Journal of International Trade, Logistics and Law, Vol. 9, Num. 2, 2023, 32-40

ASSESMENT OF BLOCKCHAIN-BASED P2P (PEAR TO PEAR) TRANSACTIONS IN INTERNATIONAL TRADE WITH SWOT ANALYSIS

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Received: May 30, 2023 Accepted: Sept 07, 2023 Published: Dec 01, 2023

Abstract:
Blockchain is known as a digitalized, decentralized online computer network on which a public ledger of all cryptocurrency transactions stored and it attempts to create and share all transactions that are verified by using a peer-to-peer (P2P) connected computer network. From the point of production to the truncating the international trade finance process or recording the customs procedures control, many companies are taking the advantages of blockchain technology day by day. The development of peer-to-peer payment systems make the crypto-currencies capable of dealing with not only the individual money transfers but also with the international trade activities. Expected result of this development is an increase the international trade volume in the short run. There are both threats and opportunities in terms of blockchain-based peer-to-peer commercial transactions. And also, some strengths and weaknesses due to the internal structure of the blockchain system. In this study, we are analyzing online peer-to-peer commercial activities via SWOT analysis from the perspective of institutions. It is expected that this study will enable to analyze the major factors of the peer-to-peer transactions in international trade facilities by applying "SWOT analysis". Even though there are a lot of research about blockchain in the local literature, institutional dimension in terms of the state-of-the-art cases of the adoption of blockchain in transport and logistics are studied scarcely in Turkey and hopefully will guide the academicians who want to work in this field

Keywords:
P2P, Peer-To-Peer Commercial Activities, B2B, Blockchain, SWOT

Jel Codes:
G32; E51; F30

1. Introduction
After the quick developments in IT systems that means information technology, blockchain has been one of the disruptive methods providing merge of the physical and the digital economy and caused the emergence of phygital economy(Purcarea, 2022). IT has reached a disruptive level of development in asset transactions in finance and provides traceability. However, current technologies do not provide a practical trading method for using IT in peer-to-peer transactions (Civelek & Özalp, 2018). The concept of blockchain or distributed ledger technology (DLT) is called a technology protocol that enables Peer to Peer (P2P) transactions between multiple users without intermediaries in a secure ecosystem. The secure ecosystem provided by the blockchain is formed by the combination of various factors. These are structures such as encryption, consensus, verification mechanism, and distributed ledger (Aktaş, 2018). Blockchain technology, which is used in many areas in international trade, is also effective in the control of the originality of the product, the verification of the licenses of the product, the control and verification of the certificates of the product and the protection of the copyrights of the product (Ortakarpuz, 2020). The daily life practices of those born after the mid-nineties, are a little different from those born before. They grew up in a time when digitalization and staying online are vital. For example, it is absurd for them for not being able to send money at the weekend. Because none of the apps they use shows this inability. They have never seen a notification on Tiktok that "you cannot share videos between these hours". It is meaningless for them that the banks are closed at noon. They have not

witnessed such a practice on Instagram. Whenever they click the share button, action of sharing occurs. If their phone has sufficient charge, they may prefer to have the electricity cut off rather than having their internet connection cut off. This fast, instant, and connected state of mind determines their perspective on everything around them. Their approach to banking and finance is also affected by this perspective. There are apps for them, not banks. It is an easy-to-use application where you can send and receive money at any time, the interface looks modern and cool. This need lies at the heart of the growth trend of the P2P payment market in both developed and developing countries. P2P (Peer to Peer) is an acronym that describes person-to-person sharing. It is a system that people who communicate with each other via DM are familiar with and would like to see this convenience in their banking transactions. It would be misleading to look at the P2P only for shopping. This method is also used for the daily operations of modern life. For example, lending money to someone else in the system, getting a refund, splitting a joint expenditure. Among the GenZ, the use of cash is very low and continues to decrease thanks to these applications. It may come as a surprise that you don't see the banks you know among Venmo, Cash App, Zelle, Apple Pay, Alipay, Google Pay, PayPal and many more that provide P2P payment services. Because a significant part of the companies serving in this field are fintech startups or big technology companies (Anbar, A. 2020).

