The Veris Foundation

Authorization, Eligibility, and Settlement for Healthcare Services via Smart Contracts, and Proof of Stake to Reduce Expense, Decentralize the Process, and Reduce Healthcare Expense

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The Veris Foundation

Abstract: The Veris Foundation solves the problem of bringing healthcare service providers, insurers, and banks together to authorize the provisioning and payment for healthcare services. The utilization of blockchain technology allows for this process to be decentralized, removing risk from any single stakeholder. The Veris business model-combined with blockchain technology -will increase the efficiency and effectiveness of the healthcare industry as a whole. The vision of the Veris Foundation is to significantly reduce the cost of authorization and settlement services, by up to $59B per year, while providing insurers more recent data for actuarial models, and growing the utilization of Healthcare Savings Accounts (and similar financial instruments) managed by banks.

The Veris Foundation is the name given to this platform as well as the business entity, 'ver' being Latin for 'spring' and 'veris' Latin for 'truth'.

Background

The healthcare market in the United States is one of the most heavily regulated and fractured markets in existence. Many processes between providers and insurers are redundant, and thus add unnecessary expense to all parties. These expenses are estimated to be in excess of $59B per year. This fragmented system is a result of stakeholders unwilling to assume the risk associated with designating an intermediary to handle processing of data related to healthcare services between all stakeholders. The result is a duplication of this process at every provider and payer involved in healthcare services. Moving to a central authority-or clearinghouse-for all healthcare services would dramatically reduce expenses for both insurers and providers. No concerted effort to move to a central clearinghouse has occurred yet, as the existing expense is clearly not as high as the risk of moving to a centralized intermediary. A central clearinghouse based on conventional technology systems would also require an overwhelming amount of trust. A blockchain's distributed ledger system allows users to interact with each other without relying on trust. Every transaction is completed with absolute certainty, allowing a versatile system capable of replacing the thousands of fragmented systems which currently facilitate this process.

Removing the need for a high level of trust would open all three of these parties to a solution where the motivations of each group can be satisfied in a mutually beneficial manner. Each group has the following motivations:

> *Providers* – 5-10% of providers' total expense is processing claims. In 2015, the total expenditure on healthcare services was $3.2T, or $9,990 per person[1] on roughly eight billion transactions per year. 20% of this expenditure was for physicians alone. Total penetration into healthcare services would impact $160M to $320M in provider spending per year. Veris will reduce this significantly, and while not reaching $0, will create free market forces driving this expense downward to a point where the market determines the added value of processing claims. Additionally, Veris will reduce the impact that late

[1] https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/downloads/highlights.pdf

receivables have on a provider's cash flow, thus increasing liquidity in a business that is often asset intensive.

Insurers – Insurance providers currently process claims by comparing patient data to their privatized repositories of rules and policy data. These rules are not publicly available, yet must be used in conjunction with smart contracts to streamline the process. This can be done by also appealing to their need to control expenses as most payers are currently under shareholder pressure to produce higher returns. Additionally, the Centers for Medicare and Medicaid Services (CMS) have a vested interest in reducing the overhead of the claims process

Payers can also be further incentivized to utilize Veris as all payers on the chain will be able to view the healthcare services authorized by the provider (but not reveal individual patients who have received specific treatments). This data is real-time and transparent. This provides payers greater detail to use within their actuarial models, and should lead to better forecasting.

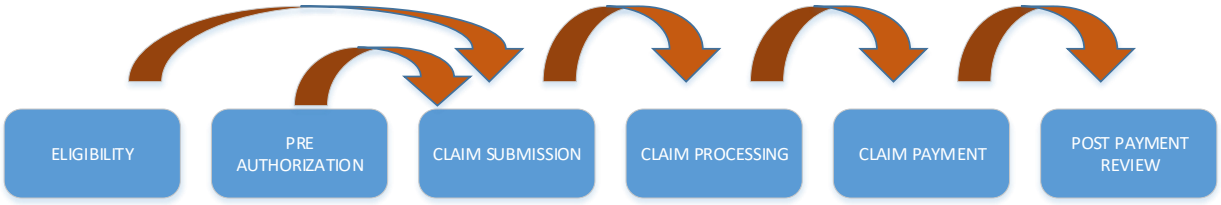
Banks – Financial institutions are interested in capturing and converting as much of consumer and business spending on health insurance and health-related services as possible to Healthcare Saving Accounts. Ultimately banks would prefer to persuade employers to stop buying health insurance for employees and instead make a defined contribution to an employee's 'HSA-like' account where the employee will purchase their own insurance. Management of these funds provides an additional revenue stream for the bank.

Currently there is approximately $28B in HSA accounts[2] with an enrollment of 20 to 22 million people. HSAs are only offered by roughly 30% of employers; of those HSAs under management, only 3% have invested any of their assets. Veris integrates payment to providers in a seamless fashion to encourage the growth of the HSA and HSA-style accounts managed by banks.

[2] https://www.ebri.org/pdf/briefspdf/EBRI_IB_416.July15.HSAs.pdf

An Introduction to Claims Processing in the United States

The process of obtaining healthcare services from a provider includes five (or when the payer requires pre-authorization, six) distinct components. Each provider and payer has their own internal resources (human and information systems) to facilitate the process. The process is also completed by both sides of the transaction–as both payer and provider maintain separate record keeping systems. This process is illustrated in the diagram below.



Eligibility – A provider establishes the identity of the patient to be treated, the eligibility of the patient's insurance plan, and checks with the insurer to see if the procedure is covered by the insurance policy. The result of this step is the ability to alert the patient to co-pays or other payments due as a result of service.

Preauthorization – Some payers require that providers request a preauthorization for specific procedures (this varies with individual payers and procedures). In this case, the provider submits relevant data to the payer. The payer then responds, either confirming or denying authorization for the procedure.

Claims Submission – Once the procedure has been performed by the provider, it is submitted to the payer for payment. This process can be done electronically via systems, via telephone, or via hardcopy paper submission.

Claim Processing – This is an interim step that is used to determine if a provider will receive payment for a service from a payer. The claim is compared to criteria set by the payer to determine if the claim should be paid or denied.

Claim Payment – The claim is paid. This is typically done in a batch of multiple claims for one provider. Payment can be made either via ACH or paper check.

