Chapter

BLOCKCHAIN TECHNOLOGY
IN INSURANCE AND REISUNRANCE

The main reason of Blockchain popularity is cryptocurrencies which are based on this technology. The most famous cryptocurrency is Bitcoin, whose value has recently reached around 20,000 American dollars. Currently, there are around 1,300 cryptocurrencies and their number is increasing. The possibilities of the application of Blockchain technology by far surpass cryptocurrencies. This paper will be intended for their presentation, with a special focus on the area of insurance.

The concept of Blockchain technology[1] was developed in 2008 in the original document of an unknown author, signed as Satoshi Nakamoto, which lends to it all a certain dose of mystery. The author proved that the so-called problem of "double spending" of digital goods can be solved without any mediators in whom both of the parties have trust; to put it plainly, for transferring digital money from the account of one customer to another's no banking mediation is needed.

Blockchain is a public decentralised database in which transactions are anonymously performed and confirmed. Apart from the functions of database Blockchain now has a possibility of programme execution, which represents a great potential for business.

The biggest world's reinsurance companies Munich Re, Swiss Re and several big insurance companies: Allianz, Generali, Liberty Mutual, and so on, have mutually put their efforts into introducing Blockchain technology to the area of reinsurance and insurance, through the initiative B3i. Reinsurance is by its nature much closer to the philosophy of Blockchain, as a lot of reinsurers and retrocessionaires share one risk. A greater transparency of the insurers' reinsurance contracts could be offered to them. In the case of risk transfer from the insurance company a reinsurer may be assisted by Blockchain to realise the number of retrocessionaires and the way in which they further divided the risk

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[1] Nakamoto, S. (2008). *Bitcoin: A Peer-to-Peer Electronic Cash System*, www.bitcoin.org

with the reinsurer. Likewise, it would make easier the exchange of information on the paid claims, especially claims reserves, among all the listed participants in the risk underwriting, which would make their adequacy of technical reserves better. The insurer would quickly and easily get the necessary information about all the retrocessionaires, for improving the capital efficiency and meeting demands for capital adequacy.

After reinsurance, Blockchain will also be applied in insurance already during this year. There is a huge potential in various areas of insurance, about which it will be written in the paper in more detail.


1. THE CONCEPT

Blockchain is a database which is not in one place, but is comprised of smaller units of data, the so-called blocks, which are digitally connected into a chain. Instead of individual keeping a record of one's own various transactions, the record is unique; it includes all the transactions and is public.

The chain of blocks

The literal meaning of the word Blockchain is a chain of blocks, where each block represents a transaction, and the chain the whole database, as shown in Figure 1. Each block comprises four pieces of information: a connection to the previous block, the resume of the transaction, the timestamp and the evidence of block formation.
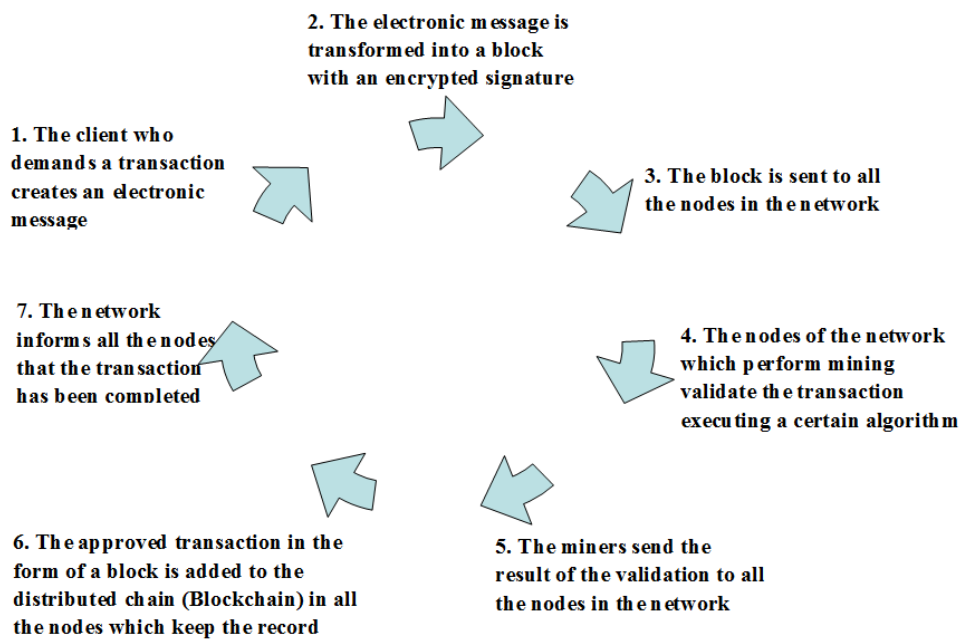
Figure 1. The beginning of the chain of blocks in one possible realisation of Blockchain technology
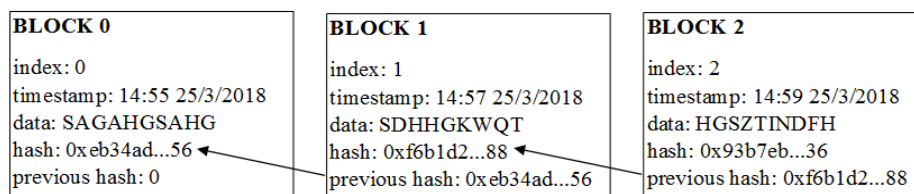
The blocks contain information on different digital transactions. The exchange of data about transactions is done in the network itself, with no mediators. When the exchange is finished, a certain number of the participants in the network must validate the transaction and afterwards the transmitted information, together with other necessary data, is cryptographically connected

