Information Paper on

Blockchain Technology in Insurance

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ASSOCIATION OF KENYA INSURERS
P. O. Box 45388-00100, Nairobi
AKI Centre, Mimosa Rd, Mucai drive, Off Ngong Rd
Tel: 254 20 20273/330-3
Mobile: 0722 204149 | 0733 610325
Email: info@akinsure.com
Website: www.akinsure.or.ke

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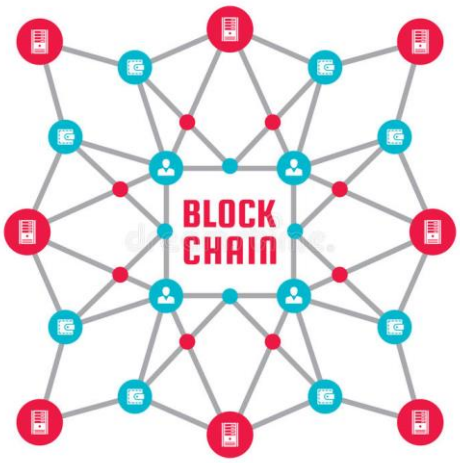
1.0 PREAMBLE

Blockchain technology is part of the fourth industrial revolution that will bring exponential changes to the way we live, work and relate to one another mainly due to the adoption of cyber-physical systems and Internet of Things.

As implementation of smart technologies continues, connected machines will interact, visualize entire production chains, verify the authenticity and make decisions autonomously. This revolution is impacting all disciplines, industries, and economies.



The insurance industry must continue to embrace new technologies to remain competitive. This paper explores opportunities in blockchain in the insurance industry

2.0 WHAT IS BLOCKCHAIN?

Blockchain is a decentralized, distributed ledger technology that can store immutable complete transaction histories enabling peer-to-peer transaction in one of the safest environments.

2.1 Key Characteristics

- **Decentralized**: Blockchain technology does not rely on a central point of control, verification comes from the consensus of multiple users.
- **Distributed**: shared with peers (computers in the blockchain network) where each user has a full copy of the ledger and participates in confirming transactions independently, making the process highly transparent

- **Immutable (Secure):** Blockchain is designed to store information in a way that makes it virtually impossible to add, remove or change data without being detected by other users i.e. Recorded transactions cannot be altered without having the consensus of the entire blockchain network participants. Since all participants have a copy of the entire blockchain, they can detect any tampering and thus, all parties know that they can trust their records.

3.0 HOW BLOCKCHAIN WORKS

A blockchain is a continuously growing list of records. Blockchain collects and orders data into blocks, and then chains them together securely using cryptography. Each block contains a cryptographic hash of the previous block, a timestamp, and transaction data.

3.1 Steps

- A business transaction first is recorded
- A block representing the transaction is created
- The block is shared with peers in the blockchain network
- The block and the transaction is validated by all the participants in the network.
- Once validated the block is complete and it is timestamped
- Other peers may also be sending their blocks simultaneously, the timestamps ensures the data is added in the right order, avoiding duplicate entries and all participants have the latest version
- A new block of data joins the existing block to form a chain and it is secured using a hash, a cryptograph that makes an unbreakable link between blocks, it becomes permanent and unalterable.

Data can be freely exchanged without compromising privacy and data security; by ensuring sensitive data is only shared with parties that have a need to see it in each instance. This provides a faster, safer way to verify key information and establish trust.

3.2 Smart Contract

A smart contract (intelligent contract software) is a contract written in computer code describing a transaction step by step. The block is linked to a smart contract that automatically triggers transactions when a specific predefined condition on a blockchain are met. A smart contract is a self-executing agreement where the terms between buyer and seller are directly written into the code itself, these mechanisms are unalterable, almost impossible to hack, and helps guarantee that both sides to an agreement aren't ripped off.

Smart contracts also allow for more complex transactions to be carried out between two anonymous parties without the need for a central authority, enforcement system, or legal guidance. Essentially, this means that smart contracts can be programmed to enable a wide variety of actions.

3.3 Smart Contract Application in Insurance

Blockchain (digital ledgers and transactions) and smart contract concepts can be applied to insurance policies.

An insurance policy is an agreement between the insurance company and the consumer. As long as the insurance policy conditions are clear and payout triggers are objective, such a policy can be written into a smart insurance contract.

If you're an insurance provider, you can use smart contracts to facilitate the terms of the policy. Every aspect of the policy will be recorded in the smart contract. The policy holder will review the terms and agree to the contract. As long as the policy holder continues to meet the terms, such as paying their premiums, the smart contract will keep the policy in effect.

Once there is a claim, the smart contract system, automatically provides claims payment to the policyholder. This speeds up the insurance payment process and keeps the entire system automated and efficient also reducing the piles of paperwork and errors.

The smart contract system helps eliminate claims processing costs, prevents insurance fraud, and improves customer satisfaction through immediate claims payment.

