**

*InsureNET Whitepaper*

1.1.2020

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1 About this document

The purpose of this document is to give an analysis of basic principles of insurance on the Ethereum blockchain and a deduction on how we can build a token system on top of these principles, which is also sustainable and financially sound allowing transparency for individuals assessing risk.

Everything is built in a predictable way using smart contracts to allow underwriting and risk assessment much faster and extremely accurate (Everyone will have the same up-to-date data at the same time).

1. Expected value of risk
2. Capital costs for long tail risks
3. Transaction costs

*Opportunity for Insurers:*

With the rise of DeFi (Decentralized Finance), insurance is not far behind.

1. Fraud detection and risk prevention
   1. Blockchain has the potential to eliminate error, negligence and detect fraud by providing a decentralized digital repository to independently verify the veracity of customers, policies and claims [with a complete underlying transaction history verifiable on public record] so there is no need to duplicate with a typical audit log.
   2. In many insurance markets, where the insurers sit three to four times removed from the insured and blockchain provides a solution to remove the middlemen.
   3. Based on blockchain’s ability to provide a public ledger and encrypted personal data, many insurers are already exploring its application to reduce fraud and liability associated with immediate payments across borders and multiple currencies.
2. Digital claims management
   1. Mobile and digital technology will become the primary solution for improved and effective claims management and customer service if also coupled with these improved compliance controls.
   2. Claims centric and customer focused looking beyond the typical algorithmic fraud detection methods currently used.
   3. Ability to use a mobile device camera for evidence reduces cost.
   4. Integrating mobile technologies in conjunction with third party services to facilitate claims payments in the event of a natural disaster in any area of the world, ensuring disaster recovery for everyone.
   5. Collecting data from local weather stations and paying claims directly based on that data and location.
   6. Providing accurate, historical data for predictive analytics modeling.
3. New distribution and disruption
   1. There are a number of decentralized applications and platforms are developing alliances with many crypto services to achieve capital efficiencies with single global ledgers and to expand our network. Driving automation to capture risk data using smart contract technology to build market knowledge, automate payments and attract financing risk.
   2. Decisions can be made faster and with full confidence.
   3. Powering innovations in micro-insurance and micro-finance.
   4. Smart contract-based cloud environment.
   5. Develop the concept of mobile wallets, allowing all of their identities and insurance information would be available instantly.
4. Cyber liability – new products
   1. The blockchain adds the ability and the real-time capability for security professionals by focusing on the integrity of the digital assets that comprise the network and configuration of data points.

*Opportunity for Insureds:*

1. Expected value of risk is redistribution of capital corresponding to sharing risks among the policy holders.
2. Capital has to be locked for a certain period of time, and there is potential risk of losing the capital provided. Capital providers are also compensated for this risk and the compensation is calculated based on the time of the ‘lock-up’ of the token and the length of time on which the risk is being insured.
3. We argue that today insurance companies are the predominant way to organize these elements and that blockchain technology provides an opportunity to replace insurance firms by decentralized structures using a standardized protocol. Capital and revenue streams can then be represented by tokens.
4. Our conclusion from this analysis is that we need two types of tokens, one for representing risks - this type will come as a collection of similar tokens, one for each risk pool, we call those “risk pool tokens”. These “risk pool tokens” will be discussed in a separate document, as they underlie a different economic dynamic. The second type of token supports the coordination 1 and economical incentivization of actors in a decentralized insurance system. This is the token to be discussed for a token sale to fund the development of a protocol and platform for decentralized insurance. We call these “platform tokens”
5. In a distributed environment with many participants, building products as a collaborative effort, the platform token serves as glue, as collateral, and as representation of the material and immaterial value of the network, much as Ether serves as a means to secure the stability of the Ethereum Blockchain. In Chapter 4, we detail our proposal for a platform token. Chapter 5 lists some requirements for the sale process of the platform token, and Chapter 6 contains the objectives we try to fulfill with our design.