with the block, which enters the existing chain with other blocks. When a transaction is once included into the block, it cannot be changed any more. Each transaction is assigned a timestamp, which arranges the chronological order of the blocks in the chain. The members of the network validating the transactions insert them into the blocks and keep their record, getting a prize for their work from the network in a certain amount of Bitcoins per transaction. That process is called mining, and the members doing that are called miners. There is no chance of cheating the system and inserting something into the records, as it would not be synchronous with the record of transactions of other participants in the network. The rules of accepting transactions are defined in advance and everyone validating the transactions carries out the same algorithm. Blockchain technology provides a secure and reliable exchange of any digital goods (digital money, contracts, proofs of ownership, securities, etc.) between two Internet users.

Figure 2 The concept of forming the next block in one possible realisation of Blockchain technology

2. The electronic message is transformed into a block with an encrypted signature

1. The client who demands a transaction creates an electronic message

3. The block is sent to all the nodes in the network

7. The network informs all the nodes that the transaction has been completed

4. The nodes of the network which perform mining validate the transaction executing a certain algorithm

6. The approved transaction in the form of a block is added to the distributed chain (Blockchain) in all the nodes which keep the record

5. The miners send the result of the validation to all the nodes in the network

The basic concepts were developed in 2008, in the paper of a mysterious author Satoshi Nakamoto "Bitcoin: A Peer-to-Peer Electronic Cash System". Satoshi's paper describes the decentralised model of the network in which every participant is equal and may, as needed, have a role of a client or the server. In

such a network (Peer-to-Peer) direct payment in electronic money is provided, with no mediation of a financial institution.

The double spending problem

The double spending problem represents spending the same digital money several times. It is achievable since digital money is actually a file which can be copied or falsified. Diverse cryptographic techniques for preventing the occurrence of this problem are used. For instance, PayPal had this problem at the beginning of its work. The client could access his account simultaneously from two different computers and spend the same amount of money on two sides.

Satoshi has proved that the double spending problem with digital goods, such as Bitcoin, can be solved without a third party, that is to say, with no mediators in whom both parties have trust. Neither digital goods nor physical can be in two places at the same time.

Private and public Blockchain networks

Public Blockchain networks are available to wide audience. Anyone can see what is written about executed transactions, send a request for transaction and if correct, that transaction will be included in the block chain and anyone can take part in the process of validating transactions.

Chart 1. Comparing public and private Blockchain networks

	Public networks	**Private networks**
Access	Rights to read and write in the data base are allowed to everyone	Rights to read and write in the data base are assigned by certain rules
Speed	Slow	Fast
Security	Consensus is reached by methods Proof of Work or Proof of Stake	The participants in the network can only be the invited nodes
Identity	Anonymous participants	The participants' identities are known
Costs	Expensive	Cheap

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Private Blockchain[2] networks allow participation in the network only to invited members, so there is no anonymity of participants, as with public networks. The rights for making a request for transactions are allowed only to the members of a private organisation. For validating the founder of the private network is held accountable or validation is done by the rules set by him. The rights to access to the executed transactions can be allowed to everyone or limited in some way.

