ReGa Risk Sharing

A platform for mutual insurance

Reinvent insurance

White Paper preview   *Jul 2017*

Introduction

We, as consumers, love the shared economy because it gives us real value for the price of good, provides us with bigger choice and makes our life more convenient. The modern technology has reduced transactional costs, making sharing assets cheaper and easier than ever — and therefore possible to use on a larger scale. The big change is the availability of more data about people and things, which allows physical assets to be disaggregated and consumed as services. But what about financial services like insurance? Why can't we share our risks with other people and buy a policy not from insurance company, but peer-to-peer from a particular person or group of people. The problem here is the risk assessment that by now only insurance companies and banks know how to do. Now the technology is here to make this knowledge available to everyone. There is a lot of data around us, machine learning is starting to become a commodity and blockchain will allow us to keep funds outside of the traditional financial institutions. That's why using our 20 years experience in risk management and scoring we've created ReGa Risk Sharing platform - the new standard for the mutual insurance with state-of-art technology that will be available for everyone as the new segment of the shared economy.

Our project is supported by Microsoft that provided a grant for Azure Cloud System including Cognitive, Machine Learning and Chatbot Services.

Executive Summary

Our peer-to-peer insurance platform should play significant role in unlocking the blockchain technology potential in insurance industry. It will allow people cover and manage the variety of insurance risks without excessive and inefficient chain of intermediaries. Peers may finally get the opportunity to manage their own risks at their own price without intermediary risk carriers receiving all upside of risk premiums. The platform just takes a flat fee for providing the technological solution to the market, peers receive all the benefits and prolonged risk coverage.

Through our platform more cost-efficient and risk-manageable distributed financial products will be created. We start from delivering our own insurance products to the market, creating value through filling the existing gaps in microinsurance sector where the competition among traditional insurance companies is low. Our current solution helps members to receive medical insurance coverage for their beloved pets (Lexi Club). Next step, we will use our expertise and disruptive technology to deliver mass market mutual insurance to the market. Finally, we will create the user-friendly interface for community members to develop and manage their own peer-to-peer insurance products, solving common chicken or the egg problem. Our platform is open-source, elaborated on Ethereum platform, that makes product design process and financial transactions traceable and transparent.

Peer-to-peer insurance products help cover potential risks by creating mutual insurance pools in Ethereum smart contracts, which absorb risk realization. Incremental part of these pools are filling Super pool smart contract, which provides reinsurance coverage for all other insurance pools on standardized conditions. We use fascinating machine learning technology based on Microsoft Azure solution to uncover risks and provide peers with easy access to the platform.

This new approach will finally lead to social role of insurance and provide solution for old conflict of interest between insurance profit gains and claims adjustments. Insurance will finally become the community development driver rather than the source of profit from unrealized risk for insurance companies. Getting rid of intermediaries will make insurance more cheap and affordable. Insured person will become part of the community, which should play significant role in his life, and expose moral hazard phenomena to reduce risk on the platform. Peers get additional benefits by sharing risk coverage with those who can not afford to get insurance products creating reputation based social networks.

We are the first insurance platform that implements insurance smart contracts on the Ethereum Platform and provides a standard for mutual insurance, delivering a viable solution to the market.

We are going to use crowdsale of the Risk Sharing Tokens (RST) to get funding for further Platform development from the current prototype that is already working and make it available to the community.

Background

Blockchain technology might change the way we think about financial products and how financial industry might operate in the future. To the greatest extent blockchain technology might impact insurance and banking industries, making it more transparent, manageable and better integrated into global environment. Distributed financial products may become the next standard for risk management on consumer markets.

At the moment financial markets operate through trusted parties infrastructure regulated with central authority. Decentralization principles integrated in existing organizational structures may lead to creation of new more efficient global economy.

Current market description

Estimating global market of insurance approximately in $5trln, we can affirm low growth rate of collected premiums and persistently low Net Promoter Score (NPS) of global market players. As more than 50% of premiums collected around the world belong to USA, Japan, UK, China, France, Germany markets, it clearly shows great potential for growth of insurance on relatively new markets. Nowadays, in China more than 330mln people are insured, but much bigger number are those investing in capital markets.

The main trouble factors for insurance industry, according to many experts, are lack of technological innovations, lack of new business models and new products, barriers to entry for newcomers and excessive regulations. Customers do not trust insurance companies and fraudulent actions flourish. Low risk consumers often pay for high risk consumers.

