Blockchain As A Tool For Effective Value Co-Creation Strategy Realization: An Application to An Insurance Case

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Abstract. Value co-creation is a new notion in contemporary business practice, which is now also becoming one of the key marketing concepts. The success of the value co-creation strategy is based on the DART (dialogue, access, risk-benefits and transparency) concept which is emerging as the basis for interaction between the consumer and the firm. Distributed ledger technologies like blockchain leverage DART realization allow the business to avoid intermediaries and make innovative business models economically feasible. The insurance sector represents a very good example here. Thus, the purpose of the present paper is to describe a case realizing the reengineering the business model of an insurance company towards actual implementation of the value co-creation strategy in a case of blockchain usage.

Keywords: DART, value co-creation, distributed ledger, insurance.

1 Situation

The blockchain technology is occurring more and more widely in the field of IT-applications. According to the data delivered by [19], the International Patent Application in blockchain grew by 33% over the period July 2015 - March 2018. As a bright example of business where the application of distributed ledgers may provide stakeholders with innovate business models the insurance sector can be considered. Insurance market analytics have started their research of how digitalization, automatization and blockchain technology particularly may affect and be emerged into existing business models [1, 2, 12, 13, 21, 22].

Building business processes on blockchain allows the organization to be almost independent on human factor, which means an ultimately low level of transaction costs – no extra risks, no overheads to secure its own sustainability, no extra-people to maintain a life process working. In existing reality there was no unified and absolutely right approach to business models creation based on blockchain. One of the major risks is the probability of wrong interpretation of empirical data.

The entire process is supposed to be completed over a period of 5-6 years. Statistically, from July 2015 to March 2018, 627 patents were filed around the world; 372 in 2017 alone; 38 of all blockchain-related applications contain the word "insurance" in their descriptions [19]. Still, according to [4] the demand for non-life insurance is expected to pickup in 2019 as the global economic scenario gradually improves with emerging markets continuing to be the main driver.

At the same time, the statistics [20] displays the insurance market state from the time perspective. It is evident that the number of existing insurance companies is reducing dramatically. There are many affecting factors and, regarding the last 5-10 years, it would be fair to claim that digitalization and automatization have a huge impact on this business area. The strategy and the position that a company chooses regards the transition from old business model to new digital world standards.

So, we suppose, that one of the competitive factors for insurance firms is the optimization of internal business processes avoiding the intermediaries which represent an integral part of the traditional insurance business scheme.

Value co-creation in the insurance industry is a well-known key to success, and at the same time it is a subject where no common model to follow for being fully productive exists. Several researches [11, 13] have highlighted that in the insurance business personal contact and individual approach are extremely important because this industry relies on customers' personal needs and fears. Every client visiting an insurance company is concerned about something – his life while traveling, his car or house, etc. This means that any value that an insurance company may produce is strongly linked to customer experience.

2 Task

Blockchain is one of the modern trends in any business domain. In the insurance business domain blockchain technology [11-13, 19] seems to be in high demand due to the following reasons:

1)   Security: blockchain is a multifunctional and multi-level information technology designed to be a reliable accounting tool. The technology is based on the concept of distributed ledger where various committed transactions may be securely stored. The blockchain is a chain of data blocks, the volume of which is constantly growing while new blocks with records of the most recent transactions are being added. This is a chronological database in which the time when the record was made is inextricably linked to the data itself, which makes it non-commutative.

2)   Infinity: the blockchain is not cyclical and, therefore, can be infinitely supplemented with new information blocks.

3)   Transparency: all transactions performed (conclusion of contracts or transactions) fit into a single chain. Everyone can see it and nobody can change it.

The incorporation of smart-contracts represents the main advantage of using blockchain in terms of business processes automation. A smart contract is a contract between two or more parties, programmed electronically and automatically executed via the blockchain technology in response to certain events in the contract. The following factors can be listed as the main advantages of smart contracts application:

1)   The speed of preparation. A company can standardize the options covered by insurance, and each new client will be able to conclude a contract without involving an insurance employee, by simply sending a request and money to the platform, if he does not have any special requirements.

2)   Data analysis upon occurrence of the insured event. The necessary data for decision-making whether an accident is an insured event or not is transmitted directly

from pre-installed / connected sensors, which makes it possible to remove extra steps from the process of considering a payment request.

