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Delivered.
Well.**

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Abstract

The current landscape of healthcare is one of disconnect between the many actors involved in the space. Patients' inaccessibility to quality healthcare, the rising costs of home healthcare in an increasingly digital world, security issues and inefficiencies associated with cross-border payments, and the protection of patient identity in relation to data sharing are all problems that have yet to be completely solved.

WELL is a global blockchain protocol for healthcare to eliminate country borders and connect healthcare specialists and patients worldwide. The WELL token will enable an on-demand system that solves the current problems of cross border payments, data accessibility, and payment risk, allowing areas with the highest quality of healthcare to serve the entire world.

The WELL application protocol will create the distributed, secure medical data storage architecture and marketplace for the healthcare industry of the future. Utilizing secure computational methods and an encrypted data storage layer built on top of a Proof of Authority blockchain network, patients will have verifiable and direct control over their personal health data. Patients will have the ability to monetize their data through the WELL token incentive structure and application interfaces. Health organizations, doctors, insurance companies, and other healthcare providers can interact seamlessly in a trustless data marketplace where integrity, anonymity, and verifiable proof of data authenticity are assured through leveraging of zero knowledge storage and secure data sharing protocols.

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Mission Statement

Our vision is to have a comprehensive and agnostic healthcare platform, blending blockchain and software solutions that enable improved outcomes for patients and healthcare providers. The WELL platform is designed to target those who are underserved via a single point of access for both minor and serious conditions that transcend country borders, provides data, best practices, and innovation in compliant and secure ways, and removes payment friction from the system. WELL will create the open and distributed data marketplace for patients to monetize access to their data and allow healthcare providers and research organizations to seamlessly and cost-effectively access pertinent medical data in a trustless environment.

Background

Limited Access to Healthcare Services

The global healthcare industry is projected to reach USD 8.7 trillion by 2020 according to Deloitte¹. However, the vast majority of this market is largely only available to developed nations with highly advanced and established healthcare infrastructures. With a growing patient-to-physician gap, limited access to medical services, and rising healthcare costs in many countries, the need for a new paradigm of distributed telemedicine has come to the forefront.

The emergence and increased prevalence of healthcare tools such as smart sensors and medical diagnostic tools utilizing Internet of Things (IoT) technologies has opened the door for a platform to provide the ubiquitous, blockchain powered environment connecting patients to physicians all over the world. WELL aims to create the all-encompassing, distributed healthcare solution through a single platform that enables patients with limited access to healthcare resources to seamlessly join a global network of transparent and high-quality health services.

Rise of Home Healthcare in an Increasingly Digital World

The global home healthcare market is growing fast, with a compound annual growth rate (CAGR) of 8%, and a total market value that will exceed 517 Billion USD by 2025². A growing geriatric population and the rapid rise of conditions requiring long-term care are driving this growth. Here at WELL, we hope the adoption of emerging technologies such as telehealth and blockchain can alleviate the financial burdens that this accelerated growth places on the market.

In the U.S., skyrocketing hospital costs along with this expansion of the geriatric population has home healthcare growing at twice the rate of the healthcare industry, with approximately \$100 billion in annual

¹ <https://www2.deloitte.com/content/dam/Deloitte/global/Documents/Life-Sciences-Health-Care/gx-lshc-2017-health-care-outlook-infographic.pdf>

² <https://www.grandviewresearch.com/press-release/global-home-healthcare-market>

services. In 2016, IBIS World estimated that the number of people aged 65 and older in the U.S. reached 46 million.

The next 15 years represent an unprecedented opportunity to provide healthcare to the wave of retiring baby boomers. Primary care, especially geriatric, is shifting to telehealth at an unprecedented pace. The global telehealth market may reach \$113 billion by 2025 (18.3% CAGR), according to a report by Grand View Research, Inc³. With baby boomers retaining significantly more disposable income than previous generations, the urgency and opportunity for a universal solution is clear.

The New Medical Data Marketplace and Distributed Network

The WELL protocol will enable an open, distributed, and secure data marketplace for patients to retain access control of their personal data and have the ability to monetize access to their data by healthcare providers and researchers. Driven by the cryptoeconomic design of the data marketplace enabled by WELL utility tokens, users of the platform can seamlessly integrate applications and participate in the distributed storage and secure computing architecture to earn tokens. Healthcare providers, research organizations, and other institutions will have the opportunity to substantially reduce costs and barriers associated with traditional data access, aggregation, and sharing methods, creating the open medical data marketplace and infrastructure necessary for WELL to become the world's ubiquitous telehealth network solution.

Apple Inc. has recently debuted a feature on its Health app that allows users to review their personal medical information from various institutions on their mobile devices. Additionally, the release of the Health Records API will enable developers and researchers to create an ecosystem of apps that can utilize health record data to improve the management of medications, nutrition plans, diagnosed diseases, etc. In the past, medical records were held in multiple locations, which required patients to log into each individual care provider's website and piece together the information to view the full picture of their health profile. Apple took a more consumer-friendly approach by creating Health Records based on FHIR (Fast Healthcare Interoperability Resources), a standard for transferring electronic medical records. This update allows consumers to have medical information from various institutions organized into one view and for the first time ever, allow consumers to share medical records from multiple hospitals with other apps to help them improve their overall health^{4,5}.

Health Records data is encrypted on the user's mobile device and protected with their passcode. When the user chooses to share their health record data with other apps, the data flows directly from HealthKit to the third-party app and is not sent to Apple's servers. Additionally, developers building health apps can individualize experiences, with the user's permission^{4,5}.

WELL will allow the users of the Apple Health app to integrate with our platform in order to monetize and protect their data. The WELL platform, leveraging the underlying application protocol, will take the concept applied by Apple and further expand upon the opportunity to provide a more interoperable framework and open data sharing environment. The cryptoeconomics of the WELL platform will both remunerate patients in the native token for granting levels of access to their data as well as incentivize

³ <https://www.grandviewresearch.com/press-release/global-telemedicine-industry>

⁴ <https://www.apple.com/newsroom/2018/01/apple-announces-effortless-solution-bringing-health-records-to-iphone/>

⁵ <https://www.apple.com/newsroom/2018/01/apple-announces-effortless-solution-bringing-health-records-to-iphone/>

healthcare providers and organizations to participate in the WELL ecosystem and distributed data marketplace. WELL will utilize advanced encryption methods that underpin many cryptocurrency transaction mechanics to maintain HIPAA-compliant patient privacy as well as providing verifiable authenticity and integrity of information immutably stored on the blockchain.