Post-payment Review – Situations occur where a payer makes an adjustment to a payment after the fact. This typically results from some form of post-payment audit triggered by a set of criteria run against all claims processed. They are then manually reviewed to determine if payment criteria is met. (This process could be completely removed with the implementation of smart contracts).

Estimates of the total expense in this process have been examined by CAQH. A 2013 study[3] performed by CAQH estimates that payers and providers process the following number of transactions on a yearly basis. Note that manual and electronic transactions have been combined. In 2013, manual transactions represented roughly 5-10% of all transactions of a specific type. The exception is for claims payments and remittance advice, of which manual transactions represented up to 50%.

Nationwide Projection (in billions)	Payer and Provider
Claims Submission	3.1
Eligibility Verification	3.1
Prior Authorization	.15
Claim Processing	.7
Claims Payments	.5
Post-payment Review	.4
TOTALS	**7.95B**

Note: Transaction counts do not include separate retail pharmacy benefits.

The expense associated with each step of the process were examined and detailed below.

Process	Estimated Expenses (USD)
Claims Submission	.54
Eligibility Verification	.22
Prior Authorization	5.38
Claims Processing	.29
Claims Payment	.51
Post-payment Review	.51
TOTALS	$7.45

Note: Expenditure estimates are included for existing electronic processes, expenses for manual processes are higher and are excluded from these figures.

An average of $7.45 per transaction, considering there are nearly eight billion yearly transactions of this type, illustrates that nearly $59.6B of the yearly expense of three trillion dollars is due to the process of providers being reimbursed for services rendered.

[3] https://www.caqh.org/sites/default/files/explorations/index/report/2013Index.pdf

For a regional insurer that has one million people insured, this represents, on average, 22.3 million claims submissions every year. For a five-year period, the expense for this regional insurer to process claims is (assume claim growth of 2% per year, all $ in millions):

Process	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Claim Submission Expense	$12	$12.3	$12.5	$12.7	$13	**$62.5**
Eligibility Verification Expense	$4.9	$5	$5.1	$5.2	$5.3	**$25.5**
Prior Authorization Expense	N/A	N/A	N/A	N/A	N/A	**N/A**
Claim Processing	$6.5	$6.6	$6.7	$6.9	$7	**$33.7**
Claim Payment	$11.4	$11.6	$11.8	$12.1	$12.3	**$59.2**
Post Payment Review	$11.4	$11.6	$11.8	$12.1	$12.3	**$59.2**
TOTAL	**$46.2**	**$47.1**	**$47.9**	**$49**	**$49.9**	**$240.1**

Note that the prior authorization expenses have been removed from this projection. Prior authorization expenses are the highest of all the expenses that comprise the process, and the insurer can opt to forgo this step. By excluding this expense, we are illustrating the most conservative expenditure model available to the insurer. Even with the most conservative assumptions, the total expenditure of the general administration of insurance for one million subscribers over five years is $240 million dollars.

These expenses are subsequently passed on to subscribers of the plan. Every insurer maintains their own systems to facilitate this process, thus accumulating corresponding expenses by creating numerous duplicative systems by each stakeholder in this process.

The Veris Blockchain and the Veris Foundation

No intermediary has been able to provide a solution to address the expenses of the eligibility/authorization/remittance process. The need for trust and control is too great for a traditional business model to meet. Veris addresses this by providing a blockchain platform, governed by a nonprofit business entity responsible for developing and maintaining the platform. This platform is freely accessible to all parties and utilizes a Proof of Stake (PoS) concept. PoS allows for a blockchain participant to 'prove' they are a member of the decentralized blockchain by possessing tokens (or coins) that represent their 'stake' in the blockchain. This PoS provides for voting rights, smart contract creation/alteration, authorization of funding methods, and generation of 'gas' to process transactions on the chain. Basing the technology solution on PoS allows Veris to then adapt a non-profit organizational business model to provide an equivalent level of transparency and governance that is provided by the technology platform. The purpose of Veris as a business entity is to update the publicly available software used for the blockchain under the recommendations of the advisory board members who are representative of all three stakeholder types-payers, providers, and financial institutions. Veris' revenue initially comes from the appreciating value of the shares which are initially created via an Initial Coin Offering (ICO). Ancillary revenue streams are possible via patient opt-in of record sharing with drug manufacturers and medical device manufacturers.

This business structure is non-traditional, and combines the power of a blockchain removing the need for trust from transactions with the voting and advisory capabilities one would find in traditional organizations. Utilizing a nonprofit legal status allows Veris to operate with levels of transparency and governance not available in privately or publicly-held organizations.

An Overview of Blockchain Technology

A blockchain is a decentralized database that maintains a continuously growing list of ordered records. Blockchain technology was first used in 2009 as the basis for the digital currency Bitcoin. Blockchains have a number of advantages over traditional record storage, key among which are:

a) **Disintermediation -** No central agent is required to approve transactions.
b) **Immutability** - No transaction can be altered or deleted.
c) **Reliability** - The database is replicated on a large network of servers and does not have a central point of failure.
d) **Transparency** - Changes to public blockchains are publicly viewable by all parties.

The second generation of blockchain designs provide a platform for smart contracts. Smart contracts are code embedded in the blockchain containing defined rules that can execute code based on those rules. This enables a formation of a Decentralized Autonomous Organization (DAO) which functions without human employees. This greatly extends the potential applications of a blockchain beyond digital currencies into any industry that is built which requires massive transaction volume based on legal agreements.

The eligibility, authorization, and settlement process for healthcare services is entirely driven by multiple contracts among multiple parties–thus blockchain is uniquely suited to solve the operational problems and expenses in these systems.

Smart Contract Fundamentals

The term 'smart contract' is a metaphor which may be a bit confusing on the surface as they are neither particularly smart nor are they-strictly speaking-contracts. When talking about smart contracts, we are referring to scripts housed on the blockchain which represent unilateral promises to provide a determinate computation based on transactions which are sent to the script.

These scripts are compiled into low level-operation codes and stored in the blockchain's data store at a particular public address–determined when the contracts are deployed to the blockchain. When a transaction is sent to that address the distributed virtual machine on every full node of the blockchain network executes the script's operation codes using the data which is sent with the transaction.

Smart contracts can be coded to reflect any kind of business or engineering logic which is data-driven: from actions as simple as up-voting a post on a forum, to the more complex ones, such as loan collateralization and futures contracts, to the highly complex such as repayment prioritization on a structured note.

