Solving the trust problem in remote software development

Building the next generation eco system for software freelancing: based on credibility and code quality, persisted in a blockchain, controlled by smart contracts, powered by instant payouts.

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More information and whitelist: https://blockcoder.io

PROLOGUE

"The first marketplace for software development capacity built on the trustless system paradigm."

BlockCoder.io - unlike many ICOs - is not just a vague or theoretical concept. BlockCoder.io is based on experience and feedback from many years and hundreds of projects in the software industry. BlockCoder.io is building on what works and is fixing what is broken, using blockchain technology. BlockCoder.io isn't using tokens, because they are all the hype now, but because tokens make a lot of sense as a utility for a freelance marketplace.

BlockCoder.io will take the traditional concepts of online freelance marketplaces to the next level by tackling the problems of reputation, credibility, disputes, code quality assurance, high commission fees and long payout cycles.

During my professional career I've been working as a web developer, software project manager, technical architect, CTO and entrepreneur in the internet industry for 25 years, which means that I've seen the world of software engineering from all different angles.

Almost 10 years of my career have been dedicated to freelancing for large enterprise clients, before I founded a software development company (Rockstardevelopers GmbH in Mannheim, Germany) committed to delivering the highest possible quality in web development.

The company was stuffed with some of the brightest minds in software engineering and so we "rocked" a long list of online projects of leading international large enterprise companies from the automotive industry, banking, pharma, chemicals and many more in the following years.

To meet the ever growing demand of our customers, we hired freelancers from Asia, Africa, Eastern Europe and South America by using sites like e.G. Upwork. From that experience we learned a lot about the customer side of freelancing: "faked profiles", "quality issues" and "missing long term reliability" are only a few of the key challenges we've faced, while trying to recruit nearshore and offshore developers.

Having seen both sides of the freelance market, we think this space is ripe for disruption: blockchain technology will help us build a marketplace for software engineering contractors and professional clients, that will fix what is broken with the current freelance job sites.

Welcome to the next level of the gig economy: BlockCoder.io

Thomas Huhn

More information and whitelist: https://blockcoder.io

Founder

ABSTRACT

BlockCoder.io is a marketplace based on blockchain technology for hiring IT contractors (Freelance Software Engineers and IT companies) from around the world: with a forgery-proof work history, risk-minimizing automated quality assurance, almost cost-free daily payouts and a minimized commission of only 1%.

The goal of BlockCoder.io is to create risk-free marketplace conditions for companies looking for reliable cooperations with trustworthy, professional contractors on one hand and for software engineers and contractor companies looking for solid employment opportunities, fair and reliable payments and minimized commissions on the other hand.

All transactions are handled via BCOC, the utility token of BlockCoder.io, which is based on the Ethereum ERC20 standard. Customers and developers will work together based on individually agreed hourly rates. As soon as BCOC will be listed on public cryptocurrency exchanges, the exchange rate of BCOC to fiat currencies will represent the fast growing global demand for software development capacity, hitting a limited supply of software engineers. BCOC is therefore unstoppably primed to rise exponentially for the foreseeable future.

While the long term perspective is bullish, short time volatility can be a problem for utility tokens. BCOC's unique feature, the Smart Crypto Volatility Management (SCVM) fund, guarantees stable prices for customers and developers during the runtime of a job.

EXECUTIVE SUMMARY

"Current freelance job sites are broken. BlockCoder is here to fix."

The demand for software engineers is growing on an exponential basis all over the world. Marketplaces for the gig economy like Upwork.com or Freelance.com are celebrating huge financial successes, despite endless complaints from customers and freelancers alike. Anyway both sides keep on using these job marketplaces, given the fact that there's a lack of viable alternatives.

Why conventional freelance job sites are broken

A typical software project, that is handled using a freelance marketplace, leads to the following sequence of problems:

First, customers without IT background will usually not be able to evaluate in depth the technological skills of the applicants for their project. E.g. a search for "web developer" brings up everything from self-proclaimed "engineers" who barely know how to setup Wordpress, to professionals who have a deep understanding of building custom websites with high class modern frameworks like Angular, React or vue.js. The reference projects a candidate lists in his profile are most of the time barely useful, because you never know if he has really worked on it - and even if he did - what parts he did work on and what improvements have been implemented by someone else after the applicant left the project.

Second, customer reviews are sometimes just paid "fakes" and not trustworthy at all. Many profiles from developing countries are even only scams, just trying to grab some money and run. For scammers the next fake profile is only a couple of clicks away.

Third, even professional TPMs are often overwhelmed by assuring code quality, stability and scalability of what has been built. Even if no security issues arise, there is no guarantee that the customer can expand his further business from the code that has been delivered. Sometimes the visual appeal hides that there are serious issues below the surface. Only well trained developers are able to identify the problems, which is the reason for the "4 eyes principle" that many professional software companies follow. Anyway, this is a time consuming and expensive solution.

With all these immanent problems, it is no surprise that only 10% of software projects are successful, while the majority fails.

This situation is creating disappointed customers, not willing to pay for what they get delivered. As a result, compromising disputes is one of the main tasks of the job platforms, but barely leads to fair outcomes.

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Basically solving such issues is a "mission impossible", because to make an educated decision, you would have to start with understanding the customer requirements in depth, then move on to analyzing the code of the developer in detail (in whatever programming language it was written), and finally compare it to the requirements of the customer.

This is obviously extremely time consuming and requires a lot of different skills and experience. In the end you would still have to face the question if a 90% finished project is worth 90% of the money, or if only the rule "all or nothing" makes sense.

Why BlockCoder.io is the solution

"Building trust through identity and reputation"

One of the undoubtable benefits of the blockchain is, that no record can ever be changed, which makes it a perfect instrument for honest and motivated software engineers trying to build their reputation.

BC not only stores "on-chain" transactions like timelogs, QA results and customer feedback (in the form of gratuities), but also "off-chain" references to other profiles relevant for identifying the developer like e.g. LinkedIn, Github, Bitbucket, Stackoverflow, Reddit etc.

If you really want to deep dive into the skills of a developer, you can even do that by reading the comments from BlockCoders QA software on each and every commit to a code repository the developer ever has done using BC.

But even the statistical overview of a timeline with daily code evaluations will give the customer a solid understanding of the reliability and quality of a developer in the long run.

Avoiding negative surprises while hiring software engineers is essential for the success of a project and becomes safe and easy when you can build on a trusted reputation and track record of an individual.

Automated code reviews: protection for customers and feedback for developers

While the proper communication between client and developer is something that cannot be automated and should always be handled by an experienced technical project manager, there are means to almost fully automate the quality assurance process: BC analyzes code for formal bugs, informal code guidelines, best practices in code structure and checks metrics like test coverage and code duplication.

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All findings are presented in an easy to understand report that helps customers to evaluate the code quality and gives developers detailed feedback and hints on how to improve their code.

To give the developer the chance to improve his results, he will always be able to test run the QA and check the outcome,before pushing his code to the customers repository.

It is even possible to agree with a contractor that only code commits above a certain quality level will be accepted as a "definition of done". It depends on the developer, if he is willing to accept such restrictions. If yes, they get integrated into the smart contract between the two parties and will be automatically executed.

Avoiding disputes and loss of money using tight feedback cycles

As already explained, it's almost impossible to settle a dispute when it comes to discussions about "the definition of done". BC has chosen a pragmatic approach to solve this problem: developers will do daily code commits and will receive daily payouts in return, while customers get daily reports on code quality. If the results are bad, the customer can ask the developer for a free refactoring or he can cancel the contract immediately.

This tight schedule is only possible with a fully automated process that is handled by a smart contract, using an almost feeless international transfer of tokens as a means of payment.

The benefits of this daily schedule are multifold: the risk of paying for software, that does not match the customers expectations, is reduced to only one day. This is significantly less than the weekly schedules of regular freelance job sites. The developers risk of losing money to a dispute is reduced to zero. Even more, he gets kind of a "daily paycheck" in BCOCs that he can exchange to other crypto or fiat currencies whenever he wants.