Rather than relying on interoperability between healthcare systems and medical records, WELL establishes an open and secure data pool that functions as a single repository for patients and providers to interact with each other, driven by the WELL token. Increased participation and integration from healthcare providers and patients will forge greater network effects of the WELL platform, accelerate the growth of the incentive system, and contribute to a vast, universal data marketplace.

Problems & Solutions

Problem 1: Access to Medical Services — Either Very Expensive or Physically Inaccessible

Access to quality medical services is either very expensive or difficult due to a number of factors such as distance patients must travel, bureaucratic complexities, and inefficient insurance and medical systems. A patient may need access to healthcare from another city, or even another country, with high-class specialists who speak the patient's native language.

Solution

WELL clients receive 24/7 access to premium healthcare services no matter where they are. The WELL platform transcends boundaries and consists of a diverse, global network of doctors. Patients can receive local, home-based specialized care in their native language.

Problem 2: Cross-border Payment for Healthcare Services

Many countries have byzantine laws preventing citizens from making out-of-country payments. When allowed, payments often take days and cost a significant portion of the amounts processed. Additionally, payment can be stopped, significantly increasing risk of non-payment leading to many clinicians facing risk of non-payment due to non-compliance of paperwork or procedures.

Solution

Blockchains inherently allow for distributed, uncensored payments across a global network. WELL allow users can send and receive payments in minutes with the immutability and efficiency afforded by blockchains, eliminating risk of non-payment. **WELL will work on development of stable coin designed for healthcare.**

Problem 3: Insurance Verification and Payment or Denial

Healthcare insurance payers have complicated billing requirements and often deny and delay claim payment. Additionally, many healthcare providers experience significant cash flow difficulties due to claim denials.

Solution

With WELL blockchain, constituents eventually will be able to manage escrow accounts through smart contracts, releasing payments upon completion and approval of milestones such as visits, paperwork completion, invoicing, etc.

Problem 4: Record Keeping and Security

Healthcare record storage and data security is notoriously poor. Concierge services are limited in influence and healthcare systems are siloed. The transition to digital records has been slow, complex, and cumbersome. Loss of records, misinformation, and HIPAA violations have become commonplace.

Solution

The blockchain powered WELL platform immutably and securely stores sensitive data on an anonymized and decentralized network.

Problem 5: Fraud

Fraud is an ever-increasing problem in healthcare. The U.S. Justice Department discovered \$900 million in false billing in 2016 alone.

Solution

Blockchain affords timestamping, transparency, and indisputable hash records of all steps of a patient's care, ensuring fraud elimination.

Problem 6: Reputation

Global healthcare has historically suffered from a lack of verifiable reputation. The fragmented nature of healthcare networks and international ID standards has led to consistently prevalent problems with managing and tracking reputation in the industry.

Solution

Innovations in distributed identification management and token mechanics have created an opportunity to redefine dynamic reputation monitoring. WELL plans to integrate with Civic, leveraging Merkle Trees to store digital identities on the blockchain and enable an infrastructure for seamless compliance and performance tracking for all users of the platform.

Real-Life Patient Examples

Nigerian Citizen in Nigeria

A middle-aged woman discovers she has an increased blood levels of estrogen potentially indicating higher probability of breast cancer. A pharma company pays for access to such WELL patients. Without revealing her identity the patient receives WELL tokens for providing limited de-identified access to her data for research. Additionally, a pharma company approaches her to about participating in a trial of a new SERM (Selective Estrogen Receptor Modulator). She decides to participate in a trial and receives additional payment.

U.S. Citizen in Malaysia

A U.S. citizen and associate of a WELL advisor contracted malaria while traveling in Malaysia. She was transported to a Malaysian hospital and told she needed immediate surgery. With the WELL platform, she would have access to an experienced doctor to review her profile and provide an unbiased recommendation regarding the procedure. All too often a procedure conducted while traveling causes irreparable damage or even death to a patient, when a second opinion could have provided alternative treatment plans, procedures, and/or medication.

Russian Citizen in Russia

A successful middle-aged businessman and friend of a WELL investor developed a few cysts. He received incorrect treatment and passed away on his youngest daughter's birthday. He badly needed access to qualified specialists and a diversity of opinions.

Oppressed Minorities

In various countries, certain groups of people have difficulties accessing medical care due to discrimination or fear based on religion, culture, and other reasons. WELL can provide patients confidential access to qualified medical professionals on mobile devices or in the privacy of their own homes.

WELL Health Protocol

Introduction

The WELL application protocol will create the distributed, secure medical data storage and marketplace for the healthcare industry of the future. Utilizing secure computational methods and an encrypted data storage layer built on top of a Proof of Authority blockchain network, patients will have verifiable and direct control over their personal health data. Further, patients will have the ability to monetize their data through the WELL token incentive structure and application interfaces. Health organizations, doctors, insurance companies, and other healthcare providers can interact seamlessly in a trustless data marketplace where integrity, anonymity, and verifiable proof of data authenticity are assured through leveraging of zero knowledge storage and secure data sharing protocols.

The rise in home-based care has coincided with developments in medical device and IoT technology, where real-time data monitoring and diverse health metrics have the potential to transform modern healthcare. Traditionally, access to this data has been siloed, lacking in security, and expensive to access. With WELL, users will be able to securely store and access medical data through a distributed storage network with hashes of data subsets stored immutably on the POA blockchain.

WELL aims to become the ubiquitous application protocol for the exchange of personal medical data. Various applications can be built on top of WELL and can interact with the underlying protocol in a trustless environment, without revealing patient identities.

