



LIFERHYTHM
MEDICAL SERVICES
LLC



Phase 3-of-4

Application & Utilities Layer

WhitePaper v0.1



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~ Overview & Synopsis ~

The Purpose of this paper is to present Nitrogen, the 3rd segment of the blockchain & crypto-based HealthCore ecosystem for the provision of the proper applications and service functions for the medical records field.

This document is meant to service the general public as well as industry professionals with a high level understanding of the topic. After acclimating themselves with this document the reader should become acquainted with the proposition presented by LifeRhythm Medical Services LLC in the provision of the Hydrogen project. Here we will briefly begin to touch on and introduce General technical concepts.

All other concurrent layers of the HealthCore project [1, 2 & 4-of-4] will be made available in accompanying documentation. Let the reader be advised that all related documentation is formatted to be chrono-neutral (read in any order) but all reflect the core ideas expressed in this paper.

Layer 3 of the HealthCore project has been given the name Nitrogen to reflect the efficiency & performance boosts that the HealthCore Ecosystem receives from the implementation of it. Nitrogen is known to be one of the most effective elements for speed, due to its reactive atomic structure, creating powerful racing machines as well as boosting rocket fuel & propulsion properties. From within the HealthCore project, Nitrogen serves that role exactly; a maximally performant environment for the provision of applications for extended medical services.

Unlike other layers of the HealthCore ecosystem, Nitrogen is capable of operating as a standalone technology layer. At a later time, LifeRhythm Medical Services LLC will be offering paid API access to the Nitrogen layer for other companies & individuals to build leveraging it.

The HealthCore ecosystem leverages an entire suite of 3rd party API's for its data feeds. None of the HealthCore applications and functions derive its data from a single API source; rather as a form of protection against single points of failure, Multiple independent API feeds are used to power all data structures.

The HealthCore ecosystem is a software deployed to the hyperledger fabric blockchain as a series of smart contracts focused on the provision & storage of medical data.

LifeRhythm Medical Services LLC. is the ambitious medical arm of LifeRhythmLabs INC.; an organization that provides a full suite of software technologies for the decentralized digital age of WEB 3.0.

~ Terminology ~

API: acronym : **Application Programming Interface**, a system to system interface component that allows disparate technologies to share data & communicate

Blockchain: a structure of record keeping which is immutable, provable, transparent, traceable, and censorship resistant.

Dapp: Decentralized Application; an application that is not hosted on a single server, thereby becoming much more redundant to failures and censorship.

Ethereum: a turing complete blockchain based smart contract platform

EVM: Ethereum Virtual Machine, computational hyperspace for blockchain applications based on ETH

Hyperledger Fabric: highly modular, enterprise grade blockchain software environment & library provided by HyperLedger foundation & powered by its own novel HackSaw consensus mechanism.

HCC: Abbreviation for HealthCore-Chain & the name of the native HealthCore blockchain environment.

MetaData: “data about data”; metadata is information that provides abstract insight and information into other data

Nitrogen: the layer of the HealthCore environment where application functions exist.

Smart Contract: The specific branch of artificial intelligence dealing with the recurrent self-sovereign-education of a mechanical non human entity.

~ Nitrogen ~

Welcome to Nitrogen, the application and utilities layer technology of the HealthCore medical ecosystem. Within this layer all necessary remote medical functionalities of the platform exist. Nitrogen can be thought of as the prompt to the underlying first and second layers; information that is pushed from layer 3 dictates the computational complexity & in turn the costs that fall onto the system.

For the first few years of operations, the HealthCore ecosystem will be leveraging industry standard Application Programming Interfaces for the provision of its applications functions. While the team over at LifeRhythm Medical Services LLC does understand that current industry standard API providers are centralized actors, using their services will not expose the overall architecture to any central point of failure. In fact, each application function that is offered will be protected with multi-level backdrops; in the event of an application failure there will be another API that will be taking its place.

Staying in line with the HealthCore progressive decentralization method of approach to its platform design; once the entire structure is operational and attains a satisfactory threshold of medical records data and participant count; the Nitrogen layer will be lifted and mirrored onto the HealthCoreChain. Once on the HealthCoreChain the centralized API Nitrogen applications will be shed and reconstructed as {De}centralized applications (otherwise known as Dapps).