2. Conceptual Framework

P2P Technologies may apply to international trade because of the common characteristics of blockchain stated below; (Niranjanamurthy, Nithya, & Jagannatha, 2018);

(1) Decentralized: Transaction is not the decision of a central authority

(2) Transparent: The result of the transactions whether they are accepted or rejected is the result of consensus in the blockchain system

(3) Open Source: Everyone can reach the source of the transaction

(4) Autonomy: Due to the idea of consensus, every node on the Blockchain can send or update data safely. The reason of this structure comes from the trust not to single person but to the entire system, so that nothing can be done to hack it.

(5) Immutable: Each and every data will be kept forever and cannot be changed unless someone who has control over more than 51% of the nodes.

(6) Anonymity: Blockchain works on the nodes, and names are not part of the security. That means data itself and also the transaction is anonymous.

At this point, how the blockchain works should be understood. There is a network of computational nodes, each client logged on the network receives a copy of the updated and validated data (Belu, 2019).

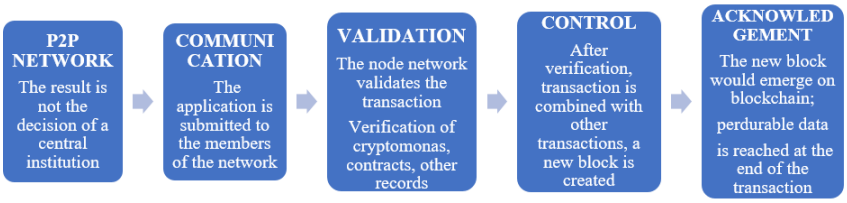


Figure 1. The blockchain transaction processing

2.1. Sector-Based Categorization of Blockchain

Blockchain based P2P applications may be used in many areas, such as finance, public institutions, (see figure 2)

2.1.1. Finance / E- Payments & Blockchain

Traditional banking services still continue to serve people successfully with years of experience and will continue to do so. But this new and agile world creates favorable conditions in which small but fast teams will succeed instead of heavy bureaucracies.

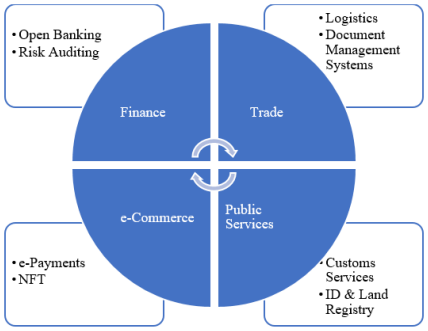


Figure 2. P2P Sectoral Potential

The companies that emerged under those conditions make a big impact with the right moves. Currently, it will take you no more than five minutes to download and register any P2P payment application. It's a great time for people who are used to doing everything instantly. The volume of the P2P payments market of $2.24 billion in 2021 is expected to grow to $2.64 billion in 2022, with a CAGR of 17.8%. According to the same report, the market is expected to reach $4.93 billion in 2026 with a compound annual growth rate of 16.9%. The Asia-Pacific region became the largest region in the P2P payment market in 2021. This information is actually not surprising because the increasing digitalization in this densely populated region, similarly, enables many sub-branches of the mobile industry to grow rapidly. Online banking and mobile banking users turn to the P2P payment market due to its advanced and useful features and encourage the people around them in this direction (Reportlinker, 2022). For example, Australian-based private company Finder Row Pty Ltd. According to a global survey of 2,899 people in April 2022, 26% of respondents from India stated that they have a digital bank account. To the same question, 13% stated that they believe they will have a digital bank account next year. Assuming that the result of this survey fully reflects the population of the country, we come to the conclusion that roughly 39% of the country's population will meet their financial needs digitally. ReportLinker expects this ratio to increase further to 46% by the end of 2027. As a result, increased customer trust and practice of mobile banking and e-commerce causes an increasing demand to P2P systems. It can be applied to contracts and other kind of electronic transactions, providing an association mechanism between digital assets and physical assets. This phygital practice may offer data security and trust between parties. It may also cause a decrease in banking fees and commissions. By this way, an encoding algorithm is used in data involved transactions and that is good to prevent the outflow of the critical data in the market (Purcarea, 2022). The computations of the algorithm's matrices can use the computing resources of all nodes in the blockchain to compute in parallel and then summarize the results. This makes it worthwhile to take full advantage of the massive graphics processing unit resources on the blockchain and computation (Su et al., 2020). HSBC has provided the first financial intermediation to an export transaction using blockchain in May,2018. The bank issued a letter of credit for American Agriculture company Cargill to Dutch lender bank ING. The trade finance transaction involved a bulk shipment of soybeans from Argentina to Malaysia. For this transaction, the bank used a platform developed by a start-up R3. This process normally takes 5-10 days but by using blockchain technology, the time required for the same process was approximately 24 hours (Browne, 2018). In November 2021, Akbank became the first Turkish bank to join the we.trade platform and successfully completed its first transaction on this platform. In the transaction carried out on the we.trade platform, Akbank pioneered the opening of new digital trade corridors by issuing a bank payment commitment (BPU) on behalf of its customer. While the platform provides credit guarantee and financing to exporters in the blockchain environment, it also offers a secure and digital payment guarantee to importers (Başar, 2023).