The Decentralized Application Vertical

The WELL application protocol aims to be the value magnet of the distributed medical data market economy. Traditional permutations of the vertical value stack in the early stages of the Internet saw applications layers built on top of the underlying protocols capture the vast majority of market value. Think Facebook, Google, and Twitter.

Blockchain technology enabled a new paradigm of the value stack vertical by shifting the value capture from the applications to the base protocols. In the cryptocurrency realm, Bitcoin and Ethereum dominate, and they represent large scale, distributed network protocols for trustless exchange of value. A new

opportunity has arisen within this paradigm, where the application protocol layers can become the aggregated value capture in a specific vertical.

These underlying protocol layers, when correctly implemented, can dominate value capture in traditional markets ripe for disruption. The WELL application protocol implements an effective cryptoeconomic design as the incentive structure driving a distributed medical data marketplace and storage infrastructure. By integrating the WELL utility token model into the application layer, users will directly participate in an unparalleled market for secure and private exchange of medical data by interacting with applications built on top of the application protocol layer.

Compatibility with third party applications and widespread adoption of the WELL token through increasing data sharing and token ownership will forge greater network effects and create the universal, distributed data marketplace of the future.

Proof of Authority Blockchain

WELL will employ a Proof of Authority blockchain anchored to Ethereum as the base protocol of the platform. The POA blockchain affords efficiency and high-throughput capacity that will execute in a computational secure Trusted Execution Environment (TEE).

Benefits of POA Blockchain

The POA blockchain is a straightforward and efficient form of modified Proof of Stake with known validators and a governance-based penalty system where validators' identities perform the role of staking. The POA node validators are incentivized through reputation and the system is predicated on implicit trust that all nodes are running the same software and validating blocks in the same way. With this implicit trust between validators comes great speed and efficiency across the network, allowing for a powerful framework to integrate with the distributed storage layer and data marketplace. Further, the POA blockchain model helps to mitigate against spam attacks as seen on Ethereum's Ropsten Testnet⁶.

The WELL blockchain has no inflation, with low fees for users who are leveraging the protocol. WELL will initially build and launch the POA blockchain through a permissioned and controlled environment before migrating to a trustless system.

Trusted Execution Environment

The WELL blockchain will operate in a Trusted Execution Environment (TEE) employing Intel's SGX software and hardware. The TEE utilizing SGX will provide a secure enclave in which to run the core of the blockchain network. This provides defenses against direct outside inspection and intervention of third parties or untrusted devices uploading data to the network data pool.

With a decentralized network of medical devices and personal devices used by patients and service providers, integrity and secure computation of the network can be significantly increased through operating within a TEE.

⁶ <https://github.com/poanetwork/wiki/wiki/POA-Network-Whitepaper>

Problems With The Current Medical Data Paradigm

The current data archetype within the healthcare industry is highly fragmented with globally disparate regulatory environments, pricing, and levels of access to this data. The need for a more ubiquitous application protocol for healthcare organizations, patients, and doctors to interact with and build applications on top of has always been there, but the technology was fundamentally not available yet to achieve this.

Data has traditionally been siloed and accessing this data without compromising patient privacy has been notoriously difficult to navigate. Further, efficient and financially prudent retrieval of this data has become convoluted with increasing duplication of information and rampant fraud as a result.

Distributed Storage and Data Marketplace

The distributed storage and data marketplace will provide the necessary infrastructure for the secure and private sharing of data across the network. As part of the application protocol, users will be able to interact seamlessly with the data in a secure and trustless format. Patients have direct control over access to their data using public key encryption with data integrity and authenticity validated through IPFS hash-based data storage.

IPFS

IPFS offers the benefits of de-duplication of information, substantially reducing identity fraud in insurance and narrowing potential attack vectors in instances where data is stored in potentially compromised, centralized data silos. IPFS additionally provides a mechanism for reducing the amount of data stored on the blockchain. Data stored using IPFS can also be retrieved and accessed offline, removing the risk of critical access loss in hospitals and emergency rooms during network outages.

As is inherent with a ubiquitous patient data marketplace, vast quantities of data being uploaded, accessed, and transacted across the network will require an efficient architecture for secure storage. IPFS works in-sync with blockchains to store immutable, permanent hashes of data inputs into a blockchain transaction. This results in a timestamped identifier of data stored on the blockchain without actually having to store the data on the blockchain itself.

Zero-Knowledge Computation and Network Transactions

Privacy within a medical data marketplace is paramount. Through encryption, users can retain control and access over their private information. The WELL application protocol will also use secure computation through employing SGX and multi-party computation (MPC). Computation in a data marketplace needs to be privacy preserving, and must be encrypted both at rest and in transit.

Interacting with the WELL application protocol never reveals patient identities unless patients agree to a set circumstance of this process. Consumers of this encrypted data can utilize MPC to query for encrypted data, obtain access from the patient, and use WELL tokens to purchase the data and execute its transfer. The incentives for the patient to furnish more data or reduce their level of anonymity in the process will directly correlate to the amount of tokens received based on the transaction's context.

WELL's zero-knowledge storage and anonymous patient data permissioned access protocol will incentivize end users to participate in the distributed storage and data sharing environment to earn WELL

tokens. WELL's zero-knowledge storage architecture is designed to drive honest and beneficial network behavior by both healthcare providers and patients alike. Healthcare providers and researchers will be able to use an anonymous query interface for searching for specific sets of data within the pool.

Importantly, validators will not have access to the information in these transactions due to them operating within a Trusted Execution Environment as afforded by SGX. Additionally, specific attestations of user (patient) data can be transacted in certain instances rather than the actual user data itself, adding an additional layer of privacy protection.

WELL Application Interface and Use Cases

The WELL application protocol will seamlessly and securely interact with applications and users in a trustless manner. Applications, medical devices, organizations, and healthcare providers can all integrate with the system as part of the WELL platform.

Building Healthcare Applications on Top of the WELL Application Protocol

Developers can build applications on top of the application protocol layer and are incentivized to do so through the WELL utility token mechanics. A few examples of applications utilizing the WELL protocol include:

- Data Monetization and Privacy
- CRM
- Health tracker
- Predictive analytics
- Clinical trials identifying/locating
- Algorithmic models predicting user fitness

The potential applications that can be applied to a vast distributed medical data marketplace are incredible. Users can subscribe to applications providing real-time alerts from everything involving availability of clinical trials to metrics for maintaining specific biometric levels outlined by their physician.