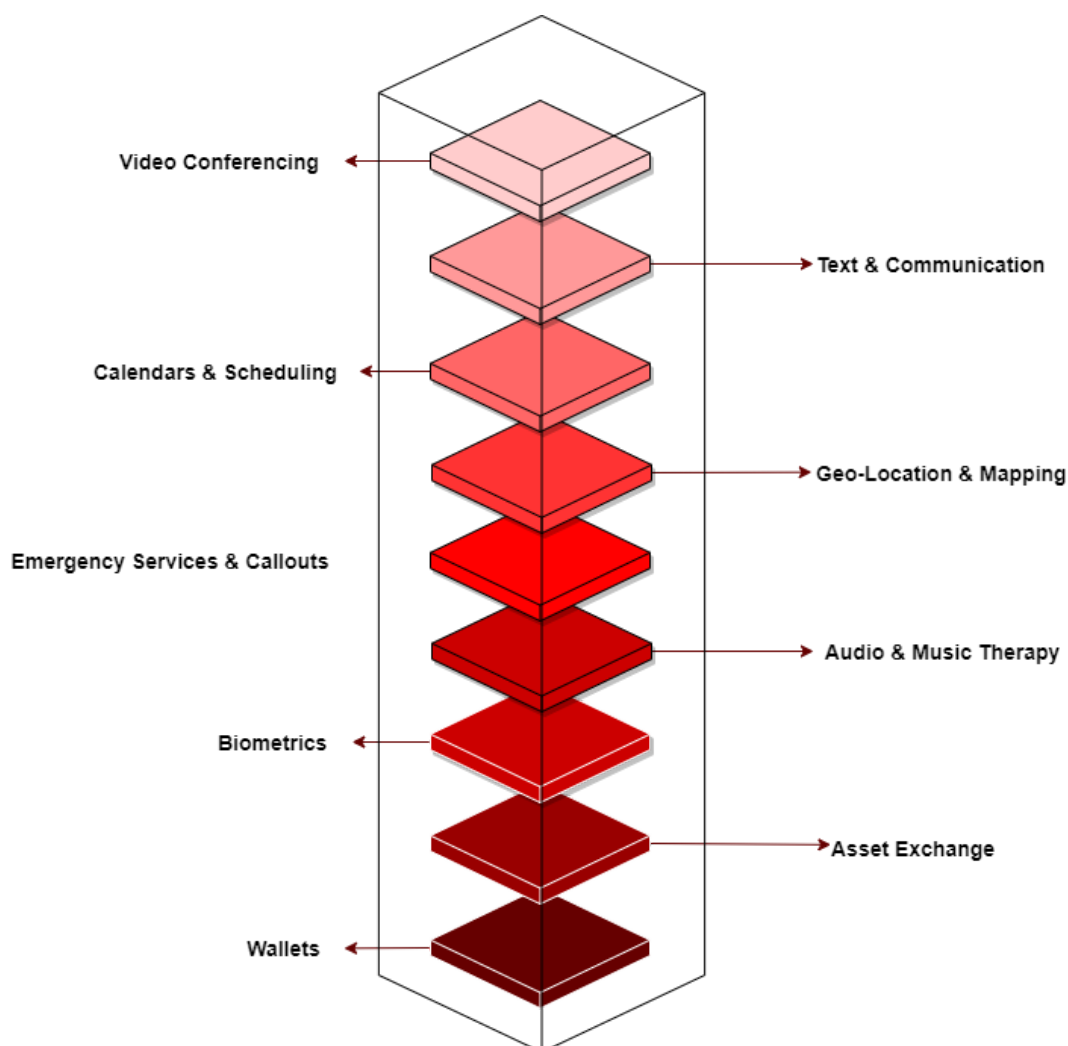
When in the transitive state of [application → decentralized application] adaptation an enhanced incentive system will be made available. Each {D}application will serve a dual function, front facing service provision & consensus driven incentiviation. Each {D}application will have its own tokenized ecosystem that will be upheld by reputable members of the HealthCore ecosystem.

LifeRhythm Medical Services LLC strongly believes that by introducing operational tokenized micro-communities into the greater HealthCore ecosystem, a much more complete end-to-end governance, incentive, and decentralization structure exists. Moreover with native Dapps, the core currencies (\$HYO & \$CRBN) become more sought after in order to

participate, thus creating a reflexive feed of heightened demand vs stable supply.

