



AFRIHEALTH



Whitepaper.

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1. Introduction

AfriHealth is a blockchain-based platform with a focus on the African healthcare market. As a for-profit organization headquartered in London, it aims to connect high-value customers to the best healthcare services around the world.

This entails the best physicians and hospitals. Innovation is key in its business model as well as putting its customers first.

The use of blockchain encryption to secure contracts helps connect clients to the world of healthcare, which in turn makes qualitative health care more affordable.

AfriHealth is committed to working with stakeholders in a spirit of shared responsibility towards fair medical treatment and is well equipped to be among the best initiatives for member satisfaction and quality of medical care on the African continent.

2. Vision and Mission

We at AfriHealth aim to enforce emergency medical services in the African continent. One of our main priorities is ensuring that every distress call is addressed and if necessary, responded to an ambulance within twenty minutes following the distress call. Furthermore, each citizen should have insurance, be insured with less effort and feel confident in relying on our medical services when required.



2.1 Vision: Connecting the world of healthcare

It is our vision to extend the benefits of revolutionary technology, automation and the 'Internet of Things' to areas with scarce remedial and health amenities. This is all to ensure that everyone has equal access to health care and emergency medical facilities.

Our core values are Innovation, Accessibility, Reliability, Efficiency, Respect, Service to others, Performance, Passion, Integrity, Responsiveness, Responsibility, Reach, Humility and Diversity.

We have three main traits that help us stand out amongst other healthcare services.

Bespoke	Everyone is different and our bespoke healthcare is tailored to suit your needs. AfriHealth's partnership with HMOs has aided in suitable plans for all our clients. We understand that health insurance isn't one-size-fits-all. Our goal is to make sure that you find the solution that is right for you.
Low premiums	With the use of blockchain technology, AfriHealth can cut out lots of unwanted waste in the care delivery value chain. Our waste containment and cost savings are in turn plugged back in the system to generate lower premiums.
Universal	We store individual electronic health records (EHR) using blockchain which assures they are encrypted and secure, and this a distributed ledger enables global accessibility to patient health records, thereby increasing patient access to preferred services as well as more sophisticated health infrastructure and talent.



2.2 Mission: To increase access to healthcare and health-care services by easing accessibility and affordability

Our mission is to provide a comprehensive one-stop solution to citizens of Africa in the event of a medical emergency. This solution is easy to use and affordable which alleviates barriers for good medical care in Africa. AfriHealth will also assist governments across the continent to track drug sales through specialised innovative solutions. This will be a key factor in the fight against illegal drug sales and subsequent abuse.

Goals for the upcoming five and ten years.

Based on sustainable and scalable innovation, the goals of AfriHealth are appropriately ambitious. The table below provides the operational, marketing, and financial goals of AfriHealth over the next ten 5/10 years:

GOALS	FIRST FIVE YEARS	SECOND FIVE YEARS
Market Reach	Presence in at least one country in the five African Regions – West, East, Central, South and North	Presence in at least three countries in each of five African Regions – West, East, Central, South and North
Consumer Reach	Capacity to research /serve at least a million individuals in each market of operations – i.e. five (5) million individuals in total	Capacity to research/serve at least a million individuals in each market of operations – i.e. forty five (45) million individuals in total
Technology Reach	At least five (5) million individuals above eighteen (18) years of age in its databases in each region of operations	At least forty five (45) million individuals above eighteen (18) years of age in its databases in each region of operations

We can summarize the essence of the organization as being sustainable in addressing issues of access to healthcare in African markets.

This through innovative technology and strategic collaboration. This strategy will drive the low premiums for health plans, address the poor level of insurance coverage, increase health delivery options and consequently drive mass access to health care services as well as improved healthcare outcomes.



3. Problems

The medical and health problems in Africa can be considered as highly critical. From research, some key figures indicate a dramatic condition: Sub-Saharan Africa accounts for 13% of the world's population, yet bears 24% of the global disease burden and has only 2% of the world's doctors. Infectious diseases such as malaria and HIV/AIDS cause 69% of deaths.

These numbers mean that the continent bears one-quarter of the global disease burden yet has only 2% of the world's doctors to heal them.

Africa suffers, in general, a severe shortage of healthcare professionals. As a result, millions of Africans still suffer from diseases that would be relatively simple to prevent or treat, but the capacity is not available. Almost half the world's deaths of children under five take place in Africa. The total expenditure on healthcare per capita is approximately 5% of that of Western countries: as little as 1% in sub-Saharan Africa. The health of most people in sub-Saharan Africa remains in jeopardy, with average life expectancy below 50 years. Only members of higher socio-economic classes can usually travel abroad to seek treatment.

As can be expected already, the healthcare sector in Africa cannot be called efficient. Many elements are going wrong or are creating an environment that makes it difficult to run smoothly. What this entails exactly will be explained in the following points that AfriHealth strives to improve in its mission towards better healthcare in Africa.

3.1. Administration

3.1.1. Administration

The administration of clinical services for National Health Insurance Scheme (NHIS) enrollees is achieved via private Health Maintenance Organizations (HMOs) who receive a per-member administrative fee to vet, process and pay NHIS accredited providers. Profitability for these HMOs is thus determined as the number of enrollees registering with these HMOs increase.

To receive payments, providers send bills based on agreed rates at the end of a billing cycle (usually monthly and up to 90 days after a particular service is provided). This situation of preparing monthly bills and the time it takes for HMOs to vet and process payments create the situation where payments for services rendered can be received more than 120 days after the service is provided.

Also, because it is not always known in advance if a service is allowable for a particular patient based on their health insurance benefits, providers are required to contact HMOs for a pre-approval before some services can be rendered.

3.1.2. Book appointments

Doctors, clinics, and hospitals often adopt paper-based appointment systems which cause on the one hand the problem of centralization in efforts and on the other hand the concentration of information in the hands of few individuals.

Even if this system is computerized or automated in some medical centres, it is mostly curtailed to maintain the information in one system or computer thus again defeating the purpose of information sharing and ease of access, as only 1-2 people from the administration of the facility will likely have access to the computerized appointment system.

How then does a common patient make an appointment? One must travel to the medical centres and check for availability until successful or else keep calling the admin department to finally get an appointment.

This becomes tedious to manage for individuals manually. In a region where healthcare attention and superior doctors are in very high demand due to poor health facilities, it is imperative that information regarding doctor's availability is shared and available to a maximum number of people within the healthcare community as well as to the common man.

3.2. Financials

3.2.1. Health expenses

Only 25 % of the African population is covered by health insurance schemes while three fourth of the pie needs to pay healthcare expenses out of their pockets.

Emergency medical services in the African continent are still a far cry from being considered developed or equipped. Specialized medical supplies, medication for rare illnesses and expensive medication have not quite made their way into the African healthcare ecosystem. Many medications and preventive pills, nutrition supplements and childcare medication are not easily available in Africa.

Finally, the common man in Africa may not be aware of details such as the names of medication, leading pharmaceutical manufacturers, ideal dosages, common medication for daily illness, etc.

3.2.2. Widespread low incomes

Perhaps the biggest disease affecting healthcare in Africa is poverty. 95% of the population and 71% of the income remain at the base of the pyramid¹. Healthcare cover in most markets is below 10%, further increasing the burden as residents must dig deep in their pockets to get access to the relatively costly healthcare². Those who can afford treatment often travel to places such as India, Turkey, and Europe³.

3.2.3. Inadequate Public Sector Spending

Universal health coverage is absent in virtually all African countries. Around 60% of health care financing in Africa comes from private sources, and about 50% of total health expenditure goes to private providers.

A vast majority of the region's poor people, both urban and rural, rely on private health care¹. To put the inadequacy of government spending in the region in perspective, almost three-quarters of African countries do not have large enough GDPs to sustain projects of more than US\$100 million².