Healthcare providers, research organizations, and other institutions will be able to interact with the application protocol in a trustless environment, enabling significant cost reductions in aggregation, access, and analysis of patient data. Further, access to vast quantities of data previously hindered by the siloed and fragmented nature of the healthcare industry's record keeping and data storage paradigm will create the underlying open and distributed data marketplace necessary to supplement the WELL platform and telehealth application integration.

Medical Device Integration and Integrated Health Networks

With the home-based, telehealth environment enabled by the WELL platform, integration of medical devices using SGX and MPC secure computation will become an integral component of the data added to the platform. IoT medical devices will automatically log data to the network and users can be paid in the WELL token whenever this data needs to be accessed, whether it be for research purposes or verification of insurance related information.

Medical devices integrated with the network will anonymize user data and contribute it back to the data pool. Token Curated Registries (TCRs) can even be leveraged for ranking of specific datasets and can be used to rank the security and integrity of specific applications or devices.

Health organizations, providers, insurance companies, and other healthcare participants will have the ability to integrate directly with the application protocol layer and participate directly in the WELL platform ecosystem. With a ubiquitous and secure data marketplace supported by an underlying POA blockchain infrastructure, enterprise applications and tools can be built that aggregate more users into the WELL ecosystem, further driving the incentive mechanisms and network effects of the platform.

Flow of User Data Sharing

1. User encrypts data and stores it in decentralized storage.
2. Data is programmatically validated, verified, valued, and quantified.
3. User can choose to expose this data to the marketplace.
4. When an application chooses to access a user's data, the user encrypts the data using public key cryptography to ensure that the data is transferred safely.
5. Once data is on the marketplace
 - Users can set a price to access and view their data.
 - Users can use their data to determine how fit they are using integrated fitness-focused applications.
 - This allows an application to run an algorithmic model to determine the value of someone's health.
 - Applications can search for specific types of data sets that they desire.
 - Applications can compute on users data and give them an output without compromising patient identity.
 - Users can subscribe to particular applications that provide push notifications, medical alerts, and data access controls.

Well Platform

Introduction

The WELL Platform will be a distributed and open environment built on blockchain technology that will connect patients and physicians while also integrating healthcare organizations, financial institutions, governments and developers. Through leveraging several emerging technologies, the WELL platform will provide reliable access to global healthcare, enabling a vast network of healthcare participants to interact with each other in a peer-to-peer model.

The WELL token mechanics will function as the underlying incentive layer, driving all users of the platform to honest and beneficial behavior. Utilizing a Proof of Authority (POA) blockchain consensus model, predicated on established validator reputation, in combination with a secure and zero-knowledge distributed data marketplace and application protocol layer, the WELL platform will establish a distributed network of frictionless interaction in a currently fragmented and complex global healthcare infrastructure.

Why Blockchain?

The opportunities created by employing a blockchain based platform in the global healthcare industry are unmistakable and abundant. From reduced transactional friction to immutability and verifiable integrity of sensitive medical data, WELL offers the efficient and modern solution to traditional problems that have plagued the healthcare industry for decades.

Benefits to Healthcare Stakeholders

Provider (Health-Related Services and Medical Goods)

- Faster transaction settlement: Increased cash flow.
- Accurate and verifiable pre-authorization of payment: Anticipated payments known earlier in cycle.
- Blockchain immutability and hash based data security: Protected and efficiently accessible information from multiple silos.
- Near frictionless access to cross-border payments.
- Intuitive platform interface available across a range of devices.
- Ability to earn WELL tokens for providing access to un/under-utilized computing and storage resources.

Payer (Private and Government Insurers and Individual Players)

- Verifiable proof of member identity: Assurance of proper treatment and reduced fraud.
- Faster transaction settlement and lower costs: Removal of financial intermediaries.
- Blockchain immutability: Ease of audits through transparency and efficient fraud detection.
- Shared distributed ledger: Elimination of “double recordkeeping”.

Member/Patient

- Control of and monetization of personal data.
- Verifiable data integrity and security: Distributed hash-based storage guarantees data integrity of both medical and financial information.
- Privacy: Ensure proper application of HIPAA guidelines.
- Accurate and verifiable pre-authorization: Immediate determination of coverage and greater ability to compare options. (Pre-authorization portal can provide insights into costs, providers, and provider reputations).
- Ability to earn WELL tokens for providing access to un/under-utilized computing and storage resources.

Game theory mechanics within the WELL platform can effectively promote cooperation in the iterated Prisoner’s Dilemma when used in conjunction with the underlying blockchain. By using a reputation score model predicated on incentives for positive behavior and disincentives for malicious or dishonest behavior, the WELL platform eliminates social dynamics that affect participant ratings in centralized models.

A purely data-driven blockchain reputation builds strictly from factual time- stamped compliance and performance and cannot be hacked or hidden. Finally, blockchain also solves non-payment and

cancellation of payment problems by making payments immediate and tied to predetermined, smart-contract- driven triggers.

Applications, Use Cases, and Medical Device Integration

The WELL platform will be an open-source, collaborative environment for developers, institutions, patients and healthcare providers to build decentralized applications and healthcare tools on top of, leveraging the underlying application protocol layer.

Integration of the WELL platform with medical devices that can upload data to the platform will be further contribute to the distributed data marketplace. Providers and developers can create tools and interact with the data in the marketplace securely, without having to reveal patient identities.

For instance, users will be able to integrate with the Apple Health application and have the ability to monetize their data while managing access to it and storing it securely on the WELL blockchain. Developers can customize and build application tools through interacting with the WELL application protocol layer in combination with integrated third party apps.

Use cases for tools and applications include:

- Healthcare institutions access to de-identified patient data for research and clinical trials.
- Aggregation of anonymized heart-rate, blood marker levels, etc. data.
- Integration of digital wallets with protocol layer.
- Enabling of pre-authorization and instant payment to providers.
- Digital identity management and verification for insurance providers.
- Real-time monitoring of health metrics through connected devices.