3)　　Security. At the time of conclusion of a smart contract, it is stored not on the centralized node, but on all interested parties' nodes. Accordingly, any falsification or modification resulting from the activity of intermediaries or any excessive complexity of the process is practically impossible.

One of the most valuable upgrades that the distributed ledger technology may bring to any business is the reduction in the number of intermediaries. From the insurance example it is evident that blockchain may exclude human intervention into the process, which will reduce overhead costs. The business level of the process will be absolved from banking and contract-controlling operations, which would significantly simplify the process of insurance for the particular type of insurance service as these operations may be fully automated by means of IoT and blockchain incorporation and integration with the bank for the financial operations part.

There will be no need for the company to collect, analyze and process new requirements every time a new client comes because the process will be patterned. The majority of the insurance company contract procedures will be simplified, automated and will require no human support. In general, the problem of multiple intermediary parties consists of information asymmetry, possible leak of sensitive data, needless time wastages devoted to building the human relationship and its further maintenance and development. Storing and management of information inside one distributed ledger saves the business the trouble of involving real parties into the process by way of replacing their presence with data from the ledger.

3　The approach taken

An approach that may be proposed consists in a combination of the blockchain-based business process technology and the DART [3, 5, 7, 17] way of customer experience improvement. On the one hand, many simple atomic actions previously executed by a human being would be performed by a blockchain algorithm that will reduce the high level of human error probability and the cost of the process itself. On the other hand, specific and highly challenging cases will be deeper analyzed by professionals who would maintain and strengthen the reputation and the position of the company as compared to other representatives in the market.

Besides, the distributed ledger approach application leads to creation of a basis for adopting the DART scheme which, in fact, supposes a closer contact with the final customer. For this problem, the lack of modelling and engineering DART-compliant methods becomes one of the major influencing factors. In its present form the DART scheme offers only generic dimensions for the analysis. However, practical implementation of the DART principles requires a catalog of reusable patterns for reengineering the enterprise models.

In this approach, co-creation involves human action, which introduces difficulty in judgment or interaction. This limitation precludes the enterprise and the customer from having absolute assurance of achievement of the entity's objectives - that is, internal control provides reasonable but not absolute assurance. Notwithstanding

these inherent limitations, the management should be aware of them when selecting, developing, and deploying controls that minimize, to the extent practical, these limitations.

The traditional insurance process consists of several steps, includes a few intermediaries and is distributed in time. Basically, there are 3 main milestones [12]:

1) Moment of insurance certificate issue
2) Moment of an insurable event
3) Moment of remittance

From an insurance company's perspective, the first point is the moment of profit, as the money brought by the customer is already part of the funds. This is the main source of gain, while the next two positions are definitely the source of loss. At the same time, the customer definitely brings money, while his/her insurable event may or may not happen only with a certain probability. So one of the fundamental decisions that the insurance company is supposed to make is to define which cases deserve to be covered, because almost all future success depends on how carefully and accurately the company has made this settlement.

An ordinary insurance process consists of several communication points between the company and the customer where every communication result becomes a starting point for the next process step. For example, the customer's first appeal to the insurance company must result in one of the following: either in the commencement of creation and preparation of a future insurance contract, or in complete termination of communication (for example, if this particular company cannot provide the required service at the moment or at all).

The following table displays the main processes of insurance and the case where an insurable event has taken place:

Table 1. Traditional insurance business processes

N°	Process
1	Request for insurance services
2	Definition of contract details
3	Discussion of contract details
4	The insurance contract signing
5	Purchase of insurance certificate
6	Request for insurable event analysis
7	Analysis of insurable event by insurance consultant
8	Damage assessment
9	Bank transfer to the customer

This flow requires at least 4 participants: the Customer, the Insurance Company, the Bank, and the Insurance Consultant. Even this quantity of actors affects the effectiveness and the clarity of the process. For the customer it means overpay and an increase of time in terms of formation and execution of the contract. For the insurance

company it signifies an increase in the risk to be defeated by any of the contractors like the Bank or the Consultant and to be obliged to pay a penalty, to lose a customer and to spoil the reputation.

The DART model is one of the currently existing frameworks proposed to conceptualize co-creation processes. It would be fair enough to say that the insurance business is fully based on co-creation. The DART structure is composed of 4 building blocks: Dialogue, Access, Risk Assessment and Transparency. The analysis of an insurance company's business flow from the DART perspective is given below:

1) Dialogue: an insurance company has a certain number of standard policies with default conditions and a fixed rate. At the same time, the terms of these insurance contracts are discussed and adjusted at the client's request. The new contract discussed with the customer is stored in the blockchain and may be used for new customers too.

