



Colibra

Democratic Insurance

(**CO**: “together”; **LIBRA**: “balance”, “justice”)

October 2018

Executive Summary

1. Abstract

Today trust in the insurance industry is at an all-time low. What's worse, fewer and fewer people are using it to mitigate the risks to their health, business and property. In order to change that, we need to change the business model of insurance itself.

That's why we are introducing the first Democratic Insurance company in the world - Colibra. Colibra is changing the way we handle risk and treat people when risk manifests.

Colibra is building an open crowdsourced platform on the blockchain for handling non-parametric insurance claims and the payments involved in a transparent, automated and autonomous way.

Our goals are to:

- Bring fairness to the industry by democratizing the claim handling process in order to eliminate the conflict of interest from the traditional insurance model
- Fix the legendary slowness of insurance claim payments by making them instant and autonomous
- Reinvent transparency by being the first insurance company, fully open about its solvency

Colibra's first domain is Travel insurance.

Table of contents



1. Abstract	1
2. Table of content	2
3. Introduction	3
4. Business case	5
5. Market	9
6. Solution	16
7. Crypto Economy	46
8. Roadmap	52
9. Token Sale	55
10. Team & Advisors	55
11. References	68

3. Introduction

3.1. Why We Exist

We believe insurance is a cornerstone of economy as it determines how our society handles risk and uncertainty. Sadly, by becoming increasingly profit-driven, insurance has lost its transparency and customer focus. We think decentralization can eliminate this inherent conflict of interest, breathing new life into the industry. Therefore, we've gathered top professionals and community members to make insurance work in a way that benefits everyone - fair, transparent and user-friendly.

For more details on Colibra's vision, see our [Democratic Insurance Manifesto](#)

3.2. What Is Colibra

Colibra is a new type of insurance company, based on the Ethereum Blockchain. It is building a platform for handling insurance claims in a democratic manner by combining crowdsourcing and blockchain with game, choice and voting theory. Colibra will underwrite its own insurance policies, starting with travel insurance. In addition, the company's actuarial reserves will be fully transparent 24/7, and claim payouts will be fully automated and autonomous.

3.3. How It Works

To get insured or submit a claim, clients use Colibra's simple and intuitive mobile app. Once all necessary documents are submitted, they are digitized. The claim handling is then crowdsourced on Colibra's platform where inde-

pendent claim handlers verify the validity of all documents. Finally, a crowd jury decides whether the claim is eligible for payout via a voting process, governed by smart contracts. Once the jury decides a claim is eligible, another smart contract instantly triggers a payment towards the client.

4. Business Case

Like every business, insurance has strategic challenges to address. While traditional insurers and industry consultants focus on profit-related problems like building distribution, reducing costs and maximizing ROI, Colibra takes a different approach. We believe that insurance companies need to be people-centric instead of profit-centric, which makes people-related problems much more pressing and crucial than profit maximization. We have hence taken the responsibility to address the key challenges that few experts talk about:

4.1. Key Challenge #1 - Lack Of Trust

A survey done by PwC in the UK found that there is a 73% distrust in insurance providers[1]. Surveys conducted by IBM[2] and the respected Edelman Trust Barometer[3] additionally support this alarming trend. The Edelman Trust Barometer states that “consumer trust in the industry is low because transparency is lacking – and has been for years.” According to those surveys, the main reasons for the clients’ skepticism towards insurers are:

- Personal experience dealing with insurance companies
- Transparency of price and terms / conditions

To put extra stress on the gravity of the problem, let’s look at a definition for “insurance company” in the crowdsourced Urban Dictionary[4]:

“An affiliation of pirate-gamblers who accept bets called premiums. The dollar amounts of the premiums are non-negotiable but the amounts of the claim settlements, should the company lose the bet, are rarely delivered

without argument."

4.2. Key Challenge #2 - Conflict Of Interest

Insurance companies are businesses - their job is to optimize profits for their shareholders. This explains why they are often reluctant to approve claim payouts to policyholders. While it is important to investigate a case in order to prevent insurance fraud, many insurance companies over-scrutinize claims, using the fine print in their policies to justify rejecting a payment. Few things are more frustrating to a policyholder than feeling both unfairly treated and powerless in the hands of a big, indifferent corporation.

The Morgan Stanley / BCG Global Consumer Survey[5] supports that by revealing that customer online satisfaction with insurers decreases along the value chain, with the lowest satisfaction seen at the claims stage, where the Net Promoter Score reaches the stunning minus 49. The main reason for this is precisely the conflict of interest - traditional insurance claim handling lacks transparency and fairness where they are most needed.

4.3. Key Challenge #3 - Slow Claim Payment

The typical settlement offer for a personal injury claim will usually have a policyholder wait for 14-28 days[6] from the date of settlement before they receive compensation.

The first part of the problem lies in simple economic reasoning - every additional day of keeping a policyholder's money yields an interest for the insurer. The second part stems from the outdated and centralized administration process. In a fast-paced world where time is money, no one deserves to wait

for weeks to get what's rightfully theirs.

4.4. Key Challenge #4 - Automated Payments in fiat currency

Autonomous payments are critical if insurance is to become fair. Several insurance companies currently claim they offer automated or autonomous claim payments. On its website, for instance, a major traditional insurer claims its flight insurance on the blockchain is 100% automated. Yet, no additional information is available to support this statement. Moreover, currently no smart contract can trigger payments in fiat money.

4.5. Key Challenge #5 - Risk Transfer

Even if autonomous payments were the norm, as of writing this whitepaper, no insurance company in the world provides autonomous claim payments that don't transfer the price & liquidity risks upon the claimant.

Example: Let's say you purchase a crop insurance policy in ETH. Later in the season an acid rain kills your harvest and your policy covers the whole amount of \$200,000 in its ETH equivalent. You automatically receive your compensation in a cryptocurrency. Before you can use it to buy new crops, however, you need to either exchange the cryptocurrency in fiat at market rates or place a limit sell order, fully embracing the price volatility.

Regardless of which option you choose, you still have to pay an exchange fee and bear the liquidity risk that can sometimes result in a lower average price for your cryptocurrency. Most policyholders are neither experienced in such financial transactions, nor eager to assume the price and liquidity risks upon

themselves. We at Colibra understand them.

4.6. Key Challenge #6 - Solvency Information

Despite the apparent government efforts to improve regulation, the risk of insurance companies being found insolvent will remain until their actuarial reserves are publicly visible. Since no steps are taken in this direction, we can expect regulatory organs to keep investigating past bankruptcies and bail-outs, rather than effectively prevent such future financial calamities.

Colibra firmly believes the time to regulate an insurance company for the way it manages its policyholders' money comes before the company experiences financial, debt-related and solvency problems, instead of after. The solution is simple and obvious - making all insurance company reserves public and open, 24/7. This way no fraudulent or miscalculated transaction can go through without the policyholders or regulators noticing.

5. Market

5.1. Overview

According to EY's "Global Insurance Trends Analysis 2018"[7], the world's insurance market in 2017 was worth \$4.8 trillion, which only comes to prove the amazing importance of insurance in our society.

The development of blockchain will surely influence all aspects of the business. We have already witnessed the birth of new insurance products and models - parametric insurance (Etherisc), peer-to-peer insurance (Teambrella, InsurePal), insurance data marketplaces (Insureum), etc. EY calls this new segment "Blockchain Insurance" and predicts that the increasing need for cost efficiency and improved trust will result in its growth from \$64 million in 2018 to \$1.4 billion by 2023.

However, even \$1.4 billion is just a drop in the ocean, when we're talking about a market worth nearly \$5 trillion. Insurance is still dominated entirely by two traditional, non-parametric and centralized insurance models - Stock and Mutual insurance.

So far, traditional insurance companies have used new technologies only to optimize costs and thus drive more profits for their shareholders. Meanwhile, blockchain insurance companies have used decentralization to build entirely new, mostly parametric insurance ecosystems.

To use a cross-industry metaphor, traditional insurers are using new technologies to build a more efficient fossil fuel car - faster and more profitable, yet still harmful to the environment. At the same time, blockchain insurance

startups are working on the first autonomous flying cars - perfect in theory, but difficult to scale in a complex and highly regulated environment.

At Colibra, we've taken a different approach. We believe that before we get to a future where cars fly autonomously, we first need to address the more pressing problem - pollution. To do that, we need to replace the notorious combustion engine with a cleaner alternative - an electric one, for example.

That engine in insurance is the claim handling process. That's where final decisions are made and where virtually all the conflict of interest originates. By fixing the thing that drives the entire insurance industry, we want to pave the way for the insurance model of the future - fair, transparent and autonomous.

5.2. Opportunity

We believe the democratization of the claim handling process hides the biggest market opportunity in the insurance business.

What's common between stock and mutual insurance companies is that their businesses are built around a highly centralized claim handling process. Blockchain finally makes the democratic governance of an insurance company possible. But instead of using decentralization to make incremental improvements - like building very niche parametric insurance products - we are going for structural change.

Colibra is using the well-oiled, super-efficient machine of traditional insurance, but is decentralizing the crucial claim handling process and making the company's solvency transparent. We like to think of Colibra as **the first Democratic Insurance company**. It is the right overlap between Stock,

Mutual and Blockchain insurance - simultaneously efficient and customer-centric, but also transparent and fair:

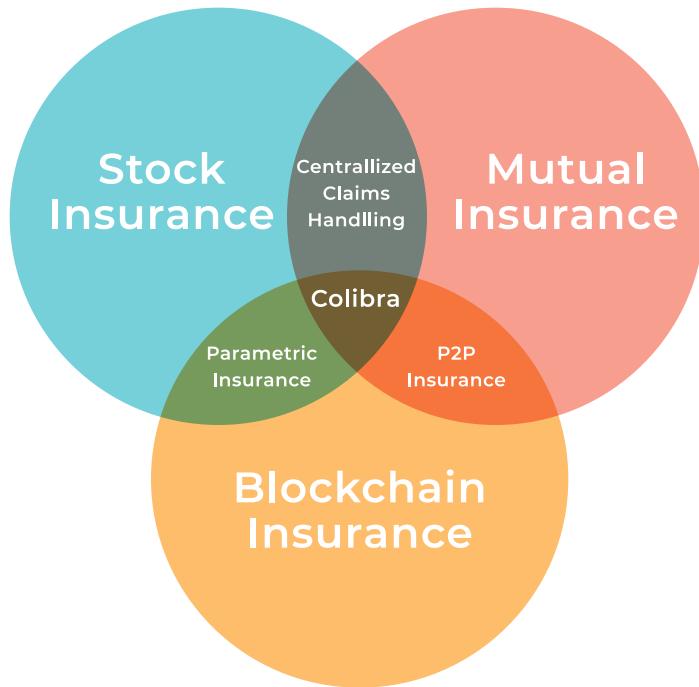


Fig.1 - Stock, Mutual & Blockchain insurance vs. Democratic insurance

Focusing on the underlying problem of centralized claim handling not only helps Colibra tackle the detrimental conflict of interest, but also allows us to directly compete with stock and mutual insurers for their global market shares in the \$4.8T market.