This daily payout is a big advantage when you're living in an underdeveloped country, trying to make a living from day to day.

As long as the objective evaluation of the code has resulted in a low quality score, we expect that the vast majority of disputes will be solved by refactoring, because developers will want to avoid blockchain records that can have a negative impact on their further career.

In case you "kill" your reputation as a software engineer, a new profile is NOT just a couple of clicks away, when all your social connections and work results are glued together to a comprehensive image of you as a developer.

THE MARKET FOR SOFTWARE ENGINEERS

"Exponentially growing demand for software development capacity and digital transformation in the developed countries leaves only one option for scaling development teams: offshoring."

The demand for software developers is exploding worldwide

The demand for software developers is probably the fastest growing demand for a skilled workforce on the planet for the foreseeable future. U.S. News analyzes that "Software Developer is the No. 1 U.S. Job of 2018".

In 2016, there were 3 U.S. jobs available for every new graduate from a program in the field of computer and information sciences, and over 223,000 software development jobs went unfilled. The situation is not likely to improve in the future. The Bureau of Labor Statistics (BLS) projects 186,600 new software engineering jobs will be added by 2024. While this represents "only" a 17% increase in total positions, it translates to an 84% expansion in jobs that have yet to be filled.

And these numbers are only based on the U.S. The MichaelPage publishing "The world's most in demand professions" shows that software engineers are clearly ahead of every other profession around the world.

Digitization is eating the world

The underlying trend this demand is based on, is that basically all industries are digitizing their business and do not only require developers for building their digital business processes, but also for running and maintaining them.

Marc Andreesen, developer of Netscape (the first internet browser) and nowadays one of the wealthiest and best known Venture Capital investors in Silicon Valley, has put this in simple words in his legendary article in the New York Times from 2011, which today is more true than ever before: "Software is eating the world"

Andreesen has predicted a consequence, that we are spotting with many traditional companies today: even established enterprises go so far to transform themselves into IT companies. We see examples from e.g. a car rental company that claims to become an IT company running autonomously driving cars using digital processes, apps, dapps, smart contracts etc. The rental cars themselves are only an afterthought, a utility.

The basic idea of these companies is, that they can only survive in a digital economy, if they are able to scale their programming capacity enough. Otherwise they are stuck in their traditional business processes and doomed to lose their market positions to those competitors that are able to transform their business into the digital age more efficiently.

International outsourcing is a chain reaction around the globe

The demand for developers in the countries of the so called "first world" is multiple times bigger than what their domestic labor markets have to offer. As a result we are seeing a growing demand for outsourcing to less developed countries, whereas those countries do their outsourcing in even less developed countries.

Example: German companies tend to outsource to Poland or Romania. Both countries belong to the European Union and are based on the same legal framework. This outsourcing increases the pressure on Polish and Romanian companies, that urgently need those software developers themselves that are "rented" to German companies. It's just that they cannot afford to pay the same high hourly rates. The solution for them is to hire Ukrainian or Indian developers.

The future belongs to freelancers

Another trend fueling the situation is the rise of freelancing as a preferred career path. A study of the Freelancers Union shows that today in the U.S. already half of the working generation of Millenials are freelancing and that the freelance workforce grew 3 times as fast as the U.S. workforce overall since 2014. *This leads to the conclusion that at this growth rate by 2027 the majority of the U.S. workforce will be freelancers.*

Hiring moves to workforce marketplaces

How does the hiring of freelancers work? The answer is: pretty much different from the traditional hiring process for fulltime employees.

Besides hiring developers directly from company websites, there is a number of international freelance marketplaces, where you can hire software engineers and other professionals from around the world. The biggest marketplaces are freelance.com, upwork.com, toptal.com or guru.com, just to name a few.

Most of these marketplaces exist since many years and have millions of users. Analyzing their feature set shows a couple of common functionalities. Each of these functions can be implemented more efficiently using blockchain technology:

Reputation management

One of the biggest hurdles to overcome for every aspiring software engineer when he's new to a job platform, is to build a reputation that is strong enough to impress potential clients so much that they consider him as one of their preferred choices when it comes to the hiring process for a project.

Reputation can be built by documenting your skills and your references. Usually the evaluation of skills is handled using tests, which can be easily faked.

A similar problem exists with portfolio references: often they are just "fake projects" with a nice recommendation from someone paid by the cheater.

Escrow payments

Generally all marketplaces offer some sort of escrow service by which clients deposit funds in advance of project completion. This service is offered to give freelancers confidence they'll be paid so long as they do their job. Similarly, escrow services are meant to give clients confidence that freelancers can't take their money and run without completing a project.

So far for the theory. The following example shows the limits of these escrow services: If you hire freelancers on a hourly basis, Upwork pays them on a weekly basis, as long as you don't reject the hour report of the freelancer.

If you reject it, the second feature that almost all marketplaces have, dispute resolution, comes into play.

Dispute resolution

The problem with dispute resolution is, that none of the existing marketplaces dares to judge if a software that has been delivered "somehow", fulfills the requirements. The only factors that are evaluated are things like "has there been activity from the computer of the freelancer" (if a keylogging and screenshot software is used) or "how long did he not respond to communication". If you're lucky, you get back 10% of your funds, but the rest is lost.

That's because cheaters know the dispute resolution mechanisms of the marketplaces very well and they are professionals in abusing them. Usually they just try to convince you that everything is running fine for 2 or 3 weeks, before you realize that almost nothing has been done during that time.

More information and whitelist: https://blockcoder.io

The incentive for cheating is high: imagine that you're living in poverty in a third world country and you see a chance to make so much money in a short time with a fake profile that you and your family can live from it for months ... would you care about this anonymous company in one of these rich countries that is losing a bit of money to you?

On the other hand, even as a solid, trustworthy and successful freelancer, you're always on risk to get hit by some aggressive customer and an incompetent service of the job market you use.

WHAT'S BROKEN WITH FREELANCING SITES

"BlockCoder.io addresses the most problematic issues of today's marketplaces for software developers from the customer side AND from the developer side."

The problem from the customer point of view

In the so called "developed countries" the demand for software engineers is much higher than what the labor market is able to offer. Surveys show that only 1 out of 3 job positions can be filled and the gap is widening on an exponential scale.

The only way to fill the gap, is to hire remote workers from countries that do not have a well developed IT industry or are not able to pay appropriate salaries to their domestic software developers.

The most annoying problems originating from the remote situation are fake skills and profiles and not being able to track work results on a daily basis to assure quality.

This often leads to situations where the hired developers "work" on a task for several days or even weeks, always promising progress, but never showing results. The customer finally ends up with a high bill for low quality or unfinished results. Disputes are settled by a mediation that gives the customer back only minimal amounts, because the mediator does not judge quality, only non-significant quantity factors like "keystrokes per hour".

The problem from the contractor point of view

An interesting summary of common problems, that remote freelancers have to face, can be found here.

Most freelance job platforms enable customers to start a job auction by posting a project description. The biggest challenge resulting from this model are the bidding wars that make it hard to earn a decent salary as a developer.

Developers are not just competing against low bids from around the globe, but also bids from inexperienced rookies who are using these sites to gain some experience to add to their CV or portfolio. To get a foot in the door, these individuals might be willing to do work for very low sums of money.

On top of the low salaries that are possible on these freelance platforms comes a commission fee for the platform itself, that spans from 10% to 30%, depending on the site.

Even more, developers lose money again during the payout, because the traditional payment systems charge fees for international money transfers.

On top of that most freelance job sites add hefty fees for their escrow payment service.

Payouts happen weekly, bi-weekly or monthly and the longer the payout period gets, the more risk of losing money to disputes there are.

Overall, freelance job websites bring a wide range of choices for the customer, but only very little benefit for the developer. Because of the downsides of this business model you will find almost no experienced, professional, highly skilled software engineers on one of these job auction platforms.