2 Why is insurance a candidate for blockchain?

3 Analysis of Basic Insurance Paradigms

* 1. Principles of insurance

Lots of literature has been written on the theory of insurance, but the basic principles are simple. Let's start with an example (I took this from the German Wikipedia). The example is not meant 2 to be “realistic” but serves the sole purpose to explain the principle; neither the mentioned time spans nor the used interest rates will be found in actual markets; and of course, most houses are not fully paid as Alice’s house in the following example. Alice has a house. The house is worth $100K. The probability of a complete disaster by fire is 0,1% per year (that is one devastating fire in 1,000 years). Alice wants to ensure that she has access to enough funds to get a new house in the case of a fire. So she decides to get a loan of $100K and has to pay redemption (also called principal) and interest rate. Statistically, she will need one such loan every 1.000 years in the average, so so she will pay $100 redemption each year (this will sum up to $100K in 1,000 years). The mathematical term for this amount is “expected value” of the random variable representing the risk. Additionally, she pays an interest rate of maybe 1%, so she has yearly costs of $1,100 ($100,000 loan \* 1% interest rate plus $100 annual redemption = $1100.00). Now we show how pooling risks in an insurance scheme reduces these costs drastically. Assume 100,000 house owners are coming together in a pool. Again, everybody pays a $100 share; this amount is now called the “premium”. They collect a total of $10,000,000 in premiums. But now there is a difference to Alice, who takes care only for herself: because of the law of large numbers, with a very high probability there will only be about 100 fires, 3 causing a damage of about $10,000,000! And because the sum of all premiums is also $10,000,000, the whole damage can be paid out of the collected premiums, there is no need for every house owner to take on a loan. (Because premiums are collected at the beginning of the year, and all the houses “expected” to burn don’t all burn at the beginning of the year, but more or less are equally distributed over the year(s), there is a so called “float” of liquidity 4 which can also generate a significant revenue. For simplicity, we won’t focus on this effect in this paper. So the costs for each single house owner are now reduced from $1,100 to $100! Such a pool may be designed solely to benefit its’ participants, and to not make any “profit”. If the pool did generate profits, these profits could be distributed back to the participants, effectively reducing the premiums again to a level where no profits are generated. This is the very basic effect of risk transfer in insurance. Please note that the effect increases with the pool size. But still, this is not the whole story. In some years, there are more fires, in other years, less. To account for these variations in damages, the whole pool has again to raise some money, e.g. $10M, to cover the unlikely event of a burst of many fires in one particular year. And let’s suppose that the interest rate for this capital is even particularly high, e.g. 20%. We will have total costs for this capital of $2M. The interest rate for the capital is a function of the risk and the riskless interest rate on the capital market; in an efficient market, the interest rate will compensate for the higher risk in comparison with a risk-free investment and will also contain a fair profit. So basically, this is where profits are generated for providing capital in an insurance structure. The overall costs of $2M are distributed among all house owners, yielding an additional cost of $20 per house owner per year, which is added to the premium. So, after this, there is also a protection against “long tail risks” or “black swan events”, at a cost of $20 per house owner. Again, the risk diversification effect increases with the pool size. Overall, participants now pay $120 per year for their house insurance. To organize 100,000 people in a pool, a professional structure is needed, otherwise, every single participant would have to talk to every other, which would simply be impossible. The operation of this professional structure adds transaction costs to the premium. This is the reason why insurance companies have come into existence: They provide a way to decrease transaction costs for the participants of the pool, creating an economy of scale and coordinating a huge number of participants and employees.

The three elements described above; pooling or risk, risk transference, and efficient administration are necessary. You can’t have insurance without each of them. For the purposes of this paper, I will call them:

1. expected value of the risk

2. capital costs for long tail risks

3. transaction costs

As we have seen, a community may not wish to generate profit from the first element. The second element yields a risk fee for binding capital which depends on the structure of the particular risk: It is typically lower if the risks are granular and uncorrelated; it is typically higher if the risks are clustered or correlated. The third one depends on the complexity of the process. A simple and highly standardized insurance “product” has a smaller transaction complexity than a more complicated, non-standardized product. This will reflect in lower transaction costs. The three elements are completely independent of the underlying technology, economic environment or currencies. They are the atomic building blocks of every risk-sharing system. 6 What conclusions can we draw from analyzing these elements for designing a blockchain-based, decentralized insurance system? The distribution of expected value (element 1) and capital costs for long-tail-risks among participants (element 2) is inevitable and not specific for a blockchain solution. Therefore, let’s focus on the third element. Blockchain is essentially - among other aspects - a way to solve the transaction cost problem without firms. Without the “design pattern” of firms, transaction costs are subject to 7 combinatorial explosions. The coordination costs for n participants are roughly of Order O(n 2) and firms reduce this to O(n). Because of this huge gain in efficiency firms have many ways to hide profits in the transaction costs, and on the other side internal inefficiencies don’t show up fast.

Transaction costs also appear in another context: regulations, which are deemed necessary to protect customers in a context with built in conflicts of interest. Regulations form a very effective “competitor” barrier to entry. While insurance companies often complain about the burdens of regulations, they actually don’t have much interest in reducing these burdens, as they discourage new competitors from entering the market.

