

Immunify.Life

DATA FOR LIFE

Whitepaper V 2.0

A unique AI supported digital registry secured
by Blockchain Users + eCertificates + doctors
+ Governments + Blockchain + AI



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Mission & Purpose

Immunify.Life My Health, My Data.

Our mission is to transform the landscape of health management and data utilization as we know it today.

We do this by utilizing blockchain technology combined with the power of community to support emerging economies in revitalizing inefficient healthcare systems.

Immunify.Life will leverage the power of Big Health Data to better serve the global community in enabling a more equitable and informed deployment of healthcare. This reduces the dependency on international aid in growing economies and works towards building a robust and self-sustaining system to save and protect lives.

Our blockchain enabled rewards system will accelerate behavioral change in both patients and healthcare workers alike to incentivize positive health actions and outcomes.

Preface

Safer, smarter healthcare.

Blockchain is a decentralized system of recording data and performing transactions which is being rapidly adopted across multiple industries, including healthcare. Its unique features, like the validation of transaction processes, prevent system failures from any single point of transaction, and approve data sharing with optimal security.

Within the healthcare sector, blockchain technologies are revolutionizing electronic medical records systems, promoting patient-centred care by securely sharing patient data for remote monitoring and management systems and strengthening disease surveillance systems in cases of disease outbreaks, resulting in local and global health emergencies.

In such conditions, blockchain is used to rapidly identify health security concerns, analyse preventive measures, and facilitate decision-making processes to act efficiently. The end result strengthens health systems around the world to reduce the global burden of diseases, mortality, morbidity, and economic costs.



What is ImmunityLife?

ImmunityLife is a transformative and self-sustaining healthcare ecosystem secured by blockchain. Its primary use is to strengthen global health systems and access to health data via an incentivized data capture tool developed for the ImmunityLife disease register. It provides an all-in-one platform and ecosystem to capture full, transparent health records of secured patient medical information. It offers the patient direct access to personal data via a unique health identification tag with the ability to consolidate this data to enable Big Data for Health.

The platform integrates a sustainable ecosystem allowing for the incentivization of health campaigns and rapid scaling of its deployment, seamless integration of peripheral health related data and data management tools.

Our solution integrates the latest blockchain technology coupled with artificial intelligence (AI) to introduce a Smart Health Ecosystem of incentivized digital healthcare.

Our Expertise.

Already established in Africa and Asia, the ImmunityLife team has more than 60 years of combined healthcare, technology and finance expertise across multiple global markets. The international management team consists of healthcare entrepreneurs, doctors and developing market finance specialists focused on building tailored healthcare solutions in emerging economies.

Having worked in emerging economies alongside international development agencies, NGOs and governments the team is in an advantaged position to understand the complexities of healthcare ecosystems while recognising the current challenges on the ground.

ImmunityLife will be a world first solution to solve the current global health management and data collection challenges.

Meet the team



Guy Newing

Chief Executive Officer

Mr. Newing is founder and CEO of Hexcel Global, a pioneer in designing simple cloud-based Electronic Health Records (EHR) and disease registries for developing countries. With a particular focus on Africa, including DRC, Cameroon, Sudan, Tanzania and Ethiopia. He achieved significant success as a healthcare entrepreneur in Australia and has 20 years of experience in healthcare sales and marketing consulting.



Daniel Kenny

Chief Operating Officer

Daniel is a highly experienced and successful biopharmaceutical sector professional, with more than 30 years of experience in the global pharmaceutical industry, including senior roles with Roche (Basel, Switzerland), and Baxter (Zurich, Switzerland & Vienna, Austria). He has more than 10 years of clinical research experience in the field of ophthalmology and HIV/AIDS prior to joining the pharmaceutical industry.

Daniel is a science graduate from the University of New South Wales, Sydney, Australia and has completed Executive Business Studies at INSEAD and the London Business School. He is also a Member of the Australia Institute of Company Directors and Member of the Australian Institute of Physics.



Diego Emilio Cruces

Chief Technical Officer

With over 20 years of experience in delivering innovative IT solutions in CXO roles for US and LATAM based companies, Diego has been a tech pioneer in the crypto revolution in emerging markets since 2013.

Having successfully delivered proof of concept and key consulting services to the TOP 10 blockchain pioneers companies in the LATAM markets, Diego brings a wealth of knowledge and expertise to Immunify.Life in the evolution of technology as we know it.



Sanjoy De Souza

Chief Science Officer

Sanjoy has over two decades of experience in developing cutting-edge, evidence-based digital health solutions across Australia, Asia and Africa. He has over 20 years experience in healthcare sales and marketing in pharmaceuticals as well as consulting for Ministries of Health in Australia and Asia.



Mbi Tabentendo

Regional Director
African Operations

Mr. Tabentendo has spent the last five years building political relationships in Cameroon, and across Africa.

He has worked in medical analysis and diagnostics for almost a decade. Prior to that, he was a Senior Executive at EurOil/Bowleven and JP Morgan.

Meet the team



Kinza Win

Director Strategic Partnerships

Kinza Win is an experienced specialist in Private and Institutional Philanthropy and the building of Cross-Sector Partnerships. She also brings over 20 years of professional expertise from the finance industry, having held senior positions in private wealth management and financial advisors roles in International and Swiss banks.

As a true advocate of re-thinking the role and responsibility of finance in addressing global issues and in 2019 she founded WIN Advisors, to offer Strategic Philanthropy and Innovative Finance advisory services to public and private sector organizations, as well as UHNW individuals. She also holds a senior board position in a Human Rights organization.



Dola Idowu

Implementation Manager

Dola's 13 years of experience in Healthcare delivery has spanned across the Royal Army Medical Corps (RAMC) and the NHS (National Health Service) in the United Kingdom (UK). His focus is making sure that health data is properly captured and made available for intervention by Clinicians, Governments and NGOs; so they can make the best decisions for their populace.

Because of his experience, he has worked to make sure that emerging economies from sub-Saharan Africa all the way to Afghanistan are given the opportunity to properly record healthcare data in ways that can help drive research and improve health economies.



John Moore

Chief Financial Officer

John has vast experience in the fintech sector, having previously been with Neville Russell's Chartered Accountants in London, honing his skills in tax accounting and auditing, whilst implementing the firm's transitioning national IT system.