There are a lot of successful start-ups like metromile.com, hioscar.com, lemonade.com, that change conventional approaches to insurance, testing more transparent, clear and technological models, drawing great attention from customers. New global trends spreading like shared economy, blockchain, robotics. AI, that influence our lives significantly, and set new standards on the markets.

With such enthusiasm in the society we count on big market opportunities for new insurance start-ups that concentrate on developing new products for new economy, processing of Big Data, new approaches to risk management and capital financing, brand new channels of communication with consumers.

Creating Rega Risk Sharing we take into consideration all those trends, feeling consumers are not satisfied with bad service and high prices that insurance companies are providing, leading to common unloyalty of insured. New insurance products created on our platform in appliance with mutual insurance model, will give our members new positive experience of managing risks, making insurance affordable and more suitable to the new society.

Rega Risk Sharing potential may attract more than 100mln users accumulating more than $5bln insurance premiums. Our platform using Blockchain technology will form new technological and financial infrastructure, which can be used globally in every country worldwide. Developers and partners can adapt our products or create their own using their expertise in the region and unique knowledge about consumers. Our pilot products will demonstrate effectiveness of Rega Risk Sharing scorecards, risk management and marketing channels, this will allow product developers be confident with our risk management solution.

Solution

Product Roadmap

As a main strategy for creation and testing of new products, Rega Risk Sharing follows the path of providing platform instruments as a base element for partners working on real markets. Project team develops these financial products actually remodeling classic business processes on decentralized platform.

Understanding how difficult it is to promote new technologies on consumer markets, we do not underestimate competition from traditional market players and distrust from consumers. We are carefully approaching market segments, regions, potential customer base we are targeting for piloting our products.

As a target audience we choose Millennial generation or Generation Y (1981-2000), who are now appear to be the main consumers of digital products and determine trends of development for many sectors of economy.

We highlight for ourselves the following perspective directions of development, where first products on Rega Risk Sharing platform could be developed:

- Newly born markets in transportation, logistics, robotics, AI, where Rega Risk Sharing is technologically similar, while risks associated with loss or damage of the property relatively low.

- New insurance products sold by conventional insurance companies with low penetration rate among potential customer base. Products, where traditional insurance exposes inefficiencies and standard channels of distribution do not work.

Some use cases of our Platform can be demonstrated through several products, that can significantly influence our lives, but actual possibilities are limitless.

Lexi Club Pet Insurance

Lexi Club became our first trial product for testing market in Russia. Lexi is a club of mutual aid for home pets, protecting them in a similar way as animal insurance does.

Potential market size for Lexi Club worldwide:

Country	Dog population	Cat population
USA	110m	77m
China	73m	53m
India	52m	
EU	43m	
Brazil	30m	
Russia	20m	13m

Lexi Club is positioned as a community for mutual help to home pets, actually acting as decentralized autonomous organization, where every member contributes a fee to mutual member pool, which is used to compensate payments for veterinary services. Fee payment amounts from $4 to $6 per month and depends on kind of pet insured, its age, weight and type of illness. We plan to integrate into the system scoring cards for pet owners to exterminate fraud and tuck up more precise rate. The variety of product plans available for club members differentiated depending on the service and coverage. Basic program lasts for 3 months and provides $500 coverage for veterinary services, unlimited online consultation and $100 payback in the case of lost pet.

We set the goal of creating many programs to satisfy inquiries of club members. Besides we have a plan for providing special programs for partners - veterinary clinics, pet breeders, dog sitters.

Pet owner can enter Lexi club simply by using Lexi chatbot in Facebook Messenger (https://www.facebook.com/msg/lexiclub) or Telegram (https://telegram.me/LexiBot). You just have to take a picture of a pet and send it over to Lexi chatbot, choose a suitable program and pay the fee. The payment confirmed and a member receives fancy animated card with ID number, expiry date and pet name on it.

In case of something happening to the pet, Lexi club member can use chatbot to get online help or using our partner's catalogue pick the nearest veterinary clinic and send request for medical help. Afterwards medical clinic representative contacts pet owner and organizes medical treatment. Lexi club member can use the help of his personal veterinary, if he is authorized, as well.

To bring Lexi Club idea to life we had to develop sophisticated service of identification of pets by photo on neural network technology, create chatbots and online consultancy. We started to expand our network of service providers and experts, delivering full cycle service.