Relationships and obligations which are 'smart-contractified' benefit from blockchain security logic and also the increase in verifiability that blockchain networks provide. They also have the benefit of being operable in the exact same manner across stakeholders involved in a particular deal or application.

By building business logic in smart contracts, developers can give their users and clients an increase in the verifiability and certainty which comes with distributed technology while simultaneously building a system

of rules which will be structured so that it can keep up with increases in automation in the world around us.

While at their core smart contracts are simply software scripts no different than those which may run in any application stack-they have one unique quality to them which any other random software script does not: certainty.

Smart contracts have visibility across the blockchain they live on. That is to say if someone has access to read the blockchain, they will have access to see the compiled script. This is a very different idea to being told that a certain script will operate in a certain way on servers which you may not control.

Let us step back for a moment from the specifics of smart contracts and think about a commercial deal which will involve a dozen entities and many different data-driven interactions throughout the life of the deal. How the IT departments for the commercial entities would likely structure the administration of the data driven aspects of the deal would be to establish a tracking system which is completely under the control of that commercial entity and, perhaps, some programmatic interface for others to query records or send new information regarding a record. It is likely that each of these dozen commercial entities will each establish a similar system to monitor and track the data interactions over the course of the deal.

This is where the execution certainty of smart contracts married with the historical transaction certainty of a blockchain should become increasingly interesting for commercial players. If the commercial entities were wise about how they structured the deal, they could track all of their data-driven interactions on a smart contract-enabled blockchain without having to build twelve different systems, ensure their interoperability, and expend labor-time to appropriately categorize and file relevant transactional data. Every entity with access to the blockchain can completely verify the entirety of the interactions as well as the entire history of the data set, which would be automatically maintained over the life of the deal and summarized at its conclusion. This scenario specifically speaks to the ecosystem of billing and settlement of healthcare services in the United States.

Under the current software design paradigm, this would never happen. Each entity would keep full control over the scripts or software tracking and execute any downstream functions after a new or updated record transaction. The duplication of systems, processes, and information is the direct driver of this $59B/year in expenses.

At the moment, there are two primary limitations to working with smart contracts. The first challenge is temporary, while the second challenge is fundamental.

The first challenge of working with smart contracts is that there is something of a prisoner's game with respect to their adoption. That is to say: the most significant benefits of smart contract adoption come when numerous commercial entities begin to automate their data-driven interactions using smart contracts and a blockchain which is purpose-built (preferably only) for multi-party interaction.

In the context of a single commercial entity, the design and deployment of smart contract systems would in the short term be less efficient than carrying on with a centralized software stack with redundancy built-in. However, in the context of multiple commercial entities, the redundancies of data and scripting capabilities required for multiple parties to track and manage a deal tips the efficiency scales heavily toward smart contracts, with marginal returns increasing over time with subsequent iterations and increasing blockchain use throughout a given market.

The second challenge of working with smart contracts is that smart contracts are simply software. They are not the "living, breathing" documents that people generally think about when they think of "contracts", and as such-they are not inherently enforceable. For the foreseeable future they will not be enforceable in any court, and few parties will be able to rely on smart contract technology alone to structure all of the terms of a commercial transaction in code.

Introducing Proof-of-Stake and Veris Smart Contracts

At the core of the Veris blockchain solution is Proof-of-Stake (PoS) and smart contracts. PoS is a concept only available in a truly decentralized system, and smart contracts become powerful when they are executed and verified by numerous, independent, disinterested third parties.

The Veris PoS system is a fork of the NEO blockchain[4]. This POS implementation provides for a 'stakee', referred to as a VeriStake, and a 'coin' referred to as a VeriCoin. Both are described below.

> **VeriStakes** – These are held by any node on the blockchain wishing to participate as a healthcare provider, payer, or financial institution. Holding these shares gives the entity a set of rights. These rights are both to create and modify the smart contracts used in the network, as well as give stakeholders voting rights on the implementation of blockchain software upgrades provided by Veris (commonly known as signaling). Holding these shares also rewards the holder with VeriCoins over time. Production of VeriCoins is directly related to the number of shares held as a proportion of the total shares in existing.
>
> **VeriCoins** – These can be used by any node in the blockchain, including the nodes which are not 'staked' with shares. This is similar to the use of Ether as 'gas' in the Ethereum blockchain. The purpose of these is to act as a medium of exchange that can be influenced by Veris smart contracts. If a number of VeriCoins are sent to an address that is endowed with a smart contract, the VeriCoin may transmit data that may influence information on the network. Requiring 'gas' requires stakeholders to stake their systems with a number of shares, which is representative of their activity on the chain – or to purchase the 'gas' on the open market. Note that 'gas' can also be used by non-staked nodes in order to execute existing smart contracts on the network, but not to create or edit them. This is useful to healthcare researchers as well as third parties who are interested in performing analysis on data included on the chain. For example, if the largest commercial insurer in the United States held one share, but utilized 40% of the chain's capacity – this would not be equitable to other members of the chain.

Smart contracts are the elements that execute activity on the chain. These are simply electronic agreements between two parties that execute under specific conditions. For example, should Provider A perform an x-ray for Patient B, this could execute the existing contract between these two parties. The activation of this contract would then trigger a subsequent smart contract between Patient B and Payer C, the outcome of which would be a request to a payment contract to execute on the chain.

[4] https://github.com/AntShares/AntShares/wiki

Contract types are:

Identity Contract [ID] – Provides the public/private key pair for all identities on the network and pointers to their Summary Contract file.

Summary Contract [SC] – This is a list of all contracts for which this identity has some level of participation, as well as the status of those contracts.

Patient Payer Contract [PPC] – A contract between a patient and a specific payer. This contract contains all the rights for accessing the contract, as well as the queries necessary to access the provider's Electronic Health Records (EHR). A query to the EHR will provide all historical services provided as well as those to be billed. *[Whether services rendered, such as CPT codes, should be stored on the chain, requires further research.]*

Patient Bank Contract [PBC] – A contract between a patient and their bank/payment source. This contains all rights for accessing the contract, as well as the query necessary to either access the patient's HSA account, or execute a third party payment system (Dwolla, Square, etc..).

