Horizon - White paper

Executive Summary

Horizon NGO is the first decentralized platform for uniting universal basic income initiatives. Built on Ethereum, each Horizon token holder is paid out in Ether, Ethereum's cryptocurrency which currently has a market capitalization of approximately $50 billion (April 16, 2018).

With an established market value since 2014 and a large community supporting the blockchain project, Ethereum was the most logical choice to integrate with. Payouts in Ether are meaningful since the cryptocurrrency already has a substantial value (1 ETH ≈ $500 on April 16, 2018) and it is accepted as a payment method by a growing number of merchants.

Through the so-called "Horizon Factory", organizations are able to create their own independent basic income service, for their target audience only. This service is an instance of the global Horizon basic income service (so with the same functionalities), but it is completely controlled by the organization itself. To fuel Horizon's main financial reserve, needed to pay out its own token holders, each organization pays a small fee for creating a new instance and contributes a wee percentage for each deposit to its own basic income service. The benefits for all are clear. Organizations only need to invest a fraction of what it would normally cost to build an automated basic income service and, by combining the efforts of like-minded initiatives, Horizon NGO is able to build a larger financial reserve for its token holders. The higher the reserve, the more people who can build a basic income for themselves.

To step into Horizon's public basic income service, one or more Horizon tokens can be acquired. A one-time fee per token guarantees an infinite and immutable benefit. Regular payouts to all token holders are made possible by the financial reserve, additionally fueled by donations and partnerships both inside and outside the crypto world. Needless to say that one of Horizon's major tasks is to keep increasing the reserve, so that more tokens can be released and more people can gain higher payout amounts. On a side note, it might be interesting to know that no Horizon tokens will be directly distributed to Horizon team members. They will also have to acquire tokens through the public channels.

In the end, this project is all about trying to create an opportunity for a large group of people to find a way to a more meaningful life. Every bit of financial support could help lead the way to new insights, less worries and hopefully more smiles and happiness. Rome wasn't built in a day, but if we follow Ray Kurzweil's recent prediction, a universal basic income will be common throughout the developed world by the early 2030's and globally by the end of the same decade. Let's make this happen!

Universal Basic Income

When researching the concept of a universal basic income, a lot of information can be found on the internet. According to Wikipedia[1], it's a kind of welfare system in which every community member unconditionally receives a regular sum of money. It should be totally independent of any other income and its intention is to meet a person's basic needs. Obviously, this is not an easy task. Where does this money come from? A growing number of pilot projects, mainly by governments, are trying to figure this out. At the same time, these projects are investigating the effects of such a welfare system on many different levels.

Basic Income UK[2] gives us 11 reasons to support a basic income:

1. It will help us rethink how & why we work.
2. It will contribute to better working conditions.
3. It will downsize bureaucracy.
4. It will make benefit fraud obsolete.
5. It will help reducing inequalities.
6. It will provide a more secure and substantial safety net.
7. It will contribute to less working hours and better distribution of jobs.
8. It will reward unpaid contributions.
9. It will strengthen our democracy.
10. It will make a fair redistribution of technological advancement.
11. It will end extreme financial poverty..

It might sound very promising and some (perhaps all) goals might be within reach with a basic income, but before we get there, quite a few battles will need to be fought. Luckily, a growing number of entrepreneurs, like Richard Branson[3] and Elon Musk[4] for example, are supporting the concept of a universal basic income, so they might inspire others. However, with supporters also come adversaries, so where exactly lies the path to follow? This is what needs to be figured out and Horizon intends to contribute to this exploration.

Horizon's approach is as follows:

1. Build a platform to unite basic income initiatives world-wide.
2. Grow a strong user base of organizations fueling the Horizon basic income service. Additionally, make partnerships deals to further strengthen the financial reserve.
3. Pay out Horizon token holders crypto assets which are worth something.

Build, grow and pay. That's easily said, but what a challenge! Therefore, Horizon NGO has also been looking for additional uses of its platform. Opportunities have been found and are now part of Horizon's strategic plans.