He has served as the Chief Financial Controller of Telford Inns, which at the time, was the largest Australian owned hotel group, with a turnover exceeding \$70 million.



Adrian Cohen

Chef Medical Advisor

Dr. Cohen has over 30 years of experience in the healthcare industry as a practicing physician and business developer, pioneer of Health IT management solutions including Paramedix, MedicalOnline, SkinChex, ConcussionPassport, Founder of GoodHealth Television, MedicalOnline, Immediate Assistants Events, Necksafe, Headsafe.

Our Partners.



BlockConsult.io



Occam

PriorityToken

PriorityToken



SixShotVenture



Faculty



LTI



MMUST



State of the Heart Recovery



Interswitch



BAWAC



Mahboba's Promise

A cryptocurrency for Health.

The Immunify.Life Token (IMM) is the digital cryptocurrency powering the new generation of healthcare delivery and health investment applications. The Immunify.Life ecosystem will serve as the catalyst to drive major behavioural change in disease management while acquiring an unparalleled quantity of reliable medical and consumer data. This data can be utilised by donor organizations, international development bodies and commercial partners offering an accurate view of disease management and healthcare deployment.

Secured Health Data.

In order to ensure complete and progressive security of data we are developing a proprietary layer 3 blockchain engine, The Immunify.Life Blockchain which adheres to the current legal and consensus security requirements of the healthcare industry and offers better data integrity and encryption by providing a unique validation system, the Immunify.Life ID.

Blockchain technology is the core component of the Immunify.Life platform and has been designed to drive major improvements in health outcomes of both emerging and developed countries using Big Data.

Big Health Data is crucial not only for the overall management of Global Health but also to improve clinical trial efficiencies that pharmaceutical and other medical research companies require. It will then provide key essential data for further research, donor and investor analytics.

The Problem

The current practices in emerging economies include widespread reliance on paper-based records or rudimentary interfaces that have historically led to paper based healthcare records being poorly managed, non-secure and inconsistent.

Incompatible data sources have led to immense inefficiencies in the deployment and monitoring of drugs and treatments of both non-communicable and communicable diseases. Despite billions of dollars in investment, largely non-scalable solutions have evolved. Lack of systems to compile and trace essential data has led to significant loss of critical resources including the poor management of drug stockpiles, misplacement of stocks and expiry of medication.

Worse still, lack of monitoring and misuse of medication has led to the development and spread of life threatening antimicrobial resistance (AMR) and multidrug resistance (MDR).

World Health Organisation (WHO) has declared that AMR is one of the top 10 global public health threats facing humanity.

Billions of dollars in medical aid is donated every year to emerging economies but keeping track of its deployment and measuring the impact has been a significant, time-consuming and costly challenge faced by all International development agencies, donors and NGOs.

The COVID-19 pandemic has highlighted the importance of being able to accurately track testing and treatment data in real time at an individual level through a trusted and verified system.

These problems are further exacerbated by a shortage of skilled healthcare workers who are over stretched and under resourced. Patients are often reluctant to take time off work to receive medical treatment as they lose essential income. Simple health issues left untreated give rise to increasingly poor health conditions which could otherwise have been treated simply.

Paper records	Not transparent	No access to treatment	No sharing of medical records
Healthcare records are poorly captured and managed, not secure or transportable and valuable drugs are often stolen or misused.	Hundreds of billions of dollars in medical aid is donated every year and keeping track of its deployment and impact is almost impossible.	Many people in emerging economies do not have access to modern medicines or well-trained healthcare workers and have to travel long distances for care.	Real time online permission based access to health treatment becomes more critical in a time of global pandemic.

The Solution

My health, my data.

We believe in the power of utilizing new technologies to create life changing opportunities for emerging economies to make rapid improvements in health outcomes.

By using the power and security of blockchain to secure personal records, ImmunityLife will make it easy to retrieve personal information from any location, at any time.

This technology will replace inefficient paper based records and complex data systems to offer safer, smarter healthcare around the world.

The building blocks of this transformative tool are the individual Electronic Health Records (EHRs) created at the point of patient treatment. Stored securely on the ImmunityLife Blockchain, these single views of patient medical data, test and vaccination records as well as chronic and infectious disease diagnostics can be updated over time and be accessible to the patient and designated parties.

The unique ImmunityLife token reward system will drive positive health outcomes of healthcare workers and patients. These goals can be set by governments or NGOs *i.e.* a target number of vaccinations within a certain time.

As these goals are achieved, patients are incentivized with meaningful rewards applicable to daily life so the barrier to patients taking time off work is removed.

Online self-sovereign identification register	Transparent	Medical aid to everyone	Remote treatment
A simple, user friendly app that can store your digital identity NFTs, health certificates NFTs, medical health records with a wallet function and an interest bearing saving account.	Real time tracking of every test and treatment delivered for every patient including donated aid, can be integrated into international tracking and data systems.	Complete confidence that treatments are delivered to real patients with authentic treatments. This encourages donors to give more aid.	Billions of individuals in emerging economies without healthcare begin to acquire a secure transportable medical record for the first time.

ImmunityLife proposes a transformative solution which will not only capture, collate and facilitate access to critical health data but also supports the healthcare ecosystem by providing critical data and traceability to those who invest in healthcare.

Our AI and smart, intuitive interfaces have been designed to achieve time and cost efficiency while increasing the overall quality and efficiency of care.

A Complete Ecosystem Solution

The Immunify.Life platform comprises of a complete eHealth ecosystem that consists of several modules based on the Immunify.Life Blockchain.

The blockchain secures all databases and information shared and accessed in the Immunify.Life system in a decentralized way, and the ecosystem comprises a fully functional combination of a personal health record and an electronic medical record compliant with the most stringent security and privacy standards (HIPAA/IHE).

The system collects point of treatment data at an individual level, and provides a secure bridge between doctors, patients, pharmacy and pathology allowing access to the data for correct care. It delivers a complete disease register and platform secured by our proprietary Immunify.Life Blockchain to give patients security, as well as transparency and trust in each transaction and piece of data.

We are able to capture and provide this data on a de-identified basis in full compliance with US HIPAA health standards.

A simple app connected to the platform can be used on a mobile device and accessed by any medical professional in real-time. The Immunify.Life app will be made available at no cost to end users to ensure equal access opportunities and encourage adoption of the technology by governments and health agencies.

