REGA

REGA Risk Sharing

crowdsurance platform

Reinvent insurance

V 2.1

Introduction

We, as consumers, love the shared economy because it gives us real value for the price of goods, 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 traditional financial institutions. That's why leveraging our 20 years experience in risk assessment and scoring we are creating REGA Risk Sharing platform - the new standard for insurance market with state-of-art technology that will be available for everyone as a new segment of the shared economy. As REGA Platform has fundamental differences with conventional insurance in foundations, rules and philosophy, we introduce new term "**Crowdsurance**", meaning people unite in communities to provide a guarantee of compensation for unexpected loss. Compared to traditional insurance, in crowdsurance there are no insurers, intermediaries and brokers, all the processes being controlled and managed by programs and algorithms. The REGA Risk Sharing platform will also provide Super Pool capacity to cover risks for own and third-party products that fit the REGA risk management standards. We can compare it with reinsurance on traditional insurance market and this a huge facility we are going to bring to the blockchain world.

Our project is supported by Microsoft, granting our team with free to use professional services like Azure Bot Service, Azure Storage, Cognitive Service and Machine Learning.

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Executive Summary

Our crowdsurance platform should play significant role in unlocking the blockchain technology potential for insurance industry. It will allow people cover and manage the variety of 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 started from delivering our own risk-sharing 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 for pet owners (Lexi Club) helps them to save on vet services and pay only 20% on bills. Next step, we will use our expertise and disruptive technology to deliver mass market crowdsurance products to the market. Finally, we will create user-friendly interface for community members to develop and manage their own peer-to-peer risk-sharing products, solving common chicken or the egg problem. Our platform is open-source software elaborated on Ethereum blockchain, that makes product design process and financial transactions traceable and transparent.

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. Crowdsurance 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 cannot afford to get insurance products creating reputation based social networks.

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

The REGA Risk Sharing platform will also provide Super Pool capacity to cover risks for our own and third-party products that fit REGA risk management standards.

We are about to build a community of experts that will help us develop and adjust risk models for crowdsurance products. To create this community we are going to use crowdsale of the Risk Sharing Tokens (RST) which will be used as a REGA expert licence to manage the parameters of REGA risk models and process some difficult cases. Such work will bring to the token holders additional income in proportion of purchased number of tokens, because part of crowdsurance contributions collected on our platform will be allocated as expert's fee payments and due to limited number of the Risk Sharing Tokens the market price of the REGA expert licence will grow in the future. The REGA Tokens will be also accepted as payment for crowdsurance products running on the platform, as an investment in crowdsurance pools.

The REGA Risk Sharing Tokens crowdsale will provide funding for platform development. The platform prototype is working now and already available to the community.

Why REGA Risk Sharing Token (RST) ?

1 **Not a share,** but utility token

2 **Price discovery** - token market price floor determine by the RST smart contract based on Constant Reserve Ratio (CRR) and RST cryptocurrency reserves (Bancor protocol)

$$Token\ price\ = \frac{Reserve\ balance}{Supply * CRR}$$

3 **Continuous liquidity** - no need in exchange to convert RST to other cryptocurrency thanks to Bancor protocol. Just call the RST smart contract SELL function to liquidate tokens and get cryptocurrency back on your account

4 **Limited emission** - the number of tokens on the market is limited

5 **Linked to business model** - RST is using as a REGA expert licence and also can be utilized as member contribution fees in crowdsurance pools

6 **Proof-of-stake** - incentivizes token holders for expert work (voting) - **3% of member contribution as an expert fee payment**

7 **Reserve growth -** part of platform / product support fee will be allocated to stabilize RST reserve that will show the efficiency of platform's business model and will influence the minimal token price

8 **Marketplace** - with RST token the products released on the platform can be payed

Key facts about REGA Risk Sharing platform and products:

REGA Products	REGA Platform
Direct: No agents or brokers	**Standard:** new standard for crowdsurance
Pay less: 50% off price compared to standard insurance products	**Super Pool:** crowdsurance capacity for 3rd party products compatible with REGA risk model
No pay is no gain: No conflict between a client and company - flat admin fee, 20% of the contribution, there is no reason to decline a legitimate payment request	**Scoring:** ready to use scoring models including facial scoring, application scoring, behavioral scoring and fraud prevention
Payback up to 50%: If community members did not have payment requests, they can get up to 50% of the contribution back	**Identification:** identification based on member photo, using machine learning algorithms
Transparency: all transactions and payments are in public blockchain	**Not from scratch:** use existing scoring & underwriting system created by our team members for the platform prototype

Privacy: no personal information in public blockchain	**Open:** open source, building blocks for everyone to create own crowdsurance products
Security: encryption and distributed database	**Social:** use community of Experts, REGA Risk Sharing token (RST) holders who help to resolve cases and improve risk management models
Social: community members help each other, communicate and share	**Proof of stake (PoS)**: REGA experts buying RST tokens get licence to make important decisions and get additional income
Fast: instant coverage & easy payments	**Underwriting:** REGA platform provides mechanisms for creating an underwriting process for any type of crowdsurance product including client database, product database and product matching algorithms that will help to find the right product based on the member needs and demographic data.
Convenient: no paperwork, no queues, just familiar messenger (Facebook/Telegram/Skype)	**Crowdfunding**: use crowdsale of RST tokens to finance development of the platform and platform products
	Crowdcoding: use community of software engineers to improve the platform

Background

Blockchain technology might change the way we think about financial products and transform financial industry's modus operandi. To the greatest extent blockchain technology is expected to impact insurance and banking industries making it more transparent, manageable and better integrated into modern global environment. Distributed financial products may become the next standard for risk management on mass markets.

Back in 2001 our team signed a contract to develop a scoring and underwriting system for the first Russian mortgage bank DeltaCredit: iNSTANTLOAN platform was born at that time and for more than 15 years it is the core business for Bellwood Systems, parent company of REGA Risk Sharing project. During those years more than $10mln were invested in our system by corporate clients, including DeltaCredit, VTB, Svyaznoy and Sberbank, the largest retail bank in Russia (#56 Forbes), which is currently using iNSTANTLOAN for selling insurance products in more than 10,000 branches around the country. In 2014 we introduced an iNSTANTLOAN cloud service and now clients can use the system for consumer loans and insurance originations. Each month iNSTANTLOAN is processing more than $25mln transactions from several retail clients including MediaMarkt (Metro group).

We've been always dreaming to develop our own financial product and now it is possible thanks to blockchain and smart contracts technology. Our REGA Risk Sharing platform is essentially the next step for the development of iNSTANTLOAN system that will be redesigned to incorporate blockchain layer and will be available as an open source software and service to the fintech community.

Current market description

Estimating global market of insurance approximately $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 330 mln. people are insured, but much greater number are those investing in capital markets.

Insurance business processes that manage risk, premiums and claims require a lot of data exchange between many parties involved. Parties store their own copies of data, and process it individually. This makes it difficult to synchronize and collaborate through a shared process. It brings a lot of overhead and unnecessary hidden charges which ultimately are paid by customers.

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 startups 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 startups that concentrate on developing new products for new economy, utilizing Big Data, new approaches to risk management and capital financing, brand new channels of communication with consumers. Currently, 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.

Creating REGA Risk Sharing we take into consideration all those trends, feeling consumers are not satisfied with bad service and high prices insurance companies are providing, leading to common people disloyalty to insurance companies. New financial products created on our platform based on crowdsurance model, will give our members new positive experience of managing risks, making insurance affordable and more suitable to the needs of society. REGA Risk Sharing is expected to attract more than 100 mln users accumulating more than $5bln. member contributions in five years. Our platform using Blockchain technology will form new technological and financial infrastructure, which can be used globally. Developers and partners can adapt our products or create their own using market expertise and target audience insight. Our pilot products will demonstrate

effectiveness of REGA Risk Sharing scorecards, risk management and marketing channels. It will allow product developers to be confident with our risk management solution.

Competitive analysis

Competitive analysis of members at conventional insurance market, p2p insurance and a number of insurtech projects shows - we don't have any company or product which meets nowadays or in the nearest future all the problems of insurance.
Lack of transparency, conflict of interest between client and insurer, high agent fees - as we see there are a lot of gaps in conventional insurance. P2P insurance mainly shies away from these minuses, but the main minus of p2p direction is low potential for the growth, actually p2p it is not an insurance as it is.

There are many projects launching crowdfunding, who declare in their roadmaps development of insurance products based on blockchain.
Though in public documents they released we don't see concrete steps and solutions how to build such products.
Below we would like to compare crowdsurance products vs p2p and traditional insurance products.

Crowdsurance vs p2p insurance

p2p	Crowdsurance
No blockchain (or blockchain is not a core)	Blockchain is a core and essential part of crowdsurance
There are insurance companies and agents as essential part of p2p insurance	There are no insurance companies, agents, intermediaries
Low potential in scalability - here is geographical and legal restrictions in frame of countries and due to infrastructure and dependence from third-party companies	No boundaries - really international solution for geographical coverage, potential for instants and infinite growth
Collective discounts for services from insurance companies and agents	Low cost because crowdsurance doesn't need agents or brokers
Rules and guides are built by members	Rules and guides are written in smart contracts
Participants confirm by themselves acceptance of newcomers	Acceptance of new users via scoring process managed by smart contract
Participants confirm claims and payment requests	Payment requests are confirmed by smart contract or via expert voting
Reinsurance of reserves are provided by third-party insurance companies	Reinsurance are provided by own Super Pool capacity

Participants redeem their shares and percentage by the end of covered period when reserves are not used

50% payback by the end of covered period in case there are no payment requests fixed

Lack of transparency for financial information where funds are stored

Transparency of all processes within crowdsurance platform are guaranteed by blockchain

Conventional insurance vs Crowdsurance

Traditional insurance	**Crowdsurance**
Strong centralization in frame of insurance company (or group of companies)	Decentralization via smart contracts infrastructure and blockchain
Agents and intermediaries	No agents, no brokers, no insurance companies
Usually has geographical and legal restrictions of country of company registration	There are no geographical or financial boundaries for risk coverage
Rules are defined by insurer	Rules are defined by developers in smart contracts
High price for services because of agent fees	Low cost because there are no agents or brokers in crowdsurance
Conflict of interest: damage assessment are conducted by insurer	No conflict of interest: damage assessment are lead by smart contract (of via expert voting)
Insurer makes a decision about reinsurance by own (without any participation of customers)	Here is own Super Pool capacity in crowdsurance infrastructure and the decision is adjusted by smart contract
By the end of covered period all amount of contribution is withdrawn by insurer	By the end of covered period member get payback up to 50% (in case member didn't request case payment during this period)
Tons of paperwork for staff and customers	Only chat bot in instant messenger

This analysis shows business potential for crowdsurance products and in particular for REGA Risk Sharing crowdsurance platform.

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, while actually remodeling classic business processes on decentralized platform.

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

According to risk-reward people typology, mostly, our service will benefit uber-egalitarian and hierarchists, to some extent individualists will become beneficial, basing on their personal experience of certain risks. Fatalists rarely lay their risks onto third party. The platform will benefit people globally giving them ability to control risk as a community, in contrast to insurance companies working as commercial enterprise.

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 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.

