, process optimization, simplification of procedures, which leads to better provision of services, and most importantly the call for trust"*.

A solution that can satisfy the needs of both producers and buyers is obvious: you need to have one database for all products. And to exclude the abuse of a possible intermediary, this database should not belong to anyone; it should not have an owner and a single central server. Since 2014, banks and other financial institutions have been researching registries that work on the principle of a blockchain. The Commonwealth Bank of Australia uses the Ripple protocol - a private blockchain platform - to transfer payments between its branches, and these transfers are provided in reliable conditions which gives trust for customers.

Respondent E: "*Potential benefits of blockchain at a country or government level can be increased trust. A blockchain service for international money transfer allows citizens and government to share access to the records, resulting in improved trust in the financial institutions and government"*.

Processes, which at this stage of technology development can not be automated, will be controlled by people. People can unite on any principle, for example, territorial. The main thing here is not the rules of the organization, but reliable control over compliance with these rules. And then we again come to the aid of a blockchain, or rather, implemented on it the technology of smart contracts and smart laws. What is it? And this, in fact - more precisely, in content - the same contracts and laws as the paper ones, but only written in the program code and stored in the locker.

Respondent L: *"In addition to these factors, blockchain can replace the current inter-bank transfers by offering more reliable and relatively faster form of money transfers"*.

According to World Bank Group regarding Fintech note №1 report the DLT has an obvious potential for availability, resilience and reliability for a variety of players in the financial sector and infrastructures. This can help solve or alleviate some of the old problems with expanding access to financial services [29].

4.3. Replacing the old model with a new one reduces costs

Most interview respondents agree that traditional institutions should revise their business models for the provision of cross-border transfer services and discuss their new roles in the financial sector. Blockchain is distributed decentralized banking, in which financial services can exist outside the framework, not through bank players, but through financial and technical start-ups. 9 of 12 respondents mentioned that using blockchain platform for money transfers leads to the cost reduction.

Respondent A: "*Over the past 10 years, the quality of provision of money transfers has not changed significantly, money transfers related to import and export contracts are carried out on days in good cases, even for weeks, which is not currently applicable, there is a need to reduce any bureaucratic barriers, time changes, now there is no need to collect a bunch of papers for instance. At the moment, all industries are transformed into a digital ecosystem, which leads to an improvement in the industry as a whole. A striking example is the Ripple platform based on Blockchain, which is a breakthrough technology for the provision of cross-border transfers and solemnly moves to the banking sector in 2017, 2018, with which the leading banks of Europe, Korea, Japan, etc. have already concluded. Also SWIFT is very advanced in technology - a huge machine that is the leader of international transfers, which broadcasts 10,000,000 transactions per second, this company will in the future be very easy to take the lead in rapidly developing technological time".*

The world financial system daily passes through itself trillions of dollars, serves billions of people and supports the global economy with a total value of more than $ 100 trillion. This is the most powerful industry in the world, the basis of world capital, and its leaders are considered masters of the universe [35].

Respondent C: "*If you discard an excessive hype that takes place in the world, the blockchain will ideally fit into the new business model, replacing, for example, SWIFT. At the same time, to implement such a project, the market needs good experts already used in the world (as Ripple)*".

Why is the system so ineffective? According to Paul David, an economist who introduced the notion of a performance paradox, the imposition of new technologies on the existing infrastructure is not uncommon in the transition from one technological paradigm to another. For example, it took 40 years in production to allow commercial electrification to replace steam, and steam and electricity were often used in parallel until production made the final choice in favor of the latter.

Respondent E: "*Blockchain technology has the potential to change the way how digital identity and financial activities are handles. Central bank and government agencies are obliged to manage resources efficiently and responsibly. Blockchain technology allows not only reduce costs associated with transaction processing but enforce governance, streamline processes and decrease audit overload".*

In the financial system, the problem is aggravated by the fact that there has not been a clear transition from one technology to another; a number of obsolete methods are used, including those that have lasted more than one hundred years, which have never fully realized their potential.

Respondent F: "*The current inefficiency of B2B payments and P2P money transfers has caused a demand for the use of the blockchain in the payment zone. It is estimated that this technology can reduce the cost of the banks' infrastructure for trading in securities, compliance with regulatory requirements and cross-border payments of up to $ 20 billion annually 2022. Significant changes are already taking place in Europe, especially in the legislation on payments. It is constantly developing due to the contribution of the EU. This requires cross-border cooperation in the field of regulation in place of a single jurisdiction. The rules, especially with regard to payments, are of particular importance for institutions, as the income of European banks from payments is estimated as one-fourth of their total revenue from retail banking operations*".

The days of the financial monster are numbered - the technology of the blockchain promises great changes and destruction of the established systems in the next decade, but at the same time there will be ample opportunities for those who will have time to use them.

Respondent G: *"At the moment, the main problem of our country is the legislative restrictions that do not allow integrating and communicating closely between financial institutions. The Central Bank gradually tightens the rules of the game with its requirements. There is no freedom in the legislation that would allow forcing and developing innovative projects. It is necessary first of all to regulate the legislative base".*

In the blockchain the network clears the peer-to-peer transfers of values, and regulates them, and does it all the time, so that its register is always relevant. If the

banks took advantage of this opportunity without changing their business model, they would save about $ 20 billion of operating expenses - these are the calculations of the Spanish bank Santander, and the real figures are probably much higher.