1. Problems with traditional insurance

Transaction costs cannot be eliminated completely. But blockchain can help to solve three main problems which pile up costs in traditional insurance companies:

1. Coordination (“managerial”) costs.

2. Conflict of interest between customers and company.

3. Information asymmetry between customers and company.

**Advantage 1.** In traditional firms, you have two types of employees: the first group is doing the actual work, the second group is coordinating the whole system. The larger a company grows, the more energy flows in the second group (like a circle, the first group forms the rim of the circle, the second the area; the larger the circle, the less efficient are the processes, and the more energy flows into the coordination of the coordinators). Blockchain can help reduce these coordination costs. Instead of a posse of managers, “smart contracts” can act as 8 trustless hubs between the agents at the rim of the system, and thus eliminating most of the costs and the inefficiency of the management.

**Advantage 2.** In a traditional insurance company, the company “owns” the whole process, including the tasks which tend to raise conflicts of interest between customer and company. An obvious example is claims management: The claims manager has the explicit goal of minimizing payouts for damages, because he is employee of the insurance provider! Of course, there is a guild of “independent” appraisers and experts, but who pays their bills? Blockchain can solve this conflict of interest, by enabling truly independent experts (who for example may be publicly ranked by their reputation for efficiency or fairness), and whose work is independent of the insurance provider, as well as being transparent and auditable by the whole community. The same is valid for another area, where the conflict of interest is (intentionally) not obvious; consider Product Design. An insurance company has a big advantage over customers, because they can design products in a way which perhaps unfairly maximizes revenues (sales) and minimizes payouts (expenses).

For example if a customer expects a payout from an insurance policy they bought for a particular “event” but the insurance company does not provide the payout because the company maintains that the policy bought doesn’t actually cover that “event”, the customer experience is severely degraded and trust is eroded between consumers and insurance providers.

**Advantage 3**. Information asymmetry is in itself a source of inefficiency and high transaction costs. Insurance companies gather data and information in huge private silos by proprietary means and the data is often not shared., This data and the companies’ experience in analyzing the data is considered one of the main differentiators in the market. The reasoning behind decisions made based on this data is opaque and difficult to challenge. In a blockchain environment, all fundamental data and the decisions based on the data can be transparent and objectively validated.

Requirements and consequences of a decentralized implementation

Requirements and consequences for implementing a decentralized insurance protocol on a blockchain:

1. A protocol needs some means to incentivize participants to use it. Fostering “Network Effects” is one such mean and can lead to a sustainable and growing user base. Why do we need a protocol and not only a single smart contract? While a single contract can handle a single product, this singularity will not generate the network effects which are desirable to form multiple large pools of similar risks needed to get the benefits of the “law of large numbers” working.

2. A decentralized insurance protocol and platform can replace “the firm”, by implementing a standardized set of rules for how stakeholders in the system interact with smart contracts and with each other using the protocol. By this, most of the coordination costs are replaced by autonomous and automated contracts and procedures and enforce efficiency by open market mechanisms. 3. The development and operation of a protocol needs funding. Even if we can drastically reduce the coordination costs, there are still the costs for the initiation of the system - e.g. acquisition of licenses, development of smart contracts, audits, as well as costs for agents at the “rim” of the system which we cannot eliminate completely. Therefore, we need a way to collect these costs from the ultimate customers and distribute them amongst these agents. 9 Network effect is described as the 4. We also need a way to calculate and distribute the expected value of the risk and the capital costs for covering long tail risks amongst the customers. 5. Tokenization may be the solution for these requirements - but only if the token is intrinsically required for the protocol to operate efficiently; i.e. “baked into” the protocol itself and usage of the protocol is only possible via tokens. If the token were not intrinsic to the use of the platform, then some new actor could replicate the protocol except without the token, and migrate users to the new protocol without the friction of a purely "rent seeking" token. The initial distribution of tokens in a “token generating event” has two primary functions; the funding for protocol development is collected and a first user base for the protocol develops. 6. Which tokens do we need and with which properties? a. For the distribution of the expected value, and for the distribution of the capital costs for covering long-tail-risks, we need a type of token which generates a foreseeable profit. The profit solely depends on the underlying risk structure, the number of risks, their correlation, and so on. The value therefore depends only on the knowledge of the risk parameters (which can be incomplete) and mathematics. These tokens will e.g. yield a fixed revenue or generate an equivalent rise in price for their owners (which is equivalent). b. For the distribution of the transaction costs we need a different type of token. This token has to be designed in a way that incentivizes the use and the efficiency of the protocol: the revenue associated with this token or its price should increase with the efficiency and use of the underlying processes. In the next chapter, we describe a proposal for a token with these properties.