Colibra's first step in disrupting the insurance market is Travel insurance - still relatively small as a segment (\$22B), but steadily growing (\$28B expected by 2022)[8] and a perfect environment to test how our innovative ideas are perceived by the new generation. Our goal is to capture 1% of the Travel insurance market by 2022 (\$280 million in yearly premiums).

5.3. Approach

5.3.1. Competition

Traditional insurance companies have been trying to integrate blockchain, AI and parametric protocols, but only to simplify their business processes and optimize their costs. In other words, they are using those groundbreaking technologies merely as profit-drivers. No matter how efficient those companies get, they will remain highly centralized, hungry for profit and non-transparent. It's an approach that's aimed at optimizing the current system, instead of looking for ways to improve what's wrong about it.

Blockchain insurance companies, on the other hand, have used Blockchain on a much smaller scale - addressing smaller risks with niche products (crypto insurance, flight insurance, etc.) or creating alternative and fully decentralized markets for trading insurance risks (i.e. tokenized risk pools). Although promising, those methods could take decades to impact an industry as big and complex as insurance. Blockchain insurers are hence both missing on a piece of the huge existing market, and neglecting some of the major advantages of traditional insurance. Such advantages include the centralized business processes that boost efficiency, coordinate participant incentivization and promote responsibility, as well as the higher capitalization that allows better solvency, reduced policy prices and a larger network effect.

In other words, traditional insurers are fully centralized and are trying to slightly optimize the current system. Blockchain insurers, meanwhile, are fully decentralized and are trying to change everything about insurance, even what's working.

5.3.2. Colibra's Approach

At Colibra we have taken an approach that is more holistic. We believe decentralization and centralization can work together. We are taking advantage of all current benefits of traditional insurance, but decentralizing the most crucial part of it - the claim handling process.

Current insurance products are almost exclusively non-parametric, i.e. their claims require human involvement to settle. For this reason, Colibra will focus on non-parametric claims. This is where most of the volume, value and consumer pain in insurance presently come from. For claim handling to really work, we need it to be both public and fair, which is why Colibra focuses on bringing transparency into 3 key areas:

Claim decisions:

We use crowdsourcing to decentralize claim decisions, thus making them democratic

Claim payouts:

We use smart contracts and stablecoins to make claim payments autonomous and automated

Solvency:

We use oracles to make solvency and other important financial data public, 24/7

5.3.3. Colibra's USPs

To sum up everything we have outlined so far, here is what makes Colibra different:

The first Democratic Insurance company

What Colibra is building is a democratic claim handling process by crowdsourcing it on the blockchain. To do this, we need a large international market for business sustainability and plenty of claims to help fine-tune our algorithms, along with a claim process that is not so complex that it requires specific expertise from independent claim handlers. But most importantly, we need a process that can be effectively crowdsourced.

Open, crowdsourced claim handling

To service non-parametric claims, Colibra is building an open platform where claims are handled by an independent but certified community of Operators and Jurors. By using incentive-centered design and game theory, all claim decisions are made in a transparent and autonomous way.

Autonomous payments

Once the independent community decides that a claim is eligible for payout, a smart contract instantly and automatically triggers the payment towards the claimant.

Radical financial transparency

As soon as a new claim payout is triggered, Colibra's actuarial reserve and all relevant financial data is updated in real time on the blockchain. This ensures 24/7 transparency and guarantees that our insurance company is solvent.

Focus on user-friendliness and the new generation

The first market we want to enter is Travel Insurance - not only because of its size and expected growth, but also due to its popularity among the younger generation. This is an opportunity that lies unexplored, mainly due to its bad UX. Colibra uses a mobile-first approach, personalization, AI automation and gamification to make the whole insuring experience effortless and fun.

6. Solution

To sum up, all our efforts to democratize insurance will come down to how well Colibra's backend can integrate and balance blockchain, AI, game theory, payment autonomy, crowdsourcing, etc.

The following section explains the technical details of building Colibra's crowdsourced claim handling platform, the logic behind our app and its features, and the mechanisms that will keep us transparent and community-driven.

6.1. Process Overview

To understand how Colibra's platform works, let us follow the process flow of a typical insurance claim:

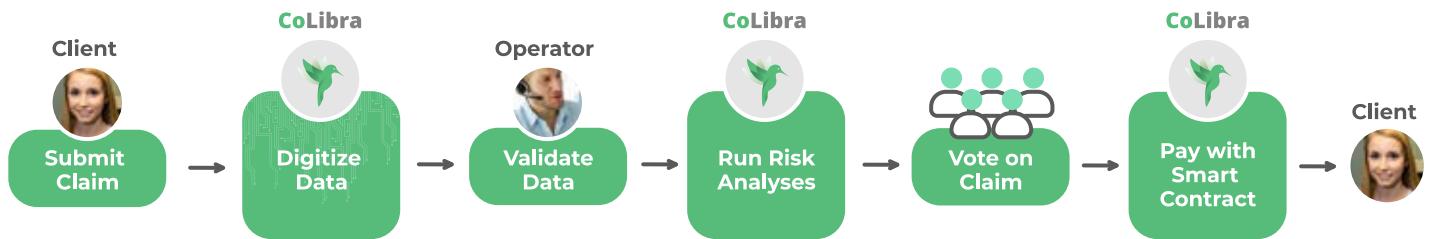


Fig.2 - Claim handling on Colibra's platform

Colibra's claim handling process includes the following steps:

- The client submits a claim in the Colibra app, providing document scans and a short video.
- Colibra digitizes the data, using OCR, and examines the video quality.
- An Operator organizes the information by pairing different data and

verifying claim validity with the institution (hospital, police station, hotel, etc.). The verified data is automatically transcribed.

- Colibra's AI uses machine learning to analyze the risk of this data being fraudulent. Video analytics pinpoint the high-risk areas in the video.
- The claim is then sent to a crowd jury for voting. Jurors use the platform to vote on the validity of the claim, based on the information supplied by the Operator and the AI, the policy data on the blockchain and all the supporting documentation provided by the client.
- A smart contract acts upon the outcome of the vote and initiates a claim payout instantly, if the vote has been approved.
- The client instantly receives their money inside the Colibra app.

All of these steps have the single goal of bringing transparency and fairness into claim handling. Since the core innovation we are working on is the democratic model of handling insurance claims, we need to dive deeper into the way Colibra's crowdsourced claim handling platform operates.

There are two key points of difference between Colibra's claim handling and the way traditional insurance companies handle claims:

- In traditional insurance claims are handled centrally by a team of company employees, sometimes even by a single employee. This lays the foundation for errors and conflict of interest. In contrast, Colibra **completely crowdsources this process** to multiple independent Operators and Jurors on the claim handling platform. Using the blockchain in this way finally makes the engine of insurance transparent and fair.

- Traditional insurers have the final say in whether they pay a claim or not. This is perhaps the biggest flaw of their business model. Smart contracts make sure Colibra does not have the last word. Whenever the jury votes a claim is eligible for payment, **a smart contract automatically transfers money** from Colibra's reserve into the policyholder's wallet.

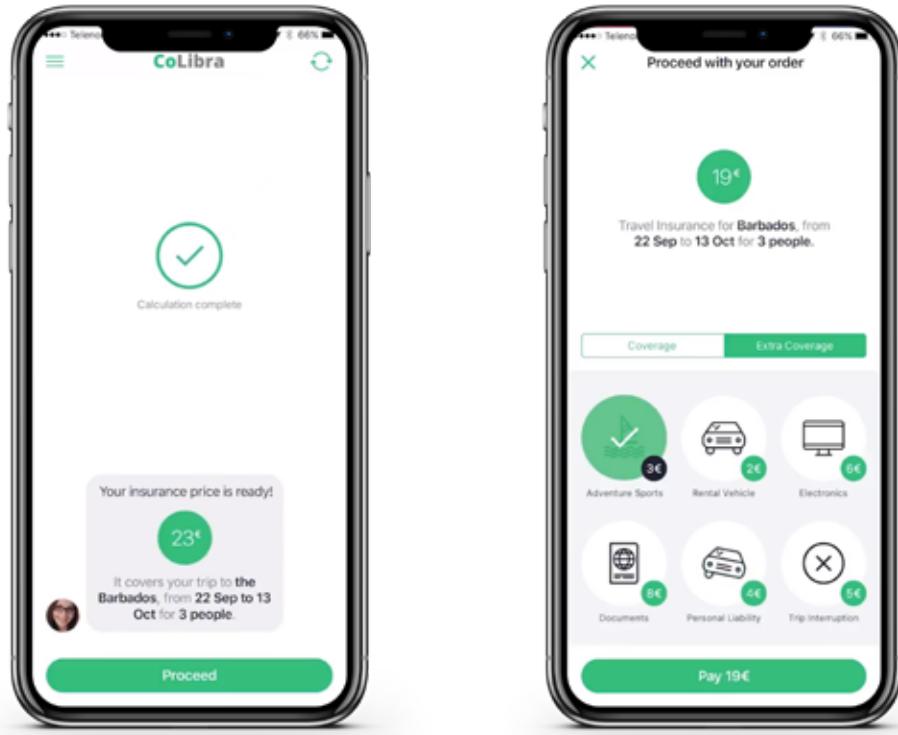
To further elaborate on each step of the claim handling, we will go through the process of submitting and evaluating a claim. Let's delve into the details of the voting process, its economics and how we plan to handle specific corner cases and outliers.

6.2. Getting Insured

As we saw in the surveys conducted by PwC, IBM and the Edelman Trust Barometer, one of the big problems of insurance is the cumbersome and impersonal user experience. Insurance UX is outdated - impersonal, bureaucratic and slow in both policy activation and claim handling.