Payer/Provider Contract [PaProC] – A contract between a payer and a provider. This contains all rights for accessing the contract, as well as the database queries to access the payers' database, as well as account information for processing payment to the provider. *[Whether summary settlement data such as charges, adjustments, receipts, etc. should be stored on the chain requires further research.]*

The structure of these contracts is inspired by the work done for the MedRec Project at the MIT Media Lab by Ekblaw, Azaria, Halamka, and Lippman[5]. The outline of how these contracts interact is shown in Figure 1.2 on page 11. Figure 1.3 on the following page.

[5] https://www.media.mit.edu/research/groups/1454/medrec

VERIS Smart Contract Design

IDENTITY CONTRACT [ID]

NAME A | PUBLIC KEY | SUMMARY CONTRACT
NAME B | PUBLIC KEY | SUMMARY CONTRACT
.
.
.

SUMMARY CONTRACT [SC]

CONTRACT PAIR ADDRESS | STATUS
CONTRACT PAIR ADDRESS | STATUS
.
.
.

PATIENT - PROVIDER CONTRACT [PPC]

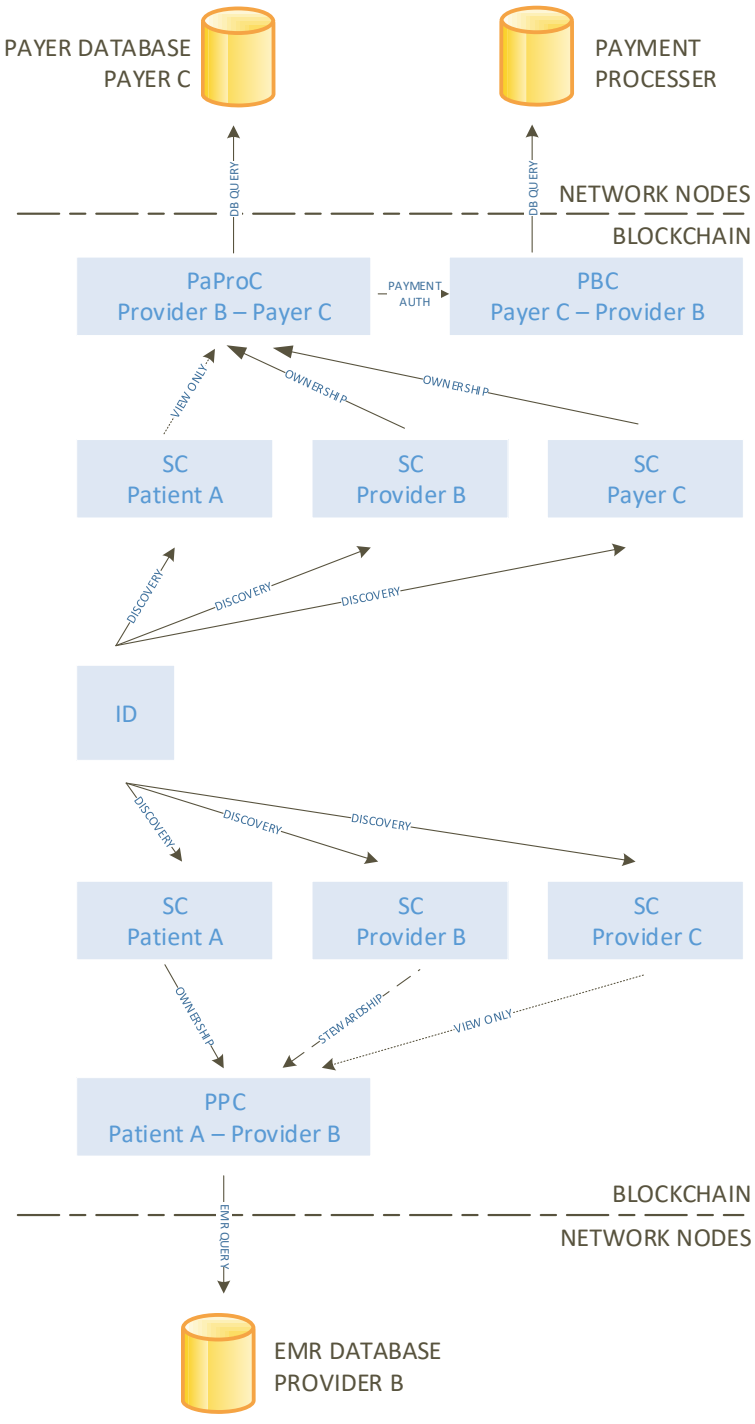
OWNER | ACCESS INFO
EMR QUERIES AND HASHES
PERMISSIONS
TRANSACTION HISTORY

PAYER - PROVIDER CONTRACT [PaProC]

OWNER | ACCESS INFO
INSURANCE DB QUERIES AND HASHES
PERMISSIONS
TRANSACTION HISTORY

PATIENT - BANK CONTRACT [PBC]

OWNER | ACCESS INFO
PATIENT ACCOUNT | ROUTING
PREFERRED PAYMENT GATEWAY
PERMISSIONS
TRANSACTION HISTORY



+ = Data Elements
- = Outputs
O= Process Details

[ID] = Identity Contract
[PaProC] = Payer Provider Contract
[PBC] = Patient Bank Contract
[PPC] = Patient Payer Contract
[SC] = Summary Contract

Step :	ELIGIBILITY	PRE-AUTHORIZATION	CLAIM SUBMISSION	CLAIM PROCESSING	CLAIM PAYMENT	POST-PAYMENT REVIEW
Inputs :	+ Patient Identification [ID] * Name * Address * Social Security + Insurance Identification [ID], [PaProC], [PPC] * Plan Provider * Plan Group # * Plan ID * Subscriber	O Not always required O Essentially confirms that the payer will pay for the specific service. Failure to get a pre-authorization before performing a service will result in the claim being denied. + Insurance Identification [ID],[PaProC],[PPC] + Procdure Codes + DX Codes	+ Patient Identification [ID] + Insurance Identification [ID] + Provider Identification [ID],[PaProC] + Service provided [UNDEFINED] * UB-04 (Ties to a revenue code, by CMS) * HCFA 1500 (Ties to a CPT dictionary) O Note that the CPT codes, CPT modifiers, and DX code are accessed in the claim throughout most steps.	O No new information is added at this step. O This process varies from payer to payer and is illustrated in the 'Claim Processing' flowchart	+ Provider Identification [ID] * Name * Address * NPI + Banking Identification [ID], [PBC] * ACH Information + Services Paid [UNDEFINED] * Service Date * Patient * Service Procedure * Amount	O On a periodic basis the payer will review a claim. This typically includes the medical record to validate the claim.The outcome is either no alteration to the claim, or an adjustment to the payment on some of the claims. This adjustment could be positive or negative. + Prior Service Claim[s] [UNDEFINED] + Adjustments [UNDEFINED]
Outputs :	- If the service is covered by this provider - Coverage amounts	- Authorization Number	- Returns a value of accepted or rejected O Note that this response could happened quickly, or could be rejected at multiple points in the claim processing process. See the Claim Processing flowchart for more.	- Pay or reject the claim	- Process payment to provider based on existing payment arrangement	- Triggers another claim payment which credit/debits the prior claim payment O Relatively common O Also used to tie out a ingle payment to multiple claims. The form is ANSI 835