Respondent H: *"Consensus Despite the obvious advantages, the use of bank technology by banks should be done complex and collectively. The implementation of the "Blockchain" register by financial institutions separately does not give all of the above advantages, over existing traditional payment instruments and platforms".*

Due to a drastic reduction in cost, banks could offer private and corporate clients in communities not sufficiently covered by banking services, greater access to financial services, markets and capital. This is beneficial not only to market leaders, but also to beginning entrepreneurs around the world. Any person in any place, having only a smartphone and connection to the Internet, will be able to join the streams of world finance.

Respondent L: "*Banks and financial institutions have particularly shown interest in the blockchain technology. Some of them have already started their own projects, others partnered up with Fintech startups to adopt the technology. Here are the examples of banks and financial institutions involved in blockchain: Deutsche Bank (2015) – it has been exploring various use cases for blockchain implementation. Such use cases include replacing the usage of fiat currencies, registering assets, and regulatory compliance*".

Also KPMG states that traditional cross-border transfers are "complicated, costly and vulnerable." According to estimates of the information service Group Experian, erroneous transfers account for 12.7% of the total, with 7% due to incorrect entry of banking codes. Blockchain can offer real-time transfers, low fees and reliable identifiers. In addition, now small and medium-sized banks have to make deposits or open credit lines with correspondent banks in advance of international payments. KPMG notes that the blockchain will allow to get rid of this practice, as a result of which significant capital will be thawed, and this will lead to increased liquidity [36].

4.4. Transparency of financial transactions

Some world experts compare the blockchain with a transparent safe, from which it is impossible to steal funds. This feature is attractive for many entrepreneurs. A vivid example of such a chain - the regulator has access to all operations, the bank - only to the postings of clients, and the client - only to own transactions.

Respondent E: *"One of the key properties of blockchain technology is transparency. This transparency comes through decentralization – everyone in the network can see and verify transactions".*

Respondent H: "*Transparency is one of the main reasons why the blockchain became so attractive for business, is that the chains almost always have open source code. This means that other users or developers have the option of it at their own discretion, but at the same time it makes it incredibly difficult to imperceptibly change previously registered data. The latter circumstance makes the blockchain a particularly reliable technology".*

It is clear that changing markets is inevitable with new business models and customer needs. As also noted by respondent D, for traditional institutions it will be painful if they try to resist this change from a conservative point of view.

Respondent D: *"The transparency and openness give a full understanding of where my money is, in comparing with the current situation in the 2nd tier banks, while there is a risk that my money can leave the country behind my back".*

Blockchain is characterized by its decentralized structure, openness and transparency, and its rule does not allow retrospectively changing data, as it has great potential in the financial industry, despite its impact on traditional financial services enterprises. In the light of this, the introduction of its principles and influence on the problems of commercial banksare considered relevant for the 21st century according to KPMG Huazhen LLP (2016) [37].

4.5. Security and cyber defense

Software and technical resources of hackers are growing every day, and corporate protection systems remain at the same level, which provokes an increase in the number of hacking. The main problem is that for the security of information on the Internet is responsible for several servers that work solely to provide protection. Such

centralization of systems today is not very effective, in view of the fact that everything is in one place.

Respondent E: *"Implementing blockchain into the banking sector, specifically in money transfer and transaction related activities can reduce the number of frauds and security breaches. Security – since blocks are written onto the blockchain are immutable, hacking or manipulating records is virtually impossible. Unlike bank accounts, where an account can be accessed by several parties, a blockchain based account can be accessed only by the account holder, who usually has the private key".*

Although the blockchain is an open registry, data transfer is strictly verified and implemented using advanced cryptographic methods. With the widespread adoption of this technology, which is considered more reliable than traditional systems, the likelihood of hacking will decrease. Cyber security will increase and at the expense of the refusal of almost all human intermediaries, according to Goldman Sachs.

Respondent K: "*Because of decentralized networks, the blockchain does not have a central point of failure and is better able to withstand malicious attacks"*.

In fact, blockchain technology has an inborn connection with cybersecurity. It, in fact, is the result of decades of research and breakthroughs in cryptography and security. Blockchain offers a completely different approach to storing information and conducting transactions, establishing new rules of trust (trust rules). This makes the technology more suitable than all other currently known variants for an IT environment with high security requirements and mutually unknown players.

Respondent J: *"Remark about secrecy: if all transactions can be tracked, this does not mean that all your names and appearances are recorded in the detachment. The sender and the receiver can also be encrypted in the form of random numbers (block-addresses), which will also change with each transaction - then the network becomes absolutely anonymous".*

Blockchain assumes responsibility for authentication, while at the same time eliminating the danger of attack. In addition, a decentralized network helps ensure consensus (consensus) between the parties for their identification.

4.6. Intermediary elimination in Blockchain leads to transaction acceleration

The data chain includes data regarding the last transaction: the receipt of funds or their transfer to a participant in the system. If a package of documents is required in the bank for transaction, the blockchain allows transferring funds to any participant. Only the procedure can be organized in a certain crypto currency. The system does not store information about account balances, but independently calculates and checks all transactions.