Sharing the expected value of risk Assume 100,000 homeowners are coming together in a pool. Again, everybody pays a $100 share; this amount is now called the “premium”. They collect a total of $10,000,000 in premiums. But now there is a difference to Alice, who takes care only for herself: because of the law of large numbers, with a very high probability there will only be 4 about 100 fires, causing a damage of about $10,000,000! And because the sum of all premiums is also $10,000,000, the whole damage can be paid out of the collected premiums, there is no need for every house owner to take on a loan. (Because premiums are collected at the beginning of the year, and all the houses “expected” to burn don’t all burn at the beginning of the year, but more or less are equally distributed over the year(s), there is a so called “float” of liquidity which can also generate a 5 significant revenue. For simplicity, we won’t focus on this effect in this paper. So, the costs for each single house owner are now reduced from $1,100 to $100! This difference asks for an economical explanation. Let’s have a closer look into it. First of all, if all house owners would follow Alice’s example, they would need a huge amount of loans, from which only a tiny part of 0.1% would been needed in the average. It is clear that providing unused liquidity is costly. Pooling of risks in an insurance optimizes the use of capital, and the participants benefit from the reduced costs, not to speak from the difficulties to obtain a loan without collateralization! Second, if everybody only cares for himself, only a tiny fraction of participants is struck by disaster, and have the burden of actually paying back their loan. The others can pay back without loss, as soon as they don’t need protection. In an insurance collective, we have solidarity: with the premiums, everybody pays for the damages of the others. To summarize, the risk pool offers three advantages for the participants: 1. Building a large liquidity pool. 2. Guaranteed access to this liquidity in case of a damage. 3. Mutual subsidizing of damages. Such a pool may be designed solely to benefit its’ participants, and to not make any “profit”. If the pool did generate profits, these profits could be distributed back to the participants, effectively reducing the premiums again to a level where no profits are generated. Such an insurance would have a loss ratio of 100%, because all premiums are used to pay the losses. This is the very basic effect of risk transfer in insurance. Please note that the effect increases with the pool size.

But still, this is not the whole story.

Sharing the long-tail-risks in some years, there are more fires, in other years, less. To account for these variations in damages, the whole pool has again to raise some money, e.g. $10M, to cover the unlikely event of a burst of many fires in one particular year. And let’s suppose that the interest rate for this capital is even particularly high, e.g. 20%. We will have total costs for this capital of $2M. The interest rate for the capital is a function of the risk and the riskless interest rate on the capital market; in an efficient market, the interest rate will compensate for the higher risk in comparison with a risk-free investment and will also contain a fair profit. So basically, this is where profits are generated for providing capital in an insurance structure. The overall costs of $2M are distributed among all house owners, yielding an additional cost of $20 per house owner per year, which is added to the premium. So, after this, there is also a protection against “long tail risks” or “black swan events”, at a cost of $20 per house owner. Again, the risk diversification effect increases with the pool size. Overall, participants now pay $120 per year for their house insurance. The loss ratio is now reduced to 83% because of the capital costs of protecting the long tail risks.

Sharing the transaction costs to organize 100,000 people in a pool, a professional structure is needed, otherwise, every single participant would have to talk to every other, which would simply be impossible. The operation of this professional structure adds transaction costs to the premium. This is the reason why insurance companies have come into existence: They provide a way to decrease transaction costs for the participants of the pool, creating an economy of scale and coordinating a huge number of participants and employees. The 7 effect is considerable and enables the modern form of insurance with huge customer bases and a capitalization which can cover even global catastrophic events like hurricanes and earthquakes. However, the remaining transaction cost are still considerable: a recent study by KPMG shows the impact on the loss ratio, which is about 66% in the average.

Information asymmetry Together with the reduction of transaction costs comes an asymmetry of information, which leads to a further increase of costs and to incredible profits for the big insurance companies. The unbounded collection of customer data and the exclusive exploitation of this data is a consequence of this imbalanced relationship. It creates an “unfair competitive advantage” for existing companies: companies with big data vaults can offer better products, and thus further optimize their data base. One of the core goals of a decentralized insurance platform is the disruption of this circle, giving back to customers the ownership of their data.