Blockchain Technology

The Horizon platform uses a set of smart contracts written in Solidity, Ethereum's primary programming language. Ethereum[5] is an open-source platform that lets anyone build and use decentralized applications that run on innovative blockchain technology. Quoting Wikipedia[6], "a blockchain is a continuously growing list of records, called blocks, which are linked and secured using cryptography. Each block typically contains a cryptographic hash of the previous block, a timestamp and transaction data. By design, a blockchain is inherently resistant to modification of the data. It is an open, distributed ledger that can record transactions between two parties efficiently and in a verifiable and permanent way. For use as a distributed ledger, a blockchain is typically managed by a peer-to-peer network collectively adhering to a protocol for inter-node communication and validating new blocks". Simply said, Horizon uses secure and immutable transactions, executed by a well-established platform run by thousands of active nodes[7] (more than 16,000 on April 24, 2018).

In summary, Horizon NGO chose to integrate with Ethereum because:

- It is the most mature smart contract platform openly available for public use.
- In its years of existence, it has grown a large community supporting the platform.
- Its network is run by thousands of active nodes worldwide, making it extremely secure.
- Its cryptocurrency (Ether) has already reached a substantial market value.
- It is maintained by a professional team of highly skilled developers.
- Ether is already accepted as a payment method.

In other words, to build a decentralized basic income service, there is no need to reinvent the wheel. No new blockchain needs to be developed when a proven smart contract platform such as Ethereum is already publicly available. Also, there is absolutely no need to create yet another cryptocurrency for paying out basic income token holders when a valuable cryptocurrency like Ether is available and widely adopted by a rapidly growing community. Instead, Horizon focuses on using a solid system to write smart contracts for its basic income service.

Horizon NGO also looks ahead and thinks about the future. Therefore, Horizon smart contracts make use of MiniMe tokens, compatible with the ERC20 token standard. It is a primarily technical standard that dictates a number of rules that a token must implement. ERC20 tokens are used frequently with ICO (Initial Coin Offering) and crowdfunding initiatives. Some sources claim that already more than 20,000 distinct ERC20 tokens been have created for multiple purposes. ERC20 tokens can be traded on many different exchanges, increasingly powered by the decentralized 0x protocol[8].

To manage Horizon's codebase, we make use of the Truffle[9] framework. Precise unit tests are performed to ensure the code has the correct and expected behavior. For linting (to analyze the source code, flagging programming errors, bugs, stylistic errors, and suspicious constructs) both ESLINT[10] and Solium[11] are used. Our front ends use the standard web3[12] API implemented through Truffle's Drizzle libraries.

Horizon Factory

Unlike any other basic income project, Horizon aims to unite basic income initiatives worldwide. To this purpose, Horizon offers a platform where basic income services can be easily set up. This works through the so-called "Horizon Factory" that, basically, creates a copy of the Horizon basic income service at each request. In the back, the Horizon smart contracts keep managing the system, but the newly created service runs independently from the main service and it is completely controlled by its creator, of course.

By using the Horizon Factory, there is no need to invest a lot of money into the development of a custom basic income service. To support the platform, a one-time fee is charged for creating a new instance of Horizon's basic income service and a wee percentage (used only to fuel Horizon's financial reserve) is kept from each deposit to this instance. In other words, the more initiatives that make use of Horizon's platform, the more people can benefit from Horizon's main basic income service. For each party involved, it is a win-win deal.

When creating a new instance, the following data needs to be provided:

- name of the new basic income service
- period length of regular payouts to token holders
- address of the token used for calculating payout amounts
- the amount of Ether in Wei[13] that is paid out periodically per token
- the maximum number of tokens allowed per account

As the Horizon platform works with ERC20 compatible tokens, already created tokens can also be used when deploying a new basic income service. To enable this option, it is only required to register the existing ERC20 token at the Horizon Factory. At the same time, through the Factory, new tokens can be easily created without an additional fee. These tokens are completely owned and controlled by its creators and work exactly as Horizon's MiniMe tokens. This means that tokens created through the Horizon Factory can be used for multiple purposes, so they are absolutely not limited to a basic income service deployed on the Horizon platform. This opens a variety of possibilities and makes one think about endless services that can be combined with Horizon's basic income service!

Horizon Splitter

Independent basic income services created by the Horizon Factory are actually instances of the "Horizon Splitter". It is called this way because it "splits" or divides the collected deposits among all token holders.