An additional challenge for developers is to create a trustworthy work experience and portfolio on a freelance job platform when you're starting new.

SOLUTION: A FREELANCING ECO SYSTEM BUILT ON BLOCKCHAIN TECHNOLOGY

"BlockCoder.io facilitates trust for customers and liquidity for developers through trustless cryptographic technology."

Helping customers

1. **Registration**
   During the registration process, new developers are asked to add as many reference profiles (e.G. github and stackoverflow accounts) as possible. The customer can check these accounts for activity and valid work experience easily. The broader the set of accounts, the more trustworthy a new profile gets. Faking a new profile will become hardly possible, because you would have to fake all other accounts too, including repositories, a history of commits and questions / answers, Karmapoints etc. BlockCoder will use the API access to the Developers accounts to calculate an initial credibility score.

2. **Daily Commits**
   BlockCoders are requested to push their code on a daily basis. This code is run through an automated quality assurance that not only shows the customer possible pain points, but also prevents the developer from pushing bad quality results (because he knows that his results are monitored).
   Each commit is recorded in the blockchain, together with the score of the quality assurance. That way new customers have a proven history that holds information about which technology was worked on, what the quality was and how much experience the contractor has in a certain area.

3. **Automated Quality Assurance**
   BlockCoders will do daily commits, because that's what the smart contract requires. Each commit is run through an automated quality assurance process, that not only evaluates code quality, but also gives hints for the developer (and the customer) how to improve the code. That way, if the code has serious issues, the customer will know about it immediately.
   Because the automated QA is based on broadly accepted coding guidelines and best practices, there is not much room for discussion, if the score of a daily commit is low. The customer can ask the contractor to fix the issues of the code for free, or - if the contractor is not willing or not able to fix it - to cancel the contract immediately. This minimizes the risk for the customer down to the work of only one single day.

Helping developers

1. **No bidding wars**
   BlockCoder.io does not have a job posting feature for clients and therefore prevents bidding wars. Clients will filter the database for programming and language skills, level of (non-fakable) experience and possibly other criteria, like e.G. timezone or country, and will be presented with a list of best matches, available for work during the chosen timeframe.
   From there, the client can get in touch with each individual he thinks is a fit. Of course the hourly rates will still be a criteria for decision, but it's more like an afterthought in case you find several available developers with almost the same skills and experience.

2. **Close to zero commission**
   BlockCoder.io does charge a 1% commission only for its services. This minimal fee is necessary to cover the long term costs for maintaining and improving the service and covering all mandatory expenses of BlockCoder LLC.

3. **Daily payouts**
   Payouts happen on a daily basis: each day counts as a number of hours that have been agreed with the client as a work unit and requires a commit to the code repository by the end of business. Code analysis algorithms do an automated quality assurance of each commit and create a report for the client. The payout is transferred automatically after the commit to the developers wallet.

4. **No disputes**
   There are no disputes possible on BlockCoder.io, but the client can always cancel the contract without a notification period. By following these rules in combination with QA automation, the risks for the client is reduced to only one work day and the risk for the developer for not getting paid is zero.

5. **Instant international payouts**
   Payouts are done via BCOC, the crypto currency of BlockCoder.io, and usually happen in minutes, not days as with conventional banking. In order to store a transaction in the blockchain, some mining has to happen and the miners are paid with "Ethereum gas". This minimal amount is deducted from the payout and it's far less than traditional banking fees.

Product architecture and product development timeline

"The planning consists of launching a functional implementation of BlockCoder.io after 6 months. While further features are already planned, we will stay agile and listen to the feedback from the community."

Workflows

Registration and proof of credibility

The registration process will require that you put yourself on a waiting list. The BlockCoder team will check each application manually and will evaluate the developers data in terms of credibility. As a result the applicant will be either approved with a credibility score or he will be declined.

A developer can move to the top of the waiting list and therefore speed up his application process and raise his credibility score, by getting recommendations by developers, who already have a BlockCoder account.

This is especially important in the pre-ico phase: BlockCoder will run an airdrop program for developers, which entitles the top 5.000 applicants in the waiting list to get an evenly distributed share of 5% of the tokens. This means, that developers with the most recommendations from other approved applicants will move to the top of the list and will receive 0.001% of all BCOC (approx. $300).

Developers register by adding personal data and external web profiles. The personal data includes all information necessary for communication and invoicing. Emails are verified by double opt-in. Skills are initially self-evaluated.

To verify a developers access to his external profiles he will have to grant BlockCoder access using a delegation method like e.G. OAuth (Example: "Login with Facebook Button"). Via such API access BlockCoder will read his unique account ID from his profile data.

Each registration runs through a manual check where all external accounts are investigated for credibility. Number of social connections, posts, comments and other social activities are the main factors for the level of trust (credibility score) the newly registered developer achieves.

Hiring process

After the developer has been approved, he will appear in the search results when a customer is looking for a skill set that fits to the developers profile.

If the customer decides that he wants to hire a developer, he sends a request with information about the job and until when he needs a response.

The developer checks his availability and the job description and accepts or declines the job offer. If he accepts, a smart contract will block the full amount for the job in the customers wallet. From this amount the daily payouts will be withdrawn.

Working on a project

As soon as the developer starts working on the project, he is obliged to push his code to the BlockCoder quality assurance process on a daily basis. If he follows his obligations, the smart contract will immediately handle the payout and the daily rate will be transferred to the developers wallet.

If the developer cannot push his code on a certain day, e.G. because he's not able to work the required number of hours or he has a bad results after BlockCoders QA process (and he does not want these bad results to be recorded in the blockchain), the payout for this day is delayed until he delivers the code. No new work day from the client contract is started until the previous work day is finished.

Quality assurance and profile building

The developer has the chance to do a trial run using the BlockCoder quality assurance system at any time. From this he will get valuable information about his code quality like e.g. code structure, code duplication, best practices and many helpful hints for improvement.

This gives the developer the chance to raise his code quality before he pushes his results to the customers repository. As soon as the developer finally commits his code, the quality assurance process does a final evaluation and saves a quality score for each programming language the developer has applied changes to, to the blockchain.

This results in a more and more trustworthy profile which reflects an objective status quo of the developers skills.

To motivate the developer for self improvement, more recent results will be weighted more than older results.

The process of commissioning

Customer seeking for a software engineer as a perfect remote worker for their internal team or simply as a solo software developer for some kind of project, will use the search function of BlockCoder.io.

Basically the customer will have access to a ranked list of software engineers to which he can apply all sorts of filters, like e.G. regions, languages, but - more important - also programming skills like programming languages, frameworks or tools.

After applying all filters wanted by the customer, he gets a ranked list of recommended software engineers. From there the customer will be able to check each profile in detail and finally send a message with a short task or project description to all developers who come into question, asking for their availability for the runtime of the project.

The developer can then check the offer, apply corrections to the days when he's available and send back a binding offer, that the customer just has to approve to create a final (smart) contract for the job.

Escrow service

By entering into a contract, both parties agree on an overall amount of workable hours and an overall amount of BCOC, which is payed out in daily chunks.

To ensure the payments for the developer, BlockCoder's smart contract works as an automated escrow service by blocking the overall amount of BCOC for the job in the customers wallet. Each day, when the applicable conditions are met (e.G. committing code), an instant payout to the developers wallet gets triggered by the smart contract of the job.

Unique "Tips" feature helps with reputation building

In many countries around the world it's usual to say "thank you" for an extraordinary good service by giving a tip. While the amount of the tip differs from cultural differences, the general existence of a tip can be interpreted as a positive rating.

BlockCoder enables the developer to accept tips and saves them together with the result of the quality assurance process in the blockchain.

Receiving tips on a regular basis adds to a developers overall reputation and to the rating of the skills that have been used in the task concerned.