Summary The three elements described above; pooling or risk, risk transfer, and efficient administration are necessary. You can’t have insurance without each of them. For the purposes of this paper, I will call them:

1. expected value of the risk

2. capital costs for long tail risks

3. transaction costs as we have seen, a community may not wish to generate profit from the first element. The second element yields a risk fee for binding capital which depends on the structure of the particular risk: It is typically lower if the risks are granular and uncorrelated; it is typically higher if the risks are clustered or correlated. The third one depends on the complexity of the process. A simple and highly standardized insurance “product” has a smaller transaction complexity than a more complicated, non-standardized product. This will reflect in lower transaction costs. The three elements are completely independent of the underlying technology, economic environment or currencies. They are the atomic building blocks of every risk-sharing system. 9 As an additional aspect we have seen the information asymmetry which is inherent in the traditional insurance systems, and which is undesirable. The distribution of expected value (element 1) and capital costs for long-tail-risks among participants (element 2) is inevitable and not specific for a blockchain solution. Therefore, let’s focus on the third element.

Blockchain is essentially - among other aspects - a way to solve the transaction cost problem without firms. Without the “design pattern” of firms, transaction costs are 10 subjects to combinatorial explosion. The coordination costs for n participants are roughly of Order O(n 2) and firms reduce this to O(n). Because of this huge gain in efficiency, firms have many ways to hide profits in the transaction costs, and on the other side internal inefficiencies don’t show up fast. Transaction costs also appear in another context: regulations, which are deemed necessary to protect customers in a context with built in conflicts of interest. Regulations form a very effective “competitor” barrier to entry. While insurance companies often complain about the burdens of regulations, they actually don’t have much interest in reducing these burdens, as they discourage new competitors from entering the market.

Blockchain can help to solve issues of traditional insurance While the current insurance business has evolved over centuries, and is optimized in many aspects, we have seen that it has severe shortcomings to the disadvantage of customers. We will outline some properties of an alternative system, which remedies these shortcomings. First, an alternative system should of course offer the basic ingredients of any insurance system: covering expected losses, covering long tail risks, and covering of necessary transaction costs. Obviously, we need ways to capitalize such a system, and we need a system to reduce transaction costs to a minimum. Transaction costs cannot be eliminated completely. But open markets have proven to be a solution for these challenges, and therefore, we propose a market-based approach with two components: - an open marketplace for capitalization of risks - an open marketplace for insurance related services This is where blockchain comes into play: a decentralized solution on blockchain can implement such open marketplaces in a way that is collusion resistant and has no single points of failure. We can watch the emergence of many such marketplaces for different domains, like computation, file storage, exchange of assets; and insurance is just another domain in this respect. More specific, blockchain can help to solve four main problems which pile up costs in traditional insurance companies: 1. Coordination (“managerial”) costs. 2. Conflict of interest between customers and company. 3. Information asymmetry between customers and company. 4. Access to risk pools Advantage 1. In traditional firms, you have two types of employees: the first group is doing the actual work, the second group is coordinating the whole system. The larger a

company grows, the more energy flows in the second group (like a circle, the first group forms the rim of the circle, the second the area; the larger the circle, the less efficient are the processes, and the more energy flows into the coordination of the coordinators). Blockchain can help reduce these coordination costs. Instead of a posse of managers, “smart contracts” 11 can act as trustless hubs between the agents at the rim of the system, and thus eliminating most of the costs and the inefficiency of the management. Advantage 2. In a traditional insurance company, the company “owns” the whole process, including the tasks which tend to raise conflicts of interest between customer and company. An obvious example is claims management: The claims manager has the explicit goal of minimizing payouts for damages, because he is employee of the insurance provider! Of course, there is a guild of “independent” appraisers and experts, but who pays their bills? Blockchain can solve this conflict of interest, by enabling truly independent experts (who for example may be publicly ranked by their reputation for efficiency or fairness), and whose work is independent of the insurance provider, as well as being transparent and auditable by the whole community. The same is valid for another area, where the conflict of interest is (intentionally) not obvious; consider Product Design. An insurance company has a big advantage over customers, because they can design products in a way which perhaps unfairly maximizes revenues (sales) and minimizes payouts (expenses). For example if a customer expects a payout from an insurance policy they bought for a particular “event” but the insurance company does not provide the payout because the company maintains that the policy bought doesn't actually cover that “event”, the customer experience is severely degraded and trust is eroded between consumers and insurance providers. Advantage 3. Information asymmetry is in itself a source of inefficiency and high transaction costs. Insurance companies gather data and information in huge private silos by proprietary means and the data is often not shared., This data and the companies’ experience in analyzing the data is considered one of the main differentiators in the market. The reasoning behind decisions made based on this data is opaque and difficult to challenge. In a blockchain environment, all fundamental data and the decisions based on the data can be transparent and objectively validated.