Respondent J: *"Blockchain is speed, because the speed of the Internet is now high, the processors are powerful, and the data can be transmitted in large volumes. To assess the advantages of using blockchain technology for mutual settlements between companies, it is enough to compare the speed of transactions - especially in international transfers. If a traditional bank transfer to another country usually goes from several working days to a week, then the payments in blockchain usually take about ten to fifteen minutes and can be made at any time, without reference to the banking day. This method is beneficial for the business, because the speed of the transactions determines the revenue of the company".*

Blockchain technology can reduce the need for intermediaries, and part transactions can be implemented offline. To date, all transactions involving at least two participants are governed by agreements that emphasize the expected result and responsibilities of the parties. The responsibility for securing these agreements depends on the legal framework. As a result, the complexity of these agreements has created the need for intermediaries who mediate disputes between the parties andpermit deviations in the consistency of the results. The potential of blockchain technology will allow in some cases to program financial agreements and automatically execute them in a distributed platform, guarantee their execution under the required conditions and with restrictions imposed by the parties. Blockchain will reduce the need for manual regulation of agreements, reduce the likelihood of human errors in the implementation of agreements, will speed up the receipt of required results.

V. CONCLUSION

The volume of cross-border payments according to the World Bank reached in 2016 429 billion dollars, preliminary estimate for 2017 - an increase of 3.3% and a mark of 444 billion dollars. Revenue shows growth in a number of regions, especially in Asia, where China is particularly prominent. The overhead costs of cross-border transfers are prohibitive, including commissions and additional charges for the first quarter of 2017 amounting to 7.45% of the total. According to the latest trends in payments - out-of-banking and shadow transactions have already reached 10% of the volume.

A notable trend in 2017-2018 was the shift in emphasis from the term "Blockchain" to terms "distributed registry", "distributed accounting registry", "distributed register of digital transactions".

Complete replacement of traditional payment systems and banks with new ones players from the technology sector is hardly possible - new players. Today it is easier and more profitable to enter the market in conjunction with traditional large: this helps to overcome the barrier of conservative perception among mass users, gives access to cheap financial resource for development, as well as to the established elements of the global payment architecture. More likely gradual replacement traditional players, especially banks, from the foremost front, distancing them from points of interaction with consumers and merchants. New Players subordinate the acquiring market, as well as the communication channel with the retail client, and the banks will remain the role of the back-office platform. Likely, this business will be of interest only for large banks, since marginality here is low, and the requirements for scale are significant. The role of payment systems like Visa and MasterCard in this configuration is strong will not change, but they can experience more serious pressure on the margin. In the longer term, they may have to move forward and liberate a part of the market for other players, which will be technical giants. For the consumer, this is generally not bad: more competition - lower tariffs and more new products and services.It is important to note that transformations will requires work - progress is not free: political interaction between governments, development of regulatoryframework, standardization of processes, technological optimization of algorithms of blockchain will be required.

The aim of the thesis was achieved: in the work options for the use of blockchain technology in the banking sector are considered.The tasks of the research work were solved: the prerequisites and the history of the technology development were considered, the logic of the blockchain operation and the range of possible technology applications were described, the list values was developed and the experts'

opinions is thoroughly analyzed, a list of examples of using blockchain in banking activity and potential advantages for market participants was formed.

Proceeding from the above author may note that global digital trends, as a blockchain, open a great opportunity for development of the financial sector of Kazakhstan. The openness of the Kazakhstan market to innovations and the creation of an innovative ecosystem provide a huge potential for attracting foreign investment, which will improve the current state of the population, which will positively affect the country's GDP. Having approved the program “Digital Kazakhstan”, the Kazakhstani Government has created favorable conditions for introduction of innovations, related to the digitalization of all sectors of the economy. Many world experts of this technology say that the blockchain can bring an economic revolution to developing countries by turning the sphere of state regulation, the sphere of the state itself as a whole, finances - all to one sphere. This thesis can be useful for banking industry workers and for the entire population of the country in order to gain competence within the confines of global digital trends.

5.1. Future Implications

According to the results of the research, it is proposed to continue researchbots and experiments on the introduction of distributed registry technology into the business processes of financial institutions in order to optimize the exchange of information, increase the level of trust, exclude processes with multiple redundant checks.It is necessary to find a balance between the costs of creating and maintaining technology, security issues, and positive effects.

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Appendix D- “Interview Protocol”

SULEYMAN DEMIREL UNIVERSITY
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INTERVIEW PROTOCOL

Aim of the Interview : Conducting an expert interview to obtain an answer to the main question of the study
General Research Question of the Interview : Introduction of Blockchain technology in the financial sector of Kazakhstan, prospects, forecasts of introducing, consideration global digital trends from all over the world.

SECTION B GENERAL INTERVIEW INFORMATION

Interviewer	Aytbenbetova T.Sh.
Interviewee	Bekzhan Mutanov
IntervieweeTitle	FinTech & Green Finance Coordinator – AIFC Bureau for Continuing Professional Development
Date of theInterview	15.05.2018
Place of the Interview taken	Almaty - Astana
Time of theInterview	15.00
Duration (inminutes)	120minutes

SECTION C INTERVIEW QUESTIONS

Part 1:Initiation “Warm up question”

Question 1: Please rate, the banking sector current situation.