Product Roadmap
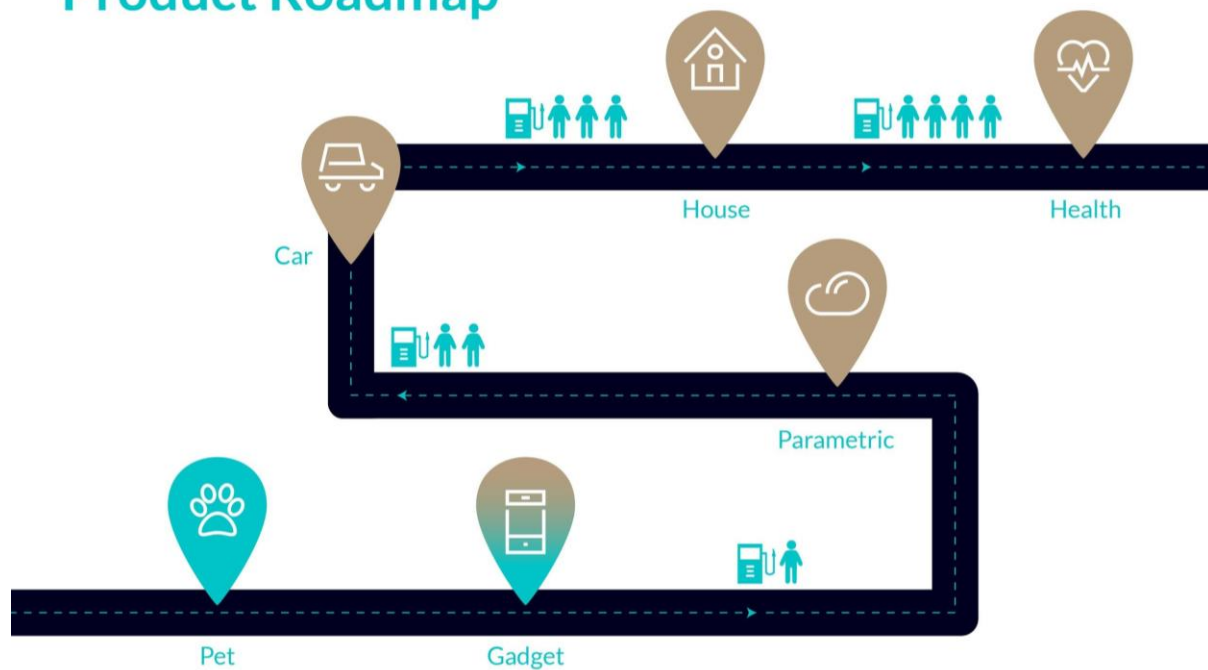
Lexi Club

Lexi Club is the first crowdsurance product created for pet owners to defend them from financial losses due to pet trauma or illness.

Pet products and services market totaled US$103.5 billion globally in 2016 and its growth is estimated approximately 4% per year. (1) The cost of vet services is high, at the same time pet insurance market for instance in US is estimated at 1-2%. The reasons for this discrepancy are seen in the high cost of pet insurance and in growing distrust of pet owners to insurance companies. As an example, average cost for pet insurance policy in US vary from 50 to US$110 per month. (2) We consider Millennials as our target audience, and this generation increasingly perceives pets as family members, buy expensive accessories to them, and carefully pay attention to their health.

Crowdsurance product Lexi Club is cost saving and convenient alternative to insurance products. Due to total automation most crowdsurance processes save time hugely compared to traditional insurance. Due to minimal human participation the cost of crowdsurance products is much lower and human factor could be excluded. Thanks to such technologies as Machine learning and Computing vision, scoring of crowdsurance members as well as cases will be continuously improving with every new member and new case.

The client part of the Platform is implemented as chatbot Lexi in messenger.

Pet owner finds Lexi bot in messenger and starts a dialog. Through identification in messenger, instant messages and sending photos of owner and its pet, user follows through KYC and scoring processes. Using own pet recognition algorithm based on computing vision and cognitive services, Lexi bot checks if pet is already in database and if not, determines scoring level. This software and algorithms are our own design and implemented in non-public part of the platform – off-chain.

The Platform is creating individual smart contract (Member Smart contract) that will gather all data about owner and pet, contributions and payment requests, and perform agent functions, controls the fulfillment of terms and conditions of membership in Lexi Club. The smart contract is implemented in the public part of the blockchain system, however all data about the owner and pet are encrypted, according to our policy.

Pet owner makes a contribution in cryptocurrency or in fiat. If the owner doesn't have e-wallet, the Platform helps to create it, exchange fiat to Ether and then transfer it to Member smart contract.

When contribution is made the owner gets issued virtual ID Lexi Card as a confirmation and becomes a member of crowdsurance community. Lexi Card will be activated within 5 days of "freeze time" as additional guarantee from fraud. Member could compensate up to 80% of expenses in case of trauma or illness of pet, and also get access to additional services like order pet food, vet home visits, access to validated vets base and get notifications about all important vet procedures. All these services will be implemented via Lexi bot.

In case of trauma of illness member open the messenger and notifies Lexi about it. Thus Member smart contract "learns" about the case, check if Lexi Card is active and launches all processes needed for payment request.

Lexi helps owner with tips, what to do first, what to do in clinic, what docs she need to get from owner to compensate expenses (photo with geolocation from clinic, checks and epicrisis). When Lexi gets all docs and probably confirmation from vet clinic Member smart contract sends this data and payment request to top-level Pool smart-contract.

Pool smart-contract checks does the payment request amount exceed the limit and if not – confirms payment and transfers funds to Member smart contract, if amount exceeds the limit – Pool smart contract launches the expert voting process where jury of experts judge the case.

Now we have Lexi Club prototype for testing and working as frontend part of the product. Thanks to Microsoft framework chatbot is implemented for [Telegram](#), Skype and [Facebook Messenger](#). Based on Microsoft Cognitive services the algorithm of pet "recognition" is realized by matching and analysis of photos at registration and case initialization. The product shows positive feedback from pet owners, although there is no culture of pet insurance in Russia. Feedback received from pet owners gave us an opportunity to develop script of chatbot, also we added online consultation with vet doctor through messenger in close collaboration with local leader of vet services – Pet Doctor. To demonstrate efficiency bot is localized for English. Now we are actively working to enter US and EU markets.

Gadget protection

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

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. We are develop and testing prototype for Gadget protection named REGA App for Android and iOs devices, which will cover devices used for less than three years and at competitive price.

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

Drones will become an 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 create number of crowdsurance products for drone related businesses, such as **drone protection**, **drone cargo protection**.

Parametric crowdsurance

Using our platform, new parametric crowdsurance products can be developed. We can use data from various sensors and detectors to trigger 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 Super Pool for such products, that will give them more liquidity, additional guarantees for users, access to riskier strategies, new user base. Distributed financial products can be tied to real world information, objects or events, by incorporating mechanisms like oracles, arbitrators. For example, a crop protection smart contract can be concluded with a farmer, where payment is triggered by a third party data feed. The smart contract receives weather data from a national weather service and when there were 20 dry days the farmer could use the funds from mutual pools. Or as another application - we can create crowdsurance product to financially protect frequently flying tourists against financial loss, when the flight is delayed, that automatically makes payment upon receiving the confirmed information from an airport about the delay. Those products are relatively easy to construct as the payment condition is automated and does not depend on qualitative dataflow.

Property protection

Drones can be used in crowdsurance Real Estate products to check the property condition and also can provide evidence, when an unexpected case has happened and the property is damaged. The property owner can be asked to place himself in front of the drone for photo/video checkup procedure to make an additional evidence that the property belongs to the specific person. After finishing the property checkup procedure all evidences will be processed and stored in blockchain and an individual price will be calculated for the owner. In 2021 global expenditures on IoT

technologies will reach an amount of $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 risk sharing products automatically, triggered by certain undesirable event, while contacting a drone for visual inspection.

Car protection

Car owners might invest in Car Protection Pool and in case of an accident pool funds will be used to cover cost of car repair. The drone service can be used to collect evidences for the accident. The car owner or driver can use mobile app or chatbot in messenger to submit an accident report and provide location for the drone. 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. These data can include licence plate of the vehicles involved. Collected photo can be used to determine exact position of the vehicle on the road. After drone has finished accident site checkup vehicles involved in accident can change location.

Health crowdsurance

The final step for the platform development will be health crowdsurance product. Parametric data from wearables, smartwatches, fitness trackers and other mobile health gadgets and applications, performing like an oracles, can be traced to identify insurance scoring systems and provide qualified risk mitigation. We start from helping to lower insurance franchise of conventional medical insurance programs, ending by creating our own medical protection products with crowdsurance pools. Partnering with projects that collect medical history data can give us user-permitted access to health information stored safely in blockchain to pool customers with the same level of risk and lower contributions collected for personalized medical help. Financial aid for covering of medical expenses will be provided using the same approach as pet insurance, however additional data will be used to manage the risk and widen competency in the field. The platform might help disabled people to receive better healthcare solution and financial support, bringing them financial coverage as a donation from other people.

Platform

The REGA Risk Sharing Platform (Platform) is an open source software system that will be available as SaaS for developers and for crowdsurance product creators. The Platform ecosystem will also include Super Pool with capitalisation in REGA Risk Sharing Tokens (RST) and Ether. The Platform prototype is already up and running and we are using it for own created products including Lexi Club mutual Pet health crowdsurance and REGA gadget protection. 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, becoming blockchain agnostic.
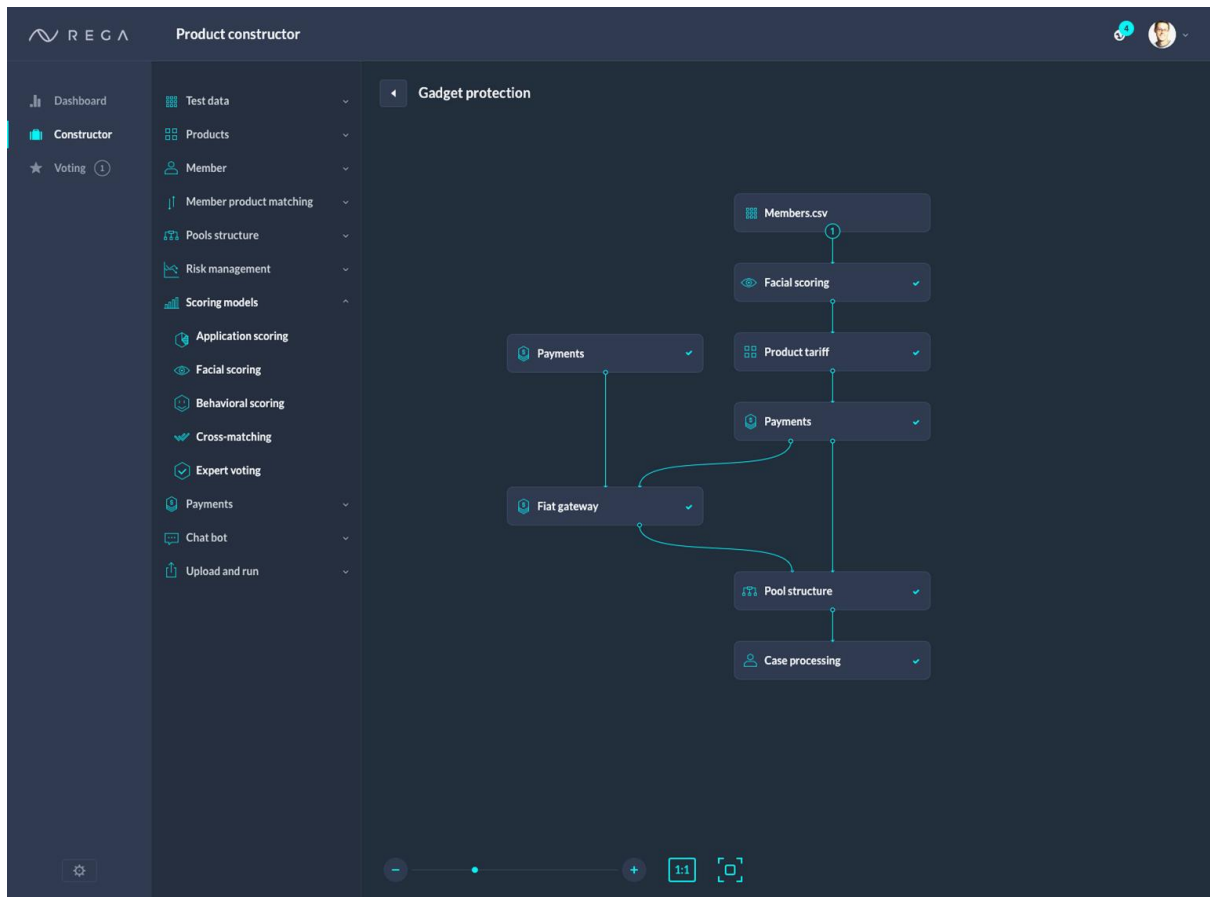
Architecture