Advantage 4. The risk pools of traditional insurances are attractive investment vehicles, but currently, they are not open to the public, and the profits generated benefit only a small circle of investors. Blockchain can democratize the access to similar instruments, by tokenizing risks with “Risk Pool Tokens”, see our 2016 whitepaper for details. We will consider issuing of such tokens at a later point of time.

Requirements and consequences of a decentralized implementation to offer an alternative to traditional company-centric insurance systems, we can identify some requirements and consequences for implementing a decentralized insurance protocol. 3.4.1 General requirements for decentralized insurance 1. We need a protocol and not just an (decentralized) application. Insurance is way too complex to be covered by a single application, and needs some means to incentivize participants to use it. Fostering “Network Effects” is one such mean 12 and can lead to a sustainable and growing user base. While a single contract can handle a single product, this singularity will not generate the network effects which are desirable to form multiple large pools of similar risks needed to get the benefits of the “law of large numbers” working. Decentralized insurance will work only if the value chain is decomposed and there is a way different participant can cooperate on the process in an interoperable way. A standardized protocol defines this way. The (architecture of the) protocol is the sole “central” part in the model. 2. A decentralized insurance protocol can replace “the firm”, by implementing a standardized set of rules for how stakeholders in the system interact with smart contracts and with each other using the protocol. By this, most of the coordination costs are replaced by autonomous and automated contracts and procedures and enforce efficiency by open market mechanisms. At the same time, a protocol does not impose a fixed set of code to the participants, but allows for flexible extension and interpretation of the basic rules. 3. The development and operation of a protocol needs funding. Even if we can drastically reduce the coordination costs, there are still the costs for the initiation of the system - e.g. acquisition of licenses, development of smart contracts, audits, as well as costs for agents at the “rim” of the system which we cannot eliminate completely. Therefore, we need a way to collect these costs from the ultimate customers and distribute them amongst these agents.

1. We also need a way to calculate and distribute the expected value of the risk and the capital costs for covering long tail risks amongst the customers. 3.4.2 Requirements for token 1. Tokenization may be the solution for these requirements - but only if the token is intrinsically required for the protocol to operate efficiently; i.e. “baked into” the protocol itself and usage of the protocol is only possible via tokens. If the token were not intrinsic to the use of the platform, then some new actor could replicate the protocol except without the token, and migrate users to the new protocol without the friction of a purely "rent seeking" token. 2. Protocol tokens: For the distribution of the transaction costs we need a different type of token. This token has to be designed in a way that incentivizes the use and the efficiency of the protocol: the revenue associated with this token or its price should increase with the efficiency and use of the underlying processes. In the next chapter, we describe a proposal for a token with these properties. 3. Risk Pool tokens: For the distribution of the expected value, and for the distribution of the capital costs for covering long-tail-risks, we need a type of token which generates a foreseeable profit. The profit solely depends on the underlying risk structure, the number of risks, their correlation, and so on. The value therefore depends only on the knowledge of the risk parameters (which can be incomplete) and mathematics. These tokens will e.g. yield a fixed revenue or generate an equivalent rise in price for their owners (which is equivalent). This type of token will be implemented in a second step. 4. Now that we have elaborated the necessary token types, we can backtest if these tokens are “necessary” Etherisc will build an economic space for decentralized insurance The space will have a broad set of participants, customers, service providers, risk carriers, etc., the goal is to incentivize these participants to cooperate and behave well, and in line with the interests of the whole space. This space is difficult to build. It comes at a cost. What adds value to the space: Page 15 Building Block Consists of Resistance against forks & copycats Licenses Formal approval by authorities Cannot be copied Operational Model Infrastructure to run a business Cannot be copied Products Code (Frontend/backend) infrastructure Certifications/Audits Developers Product managers Tech can be copied, but products are micro-ecosystems with development roadmap, user base, customer support, core development team, supporters and contributors Users Customers Supporters Contributors Cannot be copied Network Formal or informal Relations to other projects, Cannot be copied. Relations to other projects are based on common vision.