More information and whitelist: https://blockcoder.io

Unique "Smart Crypto Volatility Management"

The issue that arises from BlockCoder's payout system is, that it has to meet two different goals here, when the exchange rate of BCOC to fiat currencies is changing during the project runtime: on one hand side the developer has a serious interest in getting the amount of fiat money that he asked for, no matter if the BCOC/Fiat exchange rate falls, because he will still have to pay his daily costs for food, gas or rent in his local fiat currency.

Example on how the constant payout for developers works
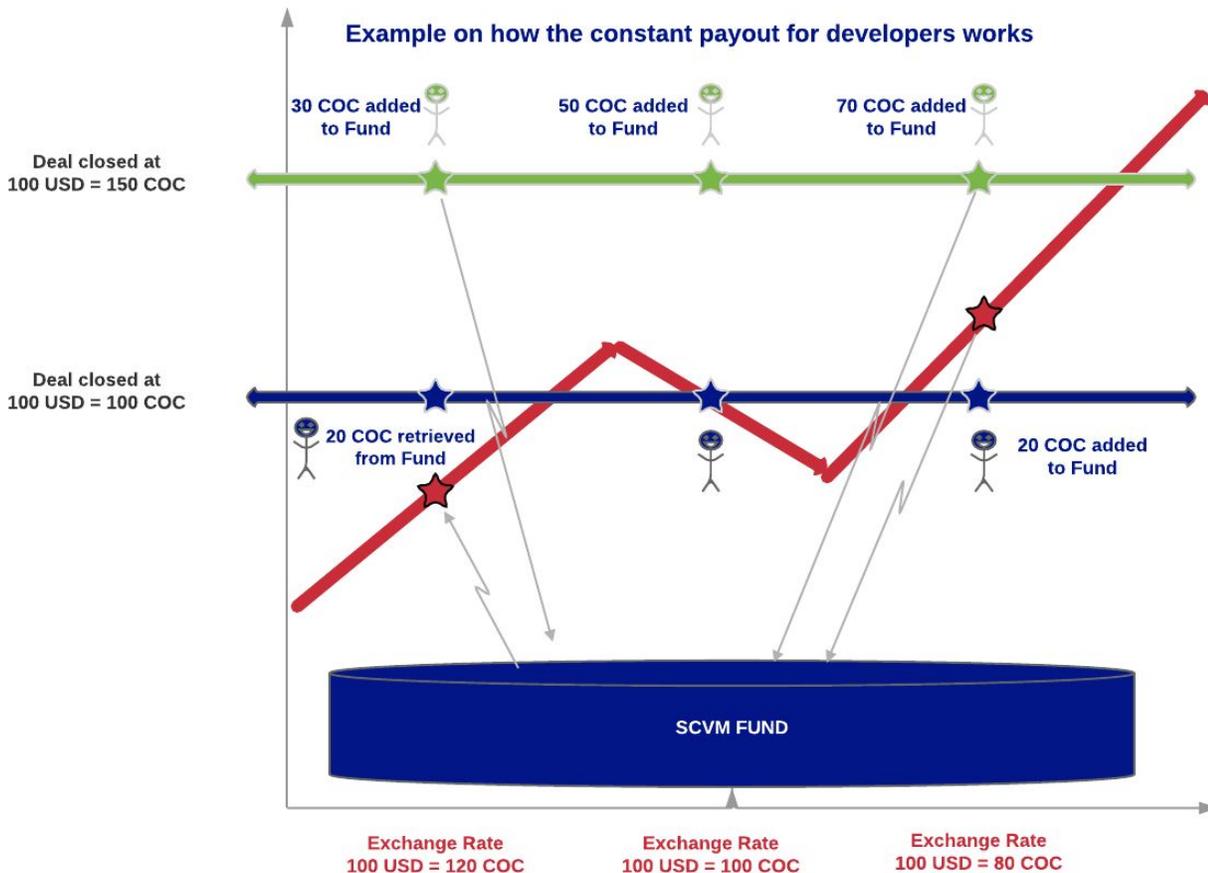
On the other hand, the customer does not want to buy more BCOC in times of decreasing BCOC/Fiat exchange rates, but without additional tokens, the escrow service would not cover the full amount for the job anymore.

To address this problem, BlockCoder has created a unique and revolutionary approach, that not only solves the problem of unsteady exchange rates and unpredictable volatility, but still leaves room for growing the value of the Block Coder Coin (BCOC) based on the global demand for software development services.

More information and whitelist: https://blockcoder.io

BlockCoders "Smart Crypto Volatility Management" (SCVM) is a smart contract that implements an open-end fund with the following functionality:

SCVM watches the exchange rate of a job contract in comparison to the day the deal was done: the exchange rate of the day when the two parties agreed on the contract is the reference exchange rate (RER) and the actual exchange rate (AER) is the exchange rate of the day when a (partial) payout happens.

If the AER is higher than the RER, the developer would be overpaid. BlockCoders SCVM smart contract solves this problem by reducing the payout by the inflated amount and transferring it to the SCVM fund wallet.

If the AER is lower than the RER, the developer would be underpaid. In this case BlockCoders SCVM smart contract takes the missing BCOC from his fund and adds them to the developers wallet.

If there are not enough Tokens in the SCVM fund, the missing amount is minted. This edge case will lead to a small raise in the overall number of tokens, which has an impact on the exchange rate by itself. The coin market cap of BCOC will be divided by more tokens than before the minting of new coins and therefore the value of each BCOC will be slightly less.

This means that - in the case of an unsufficiently filled SCVM fund - the potential loss of a developer will be equalized by the community as a whole.

The developer defines his preferred fiat currency as a reference at the time he agrees on a deal. So this will probably be his local currency, or at least a fiat currency that is accepted in his country.

The developer can only choose from a list of available currency trading pairs though, based on what reliable data from trusted crypto exchanges is available to BlockCoder. We expect to start with BCOC / USD and BCOC / EUR and expand on that step by step.

As a first thought one might think that the SCVM smart contract would keep on growing infinite when the BCOC price is on a rise and that the SCVM smart contract would have to mint more and more BCOC when the exchange rate is in a downwards trend.

But the behaviour will be not that linear: as we all know, stock and crypto prices move in waves. This means that developers that approve a contract on top of a wave, will receive additional BCOC from the SCVM fund during the downhill movement of the wave, but the SCVM smart contract will fill up his fund again, as soon as the crypto price moves to new highs.

Vice versa the same mechanism will equalize the market movements in a deal is agreed on at the bottom of a crypto price movement.

Intended product architecture

BlockCoder.io is aimed at building an eco system with thousands, if not millions, of transactions per day. To ensure scalability and performance, only necessary data will be stored in the blockchain.

Another challenge imposed on BlockCoder.io is following the European GDPR rules. Those rules clearly apply, because BlockCoder LTD is based on Malta. Especially the "right to be forgotten" is hard, if not impossible, to implement in a pure blockchain system.

The solution is a hybrid system, which stores all data that makes up the basic profile of a user, encrypted on the blockchain. Additionally all work-related quality assurance results are stored as a "skill + score" value pair.

The key to decrypt the data stored in the blockchain is stored in a centralized database and is under full control of the user. If the user decides to cancel his account, all data that is stored in BlockCoders conventional database, is deleted.

One of the key features of blockchains is, that nothing that is stored, can ever be deleted again. Without any additional mechanism this means that the encrypted data of accounts and skill / quality scores will live on in the blockchain. However, as soon as a user decides to revoke his BlockCoder secret key, all persona-related data inside the blockchain will effectively lose it's information value, since it can no longer be recovered.

To prevent scammers from deleting accounts after producing bad work results and re-creating them afterwards as "fresh" new profiles, BlockCoder will use the following process:

During the registration we will extensively use access delegation registration methods (e.G. OAuth) to get access to the API of the profile site. You will probably know this method as "Sign in with LinkedIn", "Login with Github", "Login with Twitter" etc. etc.

Using this method the user will be able to claim an account on

- Github

- Stackoverflow

- Twitter

- LinkedIn

- Google

- Facebook

More sites will be supported in future releases of BlockCoder.