2.1.2. Trade Logistics & Blockchain

It is obvious that there is a close alignment between transportation infrastructure and digital infrastructure. Transportation infrastructure refers to customs, all kinds of ports, railways and highways. The digital infrastructure refers to clouds, intelligence management, payment systems, and pass-porting mechanisms. This integration can enhance trade relations and transform the global supply chain (Koh et al., 2020). After COVID19, the importance of

the logistics is understood clearly and it is the rising star of the future of trade. What is logistics then? The logistics consists of series of operations that includes the activities below (Belu, 2019):

- packaging,
- loading the goods to a container, truck, wagon in the warehouse,
- sending the goods to the embarkation port or airport,
- customs clearance,
- transfer of goods,
- insurance,
- custom clearance actions and unloading of products

The application of blockchain methodology in logistics to improve the export - import operations may cause;

- end-to-end traceability of each unit of product from manufacturer to seller until final consumer.
- easy management of the documents necessary for the transaction,
- supply chain optimization and cost reduction:
- unalterable information storage.

It is possible to transform the assets and capabilities in blockchain system which creates collaboration in the phygital environment. But the possession of goods is still a paradigm —if they are under a bill of lading, for example—. you need to possess B/L which is not just a paper that states the terms and conditions. The question is "is it possible to take this ownership into a digital and intangible world?". the ICC's Digital Standards Initiative (DSI) and the United Nations Center for trade Facilitation and Electronic Business (UN/CEFACT) lead these efforts in cooperation with sectors such as logistics and banking towards a new world age (Janner, et al., 2006).Traceability and control of the goods at customs offices is possible anymore because of blockchain technology (Belu, 2019). The system called "Fast Track Trade" platform, which was implemented in Singapore for the development of international trade and connects the seller and the buyer without any intermediary, is a good example for that purpose (Ganne, 2018). By this way, there is a new way of organizing and controlling the entire product life cycle. It is based on the integration of phygital elements into the production and logistics process. The using IoT (Internet of Things) services in the industrial process causes alterations on the business model and organization. The Internet of Things refers to objects connected with local (Wi-Fi, Bluetooth) or global (GSM, GPRS) networks for remote monitoring and control or performing tasks. Interconnected objects have a number of smart features, and they can be smart production units, smart buildings, smart products (Purcarea, 2022). Global exemplary initiatives of blockchain based institutions are stated below;

1. The Blockchain in Transport Alliance (BiTA): This is a standards and advocacy setting organization to help educate, advocate, and establish standards for blockchain applications in the transportation industry. Blockchain in Transport Alliance (BiTA) has founded in August 2017 in USA and quickly grown into the largest commercial blockchain alliance in the world, with nearly 500 members in over 25 countries that collectively generate over $1 trillion in revenue annually. BiTA is a member-driven organization; members are primarily from the freight, transportation, logistics and affiliated industries. Alliance members share a common mission of driving the adoption of emerging technology forward (Freightwaves Staff, 2019).
2. TradeLens: In August 2018, IBM and Maersk have established a jointventure that is a blockchain based system to provide companies to exchange information and record transactions effectively (Belu, 2019). Before the launch, for 12months, both partners had worked with dozens of ecosystem partners to identify opportunities to avoid delays, information delays and other barriers due to documentation errors. One use case showed in the United States how TradeLens could reduce the shipping time by 40% by altering the packaging process until the production line and save it from costing thousands of dollars. With better visibility and more effective communication tools, some supply chain participants have reduced the steps taken, from 10 to 5. Currently, from the moment the ship arrives at the port of destination until the content of the lots and their recipient are identified, a few days may pass; in case of use of the blockchain technology, content and recipient information will be accessible when the ship arrives (Belu, 2019).
3. FedEx has tried to initiate blockchain backed system to modernize the packaging and delivery services. They started from the dispute resolution cases to apply for blockchain used it to resolve disputes on freight claims. As the next step, they have continued info sharing project among suppliers. By the they realized which data is critical and needed to be stored in blockchain to solve the customer related disputes. With this system

it is possible for customers to follow the packages, not only while they are in FedEx's possession, but also before and after the company picks them up (Custodio, 2018).