Conclusion: only tech can be copied easily. Most of the value-bearing components of the economical space (the value that participants bring) can’t be copied easily the economical space will offer opportunities to generate profits. These profits should benefit those who have participated to build up the space, and they will expect the platform to protect their participation. Reason: If you have two identical platforms, one platform with some kind of protection mechanism for its creators and contributors and one platform without such protection. The platform with protection will of course attract more contributors. It will have the stronger network effects. A platform without protection is subject to the “Tragedy of the Commons” In the prospect of decentralized exchanges the use of a token is no longer a barrier. 3.5 Protocol

3.5.1

Owner of the protocol, governance as an open standard, the protocol will be a common good, it can be used and implemented by whoever likes it. We will take care that the entry barriers are as low as possible. However, for some portions of the protocol a certification will be necessary, to reflect regulatory obligations and restrictions. Page 16 We propose a swiss based foundation as legal body, which formally holds the IP rights of the protocol and ensures that the protocol can be used freely. We will establish a continuous, community driven protocol improvement process similar to the EIP process for the Ethereum Platform.

Outline of workflow elements of the protocol

● Application for policy Process of offering a product and applying

● Underwriting Process of accepting a policy

● Collection of premiums Payment process, one-time and regular payments

● Submitting of claims Process of submitting a claim, via oracle or manually

● Claims assessment Process of assessing a claim, via oracle or manually. A claims verification process allows the system to determine which policies are legitimately claimed and to propagate agreed payments to claimants. In the case of parametric insurance, this process references data feeds about insurable events and is (fully) automated.

● Identity Management & Privacy Process of KYC and AML, respecting privacy. This may involve private chains or off-chain storage of data.

● Admission / Certification Admission of participants to offer products and perform parts of the protocol

● Asset Management As funds flow in, we have to responsible use funds which are not immediately needed.

Community of customers, users and companies The success of the platform will depend of a vivid community of users and companies. The token model should reflect and support this community. This community will play a central role in the realignment of incentives. Via tokens, customers can “own” their insurance. The community model should facilitate the development of future mutual and P2P-Insurance models. A community cannot be built from the outside, it has to grow from the inside. However, experience shows that there are some success criteria for communities.

1. Famous open source pioneer Pieter Hintjens, http://hintjens.com/blog:10 has drafted some which we consider to be helpful for an in-depth discussion:

● Quality of mission A community can only grow pursuing a worthwhile goal. The goal must be super-individual and Page 17

● Freedom of access. The community should not have barriers or walls, it should welcome those of good will and encourage participation.

● Well-written rules. If rules are necessary, they should be carefully written and obvious.

● Strong neutral authority. To resolve conflicts, a strong but neutral authority should be in place, which can also be incorporated by some kind of governance mechanism.

● Proportional ownership. "You own what you make"

4 Proposal for a platform token

The proposed platform token is an integral part of a system consisting of a protocol and a platform.

4.1 Protocol

The Protocol is a collection of Smart Contract Templates, Rulebooks, Standards, Best Practices which are developed and maintained by the community. There are many possible governance schemes for such a protocol; we intentionally don’t make a prejudice on which model should be chosen; this will be part of the protocol development. The governance should fit to the participants using it. Of course, meanwhile blockchain offers some interesting tools to formalize governance, but that should be left to developers and users.

4.2 Platform

The platform is the (sub) community of all entities which make use of the protocol, and which are connected by a common economic interest. Providing insurance is a complex process, involving possibly many participants, as we have seen above.

● Customers of an insurance need to rely on the smooth operation of these participants.

● Fees have to be distributed along the value chain, but only if all parts of a process have been appropriately fulfilled

● Participants supplying critical parts (e.g. a risk model) have to assume liability for their work.

● Some services are needed by many participants, so it makes sense to offer them as shared services. The platform will serve as marketplace for insurance-related services, which are offered according to the open protocol standard and which are therefore always interoperable.

4.3 Role of the iNET token

To make long story short, we need some strong economic principles to ensure the proper working of all participants and their cooperative, mutually supportive behavior. Therefore, we have designed the platform tokens to bind participants to the platform and to assure the quality of the provided services. We are effectively implementing what is known as "Proof of Stake", - a method of achieving consensus between multiple actors, - focusing on the specifics of the risk transfer. We would like to decompose the value chain as far as possible and to engage market mechanisms to select those participants which offer a service at the best value. This is quite similar to the operating mode of a blockchain: Miners have an economic incentive for cooperative behavior. Some aspects of “good-behavior” comprise stability properties like:

● Promise to offer a certain service over a certain time (service stability)

● Promise to offer a certain service in a certain quality / with a certain SLA (quality stability)

● Promise to offer a certain service at a certain price (price stability)

● Promise to take a certain liability for a service (guarantees) We propose to secure the platform and the products built on that platform via the platform token. Participants (not customers) will need a certain number of tokens to enter the platform “ecosystem”. These tokens are locked as collateral. Depending on the service offered, a different number of tokens will be required to avail of the platform or provide services on the platform. Simple services require a small number of tokens, complex or critical services will require a higher number of tokens. The number of tokens which have to be provided as collateral will correlate to the potential damage from participant misbehavior or from the violation of the platform terms. These parameters may be subject to a platform governance model (in the future) where participants have voting power based upon tokens owned. Or, governance may be conducted automatically by the use of smart contracts.

