1 THE CASE FOR BLOCKCHAIN TECHNOLOGY IN THE AFRICAN INSURANCE INDUSTRY

A. INTRODUCTION

Over the years, the insurance industry has been one of the late adopters of technology across its value chain. However, this has improved in the recent past with the proliferation of insurtech initiatives in different parts of the world including Africa. There is a growing consensus among industry stakeholders that technology is one of the dominant forces that will shape the future of the industry considering the myriad of challenges begging for answers particularly high expense ratios and operational costs which have led to increasing pressure on profit margins. Today, the adoption of technology is no longer a luxury but a necessary business enabler across different industries and the insurance industry is not an exception. One of the technologies expected to bring significant value proposition to the insurance industry is **blockchain/Distributed Ledger Technology (DLT).**

The insurance industry has not yet been fully disrupted as the sector moves and evolves very slowly. Although the reinsurance sector has witnessed continued technological advancement, there has been little or no change in its core operating model. There is a growing acknowledgement that the insurance industry is at an inflexion point and that digitization / technology needs to be embraced to respond to the challenges at hand. In Africa, some of the issues of utmost concern to reinsurers are the high outstanding cedant balances, evolving regulatory environment, volatility of results and a very competitive marketplace. Different companies and industry initiatives worldwide are exploring the business potential of blockchain /DLT technology across the (re)insurance value chain.

B. BLOCKCHAIN AND SMART CONTRACTS

Blockchain is a distributed and tamper-proof digital ledger that provides a shared single source of the truth between multiple trustless parties using cryptographic technology to allow each participant to utilize the ledger in

a secure way without a need for third parties. According to Frost and Sullivan, blockchain technology has the following properties:

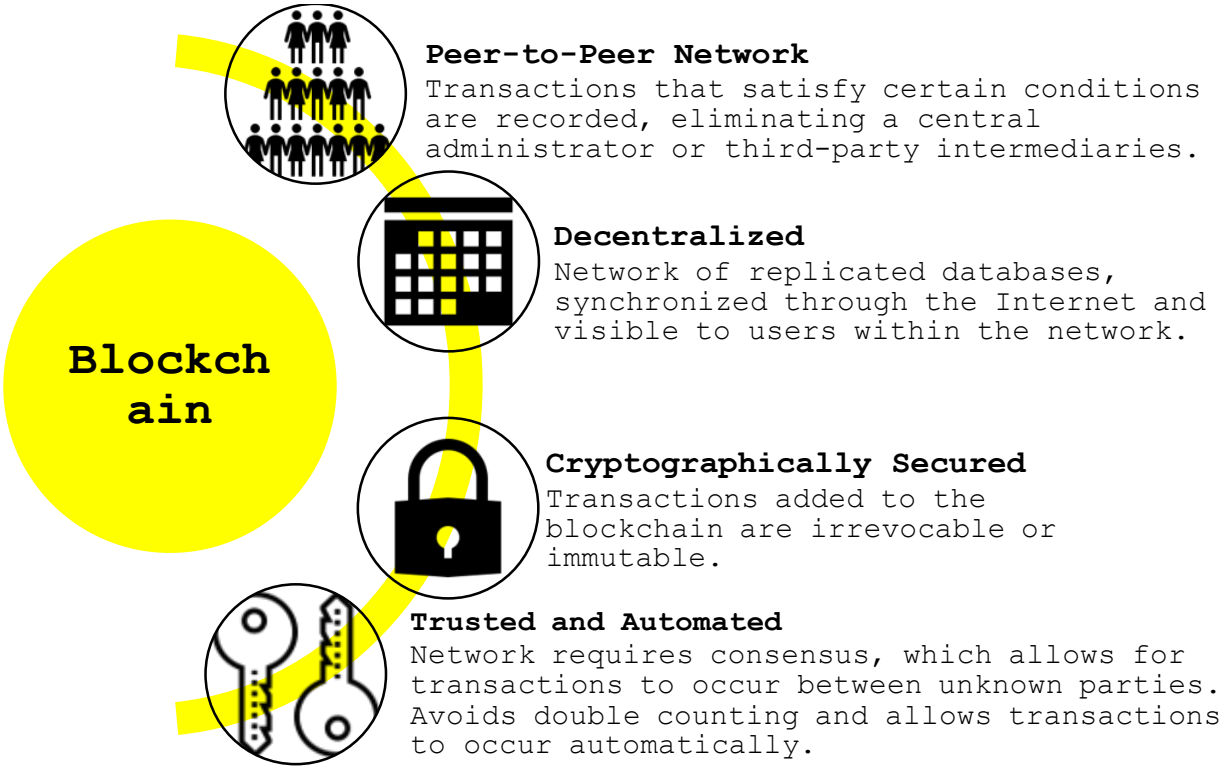

Figure 1: Properties of Blockchain
Adapted from Frost and Sullivan[1] (2018)

These properties of blockchain are the differential value proposition that makes it relevant today.

What are the differences between Blockchain and Distributed Ledger Technology? On a Blockchain, everybody gets a copy of every transaction. When you make a deal on Distributed Ledger Technology, you can tailor smart contracts and send data only to those that need to know.

One of the most practical applications of Blockchain in the insurance industry is a smart contract also called "self-executing" contracts. A smart contract is a piece of software that stores rules for negotiating the terms of a contract, automatically verifies the contract and then executes the agreed terms when triggered by an authorized / agreed event encoded into the

[1] Properties of Blockchain: https://ww2.frost.com/wp-content/uploads/2018/03/Edited_Frost_Prospective_-_Role_Of_Blockchain_in_Precision_Medicine_2nd_March_PS.pdf

contract via its underlying blockchain on which it is stored. This is illustrated below in Figure 3 by eliminating the need for intermediaries as well as driving transparency in transactions.

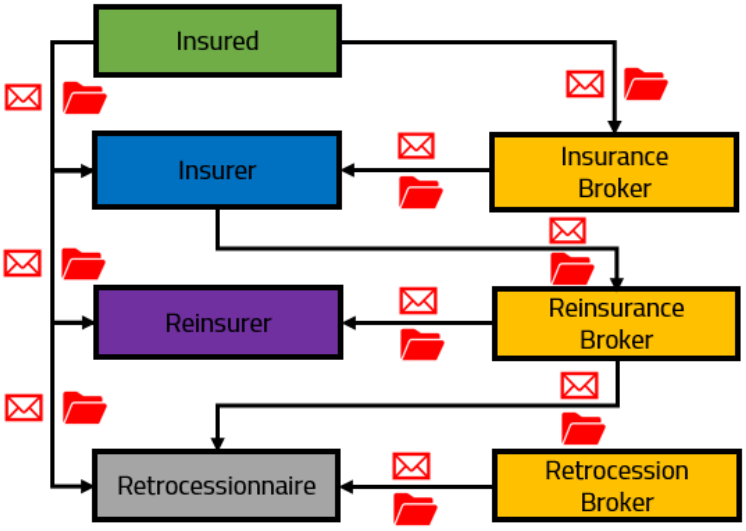

Figure 2: Traditional Value Chain in Reinsurance

The smart contract is an interesting innovation in the insurance/reinsurance value chain. The role of intermediaries will be redefined and it is expected that they will add more value to the process.