To change this, we are taking a mobile-first approach, building an app that allows users to personalize their policies, get instant coverage, pay effortlessly (in fiat & crypto) and submit a claim in just a few minutes.

With Colibra getting insured will require less than a minute and will be as easy as chatting with a friend. All it takes for the policy to be activated is a few taps on your mobile phone to answer a set of predefined questions by Colibra's conversational AI. In the case of Travel insurance, those would include destination, dates, number of people traveling, coverage options, etc.



6.3. Claim Submission

Colibra is different from both traditional and blockchain insurers in every step of the claim handling process. The first key function of Colibra's app is to allow the submission of all the necessary claim information. The user will use the application to scan documents with their camera, attach additional files and record a guided video. The video will be based on a set of questions, similar to those used by insurance companies in their paper forms.

Travel insurance, Colibra's first domain, deals with two major categories of claims, depending on the type of handling they require:

Manual Handling

Cases that require manual evaluation by a human, due to the high number of variables and the potential significance of their outcome

Health Insurance

This case type is central to travel insurance. It is where most of our efforts are focused, as health issues can have a disproportionately large financial and emotional impact on our customers.

Theft Insurance

Likewise, cases of theft require manual work and evaluation to confirm and handle. As with health issues, they can prove emotionally and financially expensive to our clients and are thus handled with utmost care.

6.4. Data Digitization

Upon successful submission of the necessary claim information, Colibra's platform performs a quality check of the data provided. It is important to ensure that all documents, bills videos are of sufficient quality to be further processed.

Next comes the digitization of all data. Scanned documents are sent to an external OCR service, which digitalizes the information in a few consecutive steps. At first, the OCR will simply return the text in electronic form, which will then be paired manually by an Operator. As the volume of documents

increases, Colibra's internal OCR system will learn to pair most of the data on its own. This will reduce the margin of error and the workload of Operators at this stage of the process to simply checking for empty pairs and quickly comparing the digital data with the actual scanned documents.

Increasingly digitizing claim data is a vital part of achieving long-term economy of scale and automating the remaining claim handling steps. To do this, we plan to focus our efforts on teaching the OCR service to recognize and process different documents and data types, thus delivering structured output. This would extremely decrease the time Operators need to handle a claim.

Finally, our team aims to build an Electronic Data Interchange (EDI) service that allows us to directly communicate with hospitals and other institutions, starting with those that handle the highest volume of Colibra cases. This way our platform can easily gather validated data directly from the institution, further decreasing handling time and possible errors.

6.5 Data Validation & Security

6.5.1 Operators' Claim Handling

After the data has been digitized, it needs to be organized and standardized, and then pass certain checks (e.g. document validation with the institution). This requires a human Operator to work on the claim. Having a properly handled claim is one of the most important parts of the process, as it's a prerequisite for the informed voting of our Jurors.

The platform randomly pings local, language-proficient Operators that are currently active. The way this randomness principle works on the blockchain is further explained in section 6.6.1. Each Operator has 60 seconds to react to a claim invitation before the next one is pinged. The first user to respond is assigned to the case. For optimum results, each claim is handled by a single Operator.

The Operator needs to perform the following actions:

- **Double-check documents** - on rare occasions, the Operator may request an additional document from the claimant or a better scan of a specific document. Most of the times, however, Colibra's frontend application & OCR will make this unnecessary.
- **Validate data with the Institution** (hospital, airport, police, hotel, etc.)
- for a claim to be valid, Colibra requires the case, diagnosis, amounts and payment status of all expenses to be confirmed. Some documents (MRI scans, etc.) cannot be obtained directly by the claimant, so the Operator takes care of obtaining them.
- **Organize case data** - Certain key data from each case needs to be manually entered into a form on Colibra's platform in order for our AI to perform the subsequent in-depth risk analysis of the claim. In the future, organizing case data will gradually automate due to the improvements in our OCR solution. The reason for gathering and storing structured claim information is to enhance the Big data that allows our AI to act smarter with each new claim. This improves the platform's per-

formance and makes it cheaper for Colibra to detect fraud, which in turn allows us to distribute more resources towards further product development.

When the Operator is done with handling the claim, they mark it 'ready', which forwards it to the next step of the process - the AI risk analysis we mentioned.

Every Operator is financially rewarded for organizing and verifying the validity of a claim, as well as rated by Jurors for the quality of their work. Doing a good job results in more claim invitations in the future. Inversely, repeated underperformance in claim preparation decreases the Operator's rating and prevents them from working on future cases.

6.5.2 Encryption & Decentralized Data Storage On IPFS

Since we are discussing the distribution of medical data over the internet, it is important to explain how this sensitive information will be stored, distributed and encrypted. A decentralized application consists of three building blocks - smart contracts, decentralized storage and cryptography. At Colibra we are going to leverage all three of them. Each of those elements plays an essential role in guaranteeing the security of the whole system.

Smart contracts validate the logic behind Colibra's platform and its participants' actions by making things transparent and thus easily traceable. The decentralized storage is the place where our data is stored, keeping blockchain's important promises - full transparency and no data

censorship. Our cryptography consists of the mathematical models we use to encrypt and decrypt data, i.e. to hide sensitive data or sign it.

Data storage

The current defacto standard for decentralized storage is called IPFS (InterPlanetary File System). IPFS is a peer-to-peer distributed file system that connects and syncs all devices / nodes within a network with the same information. It produces a unique, verifiable and immutable link to this shared information. Colibra plans to store medical and other sensitive data on the IPFS and use the links mentioned above to guarantee the immutability of its smart contracts. To ensure maximum security, we are going to use clusters of IPFS nodes, instead of single nodes.

Cryptography

Our platform counts on both symmetrical and asymmetrical encryption in different cases, depending on security requirements:

- **Symmetrical cryptography** - used to secure Colibra's app and its Crowdsourced claim handling platform on the customer's mobile phone. Symmetrical encryption uses a secret key, which can be a number, a word, or just a string of random letters - similar to locking the information with a password.
- **Asymmetrical cryptography** - used to secure strictly sensitive medical data. Asymmetrical cryptography is a method of encrypting data, based on two keys - one for encryption and one for decryption. The decryption key is known as a private key and only the claimant has it. Colibra uses the wallet of the claimant in order to encrypt the sensitive data in a way that only Operators and Jurors can decrypt it when necessary. The

encrypted data is saved on the IPFS.

- **Hybrid cryptography** - used to achieve an even higher level of security. It incorporates a combination of asymmetric and symmetric encryption to benefit from the strengths of both methods. The public and private keys of all involved parties are fully secured, allowing higher decentralization and lower encryption costs.

Key distribution

Data encryption and decryption use the help of the public and private keys of the claimant's wallet. Read more about them in the part of section 6.8, dedicated to Colibra's smart contracts.

User data on Colibra's platform is encrypted symmetrically with a random 32-bit password. The password is then encrypted asymmetrically with the backend wallet's public (encryption) key, which can be read freely. Although the public key of the backend wallet can be read in plain text, the data encrypted with it can only be decrypted with the corresponding private key. This ensures that the app's backend can read the data and thereby share the decrypted documents with all necessary authorities and voters. To do that, the backend decrypts the password with its private key, and then encrypts it with the public key of the user / organization that needs to read the data.

6.6 Risk Analysis (AI & Video Analysis)

In order to speed up the claim handling process and increase decision-making quality, our software will analyze information and try to highlight areas with high risk of fraud. Colibra's risk analysis generally falls within two categories: Document Fraud Analysis and Video Deception Detection.

6.6.1. Document Fraud Analysis

Once all data has been digitized and validated by an Operator, Colibra's software analyzes it and assigns it with a low, medium or high-risk rating. The main types of documents we need to inspect in Travel insurance are:

- **Hospital Bills** - Hospital and other bills are parsed into separate items (e.g. X-rays, examinations, MRIs, etc). Each item's cost is compared to local cost averages, first with similar cases at the same hospital, then with similar cases at other hospitals in the city / area / country. Each item on the bill is also assigned a risk indicator. Colibra's platform will use Google and other APIs to stay up-to-date with hospital ratings and prices. This guarantees that higher prices at reliable hospitals, for example, will not be considered so risky.
- **Hospital Choice** - Each claim will have a map, indicating the hospital where the treatment occurred and all nearby hospitals. Each hospital on the map is rated, based on the distance from the incident, price-range, online quality rating, etc. This would allow the AI to assess the risk involved in choosing this institution. Smaller, lower-rated and more expensive hospitals will naturally be associated with higher risk of fraud.

6.6.2. Video Deception Detection

What's new about Colibra's fraud prevention is the use of AI to analyze the videos, submitted by claimants, allowing the app to detect potential deception much more easily. This makes Colibra much faster and more efficient in handling claims. Traditional insurance companies can take weeks to investigate the circumstances around a claim.

To alleviate Jurors in their work, Colibra first asks the claimant a few typical baseline questions and then proceeds with the standard claim-related questions. Based on the claimant's baseline responses, the AI pinpoints specific moments in the claim-related answers. Those moments in the video that seriously deviate from the baseline levels are highlighted, so that Jurors can pay closer attention to them before voting.

To recognize such deviations, our AI considers factors such as vocal patterns, microexpressions, pauses, facial blood flow & temperature, etc. As new as this technology might be, it's already helping businesses and governments around the world save valuable time and efforts by detecting deception attempts. We at Colibra believe insurance needs to be fair for everyone and find this innovation a major step in this direction.

6.7. Crowd Jury

The heart of Colibra's solution lies within its open platform for crowdsourced claim handling, governed by smart contracts. This approach is based on extensive research[11],[12], which shows that crowdsourcing complex work is not only possible but leads to better long-term results.

Another way to look at Colibra's platform is as **a marketplace for claim-processing insurance tasks that require human judgement**. This makes it especially useful in resolving non-parametric claims. To give you the full picture, let's look into the details of how crowdsourced claim handling works on the platform:

6.7.1. Crowd Jury

Like Operators, Jurors are also independent actors and not employees of Colibra. They are validated and trained by Colibra but their reward system is fully autonomous - Jurors are incentivized by us and the community to evaluate claims in a fair and transparent way. Every Juror is also required to stake a certain amount of tokens before voting, to guarantee they will act in a professional manner. More on how this mechanism works will follow in the next sections.