REGA platform consists of two main parts: off-chain and blockchain. The off-chain part is the redesigned scoring and underwriting iNSTANTLOAN system that includes products and client databases, product matching engine and scoring/risk management module. In blockchain we have several smart contract types: three level cascade pool structure including super pool, tokens and smart contract factory. There is the high level architecture of the platform:
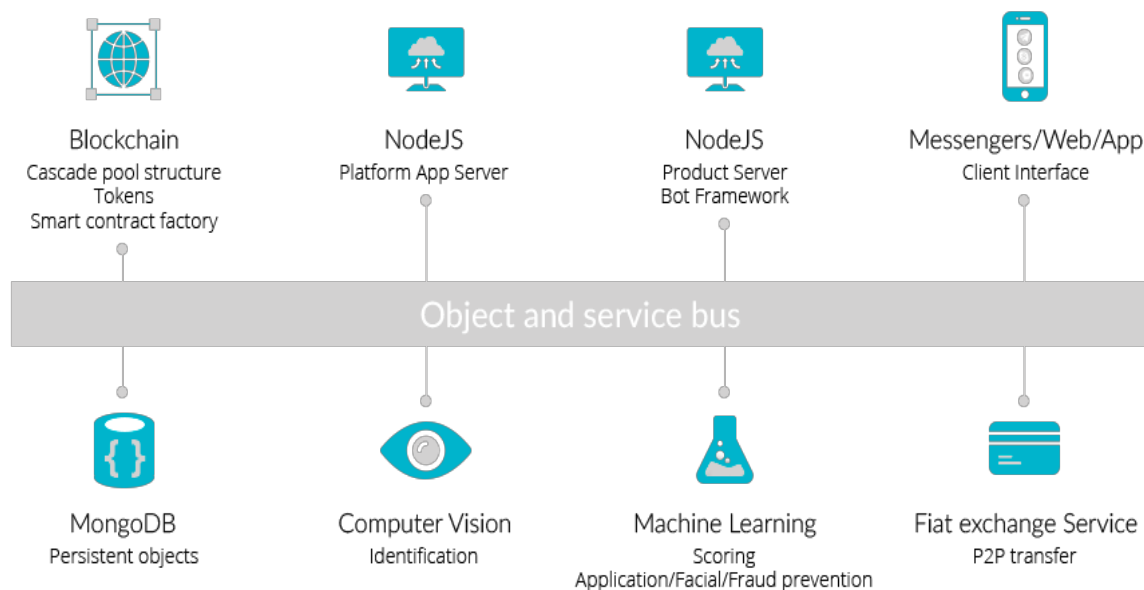
*Microsoft Azure*

We are using the following Microsoft Azure services: Azure Bot Service, Azure Storage, Microsoft Cognitive Service, Azure Machine Learning, Azure Ethereum Blockchain Consortium (test and prototyping).

Bot framework

The Microsoft bot framework allows us to create one bot that can run on different messaging platforms including Telegram, Skype, Facebook messenger, Slack and web.

REGA Platform Dashboard
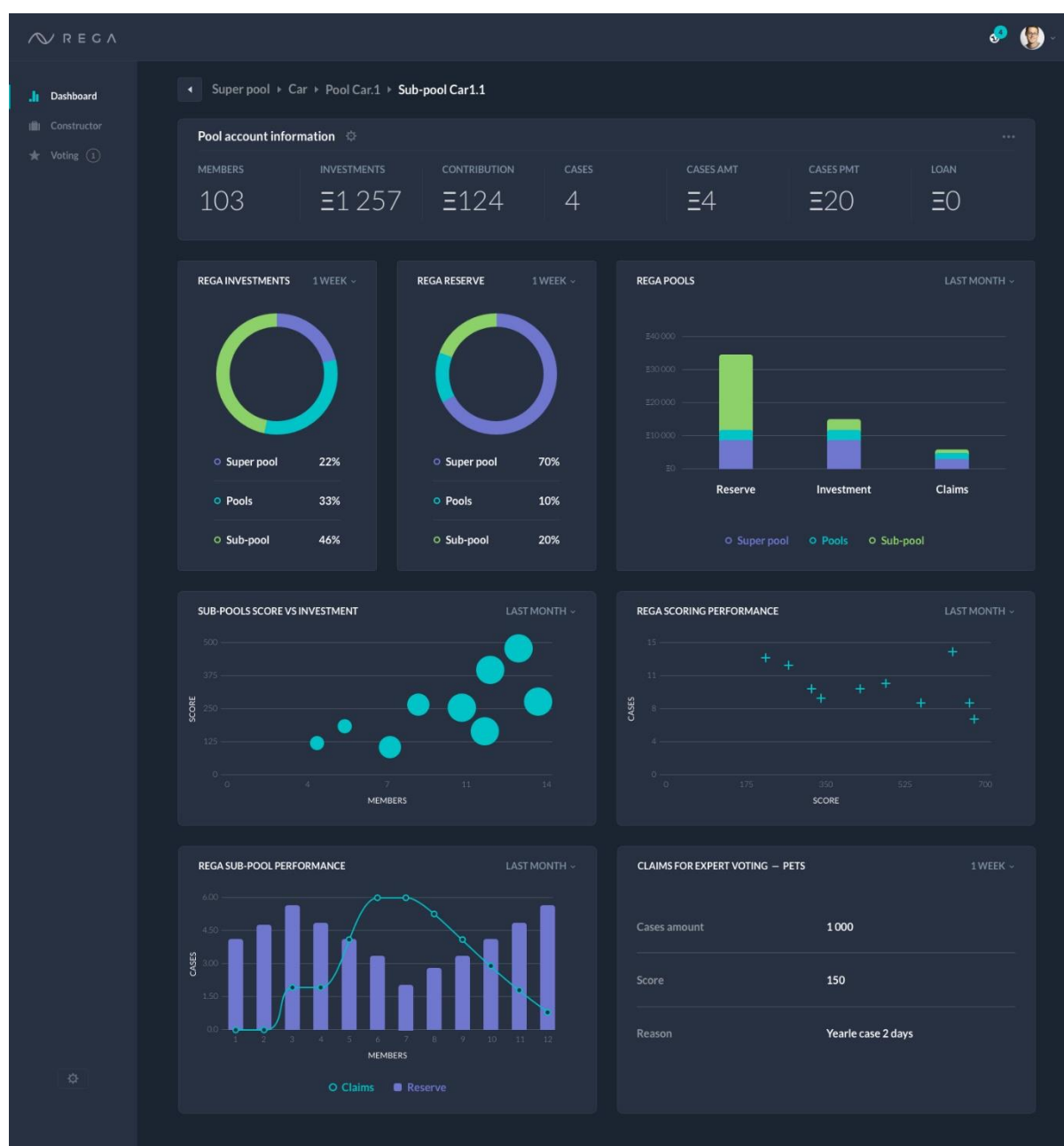
Products

The platform is using three level product model: (1) product type, (2) product and (3) product instance. For example, the product type is crowdsurance, the product is pet crowdsurance and the product instance is smart contract at blockchain address. The product is main container for several platform objects including *product calculator*, *product matching rules*, *risk management rules*, *scoring card* and *cascade pool structure*. Basing on platform members needs and scoring results the platform will calculate a product offer for the particular member using product calculator.

The main attribute of the offer is price, the amount that user should invest in a blockchain smart contract to get a member smart contract. For example, if user needs a 3 months smart contract for a 5 year old dog the price will be $20 and for other user with a 3 years old dog the 3 month member

contribution will be $15 based on higher scoring of the younger pet. Product matching rules will help to find best fit product for a particular member from several products of product database. In our pet crowdsurance case it contains as a rule, a pet age range and if the client dog is 8 year old, the platform does not offer this product to a member. The platform needs to understand how to manage groups of members with the same risk level. Risk management rules will be responsible for these decisions. If number of payment requests in the particular group (let's say it's a midsize 5 years dogs group) more than 10% of total number of members in the group then the risk management module could make a decision to close this group and payback all collected contributions to members that did not have payment requests. The cascade pool structure provides a grouping mechanism based on the risk level (score).

As we've described in the previous example the one group can be "midsize 5 years old dogs", because they all have a score from 101 to 300 points. And another group will be small dogs with the same age because they have a score range from 301 to 500. Groups of members (sub-pools) will be aggregated to higher level groups (pools). For example, 5 years dogs with a score range from 101 to 500 became one pool and 2 years dogs that all have score from 701 to 900 will create another pool. All pools belong to Super pool that establishes the minimum score level for 101 points in our example.

Members

The second platform database is community members information file. Each member will get an unique identification number - the member ID that will link all electronic documents to the particular person. We will store all applications that member has submitted with scoring results, product offers and smart contracts addresses. All information about submitted requests and payments will be linked to the member and we will use this information for scoring model adjustments. The member history will play important part during the risk assessment and give us a tool to calculate individual price for each person.

Product matching

To select right product for each member we need a matching mechanism. It does not make sense if you have just one product to sell, but we are creating a platform for many financial products and we must provide service that will help user to search through product database. As we've described above each product contains matching rules that describe a condition to whom we can make an offer. In these rules we can use attributes from member demographic data, member location, collected needs and scoring results. If as the result of the matching the member can receive several offers we will use a next level matching on the product type layer where the developer can specify how to present the matching result to the member. For example, should we show only one or several offers, how to sort it or filter.
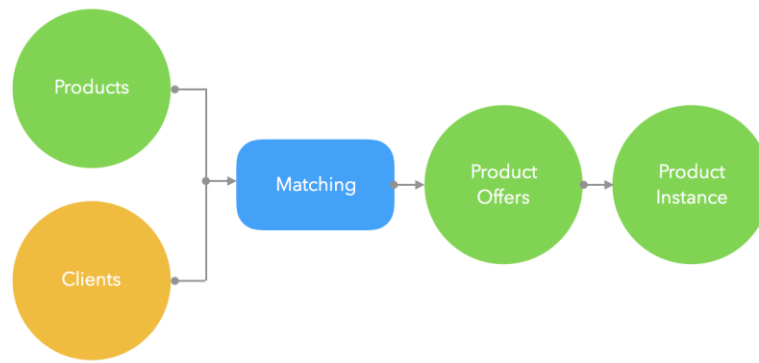
Risk management

The risk management module or service will be responsible for monitoring of the risk level inside risk groups. We will use scoring to calculate risk level for the particular member and we will group members with equivalent risks in sub-pools and pools. The risk management uses behavioral scoring models to predict running cost for particular risk group and compare it with the group liquidation cost to make a decision about next action. If the group liquidation cost is less than the predicted running cost then the given risk group can be liquidated. In this case the group members who did not submit payment request will receive back their contributions. As the result the risk model will be adjusted and the contribution for this particular risk range will be raised to accommodate the adjusted risk level and if new calculated contribution amount is more than the product maximum contribution attribute then the new coming member will not be able to receive the product offer and join pools.

There is a list of possible actions that risk management engine can take:

Action	Description
Adjust	Adjust the pool/sub-pool limits
Liquidate	Liquidate sub-pool and reimburse all funds to the members
Create	Create new pool/sub-pool in the cascade pool tree
Reserve	Ask pool/sub-pool to increase reserves and issue the loan request if needed
Risk	Adjust the pool/sub-pool risk level

Close	Close pool/sub-pool (can't accept new members)
Open	Reopen pool/sub-pool (start accepting new members)
Merge	Merge pools/sub-pools
Split	Split pool/sub-pool and create two new pools/sub-pools with existing members
Rise	Rise event

To describe risk management rules we are using a 'predicate - action' language where each rule can be defined in the following form:

```
#define rule <rule_name> {
        condition : <rule_condition>
        case <predicate 1> :
                <action 1.1>, <action 1.2>,...
        case <predicate 2> :
                <action 2.1>, <action 2.2>,...
        ......
        default :
                <default action 1>, <default action 2>,...
}
```

The condition is predicated on the cascade pool structure that specifies when the rule should be executed. Each case must contain at least one action and after the action from the selected case are executed the rule execution is finished. So, the only first case predicate that is true will be executed and if there's no true case predicate then default actions will be fired. For example, the following rule check pool limit and ask the pool get a loan from super pool if the limit is violated:

```
#define rule check_pool_limit {
        condition : pool.balance < pool.limit
        case superpool.balance > pool.limit - pool.balance :
                reserve(pool, pool.limit - pool.balance);
        default :
                adjust(pool.limit, pool.balance);
                rise(superpool, 'short of funds');
}
```

Here is an example of risk management engine work for gadget protection product.
[REGA Risk Management Example](#)

Scoring

Scoring is the set of decision models and their underlying techniques that aid the community to measure risk for particular member or/and member property. These techniques decide who can get crowdsurance product, how much will be a premium, and what risk management strategies will reduce a mutual risk for the community members. In our case community can make three types of decisions: first, whether to issue crowdsurance contract to a new applicant, second, how to deal with existing risks and whether to pay requested amount based on existing information about the case and product rules. The techniques that aid the first decision are called application scoring. Usually application scoring deals with client demographic data, but we also study a new approach and try to calculate score using member's photo. This type of application scoring we will call a facial scoring. The techniques that work with the second problem of risk management are called behavioral scoring. And the last, but not least is fraud prevention, the scoring models that help to make right decision about a payment.