There is a Consortium Blockchain network, in which only a small number of previously determined nodes have rights to perform validation of transactions. The rights to send requests for transactions and to access the executed transactions can be enabled to everyone or limited in some way.

All the Blockchain networks have a lot in common. They are decentralised and every participant is equal and may when needed have a role of a client or the server. Every member of the network keeps a copy of the whole record on all the executed transactions. The copies are synchronised through reaching consensus. In Chart 1 the main differences between public and private Blockchain networks are shown.

The Byzantine generals' problem

The key challenge encountered by the Blockchain network is how to bring to consensus the participants in the network about what the correct transaction is, which is in a theory of games known as the Byzantine generals' problem. The consensus is a dynamic way of reaching an agreement within the group. While voting serves only the interests of majority, the consensus provides respect of the interests of all the members of the group.

If a large Byzantine army, which consists of a huge number of armies from different parts of the world, surrounds one city which has an extremely strong defence, a question is raised how the generals of those armies can reach consensus about when to make a coordinated attack on the city, if they communicate exclusively through the messenger, they never meet and have no chief commander on the terrain. Reaching consensus is very important as in the case of absence of coordination and partial attack strong defensive forces will certainly prevail. The situation is complicated by the generals who are not loyal to the army but have their interests or they are in a friendly relationship with the army of the city they need to conquer. Likewise, the messengers cannot provide a completely reliable exchange of information.

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[2] Jayachandran, P. (2017). *The Difference between Public and Private Blockchain*, IBM

In other words, solving of reaching the consensus in decentralised systems in which there is no safe flow of information and there are opponents to the system is under consideration.

Blockchain solves this problem by giving incentive and rewarding good behaviour in Bitcoins that is carrying out a proposed algorithm, and making very expensive the attack on the network with a small probability of the attack success. Satoshi's algorithm guarantees that, regardless of what the enemies of the system do, loyal members will succeed to reach consensus about the right solution. As long as the computer processor's power of the loyal members of the network is bigger than the processor's strength of the enemies of the network, Blockchain functions properly.

Reaching consensus in Blockchain technology

Blockchain technology supports not only the distributed database but also executing programme procedures that is including business logic into the database. The Blockchain system is very robust for its distribution and it cannot happen that the whole system falls if a node does not function or is under attack. Considering that the distributed database does not have central authority, the consensus among the nodes of the network about the validity of a transaction is a basic tool of managing the system. There are more ways of reaching consensus in different realisations of the Blockchain system of which the most famous in public Blockchain networks are the following[3]:
- Proof of Work based on mining, originally described in Satoshi's paper and upon which are based the cryptocurrencies: Bitcoin, Litecoin, Bitcoin Cash, Ether, and so on.
- Proof of Stake does not mean mining, certain nodes validate transactions and other confirm them, but they all keep part of their money in a virtual safe and the one who tries to cheat the system loses the money; the cryptocurrencies DASH, NEO, PIVX, etc. are based on it.
- Delegated Proof of Stake – there is also no mining, it functions similarly to the previous one but the nodes which are delegates are introduced, whose role is to make decisions on the rules of work, provisions, etc. The cryptocurrencies Steemit, BitShares and EOS are based on it.

In private Blockchain networks the most popular way of reaching consensus is PBFT (Practical Byzantine Fault Tolerance). This is where consensus is reached

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[3] Milinković, N. (2017). *Uvod u Blockchain – kako se postiže konsenzus u decentralizovanom sistemu?*, www.startit.rs

more easily and quickly, at the expense of anonymity, which is not essential in private networks. The example of its realisation is in the next Blockchain systems: Hyperledger and Ripple.