Our goal is to align the Jurors' interests with those of all other stakeholders on the platform - claimants, token holders, investors, employees, Operators, etc. To make sure this is always the case, we need the platform to be self-regulating. We therefore combine game, choice and voting theory to create a mix of incentives and disincentives that promote good work and penalize fraud attempts among Jurors.

Unlike traditional insurers, Colibra wants to guarantee that all valid claims are paid out. Maintaining the highest professionalism among Jurors - the platform's decision makers - will both allow our prices to stay affordable for future customers, and make sure current customers get the fair treatment they deserve for trusting us.

To ensure Jurors will do an excellent job, we have used the following methods:

- **Validation** - Upon registration on the platform, Jurors are required to have their ID scanned and to consent to a terms-of-service form. This

form is essential, as Jurors have access to sensitive data - personal, as well as medical.

- **Rating** - After successfully passing an online exam, Operators and Jurors receive a Human Operators Rating (HOR), serving as a measure of reputation within the platform. This rating is stored on the blockchain and increases or decreases, depending on their performance.

- **Training** - In order for a Juror / Operator to be considered part of a claim's pool of handlers, they first need to have completed all relevant trainings. Here are the two types of trainings, required for different claim cases:

Basic training - Each language has a basic insurance training that guarantees the essential understanding of the logic of insurance. This training has 3 important objectives in mind:

- Validating language proficiency on insurance matters
- Making sure users understand the business logic of insurance
- Aligning users with Colibra's values - justice, fairness and transparency

Colibra's basic training enables Jurors to evaluate certain basic claims, most of them revolving around theft.

Medical training - In order for Jurors to evaluate medical claims, they need to pass a specially designed medical training for each language that they intend to work in. This training has two additional goals:

- Validating language proficiency on medical matters
- Informing users about the implications of handling sensitive data

• **Levels** - Each Juror has a personal HOR rating and depending on this rating, they qualify for a certain level within the platform. HOR ratings and levels are important instruments for Colibra to segment claim handlers based on their reputation and reliability, before assigning them with specific tasks. Here is how different HOR ranges and platform levels are interrelated:

HOR Range	<60	60-70	70-80	80-90	90-100
Level	0	1	2	3	4
Claim Exposure	N/A	<\$1000	\$1000-10 000	\$10 000+	

Newly created accounts automatically start at 70 HOR. This gives them the chance to take on more interesting cases, while keeping them very careful not to make mistakes.

The initial HOR of 70-80 corresponds to Level 2 on Colibra's claim handling platform. Being downgraded to Level 1 (60-70 HOR) decreases the trust in a Juror and thus limits their participation in future cases. Going below 60 HOR prevents a Juror from further voting, essentially making their role obsolete. In other words, Jurors will not be given many chances to be negligent. It is important to build a system that does not tolerate mistakes, as they can be quite costly for both the platform and claimants. Colibra pings available local Jurors, starting from the highest-rated, until the necessary number of Jurors is assigned to the case.

- **Randomness** - In order to prevent fraudulent behavior, Colibra proactively discourages Jurors from cooperating between each other to possibly influence a vote. To make this happen, a randomness factor is introduced to voting invitations in order to filter out part of the eligible Jurors on the case.

This factor, known as “X-randomness” on the blockchain, is something we have custom-developed to enhance our platform. Its algorithms are based on mathematical operations that generate numbers, unpredictable for both Colibra and Jurors.

- **Generating jury pools** - Whenever a claim is opened, the system creates a pool of all the Jurors that are proficient in that language (e.g. 50 German-speaking Jurors). Next, case-specific filters are added (e.g. 37 of those 50 Jurors have passed Colibra’s medical training). Further filters then apply, based on claim exposure (e.g. 27 of those 37 Jurors are Level 3+, allowing them to vote on a claim of \$15 000). Finally, our randomness algorithm excludes some of those 27 qualified Jurors and offers the claim to the remaining (e.g. 15 of those 27). Those 15 Jurors receive a notification in their Colibra apps that they have a new claim to vote on. The first 7 to respond are the ones assigned to the claim.

In the rare cases where we cannot successfully gather 7 Jurors out of a pool of 15, the platform starts pinging those Jurors that were eligible but randomly left out, until 7 Jurors are found and the claim has been handled successfully. If we still struggle locating the necessary number of Jurors, we will slowly begin to increase the amount a Juror would get rewarded to vote on this claim (similar to Uber).

6.7.2. Jury Size

According to the Condorcet's jury theorem[9], the more people a jury consists of, the higher the chance to identify the right outcome of a claim. Following the theorem's logic, the probability for a Juror to be right is greater than 50%, as even a random vote has a 50:50 chance of making a correct decision.

Example: Statistically, a jury of 3 people with 80% success rate each would end up correct almost 90% of the times. However, Colibra uses more than just 3 members to form a jury. Based on a study by Nagel & Neef[10], the risk of convicting an innocent person drops as the size of the jury decreases. Conversely, the risk of not convicting a guilty person grows as the size of the jury increases. Nagel and Neef claim that the best jury size to limit both risks would be a function of those two types of errors, weighing the first error as 10 times more significant than the second one.

Based on those calculations, they conclude that the optimal jury size would be 6-8 members. To avoid the need for a tie-breaking rule, Colibra will work with odd-numbered jury sizes, using 7 members as our starting point. As we gather more information on our platform, we will continually reevaluate this number.

6.7.3. Voting

Once the Operator has collected all the necessary information and enough qualified Jurors have responded to the open claim, the voting process begins. Based on section 6.6.1., the jury is selected to match two criteria:

- Financial exposure of the claim
- Juror's HOR, location & case-specific expertise

To participate in voting, Jurors stake a certain amount of tokens, which in turn increases the reward pool of the claim. The newly-formed jury first reads carefully through all the case's documents and decides on the quality of the Operator's work. The voting then starts. All jury members have a pre-defined time to vote and only two options - YES/NO, meaning they either approve or reject the claim. To reduce the risk of having an unfair vote, Colibra's claims are only decided with the so called "supermajority". This means that more than 1 point of difference is necessary for a vote to be valid. In our example, at least 5 of the 7 Jurors need to vote alike. Should the votes be split 4 to 3, the platform invites 2 more Jurors from the eligible pool. If those 2 new Jurors vote unanimously, the claim is settled. If not, another 2 jury members are invited, etc. For practical and financial reasons, the maximum jury size will be 15 members - even if the decision is made with a simple majority (8 to 7), instead of a supermajority (9 to 6).

Here is a simple chart that visualizes what happens with each new positive vote on a basic case that involves 7 jury members:

0 YES votes	1 YES votes	2 YES votes	3 YES votes	4 YES votes	5 YES votes	6 YES votes	7 YES votes
Reject Claim	Reject Claim	Reject Claim	Invite 2 Jurors	Invite 2 Jurors	Approve Claim	Approve Claim	Approve Claim

Fig.3 - Correlation between the number of YES votes and the voting outcome

6.7.4. Voting Outcomes

6.7.4.1. Jurors

Depending on the outcome of the vote, each Juror is either rewarded or penalized. Rewards and penalties work as incentives and disincentives, respectively, ensuring Jurors have “skin in the game”.

The following section explains the different voting outcomes and how our process works to align the interests of Jurors with the main interest of Colibra’s platform - justice:

Rewards

When Jurors vote on the side of the majority, they receive:

- A fixed amount to compensate their work - around \$10 in tokens per person
- An even share of the tokens collected by the Jurors that voted with the minority
- The tokens they have staked themselves
- Early adopters get an additional token reward from Colibra’s Network growth pool

Jurors that vote on the side of the minority are not rewarded for their participation and lose the tokens they have staked. This penalty aims to promote attention and responsibility among Jurors. To make things fair, both Jurors and Operators have the opportunity to read the case before accepting it, so that they're aware of the risks of taking part.

For further information on staking, see “Fraud prevention” below. Rewards

When Jurors vote on the side of the majority, they receive:

- A fixed amount to compensate their work - around \$10 in tokens per person
- An even share of the tokens collected by the Jurors that voted with the minority
- The tokens they have staked themselves
- Early adopters get an additional token reward from Colibra’s Network growth pool

Jurors that vote on the side of the minority are not rewarded for their participation and lose the tokens they have staked. This penalty aims to promote attention and responsibility among Jurors. To make things fair, both Jurors and Operators have the opportunity to read the case before accepting it, so that they're aware of the risks of taking part.

For further information on staking, see “Fraud prevention” below.

Rating

Voting also has effects on Jurors' ratings and their respective levels within the platform. For voting with the majority, a Juror receives 0.5 HOR. This means they need 20 votes on the side of the majority to raise a level. When they vote with the minority, Jurors get their HOR decreased by 10 points, effectively denoting them a whole level. To be invited to vote on more claims, all Jurors would thus strive to both keep their current HOR and move up the ladder. The reason to make penalties asymmetrically heavier than rewards is to increase the quality of voting and to quickly filter users that are not suitable for this job. Our customer's claims are very important to us and Colibra will have very little tolerance for careless voting.

Fraud prevention

Fraud is a central problem for insurance as it wastes valuable efforts and time, thus driving prices up. According to unofficial industry data, between 2 and 5% of all cases in traditional insurance are fraudulent. An important challenge for Colibra would be to bring this percentage as low as possible. We will therefore make sure that the platform highly disincentivizes "approve-only" voting among Jurors, which we expect to be one of the most frequent methods of system abuse.

To this end, we have devised the following methods:

- **Fake fraudulent cases** - Our platform and community will internally generate fake cases to keep Jurors vigilant for all types of fraudulent behavior. This also prevents them from voting YES on all claims, which theoretically increases their chances of being on the side of the majority. We intend to use fake cases to artificially bring fraudulent claims as

high as 15% of all cases - this way Jurors won't be able to relax or become complacent.

- **Staking** - Once a Juror begins to evaluate a claim, leaving the claim unfinished would cost them their staked tokens as a penalty. This aims to discourage Jurors from opening cases and leaving them, should they prove harder to vote on. Furthermore, upon casting their actual votes, Jurors also risk losing their staked tokens. The amount of the stake depends on the potential gain. For instance, if the reward is \$10, the voter would need to stake the equivalent amount in tokens.
- **Deposit** - In order to vote on Colibra's platform, Jurors will also need to deposit \$30 in tokens. Every time a Juror votes with the minority, they lose this deposit along with their stake. Deposits are meant to further discourage "approve-only" behavior.