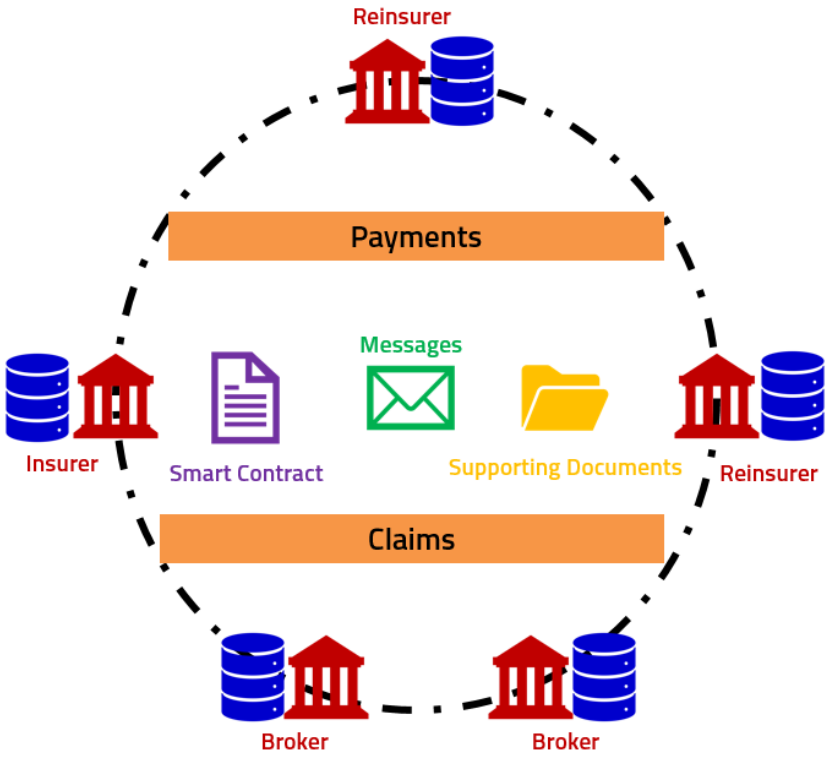

Figure 3: Redefinition of Value Chain using Blockchain

C. BUSINESS CASE FOR BLOCKCHAIN/DLT

The insurance industry is faced with numerous challenges across its value chain. These challenges fall into any of the following categories:

1. **Frictional costs:** The industry has significant frictional costs as it is largely paper based in many countries. Based on the illustration in Figure 2, the insured expresses the need for insurance which is sent to an insurer or insurance broker. An insurance contract is proposed in collaboration with the different parties to the contract up to the retrocessionaire. This contract negotiation process sometimes requires printing the contract multiple times and then sending via courier services for endorsement leading to cumbersome sign-offs. In the process, the latest versions of the document may not be the same across the value chain. In some cases, it is difficult to maintain an audit trail across the documents.

   A practical example is having a large and complex risk involving multiple stakeholders. For instance, the risk is sourced by an African insurer and then placed by two (2) local insurance brokers with two (2) local co-insurers following the domiciliation of risk. The remainder of the risk

is then placed by an international reinsurance broker with three (3) regional reinsurers and four (4) international reinsurers for the business to be fully booked. The administration could be prone to errors, cumbersome and expensive. Blockchain/DLT has demonstrated the potential to simplify the contract administration process throughout the contract cycle.

2. **Operational inefficiencies:** There are also significant process delays and since different stakeholders sometimes maintain different versions of documents, reconciliation is quite cumbersome. In Africa, most reinsurers have high receivable elements in their balance sheet due to the struggles with reconciliation. With the enactment of IFRS 9, the trend will no longer be sustainable for reinsurers. Process delays have significant impact on results especially in the area of claims notification which influences claims reserves.

   A practical example is the inconsistency in statement of accounts as applicable to an insurance broker based in South Africa writing insurance business in East Africa through some local insurers. The insurers sometimes write business with a local reinsurer in East Africa without providing updated information to the insurance broker involved in the process. This happens sometimes for fraudulent reasons or complexities of records management such that the reinsurer and insurer give statements to the insurance broker with different transaction information that is sometimes irreconcilable. Blockchain/DLT has the potential to address these concerns as the single version of the truth.

3. **Moral hazards:** Moral hazards is a real concern in the insurance value chain. Moral hazards arising from any participant to a reinsurance contract goes against the terms and conditions to get undue advantage. It could be as a result of lodging fictitious claims, altering cession information or misrepresenting material facts about a risk.

   A practical example is the administrative burden of implementing the requirements of inspection clause in insurance contracts where there are multiple parties. This will normally aim to verify whether the insurer is adhering to the terms and conditions of a reinsurance contract. The way the clause is executed could adversely affect future business relationships. The incidence of fraud and inconsistencies in bordereau

information and treaty cession notes is a moral hazard as some players alter information on risk cessions, premium payments, claims reserves, cash calls and claims payments. Blockchain promises the immutability of transactions and consistency of information. Maintaining a single version of the truth is a value proposition of blockchain/DLT as it promotes transparency.