The WELL platform will also implement the use of specific private key and password protections for users, afforded by [ZeroPass](#). Conveniently, mainstream users unskilled in private key/password management will not be required to repeatedly enter passwords on third party applications integrated with WELL. Further, they will not have to worry about storing multiple private keys for compatibility with different wallets. A patient's access to their WELL wallet and personal data access management will be intuitive and secure.

Financial Organizations

Financial institutions will act as partners. They will provide users with convenient financial instruments for currency transactions, lending, provision of special financial instruments, and loyalty programs.

Example: Participants can use a partner bank's cryptocard to pay with WELL tokens in offline pharmacies.

Healthcare System

The WELL network can help improve communication between all members of the healthcare system, socialize decision-making processes, and encourage implementation of health programs. WELL tokens are used primarily as rewards for all kinds of communication with the healthcare system.

Example: Organization of a health education program for preteens with WELL tokens can save money and effort. It may also attract doctors from other countries who want such programs for their patients.

Clinical Trials

WELL will provide value for clinical trials in the context of improving the process of patient data registration and data auditing.

Patient Data Registration

Once a patient has been accepted for clinical trial testing, their personal data is collected by a clinician. This information can be stored on a secure local server at the institution that the clinician operates from and a blockchain transaction can be created. This transaction references the trial genesis event.

Data Auditing

Once the clinician has collected sufficient data on the patient, auditors from credible establishments (FDA, NIH, etc.) can review these results. Auditors will have the ability to view the data and other information associated with the clinical trial at the authorization of the institution that holds this data. The auditors will be able to track the data, methods, and results that pertain to that specific clinical trial. Once the results are verified, there is a certifiable chain of custody for the trial and all the participants involved.

Charity

Our Charity Mission - Do Good by Doing WELL

WELL will provide blockchain, applications and tools access to our charities without fees. WELL charitable partners will pay participating doctors for their services. WELL charity partners and other charitable institutions that participate on the WELL platform will hold and transact in WELL tokens.

Research

The WELL network welcomes research institutes engaged in studying the treatment and prevention of diseases, medication efficiency, etc. The data collected by WELL can help researchers investigate the occurrence, development, and spread of disease as well as applied methods of treatment. The WELL token acts as a currency for providing access to patient personal data – with patient permission, of course.

Example: The South Korean Research Institute plans to conduct a comparative study on the drop in visual acuity among middle-aged people in different cities all over the world. To do this, they form the necessary data set and send the request to WELL. Users that have agreed to the processing of their personal data get rewarded in WELL tokens, and the institute gets data that is ready for analysis.

Pharmacies and Pharmaceutical Companies

The pharmaceutical business is an integral part of the health system. Therefore in the WELL network, we have begun developing programs for pharmaceutical companies to connect them with doctors who act as opinion leaders to promote drug lines and other products for disease prevention and treatment.

Example: The marketing department of a pharmaceutical company has developed a loyalty program for vitamin B-complex products, used in patient rehabilitation. A physician gets WELL tokens for recommending these vitamins as well as other products from this company. And

a pharmacy (offline or online) that can provide all of the necessary medicines and vitamins together gets WELL tokens, increases its position in search results, and gets financial instruments to ensure the availability of these drugs in the future.

WELL Platform Benefits

Patients

Main Benefits of Using Well

- Convenience and ease of healthcare delivery 24 / 7 / 365 via app or website for immediate appointments and access anywhere in the world.
- Connection with a curated global network of high-level doctors and other healthcare specialists often unavailable or difficult to access in some countries.
- Ability to have access control of data and monetize use of data from healthcare providers and research organizations.
- Participate in the distributed storage and computation architecture of the protocol to earn WELL utility tokens and contribute to the decentralization of the network.
- Platform for access to relevant providers: interpreters, pharmacies, labs, medical equipment suppliers, transportation companies and more.
- Reduction of costs, as much as 30% (varies by circumstance).
- Better payment outcomes, using tokens to ease cross-border payments, reduce payment risks, and eliminate third-party fees.
- Secure yet globally accessible data through the use of electronic health records.
- Participate in an open and global data marketplace.
- WELL will help Apple app users to protect and secure their data on the WELL blockchain as well as monetize third-party access to their data.
- Transparency and integrity by using blockchain and secure Multi-Party Computation to validate data.
- Ability to earn WELL tokens for providing access to un/under-utilized computing and storage resources.

Doctors

Main Benefits of Using Well

- Secure and robust work solution to address growing needs for convenient access to healthcare.

- Additional revenue from faster patient processing and lower overhead.
- Ease and cost-effective access to secure patient data.
- Better work-life balance with flexible work-at-home model.
- Ability to access de-identified patient data for similar outcomes as comparative analysis, supplementing treatment.
- Convenient tool for volunteer and charity work.
- Collaboration platform to connect with other doctors and receive additional training.
- Guaranteed payment through WELL tokens and exposure to a ubiquitous, blockchain driven data marketplace.
- Ease of patient monitoring with IoT connected medical devices and proprietary application interfaces and tools.
- Reduced reimbursement complexity with inherent immutability and transparency afforded by the underlying blockchain architecture and WELL token incentive model.
- More information faster for pre-authorization, greater data insights, and timely treatment.
- Ability to earn WELL tokens for providing access to un/under-utilized computing and storage resources.

Society

Main Benefits of Using Well

- Greater access for everyone for qualified medical care, including those in remote and underserved areas, through charity initiatives like WELL's social mission: "Buy a Visit, Give a Visit."
- Medical training for health practitioners in remote regions of the world.
- More transparency in charitable giving through blockchain.
- A globally secure and open data marketplace for users of all types to monetize their personal data.
- Ability of healthcare providers, research organizations, and other institutions to have access to previously unavailable and costly data, metrics, and analysis.
- Lower overall healthcare costs through decreased overhead and reduced readmission rates in hospitals and clinics.