According to the Lexi Club's roadmap, our next step will be entering USA and European markets. The Economist experts estimate that animal insurance is equal to 1-2% of veterinary services market counted at $16bln level in 2016.

ReGa gadget protection

The next product Rega Risk Sharing plans to deliver to the market is mobile device insurance, that will help consumers to recover their gadgets in case of breakage.

Mobile devices are too valuable and precious for consumers to repair without financial aid. Potential market size for insurance of mobile devices is valued over 100's millions of dollars. There are a lot of market players like asurion.com, gadgetinsurance.com, SquareTrade, however the market is just started growing.

It is common that all those programs work mostly for new devices and have rather high price. Our prototype of ReGa App for Android (https://play.google.com/store/apps/details?id=site.rega.rega) can protect a mobile phone, that is not older than 3 years through a mobile app receiving pretty low rate.

Estimating relatively uniform prices for new mobile devices around the world we want to demonstrate, that it is possible to form global insurance pools on Blockchain technology to deliver service anywhere in the world for ReGa Mobile App membership owner.

Parametric insurance

Using our platform, new parametric insurance products could be developed. We can use data from various sensors and detectors to trigger insurance payment upon occurrence of certain event. That may reduce transaction costs of claims adjustment and create new type of coverage for undesirable events. Projects like http://www.rainvow.org/ - based on Ethereum, which help automatically compensate the rise of expense in transportation in rainy days, already working to combine Parametric data with blockchain technology. Projects like https://gnosis.pm/ can be used for prediction markets and hedging. We are aimed to develop reinsurance Super pool for such products, that will give them more liquidity, additional guarantees for users, access to riskier strategies, new user base.

Property Insurance products

Drones will become important part of the transportation system in the nearest future. Soon self-flying drones will be the main delivery option for the last mile goods delivery and bigger machines will be able to transfer people for example from one roof to another one in the big city. We are going to crate number of insurance products for drone related businesses: *drone **delivery mutual insurance**, drone base **mutual property insurance** and use drones in **mutual car insurance**.*

For delivery insurance the Insurance premium amount will be calculated using a scoring model based on a maximum value of good for delivery, average delivery time, number of

delivery trips and delivery risk zone. The premium amount will be invested in the Delivery Protection Pool and in case when the goods are damaged or destroyed the pool funds will be using to compensate the goods value to the goods sender. The cost of Insurance can be compensated by the goods sender by including a fraction of the Insurance premium amount in the good delivery price.

Drone can be using in Mutual Real Estate Insurance to check the property condition and also can provide evidence when an Insurance case is happened and the property is damaged. The property owner can be asked to place himself for photo/video during the drone checkup procedure to make an additional evidence then the property is belonging to the specific person. After the finish of the property checkup procedure all evidences will be processed and stored in blockchain and an individual tariff will be calculated for the owner.

The car owners can invest in Car Protection Pool and in case of an accident the pool funds will be using to cover cost of car repair. The drone service can be using to collect evidences for the accident. The car owner or driver can use mobile app or chat bot to submit an accident report and provide location for the drone. The smart contract with the drone will be signed and the drone will arrive to the given location to collect video and photo materials for the case valuation procedure. The photo can include licence plate of the vehicles involved. The collected photo also can be used to determine exact vehicles positions on the road. After the drone has finished the accident site checkup the vehicles involved in accident can change the location.

In 2021 global expenditures on IoT technologies will amount to $1,4 trln, according to IDC report. This is an obvious point of growth for global insurance market. There are plenty of new products to moderate insurance premiums for house owners, who installed those systems at home. According to NTT Data, more than 1000 consumers are ready to install smart home systems in their houses. At the same time those consumers are not satisfied with their insurance rates. We see the opportunity for Rega Risk Sharing platform to fully automate not only claims adjustment, but pool membership application itself. Smart things can apply for mutual insurance products automatically, triggered by certain undesirable event, while contacting a drone for visual inspection.

Health Insurance

The final step for the platform development would be mutual health insurance. Parametric data from personal assistants, smart watches, fitness trackers, health applications can be traced to identify insurance scoring systems and provide qualified risk mitigation. Beginning from lowering franchise of conventional medical insurance programs to creating our own medical insurance products in mutual health pools. Partnering with projects like https://patientory.com/ can give us user-permitted access to health information stored safely in Blockchain to pool customers with the same level of risk and lower their premiums collected for personalized medical help.