Government spending is often characterized by inadequate expenditure on primary, secondary and tertiary health centres. Quality standards are typically non-existent or not enforced, most individuals operate in informal systems (in healthcare and other sectors) without inclusion in risk pooling arrangements, and adequate population databases are often lacking. Consequently, African markets are unable to efficiently obtain reliable market information or to effectively deploy resources³.

1. International Finance Corporation (2008): The Business of Health in Africa

2. Infrastructure partnerships: <https://www.mckinsey.com/featured-insights/middle-east-and-africa/africas-path-to-growth-sector-by-sector>

3. International Finance Corporation (2008): The Business of Health in Africa

3.2.4. Inadequate access to finance

African markets are characterized by difficulties in securing financing by entrepreneurs and business operators.

Less than 25% of people living in developing countries have access to formal financial services. By contrast, 90% of the residents of industrialized nations have access to such services. Small firms obtain 5% of their financing through banks, while large firms rely on banks for 22% of financing needs. Consequently, healthcare businesses in Sub-Saharan Africa tend to be fragmented and consist mainly of small and medium-sized enterprises (SMEs) that are often incapable of scaling⁴.

It is important to notice that with AfriHealth, there is an **initial focus on the Nigerian market**. A country where annually US\$1bn is spent on medical tourism⁵. Therefore, it is important to look at how the healthcare system works in this country.

In Nigeria, government-sponsored health insurance is regulated, coordinated and paid for by the National Health Insurance Service (NHIS). The NHIS is responsible for over 50% of insured individuals in the country, with enrollees comprising Federal government workers and their family members (in some cases including parents). Services provided under an NHIS insurance are basic medical services (paid for through per-member-per-month capitation) and secondary and tertiary services (based on an NHIS generated list of services).

Private health insurance in Africa is delivered primarily through the managed care model. In this model, health insurance companies contract with hospitals, clinics, optometry services and dentists to form a provider network that services their clients' needs. Network providers typically sign contracts with predetermined discounted rates for services and are paid either through capitation (per-month-per member prepayments), fee-for-service (at discounted rates) or through a mixture of capitation and fee-for-service. Utilization details from the medical records of clients are regularly submitted to the health insurance companies to ensure compliance with signed contracts and as part of claims adjudication and reimbursement processes.

4. International Finance Corporation (2008): The Business of Health in Africa

5. Investing in Africa's healthcare sector: <https://africanbusinessmagazine.com/sectors/finance/comment:investing:africas:healthcare:sector/>

3.3 Infrastructure and Workforce

3.3.1. Poor Logistics Infrastructure

Relative to advanced economies, most African countries have poor transport infrastructure in terms of sufficiency and quality.

Transport infrastructure to rural areas is discouraging, to say the least. Even within cities, forming effective supply chains is often a big obstacle as bad (or absent) roads and other transport infrastructure result in high vehicle repair costs. Very often the lead times are very long and result in delayed distribution.

Generally, poor infrastructure in Africa is often the cause of business failure even in cases of effective business strategies, qualified teams, and in-depth research and development⁶.

3.3.2. Ambulance Services

Ambulance services in Africa are scarce, to say the least. Most patients are transferred to hospitals by private means as ambulances come at an increased cost with a weak dispatch and connectivity system.

Nairobi, the capital of Kenya, scores well in terms of healthcare facilities and the number of ambulances with close to 100 ambulances operational for a population of three million people.

However, the logistics and red tape involved in calling an ambulance is a bottleneck within that region. A high demanding process of contacting a police dispatcher who tries to connect with various ambulance operators until he is lucky is what one must go through in the event of an emergency – all for an ambulance that does not even possess a GPS to reach the required spot at the earliest.

According to the World Health Organization, the purpose of an ambulance is to reach the distress spot within 15-20 minutes of the emergency call being placed and transport the patient to an emergency medical facility within 20 minutes of having reached the spot. But this rarely happens. In Africa in some cases, ambulances have reached as much as four days later than the time distress call was placed.

6. African healthcare industry on surge: <http://thetimesofafrica.com/african:healthcare:industry:surge/>

3.3.3. Shortage of skilled hands

A major challenge facing the healthcare sector in African markets is the lack of skilled labour.

There are less than 20 physicians per 100,000 people in sub-Saharan Africa, in stark contrast to the more developed regions such as Europe which has about 280 physicians per 100,000 people.

This shortage of healthcare workers can be attributed to the low number of medical schools which are usually under-resourced, with poor infrastructure, outdated curricula, and with low enrolment rates.

Also, the tendency of graduates to migrate out of their countries has prevented sub-Saharan African countries from having an optimal healthcare workforce⁷.

Furthermore, in the average medical facility, the health workers do not have appropriate training or access to continuing medical education. Productivity is typically low. On average, healthcare staffers spend only about 40% of their work time on patient care⁸.

3.3.4. Shortage of facilities

There are significant gaps in the number and quality of facilities, medical supplies and equipment in primary, secondary and tertiary healthcare across African markets. General Electric, for example, says it has just four PET scanners, used to produce detailed images of the body, installed in the whole of sub-Saharan Africa⁹.

However, the greatest gaps in delivery occur in primary care. About two-thirds of primary health care in African countries are provided by the public health system, the remainder by non-profit organizations, private enterprises, or the informal sector (e.g. traditional healers or moonlighting health workers).

Two types of facilities deliver primary-care services in most African markets: dispensaries (small clinics that provide basic consultations, diagnostic services, treatment for routine conditions, and referrals for more advanced treatments) and health centres (which provide the same services as dispensaries as well as certain more advanced ones).

The shortage of both types of facilities makes it difficult for people, especially mothers and children, to gain access to primary care conveniently. Further, the effectiveness of facilities is compromised by significant shortages of medical supplies. The greatest gaps in care de-

7. Africa's Massive Healthcare Opportunity is Underestimated: <https://thenerveafrica.com/12548/african-massive-healthcare-opportunity-is-underestimated/>

8. Strengthening sub-Saharan Africa's health systems: A practical approach: <https://www.mckinsey.com/industries/healthcare/systems-and-services/our-insights/strengthening-sub-saharan-african-health-systems-a-practical-approach>

9. Vate providers sense opportunity in Africa healthcare: <https://www.ft.com/content/a3c4bf38:33d8:11e7:bce4:9023f8c0fd2e>

livery, however, occur at the dispensaries, with the health centers faring little better¹⁰.

3.3.5 Weak management practices

Few dispensaries, health centres, and hospitals use effective performance-management tools in African countries. Many incentives for health workers are misaligned. For example, workers tend to be rewarded for tenure rather than patient outcomes¹¹.

4. Solution

4.1. Overview

Our primary product offering is a comprehensive mobile application (Rigour+) that can be downloaded on both iOS and Android at no cost.

On the Rigour+ application software, users will **be able to upload prescriptions, pay and schedule delivery of their medication**; this service is exclusively for enrollees whose HMO is partnered with our organization.