At present, there are 33 2nd-tier banks coexisting in Kazakhstan, of which about half with foreign participation. On the general background, experts give a positive assessment, despite the fact that the problems in the banking sector is not small. Comparing the banking systems of Kazakhstan and abroad, we can say that we lag behind in many parameters and indices. Since the day of Kazakhstan's independence, for one reason or another, one bank has died a year, the chief financial regulator has revoked the license, the banks intentionally bankrupted themselves, then some were forcibly closed.In addition to those cases where large absorbed small, but promising second-tier banks. Some banks conducted incoming cash operations, despite the lack of a license. For the attractiveness of banks 2nd-tier banks create "daughters" - organizations for managing doubtful and bad assets, to reduce the share of loans with overdue payments more than 90 days in the parent bank. Despite the fact that troubled loans of the banking sector are at a relatively comfortable level, in fact, the quality of bank assets may be worse.

Comparison of our banks with "outsiders" that are several positions higher by rating ratings (Fitch, Standard & Poor's, Moody's), as the level of the banks in Kazakhstan due to various reasons and events in Kazakhstan can not be compared. And while there is support for 2nd-tier banks through public funds, space for the development of services and quality in general can not be said.

Question 2: Please rate, the quality of providing cross border payments by banks and what suggestions do you have for improving?

Basically 2nd-tier banks uses the systems of the International IASB, such as VISA, MasterCard, Western Union, MoneyGram and so on. While breakthrough in this area, I consider multibanks that have a function similar to Wire Transfer, with which you can send money to any VISA card issued in Kazakhstan or banks of other countries. Which still does not provide a full solution to all problems of cross-border transfers. Also, one of the main barriers to the use of these products is the "financial investment illiteracy" of the population, and the economically unstable state of the socially vulnerable segment of the population of Kazakhstan.

If we recommend the Crypto-currency and the Blockchain technology, everyone has already said that "Crypto-currency is not needed by anyone, but the block as a technology has great potential." This technology has made a breakthrough in its sphere - p2p transactions, and depending on the principle or algorithm protection of network systems from abuse of services (PoW, PoS, etc). Comparing the hacking and phishing of bank cards and cryptoscalls, we can say that in the case of crypto currency, despite their "young" age, the owners of wallets themselves are to blame, or the losses occurred at the junction of "analog" and "digital" technologies, hacking sites themselves crypts, but not the database itself (blockchain).Also, we can say that people are more than confident in their means, as they are stored decentrally, and there will be no one to blame but himself, in the event of the loss of their "assets".
So the whole crypt is a trestle of the system with p2p information exchange. You see, money, capital, this is all that is valuable, what we have around us, it's just information. If there is a blackout, no bank accounts will save, and we will return to the real goods that help us live.

But while everything is fine, and it will be even better, since there will be a general robotization, and artificial intelligence will work for us, the most important of the blocks will be the exchange of information in environments where no one should believe anyone. Not because all are bad, but simply this is an extra layer that slows down the process. It's like doors that need to be opened, and we've already gained speed. And now the crypt will become the foundation for all these robots and AI to serve you, without asking each time "Enter the code sent to you via SMS to confirm the payment ..."Thousands of services around each of us will route the capital (and I remind you that this is just information!), With it not always only aside payments, but also a profitable part - sharing economy, mesh networks, sale of spare resources ... in short, refrigerators your neighbors will pay your router for access to the Internet.
Decentralization is not about a server distributed around the world, but about equal access conditions for all participants in the system. A crypt is not an anonymous payment, but an increase in the speed and efficiency of automated mutual settlements. Blockchain is not a promising technology, but the reality of today.

Part 2: Main Question
Question 1:**Potential values of utilization of Blockchain as a platform for money transfers?**

I would like to indicate the advantages, instead of explaining the benefits of use. In order to be profitable for banks and institutions that provide cross-border transfers, first of all the platform for money transfers should be convenient and beneficial for users. If such benefits are available to users, institutions will always benefit from the provision of services, and customers are willing to pay to get high-quality service.In this case, for crypto currency, the growth of excitement was the technology of blockchain. Blockchain is a digital decentralized register that allows you to register transactions

without the involvement of a financial intermediary.I counted 5 advantages compared to existing "traditional" payment networks: transparency is one of the main reasons why the blockchain became so attractive for business, is that the chains almost always have open source code. This means that other users or developers have the option of it at their own discretion, but at the same time it makes it incredibly difficult to imperceptibly change previously registered data. The latter circumstance makes the blockchain a particularly reliable technology. Reducing transaction costs Blockchain allows you to conduct without an intermediary, transaction participants, users or financial institutions, do not bear the costs associated with the work of the intermediary, which reduces their costs. Also, this technology totally removes the possibility of double payment or transaction. Acceleration of settlements on transactions Conventional banks, for a complete transaction, it sometimes takes several days, even though customers receive money immediately after sending (for example, western union). But some banks use the hawala method, where incoming and outgoing cross-border transactions are recorded, after a certain period, for example, 30 calendar days, the difference in amounts is sent by the bank to push and pull, where commissions are reduced to almost zero, and the commission difference banks for the transfer goes to the article of the bank's earnings. In addition, financial institutions are in different time zones, and this also delays the processing of the transaction. At the same time, the blockchain technology works 24/7, which means that transactions based on it will always work, and faster. But with the acquaintance of banks with financial services, such services as mobile and online banking were created, the services of which are available 24/7. Even in this case, there are barriers to cross-border transfers. Decentralization another major reason for the attractiveness of the blockchain is that the technology does not involve a central point of data collection. Instead of launching a large data center and conducting all transactions through it, the blockchain system actually allows individual transactions to have their own authentication and authorization to ensure their communication with each other. Information about specific blocks of the chain is scattered across different servers around the world, and this ensures that even if this information gets to outsiders, for example, hackers, only a small amount of data will be compromised, not the whole network. User-driven networks Consensus Despite the obvious advantages, the use of bank technology by banks should be done complex and collectively. The implementation of the "Blockchain" register by financial institutions separately does not give all of the above advantages, over existing traditional payment instruments and platforms.