Proof of Work

The first and the most widespread way of reaching consensus is Proof of Work. For validation of a transaction each node must execute a complex mathematical calculation. That is why an appliance utilizes certain resources: electrical energy and computer processor's power. On the other side, for successful validation the node (miner) is awarded with a certain amount of money in cryptocurrency. The consumption of electrical energy is a guarantee that miners will not try to cheat the system, as the only way to make a deception successful is to have more than 50% of the processor's power of the whole system; that is to spend more than 50% of the total electrical energy consumed by the system, which is too expensive. Even then, the previous transactions recorded in the Blockchain base cannot be changed, as it is unchangeable. The more processor's power there is, the node will complete the mathematical calculation faster and get the reward faster; that is earn more.

Ethereum

Ethereum[4] is a public network realised in Blockchain technology in which smart contracts are implemented and in which it is possible to run decentralised applications. The founder of Ethereum is Vitalik Buterin who, in his paper from 2013 proposed improvement of Satoshi's concept of Bitcoin and thus made possible the realisation of smart contracts and the execution of decentralised applications. He achieved that owing to the Ethereum virtual machine; that is the software which works in the Ethereum network and enables the execution of the programme code of any decentralised application. Apart from the compensation for validating transactions, as with Bitcoin, miners are here awarded in cryptocurrency Ether, also for performing services on the network.

Smart contracts

Smart contracts enable implementation of the exchange of money, property, shares and anything else which has a value in a transparent and not conflicting way with no mediation of a third party. They are automatically executed. They

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[4] Milinković, N. (2017). *Uvod u Blockchain – Etherum i pametni ugovori*, www.startit.rs

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are created when typical contracts are changed into a programme code and stored in the Blockchain network and afterwards all the nodes abide by them and implement them. The contracts define the rules and sanctions in case of disrespect and are implemented automatically and thus instead of legal security of typical contracts give the algorithm security, that is guarantee to be surely realised.

The characteristics of smart contracts which have extreme potential in business are:
- Trust - data are finally unchangeable in the Blockchain network,
- Transparency – all the contracting parties have undisputedly agreed to the contract terms,
- Security – data are protected by encrypting,
- Speed – automatic execution is multiply faster than manual,
- Autonomy – there is no need for lawyers nor other mediators and
- Lower prices – all the mediators are eliminated, reducing the price.

2. POSSIBILITIES FOR THE APPLICATION OF BLOCKCHAIN TECHNOLOGY IN INSURANCE

Although the concept of Blockchain technology was published ten years ago, not including Bitcoin, its first applications can now be seen in financial industry. It is expected that this technology will fulfil its full potential in five years' time.

In the field of insurance there are great possibilities for implementation of this advanced technology. The greatest potential for development is in the following:
1. Microinsurance – Blockchain technology enables respect of the imperative of small costs of contract administration on microinsurance, by cheap realization of a reliable register for policies
2. Claim payment – by use of Blockchain infrastructure for paying faster and cheaper claim payment is possible, especially abroad, for instance through a green card or clinics which give services for travel insurance
3. Frauds prevention – owing to Blockchain technology it is possible to obtain much more information on insured cases, such as traffic accidents, from different sources, and in that way prevent fraud attempts in insurance. Likewise, the network successfully spots false identities of potential frauds and prevents multiple paying of the same claim in one insurance company as well as one claim payment in a few of insurance companies.

4. Reinsurance – the exchange of information on risk and claims among insurers, reinsurers and further retrocessionaires is made immensely easier and faster
5. Smart contracts – automatisation of claim payment with this type of insurance contract is possible, as Blockchain technology enables checking whether payment conditions have been fulfilled
6. Specific risks underwriting – it is made easier to insure specific property whose value is hard to determine, such as artefacts, diamonds, etc, as Blockchain technology enables keeping and finding data on the origin and previous purchases and sales of such items
7. Standard risks underwriting – by easy access to public data on the previous history and behaviour of a potential insured person, for instance in Casco insurance, provided by Blockchain technology, the process of risks underwriting can be hugely improved.

The key advantages of the application of Blockchain technology in insurance are:
- Reducing acquisition, administration and claims settlement costs,
- Increasing transparency and trust by using an open distributed system,
- Increasing the efficiency of operations,
- Automatic inclusion of external data in the process of risks underwriting and prices calculation,
- Increasing the claims payment speed,
- Reducing the total amounts paid for claims through more efficient fraud detection.

In Toyota it is considered that this technology can achieve big results when applied to the automatisation of driving and activity of insurance in the following way: the sensors in a car would collect data during driving, keep them in the Blockchain chain and in case of a traffic accident those data would be sent to the insurance company, which could in that way assess the claim better.