4. UPS applied for a patent application in U.S. They planned a system to verify shipment and then trace it through all the parties who handles them. By using blockchain database, journey of the packages is kept on blockchain. Moreover, with the help of the encoding UPS have added a value-added service to this tracing circle. When a package is added to the system with the help of the "automated determination," the blockchain system searches for the most effective route for it and send the result to the related parties. The permanent ledger would also send the data of arrival and if demanded, customer can rate the service level of the carrier (O'Brien, 2018).

5. DHL as another global courier company also apply for blockchain to trace the service level of the carriage of pharmaceutical products. Company have established hubs in six different countries and created a new hierarchy to decrease the mistakes and audit the fraud potential.

However, after the financial running out of cash situation in we.trade in June 2022; as of November 2022, Maersk and IBM to discontinue TradeLens. The announcement in the official website of Tradelens stated that "TradeLens was founded on a bold vision for global supply chain digitization as an open and neutral industry platform. This vision centered on the ability to enable true information sharing and collaboration across a highly fragmented industry globally. Unfortunately, such a level of cooperation and support has not been possible to achieve at this point in time and we have to announce the discontinuation of the TradeLens platform" (Tradelens, 2022).

2.1.3. Public Services & Blockchain

Blockchain database is also valuable for public transportation. By the data on the ledgers, costs can be decreased, risks can be controlled and risks, and limited resources can be saved. Regulatory compliance may be easier because of the traceability nature of blockchain. In addition to public service providers, private contractors may be added to the system to check the SLA of them (Alhaddad, 2018). Another important gain is related to paperwork reduction. Because blockchain database provides unlimited data storage capacity on cloud. Besides, after GDPR, some data in public transportation is accepted as a kind of sensitive information anymore. Therefore, blockchain system is the best alternative for the governments is to ensure the security of all parties. But at this point we should not forget that the duration of a transaction is extending day by day. So, some services that are in need of rapid data processing like ticketing or signaling would not be comfortable with blockchain (Pramod, et al.,2019). With the help of the IoT technology, Blockchain can also be part of the daily processes, such as utility services, health care etc. However, GDPR is an obstacle for the expansion of IoT. Because they can easily be targeted by the DDoS attacks and may lock all the other services. Some academicians would propose smart contracts to manage the patients' data and medical IoT devices. They offer to use Ethereum protocol to maintain the remote healthcare system (Pham et al., 2018).

3. Pain Points of Blockchain

According to the report called "How Blockchain Can Reshape Trade Finance", there are 7 pain points for financing of international trade (Deloitte, 2020).

(1) Contract Analysis: The import bank manually reviews the financial agreement provided by the importer and sends financials to the correspondent bank

(2) Factoring: In order to find short-term finance alternative, merchants submit credible export invoices to factoring institutions.

(3) Retardation: Because of the repeating controls of the all parties related to shipment, delivery of the products can be late.

(4) AML Audit: It is not possible for the banks to check the identity of the sender or receiver on blockchain system. So, audit must be done manually.

(5) Different Platforms for Different Parties: Every market has different platforms to operate and those platforms do not communicate with the cross-border peers. That may cause a communication gap and open way to fraud the transaction.

(6) Multiple transactions with Bill of Lading: Bill of lading is a negotiable legal instrument and shows the possession of the goods. Because of the inefficiency of the system, banks may use same paper for financing the same goods more than once.

(7) Detained Payments: Since there are many middlemen for just one shipment, each and every one should verify that money is delivered to the next party as it is described in the system.

In the same report, most of these pain points have possible solutions with the blockchain technology. Smart contracts under Ethereum may solve the manual contract problem. By these smart contracts, the bank of importer would be capable to analyze the agreement or may prepare draft credit terms or may accept the payment in real time. Export bank can check the payment notice and when the control is done, a smart contract can be generated on the Ethereum to issue the contract. Exporter may be able to sign Blockchain-equivalent letter of credit on Ethereum contract to start the production and all these steps cannot be undone. Goods can be inspected by either transporters and/or by the customs agent in the system. It is ensured with all providing their respective digital signature of approval on the Blockchain smart contract. When the shipment is realized, importer can digitally sign the receipt of goods and may easily trigger payment. At the end, without any intermediator, importer can transfer the money to the exporter. Different from the report content, logistics operations monitoring and warehouse supervision may also be part of the blockchain technology (Chen, et al. 2018).