6.7.4.2. Operators

As we mentioned before, Operators are key to data standardization and validation. They prepare and shape the raw digital data and verify the claim with the relevant institutions. For those reasons, their work being excellent is central to Colibra's claim handling process.

Rewards

Due to the sheer amount of time and efforts Operators need to invest in organizing a case, they receive a reward up to 3 times as big as what Jurors receive (around \$30 in tokens). However, their performance is under strict

supervision and is rated by every Juror on a scale from 1 to 10 after each claim they handle. Here is how the average score given by all Jurors affects an Operator's reward for that claim:

8-10: Operator receives the whole amount of \$30

7: Operator receives \$20

6: Operator receives \$10

5: Operator receives no reward

Below 5: Operator loses their deposit as a penalty (see Staking below)

Rating

To guarantee that each claim case is well prepared and complete, the platform favors the Operators with the highest ratings in the area. Here is how the Jurors' average vote on the quality of the claim handling affect the Operator's rating:

8-10: Operator receives 1 additional HOR

7: Operator receives 0 HOR

6: Operator loses 2 HOR

5: Operator loses 4 HOR

Below 5 - Operator loses 10 HOR

Staking

In order for Operators to maintain a high level of engagement and high quality of work, they are also required to stake a predefined amount of tokens. Their stake matches the potential reward of \$30, equivalent in tokens. Like Jurors, Operators also need to place a \$30 deposit in tokens to be able to work on a claim.

If the Jurors rate the Operator's work with an average score below 5, this is considered a case-preparation failure and results in the Operator losing both their staked tokens and their deposit. Those tokens are used to fund a new case preparation by a different Operator, if necessary.

6.8. Disputes

As in all voting mechanisms, there are times when different parties disagree with each other and want to challenge the voting decision. This is why every party on the platform has the right to open a formal dispute and request a new vote on the case. This way we are making sure every Operator, Juror or claimant has a way to react when they feel they've been treated unfairly.

In order to open a dispute, one needs to pay an amount of tokens that corresponds to Colibra's expenses to run an entire new claim on the platform. Those expenses include the Jurors' rewards ($7 \times 10 = \$70$) + the Operator's reward (\$30) + the GAS cost for using the standard smart contract (~ \$4) + the increased GAS cost for complex cases, which includes disputes (another ~ \$4). In other words, every user has to pay around \$108 to open a dispute. If the dispute is approved, however, the stakes, deposits and rewards of the Jurors who voted with the majority in the first case are used to compensate the user who opened the dispute. Further details are provided below.

This mechanism resembles the way the American judicial system works, where claimants pay for all court case expenses, if the dispute they raise proves unwarranted. In Colibra's case, this covers the transaction costs to review the case, form a new jury, pay for blockchain GAS expenses, etc. In the meantime, the substantial investment of \$108 ensures that disputes are well thought-over before filed - we don't want constant disputes slowing down

the platform. Each dispute can be submitted within 12 hours of the previous decision, which matches the holding period for staked amounts.

When a dispute is opened, the case is sent to a new set of Jurors of higher levels and ratings. Those Jurors are not able to tell this case is any different from standard cases. Based on their vote, the decision of the previous claim can be reverted, along with all monetary perks (stakes, deposits, rewards). However, only payments made to platform users are revertible. Clients get to keep everything they have been paid - this way, we make sure that internal disputes won't affect the experience of Colibra's clients. All sides agree the superior jury's vote is final.

Below is a simple example that illustrates the implications of a dispute for all participants.

Let's assume we have a typical case, where the votes in the 7-member jury are split 5 to 2. A Juror from the minority (one of those 2) feels the case has not been resolved fairly and opens a dispute, challenging the initial vote.

To cover all costs that the new case involves, the user who opened the dispute pays \$108. As mentioned, this includes the rewards of the new Operator (\$30), the Jurors' rewards ($7 \times 10 = \$70$), as well as the standard claim + dispute GAS costs ($4 + 4 = \$8$).

After the new costs have been covered, we have two possible scenarios:

Scenario 1: Dispute gets approved

Step 1:

Jurors who voted with the majority in the first case return their rewards (5×10

= \$50), as well as the deposits of the Jurors in the minority, which they have split ($2 \times 30 = \$60$) and have their own deposits gathered ($5 \times 30 = \$150$). This means the dispute reward pool amounts to a total of \$260.

Step 2:

The other Juror in the minority in the first case is compensated, having their original stake and deposit refunded ($10 + 30 = \$40$) and being rewarded \$10 for voting on the side of justice in that first case. The dispute reward pool now contains $260 - (10 + 30 + 10) = \$210$

Step 3:

The Juror who opened the dispute receives the entire remaining reward pool of \$210.

Scenario 2: Dispute gets rejected

The case is considered closed and no further disputes are allowed. Rewards paid after the first voting decision are considered final.

6.9. Blockchain Process

The following section explains how the blockchain allows Colibra's claim handling platform to deliver an effective solution to the problems of insurance.

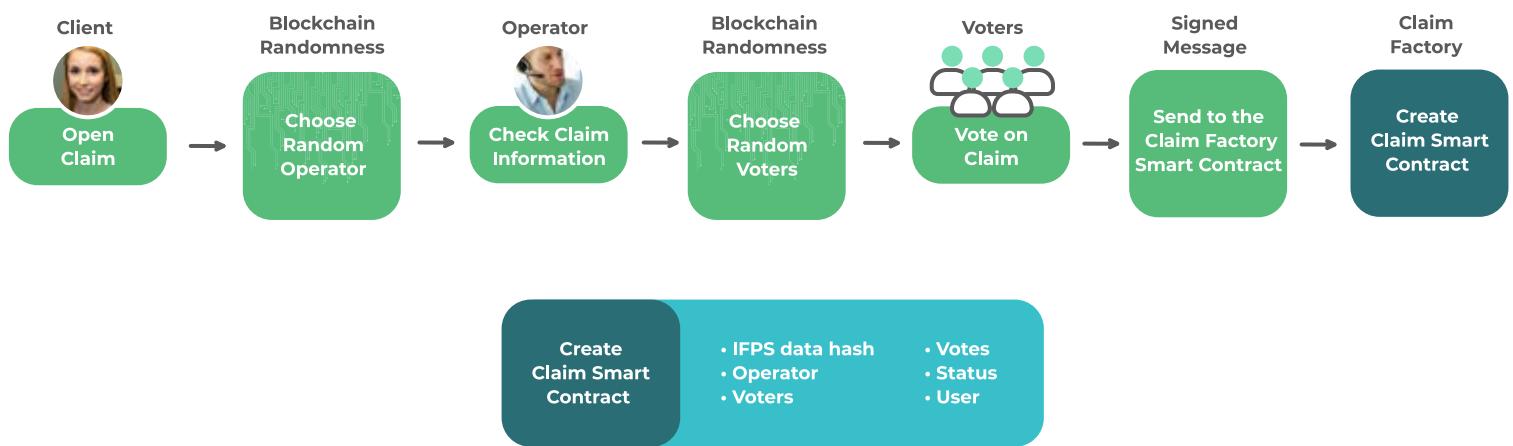
6.9.1. Data transfer

When a client wants to open a claim, they are prompted to upload all relevant documents. The data is encrypted and saved on an IPFS node. An Operator is chosen, who then forwards the information to voters via a transaction message on the blockchain. This message is signed by both the claimant and the Operator, and contains all data provided by the claimant. This is the way we prove that this specific person wants to execute this specific action.

Every Juror submits their vote through a message that carries their signature. After a decision is made, the signed message is updated with the following data: the IPFS hash where the data is stored, the Operator's work with their signature, who the Jurors are and what their respective votes are, along with their signatures. This message is now sent to the blockchain smart contract – Colibra's Claim factory.

The Claim factory verifies the information in the message and submits a transaction. Those transactions store the unique parameters of each claim.

Below is a simple illustration of the whole process:



6.9.2. Timeout Considerations

On Colibra's platform, a timeout is a situation when a Juror accepts the invitation to vote on a claim but for some reason doesn't vote in the specified time. In the event of a timeout, the Juror loses their staked tokens, while the platform resumes pinging other Jurors until the vacant spot is filled.

6.9.3. Smart Contracts

Smart contracts are programs on the Ethereum Network. Those contracts are a collection of code, written in the Solidity programming language. They store functions, data and state at a specific address on the blockchain. Colibra uses smart contracts to store the information and functions needed to raise and validate a claim. This information is processed by the smart contract after all the necessary data is present, verified and organized by the Operator.

The most typical smart contract properties include:

- **Claim ID** - a unique identifier for every claim.
- **IPFS hash** - info about the location of the claim's encrypted data on the blockchain.
- **Votes** - the votes of the different signers (Jurors).
- **Operator and Juror signatures of participation** - Info about the Operator and Jurors is also saved in the smart contracts. This allows the instant verification of their actions at all times.
- **Status of the claim** - approved or rejected.
- **Client address and payout**

The aforementioned parameters of the smart contract provide a solid reference of the claim. The transaction hash is used as a reference link for this transaction and its parameters.

The Operators' and Jurors' information verifies their actions by using signed messages. These messages are cryptographic seals and contain the work each of them has done, concatenated by their signature. The seals are accessible to outside parties and can unambiguously lead to the signer of the message. The main tool for signing these messages is the users' wallet - a cryptographic mechanism, which consists of two keys. These keys are used to encrypt / decrypt and sign messages, based on elliptic-curve cryptography algorithms.

On a smart contract level, this verification is accomplished by the help of the ECRecover Solidity function, which verifies the address of the wallet that has signed a given message by performing complex mathematical operations on the sealed message. This verification can be done 24/7. The smart contract checks who the Operator is and verifies the validity of the claims they have worked on. The same applies to Jurors. The ECRecover function brings another level of security and safety to the platform, while optimizing the GAS consumption of the smart contract. Colibra's app will thus have proof of every claim and each of the actions it contains.

6.10. GAS Costs

When developing decentralized software apps (DApps), one of the most important considerations is the GAS costs for using the application. The aim of every decentralized project is to bring transaction costs low, as this makes the app more accessible to the end users. Lowering transaction costs has

been very challenging for Colibra's dev team due to the complex character of the actions performed, especially creating and storing the claim on the blockchain. However, we managed to bring the GAS costs down to about 1 million GAS, resulting in as little as \$4 per claim.