This application will facilitate as our primary interface with our target audience. It will provide comprehensive solutions to users in terms of the following:

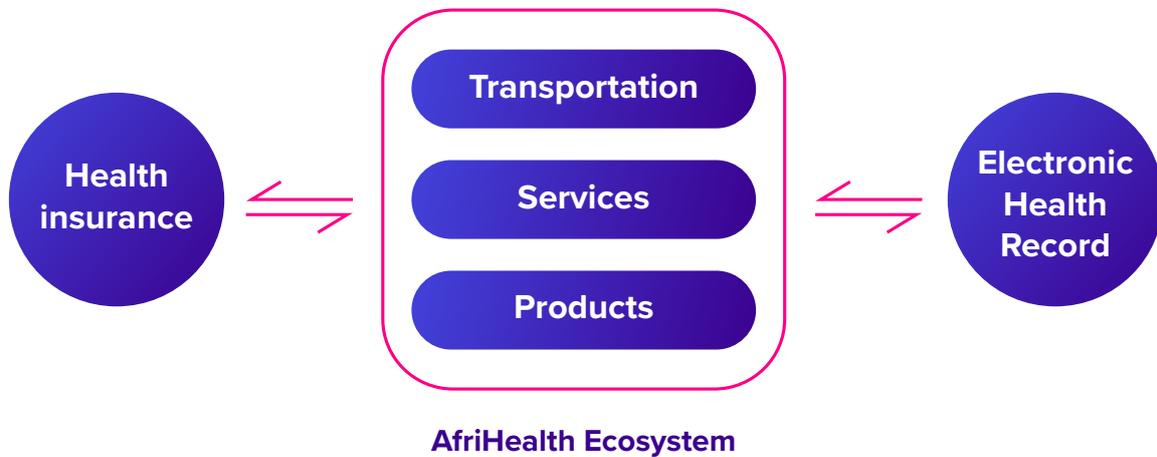
- Getting Health Insurance in just one click.
- Placing and checking the status of distress calls for ambulances.
- Ordering medication and other healthcare products leveraging our exhaustive list of products.
- Booking appointments and checking the availability of doctors in the nearby locations.
- Locating nearby blood banks, diagnostics, hospitals and healthcare centres.
- Providing useful health tips, interviews with doctors, and the importance of healthcare, sanitation, blogs and articles on various such issues related to healthcare.
- The Rigour+ app is designed to support enrollees with medication management, (e.g. provide relevant information for medication consumption, side effects and drug & food interactions that should be avoided); in addition, to assist the HMO by providing reduced costs of chronic and difficult to source medication in comparison to other pharmacy retailers and hospital-based pharmacies.

10. Strengthening sub-Saharan Africa's health systems: A practical approach:
<https://www.mckinsey.com/industries/healthcare/systems-and-services/our-insights/strengthening-sub-saharan-africas-health-systems-a-practical-approach>

11. Strengthening sub-Saharan Africa's health systems: A practical approach:
<https://www.mckinsey.com/industries/healthcare/systems-and-services/our-insights/strengthening-sub-saharan-africas-health-systems-a-practical-approach>



In the following paragraphs, we take a closer look at how exactly Rigour+ works. Different features were considered with the purpose of offering a completely digitalized and integrated healthcare system. Many answers to the problems that were previously discussed we follow.



4.2. Our Application Framework - A Multi-Layer Ecosystem

Our application will be made available to all smartphone users in Africa across service providers and operating systems on the Google Play Store and Apple App Store.

With a user experience built for ease of use and understanding, we will ensure anyone can install our application and get tasks done. By asking an email ID of the user during the application registration, secure usage can be ensured. In case of an invalid sign in or loss of a device, recovery through email will be easy and swift.

The application layout is easy, smooth and conducive. The primary dashboard in the application interface will feature a comprehensive menu or options list for the user to choose and proceed with the appropriate service. Effectively, the ecosystem consists of two layers and these are outlined below.

4.2.1. Main Layers - Electronic Health Records and Insurance

Get health insurance – User can view plans and can buy them easily

AfriHealth will deploy a blockchain-based electronic health records (EHR) system and claims adjudication application (Rigour+) that will, in turn, create cost-savings for private health insurance companies, reduce claims adjudication time, improve payment cycles and reduce the need for excess manpower in hospitals and insurance companies. This makes tasks via AfriHealth very efficient and users will have minimal problems accessing its services.

AfriHealth recognizes that successful execution of this EHR and claims adjudication application requires the participation of superior and high-level hospitals in Africa which have large patient populations and are already familiar with electronic health record (EHR) systems.

4.2.2. Extra Layers

Transportation

Find Ambulance – Raising a distress call and booking an ambulance

This feature will enable the user to book an ambulance based on their current location when there has been an accident or other emergencies that require immediate transportation to a medical facility.

In a few quick and easy steps on our mobile application, the user will be able to raise a request for an ambulance that will reach the desired location in the fastest possible time.

A factor to be noted here is that the user's smartphone must have access to the internet and our mobile application must be enabled to use the internet available on the user's smartphone. Our application requires data sharing, including contact and location information, saving time and facilitating faster arrival of the ambulance.

Where applicable, the ambulance cost will be through AHC tokens, making this a fuss-free experience. For all rides, the users will receive an auto-generated receipt for payment made and a request for feedback on the service to maintain business and economic transparency.

Getting access to an ambulance at their fingertips will be extremely beneficial in the African region which is still plagued with poor access to healthcare facilities even in the 21st century. It is our endeavour and unrelenting effort to make sure Africans can place a distress call in confidence of having an ambulance at their location in less than 30 minutes. After all, access to such a basic facility is an intrinsic human right above all else.

Find Nearby – Users can use this feature to find nearby hospitals and therefore receive the best ambulance services, medical and healthcare attention when required.

To use the feature, users must be connected to a mobile internet network and this network must be enabled to the AfriHealth application. We trust that the features offered will ease transportation methods for those in dire circumstances, overall making a positive difference to health standards in Africa.

Services

Doctor's Appointment – Browsing doctors or specialists in the surrounding areas and booking an appointment with them

Our application eases the process of appointment booking by decentralizing the system and shifting the database and appointment system onto the mobile application. The app will enable you to search and locate specialists for various diseases or ailments such as endocrinologists, bone specialists, paediatricians, gynaecologists etc. along with their clinics and other location of practice, visiting hours, visiting charges and other information.

The application gives respite to polyclinics with various practising doctors with specialities, saving human intervention in this process. On one side, the doctors can access this system



to check their appointments diary for the day in their various practice locations, block out dates and timings when they are unavailable for consultation and manage their time efficiently with minimal human reliance. On the other hand, patients have access to the location of various doctors and specialists and can check for their availability at a medical centre that is most convenient to them. They also have access to consultation charges of the doctor. The details of each patient such as name, age, ailment, medication etc. are also uploaded and saved on the application so doctors can have an advance insight into the patient's condition before meeting them. Once any app user selects a time slot with a doctor and books an appointment with them, that time slot is filled up in the doctor's calendar with the patient details and is no more available for other bookings.

It speaks for itself that on the application, all our users' information concerning patient details such as name, gender, location, appointments, and ailments will be handled with utmost confidentiality and secrecy. There will be no breach or data theft on part of the company, and all individuals signing up and registering on the application too will be required to comply with the terms and conditions of nondisclosure of patients' information.

Find Nearby – Locating blood banks, diagnostics, hospitals or medical centres around the user's location.

This feature enables the app users to find and locate various healthcare-related facilities and centres around their location such as blood banks, diagnostic centres, pharmacies, general physicians, nursing homes, maternity homes and hospitals. This feature will require the user to be connected to a mobile internet network and the user will have to enable the AfriHealth application to access the said network.

Besides the above services, the application will also throw up health tips, sanitization habits, tips on healthy eating, maintaining clean environment and surroundings, nutrition and diet information and benefits of exercise to positively influence the application users to adopt healthy lifestyle habits and improve the entire healthcare ecosystem in Africa.

As our objective is to provide the best ambulance services, medical and healthcare attention in the industry to our users, we hope our above features and services will positively impact health standards and facilities in the region.

4.2.4.Products

Purchase Medication – Placing an order for medication to be bought online

This feature will enable the user to browse and purchase various medication, first aid supplies, medical equipment and utilities and make an online payment for the same just as one would on an e-commerce website. We have structured our application interface to provide basic and important information regarding each medication listed, for the users to correctly identify the right medication in our application, corresponding to what is prescribed to them by their doctor.