4. Swot Analysis

SWOT is the analysis method used in this study and it is accepted as a qualitative and a descriptive methodology. The qualitative and descriptive method is trying to describe the existing situation and focus on the characteristics, quality and interrelationship between activities. In addition, that type of analysis does not offer any solution or change on the variables studied, but describes the immediate position. The only solution provided by this analysis is the detailed research itself, which is carried out through secondary data.

4.1. Strengths

International trade requires the approval of public authorities for the traded goods for example in customs offices. Validation process might be conducted on blockchain based systems and that would create traceability, speed, transparency and unharmed privacy for the data in a global sense. Using P2P systems and smart contracts decreases and even cut off the costs which is necessary today because of the services that are given by some third parties, such as banks. These smart contracts would also shorten the related process from weeks to hours. Especially bill of ladings as a smart contract may offer extra security on road transport. Because it is a well-known fact that bill of lading gives the ownership rights to the carrier and it is a kind of grey area for the involved parties. However, initiation of the transfer of a bill of lading through the smart contracts provides real time ownership change of the goods from the exporter to the consignee and all documents are available in the Ethereum system in the encrypted form (Bistarelli, et al.2020).

4.2. Weaknesses

The most important drawback of the blockchain is the immaturity of the users. Just for this reason, many important initiatives like "we.trade" have been fall by the wayside. Ownership of the assets on this system is protected by two types of keys but the problem lies behind these. If you lose your passwords, everything fades away. No one can find your key and reach out to your wallet anymore. In short, human nature is another obstacle to the improvement of P2P systems in finance or international trade. People are worried about losing their job because of this complex technology and they resist to change the classical trade transactions. Lack of standards and control makes the people more anxious about the system, In the meantime, fraud attempts via social engineering are abstaining people from blockchain (Başтuğ, et al.2020).

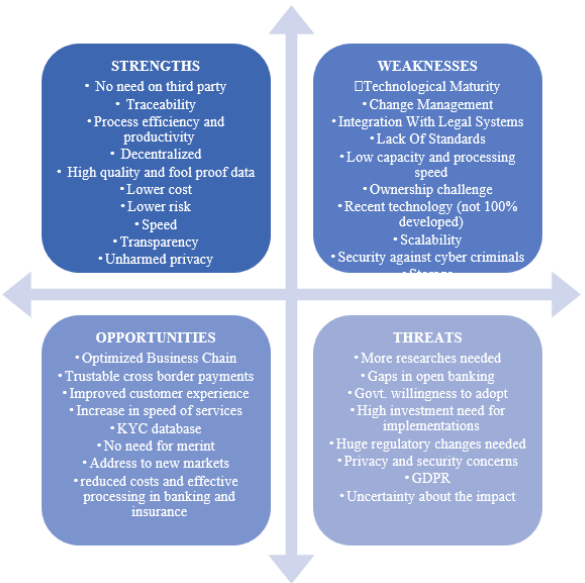
4.3. Opportunities

The most important gain of the system from blockchain is definitely the process optimization and control over the supply chain. Because blockchain informs supplier directly and all the parties who are part of the supply chain. Moreover, blockchain based applications do not allow the interruption of the system (Atzori, 2017). Another important outcome is speed. International trade transactions can be matter of hours via the smart contracts, not days or weeks. That means the goods or services in cross border transactions can be finished easily. Reason of that easiness and speed comes from reducing of the intermediaries that are necessary in classical methods of international trade. However, that does not mean there is no intermediatory body. It is still necessary to establish some platforms similar to "tradelens"

or "we.trade". That platforms provide better protection of privacy with the validation of their systems. These platforms are also needed to create better customer experience and perception of trust to the system (Jovanovic et al., 2022). Even though blockchain is familiar to everyone, businessmen may not prefer to make a deal on that peer-to-peer system. That parties can be perceived as the source of trust. Infact, there is no need for the rating agencies or MerInt (merchant intelligence) anymore. Because system requires the instant authorization for every step of traditional cross border trade. By this way, KYC (know your customer) database would be much more secure and wide spread. Why it is important for o business to know the customers? Especially on cross border B2B contracts, the counterparties performance should be followed carefully and financial position of all parties must be up to date all the time. Further significant impact of the blockchain based applications or smart contracts is the cost reduction in financial processes. For example; if the insurance contracts are designed on smart contracts the speed of the process on insurance claims increase and errors would decrease comparing with the manual process of claims. Lastly, it is possible to apply the blockchain to the new business areas like car sharing, accommodation exchange systems like AirBNB or disk storage rentals (Gatteschi et al., 2018).