Application scoring

In application scoring we are using applicant data to calculate a score. Not all the application data are used in calculation. Let's consider simple scorecard for pet crowdsurance :

Pet type		Age		Weight (kg)	
Dog	50	1-3	50	1-2	40
Cat	60	4-5	30	2-5	30
Other	0	6-8	10	5-10	20
		> 8	0	> 10	10

In this case 5 years old 5 kg dog will get the following score: *50 + 30 + 30 = 110* and 6 years 2 kg cat: *60 + 10 + 40 = 110* will receive the same score.

In this case we try to find the best linear combination of the characteristics:

$$\omega_0 + \omega_1 X_1 + \omega_2 X_2 + ... + \omega_p X_p = w * X^{*T}$$

where $w^* = (\omega_0, \omega_1, \omega_2, ..., \omega_p)$ is vector of weights and $X^* = (1, X_1, ..., X_p)$ is the set of random variables that describe application attributes, which explains the probability of payment request. Suppose we have a sample for insurance policies and p_i is the probability that in the sample member i has submitted the payment request. So we would like to find w^* to best approximate $p_i = \omega_0 + \omega_1 x_{i1} + \omega_2 x_{i2} + ... + \omega_p x_{ip}$ for all i where

$x_i = (x_{i1}, x_{i2}, ..., x_{ip})$ is actual value for application attributes. Suppose n_G of the sample are goods and did not declare cases. Without limitation we can assume then the first n_G in the sample are goods and $p_i = 0$ for $i = 1,..,n_G$. The remaining n_B of the sample are bad, so for them $p_i = 1$ for $i = n_G + 1,...,n_G + n_B$, where $n = n_G + n_B$. Using linear regression we choose weights that minimizes the mean square error between the left and right side of $p_i = \omega_0 + \omega_1 x_{i1} + \omega_2 x_{i2} + ... + \omega_p x_{ip}$. This corresponds to minimizing

$$\sum_{i=1}^{n_G}\left(\sum_{j=0}^{p}\omega_j x_{ij}\right)^2 + \sum_{i=n_G+1}^{n_G+n_B}\left(1-\sum_{j=1}^{p}\omega_j x_{ij}\right)^2$$

In vector notation the expression $p_i = \omega_0 + \omega_1 x_{i1} + \omega_2 x_{i2} + .. + \omega_p x_{ip}$ can be rewritten as

$$\begin{pmatrix} 1 & X_G \\ 1 & X_B \end{pmatrix}\begin{pmatrix} \omega_0 \\ w \end{pmatrix} = \begin{pmatrix} 0_G \\ 1_B \end{pmatrix}$$

or $Yw^T = b^T$ where $Y = \begin{pmatrix} 1_G & X_G \\ 1_B & X_B \end{pmatrix}$ and X_G is an $n_G \times p$ matrix,

$$X_G = \begin{pmatrix} x_{11} & \cdots & x_{1p} \\ \vdots & \ddots & \vdots \\ x_{n_G 1} & \cdots & x_{n_G p} \end{pmatrix}$$

$$X_B = \begin{pmatrix} a_{n+11} & \cdots & a_{n_G+1p} \\ \vdots & \ddots & \vdots \\ a_{n_G+n_B 1} & \cdots & a_{n_G+n_B p} \end{pmatrix}$$ is $n_B \times p$ matrix and $b^T = \begin{pmatrix} 0_G \\ 1_B \end{pmatrix}$ where 1_G (1_B) is the $1 \times n_G$ ($1 \times n_G$) vector with all entries 1, 0_G is $1 \times n_G$ vector of 0.

With all this definitions finding the weights of the linear regression corresponds to

$$Minimize(Yw^T - b^T)^T (Yw^T - b^T)$$

Differentiating with respect to w says this is minimised when the derivative is zero; i.e.,

$Y^T(Yw^T - b^T) = 0$ or $Y^T Y w^T = Y^T b^T$,

$$Y^T b^T = \begin{pmatrix} 1 & 1 \\ X_G & X_B \end{pmatrix} \begin{pmatrix} 0_G \\ 1_B \end{pmatrix} = \begin{pmatrix} n_B \\ n_B m_B \end{pmatrix}$$

and

$$Y^T Y = \begin{pmatrix} 1 & 1 \\ X_G & X_B \end{pmatrix} \begin{pmatrix} 1 & X_G \\ 1 & X_B \end{pmatrix} = \begin{pmatrix} n & n_G m_G + n_B m_B \\ 0 & X_G^T X_G + X_B^T X_B \end{pmatrix}$$

where m_G and m_B are sample expectations for goods and bad.

$$X_G^T X_G + X_B^T X_B = nE\{X_i X_j\} = nCov(X_i, X_j) + n_G m_G m_G^T + n_B m_B m_B^T$$

If S is the sample covariance matrix, this gives

$$X_G^T X_G + X_B^T X_B = nE\{X_i X_j\} = nS + n_G m_G m_G^T + n_B m_B m_B^T$$

Expanding $Y^T Y w^T = Y^T b^T$ and using above expressions gives

$n\omega_0 + (n_G m_G + n_B m_B)w_T = n_B$

$$(n_G m_G^T + n_B m_B^T)\omega_0 + (nS + n_G m_G m_G^T + n_B m_B m_B^T)w^T = n_B m_B^T$$

Substitution the first equitation into the second one gives

$$((n_G m_G^T + n_B m_B^T)(n_B - (n_G m_G + n_B m_B)w^T)/n) + (n_G m_G m_G^T + n_B m_B m_B^T)w^T + nSw^T = n_B m_B^T$$

Calculating this gives as the best choice of $w = (\omega_1, \omega_2, ..., \omega_p)$ for the coefficients of the lineal regression that we are using for example in our scoring card above:

$$w = (50, 60, 0, 50, 30, 10, 0, 40, 30, 20, 10)$$

Facial scoring

To make application process more convenient for the client, we are going to introduce new type of application scoring - facial scoring, where score is calculated based on the member's face photo. The model prototype is already developed and tested and gives about 70% accuracy. To build the model we are using Machine Learning and Cognitive Service Provided by Microsoft. The Microsoft Face API (MS Cognitive) was used for the member photo processing where around 15,000 pictures were digitized. For each face picture a flag attribute (good/bad) is calculated based on traditional application scoring model (base model). There are the following face landmarks/attributes we are using for the facial scoring model: age, gender, head pose, smile, facial hair and glasses. Based on these attributes the Two-Class Boosted Decision Tree algorithm trained on 11, 000 records gives the following results:

True positive	False negative	Accuracy	Recall
2156	826	0.709	0.723

True negative	False positive	Precision	F1 score
1832	812	0.726	0.725
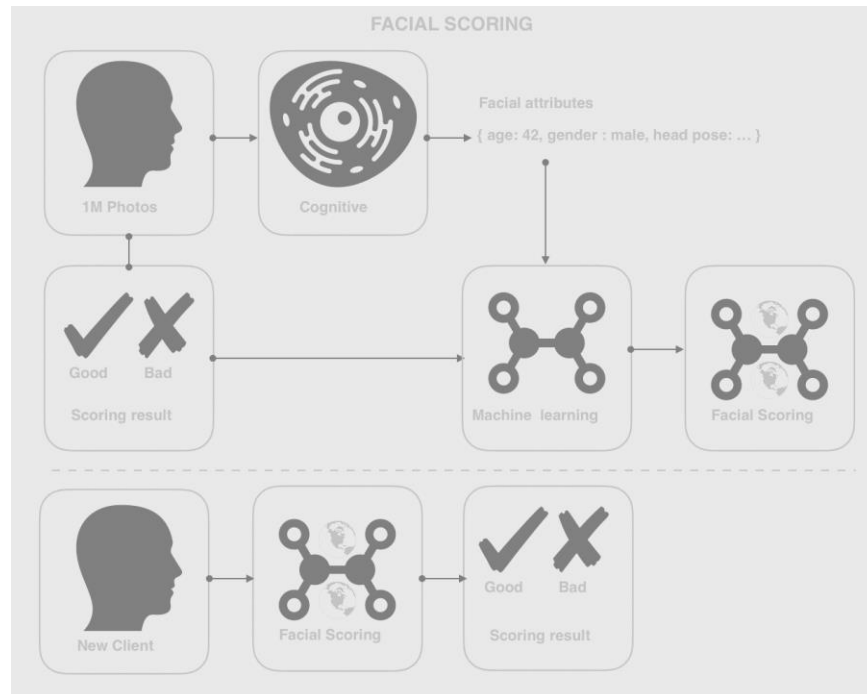
Behavioral scoring

We are using behavioral scoring to predict outcome for particular group of members (sub-pool or pool) in the amount of declared payment requests to understand if the amount below the limit defined for the group, or we are going to have more payments and need to make a decision to keep this group running or liquidate it and repay all contributions. A particular point of time is chosen as the observation point. A period preceding this point is designated the performance period, and the characteristics of the performance in this period are added to application information to adjust application scoring. A time - say 1 month after the observation point - is taken as the outcome point, and the group is classified as good - amount of claims below limit or bad if it above the limit.
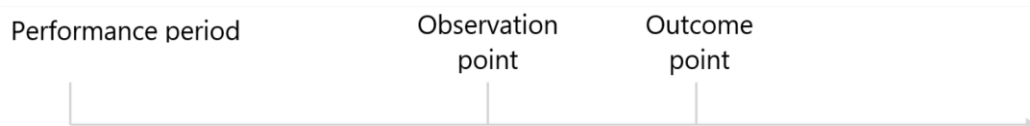
The extra performance variable in behavioral scoring system includes the current balances of the group (sub-pool or pool) for account:
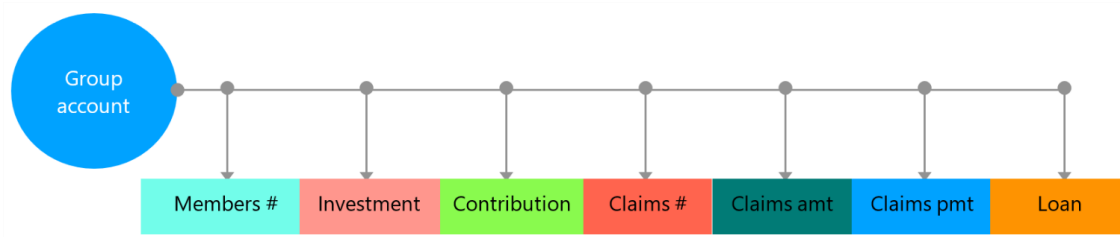
A/C ID	Account name	Description
01	Member #	Number of members in the group (sub-pool or pool)
02	Investment	Amount of member contributions collected
03	Contribution	Amount of loans issued by the group to support lower level groups
04	payment requests #	Number of payment requests declared by the group members
05	payment requests amt	Amount of payment requests declared by the group members
06	payment requests pmt	Amount of payment requests that was paid by the group
07	Loan	Amount of loan received by the group from upper level groups

The idea is to identify the different states that group account can be in and, and then to estimate the chance of account moving from one state at observation point to another state at outcome point. The states depend mainly on information concerning the current position of the account and the performance period history, but they also depend on initial application information of group members. In our case when the group account is defined as a vector of 7 accounts we can assume the probability of moving to any particular state at outcome point is depend only on the current state of the group account is in and not on the previous history. This is definition of Markov chain.

Let $\{X_1, X_2, X_3, X_4, ...\}$ be a collection of random variables that take values in one of M states. The process is said to be a finite-valued Markov chain if

$$\mathrm{Pr}\,ob\left\{X_{t+1} = j \mid X_0 = k_0, X_1 = k_1, .., X_{t-1} = k_{t-1}, X_t = i_t\right\} = P\left\{X_{t+1} = j \mid X_t = i\right\}$$

for all i and t, j, where $1 \leq i, j \leq M$. The conditional probabilities $P\{X_{t+1} = j \mid X_t \{ = i\}$ are called transition probabilities and represented $p_t(i, j)$ and the probability properties mean that one requires

$$\sum_j p_t(i, j) = 1$$

that $p_t(i, j) \geq 0$ and .

The matrix of these probabilities is denoted P_t, so $(P_t)(i, j) = p_t(i, j)$. The Markov property (1) means that one can obtain the distribution of the X_t given the value of X_0 by multiplying the matrices P_0, $P_1,...,P_{t+1}$ together. If $p_t(i, j) = p(i, j)$ for all all i and t, j, the process is stationary Markov chain. In this case, the k - stage transition probabilities are obtained by multiplying P by itself k times, so $P\{X_{t+1} = j \mid X_0 = i\} = P^{t+1}(i, j)$.