Its goal is to capture details of medical treatment in real time, including individual ID verification and drug information. The use of a proprietary blockchain for the storage of all the medical information enables an efficient and transparent environment based on higher degrees of accuracy and trust because technology is a tamper-proof public ledger.

The platform leverages the blockchain not simply to secure and consolidate patient data across the network, but also to obtain and record patient consent before any information is shared with interested parties. When patients confirm consent, the software automatically encrypts and records details of the consent transaction on the shared ledger. The platform also records which parties accessed the data, at what time, and for what purpose. As user information for subsequent visits, treatments, drug prescriptions and/or vaccinations is automatically updated to the user's account - governments and donors can receive a de-identified extract of the medical data of patients and users to allow for real time tracking of health outcomes and emerging disease patterns for clinical studies and marketing purposes.

A Complete Ecosystem Solution

The system lets users, medical professionals, Governments, NGOs, regulatory bodies and institutions use the platform to:

- Monitor the deployment of healthcare in real time to assess impact of treatment and allocation of financial resources.
- Drive desired behaviors: the IMM Digital Asset can be utilized for Incentivization, encouraging behavior change in patients and health workers e.g.:
 - Completion of a specific health test e.g. HIV, TB.
 - Vaccinations taken or administered e.g. COVID-19, Polio.
- Obtain user-controlled access to data e.g. Anonymizing data for non-patient access.
- View a single cohesive picture of patients' health through real-time data streaming.
- Receive AI-powered insights from Government and NGOs, research institutions to monitor and predict health outcomes *i.e.* Big Data with single-point dashboard for ease of access.

The Ecosystem has three key components:

The 3 components of the Ecosystem work together to create a unique and powerful health management ecosystem.

The Immunify.Life platform.

The platform is built to capture and store vast quantities of real-time, real-world data through the highly secure ledger of blockchain. We are able to capture and provide this data on a de-identified basis in full compliance with US HIPAA health standards.

The Immunify.Life Token (IMM).

An ERC20 standard token, which is a tradable instrument based on the Ether cryptocurrency. Transactions among patients, service providers, regulators, and others can use the IMM token as an accounting unit.

The Immunify.Life app.

A simple app connected to the platform can be used on a mobile device and accessed by any medical professional in real-time. The Immunify.Life app will be made available for free to end users to encourage adoption of our technology. Its goal is to capture details of applied medical treatment in real time, including individual ID verification and drug information.

The app can be utilized worldwide and can be plugged into healthcare IT systems, HIS connection via HL7/FHIR, medical imaging standards like DICOM and robust compliance with IHE and HIPAA. It will also integrate emerging digital health passports as they are evolving.

A Complete Ecosystem Solution

ISO 9001 and ISO 27001 certification will provide ironclad assurance of security and reliability of Immunity.Life as a professional-grade medical IT solution.

The need for e-vaccination certificates tied to immutable credentials is driving technology innovations in the healthcare sector. This proves the importance of Immunity.Life as a unique platform to integrate all medical interactions and information flows between patients and healthcare professionals.

Immunity.Life Ecosystem.

Costs, Benefits & Requirements.

Costs

\$0

Zero cost implementation to frontline users

Incentivization via donor support



No infrastructure requirements

Benefits

Capture patient health data globally



Empower health individuals and communities with health data



Unified patient health records

Catalyse big health data

Health Systems Strengthening HSS

Universal Health Coverage UHC

Pandemic Control

Data for R&D

Data for the future

Data for Health Investors

Requirements



Implementation partners

Global health sponsors & facilitators



Donor & private sector incentivization support



Private foundations

Development funding

Corporate sponsors

- The app is provided at no cost to end users.
- The Ecosystem will redefine the delivery and management of healthcare in emerging economies.

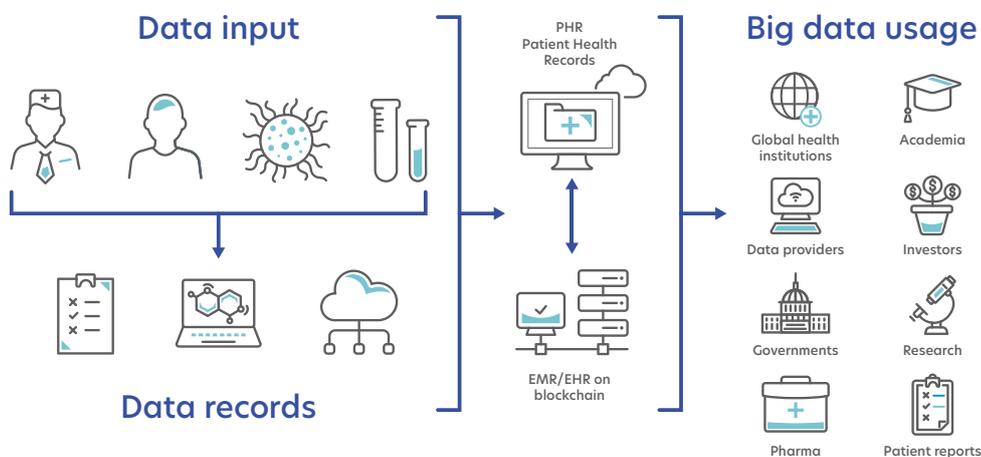
Big Data

Healthcare analytics enabled by Big Health Data has the potential to reduce costs of treatment, predict outbreaks of epidemics, avoid preventable diseases, and also improve quality of life in general.

Big Health Data can only be achieved by compiling large volumes of information which is enabled by the roll-out of digital technologies that collect both patient and health facilities records. Powered by the analytics provided by AI, data that would ordinarily be too large and complex for traditional technologies can now be analysed.

Immunify.Life's technology and platform offers the mechanism and framework to capture large amounts of vital data for populations where currently little to no reliable data exists. This would allow their health needs be better understood and provide industries like insurance companies with the vital information necessary to potentially enable health insurance to these populations to help achieve the Global Development Goals of Universal Health Coverage.

Immunify.Life Blockchain for Big Health Data.



Big Data applications in healthcare.

- Risk and disease management.
- Real-time alerting and disease tracking.
- Developing new therapies.
- Reducing fraud.
- Improved strategic planning.
- Predictive analytics.
- Enhancing patient engagement.

Advanced health technology infrastructure in times of unprecedented crisis.