Part 3: Closing Questions

Question 1: Potential, prospects of Kazakhstan in translating the processes of international transfers to the technology of Blockchain

Regardless of the widespread introduction of Blockchain technology in Kazakhstan, it will not be a "solution" to all problems of cross-border transfers.

Question 2: Your forecasts about the full use of technology

At the moment, in some companies, prototypes based on Blockchain technology, the so-called MVP - Minimum Viable Product, already work.

Appendix D- “Interview Protocol”

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INTERVIEW PROTOCOL

Aim of the Interview : Conducting an expert interview to obtain an answer to the main question of the study
General Research Question of the Interview : Introduction of Blockchain technology in the financial sector of Kazakhstan, prospects, forecasts of introducing, consideration global digital trends from all over the world.

SECTION B GENERAL INTERVIEW INFORMATION

Interviewer	Aytbenbetova T.Sh.
Interviewee	Can Erman
IntervieweeTitle	Business Development Manager at Marfle
Date of theInterview	20.05.2018
Place of the Interview taken	Almaty – Helsinki
Time of theInterview	22.00
Duration (inminutes)	70 Minutes

SECTION C INTERVIEW QUESTIONS
Part 1:Initiation “Warm up question”
Question 1: Please rate, the banking sector current situation.

Deep structural transformation in the economy, which began in the 1990s years throughout the world, was accompanied by fundamental changes in the nature of the economic relations. The transition to a market economy based on large scale privatization of the basic objects of the productive forces, the different forms of ownership and the forms of economic significant changes, radical transforma all the structures of the national economy. One of the significantly changed sectors of the economy was the banking sector, where the processes of property transformation and formation market structures took place under difficult conditions and in many respects in the deformed and ambiguous in content and consequences forms that affect the interests of the state, large groups of people. At present, banks are much different from previous banks, the role of innovation plays a huge role in this area of activity

Question 2: Please rate, the quality of providing cross border payments by banks and what suggestions do you have for improving?

Wide liberalization of foreign economic activity, on the one hand, and uneven development of states, on the other, are the main factors stimulating global migration processes.
The transfer of labor resources from the relatively backward regions to the economically developed is, in the final analysis, a consequence of this unevenness, and the resultant vector of migrants' movement is directed toward the advanced countries with the necessary production infrastructure, respectively. The cross-border money transfers connected with the production of migrants are carried out in the opposite direction.

The impact of remittances on the development of the country in a number of cases is very tangible, it can promote consumption growth, improve the living standards of the population, and solve social problems. Over the past few years, the largest recipients of transfers were Mexico, India, the Philippines, Egypt and Turkey, and the senders were the United States, Saudi Arabia, Switzerland, Germany and France. Of course, it should be noted that, for all its necessity, the system of international transfers (not to mention the informal segment), like other financial intermediary structures, can be used to launder money, finance terrorism and other criminal purposes. Therefore, behind these systems, as well as for credit organizations, not only statistical monitoring should be carried out, but also appropriate prudential supervision.

Part 2: Main Question

Question 1:Potential values of utilization of Blockchain as a platform for money transfers?

The greatest value of Blockchain, respectively, is considered as maintaining anonymity in the process of online payments, the average exchange in developing countries, sending remittances, online payments and financial investments. The current inefficiency of B2B payments and P2P money transfers has caused a demand for the use of the blockchain in the payment zone. It is estimated that this technology can reduce the cost of the banks' infrastructure for trading in securities, compliance with regulatory requirements and cross-border payments of up to $ 20 billion annually 2022. Significant changes are already taking place in Europe, especially in the legislation on payments. It is constantly developing due to the contribution of the EU. The Single Euro Payments Area (SEPA) was created and new rules for electronic money and payment services were adopted. The rules, especially with regard to payments, are of particular importance to institutions, as the income of European banks from payments is estimated as one-fourth of their total revenue from retail banking operations. The goal of SEPA is to promote cross-border economic activity by creating a cross-border payment and financial services market. Europe is a fragmented market consisting of many countries with different financial legislation. In this sense, there are many complex problems in their integration. This requires cross-border cooperation in the field of regulation in place of a single jurisdiction. The rules, especially with regard to payments, are of particular importance for institutions, as the income of European banks from payments is estimated as one-fourth of their total revenue from retail banking operations.

Part 3: Closing Questions

Question 1: Potential, prospects of Kazakhstan in translating the processes of international transfers to the technology of Blockchain

I can not say specifically about Kazakhstan, but many European countries, as well as the United States, Japan and other developed countries are carrying out active implementation activities, and they are doing it successfully

Question 2: Your forecasts about the full use of technology

According to the main technical aspects of the blockchain, it is possible to distinguish between the algorithms used to prove the work done Proof-of-Work and Proof-of-Stake are common), if possible full-fledged use of smart contract technology, as well as a platform for their implementation. Because it is impossible to list all the platforms on the basis of which numerous variations of this technology are realized, in view of their diversity.