7. Crypto economy

As an insurance company, Colibra is closely intertwined with the global world of finance. The risks we cover - hospital expenses, flight issues, lost luggage, etc. - are inescapably evaluated in fiat money. This means Colibra's crypto economy needs to be designed in a way that bridges the current realms of finance and crypto. Since this requires a way to represent fiat money on the blockchain, Colibra will introduce its own stablecoin, called STALIBRA.

To maintain a functioning crowdsourced claim handling platform, we also need to reward the different participants on the platform for their work and have a tool that regulates access to different roles and tasks. Colibra will therefore create a utility token of its own, called COLIBRA.

7.1. STALIBRA stablecoin

One of Colibra's main goals is to fully automate the entire claim handling process, from submission to payout. But most importantly, to make it completely independent from us, eliminating the price and liquidity risks that traditional insurance companies transfer to their clients. The easiest way to achieve this is by using a stablecoin to back the blockchain with fiat money. Think about it as a currency board, used by a country to maintain a fixed exchange rate with a foreign currency.

STALIBRA is a fully collateralized stablecoin, redeemable one-for-one to US Dollars (or other fiat currencies). STALIBRA tokens are pegged to Colibra's actuarial reserve.

To address the typical counterparty risk, our fiat reserves will be held in escrow as collateral for STALIBRA and will be managed by Colibra's banking partner. This banking partner will also be a legally bound and regularly audited asset manager. Preliminary talks with a major bank to partner with Colibra are already underway. Reserves will be verified by a publicly announced top accounting firm, which will publish regular audit reports.

Here's a more detailed explanation on how the mechanics behind our stable-coin work:

Colibra receives insurance premiums in fiat money (USD), which go to a bank account that serves as an actuarial reserve. When a certain amount, say \$100, is credited to the bank account, an oracle checks if the balance in the bank account has increased by \$100. Once this is confirmed, a smart contract automatically issues 100 STALIBRA on the blockchain and stores them in a wallet where they are kept until a claim request is approved. Stablecoins are always pegged one-for-one to the amount in the actuarial reserve.

When a claim for \$100 is approved by the crowd jury, this triggers a smart contract, which instantly sends 100 STALIBRA to the client's wallet.

Up to this moment, the participation of the banking partner has not been necessary. However, since we want to give clients the opportunity to exchange our stablecoins for any fiat equivalent (or another cryptocurrency when provided by the bank partner), we will do the following:

When the client wants to receive the fiat equivalent of their STALIBRA, all they have to do is submit an exchange request. This request burns the stablecoins. The transaction is then verified by our banking partner on the block-

chain. They debit Colibra's escrow with \$100 and wire the amount to the client. If the client owns a Colibra debit card, issued for free by our banking partner, they can receive the transfer instantly, as it constitutes an internal transaction.

As Colibra's stablecoins are issued on the blockchain and as there is a constant (view-only) public access to the bank account that holds Colibra's actuarial reserves, anyone can check whether the number of STALIBRA corresponds one-for-one to the balance in the bank account. Here is how the whole process works:

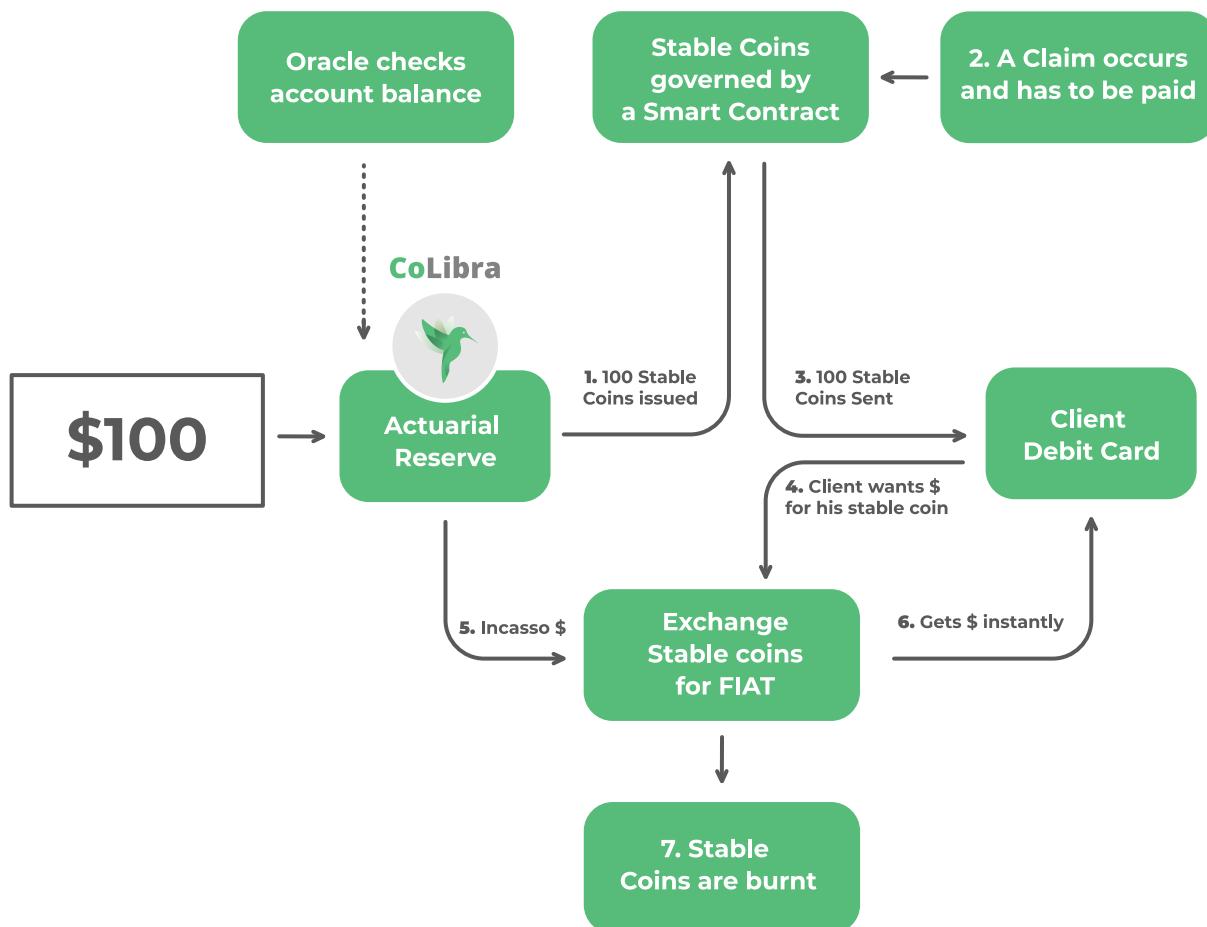


Fig.5 - Colibra's custom financial transactions process

7.2. COLIBRA utility token

One of Colibra's main goals is to fully automate the entire claim handling process, from submission to payout. But most importantly, to make it completely independent from us, eliminating the price and liquidity risks that traditional insurance companies transfer to their clients. The easiest way to achieve this is by using a stablecoin to back the blockchain with fiat money. Think about it as a currency board, used by a country to maintain a fixed exchange rate with a foreign currency.

7.2.1. Functions

The COLIBRA token is introduced as a necessary tool for rewarding work within the claim handling platform and for further promotion of the platform (early adopter incentives, affiliate commissions, etc). Listed below are the main utility functions of the COLIBRA token:

- **Access right**

In order to organize claims or vote on them, platform users must first own COLIBRA tokens and stake a certain amount of them. Staking is done to discourage negligent and fraudulent behaviour by introducing a meaningful downside. This simply means Operators and Jurors would lose their stakes if they haven't prepared their claim properly, or voted with the majority, respectively.

- **Incentivization**

Jurors and Operators are rewarded in COLIBRA tokens for their work within the platform. Once a vote has been cast, a smart contract is triggered to reward all participants for their work - Operators when the jury votes they have done a good job, and Jurors when they stand on the side of the majority.

To prevent malicious and unethical behaviour, part of a Juror's recent rewards are locked for a short period of time, based on their rating.

- **Currency**

Insurance policies can also be purchased in COLIBRA tokens from our mobile app, using a discount. Token holders who store their tokens in external wallets can also pay for insurance with COLIBRA tokens and use the discount. All they have to do is transfer the tokens to their Colibra wallet and use them to pay for their insurance policy.

7.2.2 Why COLIBRA tokens

One of the most often asked community questions we get is “Why do you need your own tokens? Why not use ETH?”.

There are two answers to this question:

1) We Don't Want To Create An Inflationary Ecosystem

Having our own utility tokens allows us to control their supply and use it to drive token demand and prices up. In other words, having an own token gives us the option to create a deflationary token economy, thus providing

further incentives to the platform's users.

To create a deflationary crypto economy, 50% of Colibra's positive financial results each quarter will be used to buyback COLIBRA tokens, which will immediately be burned. This means that as demand for the Colibra insurance services increases, there would be a corresponding decrease in the token supply, creating a rise in token prices. However, as the price of the token increases, the number of burnt tokens will gradually decrease, following a natural logarithmic function.

No additional COLIBRA tokens will ever be issued.

2) We Want To Have The Possibility Of Converting Our Utility Token Into A Security One

At some point, when the proper legislation has come into place, Colibra may offer its utility token holders the option to convert their COLIBRA tokens for Colibra security tokens. This will, of course, happen under pre-announced conditions, fully compliant with local legislation.

8. Roadmap

Building Colibra has several important milestones. Below is an overview of each product stage, its objectives and its respective timeline:

8.1. Business Research

In the first phase of the project, we formed our team of founders, strategists, developers and marketing experts. We then extensively researched the insurance industry, its market potential and the current insurance business models. This allowed us to validate the concept of our crowdsourced claim handling platform, along with its own innovative business model and its token economy. We also built the technological architecture that serves as a foundation for our entire solution and we recruited key advisors to give us deep and invaluable expertise in all aspects of the product.

Status: Q4 2017

8.2. MVP

Our crowdsourced claim handling platform is at the very core of Colibra, so we are working hard to create a demo that serves as proof of concept for the product. This demo is a vital stage of the product development, as it allows us to gather priceless feedback from users, game theory experts and advisors. This way, we can further adapt our vision and improve our solution. Although the platform is not yet operational, the demo will show that its underlying design is tested and functioning.