The global pandemic of COVID-19 has evidenced how unprepared healthcare systems around the world lack the technological & systems resources required to deal with global health management and pandemic outbreaks. It has also made governments aware of the pressing need for fast, secure and transparent access to and exchange of critical medical data between facilities, researchers, medical professionals, institutions and users as well as the need to consolidate this data as Big Health Data, to understand global trends and resource requirements.

Major challenges of COVID-19.

Although there are multiple challenges associated with COVID-19, these are the high-level concerns related to the critical role of health data:

- Lack of integrated, accurate real-time systems for tracing large populations at various stages of infection.
- Limited ability to efficiently monitor and verify vaccination records in emerging economies.
- No mechanism to track ongoing complications and symptoms of COVID-19.
- Difficulty in detecting counterfeit drugs.
- Vaccination certificates for travelers and employees can easily be forged or copied.
- Limited ability to certify accurate treatment data to allow for safe international travel.
- Misinformation spreading via social media platforms of incorrect health safety measures.
- Politicizing of pandemic response and global inequalities in allocating related health resources like vaccines.

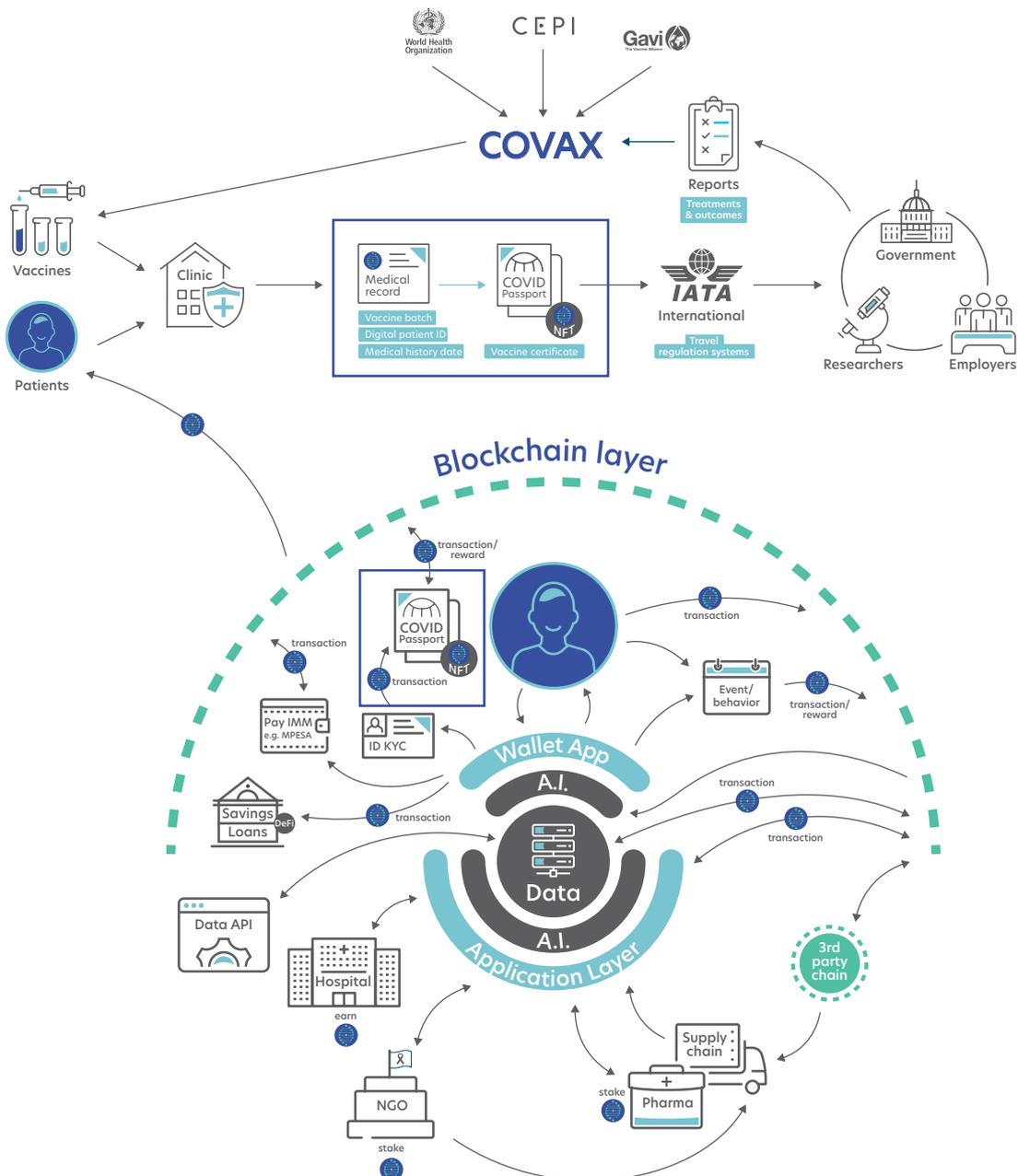
Big Data

Immunify.Life and COVID-19.

Immunify.Life will provide a vital tool to capture and share essential vaccination data in a reliable and timely manner.

As Immunify.Life collects accurate vaccination information at the point of treatment in emerging economies, it can help ensure that patients have received proper medical treatment and store the verified record to prove it.

Immunify.Life will integrate with other international vaccination systems like the IATA initiative to pursue the implementation of immunity passports, thus making the current deployment both critical and timely for scaling and commercial market entry.



Support System

Immunify.Life will revitalize legacy health systems.

- **Saves time and lost information** by eliminating incompatible systems, processes and paper records.
- **Enhances the value of existing clinical data** through intelligent integration of non-medical and medical data analysed via our AI.
- **Reduces risk of drug wastage and theft** by validating users and replacing outdated paper systems.
- **Empowers the patient** by giving them a central role in the management of their private data and clearly demonstrates their vaccination status.
- **Improves health outcomes** by rewarding patients and doctors to follow health priorities and ensuring they follow best practice guidelines.
- **Addresses vulnerabilities of healthcare** by putting accuracy of medical data and secure transfer as the core element.
- **Offers a practical approach to simplifying the international health care system** by enabling fast, reliable technology to access to medical data anywhere, any time.