- Increased innovation building on top of emerging technologies and distributed uploading and storage of medical data.
- Decreased carbon footprint from less patient and doctor commuting.
- De-duplication of data and identity using verifiably authentic distributed data and ID attestations that can reduce insurance fraud.

Connecting User Data with Healthcare Actors

With Apple, Google, Facebook, and Tencent increasingly controlling the mobile OS and application layer, there is a huge need for privacy and ownership (including monetization) of users' personal health data on health apps and devices. In turn, device manufacturers, app developers, employers and data consumers need an independent, intermediary platform. WELL blockchain protocol fills this need with its Proof Of Authority protocol.

WELL Health Protocol creates a connection between data from sensor/wearable devices, EHR systems, patient identity, and users. By utilizing WELL tokens, WELL incentivizes and compensates for the development and launch of healthcare applications and devices on its protocol. Corporates, employers, clinics, and insurance companies (sponsors) can also participate in monetization of such applications and devices by investing in their development to receive a percentage of future earnings from these devices and applications both in cryptocurrencies, fiat currencies, and WELL tokens.

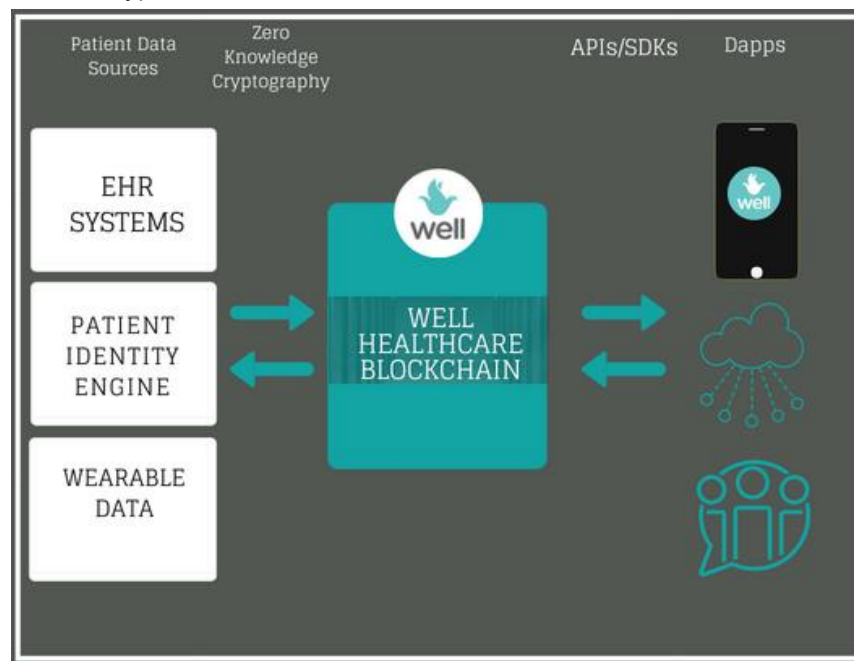


Figure 1: WELL Protocol

WELL tokens earned by developers and their sponsors will be staked for a period of up to twelve months. Additionally, service providers will be able to stake part of their crypto and fiat currency denominated earnings through WELL tokens backed by crypto or fiat currencies earned. This may create a tax deferral

and conversion of part of the service provider earnings from short to long-term gain tax treatment. Additionally, pre-approved POA validators will stake their WELL tokens along with their reputation to ensure that they validate in good faith and are punished for malicious behavior.

WELL Platform Users: Can earn WELL tokens from selling their data that can also be staked or converted into WELL tokens.

Data Consumers: Can purchase user data by buying WELL tokens on the market and converting them into WELL tokens through WELL bridge.

Employers, Healthcare Organizations, and Other B2B Users: Can participate in the WELL platform through purchasing WELL tokens (WELL tokens will be frozen for a period of 12 months in the process).

Authorized Validators: Provide computing and storage to validate blocks and earn Credit tokens. They are required to stake their WELL for a period of one month to a year and earn correspondingly, WELL and WELL tokens.

Well Tokens

The fundamental unit of value within the WELL system is the WELL Coin token (“token”). Tokens provide inflationary-resistant digital value within the WELL system. The WELL token will be derived from a standard Ethereum ERC20 token and will be tradable on exchanges.

Token Features

The WELL token is used for multiple features within the WELL platform:

Form of Payment

WELL tokens will serve as the main means of payment within the system, although we will accept and use other types of fiat and/or cryptocurrencies.

Currency Exchange

WELL tokens will support price determination for WELL services. The system will take a fee in WELL tokens and some premium features will be available only by using WELL tokens.

Gamification of Healthcare

The WELL platform will award WELL token holders for behaviors that lead to desirable outcomes. Patients will earn WELL tokens for achieving markers, such as improved blood pressure, cholesterol, and other health measurements, or ratings and timeliness. Clinicians will earn WELL tokens for patient achievements, lower hospital readmission rates, ratings, timeliness, and more. Corporate partners will receive bigger discounts for higher satisfaction ratings from their patients and clinicians or better adherence to smart-contract governance. Programmers will earn WELL tokens for their contributions to WELL source code based on measurable metrics, such as Github references, library usage in the WELL code base, and hackathon wins.

Social and Gaming Functions

The WELL token also acts as an “in-game” token, and participants in the WELL ecosystem earn tokens for certain actions. Also, network members can use the token to unlock network resources such as wellness resources for patients, clinical education resources for clinicians, and data and analytics resources for enterprise clients and partners. We intend to create strong community connections between the different parties in healthcare.

Encouragement and Rewards

WELL patients, doctors, and other users earn WELL tokens for being on time to appointments, thus reducing costs associated with schedule disruption.

Partnership Access

WELL ownership will give access to advanced platform features, and special partnership programs will help in integrating big companies and institutional players into the WELL network.

Data Sharing

Everytime WELL receives a payment for de-identified and anonymous patient and clinician data, the corresponding patient and clinician will earn WELL tokens. WELL respects the personal details of all clients and will never disclose any information to third parties without consent from the client.

Payable Access to De-identified Health Histories

Insurance companies and other enterprises will pay tokens to access de-identified WELL health data.