Details of all medical supplies on sale are mentioned such as the name of the product, ingredients, manufacturer, usage, ratings & reviews, thumbnail images and prices & discounts to help users make informed purchase decisions, identify the right medication and prevent the purchase of medication that seems similar.



Any caveats or dosage warnings regarding the product are also clearly spelt out to ensure the common man is insulated of his limited medical knowledge. Various quantity denominations are available for products and these will be provided as required, depending on the customer.

The ability to purchase world-class medical supplies at the click of a button in the comfort of their homes will greatly help the African community in substantially improving their health-care ecosystem. It is a basic human right to access appropriate and good medical supplies and we aim to deliver this facility to even the most remote African districts and areas.

4.2.5. The Pharmacy Feature

Using Rigour+, users will be able to upload, pay and schedule delivery of their medication; this service is exclusively for enrollees whose HMO is partnered with our organization.

We plan to open one-hundred brick-and-mortar pharmacy locations throughout the thirty-six states in Nigeria and expand to other countries in Africa with a similar model. Each pharmacy will stock a variety of name brand drugs, generic drugs, and other appropriate fast-moving consumer goods. The pharmacy will provide health services traditionally not offered by pharmacies like quick laboratory investigations (e.g. malaria, typhoid, HIV and pregnancy tests).

Each pharmacy depending on size and location will employ, on every shift, one-two pharmacist, two-three pharmaceutical technicians, one laboratory technician, administrative staff to ensure efficiency and a dispatch driver to deliver Rigour+ prescription orders.



4.3. Market Overview

In 2005, total healthcare spends (fewer pharmaceuticals) in the continent was valued at \$16.5 billion and was projected to have reached \$35 billion in 2016. According to McKinsey & Company, the value of Africa's pharmaceutical industry jumped to \$20.8 billion in 2013 from just \$4.7 billion a decade earlier. This growth is constantly progressing at a rapid pace and experts predict that the market will be worth \$40 billion to \$65 billion by 2028. Growth in size of healthcare in Africa is driven by the following factors:

4.3.1. Urban Migration

More and more people in Africa are shifting from villages and rural areas to the cities. It is expected that by 2025, 2/5th of economic growth will come from 30 cities of two million people or more; with 22 of these cities having GDPs above \$20 billion¹². By 2030, around 50% of Africans will be living in cities, and by 2034, 1.1bn will be of working age, further increasing the demand for improved infrastructure including healthcare provision beyond communicable diseases. According to the International Finance Corporation (IFC), these opportunities are worth US\$35bn¹³.

4.3.2. Increased Government Spending

Government health spending continues rising in Africa towards meeting millennium development goals. The WHO's Commission on Macroeconomics and Health has estimated that most developing nations need to spend \$30 to \$40 per person a year to reach the United Nations' Millennium Development Goals (MDG)¹⁴. Virtually all African nations fall significantly short of this. Communicable diseases such as HIV/AIDS and malaria will continue to be areas of focus by most of the African governments' vis-à-vis primary health centres¹⁵.

4.3.3. Increased Private Investments

The poor situation of healthcare in Africa continues to attract private investors who view the situation as problems awaiting profitable innovative (cost-saving) solutions¹⁶. Business models specific to the African continent will be pursued in contrast to those in the larger markets of developed nations, driven primarily by growth trends of emerging markets such as China,

12. African healthcare industry on surge: <http://thetimesofafrica.com/african:healthcare:industry:surge/>

13. Investing in Africa's healthcare sector: <https://africanbusinessmagazine.com/sectors/finance/comment:investing:african:healthcare:sector/>

14. Strengthening sub-Saharan Africa's health systems: A practical approach: <https://www.mckinsey.com/industries/healthcare:systems:and:services/our:insights/strengthening:sub:saharan:african:health:systems:a:practical:approach>

15. Africa Healthcare Industry Outlook, 2017: <https://store.frost.com/africa:healthcare:industry:outlook:2017.html>

16. International Finance Corporation (2008): The Business of Health in Africa.

India and Brazil. Major investments will focus on advanced diagnostic tools, artificial intelligence and mHealth (digital transformations) to drive costs of delivery down. Mergers and acquisitions are also expected, as stakeholders collaborate to achieve common outcomes (particularly between the life sciences and medical device industries to support the prevention of the onset of chronic and degenerative diseases)¹⁷.

4.3.4. Use of Prevailing Technology

Despite the lack of extensive databases in African markets, many have already achieved high levels of mobile penetration (as high as 85% in some countries).

Internet penetration is also on the rise. Mobile devices have become increasingly common and have been adopted in some countries in sub-Saharan Africa as a force for delivering better healthcare¹⁸.

According to McKinsey, 80% of health care issues can be resolved by mobile phone, at a cost per capita that is 90% lower than that of traditional health care models¹⁹.

In many African markets, mobile health care has become a way to extend the reach of dispensaries and health centers. Health workers regularly travel to surrounding unserved villages (one day a week, for example), bringing basic medical supplies and communication tools.

As a result, it has become possible to have call centres staffed by nurses (with oversight from doctors) who can support community; as well as health workers who use mobile phones or other communication technologies to consult with call centre staff. Though community health workers tend to have only limited training, they undertake health promotion activities and serve as liaisons to more highly trained colleagues. Because almost every village can have its community health worker, the basics of health care delivery have become available to all. Mobile technology may thus be better poised for diagnostics, data collection, consultations, in managing operations (e.g. inventory management), etc., in such African markets²⁰.

An example is the case of General Electric (GE) which adapted its business model through innovative financing schemes to sell portable flip-phone style ultrasound scanners and has trained carriers in remote African villages on how to identify the biggest pregnancy-complication risks. The portable device is typical of adaptations to make equipment more resilient, less power-hungry and cheaper in markets where these are necessary²¹. The figures below provide a breakdown of private health services investment opportunities between 2007 and 2016, as well as promising themes.

Breakdown of private health services investment opportunities in Sub-Saharan Africa,

17. Africa Healthcare Industry Outlook, 2017: <https://store.frost.com/africa:healthcare:industry:outlook:2017.html>

18. Digital technologies can deliver better healthcare to sub-Saharan Africa. Here's how: <https://www.weforum.org/agenda/2017/10/digital:paths:for:better:healthcare:in:sub:saharan:africa/>

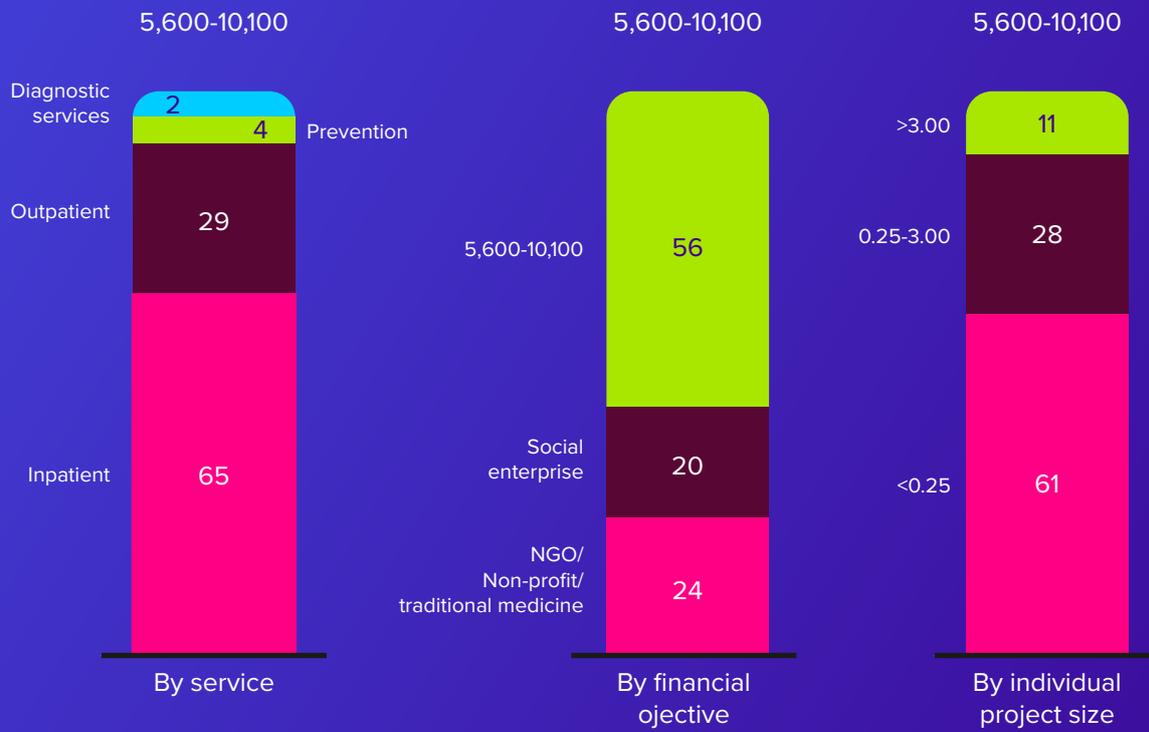
19. Telecommunications: From voice to data: <https://www.mckinsey.com/featured:insights/middle:east:and:africa/africas:path:to:growth:sector:by:sector>