Leveraging novel technologies, Immunify.Life enables the convergence of existing, but fragmented systems, and creates the basis for healthcare 4.0. Immunify.Life uniquely prevents the proliferation of isolated applications by combining all medical interaction and information in one 'self-sovereign identity' and comprehensive de-identified disease register. This comprises medical treatment records, disease immunizations, information about chronic conditions and associated communications.

This is made possible by utilizing artificial intelligence, big data mining and the latest security measures including a proprietary blockchain. The end result is an app able to be integrated worldwide and easily adapted to any healthcare market.

It can be plugged into healthcare IT systems, including HIS connection via HL7/FHIR, medical imaging standards like DICOM and robust compliance with IHE and HIPAA. ISO 9001 and ISO 27001 certification will provide ironclad assurance of security of Immunify.Life as a professional-grade medical IT solution. The need for e-vaccination certificates tied to immutable credentials is driving technology innovations in the healthcare sector.

This proves the importance of Immunify.Life as a unique platform to integrate all medical interactions and information flows between patients and healthcare professionals.

Support System Tiers

Immunify.Life will support three user tiers.

All patient users will automatically become Tier 1 Users upon signing up to the Immunify.Life platform and can upgrade at any time.

Tier 1.

No cost. Available to users who wish to receive medical treatment and participate in the Immunify.Life ecosystem. At first medical visit they consent to their data (de-identified) being shared with third parties and partners in the system.

Tier 1 users have access to their information at all times and benefit from an integrated view of their medical history, immunization schedule, appointments, prescriptions and any other data exchanged between their medical and/or insurance providers.

Tier 1 users can be rewarded with IMM tokens upon registration and benefit from any behaviour-based incentives provided by Governments and NGOs as part of Immunify.Life's incentivised program.

The complete medical record is accessible by healthcare workers, pharmacies and laboratories in the users country.

Tier 2.

Tier 2 allows users to purchase a digital Vaccination Certificate (which will be NFT) and store it in their wallet. Each certificate would cost \$25.

Individual vaccination records for both Tier 1 & 2 will be captured and be accessible by treating healthcare workers.

The respective healthcare worker can also be paid a fee in IMM tokens for recording the treatment data correctly in the system. Users can further opt in to allow their data to be made accessible to interested parties who pay a yearly license fee in IMM tokens.

Tier 3.

Organizations such as Governments, donor NGOs, research organizations, can pay fees to access de-identified real time and longitudinal (ongoing) treatment data.

Data will be accessed utilizing one of the most sophisticated Artificial Intelligence engines globally. This will allow for both accurate real time tracking of disease, and granular treatment diagnosis and outcomes. Organizations who wish to access this data will hold a predetermined balance of IMM.

Support System Tiers

1. Patients.

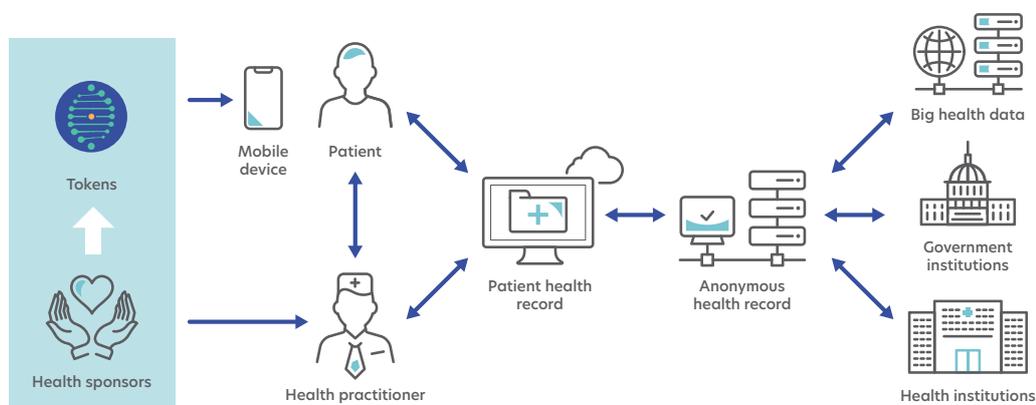
Equal access to health data for all.

Immunify.Life aggregates patients' health data to create a single medical record that can be accessed anywhere, any time to enable ongoing coordinated treatment. Users will retain ownership of their data and should they consent to share their anonymized data, will also be able to earn rewards for sharing their data and for achieving defined medical goals (such as receiving a COVID-19 vaccine or completing follow-up treatment such as required for treating HIV & TB, health checks etc).

Every patient who gives consent or performs a required health related action is incentivized through the issuance of a token wallet as part of the enrolment or health monitoring process. Their data can then be consolidated to contribute to Big Health Data outcomes.

Immunify.Life for patients.

Equal access to health data for all.



2. Donor organisations and NGOs.

Third parties can access accurate real time medical treatment data consolidated from individual consultations. They will also be able to directly monitor the impact of their donations and interventions by providing an important impact assessment tool.

Tracking the health actions through incentivised tokens will dramatically reduce inefficiencies around distribution of medical stockpiles and related fraud, theft and mismanagement. It will enable clear insights into health trends and the impact the treatment is having.

User Incentivization

Immunify.Life will enable Global Health Sponsors to ensure the rapid adoption of gathering health data.

Major global health funding and development agencies alongside private sector and corporate donors will be able to provide direct catalytic incentives to patients and health practitioners alike to encourage rapid adoption of the data collection process.

All sponsor resources may be tracked and shared via the use of the Immunify.Life token (IMM), enabling incentives/tokens to be exchanged for targeted goods or services.

The distribution and use of all Immunify.Life incentivized tokens enables tracking of redemptions and the ability to measure user behaviors.

The Immunify.Life incentivized token will provide donors with a game-changing method for immediate measurement of donor impact.

Health regulations.

Through secure Immunify.Life data, regulatory bodies will have complete confidence in key data around regulated health initiatives such as vaccination passports e.g. to verify that travelers and migrants entering a new country or workforce have been effectively vaccinated with a WHO-approved vaccine.

Platform stack.

The Immunify.Life Blockchain is a system of non-custodial, interoperable, decentralized, and multi-chain smart contracts that support the data privacy requirements of a patient record system. Immunify.Life integrates a DeFi element into its structure, providing a bridge to connect the existing economy of Ethereum-based DeFi products to the growing healthcare market worldwide.