More information and whitelist: https://blockcoder.io

All of the supported sites will give back a unique ID to Blockcoder. This ID does not change, even if the username / account name changes. The ID is stored in the blockchain using a non-reversible hash function. Additionally the data is encrypted with a key that is only known to BlockCoder.io.

If the user would try to delete and re-create an account on BlockCoder.io using one of his formerly registered profile accounts, the hash function applied to the account ID would produce the same hash as the first time. This means that BlockCoder could easily detect the attempt of re-creating an account based on the same external profiles that have already been used before.

Basically this is not something negative and as long as the developer does not want to fake a profile and get rid of his former evaluations in the blockchain, he will be happy to be able to recover his work history.

BLOCKCODER DATA STORAGE
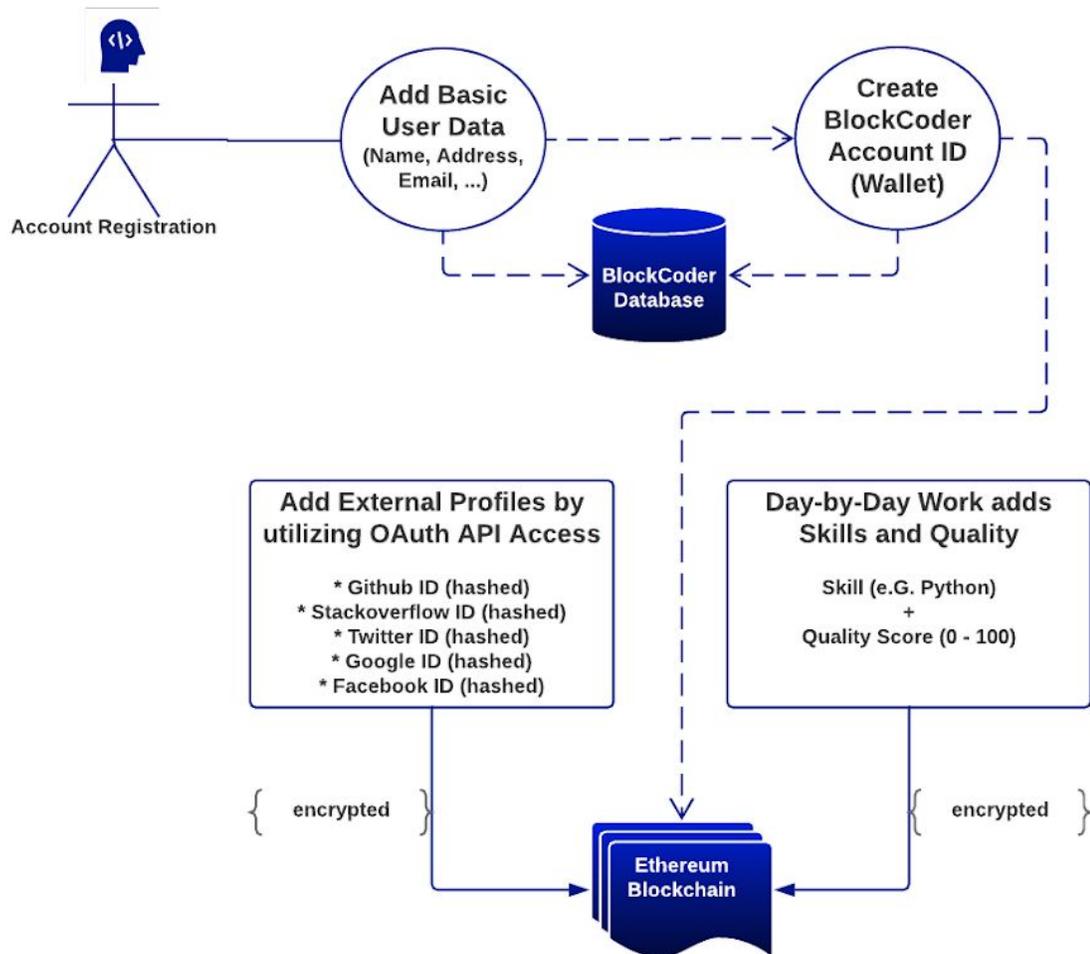
With this process BlockCoder fulfills all GDPR requirements too and circumvents the problem of non-deletable data in the blockchain: if a user asks for deleting his account, all data in the conventional database gets deleted. What's left in the blockchain is the BlockCoder account ID, which has no relation to any personal information anymore.

Joined to this ID are the IDs of the social networks that the user has connected with his account. But these IDs are encrypted and hashed. This means that even if someone would know your Facebook ID and BlockCoders hashing algorithm, he would not be able to compare the hashed Facebook ID to what is stored in the blockchain, because of the additional encryption.

BLOCKCODER ACCOUNT DELETION
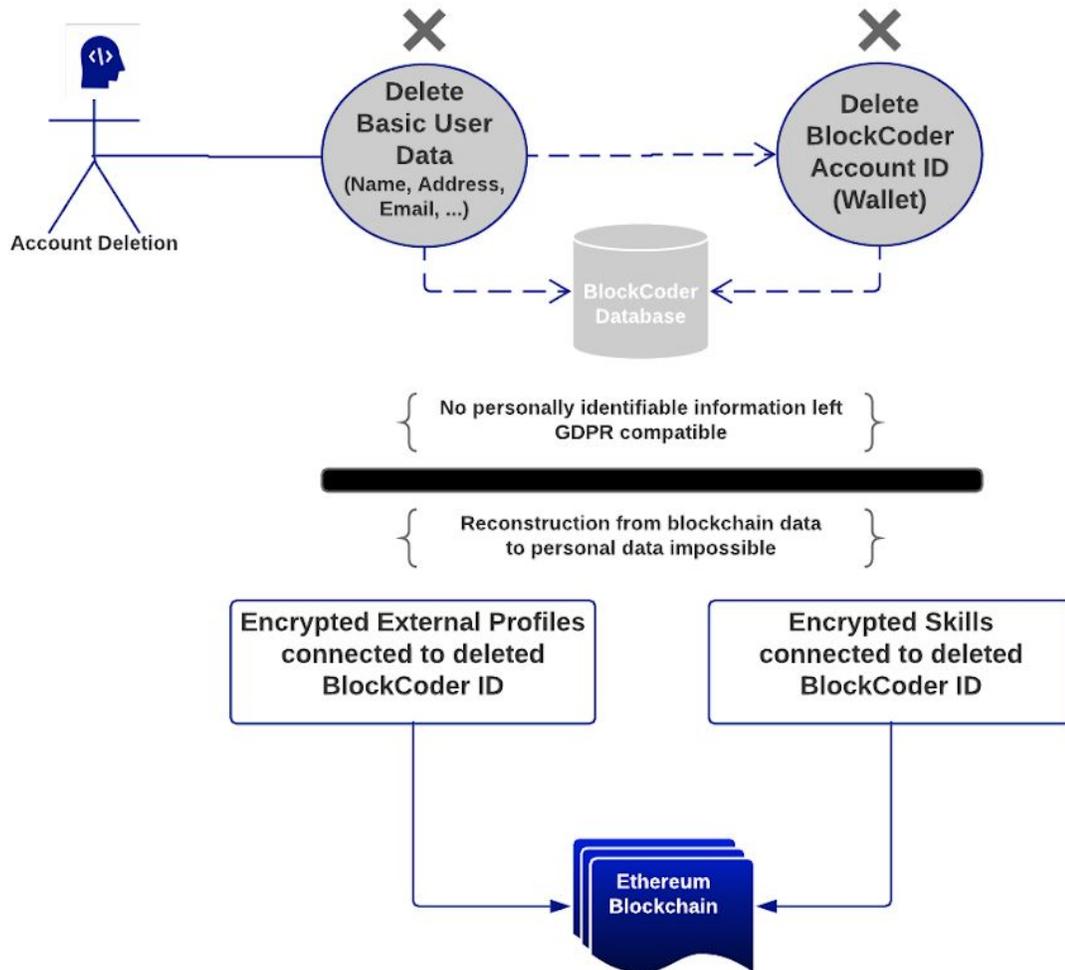
The private keys for the encryption will be generated on a per user basis. This means that even if a private key would be leaked and someone would know BlockCoders hashing algorithm, he would have to iterate through all Facbook IDs and compare the hash with the one that is stored in the blockchain, to finally find out if a certain Facbook account has a BlockCoder account.