In our case we can consider simple example of this type of model when the group account is to take one of the following states $\{NI,0,1,2...,M\}$, where NI - is no-insurance status, 0 - is no payment requests (claims # $= 0$), 1 - is where account has one claim declared, and so on. Assume M payment

requests will classify the group as bad and the group can be liquidated. The transition metric of the Markov chain would be:

From/To	NI	0	1	2	…	M
NI	p(NI,NI)	p(NI,0)	0	0	…	0
0	p(0,NI)	p(0,0)	p(0,1)	0	…	0
1	p(1,NI)	p(1,0)	p(1,1)	p(1,2)	…	0
2	p(2,NI)	p(2,0)	p(2,1)	p(2,2)	…	0
…	…	…	…	…	…	…
M	p(M,NI)	p(M,0)	p(M,1)	p(M,2)	…	p(M,M)

Consider an example of the stationary transition matrix

From/To	NI	0	1	2	3
NI	0.79	0.21	0	0	0
0	0.09	0.73	0.18	0	0
1	0.09	0.51	0	0.40	0
2	0.09	0.38	0	0	0.55
3	0.06	0.32	0	0	0.62

Thus if one starts with all the accounts having no insurance policies $\pi_0 = (1,0,0,0,0)$ after one period (let's say one month) the distribution of accounts is
$\pi_1 = (0.79, 0.21, 0, 0, 0)$.

After subsequent period, its becomes

$$\pi_2 = (0.64, 0.32, 0.04, 0, 0)$$

$$\pi_3 = (0.540, 0.378, 0.058, 0.015, 0)$$

$$\pi_4 = (0.468, 0.431, 0.070, 0.023, 0.008)$$

$$\pi_5 = (0.417, 0.460, 0.077, 0.028, 0.018)$$

$$\pi_{10} = (0.315, 0.512, 0.091, 0.036, 0.046)$$

After 10 periods, its estimates that 4.6% of the accounts will be bad. This proves a useful way for estimation the amount of payment requests and what reserve we need to allocate to support the claim payments or to liquidate the bad groups.

Fraud prevention

The fraud prevention uses a scoring model to make a decision about a payment based on existing information about the payment request and rules of pool. In many ways, using scoring for fraud prevention is the same as any other. We have experience of past claims and binary outcome - genuine or fraud. The key difference is that skilled fraudsters will make their payment request look very much genuine. Therefore, we will use two approaches to deal with this complicated nature - neural network and cross-matching.
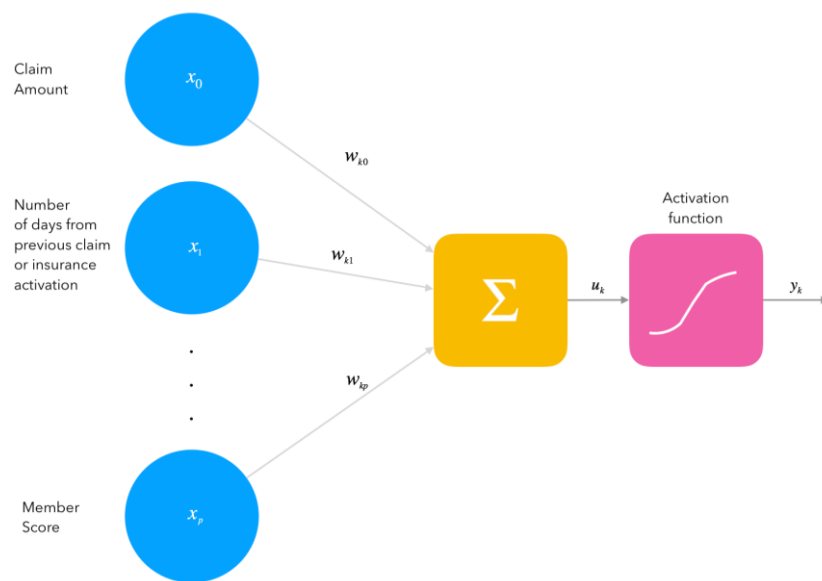
In this example we have a single-layer neural network for payment request processing where $u_k = \sum_{q=0}^{p} w_{kq} x_q$ and $y_k = \dfrac{1}{1 + e^{-au_k}}$. Each of $x_0, x_1, ..., x_p$ is a variable, such as a characteristic of a payment request application including some attributes of community member. Given the values for the weights and cutoff value, we can predict whether a payment request is genuine or fraudulent.

The second technique that work together with neural network approach is cross-matching. Cross-matching is not used as statistical model and works on the premise that once someone has been successful in perpetrating a fraud, they will attempt to repeat their success with another payment request. So, we are going to match new payment request with other allocation (rejected or paid) to identify common features. If the payment request is identified as a suspicious one then it will be sent to expert voting with all information about fraud prevention scoring and cross-matching result. For example, if number of payment requests use exactly the same claim amount these applications must be market as a potential fraud and send to experts for verification and approved by voting.

Some anti fraud measures must be implemented in product and risk management as well. For example, for some products we will have a freeze period when a claim can be submitted only after

a certain number of days after the activation of the crowdsurance smart-contract. If a beneficiary for the claim payment is a service company or a person, for example a veterinarian, then individual limits must be established for each such beneficiary. Let's say if we have service shop for mobile devices that can't process more than $2,000 per day in transactions, then this limit should be set in the blockchain part of the risk management system and all claim payments due to this particular beneficiary must reduce it. It can be stated as well, that with crowdsurance the incentive to cheat on the community is statistically lower than with traditional insurance as the conflict of interest, mentioned above, disappears.

Identification

We are going to use Machine Learning for the identification process. For example, for the pet crowdsurance product we created a neural network algorithm, that identifies the same pet on different pictures. To become a member of crowdsurance pet product user have to make a pet photo, that will be processed by identification algorithm and processing result will be stored in blockchain. If a case is declared the pet owner should prove to the community, that the same pet was treated in the clinic. The pet picture from the clinic will be processed with the same algorithm and the result will be compared with the stored signature. Now algorithm provides with 90% accuracy and we are working to improve its efficiency.

Member smart contract

When user has accepted the product offer and made the payment for calculated amount of the contribution the Member Smart contract will be created in blockchain. The contract will contain member ID, member score and payment limit, the total amount of payment requests that the community can provide to the particular member. The smart contract also provides a general ledger functionality including accounts and postings. The accounts are implemented as a smart contract persistent storage attributes. Member accounts keep records about all transactions related to the member including payment requests and transfers between member smart contract and pools smart contracts.

Pools hierarchy

The cascade pool structure provides a grouping mechanism based on the risk level (score). There are three types of smart contract: **sub-pool**, **pool** and **super pool**. There is an example of simple pool structure:

constrains	
B = J + D + G + H	100 %
J	20 %
D + G + H	80 %
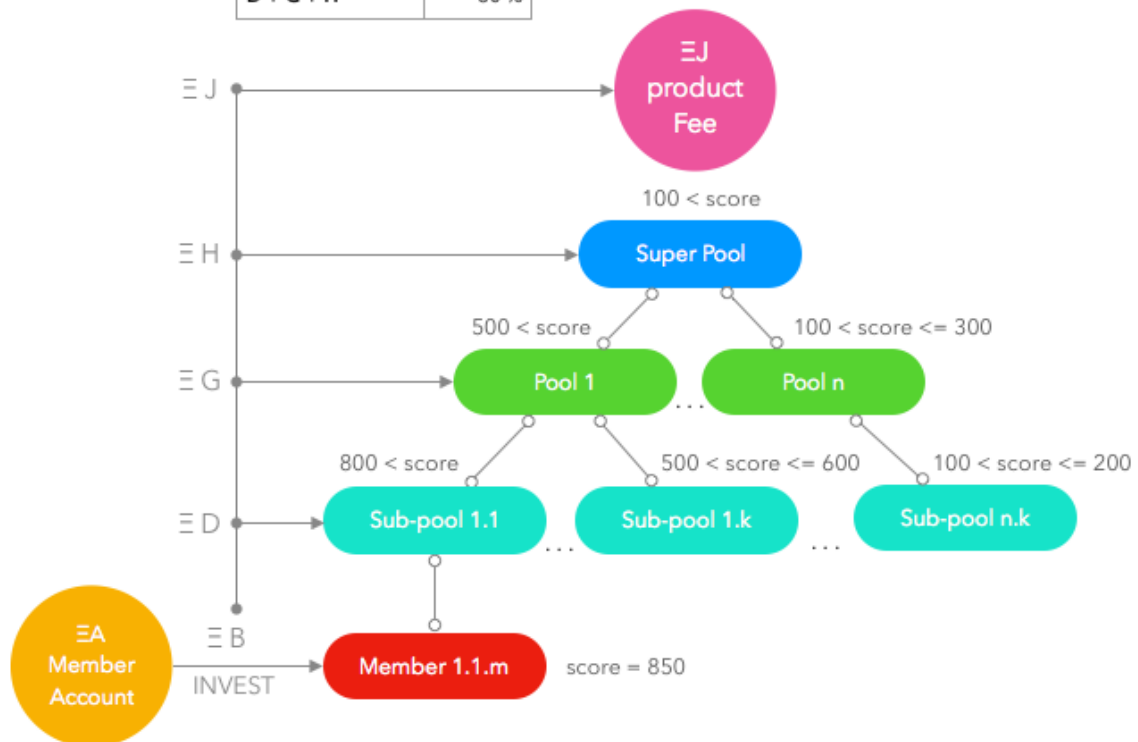
For each new user who wants to join risk sharing community, the platform creates Member Smart Contract. According to Member Smart Contract Terms user has to invest funds in Ethereum and therefore becomes a member. The amount of investment will be split between several pools in accordance with the product risk management rules. 20% of the investment will be product and platform flat fee and the rest 80% is an coverage reserves (nominated in Ethereum).

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Sub-pool

The first level in the pool structure is sub-pool layer. Sub-pool is smart contract that has a member list as an own attribute. Each member contract must be a included in some sub-pool. The sub-pool for the member can be found using search method of the smart contract that will find a path in the cascade pool tree from the super pool to sub-pool for the member contract based on the member score.

Pool

The next level in the pool hierarchy is a pool level. Pool is smart contract that has member list that contains other pools. In this case the pool is a pool of pools.

Super pool

The top level in the pool hierarchy is a super pool level. The super pool provides risk coverage to all pools in the structure. The super pool contains list of all linked pools and essentially it is also a pool of pools. There is simple claim payment scenario described on the picture. If the member has submitted the payment request and sub-pool does not has funds to pay this requested amount it will call the next level of the structure for help. In this case the pool that includes calling sub-pool will be responsible for providing a loan but if the pool also does not have funds to support the request it will call upper level, the super pool. The super pool will be the last level of support and it will provide funding from the super pool reserve or call a Super Pool Smart Token to sell reserve in Risk Sharing Smart Tokens to make the claim payment.