Using the transparent attribute of blockchain with smart contract technology, Immunify.Life creates a system where users can mint NFTs as a self-sovereign identity and connect them to NFT certificates that are built in their wallets, essentially working as an identification document across borders.

Technical Architecture of Immunify.Life

Immunify.Life's technical architecture was designed upon three core principles:

1. Transparency.

In order to transparently track the distribution of financial aid from source donors all the way down to recipients, the Immunify.Life Token (IMM) on a public blockchain will ensure this requirement is met.

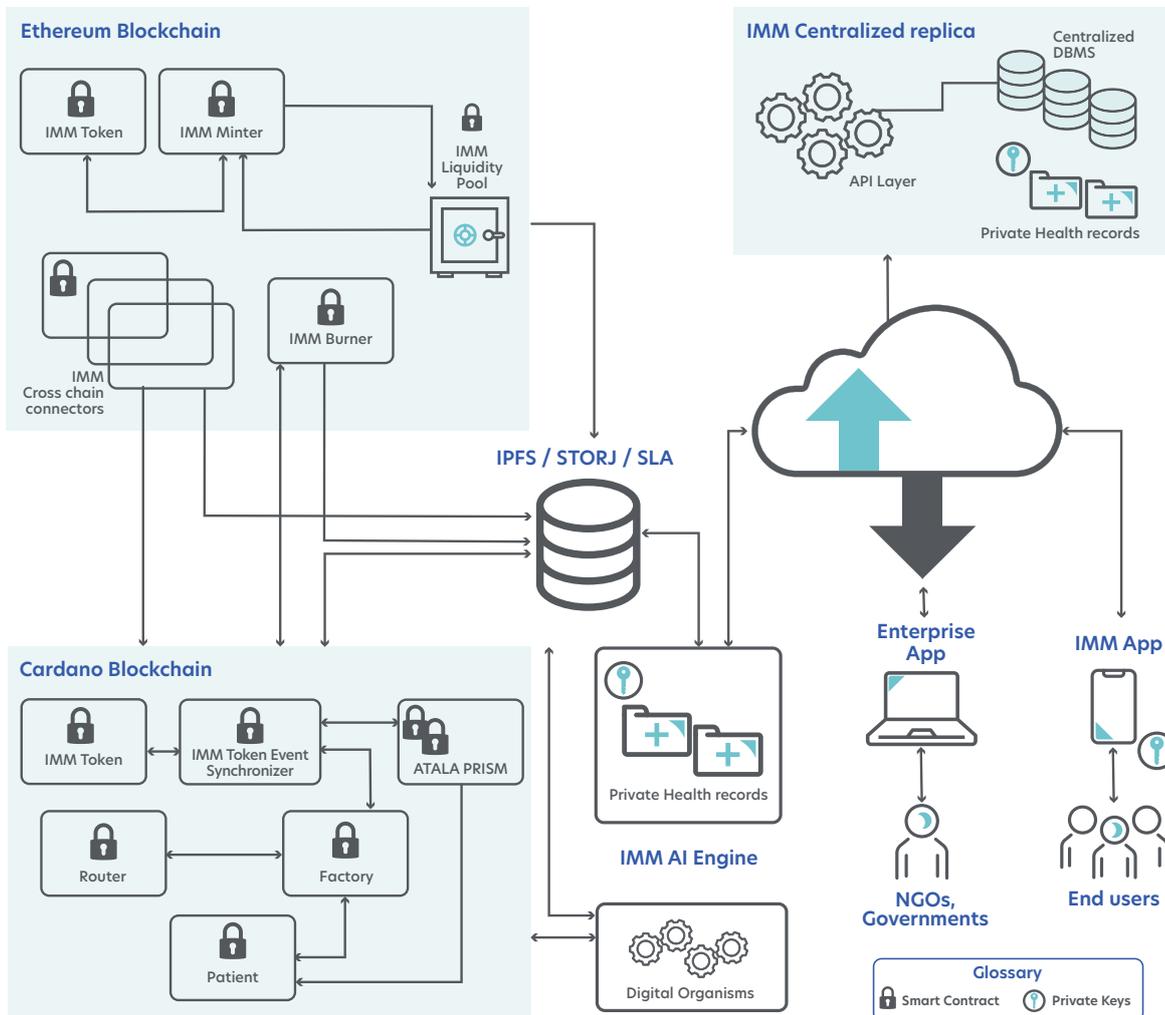
2. Data Privacy.

By heavily leveraging web 3.0 tech (decentralization) Immunify.Life Electronic Health Record (EHR) will be collecting patient and disease related data. In order to maintain patient data privacy Immunify.Life's Engineering team have designed an innovative storing mechanism. The three layered encryption architecture ensures only appropriate and relevant data is shared with approved parties. This ensures privacy and anonymity is maintained throughout the data sharing process.

3. Data Security.

A combination of blockchain based Smart Contract and Traditional Security models ensure data access and updates are strictly controlled. Every access and update and creation is recorded on the immutable blockchain.

Technical Architecture of Immunity.Life



Each actor will be uniquely identified via the **SSI** model (Self Sovereign Identity), plugging into the Atala PRISM solution on top of the Cardano blockchain. Making use of NFTs (Non Fungible Token) following the ERC721 standard or similar, as well as Cardano's CNFT.

The **SSI** implementation provides the right level of empowerment and incentives for the weaker actors in the ecosystem to become active players by leveraging access to their private information in a secure, fair way arbitrated by market prices.

Each actor will have one or many roles (hence incentives) in the system: Person/Patient, Physician, Clinic, Government, Travel Regulation Agency, Research Lab, NGO (Donor), Insurer.

Technical Architecture of Immunify.Life

A key aspect of how we plan to preserve the privacy of all the information belonging to each actor while making it public 'on demand' is by using the private key in the actor's wallet to encrypt large chunks of data 'client side' and persisting it in the decentralized system (IPFS or similar) in a way that will only be able to be decrypted by using the end user's explicit permission and only storing pointers of aggregated data: 'hashes' at the blockchain layer.

At the moment of any exchange between two or more parties, new key pairs will be generated client side and exchanged asynchronously between them using a hybrid centralized/decentralized messaging broker (Whisper alike or RabbitMQ) for the private information to be exchanged securely and decrypted **only at the client-side endpoints**.

Immunify.Life - Blockchain data flow.