4.0 WHY BLOCKCHAIN

Distributed Ledger technologies have the potential to be a key game changer in the insurance industry. Moving transactions onto a secured shared ledger, significantly transforms and streamlines business processes and systems and have a huge impact on a transparency, stability and efficiency and is a huge step forward for the industry.

4.1 Enables Seamless Data Sharing

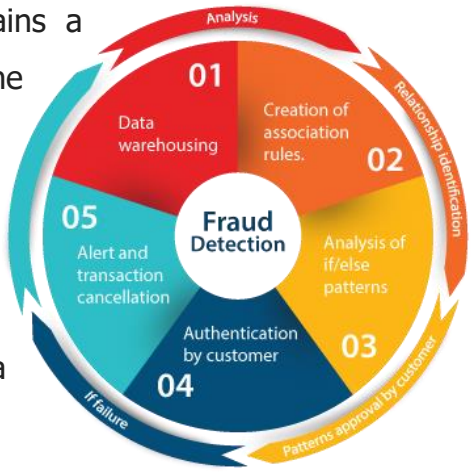
Each customer data is increasing exponentially from multiple policies per customer and also fueled by Internet of Things. Blockchain technology assists with combining and sharing data obtained from different sources and make it

easy to access and control also ensuring sensitive data is only shared with parties that have a need to see it.

Blockchain technology enables data to be captured from various sources and updated/validated by multiple participants at the same time without altering existing data. The up to date and secured data is also accessible seamlessly by all the users in the blockchain network.

4.2 Enables Fraud Detection and Prevention

Since the blockchain process is transparent, maintains a centralized database, and takes consensus from all the parties. When each transaction has been logged in a blockchain network within or across organizations. Instantly, an insurance company is able to verify the authenticity of a customer, policy or claim and identify fraudulent cases e.g. multiple claims from a single incident.



4.3 Boosts Operational Efficiency across the Insurance Value Chain

Quick data access in a shared ledger enables automatic policy execution, since there is less burden on gathering, reconciling and submitting documents. Consider, for example, a re-insurer, insurer and broker consolidating their policy data and storing it on a distributed ledger cryptographically. The underwriting and application process could have significant efficiency gains for the insured and the insurer, reducing the processing time to near real-time.

Real time data processing enables automatic initiation of claims by smart contracts reduce cost and increase operational efficiency by eliminating the role of third-parties and enhances customer experience due to faster claims processing during customer distress.

5.0 USE CASES IN INSURANCE

5.1 Motor Insurance

Telematics connected on cars can measure and transmit real-time information to the blockchain system on driving behavior (speed, braking etc.); driving duration and frequent routes. This has led to usage based insurance innovation, opening up opportunities for pay-as-you-drive insurance policies that incorporate this data into a smart contract.

5.2 Crop Insurance

When processing a crop insurance claim, the insurer might compare satellite images, weather station data, and drone videos to photos supplied by the insured. This automated scrutiny can detect fraudulent claims before they're ever subjected to human review.

5.3 Travel Insurance - Flight cancellation or delay

Due to availability of flight information the smart contract system, automatically provides claims payment to the policyholder without claiming if the relevant flight is delayed or cancelled.

5.4 Marine Insurance

Consider a ship transporting an insured refrigerated cargo. Due to telematics, sensors in the cargo containers can communicate accurate information about the location, temperature, humidity and atmosphere of the cargo. This information can be updated in a smart contract on a blockchain platform in real-time, enabling an automatic pay-out to the customer if the cargo is spoiled by high or low temperatures. This saves the insurance company time and money while providing the customer with a better experience.

5.5 Life Insurance

With collaboration and proper structures smart contracts enable automatic life insurance processing through input from death registries and or medical centers for direct processing, which eliminates the need for claims initiation by dependents or beneficiaries.

5.6 Reinsurance transactions

By securing reinsurance contracts on the blockchain through smart contracts, the blockchain can simplify the flow of information and payments between insurers and reinsurers, increasing operational efficiencies.

5.7 Health Insurance

Through the blockchain, medical records can be cryptographically secured and shared between health providers, increasing interoperability in the health insurance ecosystem.

6.0 CONCLUSION

Blockchain has numerous use cases in a wide variety of industries, including finance, energy, supply chain management, health, data storage and more. Despite this, adoption will not happen overnight, however, trends are already emerging. While the time factor must be kept in mind, lack of knowledge, setup costs, scalability, absence of regulation, resistance to change are some of the challenges that need to be solved before we can see blockchain adopted at a mainstream level.

Given the current technological advancements, the revolution will entail a convergence of technologies: blockchain, artificial intelligence and the internet-of-things.

The core benefits of blockchain technology are being explored across the global insurance industry, with example collaborative initiatives from the Blockchain Insurance Industry Initiative - B3i; RiskBlock Alliance; Blockchain advisory council (formed by LIMRA).

Insurance stakeholders need to collaborate and position themselves to take advantage of the numerous opportunities and further efficiencies that blockchain and its convergence with other new technologies will deliver over the coming years.