constrains	
B = J + D + G + H	100%
J	20%
D + G + H	80%
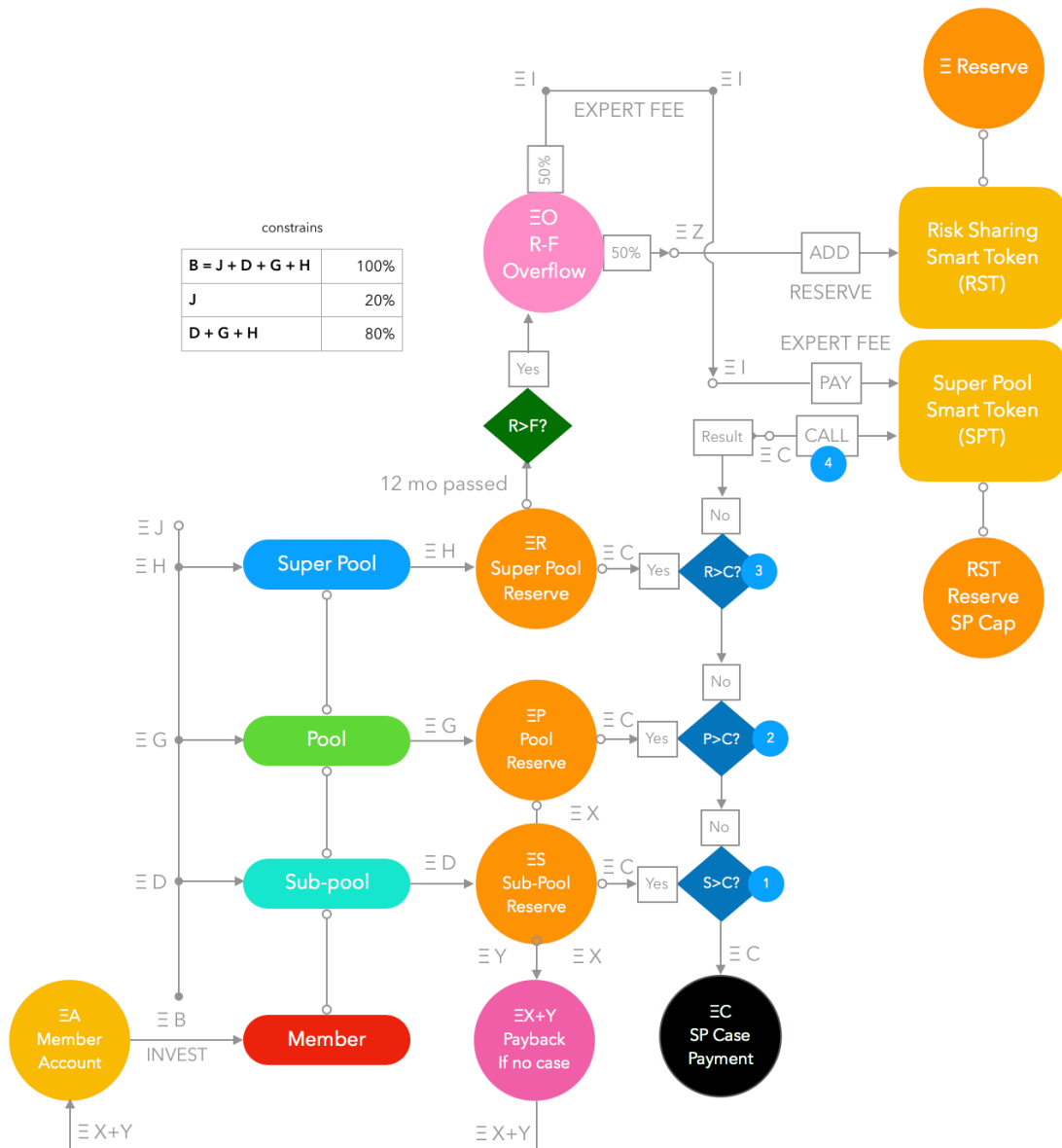
Smart contract factory

To provide REGA smart contracts to 3rd party developers we are creating REGA smart contract factory - smart contract, that creates new smart contracts basing on templates and parameters. Using this approach we will guaranty, that 3rd party smart contracts through API can work with our off-chain modules and use Super pool capacity.

Token smart contract

REGA Risk Sharing platform will use smart token basing on Bancor protocol to provide funding to the project and to build the REGA Expert community. REGA Token can be also used as an investment in pools for crowdsurance products, and means of payment for REGA services.

Risk Sharing token (RST)

To build a community of experts that will help us to develop and adjust risk models for different crowdsurance products we are going to use the Risk Sharing Tokens (RST). Those tokens will be used as REGA expert license to manage the parameters of the REGA risk models and to process some difficult cases. Such work will bring additional income to the token holders in proportion of purchased number of tokens. For this purpose part of the platform and product fees will be allocated as expert's fee. The expert fee can be distributed between token holders as cryptocurrency payments to holders account, or be utilized to increase Risk Sharing Token reserve, or to issue new tokens using BUY method and then distribute new issued tokens between token holders (subject to initial token holders voting).

Risk Sharing Token (RST) @ AA123FD890

Owner key	RST Balance	DR/CR
FF126A78907D	100	
AFD12390CEF	50	
AC23456789	**150**	**-D**

Super Pool Token (SPT) @ AC23456789

Owner key	SPT Balance	DR/CR
FF126A78907D	50	
AFD12390CEF	100	

ReGa Risk Sharing Tokens

Token ID	Reserve	Description
RST	ETH	**Risk Sharing Token.** 'REGA expert' licence
SPT	RST	**Super Pool Token.** 'REGA Super Pool expert' licence

ReGa Tokens non standard methods

| Token ID	Method	Description
RST/SPT	PAY	Payment for expert in cryptocurrency
RST	ADD	Increase reserve in cryptocurrency
SPT	HOLD	Disable buy/sell of the token for given number of months
RST/SPT	CALL	Sell tokens to get specified amount of cryptocurrency

Economy Model

Insured all over the world receive insurance coverage by paying quite high premiums to the insurance companies, covering risks with their capital. Insurance companies are commercial enterprises who receive benefit by taking financial risks which are not realized at the end of the contract period. While the insurance policy is sold through a chain of intermediaries, policyholder bears all commission costs involved.

Our platform provides low cost risk sharing solution for pool members receiving risk coverage without intermediaries, and does not receive any benefits from unrealized risks. We just take a flat fee for providing the service to members to cover platform and product development costs and making payments to token holders. We create value on the market by providing risk coverage at more affordable price, bringing convenience, simplicity and transparency to the market.

Economy model structure
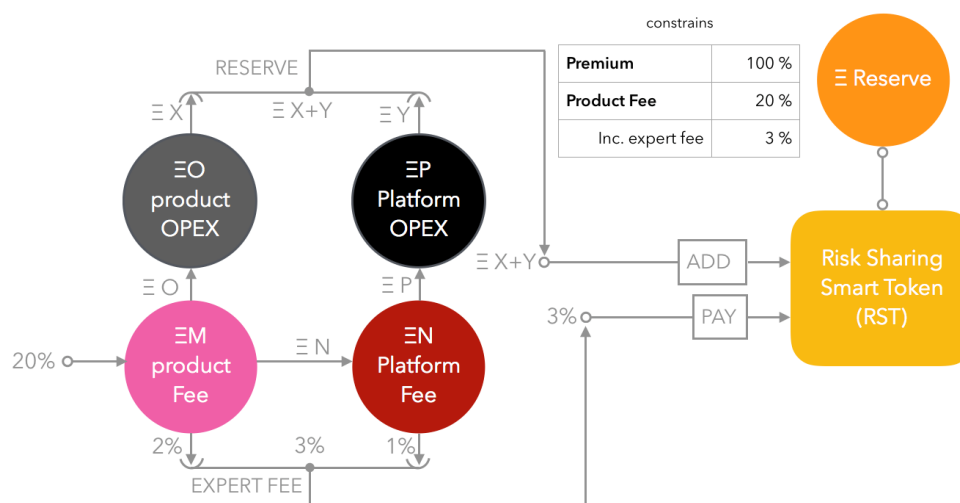
REGA Risk Sharing platform is targeting community members through social network approach. Platform members are beneficial sharing risks with people with the same level of risk, and may involve other participants through direct model of distribution, creating network effects on the platform. As the platform develops, more and more members join and more crowdsurance products created. As soon as we provide an easy and convenient risk modificator for product development peers may create crowdsurance products suitable for *their* needs, while the platform helps with risk calculations. Starting from being a vendor, creating our own crowdsurance products, we become a platform, taking a flat fee for risk management between peers.

Platform process example

Here is platform process of pet crowdsurance product that is running on the REGA Platform prototype (see the picture below):

1. Use the messenger identification process for KYC (Telegram, Skype, Facebook), start chat with Lexi Club Bot (Bot)
2. User sends to the Bot own photo and pet photo
3. The Bot is using MS Cognitive Service to identify pet type (cat or dog) and process pet photo using own pet recognition algorithm to check if the pet is already in database (existing pet/member)
4. Score pet /user, calculate member contribution amount
5. User links his fiat e-wallet to the profile and issue a permission to withdraw calculated amount in the fiat currency
6. The Bot finds another person who would like to exchange Ether to fiat currency and make P2P exchange transaction. Sends Ether to the member smart contract and issues Lexi Card
7. Member reports the case. The Bot checks if Lexi Card is active (active date = issuing date + 5 days)
8. If card is active the member can use Bot to make an appointment or get advice from vet on-line
9. The member has visited clinic. Pays for the service and sends pet photo from clinic with geographic location. Also the member sends bill and epicrisis to the bot and proves payment.
10. The Bot checks provided documents and approves payment and if the reimbursement amount is less than 50$ approves the payback. If amount is more than 50$, calls expert voting procedures.
11. The Bot makes up to 80% of the vet bill reimbursement to the member from Pool. A person who would like to buy Ether (can be new user) is found and P2P exchange transaction is committed. The fiat reimbursement amount will go to the member linked e-wallet.
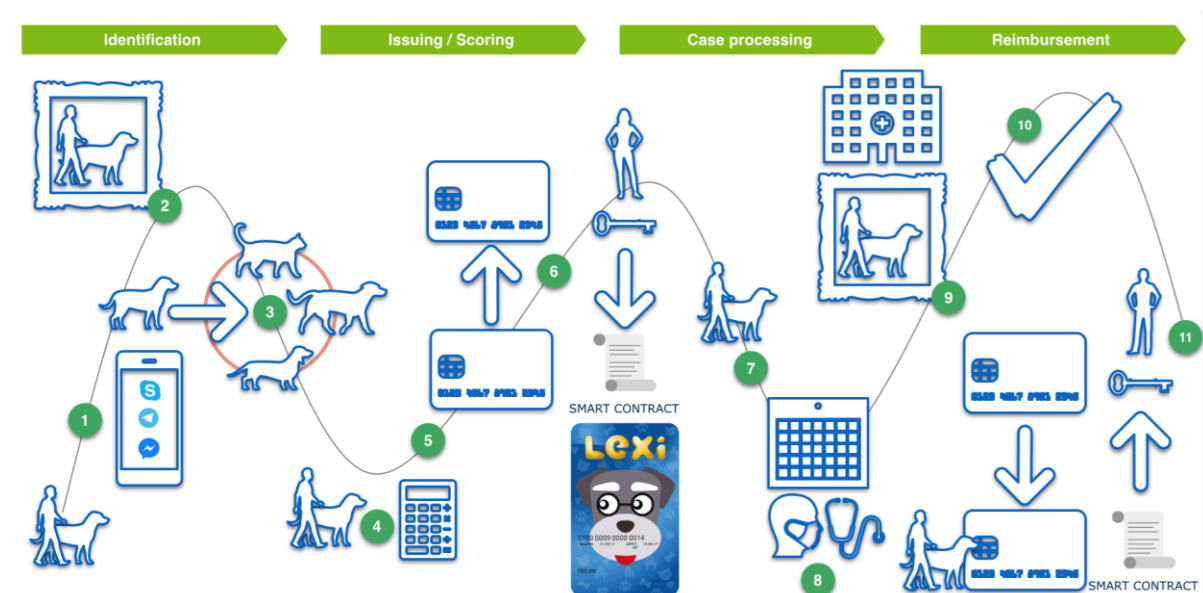
REGA Expert Community

REGA Risk Sharing platform will be used by REGA Expert Community to develop and adjust REGA risk management models to process payment requests. To become a member of the REGA

Expert Community someone should buy a Risk Sharing Token(s) during the crowdsale. Such token will give the token holder additional cryptocurrency income for the expert work, that will include decision making and voting on several subjects. For example, Risk Sharing holders can use their tokens to vote for giving additional reserve to the REGA Super Pool to provide community members with more reliable Super pool product or became a member of an expert group that evaluates payment requests, that can't be processed automatically, due to big payment amount. The expert group will be created for each case by the platform using random selection mechanism from the token holders community and will include from 3 to 5 members on each claim. Due to limited number of tokens issued during the crowdsale, we can forecast the additional demand for the tokens after the crowdsale end. Each token holder will be able to give up the license to the REGA Risk Sharing Token smart contract and receive the cryptocurrency based on the REGA Risk Sharing Token exchange rate calculated using the following formula:

$$Token\ exchange\ rate\ =\ \frac{Reserve\ balance}{Supply * CRR}\ (1)$$

where Reserve balance - amount of Ether reserves, Supply - number of issued tokens and CRR - token reserve ratio equal to 20% for REGA Risk Sharing tokens.

We are going to implement a number of crowdsurance products on our platform and we understand that the more products we are going to create the bigger expert community we need to create.