Nitrogen Functionality Stack ~

Whenever inspecting what is required of a digital medical ecosystem from the standpoint of a consumer/patient as well as a medical service provider/professional a plethora of utilities come to mind. However, whenever a platform's user is given far too many options cognitive dissonance might take place; cognitive dissonance is an overwhelming feeling of indecisiveness or decision exhaustion. Knowing that in order to become the world's default medical environment the most important aspect will be the completeness and satisfaction in the users experience. Hence, the application stack in Nitrogen has been defined as follows:



1) Video Conferencing

At the core of any medicinal event lies the evaluation. Whenever a person is not feeling well the default thought process to fall into immediately is to go “see” a doctor/medical professional. This is so due to there being a certain psychological relief that takes place whenever we can see the face of our caretakers. While there is definitely a case to be made that the majority of diagnoses that take place should generally be conducted in person, a good portion of diagnostics can take place through video communication.

Video appointments actually serve beneficial to both parties across multiple vertices; first and foremost on behalf of the patient the time that is saved on traveling. Alongside time saving there is direct cost savings associated with the traveling (minute but still prevalent). Additionally, the freedom & flexibility of doing video communication opens up opportunities to have appointments take place from previously places previously thought of as impossible, such as at work, shopping, or even picking up the kids. On behalf of the medical providers, flexible scheduling is a huge benefit that comes with video communication, allowing them to see and help more people throughout the course of the same 24 hour period. Moreover, by having less sick patients in their proximities, medical professionals are able to keep themselves safe from possible transmissions of illnesses, as well as keep their working quarters more sanitary.

2) Text Based Communication Channels

As in the case with video capabilities, evaluations can happen through spoken or written. There are medical conditions which make individuals terribly uncomfortable when going to conduct face-to-face meetings (such as issues of dermatological nature), this faction of problems & patients stand to benefit tremendously from written correspondence.

Text based communication channels empower users to create & join pseudo-anonymous help groups for people suffering with similar issues. Some of the most prominent use cases being psycho-social problems that millions of people suffer with. Many individuals suffer from depression and are shy of sharing this with their friends and families because they might feel inadequate about it and do not want others to treat them any differently. Now they will have a forum with others who are in similar situations and healthy support groups will be built. There will most definitely be extensive protective measures taken to protect community members from harassment,

but design specifications for the applications will be made readily available at a later date alongside alpha testing & deployment.

3) Calendars, Scheduling, & Appointment registry.

Organization remains one of the critical areas in the medical field. Something as simple as scheduling can have a huge impact on the likelihood of a patient's satisfaction. It comes as a shock that most appointments that are missed happen because of a lack of proper accountability & organization!

To express the benefits of streamlining the user experience with scheduling and calendars tools we need to simply imagine a situation like so: Doctor and patient are having a regular appointment via Video Chat. Towards the end of the appointment, the Doctor tells the patient to follow up in one weeks time. As soon the doctor recommended that a push notification pops out and verifies if the patient would like to add a “Doctor Appointment” to their schedule in one week. Clicking NO, the doctor is notified that he has an extra time slot for a different patient; clicking YES an appointment would be inserted into the applications calendar and a reminder would be set for 24 hours, 12 hours & 4 hours before the appointment.

4) Geo-Locations & Mapping

Providing access to digital medical services might revolutionize industries, however LifeRhythm Medical Services LLC is looking to revolutionize qualities of life. Essential functions such as finding local medical professionals or getting direction to the nearest health clinic or even dropping a pin and having an ambulance arrive at an exact location of a person in need, can be the difference between life and death.

5) Emergency Service Callout

An emergency can happen at any moment and we must be prepared to respond. Rather than having people open their phones to dial emergency numbers, the HealthCore application ecosystem provides a “EMERGENCY” widget that at a single touch alerts the appropriate authority and sends help. What’s more is that the HealthCore project is working on developing its own proprietary “screamREC” technology to respond to environmentally prompt distress signals, such as but not limited to screaming.