2) Access: customization of each contract is carried out with close cooperation on the shared platform of both parties - both the insured and the insurer.

3) Risk Assessment: at the stage of preparation of each contract with the policyholder, the insurance company assumes responsibility for paying a fixed amount upon occurrence of an insured event. Accordingly, the company assesses the risks at the time of conclusion of each contract, including in the cost of the insurance policy itself.

4) Transparency: all operations, rates and options are available for viewing by each client. The insurance company provides full information on all available contract options.

Such a closer contact with the final customer represents a fertile soil for blockchain application which may multiply the positive effects of the DART approach. In fact, the intermediary activities like consultancy and payment services can be successfully avoided.

Blockchain applied to the traditional insurance business model makes it similar to the DART scheme because it complies with its most important characteristics: absence of intermediaries and providing a needed level of security. In fact, thanks to these properties the blockchain:

- simplifies the dialogue with the customer and his/her access to insurance services (D- and A- components in the DART approach);
- better satisfies the customers' right to be fully informed of the risks they face when accepting the value proposition (R-component);
- makes the process of insurance assessment more transparent and unbiased, and removes the information asymmetry between the customer and the supplier by practicing the openness of information (T-component)

A blockchain, especially if it incorporates different aspects of the surrounding ecosystem and is enforced by data collection technologies like Internet of Things, can significantly reduce the transaction costs of the insurance process. The contents of blockchain could involve rival insurers and regulators forming a blockchain to share data in order to reduce manual work and accelerate the processes of collecting the customer information and generating quotes in much less time than it takes to handle them traditionally.

4. The Results

So, the process described in Table 1, dramatically transforms into a completely different model of face-to-face communication between the insurance company and the customer only in unique cases allowing insurance agents to work as close and accurate as possible with these unusual situations without wasting time with ordinary contract services. The process will work without the physical presence of several intermediaries such as representative of an insurance company, bank employee (at the time of transaction, irrespective of internal bank processes) and insurance consultant, as all contract verifications would be made by IoT support. Thus, the total process cost may be significantly reduced for both the customer and the company – one party will not pay for the professional services from 3 extra process participants, while the other one will avoid possible transaction costs. Moreover, the major part of an insurance company's expenses consists of back-office operations where costs have a tendency to rapidly grow and which will be handled by technical solutions in the majority of cases as well. The business process model of a simple insurance contract would resemble to the following:

Table 2. Transformed insurance business process

N°	Process
1	Request for insurance services
2	Definition of contract details
3	Customer request to the platform
4	Purchase of insurance certificate
5	Collection of data from the place of insurable event
6	Payment

In this new transaction composition, the transactions linked to the payment by means of bank and analysis of insurable event disappear and the two new processes 3 and 5 appear. Besides, the sequence 2-5 reflects perfectly the DART scheme:
- the process n° 2 means dialogue with the customer (D-component);
- the process n°3 is a new one, which doesn't belong to the traditional insurance business scheme. It explains the modes of customer access to the information space shared with the insurance company (A-component);
- the process n°4 deals with the risks of the insurance procedure (R-component);
- the process n°5 is a new one (T-component) which reflects the transparence setting process. It is not inherent to the traditional insurance scheme and appears thanks to the blockchain technology usage.

The process n°6 is a usual transaction retained from the old scheme.

By way of smart contracts application a series of processes (3-5 and 7-9) are eliminated or moved from to the support processes. It offers the possibility to avoid any intermediate banking or consultancy activities, which can be seen very well in the DEMO model that drastically reduces the number of actors, transforming the entire process into a pure value co-creation scheme.

5 Reflection

We may conclude that the newly introduced artefacts provide the enterprise with critical elements of the value co-creation mechanism.

One of the future directions of the research could be the analysis of the process aimed to find people with required expertise. The process usually starts with publishing a call for people, to which internal/external observers respond. The internal performer selects the right candidate(s) and publishes the final decision. For such analysis the tool of competence maps can be used.

Besides, it would be promising to investigate the application of DART-transactions introduced in [3] to a particular category of the insurance business, taking into consideration the specifics of different insurance branches. The future research will also be dedicated to the radical application of fully decentralized and distributed public blockchain to insurance companies seen as a group of citizens who would possibly provide insurance for themselves with no need of traditional insurance companies.

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