Expert Token Vote

Experts will vote for several token related subjects in accordance with the following rules:

Token	Method	Subject	Period	Votes*
RST				
	Pay expert fee	*Stop expert fee payment for period/amount*	*1-3 days*	*50% + 1*
		Route all expert fee payments for period/amount to token reserve	*1-3 days*	*67 %*
	Add reserve	*Route all payments for period to token expert fee*	*1-3 days*	*67 %*
	Emission	*Make emission with particular parameters (start date, period, number of tokens and delta reserve)*	*1-3 days*	*50% + 1*

*number of votes to accept subject

Expert Case Voting

Experts are also going to vote to resolve case related subjects. For this purpose experts will be selected randomly to create an expert jury that will consist of 5 members and will be called in action if:

A. The payment request amount is more than an automatic payment limit established for the product;

B. The payment request amount is more than remaining limit amount for all automatic payments for the product (each automatic payment decreases the remaining limit amount);

C. The member originated the payment request has a low score (30% less than average score for all community members);

D. The payment request was processed by automatic payment scoring model and was rejected by it. All rejected payments must be considered by the expert jury.

The motivation for expert to vote and consider the payment request will be the development and popularization of the platform, increasing its attractiveness for users. There are several voting strategies for expert:

1. To vote always against to the payment. In this strategy all good and bad cases are rejected and all collected contributions are returned to rejected members.

2. To vote always to make the payment. In this case some bad cases can be paid and that will bring the loss for the community.
3. To vote randomly on each payment and not consider the payment request specifics. This case is combination of 1 and 2.
4. To consider the case specific and vote with accordance with product payment request processing rules. This approach will bring the maximum value for the token holders.

Assume that the profit from a claim (payment request) is a random variable R, where:

- $R = 0$ if the claim is rejected;

- $R = L$ if the claim is accepted and the claim was good. Accepting good payment requests is good for the crowdsurance model that based on probability of payment requests. A claim is a good claim if it's created as a result of random event. If the insurance model is working (number of payment requests are in accordance with model parameters) then token holders will receive the expert commission for the claim processing and also the reserve of tokens will be increased due the super pool overflow (see super pool section for more details);

- $R = - D$ if the claim is accepted and the claim is bad. The bad claim is the claim created by member artificially just for purpose to get support funds from the community. If we are accepting bad payment requests then the insurance model will become unstable due increased number of payment requests payments (good and bad) and as result super pool level will be engaged to pay claims or to payback rejected claim's premiums. In this case the valuation of tokens can decrease because the part of token reserve can be utilized for claim/payback payments.

Suppose that the claim has number of characteristics including voting result if it was committed we will use x as a notation for the characteristics vector $x = (x_1,...,x_n)$. The claim characteristics x will give as a score $s(x)$ (to simplify the notation we will use just s and drop the x dependency of the score). We are defining p_G and p_B as the proportions of good and bad payment requests in the all payment requests population. $q(G|s)$ and $q(B|s)$ are conditional probabilities that the claim with score s will be good (G) or bad (B) and $q(G|s) + q(B|s) = 1$. Let $p(s)$ be the proportion of the payment requests population that has score s.

The expected profit from accepted claim with score s is:

$$E\{R|s\} = Lq(G|S) - D(1-q(G|s)) = (L + D)q(G|s) - D$$

Thus to maximize the profit, we should accept the claim with score s if

$$q(G \,|\, s) \geq \frac{D}{D+L}.$$

Let A be a set of all scores where the inequality holds, then the expected profit per member from the whole population is:

$$E^*\{R\} = \sum_{s \in A}((L+D)q(G \,|\, s) - D)p(s)$$

We assume that the profit and losses are independent of the score and that $q(G/s)$ is monotonically increasing is s. In this case, define $F(s/G)$ and $F(s/B)$ to be probabilities a good or a bad has a score less than s.

$$E^*\{R\} = \sum_{s \geq c}((L+D)q(G|s)-D)p(s)=$$

$$\sum_{s \geq c}(Lp_G p(s|G) - Dp_B p(s|B))=$$

$$Lp_G(1-F(c|G)) - Dp_B(1-F(c|B))=$$

$$Lp_G - Dp_B + (Dp_B F(c|B) - Lp_G F(c|G))$$

The first term in the resulting formula $Lp_G - Dp_s$ is the profit if we accept all claims (and it can be negative number), and the second part $(Dp_B F(c/B) - Lp_G F(c/G))$ is the profit that scoring and voting brings. So, we need to have $Dp_B F(c/B) > Lp_G F(c/G)$ or

$$\frac{F(c|B)p_B}{F(c|G)p_G} > \frac{L}{D}$$

Let $F(s)$ be the proportion of scores below s and $F(s) = F(s/G)p_G + F(s/B)p_B$. We define a bad acceptance rate as $(1 - F(s/B))p_B$ and an acceptance rate as $1 - F(s)$. The actual bad rate, which is the percentage of those accepted who are bad, is the following ration then:

$$Actual\,bad\,rate = \frac{(1-F(s|B))p_B}{1-F(s)}$$

Suppose that $L = 3\%$ and $D = 150\%$ from the premium, then $\dfrac{L}{D} = 0.02$ and out acceptance rate is 72%, $p_G = 0.912$ and $p_s = 0.088$. There is an example of the scorecard for which we calculated $Q = \dfrac{F(c|B)p_B}{F(c|G)p_G}$

c	650	600	550	500	450	400	350	300	250	200
$F(c/B)$	0,767	0,782	0,787	0,807	0,819	0,834	0,856	0,874	0,903	0,931
$F(c/G)$	0,152	0,159	0,167	0,173	0,182	0,197	0,224	0,254	0,307	0,369

Q	0,487	0,475	0,455	0,450	0,434	0,408	0,369	0,332	0,284	0,243

From this example we can see that for all c the value of Q is greater than $\dfrac{L}{D} = 0.02$, so the scoring and voting brings additional income to token holders.

Super Pool

The REGA Risk Sharing platform will provide Super Pool capacity for all crowdsurance products that fit the REGA risk management standard. The REGA Risk Sharing platform products could use Super pool service by transferring part of the member contributions to the REGA Super Pool. Usually, it will be about 10% of the contribution, but for some risky products the percentage can be much higher. The REGA experts will be responsible for REGA Super pool management and will use voting mechanism.

Transparency

To provide maximum openness and transparency to the society REGA Risk Sharing is operating as an open source project, where all financial transactions can be traced in public Ethereum Blockchain. Smart contracts involved in the project will be published on Github resource and might be reviewed by general public. Blockchain technology provides verifiable public record, that creates environment with no need for trust to third parties. Interaction time stamps created within Blockchain will become an inevitable record that can not be altered or deleted. The amount of crowdsurance pools in each category is open to everybody, as well as number of members on the platform.

● To Members

Our platform solution helps members in a user friendly interface overlook all attributes of risk coverage product. Risk Constructor will enable Customers to choose suitable parameters for risk coverage in a fun manner, while immediately calculating the member contribution, making the process easy and transparent. Helpful Dashboard enables to see contributions collected, amount of risk covered, dates of inception and expiration of the smart contract, types of risks within the smart contract. Social Network Bot will also remind member about approaching expiring date of smart contract.

● To Partners

REGA Risk Sharing will provide Partners with Open API to connect to the platform and get access to Customers. Personal blockchain accounts and transactional records will be created to monitor overall activity. Super Pool structure, created to cover substantial risks involved within the products, will give additional confidence of credibility of the platform to third parties. Compliance of business processes with legal environment in different jurisdiction is univocal for REGA Risk Sharing platform.

● To Tokenholders

We disclose all necessary information to Tokenholders and auditors to ensure clarity and accuracy of operation, including risk assessment. To ensure liquidity of REGA Risk Sharing token we create Smart contract in Ethereum, that will guarantee Tokenholders a buyout of their token at a certain price, with the calculations presented on the page 34 .

● To Regulators

We ensure regulators to comply with all necessary procedures including identification of platform members, working according to current jurisdiction legislation. Internal policies are designated to prevent and mitigate possible risks of the platform being involved in any kind of illegal activity. REGA Risk Sharing adopts risk-based approach to combat money laundering and terrorist financing. The principle is that resources should be directed in accordance with priorities so that the greatest risks receive the highest attention. Upon request of regulating authorities we disclose all information concerning the case, if that information can not be found in public blockchain.

Legal

Blockchain technology raises a lot of significant legal questions, the answers to which cannot be determined with the certainty in the abstract. Theoretically, DAO's are autonomous entities subsisting independently from any legal, moral or physical entity. However, coupling DAO with a real world legal entity would benefit from the efficiencies related to blockchain and cryptographic technologies. As Blockchain becomes more widely adopted, legislators, regulators and courts will have to turn their minds to fit associated technologies within existing regulatory framework. Some key legal issues, that should be solved include:

● Applicable law issues – as servers are decentralized and can be spread around the world, determining where a breach, failure or fraud occurred may be complex

● Decentralized autonomous organizations legal status as entities, when they will be facilitating commerce

● Liability side of decentralized autonomous organizations and their founders

● Legal validity of smart contracts

We will try to find the optimal solution to adopt the appropriate structure to legalize operations in Ethereum Blockchain within current legal framework. Possible solutions may include wrapping-up

contractual agreement in contractual terms, for example Master Supply Agreement, incorporated as prevailing terms for the linked DAO, or a split-contract could be used which incorporates elements of both of codified program and more traditional contracts. In respect to the status of the platform one of the possible options would be for contracting entities to simply adopt a free-to-use platform with an agreed code. However, at this stage the flexibility remains and we will definitely consult with professional legal advisors in jurisdictions, where common law in a more creative manner adapts to technological changes of modern time.

With all concerns nonetheless, it should be stated, that REGA Risk Sharing is not an insurance company, but developer and software as service provider for REGA platform and crowdsurance products. REGA Tokens are functional utility tokens acting as an Expert license on the platform and should not be considered securities. By contributing to REGA Token crowdsale, participants waive all rights for legal claims and all disputes and will be heard by REGA Team solely, making their decisions final and unchallengeable. REGA Tokens are non refundable and not for speculative investment. No promises of future performance or value, no continuing payments with respect to REGA Tokens is made. All proceeds received in the crowdsale should be considered pure donations and may be spend freely without any conditions. This document is intended solely for informational purposes and does not constitute an offer or solicitation to sell shares or securities.

REGA Tokens

REGA Risk Sharing platform will use smart token, based on Bancor protocol (Bancor) to provide funding to the project and to build the REGA Expert community.

TID	Name	Reserve	Description
RST	Risk Sharing Token	ETH	Platform and product expert licence

The Risk Sharing Tokens will be also acceptable as an investment in pools.

There are several adjustments to the Bancor smart token protocol that we have implemented for the REGA Tokens:

TID	Feature	Description
RST	PAY	Expert fee payment to token holders in cryptocurrency
RST	ADD	Increase token reserve in cryptocurrency

PAY

The pay method is used to pay expert fee to the token holders. Each token holder when buying tokens must provide a private account address that will be stored in the smart token contract with amount of tokens belonging to the given investor. The pay function accepts as a parameter an amount in cryptocurrency that must be transferred to all token holders in proportion with token balances. So, if amount is fee amount, tokens - number of tokens in the account and supply - is total amount of tokens then the amount of expert fee for given token holders will be - *amount * tokens / supply*. If the token holder is Smart Token contract then calculated amount will be paid to that token holders using the same formula.

ADD

This method is adding specified amount to the token reserve.

Crowdsale

We are going to use crowdsale mechanism for Risk Sharing Token (REGA Expert license) and then use part of issued RST tokens to provide reserve to Super Pool Token. As a result of crowdsale we will be able to achieve our goals based on provided road map (see Milestones).

Token price: 1 ETH = 10 RST
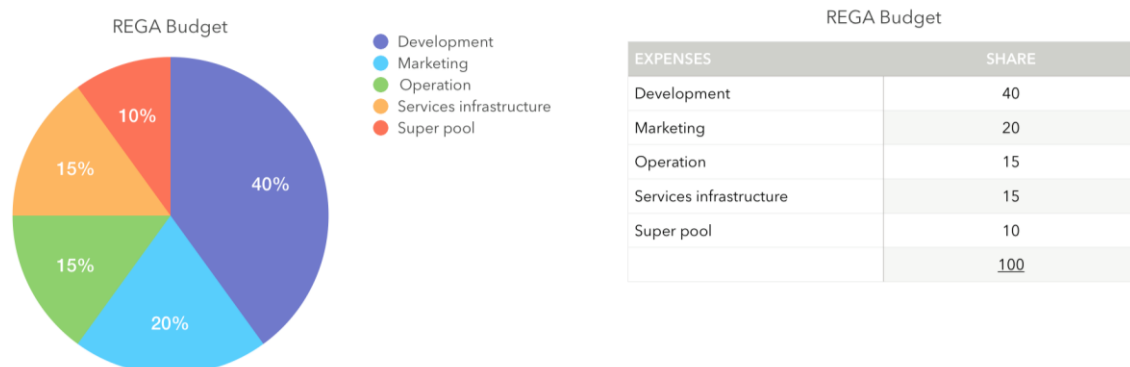Soft CAP: 10,000 ETH
Hard CAP: 10,000 ETH
Total Token Pool: 200,000
Sale Pool: 100,001

The following is the estimated funding allocation:

REGA Budget

EXPENSES	SHARE
Development	40
Marketing	20
Operation	15
Services infrastructure	15
Super pool	10
	100

RST Crowdsale Objectives

1   A portion of the funds raised will be used as the Ether reserve for RST (details on the CRR will be outlined in the crowdsale launch announcement), enabling continuous liquidity to Ether for any RST holder, as well as any holder of a smart token using RST as a reserve.