20. Strengthening sub-Saharan Africa's health systems: A practical approach: <https://www.mckinsey.com/industries/healthcare:systems:and:services/our:insights/strengthening:sub:saharan:africas:health:systems:a:practical:approach>

21. Private providers sense opportunity in Africa healthcare: <https://www.ft.com/content/a3c4bf38:33d8:11e7:bce4:9023f8c0fd2e>

2007-2016

Procent, \$ million



Source: Ministries of Health, National Health Accounts, country interviews, McKinsey analysis.

Promising investment themes in health provision

GOALS	EXAMPLES	REVENUE RANGE \$ MILLION	SETUP COST \$ MILLION	DEVELOPMENT IMPACT
Small, hi-end centers	Tanzania Heart Institute (Tanzania), Lagoon Hospital (Nigeria), Bridge Clinic (Nigeria) Lister Hospital (Ghana)	0.2 – 10.0	0.5 – 3.0	Allows the retention of high-quality, specialized resources in country
Network of primary and secondary care clinics	Christian Health Association (Kenya), Biruch Tesfa (Etiopia), Clinic Africa (Uganda)	0.01 – 0.3 per clinic	0.02 – 0.6 per clinic	Improves access within rural regions, providing quality care to underserved populations
Hospitals offering in-house insurance	Kadic Hospital (Uganda), AAR Clinic (Uganda), Selian Lutheran Hospital (Tanzania)	0.3 – 5.0	0.5 – 3.0	Increases accessibility to health care services to regions without establishment insurance systems
High-volume, low cost hospitals	R-Jolad (Nigeria), Nsambya Hospital (Uganda), Selian Lutheran Hospital (Tanzania)	1.0 – 5.0	0.5 – 3.0	Increases access to standardized services within a larger population base
Hospitals with cross-subsidization model	International Hospital (Kampala, CCBRT (Tanzania)	0.2 – 2.0	0.2 – 1.5	Extends affordable care to larger population base, especially the poor
Large diagnostic laboratories	Bio 24 (Senegal), Radmed Diagnostic Center (Nigeria)	0.5 – 3.0	1.0 – 3.0	Improves the overall efficacy of treatment by supporting the diagnostic phase
Telemedicine	Tsilitwa (South Africa)	0.1 – 1.0	0.3 – 1.0	Provides access to specialized resources in rural areas
Specialized doctors covering network of hospitals	N/A (potential model yet to be piloted)	0.1 – 1.0	0.2 – 2.0	Increases access to speciality care across the region

4.4. Competitive Landscape

The highly competitive multi-billion-dollar industry comprises of businesses' health plans, their employees and private individuals. In this industry, prominent national insurance companies like Hygeia, Total Health Insurance Trust, AllCO Multishield and Integrated Health-care seek dominance for customers seeking to purchase insurance packages.

A plenitude of HMOs, both regional and national, also compete. Many companies are already self-insured. Some of these companies use TPAs for outside claims processing while others use insurers or attempt to self-administer. Certain claims processors are also gravitating toward benefits management services. AfriHealth believes an unexplored niche exists that none of the current potential competitors offers. HMOs have gained substantial and significant market share over the past two decades.

Their cumulative share of covered insured employees now exceeds the national commercial insurance carriers by a wide margin. However, these plans have been ruled primarily by cost containment strictures.

Freedom of choice is severely limited: there is a perception that the quality of care is at an all-time low. By providing freedom of choice by way of universal access to care at a fair price, AfriHealth believes a competitive sales advantage exists that will permit attainment of the market shares sought. AfriHealth strategy which also involves directly marketing to HMO's turns our competitors to partners and increases business reach for both parties.

AfriHealth has multiple competitive advantages:

- As a pioneer in this sector, AfriHealth can maximize market size and margins through a blockchain backed-health insurance business model.
- Lower premiums compared to existing health plans.
- Variety of products that meet the needs of unique clients.
- Converting our direct competitors (HMO's) to partners

5. Technology

The business model of AfriHealth is heavily reliant on technology not only in the blockchain space but also in the mobile applications and e-commerce area.

We offer a tech product that will help provide better healthcare facilities in Africa. From the very start, our bespoke product has been internalized and we trust that it will be our mainstay if the AfriHealth business model succeeds.

Hence, we have laid special emphasis and focus on ensuring we build a robust technological framework which is of fundamental level.

Before going into detail on how technology is applied in our application, it is important to have a good understanding of Blockchain and Cryptocurrencies in general. Therefore, a short explanation will be given on how these technologies work. Afterwards, it will be explained how it is implemented in AfriHealth and how it benefits for our features offered in the application.

5.1. Introduction – Why is blockchain essential for the project?

The Blockchain is a ledger, a database, that ensures data accessibility, availability and censorship resistance with consensus algorithms and decentralized network protocols. It allows establishing trust between actors that would otherwise need third parties and middlemen for it to exist. Users can create an account on the Blockchain, similar to an email. While user data is usually not encrypted and publicly accessible, the accounts use public-key cryptography. There is no direct link between a Blockchain account and a user identity.

Regarding trust, specifically in AfriHealth. Medical records can be very problematic since they can be lost and falsified, leading to problems with concerning insurance coverage. Storing medical records on the ledger allows medical records to be immutable and thus eliminating all problems regarding trust.

While privacy and encryption of health records are not, by default, supported by most Blockchains, some solutions make encryption and data privacy on blockchain possible. The fact that public blockchains are decentralized means that the control of the network does not belong to one entity, such as Google or Amazon. However, that also means that any storage of value other than cryptocurrencies, such as files or medical records, can be expensive and not scalable on a database that replicates itself across the computers of users. Therefore, we will further introduce the concepts of side chains, that solve this problem along with the encryption one, specifically.

5.2. Blockchain Technology – Blockchain Agnostics

5.2.1. Ethereum Blockchain

Smart Contracts

Of all the available solutions, the Ethereum Blockchain is currently the most suitable and rich blockchain ecosystem that suits AfriHealth.

Ethereum is the most popular solution for decentralized applications because of the network effect it has gathered. This is understandable because Ethereum revolutionized how people were using and building on the blockchain technology.

Ethereum introduced the concept of smart contracts to the Blockchain. While the idea of contracts that are smart was created by Nick Szabo, an American legal scholar and computer scientist, smart contracts in Ethereum are very different and do not target the idea of a legal contract in an electronic form. Ethereum Smart contracts are simply put, scripts written on the blockchain like apps are written for a smartphone.