To understand how much life saving implications something like this can have let's inspect a familiar situation. Gary is an avid mountain biker and goes out for solo rides though the mountain side every week. One of those weeks Gary decides to try a new path. While blissfully riding through, a sharp stone slashes the front tire, Gary's arms cross like noodles the bike tips over. Screaming in pain, the Widget quickly activates and begins to communicate with Gary asking locations, pains, and ultimately keeping him awake to avoid the dastardly grips of a concussion! As soon as the widget is prompted it automatically records all events and opens a direct voice channel between itself and the quickest responding appropriate authority.

6) HeartRate & Vitals Monitoring (Biometrics)

Of the many medical practices that can be conducted remotely, heart rate monitoring is among the readily accessible. There are a plethora of applications built into modern devices that track biometric & environmental factors to deduce the physiological state of a person.

Having a comfortable and intuitive way to press a thumb to a screen will supersede all current clunky medical devices that must be wrapped around a person's arm; HealthCore hopes to provide just that. For patients on the older side of the age spectrum, monitoring & convenience is everything. As in the case with the Emergency callout widget, if grandma says “check my Heartrate” and on her screen pops out a little square with a thumbprint sign; her cardiologist can get notified of any irregularities, if they happen. Then what of a person's blood pressure and oxygen levels? Medical technology might be closer than we can imagine. Symptom Detection?

7) Audio Therapy

Anxiety, Depression, Trauma; more than physical medical problems, mental health problems ravage the surface of this earth. Whenever panic settles in and breathing turns shallow, the comforting sound of a confident professional eases away the discomfort and keeps us grounded. Audio therapy would be a highly customizable parameter in the HealthCore ecosystem where therapy can be conducted in the voice of one's mother, grandfather, sister or brother.

Medical professionals from the field of psychology can combine the HealthCore's Audio Therapy and Video Conferencing to conduct sessions with success rates previously thought impossible. Moreover, private

community groups are able to tune in, and just like participants in a book club they read, in these clubs, they are read to.

8) Asset Exchange

Being a blockchain-based ecosystem with a tokenized incentive structure built-in; economic activity will happen beyond the platform. Having an exchange native in the ecosystem will allow for greater redundancy and protection against data leakage. Why would a user want to leave the platform and juggle applications when it can be offered to them on a silver platter?

9) 3rd Party Non-Custodial Wallets

As addressed in phase 2, storage of crypto assets is vital to a healthy ecosystem. It is expected that many participants will already be using alternative wallet solutions; why not make it all the more streamlined and allow them to port their wallets in. Solutions must be non-custodial, otherwise dangers around privacy & metadata arise.

* * *

The above application points are by no means exhaustive; as the platform develops further more abstractions will be introduced, through combinations of existing services and the creation of entirely new ones. Among the most prominent of abstractions that Life Rhythm Medical Services LLC is excited about providing is the two-way data conversations between users and medical providers. Whenever some localized data is shared with providers, such as the weekly heart-rate chart of a patient, then the provider can have the ability to push a notification to their patient requesting they come in for a visit (should some abnormalities be detected in the results).

~ Nitrogen API SourceMap ~

Video Conferencing	Text-based Communication Channels	Calendars, Scheduling & Appointment Registry
<ul style="list-style-type: none"> - Twilio - Voxeet - Vonage - Eyeson - Zoom 	<ul style="list-style-type: none"> - Trumpia - Google Hangouts - Sendbird - Bandwidth - Smooch 	<ul style="list-style-type: none"> - Google Calendar - Microsoft Calendar - Cronofy - Nylas - Vyte.in

Geo-Location & Mapping	Emergency Service Callout	HeartRate & Vitals Monitoring (Biometrics)
<ul style="list-style-type: none"> - Google Maps - Mapbox - Microsoft Bing - Mapquest - Carto 	<ul style="list-style-type: none"> - RapidSOS - Noonlight - Reactmobile - Emergencynumberapi - Pitneybowes 	<ul style="list-style-type: none"> - Hexoskin - Fitbit - Valencell - Biosppy - Android Bios

Audio Therapy & Music	Asset Exchange	3rd Party Non-Custodial Wallets
<ul style="list-style-type: none"> - Spotify - 7digital - Last.fm - Musicbrainz - Auphonic 	<ul style="list-style-type: none"> - Bitfinex - Opensea - Kraken - Coinbase - Cryptoapis 	<ul style="list-style-type: none"> - Metamask - Securewallet - Blockchain - Block.io - Cryptoapis

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