The Veris Foundation

The Veris Foundation (VF) is the business entity which creates, maintains, and provides updates to the public Veris blockchain. The Foundation is a Delaware based nonprofit entity whose core objective is the establishment of the Veris platform to reduce the cost of healthcare and make it more affordable to patients. The Veris Foundation has applied for a 501.c3 exemption with with the Internal Revenue Service.

The Foundation will initially fund itself and development of the blockchain from the proceeds of an initial crowd sale (herein referred to as the initial coin offering, ICO). The ICO will provide startup capital as well as a store of shares which the Foundation cannot access for a period of time. These 'locked' shares become the assets which can be used to fund intermediate and future development. Specific details of how the ICO is designed as well as the number of coins issued and withheld are given in the ICO portion of this document.

The VF Board of Directors contains stakeholders from the banking, payer, and provider space to drive adoption of the Veris platform while conforming to the industries' specific needs. While the Board of Directors sets the direction of the development for the Veris platform, possession of VeriStakes allows for the Veris end user to 'vote' on proposed software changes. In this manner, the shares act as a proxy for stock in the organization.

The software itself is free to use, the only expense to an organization wishing to utilize the platform is the initial purchase of digital assets. When the platform is launched, the shares should incur a relatively insignificant expense for a stakeholder. As the platform is more fully utilized the shares must be purchased at market value, and should thus increase in value as demand for the shares increases. The shares themselves behave as an asset for the business. In this way, joining the platform provides immediate operational expense savings, while becoming a valuable asset boosting the entities' balance sheet over the long run.

Veris Asset Sale

Veris will hold a sale to fund the startup activities of the business, as well as create a pool of assets comprised of 'locked' shares to provide long term funding for the Veris Foundation. The initial creation of VeriStakes must be sized to meet the following requisites:

a) Provide enough shares so that it is feasible for shares to be purchased at maximum utilization of the platform–which is every bank, payer, and provider holding shares.
b) Provide enough shares to represent the volume of transactions which occur periodically on the platform.
c) Not be so numerous that the shares never appreciate in value.
d) Provide for a reasonable number of shares which are locked and only accessible by the Veris Foundation after one year.

One key requisite to be met is the total volume of transactions on the platform. Using the 2013 estimates, the Veris platform would need to process approximately 8 billion transactions per year if fully utilized by the health care system in the United States. This volume can be met, and adjusted, by how many VeriCoins are produced over time by holding VeriStakes. For example, each VeriStake may generate .01 coins for each block added to the blockchain. Thus, if a claims submission requires one coin, a provider would need to hold 100 VerisStakes per every transaction they process. This would also be dependent upon the amount of activity on the chain. As activity increases, their shares will also create more coins. Note that VeriCoins could also be purchased for a provider to use in times of high volume to buffer the need for more Veristakes.

The maximum number of banks, payers, and providers who would utilize the system is a more difficult number to determine. The U.S. Department of Labor estimates that in 2015, 12.4 million Americans were employed in the healthcare field[6]. This does not include self-employed or self-practitioners. For this calculation, we will assume that if all payers and providers were utilizing the platform this would be a maximum of five million entities. For banks, if we consider the number of FDIC-insured commercial banks, as well as credit unions, this would represent 12,942 institutions in 2015. We will assume a maximum number of entities needing shares on the platform to be six million.

Thus for the purpose of estimating the number of VeriStakes to be created to satisfy the maximum utilization of the platform we will use the following determinants:

I) 6 million stakeholders
II) 3,800 million transactions yearly
III) Stake-to-Coin creation factor of .01 coins/block/stake (this is variable and can change with an election among those holding stakes)

[6] https://www.bls. gov/oes/tables.htm

The sale itself will be carried out through a custom front end that accepts both Ether and NEO, and occurs in two phases. The phases will include a pre-sale and an ICO. Registration will be required prior to each phase. Registration will require email addresses and a public Ethereum, or NEO address to create a whitelist of wallet addresses. This will guarantee participants the ability to access both the pre-sale and ICO. These email addresses will also be used to issue wallet addresses on the Veris Foundation once funds are received. Payout of VeriStakes occurs immediately upon receipt of Ether or NEO. Note that these are not tokens, these are the digital assets which comprise the Veris blockchain.

The first phase, the pre-sale is for early supporters and rewards support with a 25% bonus in VeriStakes. Of the total funds raised at the pre-sale, a maximum of 2,000 NEO will go towards expenses already incurred by Veris(such as business setup, initial development, and design expenses).

Because we are accepting both Ether and NEO as part of this sale we are making NEO the primary asset and 'pegging' ETH to it. This is being done to avoid scenarios during the sale when the value of one asset moves and the other does not. This 'pegging' is done via a ratio given below:

80 VRS = NEO
*80 VRS * (Market Price of ETH/Market Price of NEO) = ETH*

Our sale tool (ico.verisfoundation.com) will calculate your VRS payout at time of wallet creation based on values fed from coinmarketcap.com for both ETH and NEO.