Each Splitter instance (also the main one) collects Ether on its Ethereum address. Deposits can be made by simple transactions, sending Ether from any account to the address of the Splitter instance. Deposits to Splitter instances created by the Factory contribute a small percentage (default is 1%) to Horizon's main splitter. Obviously, collected funds remain in each Splitter's "financial reserve" and are only used to pay out its own token holders. The token that is used for calculating the payout amounts is defined when creating a new Splitter instance at the Factory and cannot be changed afterwards.

Collecting income from a Horizon Splitter is easy. Only a simple function needs to be called, nothing more. When called, the Splitter checks the following:

- How many tokens does the caller possess?
- How many periods does the caller need to be paid out?
- For each period, how much Ether needs to be paid for each token?

Splitter tokens can be distributed in many different ways. As Horizon NGO only controls Horizon tokens, distribution of Splitter instance tokens is managed entirely by the Splitter owner. Horizon tokens can be purchased, or obtained through Horizon partners. Horizon tokens are tradable, so they can be sold or donated to others. In general, an Ethereum account can hold one or more tokens, limited by the maximum set in the Splitter instance.

When creating a new Splitter instance at the Factory, a fixed period length is also defined. Its unit is number of Ethereum blocks. The time needed for processing a single block on Ethereum is approximately 15 seconds (can be lower or higher), so if one is aiming for payout periods of 30 days, the Splitter's period length should be 172,800. For each period someone holds one or more tokens, he or she is entitled to a payout amount equal to the number of tokens in each period times the payout value in the corresponding period. The Splitter keeps track of periods already paid and only pays out periods when its financial reserve is big enough to pay out all token holders in that period.

The collect income function can be called at any time and returns the Ether that the caller is entitled to and that can be paid out by the Splitter. Important to know is that calling this function also involves a transaction cost on Ethereum, which increases with the number of periods that still need to be paid. In other words, even when this cost should not be significant, it's a good idea to collect the basic income on a regular basis.

To balance out fluctuations in the Ether exchange value, the Splitter variable used for storing the amount of Ether to be paid out per token can be changed for each period. As most of us still need fiat currencies for paying monthly bills, this is a welcome feature and keeps a relatively good balance in payout amounts. Currently, this variable is updated manually, but future Horizon updates could use an automated service for this, like an oracle[16], for example.

Horizon tokens

Basic Income tokens

Horizon's ERC20 compatible MiniMe[14] tokens will NOT be distributed through an Initial Coin Offering[15]. This would be a completely wrong decision, as we first want to establish a financial reserve big enough to pay out all token holders for at least one year. In this regard, it is likely that the first Horizon tokens will become available through Horizon partnerships, although a very limited amount will be offered for purchase to early bird followers. Important to mention is that Horizon team members will have to acquire the tokens through the same channels as everyone else, so nobody gets advantaged above others.

When Horizon tokens will be distributed to the public, we will offer them through a decentralized exchange, making use of the 0x protocol for example. Based on the financial reserve built until then, we will set a price per token for the sell orders on the exchange. As the target is to have as many people as possible benefit from Horizon's basic income service, several strategies will be used to create the sell orders, so token hoarding becomes quite hard. Also, the Splitter will only accept a maximum number of tokens per account. This value can (and should) increase, so total basic income amounts can grow over time.

Distribution of tokens used by Splitter instances is, of course, entirely controlled by their creator. Horizon NGO might build some tools to assist with this, although a growing number of platforms, like Wings[17] and Aragon[18], already provide these kind of services.

Together with the fees for setting up new Splitter instances through the Horizon Factory, Horizon token sales are collected to support further development of the platform. In a next phase, these funds will be controlled by the Horizon DAO (targeted release date: 4th quarter of 2018).

Transaction tokens

As Horizon tokens are not intended (and therefore not foreseen) to be heavily traded, we will also offer another kind of token that can be used for daily transactions.

At each transaction, these tokens will transmit a micro contribution to a financial reserve used for paying out basic income token holders. This reserve can be the main Horizon reserve or a reserve used by a certain Splitter instance. By using (micro) fees for each transaction, financial wealth is built inside the basic income service, before redistributing these funds among token holders. In other words, redistribution of wealth[19] through daily financial transactions will also be possible through the Horizon platform.

The timeline for Horizon's transaction tokens has not been set yet and will partially depend on partnerships that will require such a token in combination with a basic income service. Talks in this direction have been set up already and will hopefully soon lead to one or more successful partnerships.