Token Usage

Participants of the WELL Network

WELL serves as the intermediary platform for its network, with the goal of connecting patients, doctors, institutional partners, and the healthcare society.

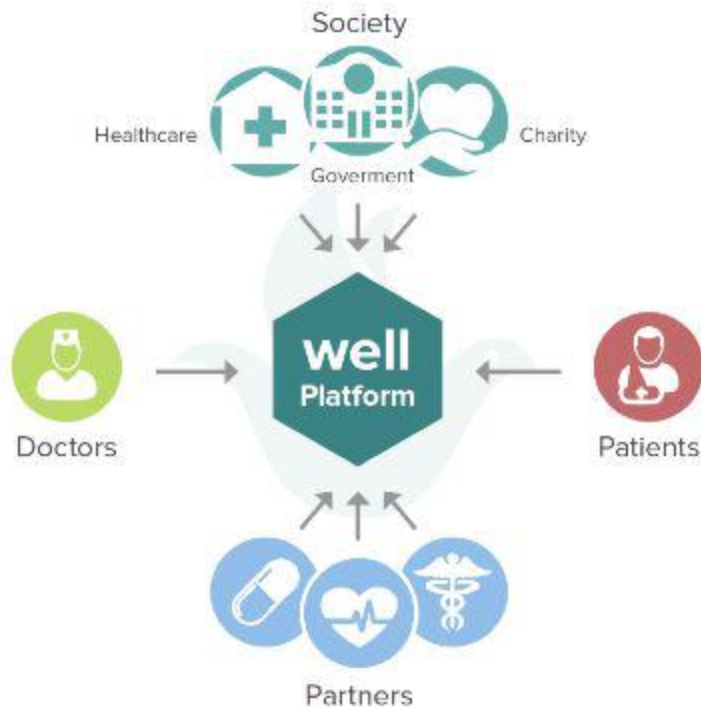


Figure 2: WELL Network

The following parties can use the WELL token:

| | Pay with Token | Earn Token |
|----------------------------|---|--|
| Patients | Access to analytics, applications, metric tools. Transacting across the network. | Selling data access, contributing to distributed storage and computing network. |
| Doctors | Access to de-identified patient information and metrics, real-time health tracking, research data. | Contributing to the data pool, providing access to computing and storage resources, services for patients. |
| Insurance Companies | Obtaining data about general health patterns and outcomes, access to patient identification attestations. | Partnership opportunities for WELL corporate clients, services to WELL clients |
| Healthcare Systems | Access to research data, de-identified patient data, application integration and services. | Sharing data with other WELL partners and clients, contributing to storage and computing layer. |
| Charity | Payment for care and product | Donations from patients, doctors, |

| | | |
|---------------------------------|--|-----------------------------------|
| Organizations | sales | companies, and healthcare systems |
| Research Institutions | Collecting data from the system | Sales of research |
| Pharmacies | Marketing and sales | Pharma sales |
| Pharmaceutical Companies | Patient trials, referrals from doctors | Pharma sales |

Table 1: Well Token Users and Associated Function

To see the full list of WELL token functions, please view our [Token Matrix](#).

HIPAA Compliance & Security

The Health Insurance Portability and Accountability Act (HIPAA) governs how U.S. healthcare providers handle sensitive patient data. Accordingly, healthcare organizations must follow many compliance regulations when adopting blockchain. By combining blockchain with dynamic data obscurity⁷, the WELL platform will be a **HIPAA-compliant blockchain platform**. WELL’s dynamic de-identification protocol will partition data based on levels of access needed for different parties, times, reasons, and locations, only on-the-need-to-know basis. By deploying non-mathematically derived dynamically anonymous identifiers, WELL blockchain will also overcome the so-called Mosaic Effect⁸ and enable granular privacy controls.

Blockchain combined with dynamic de-identification protocol and powered by a distributed P2P network is the safest way to preserve and defend against security breach attacks that all centrally-held databases, however secure, are susceptible to. Traditional EMR systems, despite being HIPAA-compliant, are no exception to such exposure. The Equifax hack exposing 143 million Americans is just the latest in a string of security breaches to traditional centrally-held databases⁹.

Currently, WELL deploys HIPAA-compliant Amazon Web Services (AWS) for hosting and partners with Qi Express, a modular, menu-driven security assessment and certification software application for healthcare entities and related organizations who must protect personal health information (PHI).

⁷ <http://informationaccountability.org/data-dynamic-obscurity-project/>

⁸ <https://gcn.com/articles/2014/05/14/fose-mosaic-effect.aspx>

⁹ <https://www.usatoday.com/story/money/2017/09/15/equifax-data-breach-what-you-need-know-hacking-crisis/670166001/>

Financials

Token Distribution



Figure 3: Well Token Distribution

Approximate 1.5 billion WELL Tokens will be created and distributed as follows:

Issued: We will issue **40%** of the coins for the crowdsale.

Reserves: We will reserve **40%** for business and network developments, future financing needs, and coin liquidity to support timely access to healthcare network members. We will also provide bounty and advisors programs with part of the reserved coins (not more than 5%). All unused tokens for special programs return to the reserve.

Team: We will provide the team and project launch with **20%**. We will prohibit the team from liquidating WELL tokens at a rate of more than 25% of their position within the first calendar year to demonstrate that we are in this for the long run and that the team’s incentives align with the tokenholder’s interest.