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Platform

The ReGa Risk Sharing Platform (Platform) is the open source software system that will be available as the Software as a Service for developers and for insurance product creators. The Platform ecosystem will also include Super Pool as a reinsurance provider with capitalisation in Risk Risk Sharing Tokens (RST) and Ether. The Platform prototype is already up and running and we are using it now for the own created products including Lexi Club mutual Pet health insurance and ReGa gadget protection.

The Platform consists from several levels or tiers where each tier is independent from the upper level tiers. It will help us to make the Platform easily portable to other blockchain infrastructure and in this case any insurance product created on the Platform can be available on any other blockchain system that is supporting smart contract concept. We are starting on Ethereum as the most developed virtual machine but already planning to implement the blockchain tire on other systems including Waves and RSK.

There are two main segments or parts of the Platform: **blockchain part** and **off-chain part**. Both segments provides financial primitives that are reusable construction blocks for financial products. In the blockchain segment we have the following modules: **customer identification**, **accounting**, **transactions**, **limits**, **auctions** and **pools**. Other two primitives - **scoring** and **risk management** are implemented outside of blockchain in off-chain segment.

The blockchain primitives as smart contracts will be available for the 3rd party developers through the ReGa Smart Contract Fabric - a smart contract that creates other smart contracts. It will guarantee that all blockchain primitives are consistent with the platform off-chain part and can use ReGa Super Pool as the reinsurance provider. The off-chain modules will be available as services via API.

Blockchain part

Identification

The customer identification is the key element for building of financial product. We can't issue a loan or provide an insurance to an anonymous person. So, every stakeholder in the financial product business process must be identified. From another hand, we can't store the customer identification data openly in the public blockchain. The solution can be to keep in the blockchain a result of hash function from the customer identification documents and during identification process ask the customer to produce signatures from the identification documents and from a nonce of the requested party. Each successful identification process must be finished by an exchange of tokens of trust between two

identified parties. The identification smart contract will check the effective level of trust for the party that will be equal to number of tokens of trust from the third parties that requested party trusts. If all signatures are valid and the effective level of trust is larger than the specified threshold then the identification process will be completed successfully and new issued tokens of trust will be exchanged and stored by the identification contracts. The identification documents can be provided by the parties using the secure transfer data service from the blockchain tier.

Accounting

An accounting service provides basic general ledger functionality including accounts and postings. The accounts are implemented as a smart contract persistent storage attributes. The total balance for all accounts must be equal to zero and each transaction must keep this condition. The transaction consists of number of postings and can include financial messages of the blockchain tire. Each posting changes only one account balance making debit or credit and total amount of all posting amounts for given transaction must be equal to zero.

Transactions

The transaction service is responsible for keeping general ledger in the consistent state and for logging each posting and internal messages. If during the transaction execution an exception is happened the transaction will order the blockchain tier to reverse all changes and mark the transaction in the logs as reversed. The transaction can't be responsible for refunding of the charged message processing cost but the upper tiers could use logs to check transaction status and if transaction is marked as reversed makes a refund if needed.

Limits

The limits is part of the Risk Management service implemented as smart contract. All postings must be tested on the respective limits before execution. If one of the transaction postings is about to violate the limits the whole transaction will be reversed. Because each transaction has associated the transaction execution cost the limits service provides mechanism to check limits before the transaction initiation. It can be done by using smart contract calls in 'dry run' mode when the contract code executed only on local node of the blockchain tier. In this way the limit check before the transaction run can save money but the limit check will be repeated twice before the transaction start and during transaction run.

Auctions

One of the most useful smart contract is blind auction. The upper tiers can use this primitive to select service providers for 'no money' insurance products. Authorised parties

can send their bids during a bidding period in form of a hash function results from the actual proposals. After the end of the bidding period, the bidders have to reveal their bids: They send their values unencrypted and the contract checks that the hash value is the same as the one provided during the bidding period. Up to three best proposals will be selected and the upper tier can use the auction result to provide choose to the client.

Voting

The voting smart contract will be utilised in several cases including the platform stakeholders decision process and cases payment. We are going to use scoring model to make a decision about payment in particular case, but if the amount of payment is more that specified limit the expert voting procedure will initiated. Also for audit purpose some minor payment cases could become subject for the expert voting procedure. The number of experts can vary from case to case and selection of expert will be random to minimise the possibility of fraud.