4.4. Threats

From the macro-economic point of view, the most crucial vulnerability of the blockchain on trade systems is the immaturity of the idea. There is more way to go in terms of research and development of the idea to be applied in real world. Why we say that? Because, even though the market makers of the global trade system invested on blockchain based platforms, they could not be successful to ensure and push the actors of the global trade to be part of these platforms. Another major obstacle that can be accepted as a threat is definitely the lack of internet infrastructure in global sense. Even in Türkiye, we don't have resilient internet web to provide uninterrupted service. This caused Open banking has emerged from the applications of blockchain on personal banking instruments. It has mainly come out in South East Asia specifically Hongkong and around. But still the traditional banking instruments are dominant for B2B trade and no change is expected in the short run. Because, G20 governments do not act confidently about the regulations that are needed. Therefore, banking system acts unwillingly too and API configurations that are served by the financial institutions remained limited. From the business point of view, it does not feasible for the companies in terms of fees and time to make the transactions over there. Last issue, which should be considered as the legal drawback, is GDPR. Due to the negative image of the newly developed coins, lack of regulations has seemed to be an important problem. Although GDPR is partly covering the security issues, it is not enough to understand all the potential problems. Since as it is stated at the beginning of "threats", blockchain is immature yet (Güler, et al.2023).



5. Discussions and Conclusion

Peer-to-peer transactions use Blockchain database to keep the information about the transaction. Blockchain database works in a multi-disciplinary model that combines algorithm, cryptography, mathematics, and economics (Niranjanamurthy et al, 2018).Blockchain based applications on commerce are still in the development phase. For the next 10 years it is expected to change the way of doing business dramatically. However, the most crucial vulnerability of the blockchain on trade systems is the still perception of safety. There is more way to go in terms of research and development of the idea to be applied securely in real world. Why we say that? Because, even though the giants of the global trade system like Maersk, A.P. Moller or IBM, invested on blockchain based platforms, they could not be successful to ensure and push the actors of the global trade to be part of these platforms. For example, as it is stated in the study, some global blockchain logistics initiatives like we.trade and/or Tradelens had been shut down recently. The reason behind these failures is also related to the resistance of the traditionalists. Decentralized and digitalized system seems complicated for most of the merchants and let's accept that the system is not immune from the villain attacks. Therefore, related parties did not feel secure even if it is claimed that the system is transparent and unhackable. So, what can be done with P2P systems for now? All kind of next generation rental models may use blockchain. One of the significant outputs of this study is; Blockchain-based solutions should be preferred in the processes which take days, weeks or months. In other words, long, complex and hidden costs bearing cases would be better rather than the transactions that can be finished in seconds. Like the AirBNB case, which uses blockchain technology from the ordering to payment step, even they transfer the digital key of the house through blockchain based application, the electrical scooters rental system (Martı, Bin-Bin, Scoty etc.) can be converted to blockchain based apps. Because most of the users of these scooters are from GenZ., it would even be more desirable for them. Without any paper output, it can be stated that these applications are accepted as environmentally safe, in other words "Green" services.

Due to many global blockchain applications for payment process in foreign trade transactions, banks are forced to digitalize some services and, therefore, a reduction in the costs of some banking transactions had happened. Moreover, it is much easier, faster and cheaper to send cash instead of SWIFT. But system still in need of banks to initiate and conduct a trade transaction. According to the recent report of KPMG that is called "Future of Commercial Banking", in the near future, banks will be the leading institutions where personal data is securely stored. 47 percent of consumers who participated in the survey, see banking as the most reliable option for storing data, not the decentralized blockchain system. As a result, it can be stated that data is and will be the key element of the near future and even though blockchain system is safer and faster, people would choose to trust to the familiar systems like banks. Therefore, intermediary institutions will be in our lives a while more.

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