This allows to quickly build applications that run on top of the Blockchain database similar to how one can build an application that runs on top of the iOS.

Thanks to smart contracts, AfriHealth can create an application on the Ethereum Blockchain without the need to create a monolithic Blockchain specialized in what we want to achieve. Before Ethereum existed, people were forking the Bitcoin source code and were modifying

it to include all sorts of functionalities. This led to huge, monolithic and difficultly sustainable codebases because Bitcoin was quite monolithic since the beginning.

Because smart contracts exist on the blockchain and that the blockchain is immutable, the code of smart contracts is also immutable once it has been deployed. This is quite problematic if we plan to extend or enhance the functionalities of AfriHealth.

Therefore, we will use a design pattern that will make our smart contracts modifiable. Functionalities will be encapsulated into individual smart contracts like modules and could be easily detached from the main smart contract and upgraded.

5.2.2. Sidechains

One of the two main problems when it comes to Ethereum is the speed at which transactions are propagated through the network and mined (verified and included in the database) as well as the numerous barriers regarding user adoption.

Regarding the transaction speed, roughly 25 tx/sec for Ethereum, the limit can be greatly sped up to thousands of transactions per second thanks to technologies like side chains and state channels.

Sidechains are blockchains that are linked to the main Blockchain. They allow the flow of tokens and other digital assets from the main Blockchain to child blockchains and vice versa. Technically while the main Blockchain, such as Ethereum, has its limits in terms of speed, a sidechain can be more performant or use another consensus algorithm (rules based on which miners can mine blocks) which allows it to be much faster but still be very similar to the main Blockchain.

Sidechains can, for instance, use smart contracts, or can have very specific governance and consensus systems.

In a nutshell, a sidechain is a separate blockchain that is attached to the parent/main blockchain using a two-way peg. That means that tokens can flow easily between the sidechain and the main chain.

In the case of Afrihealth, the tokens can be issued on Ethereum but once they have been purchased, users can transfer them to the AfriHealth sidechain(RigourNET) that will have a gateway payment mechanism between the sidechain and the main chain.

Practically that means that if a user wants to transfer 500 tokens from Ethereum to RigourNET, he will need to lock those 500 tokens on Ethereum in a common pool and mint them on AfriHealth. Of course, this process works the other way around as well. If the user has 500 tokens on AfriHealth sidechain, he can get those 500 tokens back on Ethereum while burning them on the sidechain. There will be a 1 to 1 peg between tokens on the Ethereum and tokens on the sidechain.

This will allow AfriHealth to maintain the economic value of the tokens on a largely proven blockchain such as Ethereum while keeping AfriHealth records and application metadata on the sidechain. This allows a fast and inexpensive solution for scalability and privacy. The AfriHealth sidechain can even incorporate a proprietary symmetric cryptography mechanism or use blockchains like quorum which have privacy built-in.

State channels

State channels are different from side chains but they also provide tremendous improvements in terms of scalability and speed.

State channels refer to the process that allows users to transact “off-chain”, so not on the Blockchain. That means that there is theoretically no limit regarding transaction speed. Transactions and even micro-transactions can be executed almost immediately. State channels can use traditional databases or more decentralized protocols.

The key takeaway is that state channels are not blockchains, unlike side chains. State channels is a concept that allows the creation of a channel between users outside of the blockchain and the execution of transactions whose results are in some way linked to the blockchain they originate from.

Contrary to side chains, state channels are all about quick and fast token payments without the need to wait until the transaction is incorporated in the block. While side chains still need to create blocks because they use blockchain technology, state channels don't suffer from those limitations and are great when it comes to fast and undisputable payments.

AfriHealth is blockchain agnostic, that means that we will choose the technology that suits our mission. While state channels are great for payments, they do not store anything else than the payments. That means that the medical records will need to be conserved either on a sidechain specialized for that or a centralized database.

While we will consider state channels as a future payment method, once we get sufficient traffic, our primary implementation will be done using sidechain technology.

5.2.3. Wallet

The next very important problem when it comes to Ethereum is the barrier of entry. This concerns the user experience. Nowadays, people are familiar with mobile applications, emails, and web apps. But they are completely lost when it comes to the storage and securitization of private and public keys, necessary when using Blockchains.

This is why the integration of the AfriHealth app to a mobile app is essential. Modern web technologies such as React Native or Ionic allow the creation of robust mobile solutions using web languages. Users should be able to manage their accounts, wallets and with the AfriHealth ecosystem from their phones.

5.2.4. The AfriHealth Blockchain[RigourNET]

The vision of AfriHealth is to build a whole ecosystem that is scalable and sustainable. To do so, the AfriHealth ecosystem must lie on top of an architecture designed and optimized for it.

A Blockchain like Ethereum has its pros and cons. Smart Contracts make it possible to build applications on top of Ethereum in record time, however, it also means that all the applications will use the same blockchain. That means that if an application is very successful like crypto kitties were in 2017, it can clutter the network and make the usage of the Blockchain expensive and slow, impacting all the users of the network.

This is why solutions like sidechains and state channels were developed. However, as helpful as those solutions are, they don't come any nearer to an optimized and well thought out architecture.

Application-based sharding is a relatively new concept introduced by the Tendermint Foundation. The ratio legis follows mutatis mutandis the sidechain logic but allows a more scalable and united approach.

While implementations using sidechains are a disorganized attempt to make blockchains scalable, we believe that Cosmos Network powered by the Tendermint blockchain can help to create a large ecosystem of applications living on their blockchain and communicating through a large network of applications using hubs.

The communications are largely intended to be economic. That means that as long as the supply and demand allow it, tokens will be able to flow organically between various actors of the network allowing applications that are part of the cosmos network to “talk to each other”.

5.3. Mobile Application

5.3.1. Integration of the Blockchain layer on the wallet

The mobile application is quintessential to the user mass adoption and will have several functionalities:

The wallet

The wallet is hot storage (connected to the internet) that will store user private keys encrypted with biometrics. It should allow to decrypt the user private keys and sign transaction payloads on demand. This should greatly facilitate user-blockchain interaction regarding payments and authorizations of access

Webview

Users will also be able to access all the functionalities of AfriHealth application directly from their phone. Because the wallet is integrated into the application, users could interact with the AfriHealth smart contracts and its web interface in a very straightforward way.

5.3.2. SDK – Flexible solution to be adaptable by members of the network

Blockchain is all about communities and network effect. This means that we pay specific attention to integrations and partnerships.

We will provide a software development kit (SDK) that will allow third parties and interested users to implement certain functionalities of RigourNET into their applications or services. We will provide detailed API documentation about how AfriHealth should be integrated and work.

5.4. Ecosystem and Token Flows

AfriHealth has built an ecosystem to offer the possibility for its network's customers to pay using either cash or AHC tokens. It is important to note that paying with AHC tokens will include a discount to the products and services of AfriHealth. As such, the AfriHealth network will be extended to crypto sceptics and generate better price stability for AHC tokens, to tidily connect the value of services with discount prices.

5.4.1. Token issuance and Token Supply

AfriHealth will issue 500 Million AHC Tokens. This supply has been determined according to the expected users of the tokens, the size of the network, and the necessity to have a liquid asset (requirement to be listed on the major exchanges).

The whole token supply will not be released immediately on the market - given the necessity to not overflow it with a supply that doesn't match the demand of the token (normal phenomenon at the launch of a Network of Services). As such, AfriHealth will keep a part of the supply in a vault and will release it progressively at each step of the roadmap and growth of the Network.

5.4.2. Token Flows

The tokens will be at the centre of the application. It will be possible, for any person on the Network, to spend their tokens on every layer of the application - from the insurance services to the purchase of Goods. As explained above, the token flows will use sidechain technology to avoid at most the non-necessary transaction fees.