Patients medical records access

Patient gives informed consent to share medical data to medical professionals and/or third-parties. This data is then decrypted with the patient's authorization recorded in the private Immunify.Life Blockchain.

At the same time a transaction record is saved to the chain including identification, IP, and date/time.

Doctors/hospitals upload/download anonymized medical records

Doctors, hospitals, pharmacies and laboratories retrieve from the secure server the data described above. This data is then decrypted with the doctors' authorization recorded in the private Immunify.Life Blockchain.

Authorization for the above upload and retrieval is provided to the Doctor/hospital under the rights management access authorized by the patient.

At the same time a transaction record is saved to the Immunify.Life Blockchain including identification, IP and date/time.

On subsequent visits to the clinic, pharmacy or laboratory, all transactions are linked to the patient record and updated over time to build a complete record.

Researchers/pharma extract anonymized medical records

Scientific researchers and pharmaceutical companies can retrieve de-identified data generated on demand by the Immunify.Life artificial intelligence data crawler engine.

Users are incentivised to license their data to organizations to use personal data in a legal, responsible way.

How to Access Immunify.Life

AI powered dashboard.

The device agnostic platform is built on top of a private blockchain and accessed via an AI powered dashboard.

The platform is designed to be user friendly to both novice and advanced users alike.

Through a strategic partnership with LTI - Larson & Toubro Infotech, Immunify.Life leverages their AI powered engine for data engineering and advanced analytic LENI.

Wallet/App.

We have expanded the functionality of the platform with the introduction of the digital wallet, so that users can store and access their IMM tokens and their self-sovereign ID NFTS safely.

The wallet acts both as a passport and a savings account for each user. It holds all medical records, treatment information, immunization status and personal identifiers. It forms the core element of a user's digital identity that's stored in the digital wallet on the Immunify.Life Blockchain.

The wallet collects and protects all biological, and geospatial data and users decide how they want to utilize it. Medical records are central to this identity. The cloud based EHR system provides the basis for capturing patients medical data. This is then processed and segregated via Immunify.Life's three layer Software-Hardware Security model before storing. The EHR system will also have REST APIs for communicating with the Private blockchain, the Immunify.Life app and Immunify.Life website.

Smart contract use cases in the Immunify.Life ecosystem.

The Immunify.Life Blockchain has two important features that are critical in implementing the Immunify.Life solution.

The first is the ERC20 standard token (and it's 'mirrored' counterpart in the Cardano blockchain), which is a tradable instrument based on the Ether cryptocurrency. Transactions among patients, service providers, regulators, and others can use the IMM token as an accounting unit. IMM Tokens are the unique digital asset that is the building block of the entire Immunify.Life platform.

Powered by user-generated and user-controlled health, medical and wellness data, Immunify.Life will allow the exchange of value through the introduction of IMM utility tokens. The goal is to fairly, transparently and securely reward users for better motivation and engagement with their health, vaccination status, medical history and compliance with government restrictions.

The second is the value of the token which is greatly enhanced by the Ethereum blockchain supporting fully programmable contracts, or object-oriented software components, which execute when the token is exchanged between parties. The token's "smart" behavior can be leveraged in many ways, including the user cases below.

Smart Contracts

Immunify.Life smart contracts.

Smart Contracts are integral to making a robust system and will execute in the following manner:

- Address of the individual to receive the rewards.
- Rewards are calculated based on predefined algorithms.

The Smart contract will be responsible for granting and recording access and updated patient data between doctors, diagnostic centres, labs and pharmacies, for example. Upon completion of present events the smart contract will trigger distribution of IMM Tokens where necessary.

In the Immunify.Life system, smart contracts are categorized into two types:

1. Individual contracts will keep a record of the data steps provided by users while the parent contract will get the record from individual smart contracts and perform calculations for IMM Token reward distribution.
2. The user will also have the ability to transfer their IMM Tokens from Address A to B in a matter of seconds, ensuring everything is recorded and is accounted for within the blockchain.

Users would use our Immunify.Life wallet or any ERC compatible wallet, *i.e.* metamask wallet to store their IMM tokens.

Smart contracts architecture:

Router Contract.

Required to route requests to the right versions of the contracts (all the contracts we will design are upgradeable in order to keep improving them during the project's lifecycle).

Factory Contract.

Template contract containing the base code for the creation and upgrades of all other contracts.

Patient Contract.

Contains the pointers to all personal/private information related to the patient, including the list of treatments, vaccines, certificates and future records we will be storing.

Negotiator Contract.

Business logic that arbitrates the information flow between actors.

The 'Negotiator' smart contract is where all the key logic happens, making sure that the 'game theory' of all the multiple users in the system align towards the best outcome that maximizes information rewards.

To leverage the impact knowledge of the ecosystem we are connecting it to the centralized backend AI engine which will be powering all the intelligent decisions that once defined will be automatically coded by the engine and persisted in different versions of the Negotiator contracts.

Smart Contracts

The 'DAO' concept/vision.

The Negotiator Contract will hence be a truly digital organism (Digital Autonomous Organization), mutating and evolving its own code by improving iteratively as the information and power structure change in the complex ecosystem with only one hard-coded non-upgradeable goal: Optimize information rewards for all participants.

This unprecedented self-organizing code structure allows the flexibility of mutating the code to suit the future challenges humanity will face in the next decades, which nobody can predict today.

Tokenomics

[Click here to view tokenomics](#)

Immunity.Life's Market

Healthcare expenditure.

Healthcare expenditure is currently greater than 10% of GDP in many first world economies, and before the pandemic was already forecast to rise to \$US 8.7 trillion by 2020. According to the World Health Organization, infectious diseases remain a major global health risk. Integrating the right health systems will be one of the most important factors to ensure health spending is efficient and benefits all populations.

Africa alone accounts for 24% of the global disease burden with only 3% of the global health workforce and 1% of global healthcare expenditure. The high incidence of infectious disease and poor infant mortality means that life expectancy in some African countries is less than 55 years compared to around 85+ years in many first world countries.

The building block to addressing this basic inequality is through strengthening Africa's health systems.

Major international aid organizations e.g. The Global Fund, Unicef and the Gates Foundation donate billions each year to fight diseases such as HIV, Malaria, Tuberculosis and other diseases. It seems evident that with the current pandemic and rapidly expanding demographics especially in the emerging economies, spending in the healthcare sector can only to grow, and as does the need for improved, secure and scalable health systems alongside it.