Various scenarios can be envisioned in which insurance Blockchain technology will be applied in situations which are not possible at this moment, but in a relatively near future will become reality, owing to this technology among other things.

Scenario 1: MTPL Insurance only in the period of time when an automobile is driven

In the modern world purchase of various services in a relatively shorter time period, when they are really used, is more frequent. An example of insuring the

future is that a vehicle has no MTPL coverage throughout the year, but only in a time period when it is driven. In insurance it is most easily achieved by using mobile applications in which insurance coverage is purchased only for the period when it is needed. One of possible realisations of such insurance, by using Blockchain technology looks this way. The automobile sends necessary data on itself to the application of insurance company installed on a mobile device of the client and when the client enters the expected time period of travel, the application of insurance company calculates the insurance premium and shows the client an offer. If the client accepts the offer a request for insurance is sent into the Blockchain network. As soon as the network validates the request, the data are entered into the Blockchain records and insurance coverage begins to be valid. When the client after a while decides to return home, as his previous coverage for the same way in a different direction is already in the Blockchain records, one click activates insurance coverage for return travel.

Scenario 2: Casco insurance of self-driving automobiles

Vehicles with no driver are already being tested throughout the world and it is only a matter of time when they will become reality in the streets and who will and how insure them. When an autonomous, self-driving taxi vehicle ends driving passengers, at the closest taxi rank, it awaits a new customer. Several vandals see that the previous customer has forgotten something on the seat and they smash the window to steal it. The car automatically summons the police drones which fly to record the faces and locations of these persons and the car pays the drones for the service. Afterwards, it drives to the service shop where the glass is being replaced. The drone footage and the mechanic's receipt are sent to the insurance company and the claim is practically immediately paid, which is much faster than by current procedure. The automobile gets relatively quickly back to business.

Scenario 3: Claims settlement

The process of claims settlement is most suitable for implementation of Blockchain technology. The moment of claim settlement is the moment of truth for an insurance company, since a further contact with the client depends on it. In case that this process does not run smoothly, loss of client's trust in the company is imminent as well as cessation of any further cooperation. The greatest challenges in this process are the following:
- Manual entering of data in the claim report,
- Too bureaucratic and complicated procedure of claims settlement,
- Expensive intermediations services of claim reporting,

- Delay in claim settlement process due to examination whether it is a fraud in insurance,
- A large number of documents needed to be collected for claim settlement,
- Manual preparation of payment documents,
- Long waiting for claim payment.

Blockchain technology can assist in overcoming most of the named challenges owing to the fact that it brings transparency and in that way trust, the processes are very efficient and everything is based on the reached consensus.

The existing process of resolving claims

Traditional insurance companies often have the processes of claims settlement organised in a following way:
1 Clients deliver data about incurred claims to insurance companies. Very often, certain data are missing and sometimes the delivered data are not consistent. Likewise, they are sometimes falsified, as the American statistics says that around 10% of all the claims are actually a fraud attempt in insurance.
2 The regulator of the insurance industry or the insurers association is usually trying to   establish a central record on claims. That is a rather huge burden for their administration, primarily due to diverse information systems insurers have and their inability to deliver completely correct data.
3 Data on claims are delivered in certain cases to court, organisations for protection of customers' rights and similar organisations. Those processes are entirely non-transparent for the client.
4 The exchange of data on paid and reserved claims with a reinsurer is slow and complicated as it is most often carried out manually.

An improved process of resolving claims

By introducing Blockchain distributed encrypted records whose network nodes are insurance companies, the regulator, the association and reinsurers, the process may be rather improved. The processes would look this way:
1. All the data on claims are entered in the Blockchain records and their correctness is complete, as it is based on the consensus, for instance a date of incurred claim confirmed by both the client and the insurance company. Once entered data cannot be altered, which makes falsifying difficult and practically disables a fraud attempt in insurance.
2. The regulator and the association have an equally easy and quick access to the data as well as insurance companies.
3. Court and other interested parties, upon authorisation by competent network nodes can also equally efficiently access all the data they are authorised to see.

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4. Reinsurers are part of the network and they have an insight into all the data on claims at the moment of entering, the same as insurers.