Status: Q4 2018

8.3. Funding

8.3.1. Private Sale

At the moment of writing this whitepaper, Colibra is in its Private sale phase, seeking large investors to support the project. So far, we have been able to bring a couple of big players on board, including a prominent VC.

What's worth mentioning here is that our Private sale does not envision price or volume discounts, as they incentivize speculation and create selling pressure the moment the crowdfunding stage is over. Instead, our approach is to offer equity as an alternative bonus to private investors.

Status: Ongoing

8.3.2. Public Sale

At the moment, we don't have a fixed date for our Public sale. Follow our official Telegram channel for updates.

Status: Estimated in Q1 2019

8.4. Live Product

8.4.1 Colibra 1.0

Once we have reached our soft cap target, we will begin developing version 1.0 of Colibra's app. Our current estimates show that we would have our first operational product within 6 months, ready to launch. This product will include a customer-facing insurance app (Android, iOS, Web) and a working crowdsourced claim evaluation platform. Most importantly, it will give us a scalable server solution with separate well-designed modules for AI & Big data analytics, video analytics, OCR handling, etc. Our goal with this version of the app is to go live and to start handling insurance claims in order to gather the data that will feed our data-driven modules. Along with the development of our solution, this is the stage where Colibra will acquire all necessary insurance licenses.

Status: Estimated in Q1 2020

8.4.2. Colibra 2.0

The second version of Colibra's app will focus on integrating AI into the voting process to increase operational efficiency and on making the OCR service smarter to decrease the Operators' workload. It will also introduce personalized policy pricing to our customers. Finally, we will improve the end-client experience of using the Colibra app to purchase policies and submit claims. Those improvements will be based on what we have learned on the previous stage and the data gathered in the app's backlog (e.g. on-demand GPS-based directions to the best local hospitals).

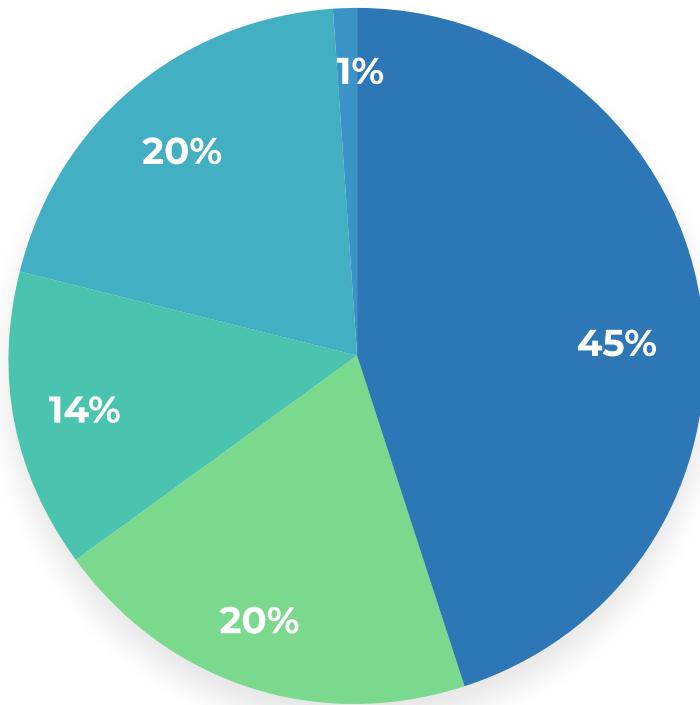
Status: Estimated in Q1 2021

9. Token sale

9.1. Summary

Token name	COLIBRA
Use	Contribution, Payment, Access
Total Supply	500,000,000 tokens
Tokens for Sale	225,000,000 (45%)
Private Sale Price	1 COLIBRA = \$0.10 (50M tokens cap)
Pubic Sale Price	1 COLIBRA = \$0.12 - \$0.14
Token Economy	Deflationary (Burn)
Platform	Ethereum (ERC20)
Currencies accepted	BTC, ETH, LTC, Various, Fiat
Minimum investment	\$100
Soft Cap	\$5,000,000
Hard Cap	\$25,000,000
Jurisdiction (legal)	Malta, EU
KYC	KYC
Restricted Areas (Public Sale)	US
Private Sale Bonus	Equity
Public Sale Period	21 days
Public Address	TBA
Public Sale Start Date	TBA
Team Tokens Vesting	5Y / 6M cliff / linear

9.2. Token Allocation



The total and final amount of Colibra tokens to be issued is 500,000,000. They will be split in the following way:

- **45%** (225,000,000 tokens) will be available for sale to the public
 - 50,000,000 Colibra tokens will be sold during the Private Sale
 - 175,000,000 Colibra tokens will be sold during the Public Sale

How the proceeds from those tokens will be distributed is described in section 9.3.

- **20%** will go to Colibra's Team & Advisors
 - Team's tokens will be vested linearly for 5 years with a 6-month cliff
 - Advisors' vesting will also be linear and will range between 1 and 3 years

■ 20% will go to Colibra's reserve to keep a good solvency:

- To keep a fixed token supply for possible future crowdfunding rounds - this guarantees the token value will not be diluted
- To serve as a “solvency buffer”, paramount for young insurance companies

■ 14% will be used for network growth. Colibra's Network growth pool will be used to:

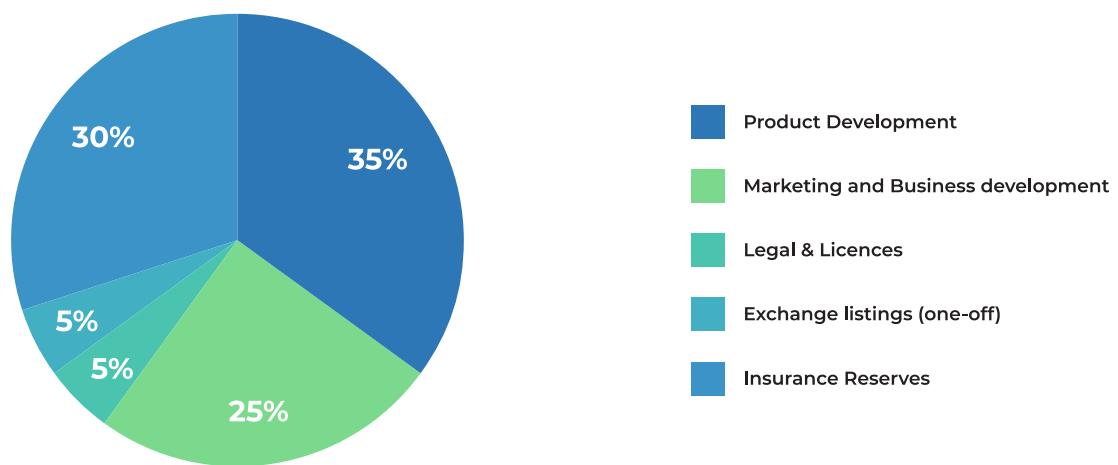
- Reward early adopters of the platform (Operators, Jurors, affiliates)
- Provide insurance companies that want to test Colibra's platform with free tokens or incentivize big insurers to partner up with Colibra

■ 1% will be set aside for a bounty program in order to:

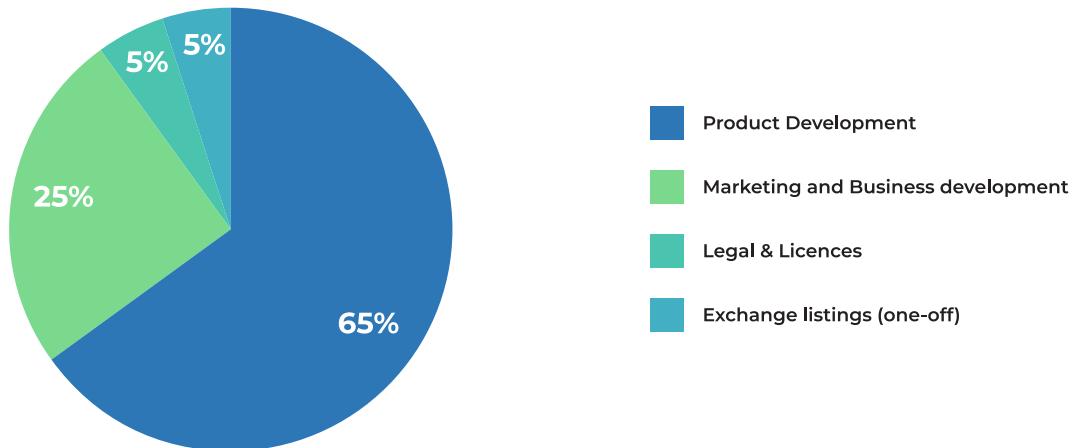
- Further promote Colibra in its initial steps
- Make the app more attractive to early adopters

9.3. Budget Allocation

9.3.1. Hard Cap - \$25M



9.3.2. Soft Cap - \$5M



9.4. Bounty

We offer the opportunity for everyone interested in helping Colibra to perform certain tasks in exchange for a part of our bounty pool. Our bounty program mirrors Colibra's marketing and business development strategy. We plan to use bounty to crowdsource tasks that are very specific and time-bound. This adds a wider external expertise to our team's deep knowledge.

A typical bounty pool size amounts to 1–3% of all funds raised in the token sale. Colibra will allocate up to 1% of the tokens sold to its bounty program - up to 2,250,000 tokens.

10. Team & Advisors

10.1 Management Team



Kalojan Georgiev, CEO

KPGG

Kalojan is the founding partner of K-Pharm Global Group (KPGG), a \$100mln+ group of pharma-trading companies. The company is a one-stop shop, offering services such as logistics, distribution, marketing and regulatory support for pharmaceutical manufacturers, covering over 50 countries in Africa, Europe and Asia.

He has 20+ years of experience in building huge companies from scratch - including a low cost airline carrier and a telecom, acquired by Deutsche Telekom. Kalojan has been the strategic financial advisor for deals worth hundreds of millions of dollars, working with governments and top global VCs.



Boris Strandjev, Chief Technology Officer

Experience: Google, Musala Soft

Boris is a solutions architect that has a long proven track record of designing and delivering complex technical solutions with multiple front-end applications and high-availability backend systems. He has a BSc in Informatics and an MSc in Artificial Intelligence. He has worked at Google, as well as Musala Soft, where he developed software solutions for companies such as IBM, Deutsche Telekom, Commerzbank and many more.