Horizon DAO

For transparency purposes, we will build a Decentralized Autonomous Organization[20] that will manage all Horizon smart contracts. This basically means that all decisions regarding Horizon's governance will be voted for by Horizon stakeholders and recorded on Ethereum's blockchain. Most likely, a custom DAO will be built, unless existing solutions prove to be compatible with Horizon's framework.

Partnerships

To continuously fuel Horizon's reserve, many partnerships need to be forged with organizations and companies both inside and outside the crypto world. Important to mention is that not only basic income initiatives are eligible to create Splitter instances. In practice, any kind of platform that runs a periodic payout service (for paying out investors, employees, affiliates, …) can make use of Horizon's platform! Some examples: governments that want to set up a basic income pilot in (part of) their country, impact investment[21] firms who add this option for supporting global sustainability to customized impact solutions, companies that offer tokenized services to clients or shareholders, affiliate programs that wish to add a charity aspect to their platform, … And herein lies Horizon's real strength. In offering a multipurpose set of smart contracts that connects institutions and industries with a universal basic income service that aims to unite initiatives to the benefit of its own token holders.

To each partner, Horizon NGO offers support and help with custom integrations. We can assist with custom smart contract, web3[22], UI and mobile development. Depending on requirements, we can work on-site or remotely. Our head office is located in Germany, not too far from Berlin, from where the Horizon project is managed. Team members are spread across the globe, but many of them reside in Europe.

Horizon partners can be found on Horizon's website and each partner can use a Horizon badge in their communications, to let everyone know that they help fuel a global basic income initiative worth supporting.

Mining

As the Horizon platform makes use of Ether (Ethereum's cryptocurrency), it is not possible to mine[23] Horizon tokens. Instead, we are investigating whether or not to invest in a mining farm solution that could help power the project. As competition is high and profits low (especially with high electricity costs), this might not be a good path the follow, but at least we need to know about the options. We have a few ideas to try and make this profitable, but further research is required before we can come to conclusions. In the meantime, we invite current crypto miners to consider sending a regular contribution of their profits to the Horizon Splitter. Every cent counts and only by working together we can create a successful platform.

Another idea to increase the available financial reserve is through crypto market making[24], but this path needs to be thoroughly investigated as well. However, we will never make decisions that will put the available funds at risk.

Core team

Founder

Dirk von Heinrichshorst[25] is an engineer in electronics and telecom, but has been working in IT his entire career. He spent many years developing his web development skills before starting his own company in Belgium, serving top clients and building innovative prototype applications. After 6 years of leading this company, he switched his focus to business development and started working as a consultant before moving to Germany. By then, he was introduced to blockchain technologies, which seriously caught his attention. For the past five years, he has been setting up blockchain projects with expert developers. Currently, next to the Horizon platform, this includes a dedicated reputation blockchain built on Hyperledger[26].

As a business concept developer, Dirk is very much interested in topics such as machine learning, artificial intelligence, cryptocurrencies, blockchain applications, distributed autonomous organizations, open government, virtual countries, the economy of the common good, open source, open hardware, the internet of things, co-creation, permaculture, self-provision and even quantum energy devices. Together with his love for arts, photography and movies, it has led him on a path filled with exciting discoveries.

To summarize his skill set, Dirk has:

- 25 years of experience in analytical thinking and problem solving
- 15 years in web development, concept development and visionary thinking
- 15 years in business development and customer relations
- 10 years in consultancy, diplomacy and leadership
- 5 years in blockchain technologies

Lead Developer

From an early age on, **Eliott Teissonniere**[27] has been interested in computer science. His passion for cybersecurity, for which he analyzed advanced threats and built cutting edge tools, led him towards blockchain and smart contract development at a time when hardly anybody had heard about Bitcoin. Relatively quickly, he became the CTO of Bitnation[28], "the world's first Decentralized Borderless Voluntary Nation". For Bitnation, Eliott designed complex frameworks to support a reputation system as well as a DAO[29]. As a co-author of Bitnation's white paper, he detailed the inner workings of the systems he developed.

After leaving the Bitnation team, Eliott started to work as a blockchain consultant, helping companies transition to this new technology. He also released the world's first DApp[30] for couples to get married on the Ethereum blockchain.