5.4.3. Revenue Model

AfriHealth has a dual revenue model:

1. **Commission-based system:** for the insurance services, AfriHealth will take a commission on all claims resolved within the AfriHealth Network. This commission rate might vary over time, but will always stay competitive.
2. **Direct Sales:** AfriHealth will generate revenues out of the direct sales of product and services including but not limited to the sales of medication.
3. **Ambulance Rides:** AfriHealth will also generate revenue through its ambulance network by charging competitive fees per trip.

5.5. Main features of the App and the Importance of the blockchain

In this part, the blockchain characteristics will be discussed that create value for customers, clients, health insurance companies and providers on the network.

These features give blockchain superior value over current health records management systems used by industry players. These EHR systems tend to be isolated, do not speak to one another even when used in the same hospital or HMO, and are cost centres, generating significant yearly expense for their users.

In contrast, AfriHealth proposes a system that mitigates inefficiencies in service delivery and improves reimbursement processes.

The features of our EHR system are:

5.5.1. Federated Health Records

AfriHealth aims to create federated health records. The idea of linking patients' medical records to various providers and health insurance companies is very powerful and will provide a lot of value consisting in the quick update of medical history, instant claims adjudication and denial free claim reimbursements.

Since users are in control of their medical record, they will be able to share it with whomever they choose through the mobile application.

For example, Ngozi is signed with Ideal HMO as a client. She can use any of the two hundred facilities on the HMO's network. She travels from her home in Enugu to Abuja for a conference and needs to see a doctor while there. On the blockchain EHR, details of her visit to the doctor in Abuja are updated in real-time to her primary physician's records in Enugu. Because the health records are federated and consultable on the Blockchain, the Abuja clinic will receive immediate authorizations to carry out covered treatments. The clinic will treat her, assured that it will be paid in full by the HMO. The clinic can also determine the best treatment options for Ngozi because it can instantly access her medical records from her Enugu provider. In a few months, Ngozi travels to the UK and can share her medical records with doctors there with just a few taps on her phone.

5.5.2. Automated Claims adjudication

Since contracts between enrollees and insurance companies are linked to the smart contract ecosystem on the Blockchain, it so happens that once a patient is seen by a doctor, prescribed tests are automatically flagged off as authorized (or not permissible) under the enrollee's contract, thus preventing the hospital from billing HMOs for services not covered under an enrollee's plan.

The smart contract that will run the application logic of RigourNET can be automatically updated based on real-life events and will hold a single source of truth. Agreed rates between

the provider and the health insurance company could, for instance, be included in the smart contracts and payments can be made based on the rates

Moreover, it is possible to link International Statistical Classification of Diseases and Related Health Problems (ICD-10) codes to the smart contracts. Those codes classify all current diseases and medical conditions as well as the Current Procedural Terminology (CPT).

5.5.3. Interoperable Health Information Management System

Interoperability refers to the ability to use information across several domains and by several actors. Privacy and immutability are core features of the blockchain technology and can help to create interoperability in an EHR and bring significant value. This means that the Blockchain will be a single source of truth that different actors can use.

If longitudinal patient data is entered into the blockchain, in our case the AfriHealth sidechain, health insurance companies will have the capacity to analyze that data to determine actuarial risks with very high levels of certainty.

Because we will encrypt medical records on the Blockchain, this data can be shared with insurance sponsors e.g. employers without identifying individual members as key cost drivers. Also, the presence of large patients' medical data stripped of personal identification markers creates opportunities to understand health dynamics and can inform population health interventions, as well as provider and insurance company strategies.

5.5.4. Immutable (auditable) track record

Immutability is a concept that lies at the core of Blockchain technology. Once information is written in the Blockchain, it can't be erased or hidden and will remain there forever. This concept is a double-edged sword because on one side it is very important to have a clean audit and traceability of what is happening on the Blockchain (e.g. monetary transfers). But on the other side, it is very difficult to hide private and sensitive data.

Therefore, we encrypt medical records and sensitive data on the blockchain with a proprietary solution.

Thanks to immutability coupled with privacy, AfriHealth greatly lowers the chances of falsification and fraud of medical records while maintaining user privacy.

5.5.5. Digital Identity Management

Digital identity management is a big topic in 2019. People can use blockchain to store primary, non-modifiable personal identification attributes – for example, names, gender, and date of birth - and thus create high assurance digital identities for themselves that are verifiable by interested and relevant third parties. This identity can, for instance, be linked to their medical records.

Blockchain is one of the most promising technologies that can create digital identity management systems, and a healthcare based blockchain application can contribute significantly to solutions in this regard. Because insurance is largely employer-based and because patients will, in their best interests, give accurate answers to personal identity markers (sometimes verifiable by performed tests), the AfriHealth EHR's blockchain network of enrollees can become a high assurance digital identity database that can be leveraged by identity authentication services such as Civic.

To meet the high assurance digital identity characteristic, the AfriHealth EHR will assign unique identifiers to all participants on the network. For example, several people on the network might go by the name Dauda Musa and these must be made distinctly identifiable from each other. This solution not only gives users distinct identities but creates high assurance digital identities that can be leveraged in other sectors, not only in healthcare and insurance.

6. Go to market strategy

6.1. Market Entry

6.1.1. Market Entry Objective

The objective for AfriHealth is to take advantage of the increasingly significant growth in healthcare markets, especially in the insurance industry, and eventually become the number one brand for health plans in Africa.

In just the past few decades African healthcare has spiked and most of its people have greatly benefited from this growth. It is without a doubt that this expansion will only grow even faster and this needs to be parried with the services that AfriHealth offers. By entering markets in Africa, we will make a positive contribution to one of the largest continents in the world.

The AfriHealth insurance provides an innovative solution to health access issues as it eliminates the universal problem of everyday logistic clutter and provides convenience for HMOs, providers and members.

6.2. Market Entry Rationale

Market Entry will typically begin with the establishment of an AfriHealth Housing Centre. AfriHealth centres will be in major cities in different markets.

These centres will also constitute “country offices” where growth will be driven by both marketing and business development, as it relates to partnership development and management.

Each AfriHealth Centre will be the hub of operations in the market of establishment and shall operate according to the strategy outlined for that market, taking into consideration

the market peculiarities.

Expansion into markets will be determined by how well market conditions fit the AfriHealth model. Market entry decisions will take into consideration the differences between African markets.

At a high level, these considerations will include the situation of private versus public healthcare delivery; the nature of private players, and the opportunities within the private sector space.

Such decisions will, however, be subjected to objective ranking. An example (i.e. subject to modification) is provided in the table below:

S/N	MARKET FACTOR (I.E. PREVAILING EXPENDITURES)	WEIGHT
1.	Predominance of private sector healthcare services (a)	30%
2.	Predominance of for-profit amongst private sector healthcare services (b)	25%
3.	For-profit accounts for above 50% of inpatient & speciality care revenues (c)	20%
4.	For-profit accounts for above 50% of outpatient revenues (d)	15%
5.	Above 10% insurance coverage (e)	10%

Nigeria will be the first market of entry for various reasons. This is based on its market size (largest population and GDP in Africa); the predominance of private sector healthcare services (58%), the predominance of for-profit organizations amongst private sector healthcare services (52%), high share of for-profit revenues in inpatient & specialty care services (72%) revenues, and high share of for-profit revenues in outpatient care services (65%). Its centralized location in Africa is also a critical consideration factor. Thus, AfriHealth expects successful and fast growth in the Nigerian market once entered.

6.3. Target group

AfriHealth believes in the successful execution of this EHR and claims that judgment of the application requires the engagement of private health insurance companies looking to improve payment cycles and reduce excess manpower that is typically spent on call centres for pre-authorizations, claims adjudication and reimbursement processing.