The proceeds from token sale(s) are used to nurture the development of the platform and to establish or provide central services as long as there is no independent participant providing them. The exact definition of “Proof of Stake” in this context is subject to ongoing research and discussion. A certain insurance product needs a collection of services chained together to some business process. Participants offering these services can organize to offer such a product (maybe there is a market for such services and a “product management service” doing the coordination work). It is even possible that the fees for some of the services offered by participants in the ecosystem may be negotiated on an open-market platform. The protocol will offer ways to distribute the premium to the various risk pools and to the participants who provide product “processing”.

4.4 Use of the protocol outside the platform

The protocol can - of course - be used outside the platform. However, every single use of protocol standard outside of the platform will always lack the following:

● the support of the platform

● economies of scale and cost benefits proved by the platform

● access to the platform’s “commons” - i.e. services offered by the community of all participants for the benefit of all.

● the securing and integrity mechanisms

● the stability assertions (service, quality, price, liability) 4.5 Many platforms?  It can be argued that in principle several platforms could exist in parallel. That’s true - nothing prohibits to launch a second, identical platform. This is analog to the existence of altcoins. However, an altcoin can be launched at substantially lower costs than an insurance platform, making the existence of parallel platforms quite improbable.

4.6 Platform without token?

Can the platform exist, and maybe even be better, without a token? We argue that it cannot as the core function of the token is to serve as the collateral to enforce the proper behavior of all participants of the platform. A platform without a (similar) token will simply not have the trustworthiness needed for insurance applications, because the participants would not have incentives to behave as they should.

All parties have the same risk data at the same time and underwriters can rate based on that data. The data is linked to smart contracts which can be programmed to react and trigger automatic processes. Clear immutable audit trail for end-to-end claims processing and underwriting.

Platform would create more collaboration and transparency for all parties and with many of the activities automated, it would reduce administration costs. Focus could now be trained on higher-value activities such as better client service.

InsureNet platform demonstrates how blockchain can give organizations real-time access to client, risk, exposure and claims data.

Appendix:

**Problem Statement:**

**Mission & Vision:**

How will blockchain (InsureNET) make insurance work better?

* Real-time decision making becomes a reality as error-free data moves quickly from risk to capital.
* Process fulfillment, enabled by smart contracts running on the Ethereum blockchain, is faster, more accurate, more consistent and much cheaper.
* The ecosystem uses a consistent central dataset also on a decentralized network IPFS also providing super-fast access to losses quickly.
* Automation of invoicing initiates settlement between all contracting parties and their financial systems.
* Participants can innovate new products and services without traditional cost challenges.
* Auditability and controls around contracts better support and enables the multinational law.

**Roles & Incentives:**

**Customers:**

**Agents:**

**Underwriters:**

**InsureNET:**

Tokenizing the policy assets on the blockchain.

Policy Ownership

Stakeholder payouts – how much and how often?

**Partners:**

* ACORD - information exchange regulation in the insurance industry

InsureNET payouts – how much and how often?

Fee schedule?

**Distribution Plan: (iNET ERC20 Token)**

iNET Tokens Uses:

* Purchase policy
* Pay commissions and fees
* Pay claims to Insureds, they can convert to ETH at their discretion
* Pay employees who can exchange or hold as well
* Pay stakeholders

How many tokens will be issued?

total supply = 100,000,000 (100 Million)

How many sold during each stage of sale?

Private, Pre and Post sales (Bonuses)

How will we issue additional tokens?

Value: 1 ETH = 100 iNET

**Growth Potential:**

**Ethereum Wallet Address Growth:**

**Total Transactions Value Growth:**

**Distribution Plan (iNETa ERC721 Authentication Token)**

These tokens are for our clients, insureds, agents, brokers, stakeholders, investors, employees and owners to authenticate on our platform of services.

**Platform Release Date:**

Ethereum MainNet:

Ethereum Rinkeby:

Ethereum Kovan:

Ethereum Ropsten:

**Roadmap:**

*03/2020 –*

*05/2020 –*

*08/2020 –*

*12/2020 –*