In general, the way in which information is exchanged today is inefficient, expensive and has both security and human vulnerabilities based on the following challenges: high cost due to administrative friction; regulatory reporting requirements; increasing number of complex contracts; paper-based processes; lack of standards; trust concerns with respect to data. Blockchain/DLT based on existing proof of concept from industry stakeholders in Europe and America has the potential to improve efficiencies, traceability, confidentiality and auditability. The technology can also help with increasing business opportunities for African insurers and reinsurers based on the ability to identify available (re)insurance capacity on the African market.

To determine the suitability of Blockchain in the reinsurance industry. Dr. Adrian McCullagh[2] applied the FITS model to the technology. The acronym FITS stands for: Fraud, Intermediaries, Throughput and Stable Data. The model is a relatively cost-effective procedure to determine whether the development of a blockchain/DLT business case is really a worthwhile exercise. It is in effect a precursor exercise that can assist in finalizing a position on whether a blockchain deployment will solve a particular problem. The model is applied to the insurance industry as shown below:

[2] FITS Model: https://www.linkedin.com/pulse/blockchain-technology-commercial-panacea-every-dr-phd-dr-adrian

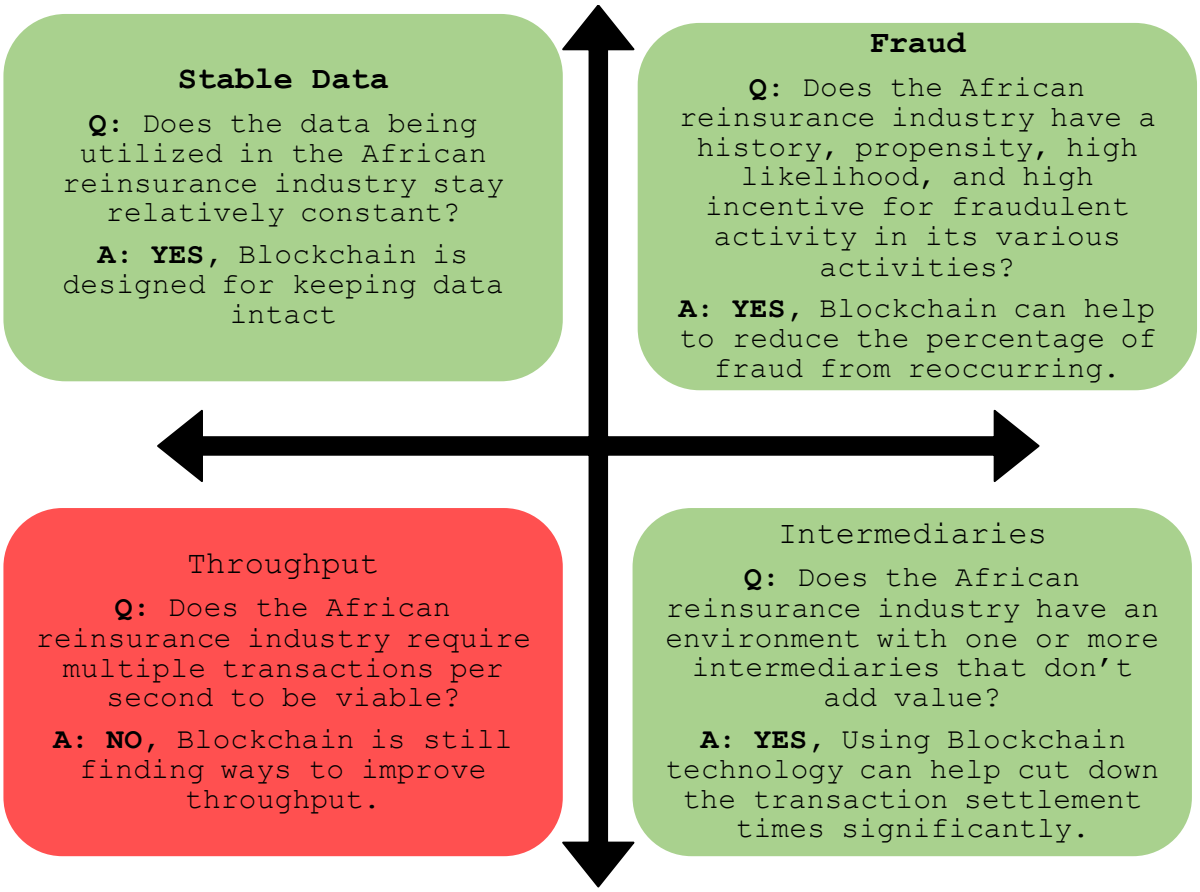

Figure 4: FITS Model for Blockchain

From the assessment above, the business case of the African reinsurance industry fits the profile of a niche for which blockchain/DLT is relevant.

D. BENEFITS OF BLOCKCHAIN/DLT

PwC[3] in a study found out that blockchain/DLT has the potential to enhance risk understanding and open a $5-10 billion cost saving opportunity through faster, more efficient and more accurate placement, claims settlement and compliance checks in the reinsurance industry. The study described that the expense ratios of the industry are typically around 5% - 10% of premiums and the potential gains from both efficient data processing and reduction in claims leakage and fraud indicates that the blockchain/DLT solution can eliminate 15% to 25% of expenses.