Obviously, the process is significantly improved to general benefit of all the interested parties. The client gains an insight and control over the use of his data, a cheaper next policy if he has a good history of claims and in case of claim has to collect fewer documents. The insurer fights more successfully against frauds in insurance, has more efficient internal procedures, and offers a better service to the client, thus having a better relationship with the client. Also, every insurer gains access to claims of every potential client, which enables better portfolio risk management. The reinsurer has an automated access and work with data on the claims from the insurer.

3. IMPLEMENTED EXAMPLES OF THE APPLICATION OF BLOCKCHAIN TECHNOLOGY IN INSURANCE

It is possible to design a truly enormous number of applications of Blockchain technologies in insurance but apart from theory and implementation of certain solutions is almost finished. In further text there will be more about concrete examples of implementation of this technology in the area of insurance.

B3i

One of the examples of successful implementation of Blockchain technology in reinsurance and retrocession is B3i consortium, which has provided a proof of the concept of using distributed records which alters the traditional infrastructure, for the purpose of increasing the speed of information exchange and reducing risks. The key determinants of the mission of this initiative are: standardisation, integration and automatisation. The founders of the consortium are among the biggest and the most famous insurance and reinsurance companies in the world:[5] Achmea, Aegon, Ageas, Allianz, Generali, Hannover Re, Liberty Mutual, Munich Re, RGA, SCOR, Sampo Japan Nipponkoa, Swiss Re, Tokyo Marine, XL Catlin and Zurich.

The modern process of reinsurance is rather inefficient and has not changed much in the last hundred years. Inefficiency leads to delay in contracting process on reinsurance and claims, which brings reputational risk for the insurer and possible problems with cash flows, as shown in Chart 2.

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[5] www.b3i.tech

Distributed ledger offered by Blockchain technology can largely improve the process of reinsurance.[6] If all the reinsurance contracts were included in the Blockchain records, the need for reconciliation would be lost since all the data would be in one place in the unique distributed ledger whose copies are with all the insurers and reinsurers. There would be one standard for data processing and one platform which would be executed automatically. All of that would accelerate the process, optimise cash flows and provide a completely integrated information system.

Chart 2. Comparison between the existing and future reinsurance process

The existing process of reinsurance	The process of reinsurance aided by Blockchain technology
- The contract is manually defined on paper	- The contract is digitally defined on platform B3i
- Written and oral negotiation on every contract between more brokers and the reinsurer	- Negotiation between more brokers and the reinsurer is automated
- Data are manually processed by all the participants for themselves	- Data are entered only once, and processed automatically in the Blockchain network
- Invoices and receivables are made for oneself so everyone's reconciliation is needed	- Invoices and accounts receivable are generated by the network so the reconciliation is not necessary
- Complicated and long-lasting adjustment causes delay in money transfer	- As there is no reconciliation money transfer is immensely accelerated
- Copies of the contract are kept locally	- The contract is kept in the Blockchain network

In September 2017 the members of the initiative of the insurance activity B3i presented for the first time the functional beta version of IT solution of managing the contracts on property reinsurance of excess of loss in case of catastrophe such as smart contract, based on Blockchain technology. Reinsurance of excess of loss upon a disaster is a nonproportional contract on reinsurance which limits the accumulated claims which can happen by a

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[6] Crom, S. (2017). *Blockchain: the Potential to Drive Efficiencies across the Industry,* Aegon, Utrecht, Nederland

catastrophic event. It is common for a reinsurer not to pay anything up to a certain amount of accumulated claims, but all the claims above that amount are paid.

It is expected that by the end of the third quarter of 2018 the beta version is tested and the improved application "Codex1 Property Cat XL Treaty" is launched, which will be used in the reinsurance market. The main functions of the application, which should be available in the whole world, are ceding, underwriting and further risk trade in the reinsurance market. Blockchain technology means using one distributed ledger on reinsurance contracts, which enables safe, trustworthy and efficient transactions. In the future, this solution for reinsurance will be spread onto the field of insurance.

By a case analysis[7] it has been confirmed that this solution increases productivity, that is reduces administrative costs by 30%, which would lead to reducing the combined ratio by around two percent points. Considering that the total annual premium of this kind of reinsurance is around 60 billion US dollars, by applying this solution the whole industry of insurance would increase the profit by more than one billion US dollars a year.