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SECTION B GENERAL INTERVIEW INFORMATION

Interviewer	Aytbenbetova T.Sh.
Interviewee	Chingiz Aitimbetov
IntervieweeTitle	Importer, Décor Design company representative in Kazakhstan
Date of theInterview	12.05.2018
Place of the Interview taken	Almaty – Atyrau
Time of theInterview	20.00
Duration (inminutes)	100 Minutes

SECTION C INTERVIEW QUESTIONS

Part 1:Initiation “Warm up question”

Question 1:Please rate, the banking sector current situation.

The state of the banking sector as a whole objectively reflects the current level of market development of the country's economy. In other words, if the banking sector is weak (compared to the banking systems of many other countries), this means nothing more than a recognition of the relative weakness of Kazakhstan's economy exists. As far as I know, the banking sector of our country plays a big role in the country's GDP. And the 2008 crisis left a lot of traces in the country's economy. Until now, banks have troubled non-repayable loans, earlier, which they themselves distributed.

Question 2: Please rate, the quality of providing cross border payments by banks and what suggestions do you have for improving?

Blockchain is a very popular tool, including for transactions. If you discard an excessive hype that takes place in the world, the blockchain will ideally fit into the new business model, replacing, for example, SWIFT. At the same time, to implement such a project, the market needs good experts already used in the world (Ripple). In Kazakhstan, there is an active discussion about the introduction of various developments of the Fintech in the business model of various directions. At the same time, it should be noted that Kazakhstan is very tightly integrated into the world economy and will accordingly use the tools that its partners will use in the EU, the US or Russia. The blockchain system is an interesting tool, but its implementation will largely depend on economic feasibility and benefits, as well as lobbying by stakeholders.

Part 2: Main Question

Question 1:Potential values of utilization of Blockchain as a platform for money transfers?

Blockchain is speed and security, because the speed of the Internet is now high, the processors are powerful, and the data can be transmitted in large volumes. The main benefit of blockchain is decentralization. Everyone duplicates the history of all transactions, as it would be if everyone

collected paper checks about their transactions on the account, and then posted them on the Internet. Remark about secrecy: if all transactions can be tracked, this does not mean that all your names and appearances are recorded in the detachment. The sender and the receiver can also be encrypted in the form of random numbers (block-addresses), which will also change with each transaction - then the network becomes absolutely anonymous. To assess the advantages of using blockchain technology for mutual settlements between companies, it is enough to compare the speed of transactions - especially in international transfers. If a traditional bank transfer to another country usually goes from several working days to a week, then the payments in blockchain usually take about ten to fifteen minutes and can be made at any time, without reference to the banking day. This method is beneficial for the business, because the speed of the transactions determines the revenue of the company. Moreover this technology provides cheaper fees for transaction made. With blockchain payment system, you do not need to wait for several weeks until another payment arrives from the counterparty, which means that you can quickly put these funds into circulation. Due to this, the cash turnover ratio is growing, which directly affects the volume of revenue and, accordingly, the profit.

Part 3: Closing Questions

Question 1: Potential, prospects of your country in transforming the processes of international transfers into blockchain technology

To date, Blockchain is widely distributed around the world, and the real sectors of the economy are already implementing this phenomenon. First of all, in Kazakhstan, of course, it is necessary to introduce it in the financial sector. This will have a positive effect on improving the country's economy. At the moment, there are barriers of a legislative nature that need to be addressed in a comprehensive manner. This requires more active participation of the State, training of young people, that is, it is necessary to increase financial literacy, as the blockchain market, and especially crypto currency, is associated with fraud. I personally hold free seminars for teaching people and I notice that everyone who has at least a little mastery of information immediately sees great potential in this technology. It is necessary to develop platforms for further development, the creation of the infrastructure of the detachment. My forecasts regarding the implementation of our country, I think- 2 years, the State will actively study, and then actively begin to implement in practice.

Question 2: Your forecasts about the full use of Blockchain technology in financial industry
To date, it has not been clearly defined and clearly designed in accordance with legal issues, but the breakthrough is expected in 2018, in 2019, I think that all the processes of legal relations will be completed, which will positively affect this sector of the economy.

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SECTION B GENERAL INTERVIEW INFORMATION

Interviewer	Aytbenbetova T.Sh.
Interviewee	Mirus Kurmashev
IntervieweeTitle	Digital economy developer, Game changer technologies
Date of theInterview	30.04.2018
Place of the Interview taken	Almaty
Time of theInterview	19.00
Duration (inminutes)	65 Minutes

SECTION C INTERVIEW QUESTIONS

Part 1:Initiation “Warm up question”

Question 1: Please rate, the banking sector current situation.

Banks are diversely connected with the rest of the economy, depend on in its activity is absolutely from all links of the latter and in its own. They may have an active back impact on them. This is a unique the position of banks in the economic structure of society allows see the state of the banking sector and the ten as a sufficiently representative indicator of the state and trends that characterize the rest of the national economy, healthy or painful (crisis) state of the banking sector as a developer (litmus test) of a healthy or crisis costanding of the real economy. The latter circumstance imposes quite definite restrictions on decisions that the authorities can take in relation to banking system (banking sector) as a whole. For example, that solutions that stimulate (or at least make possible) more progressive and effective development of this sector legal and civilized principles, will be beneficial for the rest of the economy. And vice versa, everything that serves as an obstacle for such development of banking in the country, will result in losses andopportunities for the entire economy.

Question 2: Please rate, the quality of providing cross border payments by banks and what suggestions do you have for improving?