Note, all calculations below are based on the current market prices for Ethereum and NEO as shown below:

Date	1/17/2018
Ether	$864
NEO	$107

Sale Summary:

- Total Minimum Cap: The equivalent of 28,000 NEO in market value determined by the ratio below:

  (x donations) NEO + (y donations) ETH($864/$107) = 28,000 NEO

- Total Maximum Cap: 90,000 ETH

  (x donations) NEO + (y donations) ETH($864/$107) = 270,000 NEO

Presale Phases

- Mandatory registration
- Sale Begins: March 19th, 2018 at 12PM GMT
- 7-day Sale

- Registered addresses will be guaranteed participation
- Minimum Cap: 560 NEO or a ETH/NEO ratio as shown below:

(x donations) NEO + (y donations) ETH($864/$107) = 560 NEO

- Up to 2,000 NEO used to cover startup expenses
- Token Price 100 VRS / NEO (20% bonus)
- Pre-sale participants will be issued a wallet address on the Veris blockchain which will be funded at the time of purchase

Veris Foundation Initial Coin Offering

- Mandatory registration
- Sale Begins April 2nd, 2018 18 at 12PM GMT
- 2-week Sale
- Registered addresses will be guaranteed participation
- Minimum Cap: 28,000 NEO or a ETH/NEO ratio as shown below

(x donations) NEO + (y donations) ETH($864/$107) = 28,000 NEO

- Token Price 80 VRS / ETH
- Sale ends April 16th at 11:59pm GMT, or when maximum cap of 363,000 NEO or a ETH/NEO ratio as shown below is reached.

(x donations) NEO + (y donations) ETH($864/$107) = 363,000 NEO

Token Allocation Summary:

- Public Contributors: 30,000,000 VRS, 60% of total
- Reserved for Veris Foundation: 13,000,000 VRS, 26% of total
- Reserved for Veris Core Team : 4,000,000 VRS, 8% of total
- Bounties: 1,000,000 VRS, 2% of total
- Partnerships and Advisory: 2,000,000 VRS, 4% of total

Allocation rules governed by smart contracts on the Veris blockchain are as follows:

Veris Foundation Core Team – 8% of the VRS created will be allocated to the Core Team (founders, early backers, and the development team) to incentivize long term participation in the platform. These VRS will vest over three years with a three-month cliff. Thus VRS will not be immediately available, and 8.3% of the total will mature every three months for three years.

Public Contributors – 60% of VRS will be distributed during the presale and ICO.

Partnerships and Advisory – 4% of VRS are allocated for our partners and advisors. These will vest over a year with a three-month cliff. Thus,VRS will not be immediately available, and 25% of the total will mature every three months.

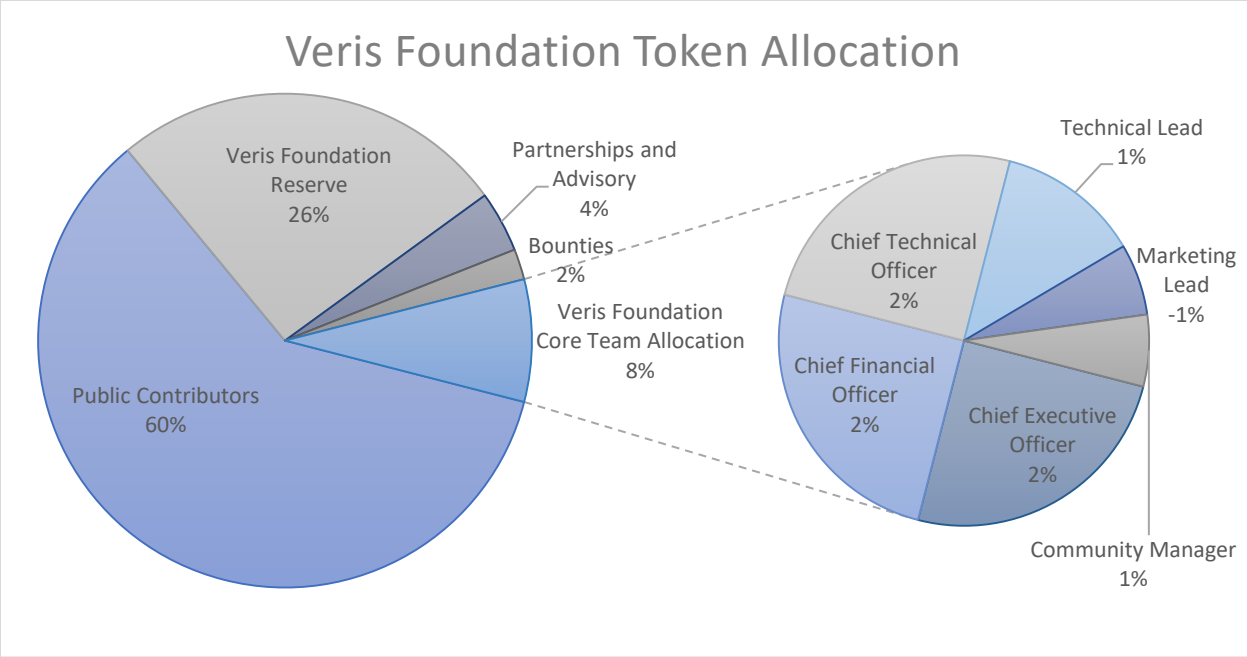
Reserved for Veris Foundation – 26% of VRS are allocated for future use by the Veris Foundation. These VRS allow Veris to enter into strategic partnerships, or raise additional funds if it is determined that such a move would accelerate development. This reserve will be locked for 6 months via smart contract, and only used if necessary.

Bounties – 2% of VRS are allocated for bounty campaigns to help audit our code base and increase mindshare of the Veris Foundation.

Veris Foundation Core Team Allocation Detail:

The 4,000,000 VRS allocated to the core team will be distributed as such:

1,000,000 – Chief Executive Officer
1,000,000 – Chief Financial Officer
1,000,000 – Chief Technical Officer
500,000 – Technical Lead
250,000 – Marketing Lead
250,000 – Community Manager


Veris Foundation Token Allocation
Veris Foundation Reserve 26%
Partnerships and Advisory 4%
Bounties 2%
Veris Foundation Core Team Allocation 8%
Public Contributors 60%
Technical Lead 1%
Marketing Lead -1%
Chief Technical Officer 2%
Chief Financial Officer 2%
Chief Executive Officer 2%
Community Manager 1%

Veris Foundation Token Sale Proceeds Usage

Funds raised during the token sale will be used to cover startup expenses, as well as fund the growth and deployment of the Veris blockchain. At the minimum raise of 28,000 NEO, (or a mix of ETH and NEO as given in the ratio earlier) Veris will be able to fund operations for approximately two years. At the maximum raise of 363,000 NEO (or a mix of ETH and NEO as given in the ratio earlier), Veris will be able to fund the operations for a minimum of five years. Any funding from 28,000 to 363,000 ETH will be placed in dividend-producing financial instruments and used to finance the operations of Veris. This is essentially an endowment that you find at many non-profit educational institutions. We feel that growth in an entrenched industry will be our largest hurdle-not the implementation of the smart contracts. This investment income will allow Veris the time to build partnerships, as well as keep entities from essentially ignoring our solution long enough with the expectation that we are not properly funded for the long run.