Summary: hashing combined with per-account encryption ensures a maximum security against privacy leaks.

Pilot version of the product

BlockCoder is not yet publicly available for testing, but the project already has a kick start: the user interface is under early development and will be used as a click dummy for usability tests.

More information and whitelist: https://blockcoder.io

Product development roadmap

The overall goal of the product development is to create the perfect environment for developers to work remotely with fast and fair payments and for customers to get programming work done reliably and with the best possible quality.

■ MVP Release	■ Focus QA Release	■ Banking Release	■ Agile Release	■ AI Release
30.06.2019	31.12.2019	30.6.2020	31.12.2020	30.6.2021

Milestone 1: "MVP Release"

The first goal of the BlockCoder team is to get a minimum viable product "on the road". This MVP will include all the basic functions needed for the searching, filtering and hiring of software engineers, but also wallet and payment functions and automatic QA evaluations.

As we think that the SCVM (Smart Contract Volatility Management) is key to the system and the most required feature from a developers point of view, we're gonna implement that too from day one for USD and EUR. Other currencies will follow subsequently.

Milestone 2: "QA Release"

While the MVP will be equipped only with a basic QA that takes measures, but leaves the decisions to the customers, Milestone 2 will add some advanced functionality:

First, a customer can agree with a developer on some basic measures concerning code quality, that will be observed by smart contracts in a way that payments will only be issued if all minimum requirements are met.

Second, BlockCoder will introduce the "tips feature", which enables customers to donate some additional money to the developer, when he has done an extraordinarily good job, when he was faster than expected or proactive and forwardthinking.

Along the lines of "put your money where your mouth is", Tips will be used as an additional parameter that adds to the overall reputation and quality of a developer and will thereby influence his ranking.

More information and whitelist: https://blockcoder.io

Milestone 3: "Banking Release"

With this major release, BlockCoder will take its eco system to the next level: by integrating checking accounts in fiat currencies for developers and adding debit cards for easy spending of cash, BlockCoder helps banking the unbanked and bridges the gap between crypto and fiat.

This step will be backed by a European banking partner.

Milestone 4: "Agile Release"

This release adds a feature that will enable customers to handle the whole process of managing a software project inside of BlockCoder. The missing utility for this is a ticket system, that supports agile processes like Scrum or Kanban.

The internal ticket system qualifies developers to discuss and estimate upcoming tasks from a backlog. The customer then checks the estimations and if he agrees, a smart contract is created that watches the outcome of that task as soon as the developer starts working on that ticket.

The customer can decide if he allows automatic or only manual approval of finished tasks. The developer will be paid for the estimated time, no matter if the task took him longer or shorter.

This release is clearly aimed at professional customers with experienced project managers who are used to handle such projects e.g. in the role of a product owner.

Milestone 5: "AI Release"

This release brings artificial intelligence to the identity problem in software development. Our goal is to build on the research of Aylin Caliskan and her fellow researchers in the field of de-anonymizing code by identifying authors through machine learning algorithms.

The goal is to identify the amount of code a developer has written himself - versus copy and pasting it from another source - and to make sure that no developer is pipelining his jobs to some underpaid third world developer and therefore preventing this other developer for getting credit and building reputation.

We see this AI feature mainly as a further component in assuring identity in a system that is built on the trustless concept of the blockchain.

Further milestones:

The BlockCoder team will not stop enhancing the software after all key features have been implemented. For example we are a big fan of the idea of decentralized identity management

and therefore very interested to implement the proposal of ERC725 as soon as there is sufficient support for this technology.

But we see blockchain technology as such a fast moving space, that we would not want to predict what opportunities will arise over the next 2 - 3 years. Our goal is to stay hungry and agile: hungry for being the best freelance platform in the professional industry and agile in adapting to new technological trends and feature requests from the community.

THE COMPANY

BlockCoder LTD is a limited liability private company incorporated in Malta, which is a full member state of the European Union.

We have chosen to establish in Malta given our understanding that the jurisdiction is crypto-friendly in terms of the regulation of token sales. The legal framework of Malta and the overall framework of the European banking system gives security to investors and reliability for entrepreneurs.

The company has contracted Rockstardevelopers GmbH, a German corporation, to develop the initial BlockCoder software with the goal to create a first MVP (Minimum Viable Product).

Rockstardevelopers GmbH was founded in 2013 by Thomas Huhn and has a core team of 11 developers and consultants. Huhn has a diploma in business and information systems from the Saarland University, Germany.

Together with his co-founders Michael Sindlinger and Torben Berger, the Rockstardevelopers team has built up world-class expertise by programming many high profile web and mobile projects for international brands and large enterprises like Mercedes Benz, Audi, Bosch, Credit Suisse, Postbank, BASF, Roche, Osram, Zeiss and more.

The team consists entirely of senior coders and consultants and brings a diverse background including corporate, agency and freelance work.

Rockstardevelopers is located in Mannheim, Germany, in the center of one of the most vibrant and best connected business hubs in Europe.

THE TEAM

A Team full of Rockstardevelopers

The secret to success is BlockCoders fully staffed team of 11 highly skilled people, well known as the "Rockstardevelopers", a Germany-based software development agency, who have already worked together for many years.

This is not only a huge benefit when it comes to complex technical problems or the experience that is needed to build enterprise level solutions, but this is also extremely helpful by having a long term market knowledge about developers needs, professional company requirements and the marketplace for software development services overall.

More information and whitelist: https://blockcoder.io

Just like a soccer team that has played together in hundreds of games and tournaments, the eleven members strong Rockstardevelopers team plays in the champions league when it comes to software development for large scale web applications and apps on the European market, but also on other continents around the globe.

The team is proud to originate from a country known for the highest standards in engineering and is fully committed to work in the tradition of what is required to earn the quality seal of "Made in Germany".

Thomas Huhn

CEO

Thomas is a Software Engineer with an MBA, which is a quite rare, but also ideal background as a founder in the technical space: Thomas not only fully understands the strategic implications of new software technologies like cryptocurrencies, he's even able to develop blockchain solutions in Ethereums Solidity programming language himself. Thomas's experience goes way back to the early days of the dotcom boom 20 years ago, when he started to learn the new art of webdevelopment. Subsequently he was launching dozens of projects, mostly for enterprise grade clients, but some of them also on his own behalf.

One of his widely known projects was lifestrea.ms, a social feed aggregation service that invented the "social news feed" before even Facebook built it into their product. Because of the innovative concept Thomas was invited to the Social Web Foo Camp of O'Reilly, a once per year think tank, located north of San Francisco, with select participants from around the globe, multiple times.

Client work since then included websites and apps for car companies, banks and industrial enterprises. His network of business partners and developers was a foundational part for the success of the Rockstardevelopers company.

Michael Sindlinger

CTO

Michael is a software engineer with 20 years of extensive, daily development experience. His career in one of Germanys largest agencys has confronted him with numerous clients and projects of internationally prestigious brands. He was the lead developer on the Mercedes Benz Online Store, same as for Smart automobiles and many other automotive projects. Michael is a profound team leader and paves his way on a structured path even in the most complex situations. Michael is co-founder of the Germany-based Rockstardevelopers software development agency.

More information and whitelist: https://blockcoder.io

Torben Berger

Developer Evangelist

Torben is a software engineer with 15 years of experience from a long and diverse list of prestigious projects for international clients with big consumer brands. On top of that he's very skilled with all kinds of grafic works, photography, filming and so on. Torben lately found his passion for social media and is an active content producer on Instagram, Facebook and other networks. He will put his words where his heart is, by taking care of developer relations for BlockCoder.io. Torben is co-founder of the Germany-based Rockstardevelopers software development agency.