With the distributed ledger technology, blockchain can be a competitive threat for SWIFT when it comes to cross-border payments. SWIFT -a consortium of banks that manages transactions- enables inter-bank transfers using its messaging system. Currently, international transfer with SWIFT are slow and expensive (usually involves one or several intermediary banks). There are six players involved in a typical SWIFT transaction:

- Sender
- Sender’s bank
- Sender’s bank’s correspondent

- Beneficiary bank's correspondent
- Beneficiary bank
- Beneficiary

Sending money to someone in another country it should pass sequentially through this parties. Often, the correspondent banks impose their processing fees, in addition to sender's or beneficiary bank. Such transaction can take 2-3 days and numerous manipulations. In the best cases, money can arrive within 24 hours. In the age, where companies like Amazon can offer prime shipping of physical goods within 24hrs, banks still lag behind.

Ripple, on the other hand, has disrupted this model. The Ripple technology can offer faster than a second cross-border payment. There are several advantages of the Ripple technology, in addition to the speed of transactions. Instantaneous transactions lower transactions costs, lowering overall bank costs. The fees are optimized so that senders get the best possible prices for making cross-border payments. The technology is based on blockchain, making the network transactions immune to any manipulations and improving transparency and trust. Finally, Ripple's technology can provide and exchange more information compared to the traditional method.

Part 2: Main Question

Question 1:Potential values of utilization of Blockchain as a platform for money transfers?

In theory, the blockchain invented that there should be no intermediary banks, since the Bank is just an extra chain between customers, the Blockchain emerged after the economic crisis in 2008. When the crisis arose banks as well as mortgage banks, left people without a roof over their heads, just as banks did not enter into the provisions of the common people, punishing them with penalties more than the main debt on outstanding loans, and therefore financial transactions had to be resolved without the participation of any intermediaries. Thus one of main values of this technology is reliability. If we return to the financial sector, then everything that is beyond payments and transfers is interesting: trade finance, fixing of collateral, issue and trade in shares, document circulation between banks and their corporate clients. But in reality, just the biggest activity takes place either in the field of remittances, or the establishment of new standards for the banking sector through various associations and consortia's. The most interesting (and promising) areas in the blockchain are all those that are outside the cryptocurrency: health care and medicine, logistics, land cadasters, state and corporate document circulation. According to a survey of participants of one of the last World Economic Forum, which I studied recently, by 2023 the technology of blockchain will be actively used in the sphere of public services by the world leading countries. Moreover, about 10% of world GDP will be created with the direct use of blockchain technology. The main benefits from the introduction of technology are expected in the reduction of operating expenses (73% of respondents), reduction of settlement time (69% of respondents), risk reduction (57% of respondents), an increase in the possibility of receiving additional income (51% of respondents). And all of the above is a value for the population of the country, for business and for the State as a whole.

Part 3: Closing Questions

Question 1: Potential, prospects of Kazakhstan in translating the processes of international transfers to the technology of Blockchain

Potential benefits of blockchain at a country or government level can be increased trust, protection of data, and reduced costs. One of the key properties of blockchain technology is transparency. This transparency comes through decentralization – everyone in the network can see and verify transactions. A blockchain service for international money transfer allows citizens and government to share access to the records, resulting in improved trust in the financial institutions and government. Data Protection – Hacking of personal data is very common these days. Financial institutions, insurance companies and banks are the large targets for hackers. Implementing blockchain in the banking sector, specifically in money transfer and transaction related activities can reduce the number of frauds and security breaches. Blockchain technology has the potential to change the way how digital identity and financial activities are handles. Improved efficiency and reduced costs – Central bank and government agencies are obliged to manage resources efficiently and responsibly. Blockchain technology allows not only reduce costs associated with transaction processing but enforce governance, streamline processes and decrease audit overload.

Question 2: Your forecasts about the full use of technology

At the moment, blockchain technology for money transfers is still immature. But companies like Ripple are working to bring that change that will revolutionize the money transfer industry. Cryptocurrencies are decentralized, and they don't rely on governments and banks to exist. This is a very critical advantage over financial institutions as they can be bypassed. In order to implement blockchain for money transfers one does not have to use cryptocurrencies.
Although blockchain can disrupt many industries, several challenges need to be addressed to develop and run a blockchain based services. We can divide these challenges into three main categories: People, Processes, and Technology. Technology includes all the infrastructure requirements, such as servers, databases, networks, etc., where Processes include business processes and practices, any related regulations and requirements. Those processes can be at a market, country or organization level. Finally, challenges related to People include having skilled developers, business, and legal professionals. All these factors are vital to have a blockchain services to run smoothly once developed.

Appendix D- “Interview Protocol”

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INTERVIEW PROTOCOL

Aim of the Interview : Conducting an expert interview to obtain an answer to the main question of the study

General Research Question of the Interview : Introduction of Blockchain technology in the financial sector of Kazakhstan, prospects, forecasts of introducing, consideration global digital trends from all over the world.

SECTION B GENERAL INTERVIEW INFORMATION

Interviewer	Aytbenbetova T.Sh.
Interviewee	Sergei Shabelnikov
IntervieweeTitle	Centralized Operations Department Director
Date of theInterview	05.05.2018
Place of the Interview taken	Almaty
Time of theInterview	18.10
Duration (inminutes)	71 Minutes

SECTION C INTERVIEW QUESTIONS

Part 1:Initiation “Warm up question”

Question 1:Please rate, the banking sector current situation.