In an effort to provide those who purchase VerisStakes a level of confidence in VRS, should the Veris Foundation not meet the following specific growth targets-the endowment will be liquidated and returned in ETH/NEO to the originating addresses. For example, assume Veris hits the 363,000 NEO target, and in year three misses the specified growth target. This would trigger a refund to contributers during the sale and a shutdown of Veris activity. Now take someone who three years earlier had sent 10 NEO as part of the token sale. The endowment in year three would be 28,000-363,000 (or 92.3% of the total funds raised by Veris). This would be returned to the individual by purchasing NEO, and returning 10 * 92.3% of their NEO at the market value of NEO at the time of liquidation. Note that the return would only be to the original address from the sale. For example, if in three years NEO is trading at $10, Veris would return:

10 NEO Contributed * (contributing market rate $110 / current market rate $10) = 110 NEO

Conversely, if NEO is trading at $1,000 at the time of liquidation, Veris would return:

10 NEO Contributed * (contributing market rate $110 / current market rate $1,000) = 1.1 NEO

We are unable to currently create a smart contract to facilitate this process, but it is included within the Veris roadmap. Once created, this contract to refund participants in the sale will be released to the community for use in other entities initial coin offerings.

The growth targets are as such:

Year 1 (calendar year 2018) – Successfully process one health care claim on chain by 12/31/2018.

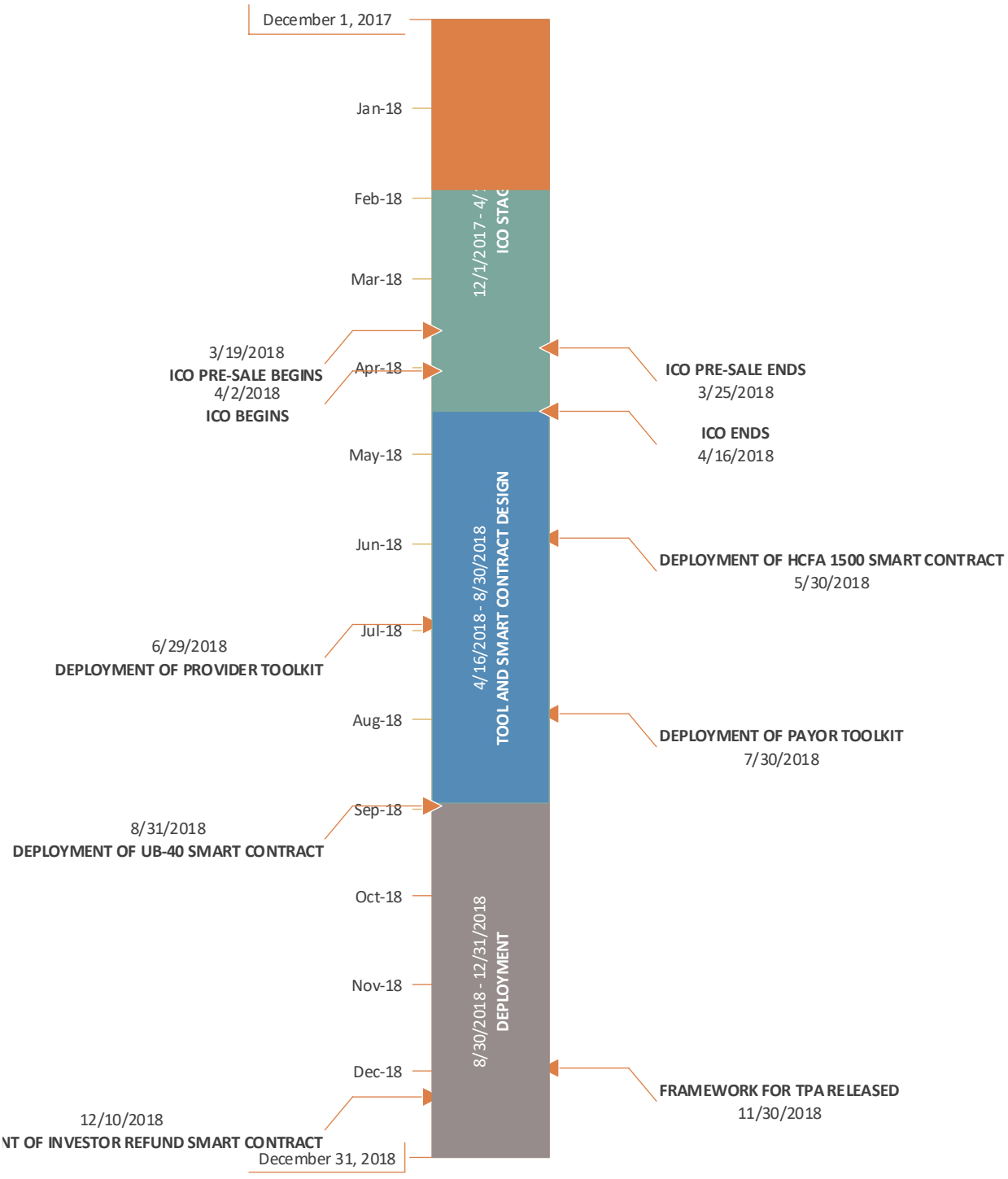
Year 2 (calendar year 2019) – Successfully process 100,000 individual claims on chain 12/31/2019.

Year 3 (calendar year 2020) – Successfully process 1,000,000 individual claims on chain 12/31/2020.

Year 4 (calendar year 2021) – Successfully process 10,000,000 individual claims on chain 12/31/2021.