Pools

The pools service provides a grouping mechanism based on the risk level. It can be group of investors that accept the same risk level and RIO or it can be group of borrowers with the same level of scoring. For the purpose of risk management the pools can also be grouped forming pool of pools. Therefore the pools service supports a three level cascade pool structure (cascade pool tree) : *super pool*, *pool*, *sub-pool* and *pool member*. The last level in the pool tree structure will be a pool member that has an acceptable risk level and a score. All nodes in the pool tree structure use own accounting and limits services. In this case the upper level pools accounts aggregate the accounts of the own members. Any posting or transaction that changes member account balance will be propagated to the upper levels of the cascade pool tree. From another hand the upper tiers use super pool as an entry point for search in the cascade tree to find right place in the structure for the new pool member.

Off-Chain part

Scoring

The credit scoring is the set of decision models and their underlying techniques that aid lenders in granting of consumer credit. The upper level tiers can use the scoring service to calculate score for the particular customer or/and for an object of financing. For example if a customer would like to use pool funding to cover a cost of repair for the own smartphone, we need to have a score for the customer and for the smartphone to calculate the investment amount that pool member must invest to the pool to have the smartphone

coverage. We use an application scoring when a customer applies for the financial product and use a behavioural scoring to predict running cost for the pools. Scoring is using scorecards for score calculation and there are number of score card for each financial product.

Risk Management

The risk management service responsible for the management of the pool structure based on established limits. The risk management uses behavioural scoring models to predict running cost for particular sub-pool and compare this running cost with the sub-pool liquidation cost to make a decision about next action.

Financial products tier

The financial products tier contains customer and financial product databases. In the financial product database with the following structure :

LEVEL 0	LEVEL 1	LEVEL 2	EXAMPLE
Product Type			INSURANCE
	Product		GADGET PROTECTION
		Product instance	SMART CONTRACT @
			15hEhffpSfXsHRVS8tEwUqKA655ZSbgYht

Each financial product consists of the following parts:

- product parameters
- product matching rules
- underwriting process
- support process
- closure process
- risk management rules
- scoring cards
- accounting rules
- pools structure

The product parameters describe financial product provided for the customer based on static parameters, calculated parameters, customer needs and demographic data. The matching rules specify conditions how to select a product from the product database based on the customer needs and demographic data. The underwriting process defines the financial product origination process - how and what we must do to close an agreement with customer for this particular product and create a product instance. The support and closure processes define the product instance life cycle. The rest of parameters are explained in the previous sections. The several products can be combined into a product bundle, for example we can offer a loan for smartphone with a gadget protection program.

The client database contains information about all parties involved in the financial product issuing and processing. Each party identified by unique address of an identification contract in the blockchain tier.

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Business Model

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Technology

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Ethereum Blockchain

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Facial Scoring

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Identification

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Chatbots

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Transparency

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Legal

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ReGa Tokens

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Crowdsale

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Milestones

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Team

Sergei Sevriugin, ReGa Risk Sharing CEO, Co-founder. More than 15 years experience in FinTech, currently CEO of Bellwood Systems. Former Executive Vice President of DialogBank, President and CEO of Delta Bank, COO of DeltaCredit. Degree in applied math and cryptology.

Victor Chernyshev, ReGa Risk Sharing CTO, Co-founder. CTO of Bellwood Services company. 15+ years experience in financial IT projects.

Roman Ischenko, ReGa Risk Sharing Chief Architect, Co-founder. 15+ years of experience in financial IT projects, software architecture and development. Degree in math and applied math.

Sergey Kiselev, ReGa Risk Sharing Business development and CMO, Co-founder. 10+ years of entrepreneurship in a different business areas including brokerage, insurance, entertainment. Management degree.

Maxim Urazaev, Lexi Pet CEO, Co-founder. 10+ years of experience in veterinary products and services market, Professional Affairs at Hill's Pet Nutrition Russia (Pet Food), Area Partner Business Development at Vetoquinol s.r.a. (Veterinary Pharmacy). Degree in Veterinary medicine.

Leonid Morozovskii, Co-founder. 15+ years of experience in commercial banking and insurance, Head of Sales, Vice-President, CEO, Deputy CEO. Law degree, PhD in Economics, Chicago Booth Executive MBA.

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Advisory board

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