Health Systems & Data.

The key profit drivers for the coming years will be a growth in consumer awareness and engagement, rapidly increasing the access to reliable health data as well as standardization of healthcare.

The Immunity.Life ecosystem is designed not only to directly address key healthcare inequalities in developing economies by providing self-sustaining solutions, but also to provide the framework to strengthen all health systems in the process with secure and reliable ways of gathering, tracking and reporting data and impact.

We have chosen to initially focus on Africa as the continent needing the most urgent support to strengthen health systems, it is also one of the most rapidly growing health markets and receives a large proportion of international aid.

Pharma.

Pharmaceutical companies and other corporations spend billions each year to purchase market sales data to inform their marketing approaches and the health information market alone is currently estimated at \$US 54 billion. IMS, a company that sells such data to pharmaceutical companies had revenues of \$US 2.9 billion in 2015, and grew revenue in emerging markets by 32%. There remain huge

Immunity.Life's Market

difficulties in currently obtaining accurate market data in Africa, and the verifiable and secure nature of Immunity.Life data ensures that there will be very strong demand for Immunity.Life's Big Data.

Incentivization.

Immunity.Life's unique incentivisation mechanism (Token) provides an efficient fundraising and real-time impact monitoring mechanism that will enable simplified, scalable and targeted health sponsorship, reducing costs of health campaigns as well as significantly increasing donor ability to monitor impact.

Over \$US 400 billion is donated around the world each year from individual charity donors, governments and NGOs. There were more than 1.4 billion individual donors last year in 2020 alone.

Mobile phone accessibility.

There are over 500 million holders of mobile phone accounts in Africa. Last year sales of smartphones in Africa grew by 50%. Alongside this growth, Immunity.Life will enable more patients to own their health data and contribute to the Big Health Data for their continent as well as globally.

Viable research alternatives.

Research organizations can spend up to \$US 10 billion to develop a new drug. A significant part of this cost is in clinical research and pharma companies are increasingly looking to Africa and Asia to conduct research to reduce costs. Capturing data to support research and development is critical for the Pharma industry as currently close to 50% of all clinical trials are delayed due to problems recruiting suitable patients.

Supporting the growth of eHealth.

eHealth is growing rapidly and will become one of the most important areas of healthcare worldwide. This trend is true across both developed and emerging economies and can be strongly supported by the Immunity.Life ecosystem as well as significantly accelerate the access to further Big Health Data.

Leveraging AI in Health.

Another big market is the AI market, which currently improves medical diagnostics and patients' safety by optimizing clinical diagnostics in radiology and neuroradiology, through the Immunity.Life platform AI.

Affected Countries

Partnerships

We are focused on establishing connections with strategic healthcare players in Africa and Asia, with an emphasis on countries that are part of the Global Alliance for Vaccines and Immunisation (GAVI) and those that receive funding for immunization campaigns under the patronage of the World Health Organization. Gavi's strong network of core partners, the World Health Organization, UNICEF, the World Bank and the Bill & Melinda Gates Foundation means Immunify.Life will be well positioned to become one of the key players in ehealth and vaccine passport technology and provider of Big Health Data.

Tunisia.

Tunisia receives funding from Global Fund to treat malaria and tuberculosis and is receiving support for COVID-19 vaccinations from GAVI. We are having discussions at the ministerial level to provide the Immunify.Life app to capture treatment data.

Tunisia has cumulatively received over \$US 30 million to treat HIV and Tuberculosis.

To date, Tunisia has had close to 200,000 patients diagnosed with COVID-19 and approximately 6,000 deaths. Immunify.Life is working closely with the Tunisian government to adapt and roll out an Immunify.Life app to collect and monitor both HIV/TB and COVID-19 treatments.

Kenya.

We have an agreement to conduct a trial of the technology with the Masinde Muliro University of Science and Technology (Department of Paramedical Sciences). They will leverage their close relationships with local NGOs including the National Treasury of Kenya and Amref Health Africa to roll this out.

Once funding is secured, we plan to conduct a wide scale roll out of the platform in Kenya that will initially target Tuberculosis. Kenya faces a significant threat from HIV (1.14 million people treated by Global Fund, Tuberculosis and Malaria (over 13 million families supported). Kenya has also had over 100,000 COVID-19 diagnoses and close to 2,000 deaths.

Nepal.

After field visits in Kathmandu, we connected with Save The Children Foundation which links to a world-wide grant portfolio with the Global Fund including Africa (South Sudan, Angola, Tanzania), Asia (Myanmar, Bangladesh, Pakistan, Cambodia and Nepal) and Latin America (Haiti) markets. We have a draft agreement NCELL to provide discounted telecom and a way for subscribers to redeem any IMM tokens earned. NCELL is one of the most popular mobile network operators in Nepal and is the first privately owned mobile network operator in

Affected Countries

the country. Nepal has received over \$US 250 million in Global Fund donations primarily for HIV and Tuberculosis. Nepal is also seeing a rapid spread of COVID-19 with over 270,000 infections and over 2,000 deaths. Our local operator has close ties to the present Minister of Health, a relationship that is proving effective in streamlining decisions and successful deployment. Nepal has the potential to unlock many other markets for us.

Cameroon.

Within Cameroon, life expectancy at birth is between 56-59 years, this is despite receiving hundreds of millions of dollars a year in aid for healthcare. There are major issues with HIV, Tuberculosis and Malaria.

Cameroon has been slow in the COVID-19 vaccination roll out due to a challenged and struggling health system. With a population of 26.5 million, only 633 vaccinations are given daily. 0.1% of the population has been vaccinated to date. This is currently one of the lowest in the world (data as of June 20th 2021).

The unemployment rate in Cameroon is over 40% and a large percentage of the population live on less than \$US 2.00 per day.

Immunify.Life has conducted significant early testing and research in Cameroon in four hospitals across the country in partnership with the National Government. The testing was vital in informing the final design of the current Immunify.Life app and ensuring our app is fit for purpose and withstands the various challenges that exist on the ground. We are in discussion with a local NGO to conduct a field study to evaluate the impact of token rewards on patients completing the two courses of vaccinations for COVID-19.

Development Roadmap

[Click here to view Development Roadmap](#)

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