Roadmap

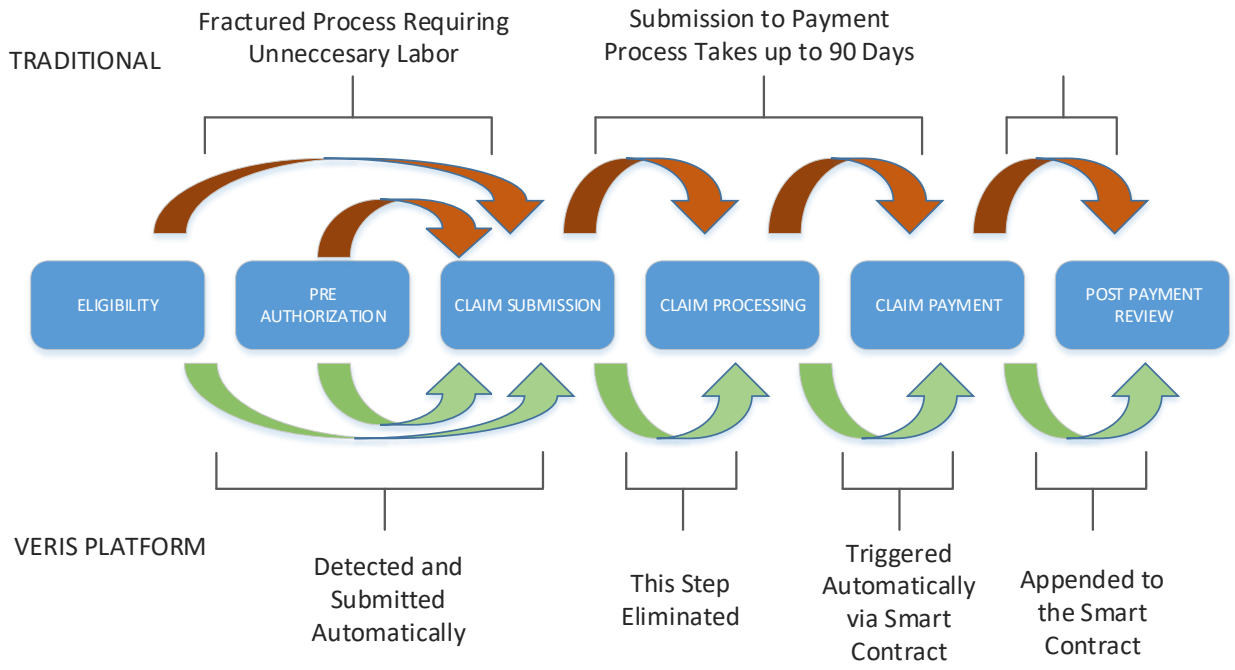
The diagram below gives deliverable dates for key elements of our claims processing solution.



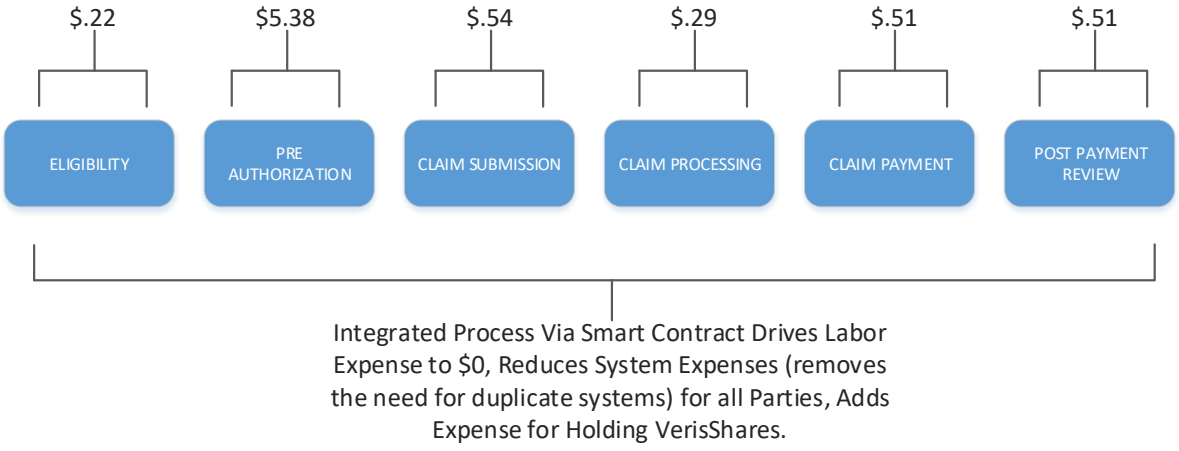
Examples and Illustrations

Example #1:Traditional claims processing versus Veris Process

The delivery of healthcare services is a process which includes five (and sometimes six) core steps. The figure below illustrates this process and calls out the differences between the traditional process and how it is handled on the Veris platform.



TRADITIONAL EXPENSE PER TRANSACTION[9] - $7.45



VERIS PLATFORM EXPENSE PER TRANSACTION[10] - < $1.00

Example #2:Patient Interaction – Private Key Management

The most difficult portion of the system to maintain may be the front end where the patient authorizes services themselves. Traditionally patients give their provider the insurance plan information and their own personal information in the form of name, address, and Social Security number. When a patient does not have the insurance plan information, the provider is able to contact the insurer and verify eligibility manually.

With the Veris platform, every patient who is insured has an existing smart contract (in this case a Patient-Payer Contract, or PPC) which already exists on the platform. Creation of this PPC creates a public and private key cryptographic key pair. The public portion of the key pair is essentially the address by which one can find the PPC on the chain, while the private key allows access to the contract and the ability to attach it to a Patient-Provider Contract (PPC). Private keys in Veris are hexadecimal strings which appear as such:

586f9e318a63769b719918257fbd657b5592fc38de8139119e4b16d15bab1591

This is not a viable piece of information to request the patient to provide to begin the service delivery process. This hurdle can be overcome by 'tokenizing' the private key into either something easy to remember, or attaching it to a device (possibly mobile phone number) via an additional smart contract.

Additionally, one question remains of: how will the scenario where the patient has either forgotten their private key, or lost their token, be handled? An intermediary will be necessary to solve this problem in one of two ways:

a) Intermediary has write access to all ID contracts in order to regenerate a private key for any ID contract.
b) Intermediary has the ability to clone any ID contract to a new contract with new public/private key pairs.

The advantage of option B, is that it maintains the immutability principle of the blockchain – though it may create redundancy on chain. It also requires the intermediary to spend VeriCoins on a transaction due to the patient's negligence.