Chris Grieger

Lead Software Architect

Chris is a software engineer from passion and education. There's almost no programming language that he has not at least tried out or is even a professional user of. Chris is one of the first team members and the solid backbone of any project he's on. His approach to learning blockchain technology was to build his own blockchain from scratch, based on Satoshi Nakamotos whitepaper. There's probably no better way to dig into this topic in depth.

Teaching juniors is his second passion and nobody does a better job in educating young developers in coding skills, best practices and software security. Chris will lead the development team of BlockCoder.io.

Dirk Rossbach

Senior Software Engineer

Dirk is probably the most social developer in the team. In fact he has started his professional career as an educator. After noticing that his private passion for software development was stronger than anything else, he decided to switch jobs, visit university again and getting himself a degree as a developer. Dirk has been working for different agencies and software companies since then and has a very broad background in backend and frontend technologies, also in Android app development.

Helena Maretic

Senior Software Engineer

Helena moved to Germany to start working as a software engineer after finishing University in Croatia. She's fluent in German and English and even more in a wide range of frontend

technologies. Helena has extensive project experience in several industries and was even the lead developer in a long term industrial B2B project with a team of 9 developers.

Thomas Altmann

Senior Software Engineer

Thomas has started his "career" as a software developer at the age of 8, programming some games. He switched to web development at the age of 10 and stayed with this passion throughout his studies until blockchain technology caught his attention. Building his own blockchain was his personal approach to learning this new skill. Today Thomas is one of the most experienced developers in the team when it comes to developing in Solidity on top of the Ethereum network. Thomas is passionate about the idea of BlockCoder, because he knows all the negative aspects of the common job platforms from being a freelancer himself for a couple of years.

Victor Tolentino

Senior Software Engineer

Victor started his education as a software developer in Brazil and moved to Germany to get his masters degree there. He worked as a hardware developer first and later switched to web development. Victor is the perfect guy when it comes to understanding complex machine-oriented problems, which helps a lot in terms of performance optimization.

Niels Grieger

Software Engineer

Niels is like a younger version of Chris, his brother: only 18 yrs old, he already knows more programming languages, best practice patterns and libraries than most senior software engineers. Niels is an extremely fast learner and also a proficient security hacker. At the time of this writing he's already working on the early prototype version of BlockCoder.io since a couple of months.

Marc Ruelius

Investor Marketing

Marc has started his own online business a couple of years ago, while still a marketing student. Together with his wife Leslie he was running a successful online shop for sports clothing. Drawn from this experience, his next entrepreneurial adventure took him into influencer marketing. Being highly interested in the crypto space, he's looking forward to use his broad online

marketing experience to attract the interest of private and retail investors for the BlockCoder tokensale.

Leslie Huhn

Press Relations

Leslie is wife and business partner at the same time to Marc and all the successes she can celebrate have always been the team work of both of them - with one exception: Leslie is a very influential personality on instagram as a so called "beauty blogger". Being an influencer herself she knows what makes the difference between good and bad events and she has already planned, executed and marketed international events on several continents. Leslie will organize the attendances of the BlockCoder team for blockchain events and meetups around the globe.

Vanessa Neumann

Marketing Assistant

Vanessa (nickname "happinessa") is some kind of inofficial "feel good manager" and is always bringing some sunshine into our office, even if the skys are gray. She's helping on all fronts, especially with organizational tasks and with communication. While she's new to the crypto space, she brings a vibrant touch to a highly technical team.

TOKEN DEPLOYMENT & PLAN

Utility Token and Exchanges

BCOC is a utility token with the sole purpose to be exchanged for freelance work. In contrast to most other tokens, the BCOC is backed by something real - the hours of work of software engineers. This work has an intrinsic value, of course.

That said, BCOC is a stored value of a developers work. But obviously there is a global market for software development capacity and the price for software development services are a matter of demand and supply.

As it is impossible to stem against the market forces, BCOC will have to be traded against other currencies on appropriate exchanges. Immediate trading can be expected from exchanges that are specialized in trading altcoins based on EC20 tokens against Ethereum, like e.G. IDEX or EtherDelta.

From there you can easily withdraw your Ether and exchange them on one of the major crypto exchanges, like e.G. Bitfinex oder Coinbase, to your preferred fiat currency.

Future plans include the exploration of features of "Banking as a Service" providers, which should enable BlockCoder to exchange fiat currencies from and to BCOC directly on its own platform and even provide debit cards for the easy usage of developer salaries for payments in local currencies.

Token Sale

	Public Sale Starts	Q4 2018
	Public Sale Ends	Q4 2018
	Min Raise	$5.0m
	Max Raise	$30.0m
	Token	Ethereum ERC20
	Ticker Symbol	BCOC

More information and whitelist: https://blockcoder.io

	Genesis Total Supply	5,555,555,556
	Value	1 BCOC = $0.01 USD

Soft Cap

The first goal of the BlockCoder tokensale is to bring enough liquidity to the internal marketplace to enable the daily payouts. From this goal you could easily derive that the necessary liquidity to handle the daily cash flow (DC) must be the overall average daily rate (AVR) of a developer multiplied with the number of developers that are working actively in contracts (Daily number of Contracted Developers = DCD):

DC = AVR * DCD

But exchanging your BCOC tokens to fiat currencies on a daily basis will mean some effort. Additionally the citizens of many countries are used to a weekly payment schedule (think of the "weekly paycheck"). As a result a habit of exchanging BCOC to fiat on a 5-7 day basis can be expected.

This means that BCOC tokens will be "hodld" by the developers in the meantime, which raises the required amount of money circulation by the factor of the holding period (HP):

DC = AVR * DCD * HP

We expect a considerate entry into the market with a phase of building confidence into the functioning of BlockCoder.io. Later on network effects will start to kick in and fasten up the growth of the userbase (companies and developers). In the following years an exponential growth in international freelancing as a general market trend will start adding up to the natural growth of BlockCoder.io, which leads to forecasting a steadily growing acceleration for the DCD numbers after 3-4 years.

Basically it would be sufficient to let enough fiat cash flow into the BlockCoder marketplace to be able to fully support the payouts of the initial number of contractors. If we take the number of developers from the BlockCoder airdrop program (5.000) and the average daily rate from two recent worldwide developer surveys (median value from Hubstaff and Payoneer is $195), we come to the following numbers:

DC = $195 * 5.000 * 7 = $6.825.000

As we do not expect all registered developers to have a contract assigned to them from day one, we're adding a occupancy rate (OR) to the formula:

DC = AVR * DCD * HP * OR

More information and whitelist: https://blockcoder.io

If we assume a 50% occupancy rate, this leads to the following result:

DC = $195 * 5.000 * 7 * 0.5 = $3.412.500

This calculation is surely running under some assumptions and uncertainties. Especially the occupancy rate will not be known upfront. Another factor, that can influence the market a lot, is the amount of BCOC tokens that is available for sale on the day of the grand opening of the market place. It is surely possible that some market participants are reserving their BCOC tokens for project work that should happen later or that they are simply not willing to sell right away.

Such behaviour would decrease the market supply with tokens and therefore either limit the amount of work that can be handled through BlockCoder.io or it will lead to a rise of the exchange rate of BCOC.

In other words: overall 3.5 mio USD is the basic sum to get the marketplace going, left aside any costs for development, legal consultation, marketing or licensing, which we expect to add up to another 1.5 mio USD until the first launch of the BlockCoder.io marketplace.

That said, the soft cap to get BlockCoder.io's MVP ready for launch, is 5 mio USD.

Hard Cap and usage of funds

The hard cap takes into consideration, that almost all new businesses take a couple of years to get cash flow positive. The first years are determined by investing in growing the user base, expanding to new markets and perfecting business flows.

To be able to get to this point, substantial further funding - on top of the soft cap - is essential. The amount of funding determines much of the speed that is possible in growing BlockCoders marketplace.