Strongly focused on artificial intelligence, trustless systems, mesh networks, cryptography and security, Eliott is helping to pave the way for the upcoming digital revolution.

Ambassadors

As partnerships are extremely important for the success of the Horizon platform, we decided to work together with multiple ambassadors, who not only spread the word about our United Basic Income service, but also help us forge strategic partnerships across the world. Needless to say that we still need extra help in this department, so feel free to apply for a position as a Horizon ambassador, joining Amin Rafiee[31], a passionate blockchain advocate who already joined our team from the very start.

Case study

In a certain rural area in Germany, quite a few villages (with about 150,000 inhabitants in total) have joined forces to build a professional glass fiber network, mainly to offer a faster internet to their residents. Not an easy task and without government funding impossible to implement, the initiative is getting support from the telecom provider who has been selected to operate the network. However, in order to succeed, 50 to 60 percent of the current households need to participate in this project.

To motivate everyone to switch to another provider for at least 2 years (with the option to opt out afterwards), many initiatives have been organized by local officials. Unfortunately, by the time the subscription deadline passed, only about 16 percent of the households had decided to join the program. Nowhere near the percentage required to set up the glass fiber project, officials got worried, to say the least. Apparently, most people were not willing to pay an extra 10 euro per month for "the same" (even when they would get a 10 times faster internet) and they feared the uncertainty (mainly new costs) after those 2 years.

In parallel, local officials also started to think about setting up a basic income project in the same region. Although still very early to launch such an initiative in a rural area and although many questions still need to be answered, it was already suggested to look into the Horizon project as a solid platform to set up a basic income service for the local community. On top of this, it was also suggested to consider connecting the glass fiber and basic income projects. What if a deal could be made with the telecom provider, to return 10 euro per month to each customer who also registered for the basic income project? Why would they do that? Well, at least to reach the required quota for an estimated 40 million euro deal. Also, it was calculated that, by setting proper conditions, the provider would be looking at a commercial discount of 3 to 5 percent, which doesn't sound too crazy, especially when you consider that free installations for early subscribers (before the passed deadline), worth 90 euro each, have not been included in the calculations. In other words, the extra benefits already foreseen by the telecom provider would largely cover any commercial discount they would have to give for fueling the local basic income project.

Upon successful implementation, local officials would not only have established a modern glass fiber network for all their citizen to use, but would also have paved the way for setting up a basic income project in their region. Inhabitants would continue to benefit from such a collaboration, as their periodic payouts would go on past those 2 years. Other strategic partnerships can be forged in the area, which would then further fuel the financial reserve needed for paying out the basic incomes. Also, if the officials would decide to work through the main Horizon basic income service (instead of their own), their token holders would benefit from Horizon partnerships made throughout the world as well. At all times, the target is to increase periodic payout values and to offer this basic income to a growing number of local residents.

At the time of writing, talks between parties are still being held, so unfortunately we can't report about any decisions made in this direction yet. Once more information becomes available, we will update this white paper accordingly. In the meantime, we encourage everyone to think about this case study and about how this kind of approach could be applied to their own initiatives, in order to create a win-win deal for all parties involved. Needless to say that we are focusing on quite a few possible partnerships at the moment, with many more to come over time.

Future plans

Right now, we are following the current roadmap, which means:

- Q2 2018: Testnet live
- Q3 2018: Mainnet live
- Q4 2018: Horizon DAO
- Q2 2019: Mobile app

Along the way, depending on which partnerships will be established as we move forward, we could potentially also focus on Horizon's transaction tokens mentioned above, as well as on an additional token standard, ERC721[32], for use in Horizon Splitters. Right now, we are already investigating the possibilities and examining the advantages these kind of tokens might have over regular ERC20 tokens. Reducing Ethereum fees is part of our objectives here. Today however, ERC721 tokens are not supported heavily by exchanges yet, but this will probably change in the near future. It's always a good idea to plan ahead.

As for Horizon's mobile application, we are still in the design phase. It's primary purpose will be to collect Horizon tokens and the basic income they produce. At the same time, we want the app to be configurable for independent initiatives (who have created a Splitter instance through the Horizon factory).

Spreading the word about Horizon, the "United Basic Income" platform, is a never-ending task, of course. We will work hard to show that, by combining forces, we can achieve so much more than just on our own. Feel free to join!

More info

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