[3] Blockchain: The $5 billion opportunity for reinsurers

The findings have been applied to the African reinsurance industry as shown below, based on industry data provided by Atlas Magazine for Gross Written Premium[4], Net Profit [5]and Shareholders' Fund[6] in its annual ranking of over 40 African reinsurers.

Item ($000)	**2013**	**2014**	**2015**	**2016**	**2017**
Gross Written Premium	3,436,288	3,582,704	3,232,210	3,578,897	4,034,753
Net Profit	367,683	331,629	321,839	287,389	352,411
Shareholders' Funds	2,655,696	2,746,215	2,735,897	2,960,626	3,205,537
Return on Equity	**13.85%**	**12.08%**	**11.76%**	**9.71%**	**10.99%**
Expense Ratio*	343,629	358,270	323,221	357,890	403,475
Blockchain Efficiency*	85,907	89,568	80,805	89,472	**100,869**
Net Result *	453,590	421,197	402,644	376,861	453,280
Return on Equity*	**17.08%**	**15.34%**	**14.72%**	**12.73%**	**14.14%**
Expense Ratio**	171,814	179,135	161,611	178,945	201,738
Blockchain Efficiency**	25,772	26,870	24,242	26,842	**30,261**
Net Result **	393,455	358,499	346,081	314,231	382,672
Return on Equity**	**14.82%**	**13.05%**	**12.65%**	**10.61%**	**11.94%**

Table 1: Blockchain in Reinsurance Efficiency Gains

**: This row uses the upper bound of 10% for expense ratios and 25% indicative savings*
***: This row uses the lower bound of 5% for expense ratios and 15% indicative savings*

[4] https://www.atlas-mag.net/en/article/african-reinsurers-ranking-according-to-2017-turnover
[5] https://www.atlas-mag.net/en/article/ranking-2017-of-the-african-reinsurers-according-to-net-result
[6] https://www.atlas-mag.net/en/article/ranking-2017-of-the-african-reinsurers-according-to-shareholder-s-equity

In the African reinsurance industry, it is evident that there are potential efficiency gains between **$30-100 million** based on the 2017 data. The gains will improve the Return on Equity of the market from **10.99%** to between **11.94% (+0.95%)** and **14.14% (+3.15%).**

E. INDUSTRY INITIATIVES

Blockchain adoption is a market-driven initiative for efficiency gains which no single insurer or reinsurer can derive any benefit from by doing it alone. Based on this critical factor, different industry stakeholders have formed several consortia to facilitate information exchange between competitive parties.