**Teuta Oruci**, Chief Financial Officer (int.)

Experience: Barclays, Credit Suisse, Willis Towers, Vanguard

Teuta is a CFO/Executive Director with 19 years in regulated financial markets, specialized in investment banking, insurance and asset management. Former director at Willis Towers, one of the largest insurance brokerage companies in the UK, she is bringing invaluable industry expertise on the team.

**Miroslav Zaporozhanov**, Chief Marketing Officer

Experience: E.On, OMV

Miroslav is a former business consultant to some of the largest energy companies in Europe, OMV and E.ON. He's also a co-founder of Zapomedia, which is one of the most prominent digital marketing companies in Bulgaria. Miroslav is a former international markets stock broker in the largest investment company in Bulgaria, Karoll.

**Ivan Belomorski**, Chief Operating Officer

Experience: IBM, Deutsche Telekom, Musala Soft

Ivan has extensive experience as a Product and Project Manager in developing multiple successful mobile and backend systems. Understanding a product's added value from a customer standpoint, he excels at using meaningful functional and UX design to translate this added value into a coherent software product. Ivan is experienced in structuring large-scale operations with multiple teams and complex deliverables.



Borislav Petrov, *Product Designer*

Founder of BLINK

Working at the intersection of product design and brand identity, Borislav had the privilege of influencing products used and loved by millions. He worked as lead product designer & art director at companies like Safecharge and Mobicomms. Borislav is the founder of BLINK, a digital agency, specialized in product design, art and creative direction.



Svetlin Zhakov, *Full Stack Developer*

Ex: Munich Re

Svetlin is an experienced Team Lead with a strong track record in the software industry. Skilled in J2EE, Hibernate, Spring and Calypso, he is focused on not just the support and implementation of software but also on the strategic value of a project, providing excellent leadership, analytical skills, and multidisciplinary knowledge.



Alexander Ivanov, *Back-end Developer*

Ex: Urbanise.com, VMware, Musala Soft, MobileSystems

Alexander is a Software Engineer, specialized in object-oriented design and analysis, Java EE architecture, code quality, and software development. He is experienced in the full life cycle of the software design process, including requirements definition, prototyping, proof of concept, design and architecture, interface implementation, testing and maintenance.



Mario Ignatov, Front-end developer

Ex: Qualifast Ltd, Musala Soft, VMware, MICROS Systems UK Lmd

Mario is an experienced Senior Software Engineer with a demonstrated history of working in the software industry. He is skilled in Java, Spring framework and Spring projects like Data, MVC, Batch, Boot, Security, Hibernate.

10.2 Advisors



Vassil Terziev, VC & Strategy, Co-Founder and Co-CEO

of Telerik, part of the Progress company

Vassil is a co-Founder and co-CEO of Telerik. He played an instrumental role in growing the company from a small Bulgarian startup to a leading global enterprise-software vendor with 9 offices in 7 countries and more than 130,000 customers, including over 450 of the Fortune 500 companies. Following Telerik's acquisition by Progress Software (NASDAQ: PRGS) in December 2014, Vassil now serves as Chief Innovation Officer of the parent company where he is responsible for identifying growth strategies and new market opportunities, as well as promoting internal innovation.



George Stoyanov, Conversational AI

CX Engineer at Chronicle (a Google X company), Ex: Uber

George has launched two Deep Learning products with hundreds of thousands of users, processing millions of images per day and containing millions of analyzed events, first to commercially pioneer video style transfer. Currently focusing on bespoke Deep & Machine Learning consultancy – delivered Predictive and NLP solutions for companies with millions of users. Featured on the cover of Forbes Bulgaria as part of the selection for 30 Under 30. He worked for Uber prior to starting his entrepreneurial journey.



Atanas Raykov, Viber - Head of Global Telecom Partnerships & Director Business Development CIS & CEE

As Director Business Development CIS & CEE at Viber, Atanas is currently responsible for leveraging Viber's incredible reach and exposure opportunities across 25 countries in the two regions. His goal is to build a strong ecosystem and partnership network that drives increased customer growth, user engagement and revenue. In his other role at Viber - as Head of Global Telecom Partnerships - he is responsible for the forging of strategic partnerships with the leading telecom groups around the world to create winning B2C propositions, based on Viber's cutting-edge technology.



Anton Titov, Security & Technology

CTO of pCloud

Founder of Hotfile.com, one of the largest p2p file sharing websites. Co-founder and CTO of the leading hosting company in Bulgaria. CTO of the Top5 Cloud Storage service pCloud with 7 million users.



Zlatolina Mukova, Insurance

NEVEQ, Euroins Bulgaria, former Deputy Minister of Bulgaria

Zlatolina is the Managing partner at NEVEQ - the largest private equity fund in Bulgaria. Former CEO of Euroins Bulgaria. Former deputy minister of transport and telecommunications. ACCA holder and Master of Mechanical Engineering.



Tunio Zafer, Business Strategy

CEO of pCloud, former CSO of Host.bg

Tunio is the CEO of pCloud - one of the world's Top 5 cloud storage providers with 8+ million users. Former CSO at Host.bg - the largest hosting company in Bulgaria. An online marketing veteran with 12 years of invaluable global experience.



George Spasov, Blockchain Architecture

LimeChain

Currently heading the technical team at Limechain, George has priceless experience leading the development of successful software projects for various companies - from startups like pCloud to international giants like IBM. In addition, his blockchain expertise has earned him recognition as a top performer of the inaugural Blockchain Developers Academy, run by ConsenSys.



Nikolay Todorov, Blockchain Integration

Blockchain Integration

Nikolay combines the rare marketing experience of building both brands and companies, and applying blockchain technology. His deep understanding of business processes and his firm grasp of the technical capabilities of blockchain allow him to act as the crucial link between his team's technical expertise and his clients' needs.

**Marin Panekov, OCR & EDI**

Document Scan, Management and Archive Solution

Architect at Coca-Cola Hellenic

Marin has unparalleled experience as the document-management system designer at Coca-Cola Hellenic - a company famous for having one of the highest-volume document systems in Europe. He combines this with being a skilled Optical Character Recognition (OCR) manager and functionality designer, an Electronic Data Interchange (EDI) expert and a Document Archive specialist. Marin holds the key knowledge and skills to help Colibra build a working and highly efficient claim-processing solution.

**Ivaylo Strandjev, Artificial Intelligence & Machine Learning**

Google, VMWare, Machine Learning Tech Lead at HyperScience

An advanced Machine Learning and Artificial Intelligence solutions architect, Ivaylo excels at delivering high-performing algorithms for machine learning. He will help Colibra design the self-learning Artificial Intelligence modules that monitor the system's performance and adjust product pricing, product generation, customer segmentation, etc.



Velizar Velichkov, Commercial Advisory

Co-founder of Trendo.bg, Grabo.bg

Velizar is the co-founder of several online platforms with combined annual turnover of nearly EUR 30 mln. The first of them is Grabo.bg - the biggest daily-deal website in Bulgaria with 2 million visitors per month and EUR 15 mln in annual revenues. He is also the co-founder of the online shopping club Trendo.bg and a worldwide digital company for online personal meal plans, operating on more than 100 markets.

10.3. Strategic partnerships



Viber is one of the top messaging and calling apps in the world with over 1 billion users. Owned by the Japanese online giants Rakuten, Viber is famous for its high-quality audio and video calls and for its privacy and security - all its calls and chats are protected by built-in end-to-end encryption.

Viber and Colibra are currently discussing the opportunity of cooperation to allow the users of both apps a better and more effortless travel experience.



Pioneers in the development and application of blockchain technologies, Limechain combine extensive business experience with top-notch

technical expertise in applying blockchain solutions to business' toughest problems.

Limechain have taken on the important task of building the technology that will allow Colibra to seamlessly integrate with the blockchain.

11.Disclaimer

[1] How the financial services lost its mojo - a study by PwC

<https://www.pwc.co.uk/industries/financial-services/regulation/how-financial-services-lost-its-mojo.html>

[2] Trust, transparency and technology: European customers' perspectives on insurance

<https://www-935.ibm.com/services/us/gbs/bus/pdf/gbe03008-user-02-insurancet3.pdf>

[3] Edelman Trust Barometer, 2017 (p.26)

<https://www.slideshare.net/EdelmanInsights/2017-edelman-trust-barometer-financial-services-results>

[4] Definitions of the term insurance company in The Urban Dictionary

<https://www.urbandictionary.com/define.php?term=insurance%20company>

[5] Morgan Stanley/BCG Global Consumer Survey 2014

http://image-src.bcg.com/Images/evolution_revolution_how_insurers_stay_relevant_digital_world_tcm9-165956.pdf

[6] Spencers Solicitors - How long does compensation take to come through

<http://www.spencerssolicitors.com/accident-guides/how-long-to-receive-my-compensation.html>

[7] EY - Global insurance trends analysis 2018

[https://www.ey.com/Publication/vwLUAssets/ey-global-insurance-trends-analysis-2018/\\$File/ey-global-insurance-trends-analysis-2018.pdf](https://www.ey.com/Publication/vwLUAssets/ey-global-insurance-trends-analysis-2018/$File/ey-global-insurance-trends-analysis-2018.pdf)

[8] Travel Insurance Market Research

<https://www.alliedmarketresearch.com/press-release/travel-insurance-market.html>

[9] Condorcet's Jury Theorem

https://en.m.wikipedia.org/wiki/Condorcet%27s_jury_theorem

[10] Nagel & Neef, Deductive Modeling to Determine an Optimum Jury Size and Fraction Require to Convict, 1975

Wash.U.L.Q. 933: https://courses2.cit.cornell.edu/sociallaw/student_projects/JurySize_lessonisnotmore.html

[11] Kittur, Smus, Khamkar, Kraut - CrowdForge: Crowdsourcing Complex Work

<http://smus.com/crowdforge/crowdforge-uist-11.pdf>

[12] Valentine, Retelny, To, Rahmati, Doshi, Bernstein - Flash Organizations: Crowdsourcing Complex Work By Structuring

Crowds As Organizations: <http://hci.stanford.edu/publications/2017/flashorgs/flash-orgs-chi-2017.pdf>