If no further funding on top of the soft cap would be available, BlockCoder would have to trust on a slow "word by mouth" growth, maintained by a small development team that can only proceed slowly to major new milestones. Such a scenario would put BlockCoder on serious risk for losing it's advantage to competitors.

That said, to be able to follow our timeline and reach all milestones in a timely manner, the calculation is as follows:

More information and whitelist: https://blockcoder.io

1	$1,50	$2,40	$0,00	$0,10	$0,10	$4,10	$0,43	$23,26	-$3,67
2	$1,50	$2,80	$0,20	$0,20	$0,40	$5,10	$0,86	$18,16	-$4,24
3	$1,00	$3,20	$0,40	$0,40	$0,70	$5,70	$1,72	$12,46	-$3,98
4	$0,75	$3,60	$0,60	$0,60	$1,00	$6,55	$3,44	$5,91	-$3,11
5	$0,50	$4,00	$0,80	$0,80	$1,00	$7,10	$6,88	0	-$0,22
6	$0,50	$4,00	$0,80	$0,80	$1,00	$7,10	$13,76	0	$6,66

All values in MM (millions of USD). "Funding left" assumes a hard cap of $30 MM.

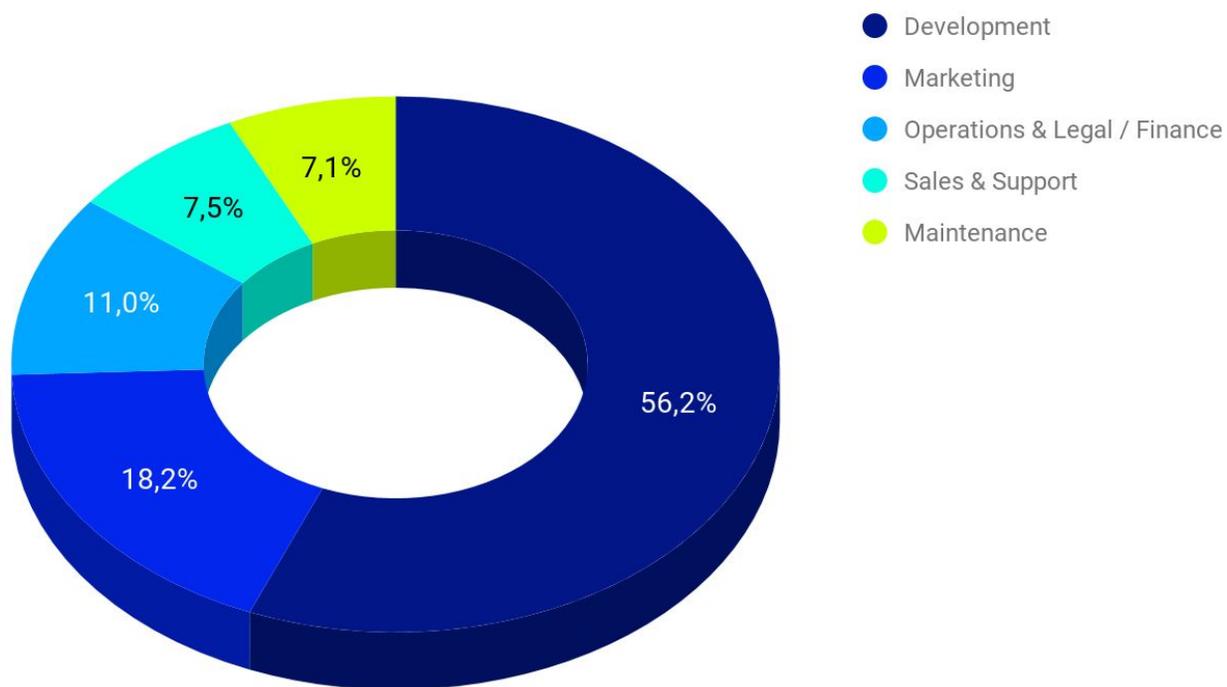|	
1	Starting with 1 office and a team of 11
2	Opening offices in US west and east coast and Japan, expanding the team by 5-6 employees
3	Opening offices in France, Spain and the UK and expanding the team by 5-6 employees
4	Opening offices in Australia (Sydney and Brisbane) and Canada and expanding the team by 5-6 employees
5	Expanding the team by 5-6 employees
6	Running full sales operations in the most important first world countries

In year six after the Token Distribution Event (TDE) BlockCoder will become cash flow positive and will be able to maintain it's business and further growth solely by using the 1% commission fee that's built into the system.

That said, the hard cap to enable BlockCoder's full deployment as a leading marketplace for software development services with local sales presence in the most important markets of the world, is 30 mio USD.

Token Distribution

- Token Sale
- Team
- Airdrop & Bounty
- Advisors
- SCVM Fund

54,0%
25,0%
8,0%
5,0%
8,0%

Funds Allocation

Legend:
- Development
- Marketing
- Operations & Legal / Finance
- Sales & Support
- Maintenance

Values: 56,2% Development, 18,2% Marketing, 11,0% Operations & Legal / Finance, 7,5% Sales & Support, 7,1% Maintenance
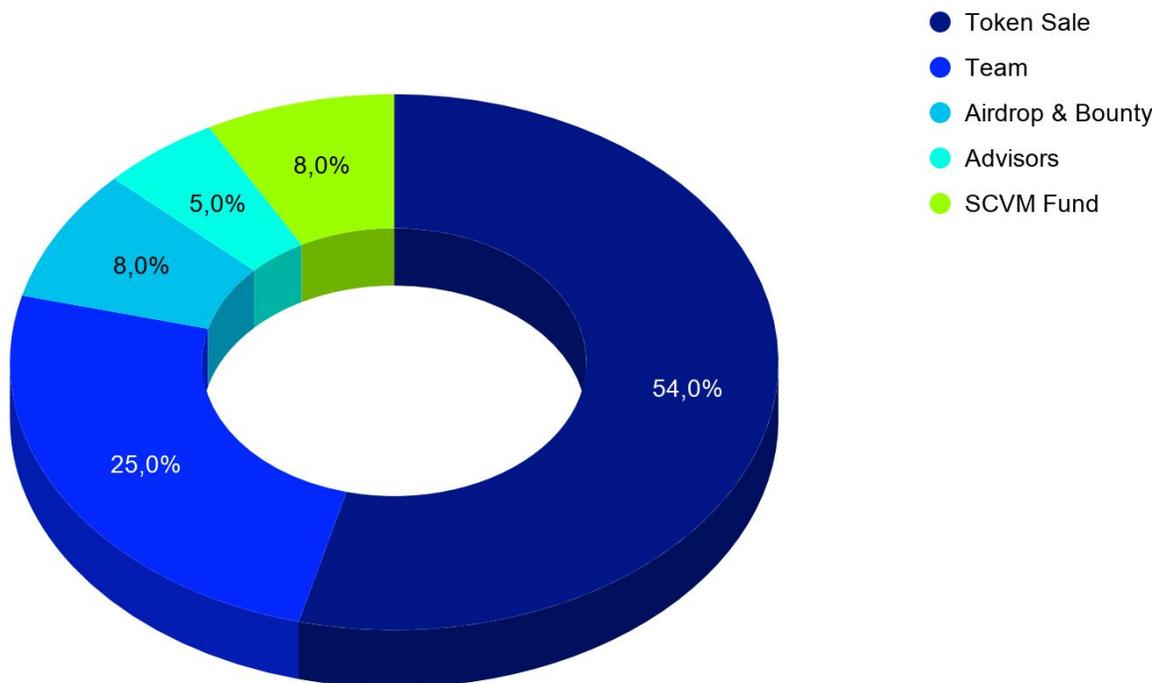
Vesting

The founding team will have a 12-month cliff from the completion of the token sale before being able to dispose of 50% of their allocated tokens. Another 50% of tokens allocated to team and founders will be available for disposal after another 12 months of vesting.