2   A portion of the funds will be used to develop, promote and support the open-sourced, blockchain based REGA Risk Sharing crowdsurance platform including the development of new scoring models using Machine Learning and Cognitive services

3   A portion of the funds will be used for development, promotion and support of crowdsurance products on the REGA Risk Sharing Platform

4   A portion of the funds will be used to provide the initial capital for the REGA Super Pool in terms of reserve for Super Pool Tokens.

5   A portion of the funds will be used to develop infrastructure of service providers on the platform to deliver non-financial service as well

6   A portion of the funds will be used for Compliance and Legal procedures, in order to operate worldwide

7   A portion of the funds will be saved for unforeseen costs

Token values and platform reliability

There are several ways how REGA Token will increase their value and platform reliability:

- The crowdsurance product on REGA Risk Sharing platform will pay the expert fee to the RST token holders by transferring 3% (subject to change by voting) from each contribution amount using the PAY method

- The crowdsurance product on REGA Risk Sharing platform will increase the RST reserve by transferring an amount that left after the deduction of the operation expenses from the product support fee using ADD method

- The REGA Super Pool will increase the RST reserve by transferring part of smart contract account balance in cryptocurrency by the end of each year   using ADD method

The REGA Risk Sharing token as the smart token can be exchanged at any time to the reserve cryptocurrency, which is Ether (ETH), using exchange rate presented on the page 34.

Development plan

REGA Team will use funds raised through the crowdsale of REGA Risk Sharing Tokens to develop the platform and various products, provide solutions for people around the globe using our innovative technology, according to provided development plan. Our main strategy for development will be to create community of developers to elaborate the platform tools together and achieve platform growth and expansion. We see crowdcoding as the most efficient way to work on such complex and innovative solutions. The growth of our expertise in platform development will help us to create more sophisticated financial products, covering more risks and creating more services for members. The more support we will receive from the community, the faster we will be able to develop new products and attract more 3rd party product developers and service providers.

REGA Development plan

#	Crowdsale targets	MINIMUM		AVERAGE		GOOD	
	Projects	10 000		25 000		75 000	
1	Expert Voting off-chain interface	2018	Q2	2018	Q2	2018	Q2
2	Member dashboard	2018	Q2	2018	Q2	2018	Q2
3	Accepting cryptocurrency and RST tokens as pool investment with KYC/ AML and scoring	2018	Q2	2018	Q2	2018	Q2
4	Baggage delay product for WW	2018	Q2	2018	Q2	2018	Q2
5	Pet product for US market	2018	Q3	2018	Q2	2018	Q2
6	Pet product for EU market	2018	Q4	2018	Q3	2018	Q2
7	Improve claim payment mechanism including cross-matching and scoring	2018	Q4	2018	Q3	2018	Q3
8	Gadget product for US market including accepting fiat currency and support for Apple devices	2019	Q1	2018	Q4	2018	Q4
9	Platform API Alfa	2019	Q1	2019	Q1	2018	Q4
10	Platform API Public Beta	2019	Q3	2019	Q2	2018	Q4
11	Gadget product for EU market including accepting fiat currency	2019	Q3	2019	Q1	2019	Q1
12	Parametric product support	2019	Q3	2019	Q3	2019	Q2
13	Platform API v 1.0	2020	Q1	2019	Q4	2019	Q2
14	Drone API Alfa	2020	Q2	2020	Q1	2019	Q3
15	Car product for US market including accepting fiat currency	2020	Q4	2020	Q2	2019	Q3
16	Product constructor Alfa	2020	Q4	2020	Q2	2019	Q4
17	Product constructor Public Bets	2020	Q4	2020	Q2	2019	Q4
18	Product constructor v 1.0	2021	Q1	2020	Q3	2020	Q1
19	Car product for EU market including accepting fiat currency			2020	Q3	2020	Q1
20	Property product for US market including accepting fiat currency			2020	Q4	2020	Q2
21	Property product for EU market including accepting fiat currency			2020	Q4	2020	Q2
22	Platform API v 2.0					2020	Q3
23	Product constructor v 2.0					2020	Q3
24	Drone Public Beta					2020	Q3
25	Drone API v 1.0					2020	Q4
26	Health product for US market						
27	Platform API v 3.0						
28	Product constructor v 3.0						

Marketing strategy

REGA marketing strategy consists of 3 levels:

1. **Concept marketing** – aimed at laying the ground for future crowdsurance products utilization by supporting and popularization shared economy concept and crowdsurance as its integral part

2. **Platform marketing** – aimed at building ecosystem around REGA platform and promoting it among crowdsurance products developers

3. **Product marketing** – aimed at promoting and expansion of owned and partner crowdsurance products on REGA platform

REGA marketing strategy canvas

Concept	○ REGA is a part of shared economy
	○ REGA is a catalyst of shared economy
Platform	○ REGA creates scalable ecosystem for crowdsurance devs
	○ REGA provides risk management "back-
Product	○ REGA sales affordable and easy to use risk management products
	○ REGA guarantees transparancy and

Concept marketing

Message: shared economy is becoming one of the main trends in WW economic landscape. This is the right and logical evolution of the market. Shared economy concept is at the heart of crowdsurance:

$$\text{insurance in shared economy} = \text{crowdsurance}$$

One of the main showstoppers for shared economy expansion – lack of security from potential risks for its members. Meaning that crowdsurance is not only the part of shared economy, but it's catalyst

Strategy: Support and evangelize crowdsurance philosophy together with shared economy successful companies and KOL adepts. Positioning REGA as blockchain and emerging technology expert

Target audience: millennials, innovators and early adopters, shared economy adepts

Channels: PR, events, digital with focus on educational content. Partnership with shared economy market participants, memorandums. Partnership with IT market leaders (joint PR, events)

Platform marketing

Message: REGA – scalable technological platform based on blockchain and off-chain infrastructure for crowdsurance devs

Strategy: Building scalable partner ecosystem

Target audience: insurtech & fintech devs, shared economy companies

Channels: partner recruitment and activation, focusing on education, technical support and co-marketing programs.

Product marketing

Message: REGA sales affordable and easy to use risk management products. REGA guarantees transparency and repayment obligations to its users.

Strategy: aggressive expansion on target markets thru digital channels and partnership programs. Cross-sell of associated products (e.g. 24/7 vet consultations for pet care crowdsurance). Competitive marketing (vs traditional insurance players).

Target audience: crowdsurance product users

According to roadmap first REGA product portfolio starts with Lexi Club. Main target audience - pet owners. Target markets - US, EU & UK

Channels:

1. Awareness: webinars, events (participating and organizing), blog, influencer outreach, articles in PR, relationship with universities and student communities, SMM (incl. dedicated forums), content creation (wiki etc). Community crowdsourcing (feedback and cusdev). Viral marketing.

2. Promotion: aggressive ad campaigns focused on cost, service rate and other advanteges in comparison with conventional insurance.

3. Co-marketing with partners

As a target markets, we are considering at first developed insurance market like US, UK, EU.

Crowdsurance is a brand new for people and we have to build some 'ecosystem' to wrap this unknown product. Under 'ecosystem' we mean set of services and co-products around main financial product. For instance, for Lexi Club we build some kind of one-stop service, where pet owner could make a lot of things via chat bot in instant messenger: to get online consultation from a vet, to book pet food or cat litter, to home visit of vet specialist etc. On other hand, we will push word of mouth through this ecosystem to engage new clients (loyalty program, discounts for member's friend etc).

Team

Sergei Sevriugin, CEO, 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, CTO, Founder. CTO of Bellwood Services company. 15+ years' experience in financial IT projects.

Roman Ischenko, Chief Architect, Founder. 15+ years of experience in financial IT projects, software architecture and development. Degree in math and applied math.

Sergey Kiselev, Business development and CMO, Founder. 10+ years of entrepreneurship in a different business areas including brokerage, insurance, entertainment. Management degree.

Leonid Morozovskii, CFO, 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.

Advisory board

Vince Chan, Founder and CEO of UnLearn, double MBA graduate from Yale and Chicago, U.S. CPA and CFA Charterholder, managed a $700 million global credit fund at TCW Asset Management in Los Angeles, worked at Deloitte & Touche, PricewaterhouseCoopers, Standard & Poor's, Hong Kong Monetary Authority and Goldman Sachs.

Igor Ryabenkiy, Managing Partner in AltaIr (one on the leading VC in Russia), serial entrepreneur and angel investor with over twenty years of successful executive and investment experience including Internet startups and IT companies. He has funded, developed, and exited a significant number of investment projects worldwide.

Hannes Shariputra Chopra, General Director of Sberbank Insurance (Affiliated company of Largest Russia Bank), Board of Advisors of AIESEC Russia, Member of the Supervisory Board of AIESEC International, Member of the World Economic Forum Global Agenda Council on Russia.

Glossary

Blockchain	Essential part of crowdsurance. "List of records, called blocks, which are linked and secured using cryptography" as Wiki says
Contribution	The amount of cryptocurrency invested by community member extend membership at REGA Platform.
Crowdsurance	Association of individuals in groups to share their risks managed by smart contracts. Compared to traditional insurance in crowdsurance there are no insurers, intermediaries and brokers, all the processes being controlled and managed by programs and algorithms. The essential part of crowdsurance is blockchain, cryptocurrency and other technologies.
Crowdsurance product	Software product based on crowdsurance rules and algorithms. This is a new type of financial products where community members unite their contributions for crowdsurance.
Fraud prevention	Measures to reduce level of fraud on the platform (see Fraud prevention part)
KYC, AML	Know your client and Anti-money laundering
Liquidation cost	Total amount of contributions for all members of the certain group inside the community
Member	User who made a first contribution to the crowdsurance community in such a way accepted REGA Platform terms and conditions. For every member REGA Platform creates Member smart contract.
Member contribution	see Contribution
Payment	Payment to the community member or to the service provider crowdsurance community makes in response to the payment request.
Payment request	Request from a member of the crowdsurance community to compensate expenses when case (event) happened described in crowdsurance product rules.
Platform	Software system running in cloud available as API and end-user interface for developers of crowdsurance products

Pool	In general definition - group of members, united by the certain attribute (e.g. age, scoring score etc). In platform architecture - the group of sub-pools
Product	Crowdsurance product developed for certain purpose
REGA Expert Community	RST holders
REGA Member	Crowdsurance community member
REGA Platform	Open-source software system for crowdsurance products
REGA risk management models	REGA Risk Management algorithm and its data
REGA Risk Sharing	Developer and SAAS (Software as service) provider for REGA Platform
REGA Risk Sharing platform	See PLATFORM
Risk calculations	Risk estimation based on object attributes
RST holder	Owner of Risk Sharing token
RST Risk Sharing Token	Token issued by REGA Risk Sharing
Running cost	Estimation for payments that will be made by the community for certain period of time in the future
Smart contract	Essential part of REGA Platform as a decentralized system. Self executed program which is a collection of code (its functions) and data (its state) that resides at a specific address on the Ethereum blockchain
Smart token	Smart Token is a new type of ERC20 compliant token that can be bought or sold at anytime through the smart contracts which govern them
Smart token contract	Smart contract for tokens
Sub-pool	The group of members aggregated by the risk level
Super pool	Smart contract that provides on-request support for Risk Sharing Community if the community does not have funds to provide support to member or to payback member contribution

Super pool	Top-level pool that covers risks for all products at REGA platform. Alternative of reinsurance on traditional insurance market. The group of all pools in the platform architecture.
System (software)	Stack of software developed by REGA and third-party technologies to create crowdsurance platform (REGA Platform)
Token holder	Owner of RST token

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