The following table presents the estimated allocation of the Well Token:

| Part | Distributed | After Crowdsale |
|-----------|---|--|
| Crowdsale | Up to 600,000,000 WELL Coin tokens | Up to 600,000,000 go to contributors |
| Reserves | 600,000,000 WELL Coin tokens (5,000,000 tokens used for bounty) | 4,000,000 go to bounty 1,000,000 unused tokens go back to main reserve pool |
| Team | 300,000,000 WELL Coin tokens | 225,000,000 tokens are frozen for one year |
| Summary | 1,505,000,000 WELL Coin tokens | Up to 604,000,000 to contributors and bounty |

| | | |
|--|--|---|
| | | 601,000 000+ to reserve 300,000,000 to team (225,000,000 frozen) |
|--|--|---|

Table 2: Detailed Allocation of Well Tokens

Use of Reserve

The Well Tokens in reserve will be released based on the following schedule:

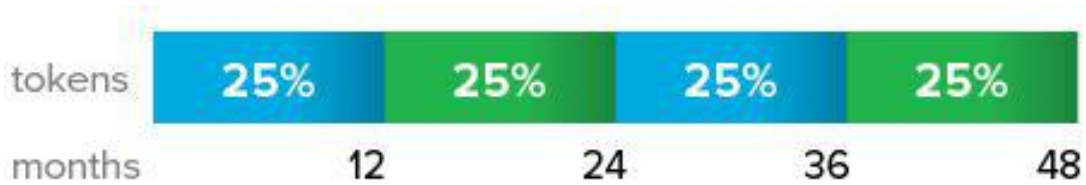


Figure 4: Well Token Reserve Distribution

Bounty Program

Please visit our site <https://joinwell.io/> to see available bounty campaigns.

Use of Funds

The funds collected through the CTL will cover the expenses of the project until the project starts making profit and sufficient cash flow to function on its own.

The key expenses for these funds collected are as follows:

- Cost of building WELL platform
- Staff salaries
- Sales and marketing expenses
- Recruiting, partnership building, and business development
- App development costs

The company will use the crowdsale proceeds primarily for the development of the platform. The amount raised and used may vary based on changing market, technological, business, and other factors.

Roadmap

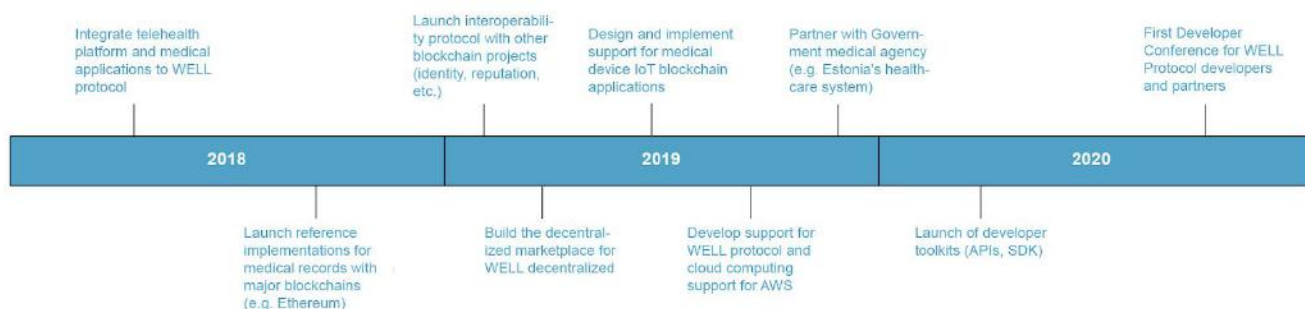


Figure 5: Well Timeline and Milestones

Team, Advisors, and Investors

Team

The WELL team is unique in that it combines deep healthcare and fintech industry experience with blockchain and software expertise. Unlike many other blockchain crowdsales, WELL's crowdsale is a natural step in WELL's long-term vision of delivering frictionless high-quality healthcare for everyone.



Ildar Fazulyanov
Co-founder and CEO, Serial entrepreneur with over 20 years of experience in healthcare, fintech, and venture capital



Alex Prokhorov
Co-founder & Chairman of Advisory Board, Managing partner and co-founder of Finsight Ventures



Roque Espinal-Valdez
Chief Medical Information Officer, Collaborative clinician who works cross functionality to anticipate challenges, opportunities and develop innovative Digital Health Solutions



Dr. David Lefferman
Clinical Director, Pioneer of the Modern House Call, providing house calls by coordinating primary, ancillary and specialty treatments



Chris Bright
Lead Software Developer, Expert in Web development, cloud computing, AI, and mobile development



Nate Flake
Project Manager, Experienced consultant to many companies across various industries both in the US and internationally

Advisors



Paul Brown
Investor and advisor
Consulting Partner at
Granite Growth Health
Partners, Co-Founder of
Sandbox Industries



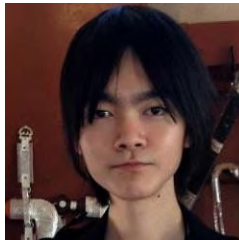
Harry Nelson
Legal advisor
Founder and Managing
Partner of Nelson Hardiman



Robert Zimmerman
HIPAA & IT security
advisor, Co-Founder of
Maryland Health Tech
Coalition



Brian Hansen
Investor and advisor
Managed Newspapers.com,
Fold3, ProGenealogists,
Find a Grave, Memoriams,
WeRemember, Archives, and
Ancestry's institutional products



Tomoaki Sato
Advisor, Blockchain
Engineer, Founder
of Starbase



David Johnston
Advisor, Chairman of
the Board for Factom,
and CEO for several
technology startups



Angelo Dodaro
Advisor, Award winning
digital marketer, blockchain
entrepreneur, 10+ years of
marketing experience



Marty Tate
ICO legal advisor,
Specializes in securities law,
crowdfunding, fintech, token sales,
Peer-to-peer lending, private equity
and fund formation and management



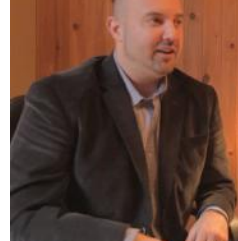
Akin Sawyerr
Advisor, Builds and
advises businesses
focused on underserved
communities



Azam Shaghghi
PR advisor, experienced
blockchain consultant



Alex Mashinsky
Advisor, CEO of Celcius
Network, and Managing
Partner of Governing
Dynamics



Christopher Kramer
CEO of OneName Global
inc., and blockchain strategist
at CeekVR

Investors

Between April 2015 and December 2017, angel investors and venture capital firms

invested \$3 million.



Zuma Partners
Venture Capital Firm



Skagit
Venture Capital Firm



IQ Ventures
Early Stage
Investment Fund



Jeff Danley
Founder of Peak Ventures