They also want to adopt smart contracting that issues automatic pre-authorization, prevents the manual entry of utilization and billing records by provider and HMO staff; and overcharging by provider billing departments.

This approach helps the health insurance company streamline its business operations and eliminates excess staff that issue pre-authorizations to network providers via phone calls. It also eliminates the tasks of entering utilization and billing information onto paper sheets by providers, re-entering of the same information by HMO staff onto a billing software, manual adjudication by claims; and delayed processing by compliance and finance units.

Secondarily, AfriHealth will require the participation of superior and high-level hospitals in Nigeria which have large patient populations and are already familiar with electronic health record (EMR) systems. Thus, our market approach will include engaging top players in the health services industry to join our network to create a secure, federated, longitudinal electronic health records system that can be accessed and updated in real-time by all parties with valid clearance to enter the system. Our market approach will include partnering with identified superior facilities to join the EHR/claims adjudication network.

Prioritization criteria are defined as: Firstly, feasibility which aims to improve the likelihood that a significant number of network members can be engaged to successfully join the AfriHealth blockchain network. AfriHealth also strives to work on the cost of implementation, which refers to the financial cost and political manoeuvring required to successfully engage key players to join the network.

Finally, the company recognizes that attractiveness to other networks is crucial so it will focus on the likelihood that network providers will see the benefits of switching to a new EMR based on a blockchain, and will be willing to overcome switching costs in the short term.

6.4. Marketing edge

6.4.1. Price

The pricing of AfriHealth services will be in tandem with its diverse contracts with individual health plan offerings and eventually directly by a provider engaging in services. In essence, its pricing will compete at different levels depending on the level of healthcare required and the chosen subscription.

However, its pricing will typically reflect its cost leadership strategy by being benchmarked against the most affordable alternatives. AfriHealth aims to offer affordable services that satisfy its clients' desires and needs.

6.4.2. Positioning

AfriHealth will position itself as the premier health plan administrative service with both quality and cost advantages relative to its less flexible competitors. Members will appreciate AfriHealth health plan administration and consultation services.

AfriHealth will leverage its competitive edge:

By working on competitive customer attention, since beyond the fact that the entire or-

ganization adopts a customer-centric approach to business, all AfriHealth service offerings concentrate on providing the customer (HMO's and Members) with the exact type of service that meets their needs. Creating A+ sales and sales support to partners by providing the tools (collateral, demos and presentations) as needed, approach for client acquisition and channel mix (direct sales) and training support.

Furthermore, AfriHealth cannot forget about cost advantages by forming meaningful strategic alliances with HMO's and by leveraging cost savings from the application of blockchain technology, AfriHealth can offer top-quality services at a reasonable price by taking advantage of the proficiencies of individual partners.

6.4.3. Placement

AfriHealth will be available for service support and member interaction in the following places:

First, at centres which consist of personal centres (non-shared) located in central cities and towns within markets. This will house corporate structures within those localities. Second, at offices which include the shared offices for co-production with HMO's and providers. Third, electronically since AfriHealth aims to have an electronic presence.

Using an appropriate CRM tool, clients and patients will be able to interact with AfriHealth support service using mobile and other ICT devices to request information and technical assistance, update medical records etc. Lastly, via its website to deliver both engaging and valuable content, PR and advertising, internal and external marketing.

6.4.4. Promotion

AfriHealth insurance products will be promoted through the following channels:

Brand development by creating a unique and consistent brand identity, and direct marketing (B2B) by targeting and engaging large HMOs via direct meetings, emails, telecommunication etc. Further, with the use of online activities which includes online write-ups and articles, search engine, optimization activities, social media platforms, email marketing, digital advertisements, and SMS marketing.

On top of online activities, there is also traditional media which will include radio, television, billboard and print advertisements, as well as programs on radio and television as is relevant to educate the market about its services as well as how to access them. Then there is the word of mouth and celebrity endorsements where these means of promoting AfriHealth will largely be done by licensed practitioners such as nurses and community workers as well as public figures who will serve as influencers.

6.4.5. Partnerships

In this section, we cover the importance that the network is developed first by doing part-

nerships with each dominant institution of every sector to progressively developing the AfriHealth network of transportation and pharma. Multiple signs of interest for potential partnerships have been shown by renown insurers such as Aiico, Health Partners and Hygeia.

When AfriHealth finally enters a market, it is crucial for strong partnerships with supporting companies to be made to better expand the network. Overall this will mean benefits to all parties involved, with details that will be discussed in extensive meetings. Close partners will aid AfriHealth in its widespread reputation and growth so that it gets closer to its mission of providing a comprehensive one-stop solution to citizens of Africa in the event of a medical emergency.

Furthermore, since the execution of AfriHealth's planned electronic health records system and claims adjudication application will likely require the participation of superior and high-level hospitals in Africa with large patient numbers and familiarity with electronic health record systems, partnerships are a major factor in the company's marketing strategy.

7. Product Development

In the past year, AfriHealth has successfully achieved concept generation which has defined the idea of healthcare record storage and insurance facilitation on blockchain technology, along with having found solutions the main problems in the African healthcare landscape such as inadequate access to emergency services, lack of transparency and inefficient health data management.

More recently, both a feasibility study and team setup have been achieved, and now AfriHealth is looking towards its platform development and then in the next year or so, launch of its beta version for the mobile application Rigour+. Soon after, the official launch of the public version for Rigour+, which will aid in the expansion of the AfriHealth network.

8. Token Sales

By the first quarter of 2020, AfriHealth aims to hold a private equity sale in a seed round and IEO sales complemented with the launch of the beta version for Rigour+ as discussed earlier. The following quarter, AfriHealth hopes to have a public sale and token distribution to existing and potential clients of the company. This will be before the official launch of the public version.

9. Team

Our core management team has conceptualized and nurtured this idea from scratch to

bring it to what it is today. The organizational structure of AfriHealth is designed to fit its purpose. It consists broadly of a medical and business development structure for healthcare administration and business growth respectively. AfriHealth is managed by a team of highly skilled professionals with vast experience and capabilities that span the field health care delivery and health care business. The team is led by a Chief Executive Officer/Managing director (CEO/MD) and supported by a Chief Operations Officer (COO), Chief Financial Officer (CFO) and Chief Technical Officer (CTO). The team is also backed by a group of competent advisory board members comprising industry captains with extensive business profile and experience.

Following is a brief insight into our management team and their areas of work:

9.1. Co-Founder & CEO

The highest-ranking executive in our organization, the CEO is entrusted with the responsibility of making corporate decisions, managing the overall functioning of AfriHealth and acting as the primary representative of AfriHealth. He will be the main point of contact between the investor board and the second in line managers of AfriHealth.

9.2. Strategic Alliances

The Strategic Alliances wing will assist the CEO of AfriHealth in planning, developing, communicating, executing and sustaining strategic initiatives and plans at a corporate level for the betterment of AfriHealth.

9.3. Blockchain Advisor

The blockchain advisor is entrusted with ensuring that the blockchain space in AfriHealth functions smoothly and all transactions concerning the purchase and sale of cryptocurrency are consistently being executed more and more economically and efficiently. He also works towards imbibing and applying any latest technological and operational improvements in the blockchain space to AfriHealth's operations.

9.4. Chief Technology Officer

The CTO develops and charts out the technical direction and initiatives for AfriHealth at the organizational level. The organization must be abreast with the latest technological developments to aid functioning and reduce operating costs.

9.5. Head of Operations

Entrusted with overseeing the daily operations of the organisation, the COO of AfriHealth reports to the CEO regarding ongoing business operations in the firm and consistently working towards bringing about greater operational efficiency in the organization.





AFRIHEALTH