The B3i solution is implemented in the IBM private Blockchain network, under the name Hyperleder Fabric Network. At the start of 2018 the network had 117 nodes which perform validation of transactions, which makes it the biggest network of this type.

Seasonal ski pass insurance

Parametric insurance is known from before but Blockchain technology gives it a new value and provides complete automatisation and transparency. The major features of parametric products are:
- Claims are paid when the predefined values of risk parameters are measured, for instance the level of water in the river, number of rainless days, and so on. The parameters must be consistent, easily measured and constantly up-to-date;
- The source of information for parameters needs to be automatically measurable and entirely independent from the influence of insurers and the insured.

The named type of insurance has big advantages: fast and consistent payment of claims, transparency of products, maximum simple administration with insurers,

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[7] Di Marzo, A. (2017). *B3i Consortium: the Future of (Re)Insurance Transactions*, Generali Blockchain Conference, Mogliano Veneto, Italy

impossibility of fraud in insurance, small uncertainty as the parameters are usually simple risks, possibility to insure the risks which have not been insured so far, etc. Blockchain technology can completely automate the work with parametric insurance products.

Generali in Italy is preparing an innovative product of insuring the seasonal ski pass in the ski region Prato Nevoso, which will be realised in Blockchain technology. By purchase of this product the skiers who have the seasonal ski pass can refund part of the money for the days when the conditions for skiing were not acceptable. If optimal skiing conditions, which mean that more than 70% of ski trails worked in the ski region Prato Nevoso, lasted less than twenty days, 50% of costs of a daily ski pass (17 Euros) are refunded, for every day when the conditions were not optimal. Likewise, 50% of costs of the daily ski pass with a discount (12.5euros) are also refunded, for every extra day when skiing was not possible for some reason. This refund is done automatically to the skiers' account, once the conditions are met, without any need for skiers' addressing Generali and claiming for claim. Purchasing this insurance, the skiers who ski in the whole season get a new value; that is they have a comparative advantage of skiing in this region over others.

All the legal and actuary details of this product have been confirmed and the agent, who is going to sell it, chosen. Launching of this product is expected during 2018.

Start-up companies

Among others, the following three start-up companies have experience in implementation of Blockchain technology in insurance: Etherisc, Spidchain and IOTA.

Etherisc deals with the innovative parametric insurance realised as smart contracts and promotes partnership between traditional companies and start-up companies.

Spidchain develops Blockchain technology in managing users' digital identities, and the main goal is cost reduction.

IOTA is trying to find the way to include the devices which are part of Internet of Things as the main participants of trust in the field of insurance.

4. FURTHER DEVELOPMENT BLOCKCHAIN TECHNOLOGY

After only ten years since the appearance of Satoshi's paper in which Blockchain technology was promoted, conditions for its mass implementation were created. Although its full application is expected in five years' time, apart from trade in cryptocurrencies, there are already interesting and useful implemented projects based on this technology. The areas of implementation are numerous but the paper was dedicated to the application in the field of insurance.

The future application of Blockchain technology will provide the insured with simplicity, mobility, security and improvement of users' experience. Insurance companies will expand their knowledge of the insured, improve the contact with clients and be able to individualise insurance offers based on the data about a client's behaviour in the past. All the interested parties will get reliable systems which will not be able to fall, proofs of executed transactions which cannot be falsified and the complete history of transactions which can be tracked and used as needed.

Regarding the short experience of using Blockchain technology not all the issues have been resolved, which makes difficult fulfilling full potential of this innovative technology in practice. There are no standard protocols, such as http protocol for the Internet or a simple solution for the implementation of Blockchain technology. Certain ecosystems are trying to impose their version as a standard (Hyperledger, Bitcoin, Ethereum, etc.), which is a characteristic of an early development of different technologies. The integrity of data enabled by Blockchain technology at this moment is compromised by quantum computers. The consumption of electrical energy for validating transactions is increased with the network increase, bringing to question future economic justification of using this solution. Although some time will pass until problems are resolved, now is the real moment for experimenting and pilot projects for the purpose of finding a suitable business model in the field of insurance.

Of course, a question is raised, when the first policy will be paid in cryptocurrencies.

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