The biggest interest in using blockchain technology by banks is to streamline transfers. There are several drivers of blockchain disruption in the banking industry, including but not limited to reducing costs, mitigating money laundering and improving compliance with financial regulations. In addition to these factors, blockchain can replace the current inter-bank transfers by offering more reliable and relatively faster form of money transfers. Banks and financial institutions have particularly shown interest in the blockchain technology. Some of them has already started their own projects, others partnered up with FinTech startups to adopt the technology. Here are the examples of banks and financial institutions involved in blockchain: Deutsche Bank (2015) – it has been exploring various use cases for blockchain implementation. Such use cases include replacing the usage of fiat currencies, registering assets, and regulatory compliance. The bank has its innovation labs in Berlin, London and Silicon Valley.

NASDAQ (2015) – Initially NASDAQ has announced that the exchange firm will explore blockchain to build a platform for NASDAQ Private Market. The intent of the Private Market Platform to enable trading among private (pre-IPO) companies. Recently (2018), the CEO of the firm has announced that the company intends to become a cryptocurrency exchange.

DBS Bank (2015) – The Singapore headquartered bank facilitated blockchain hackhaton in Singapore. The top three participants were Omnichain (investment platform in emerging markets), Nubank (platform to provide banking for unbanked customers), and BlockIntel (transaction security platform)
US Federal Reserve (2015) – There has been some news that the Fed is working with IBM to create their own blockchain-based digital payment platform.
Goldman Sachs – A cryptocurrency startup Circle completed its $50M round of where GS participated. In Feb 2018, Circle has acquired Poloniex -a cryptocurrency exchange platform- for $400M. Just recently, the bank hired the first person for its digital assets division.
Fidor Bank – Partnered with Kraken to provide digital currency exchange in Euros. Later, the bank partnered with Ripple for money transfer services.
CBW Bank, Cross River Bank, Rabobank, ABN Amro and ING Bank – Also partnered with Ripple to explore blockchain for various banking services.
Westpac – Partnered with Ripple to develop low cost international payment platform. Westpac also participated in Series C funding of Coinbase.
ANZ Bank – partnered with Ripple and exploring various use cases.
BNP Paribas – In its innovation lab, experimenting with faster transactions using blockchain.
In addition to interest by the banks, there has been some blockchain platforms and projects in the developments that are worth noting:
Popular platforms: Ethereum, Ripple, MaidSafe, Counterparty, Stellar
Popular projects: Blockstream, Hyperledger, PeerNova, Chain.com

Question 2: Please rate, the quality of providing cross border payments by banks and what suggestions do you have for improving?

Services like Western Union or MoneyGram – Usually, senders pay in one WU or MG location and recipients collect money in retail locations. Transfer can be initiatied by cash, credit card or even bank account. Transfers might take shorter compared to inter-bank transfers, but one might expect higher fees. Third party services like Venmo, PayPal, Square Cash – In order to fund accounts on these platform, one still needs to provide credit card or bank information. In addition, these platforms serve as intermediaries and senders share their information with additional parties. All these methods of transfer involve some sort of intermediary who either collect information from senders and recipients and/or charge fees. The main advantage of blockchain money transfer is it eliminates the need for intermediaries. Let's look at a hypothetical blockchain money transfer.

1. Imagine that you want to send some money to your friend in Kazakhstan, Tolkyn.
2. Once you initiate a transaction, the details of the transaction are configured into a "block" and shared online in the blockchain network.
3. Everyone in the blockchain can see the details of the transaction.
4. Some participants of the network will "work" to validate the transaction.
5. Once validated by the majority, the block containing this transaction is added to the chain, which is a public ledger. Once added, the block becomes immutable as other blocks in the blockchain.
6. Tolkyn receives money in her blockchain address.

Part 2: Main Question
Question 1:Potential values of utilization of Blockchain as a platform for money transfers?

Currently, thereareseveralways of sendingmoneyoverseas:
Bank transfers – Generally, when someone sends money, it goes from the sender's bank to the recepient's bank. Banks in this case are intermediaries. In order to send money, one has to have a bank account provide necessary information to banks.

Here are some advantages of the blockchain technology over traditional ways of money transfer:

Security – Since blocks are written onto the blockchain are immutable, hacking or manipulating records is virtually impossible. Unlike bank accounts, where an account can be accessed by several parties, a blokchain based account can be accessed only by the account holder, who usually has the private key.

Integrity of the records – Every transaction is done and recorded online. Everyone can view transactions, but not modify them. This also makes traceability of transactions easy compared to complex paperwork and other means of book keeping.

Faster transfer time – In blockchain network, manual work and intermediaries are replaced with digital technology. This allows significantly reduce processing time and number of errors. Cheaper transaction fees – Elimination of intermediaries and manual works, removes charges such as service and clearing fees, penalties and other costs associated with money transfers.

Part 3: Closing Questions

Question 1: Potential, prospects of your country in transforming the processes of international transfers into blockchain technology

Unfortunately, the banks of Kazakhstan are not yet ready, as we do not have the appropriate staff that could implement this technology with a minimum of costs and have a positive effect; most likely we will turn to outsourcing companies.

Question 2: Your forecasts about the full use of Blockchain technology in financial industry

I think full-fledged use will not come soon, maybe in 5 years