1. B3i

The Blockchain Insurance Industry Initiative (B3i) was formed in late 2016 as a collaboration of insurers and reinsurers to explore the potential of using Distributed Ledger Technologies within the industry for the benefit of all stakeholders in the value chain. The progress of the B3i Initiative manifested itself in the incorporation of B3i Services as a fully fledged InsurTech company based in Switzerland. As per B3i website, the mission of B3i is to:

- Create a DLT based network through the adoption of standardised systems and protocols
- Through the network, enable the market to optimise processes and capital allocation and generate significant cost savings
- Offer network users a variety of integrated applications from B3i and partners

B3i's purpose is to provide an ecosystem which provides efficiency improvements and cost saving opportunities as well as enabling profitable growth through innovation and new business opportunities. It will also facilitate increased quality and trust through common standards, data, resilience and strengthened security. B3i is currently made up of 20 shareholders in the industry based in North America, Europe, Asia, South America and Africa.

2. The Institutes RiskStream Collaborative™

The Institutes RiskStream™ Collaborative is the risk management and insurance industry's first enterprise-level blockchain consortium that brings together industry experts and developers to advance insurance-specific use cases via *Canopy*, RiskStream's interoperable blockchain architecture. This is an industry-led consortium collaborating to unlock the potential of blockchain across the insurance industry. It is composed of 30 different companies and it intends to adopt blockchain technology to build solution to decrease transaction cost, optimize consumer experience, speed up process and enhance the security of data exchanges between different parties.

3. Fédération Française d'Assurance (FFA)

FFA brings together insurance and reinsurance companies operating in France, representing 280 companies accounting for about 99% of the market. In 2017, fourteen insurers forming the Blockchain working group of the FFA's Digital Standing Committee **trialed this technology for** exchanging data on contract cancellations under the **Hamon Law.** The purpose of this initiative is to bring together insurers and set a governance body that facilitates the respect of rules within competitors whilst homogenizing their working techniques in order to facilitate data sharing.

4. Open Insurance Data Link (OpenIDL)

The open insurance data link is an initiative created by the American Association of Insurance Services (AAIS) and IBM. OpenIDL is a blockchain platform whose main function is to enable efficient, secure and permission-based collection and sharing of statistical data. One of the major strengths of this platform is that it eases the burdensome process of statistical data reporting that has no value for insurance carriers and provides insufficient information to regulators. This open platform allows statistical data sharing which includes policy data, premium data, claims data and loss experience data to AAIS from all its members as an authorized statistical agent and advisory organization. Their advisory services are used by over 700+ member insurance companies and 52 US regulators who use this information for compliance purposes.

All these initiatives have adopted different implementation models which are worthy of consideration by African (re)insurers. Some of the existing and emerging models are:

i. **Consortium-Based Model:** The coming together of insurers and reinsurers to set-up a company to explore the potentials of blockchain/DLT as adopted by B3i, FFA, The Institutes and Open IDL. In this model, the company will be wholly-owned by the market players.

ii. **Subscription Model:** This is an emerging model in which a technology company builds the technology platform for blockchain and (re)insurers pay a subscription and/or transaction fee to use the platform. This is based on a middleware-based agnostic blockchain platform.

iii. **Partnership Model:** This is also an emerging model in which a technology company builds the technology platform for equity in a company to be formed for the initiative. This allows partnership with either the existing consortium-based companies or the emerging subscription model.

African players could begin to explore these options in a bid to maximize the potentials of the technology.

F. CONCLUSION

Blockchain/DLT has demonstrated its value proposition to the insurance and reinsurance industry. Industry initiatives are at different stages of maturity in the quest to unlock value. Africa cannot be left behind in this revolutionary change in the (re)insurance industry. At the moment, the African (re)insurance industry is experiencing volatility in returns and every player needs the efficiency gains proposed by blockchain/DLT. Although the technology is at its infancy with concerns from some industry watchers, its anticipated benefit of about **US$30-100 Million** annually is worthy of consideration. It should be noted that the competitive position of each player will not be threatened but improved efficiencies across the value chain which is a win-win for all market participants whilst unlocking more value from existing intermediaries.